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EXTERNAL SCIENTIFIC REPORT

on the

Contribution of meat inspection to animal health surveillance[1]

in

Bovine animals

Prepared by COMISURV[2]

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ABSTRACT

The objective of this work was to assist a working group (WG) under the Animal Health and Animal Welfare Panel in the development of models of the meat inspection (MI) system for bovines and to investigate the probability of detection of specific diseases and welfare conditions within that system. A list of diseases and welfare conditions was provided by the WG. Three scenarios were considered; one with inspection tasks implemented according to current EU legislation, one with only visual inspection and one where risk categorisation based on a hypothetical public health risk formed the basis for subsequent inspection. Definitions of typical and mild cases as well as detection probabilities were elicited from experts. Overall probabilities of detection at ante- and post-mortem MI were estimated, as well as the proportion of infected/affected animals in the population successfully detected, alternatively, the probability of detecting one or more cases of the infection if present at the design prevalence or higher. For five diseases and welfare conditions, the effectiveness of MI relative to other surveillance was investigated.The results show that a change from the current inspection to "visual-only" resulted in a significant reduction in the probability of detection at MI for respiratory diseases, cysticercosis, and particularly for milder case of fascioliasis and bovine tuberculosis. Similarly, a significant reduction in the fraction detected was seen for cysticercosis and for bovine tuberculosis. A move to visual inspection was not considered as having an impact on surveillance for the exotic diseases considered. The effects of risk categorisation by public health risk were limited, but impact was once again seen for cysticercosis and bovine tuberculosis. The role of MI within the overall surveillance system proved to be relatively higher for foot-and-leg disorders, an important welfare issue for dairy cows, and for fascioliasis where surveillance by clinical observations (clinical surveillance) is minor or absent. Meat inspection was regarded as having a high probability of detecting foot-and-mouth disease or bluetongue, but so did clinical surveillance. For bovine tuberculosis control programmes are more efficient in identifying cases in the population; however meat inspection will nevertheless serve as an important quality parameter for evaluation of control programmes.

KEY WORDS

Meat inspection, bovine, detection, infectious diseases, welfare conditions, sensitivity, scenario tree

SUMMARY

In summary, the results show that a change from the current inspection to “visual-only” is expected to result in a significant reduction in the probability of detection at meat inspection (combined AM and PM inspection) for respiratory diseases, cysticercosis, fascioliasis and for bovine tuberculosis. For fascioliasis and bovine tuberculosis, this was seen for milder cases in particular. Similarly, a significant reduction in the fraction detected as positive by meat inspection (“abattoir surveillance”) (based on AM and PM inspection combined) was seen for cysticercosis and for bovine tuberculosis. A move to visual inspection was not considered as having an impact on surveillance by meat inspection for the exotic diseases and welfare conditions considered.The effects of risk categorisation by public health risk were limited, but impact was once again seen for cysticercosis and bovine tuberculosis.

The role of meat inspection within the overall surveillance system seem to be relatively high for foot-and-leg disorders and for fascioliasis, where surveillance by clinical observations (“clinical surveillance”) is minor or absent. For bovine tuberculosis, control programmes are, overall, more efficient than meat inspection in removing infected animals from the population; however, meat inspection is a sensitive tool for following up on control programme performance. Therefore, the reduced probability of detection seen with a visual-only inspection procedure is likely to have a strong negative impact on bTB control.

With regard to the detection of introductions of foot-and-mouth disease or bluetongue, meat inspection was judged as highly sensitive, but so did clinical surveillance.

Note that the word surveillance as used in this report does not imply that any action is taken to capture, or act upon, the information. It merely points to the potential of these systems to be used for such purposes.

The data needed to parameterise the models was substantial and highly inaccessible through regular literature. It was therefore necessary to take a case study approach, using France as the example country. Consequently, the results, including their residual uncertainty, can be seen as describing a French situation.

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BACKGROUND

The inspection of animals for slaughter constitutes a potentially important sentinel function for animal diseases. The European Commission has mandated the European Food Safety Authority (EFSA) to prepare scientific opinions related to meat inspection in different species (M-2010-0232). It specifically requires EFSA to evaluate meat inspection (as defined by Regulation 854/2004) in order to assess the fitness of the meat for human consumption and to monitor food-borne zoonotic infections (public health) without jeopardizing the detection of certain animal diseases or the verification of compliance with rules on animal welfare at slaughter. If the current methodology for monitoring major hazards to public health is found to be unsatisfactory, additional methods should be recommended. Implications of these changes on animal health and welfare should be assessed.

In order to ensure a risk-based approach, the EFSA has been requested to provide scientific opinions on meat inspection in slaughterhouses and, if considered appropriate, at any other stages of the production chain. Several species are to be considered, of which bovines is one.

The COMISURV Consortium, consisting of the National Veterinary Institute (SVA), Sweden, Safoso Inc., Switzerland, Anses, France, BfR, Germany and the Royal Veterinary College, United Kingdom has been contracted to support a working group under EFSA's Animal Health and Animal Welfare Panel (AHAW) in their work to critically assess implications of any changes in current meat inspection methods for animal health and welfare.

INTRODUCTION AND OBJECTIVES

OVERALL OBJECTIVES

The overall objectives of this work are to assist the AHAW Panel and its WG in responding to the Commission's request to critically assess implications of any changes in the current meat inspection methods, (suggested in the light of public health risks) on animal health and welfare.

The target of the work is the collection of relevant data and implementation of models to assist the AHAW Panel and its WG to estimate the effectiveness of monitoring and surveillance (with respect to animal health and welfare) of both meat inspection and the overall surveillance system, both prior to and following suggested system changes.

SPECIFIC OBJECTIVES

The specific objectives of this work were to:

1) assist in the development of a stochastic model of the meat inspection system for bovines, and for specific diseases and welfare conditions (as determined by the WG);

    - identify and collect the data needed for the model and to identify data gaps preventing accurate modelling,
    - implement the model to quantify the effectiveness of monitoring and surveillance using meat inspection, both prior to and following suggested changes to the meat inspection system.

2) assist in the development of and to implement a stochastic model, focussing on the overall monitoring and surveillance system, and for specific diseases and welfare conditions (as determined by the WG):

    - identify and collect data needed for the model and identify data gaps preventing accurate modelling,

- implement the model to quantify the effectiveness of monitoring and surveillance (detection probability, validity, precision) in the overall monitoring and surveillance system, both prior to and following suggested changes to the meat inspection system.

Note that the word surveillance as used in this report does not imply that any action is taken to capture, or act upon, the information. It merely points to the potential of these systems to be used for such purposes.

DELIMITATIONS

The Tender specifications of the procurement contract specifically identified bovine animals under six weeks old as well as animals over six weeks old as subjects for this analysis. Age was therefore considered in the design of the models used, by including it as an animal-level risk factor. However, the diseases and welfare conditions identified by the WG are mostly of the kind that rarely affects animals under 6 weeks of age. In addition, such animals are not slaughtered in the case country, France. Nevertheless, probabilities of detection for meat inspection in this age category were elicited from the experts, but in agreement with the WG the effect of any specific changes to meat inspection in bovines less than 6 weeks of age have not been further commented upon in this report. However, the model output for this age category is still included in Appendix 5, for future reference.

TERMINOLOGY

To facilitate communication, the use of the following terms was agreed (Figure 1):

1) Non-detectable cases: these are all cases that are are beyond the detection capacity of current routine meat inspection procedures. This means they are subclinical and without pathological lesions that are observable by meat inspection procedures. Often they are early cases at a stage where distinct clinical signs have not yet developed.

2) Detectable cases: these are all cases that are detectable by routine meat inspection procedures. They will consist of a range of combination of clinical and pathological signs. A proportion of detectable cases will fit the definition of the typical case and a proportion will be milder cases.

3) Mild cases: the mild case of a disease or welfare condition is the form that could be seen at the early stages of the disease or at some point between the subclinical and the fully developed (i.e. the “typical” form of the disease or welfare condition). A mild case is neither typical nor subclinical. The animal will present more subtle signs than typical case. Mild cases fit the mild case definition validated by experts.

4) Typical cases: Typical cases are by definition detectable cases and express more developed clinical signs than mild cases. They fit the typical case definition provided by the experts.

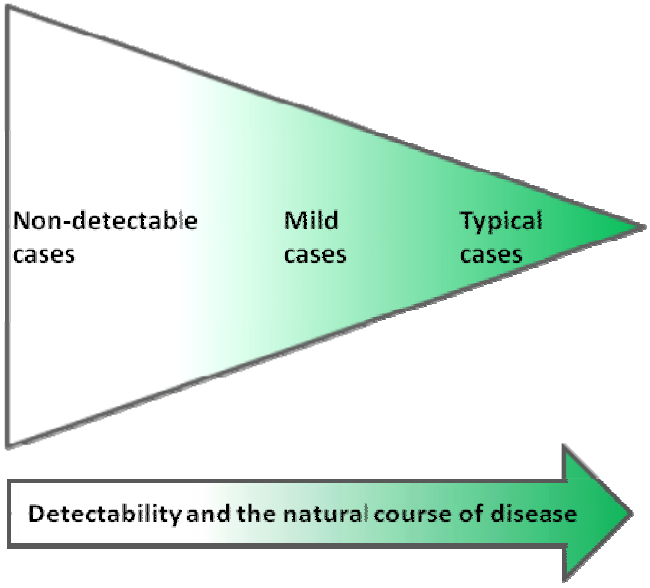

Figure 1: Graphical representation of the three types of cases which may be present at the abattoir and their different likelihood of detection based on meat inspection tasks. The arrow indicates both the possible progression of the disease and that detection will increase from a non-detectable stage to a typical stage. However, not all exposed animals will become diseased, not all non-detectable cases develop into mild and/or typical cases and not all mild cases progress through typical cases. For the purposes of this report, mild and typical cases have been combined into a 'detectable case' category. The proportion of cases in the different case categories will depend on multiple factors including disease biology and environmental factors.

MATERIALS AND METHODS

1. Diseases and welfare conditions to consider

The list of diseases and welfare conditions to be considered was provided by the WG. The list consisted of seventeen items, of which ten were infectious diseases and seven were welfare conditions (Table 1). The diseases and welfare conditions were initially screened by the WG according to their likelihood of detection at ante- or post-mortem inspection and only those considered to have a medium or high probability of detection were retained. Additional criteria were applied as described in the WG's Annex to the EFSA opinion; relevance of the disease in European bovine production and existence of other surveillance systems preferred to meat inspection for disease monitoring. Diseases that were predominantly zoonotic rather than animal health related were excluded.

Table 1: List of infectious diseases and welfare conditions in bovines identified by the AHAW working group for consideration in the assessment conducted by COMISURV.

	List of diseases and welfare conditions	Stage 2	Stage 3
Diseases	Echinococcosis/hydatidosis	X	
	Enzootic Bovine Leukosis	X	
	Fascioliasis	X	X
	Granuloma (tuberculosis, lymph nodes lesions for actinobacillosis or tumours)	X	X
	Necrobacillosis	X	
	Pathological lesions in the heart of possible bacterial origin	X	
	Respiratory diseases (transport fever and other causes of pneumonia and associated pleuritis)	X	
	Cysticercosis (*Taenia saginata*)	X	
	Ulcerative diseases (Malignant catarrhal fever and Blue tongue)	X	X
	Vesicular diseases (foot and mouth disease and vesicular stomatitis)	X	X
Welfare issues	Bruising and injury	X	
	Cleanliness score	X	
	DFD meat	X	
	Foot and leg disorders (foot and leg disorders linked to trouble in housing system but excluding fractured limbs)	X	X
	Fractured limb	X	
	Integument alterations	X	
	Low body condition	X	

All diseases and welfare conditions listed by the AHAW WG were to be evaluated with regards to their probability of being detected at meat inspection (refered to as **"stage 2"**). In addition, for five diseases or welfare conditions, surveillance by meat inspection was to be compared with 1-2 other surveillance components, such as clinical observations in the field (hereafter denoted clinical surveillance) and serological surveys (**"stage 3"**). It was agreed with the AHAW WG that the analysis should be based on a country example, as a lot of the data were expected to be highly country-specific and also only available in industry databases and similar. Consequently, because the partner responsible for this work package has extensive access to information from France, this is the context within which the current analysis has been placed.

1.1. Recruitment of experts

Experts were selected on the basis of their professional expertise in meat inspection or in bovine pathology in relation to the bovine production chain in Europe. Four experts from Finland, Sweden and France, with extensive knowledge and numerous peer reviewed publications on meat inspection, infectious diseases and/or welfare in bovine were identified and invited to participate in the study. The experts were contacted in writing and briefed on the project aims and objectives and were given clear instructions on the elicitation process. Their agreement to participate in the expert elicitation was

obtained. Results were therefore available from four experts. As each expert could not be an expert in all fields (meat inspection, animal health and welfare), the elicitation process was adapted to take this fact into account, as explained in 1.2.1.

1.2. Case definitions

1.2.1. Methodology

Following the lists of diseases and welfare conditions provided by the WG, case definitions of "typical cases" were developed and used as the basis for further evaluation.

The aim was to provide a definition for a "typical case" which was defined as the presentation typically observed in >60% of affected/infected bovine at slaughter age, and fit enough to travel to slaughter.

First a list of signs and lesions based on disease descriptions from the literature (Herenda 1994); (Menzies and Neill 2000); (McIlroy, Neill et al. 1986; Cherel, Couillandeau et al. 2006) was submitted to the bovine experts. The experts were asked to select signs and lesions that were the most likely to be observed in a "typical case" (Appendix 1-A). The answers of experts were summarized and items obtaining two votes or more were kept in the definition. A second questionnaire was proposed to experts using the previous results so as to obtain a consensus on definitions (Appendix 1-B).

As the field of expertise of each expert was different, we included in each questionnaire the possibility for the expert to choose a "Not expert" answer when he or she felt a lack of expertise to answer a certain question.

All questionnaires were available in two languages: English and French. This was to facilitate the understanding of experts and rapidity of responses.

A timetable with the date of dispatch of the questionnaires as well as the planned return date is presented in Appendix 2.

Once the definition of a typical case was validated the bovine experts were invited to validate or comment on a proposition of a mild case definition for diseases and welfare conditions (Appendix 1-C). This proposed definition was based on both the typical case definition questionnaire results and the initial list of signs or lesions proposed in the first typical case definition questionnaire.

It was decided that the definition of a mild case was not relevant for low body condition, fractured limb and cleanliness score.

In summary, the elicitation of case definitions resulted in two definitions for each disease – one more developed and one milder. These were subsequently taken forward for elicitation of the percentage of infected or affected animals in the population expressing typical, mild or no signs. During the subsequent elicitation, there was no pre-set assumption regarding the percentage of cases belonging to either category. In other words, the case definitions provided below are merely expressing two levels of severity, and their relative proportions as used in the subsequent analyses were elicited in a separate step as described under section 1.4. Consequently, for the purpose of this analysis, what is defined below as *typical* is simply a more severe form of the disease or welfare condition, which does not necessarily correspond to the more *common* form.

1.2.2. Case definitions

1.2.2.1. Necrobacillosis (liver, oral cavity): *Fusobacterium necrophorum*

Ante-mortem

Interdigital form of necrobacillosis is excluded from the definition. **A typical case** of necrobacillosis is assumed to present itself at ante-mortem inspection (AMI) with hypersalivation. **A mild case** of necrobacillosis is assumed to present itself at AMI with no visible signs.

Post-mortem

Interdigital form of necrobacillosis is excluded from the definition. At post mortem inspection (PMI), **a typical case** of necrobacillosis is assumed to present itself with ulceration in the tongue and /or swollen cheek. At post mortem inspection (PMI) **a mild case** of necrobacillosis is assumed to present itself with liver abscesses

1.2.2.2. Enzootic Bovine Leukosis[3]

Ante-mortem

A typical case of enzootic bovine leukosis is assumed to present itself at ante-mortem inspection (AMI) with enlarged superficial lymph nodes (mandibular, scapular or pre-crural). **A mild case** of enzootic bovine leukosis is assumed to present itself at AMI with no visible signs.

Post-mortem

At post mortem inspection (PMI) **a typical case** of enzootic bovine leukosis is assumed to present itself with superficial lymph nodes enlarged and / or abdominal-pelvic cavity lymph nodes enlarged[4]. At post mortem inspection (PMI), **a mild case** of enzootic bovine leukosis is assumed to present itself with a limited number of superficial lymph nodes enlarged.

[3] In countries where elimination of EBL has been taking place, or is taking place, cases are detected far before they develop tumors. This case definition was developed based on a scenario where EBL is considered eradicated and where active surveillance is no longer in place.

[4] The definition of EBL case include enlarged lymphnodes at PM inspection, as defined by the experts and also as described in the literature. However lymphosarcoma would be expected to have a similar presentation.

1.2.2.3. Respiratory diseases

Ante-mortem

The respiratory diseases bring together transport fever (Histophilus somni = Haemophilus somnus, Mannheimia haemolytica) and other causes of pneumonia (incl. viral causes) and associated pleuritis.

A typical case of respiratory diseases is assumed to present itself at ante-mortem inspection (AMI) with mucopurulent nasal discharge and rapid respiration.
A mild case of respiratory diseases is assumed to present itself at AMI with minor respiratory difficulties

Post-mortem

The respiratory diseases bring together transport fever (Histophilus somni = Haemophilus somnus, Mannheimia haemolytica) and other causes of pneumonia and associated pleuritis.

At post mortem inspection (PMI) **a typical case** of respiratory diseases is assumed to present itself with fibrinous or fibrosis pleuritis associated with fibrinous or fibrosis pneumonia and abscesses more or less voluminous in lung.
At post mortem inspection (PMI), **a mild case** of respiratory diseases is assumed to present itself with fibrinous bronchopneumonia

1.2.2.4. Vesicular diseases

Ante-mortem

The vesicular diseases bring together foot and mouth disease and vesicular stomatitis.

A typical case of vesicular diseases is assumed to present itself at ante-mortem inspection (AMI) with vesicles on nostrils or muzzle, a hypersalivation and reluctance to rise or stamping/shaking the feet.
A mild case of vesicular diseases is assumed to present itself at AMI with hypersalivation or trample.

Post-mortem

The vesicular diseases bring together foot and mouth disease and vesicular stomatitis.
At post mortem inspection (PMI) **a typical case** of vesicular diseases is assumed to present itself with at least one fluid-filled vesicles or bullae on muzzle and gums, feet or on pillars of the rumen associated with red eroded areas or ulcers (vesicle rupture).
At post mortem inspection (PMI), **a mild case** of vesicular diseases is assumed to present itself with single fluid-filled vesicles on muzzle or gums.

1.2.2.5. Ulcerative diseases[5]

Ante-mortem

The ulcerative diseases bring together malignant catarrhal fever and bluetongue.
A typical case of ulcerative diseases is assumed to present itself at ante-mortem inspection (AMI) with ulcers of the nose associated with hypersalivation.
A mild case of ulcerative diseases is assumed to present itself at AMI with no visible signs.

Post-mortem

The ulcerative diseases bring together malignant catarrhal fever and Blue tongue.
At post mortem inspection (PMI) **a typical case** of ulcerative diseases is assumed to present itself with multifocal haemorrhages on the lip and dental pad associated with ulcers of oesophagus and/or rumen and/or mouth and/or nose.
A mild case of ulcerative diseases is assumed to present itself at PMI with a limited number of ulcers whatever the location.

1.2.2.6. Echinococcosis/hydatidosis :*Echinococcus granulosus* - larva in liver, lungs

Ante-mortem

A typical case of hydatidosis is assumed to present no visible sign at ante-mortem inspection (AMI).
A mild case of echinococcosis is assumed to present itself at AMI with no visible signs.

Post-mortem

At post mortem inspection (PMI) **a typical case** of hydatidosis is assumed to present itself with a limited number of *cysts* of different sizes and shapes which contain a clear fluid under pressure in liver and / or lungs.
A mild case of echinococcosis is assumed to present itself at PMI with one small cyst in the liver or lungs that contains a clear fluid under pressure

1.2.2.7. Taenia saginata :*Cysticercus bovis* - larva in muscle)

Ante-mortem

A typical case of *Taenia saginata* is assumed to present itself at ante-mortem inspection (AMI) with no visible signs.

A mild case of *Taenia saginata* is assumed to present itself at ante-mortem inspection (AMI) with no visible signs.

[5] The mucosal form of bovine viral diarrhoea was not listed explicitly for the experts to consider; however, based on the case definitions it could also be considered as belonging to this syndrome.

Post-mortem

At post mortem inspection (PMI) **a typical case** of *Taenia saginata* is assumed to present itself with either clear transparent bladders full of opaque pearl like liquid or degeneration, caseation and calcification lesions.
A mild case of *Taenia saginata* is assumed to present itself at PMI with a limited number of small white lesions in focused areas of muscle tissues

1.2.2.8. Trematodes – Fascioliasis :*Fasciola hepatica*

Ante-mortem

A typical case of fascioliasis is assumed to present no visible sign at ante-mortem inspection (AMI).
A mild case of fascioliasis is assumed to present no visible sign at ante-mortem inspection (AMI).

Post-mortem

At post mortem inspection (PMI) **a typical case** of fascioliasis is assumed to present itself with black parasitic debris or entire fluke in the liver and enlarged/thickened ducts.
A mild case of Fascioliasis is assumed to present itself at PMI with enlarged/thickened ducts.

1.2.2.9. Granuloma (in any organs)

Ante-mortem

Granuloma diseases bring together tuberculosis, lymph nodes lesions for actinobacillosis or tumours.
A typical case of granuloma is assumed to present itself with no visible sign at ante mortem inspection
A mild case of granuloma is assumed to present itself at AMI with no visible symptom

Post-mortem

Granuloma diseases bring together tuberculosis, lymph nodes lesions for actinobacillosis or tumours.
At post mortem inspection (PMI) **a typical case** of granuloma is assumed to present itself with granulomatous lesions in at least one of these locations: head, lungs, liver, intestine and/or carcass.
A mild case of granuloma is assumed to present itself at PMI with one granulomatous lesion in one of these locations: head, lungs, liver, intestine or carcass.

1.2.2.10. Pathological lesions in the heart

Ante-mortem

Definition includes pathological lesions in the heart of possible bacterial origin such as pericarditis.
A typical case of pathological lesions in the heart is assumed to present itself with slight breathlessness and hesitant behaviour with reluctance to move at ante mortem inspection.

A mild case of pathological lesions in the heart is assumed to present itself at AMI with no visible sign.

Post-mortem

Definition includes pathological lesions in the heart of possible bacterial origin such as pericarditis.
At post mortem inspection (PMI) **a typical case** of pathological lesions in the heart is assumed to present itself with fibrous pericarditis.
A mild case of pathological lesions in the heart is assumed to present itself at PMI with exudative pericarditis

1.2.2.11. Foot and leg disorder

Ante-mortem

The definition includes foot and leg disorder linked to trouble in housing system but excluding fractured limbs.
A typical case of foot and leg disorder is assumed to present itself with a minor lameness at ante-mortem inspection (AMI).
A mild case of foot and leg disorders is assumed to present itself at AMI with a more hesitant and natural walk with eventually one or more foot on which the animal cannot put all his weight.

Post-mortem

The definition includes foot and leg disorder linked to trouble in housing system but excluding fractured limbs.
At post mortem inspection (PMI) **a typical case** of foot and leg disorder is assumed to present itself with amyotrophy associated with arthritis and/or arthrosis.
A mild case of foot and leg disorders is assumed to present itself at PMI with bursitis of knee and/or hock associated with enlarged lymph nodes.

1.2.2.12. Low body condition score: thin body

Ante-mortem

A typical case of low body condition score is an emaciated animal presenting an extreme thinness at ante-mortem inspection (AMI).

Post-mortem

At post mortem inspection (PMI) **a typical case** low body condition score is assumed to present a carcass abnormally lean with little body fat.

1.2.2.13. Fractured limb

Ante-mortem

A typical case of fractured limb during ante mortem inspection is an adult cow which can't get off the ground or a calf with severe lameness.

Post-mortem

At post mortem inspection (PMI) **a typical case** of fractured limb is assumed to present itself with a fracture of one bone of the limb and serohaemorrhagic infiltration of all tissues around the broken bone.

1.2.2.14. Cleanliness score

Ante-mortem

If we suppose a codification of cleanliness score from 0 to 4, we consider in the definition only bovine having a cleanliness score of 3 or 4.
A typical case of bad cleanliness score assumed to present itself with an extremely heavily soiled with dried manure and/or manure armour in critical areas[6] at ante mortem inspection.

Post-mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

1.2.2.15. Integument alterations

Ante-mortem

A typical case of integument alterations is assumed to present itself with a lot of injuries or wounds or bedsores due to insufficient bedding and other housing problems at ante mortem inspection.
A mild case of integument alterations is assumed to present itself at AMI with a limited number of minor injuries/wounds occurring at head, neck or hindquarters-near the tail.

Post-mortem

Post mortem: Not relevant because there is no inspection of the skin during post-mortem inspection.

1.2.2.16. Bruising and Injury-related haemorrhage (related to transport)

Ante-mortem

A typical case of bruising and injury-related haemorrhage is assumed to present itself with a lot of fresh bleeding wounds during ante-mortem inspection (AMI).

[6] Critical areas= under surface/mid line of abdomen; under surface of chest; hock and Achilles tendon; under surface of neck; udder and genitalia; area around the anus, including rear part of udder

A mild case of bruising and Injury-related haemorrhage is assumed to present itself at AMI with no visible sign

Post-mortem

At post mortem inspection (PMI) **a typical case** of bruising and injury-related haemorrhage is assumed to present itself with large serohaemorragic infiltration involving carcass portions.
A mild case of bruising and Injury-related haemorrhage is assumed to present itself at PMI with serohaemorragic infiltration involving one limited part of the carcass.

1.2.2.17. DFD meat (Dark, Firm, Dry meat)

Ante-mortem

Ante mortem: Not relevant because it is impossible to detect at that stage of the meat inspection

Post-mortem

At post mortem inspection (PMI) **a typical case** of DFD meat is assumed to have darker and drier meat than normal affecting large muscles.
At post mortem inspection (PMI) **a mild case** of DFD meat is assumed to have darker and/or drier meat than normal, affecting few and small muscles.

1.3. Scenarios to consider

The scenarios with respect to changes in meat inspection were developed in agreement with the AHAW WG, taking into account changes already proposed by EFSA's BIOHAZ panel for swine and for poultry. The scenarios were;

1. Meat inspection performed according to current European legislation (referred to as 'current'),
2. Meat inspection by visual inspection only, i.e. where incision and palpation tasks are removed (referred to as 'visual-only'),
3. Meat inspection based on risk categorisation by a hypothetical public health risk (referred to as 'risk categorisation'). This scenario was considered in stage 2 only.

1.4. Data collection

Data related to the probability of detection at meat inspection were obtained primarily through elicitation of expert opinion. A protocol based on a modified Delphi technique was developed consisting of five steps: (i) questionnaire development; (ii) the first elicitation round; (iii) data collation; (iv) the second elicitation round; (v) the final estimates.

1.4.1. Questionnaire development

A questionnaire was developed to obtain information on parameters related to detection probabilities at meat inspection on the basis of the case definitions provided by the experts. The outline of the questionnaire was the ante- and post-mortem inspection procedures for bovine which means the conventional meat inspection procedure carried out according to current European legislation. The different inspection tasks that make up the full inspection were grouped into two steps: the ante-mortem inspection and the post-mortem inspection.

A document was created to list all data needed for the models such as the individual and herd level risk factors to take into account for each disease or welfare condition (Table 2). The objective was to support the development of the questionnaire and guarantee the collection of all data needed. The list of individual and herd level risk factors was obtained based on literature review and expert opinion. Only risk factors on which data were likely to be available were kept.

Table 2: List of individual and herd risk factor for each disease and welfare condition considered.

Disease/welfare condition	***Risk factor***	
	Animal level	***Herd level***
Necrobacillosis	Age: - young<6 weeks - young>6 weeks - Adult	
Enzootic Bovine Leukosis	Age: - young<6 weeks - young>6 weeks - Adult	Geographic region: - high risk of introduction/recently free - low risk of introduction/free since long
Respiratory diseases	Age: - young<6 weeks - young>6 weeks - Adult	Geographic region: -High prevalence area of immunosuppressive infection -low prevalence area of immunosuppressive infection
Vesicular diseases	Age: - young<6 weeks - young>6 weeks - Adult	Frequency of contact: -high frequency of contacts -low frequency of contacts

Disease/welfare condition	*Risk factor*	
	Animal level	*Herd level*
Ulcerative diseases	Age: - young<6 weeks - young>6 weeks - Adult	Geographic region: -High risk of introduction -low risk of introduction
Echinococcosis	Age: - young<6 weeks - young>6 weeks - Adult	Geographic region: -High prevalence area -low prevalence area
Taenia saginata	Age: - young<6 weeks - young>6 weeks - Adult	
Fascioliasis	Age: - young<6 weeks - young>6 weeks - Adult	Geographic region: -High prevalence area -low prevalence area
Foot and leg disorder	Age: - young<6 weeks - young>6 weeks - Adult	Production type: -Dairy -Beef
Low body condition	Age: - young<6 weeks - young>6 weeks - Adult	Production type: -Dairy -Beef
Fractured limb	Age: - young<6 weeks - young>6 weeks - Adult	Transport : -Long -Short
Cleanliness score	Age: - young<6 weeks - young>6 weeks - Adult	Production type: -Dairy -Beef
Integument alterations	Age: - young<6 weeks - young>6 weeks - Adult	Production type: -Dairy -Beef
Bruising and injury	Age: - young<6 weeks - young>6 weeks - Adult	Transport : -Long -Short
DFD meat	Age: - young<6 weeks - young>6 weeks - Adult	Transport : -Long -Short
Granuloma	Age: - young<6 weeks - young>6 weeks - Adult	Geographic region: -High prevalence area -low prevalence area

Disease/welfare condition	*Risk factor*	
	Animal level	*Herd level*
Pathological lesions in the heart of possible bacterial origin	Age: - young<6 weeks - young>6 weeks - Adult	

Questionnaires used in the poultry and swine work packages formed the template from which the bovine questionnaire was developed. This enabled continuity between work packages and feedback from prior usage to be incorporated into the bovine questionnaire.

A draft of the questionnaire was circulated among consortium members for revision and comments to ensure all relevant information was included.

The final questionnaire (Appendix 3-A) contained four questions for each of the 17 diseases and welfare conditions:

i) What is the probability for a bovine infected/affected, given age, to present the typical form of the disease or welfare condition, the mild form of the disease and no clinical sign of the disease;

ii) What is the probability for a bovine infected/affected with a typical or mild form of the disease or welfare condition presented for slaughter to be detected at ante -mortem inspection, given age and herd level risk factors (depending on the disease);

iii) What is the probability for a bovine infected/affected with a typical or mild form of the disease or welfare condition presented for slaughter to be detected at post -mortem inspection, given age and herd level risk factors (depending on the disease);

iv) What is the probability for a bovine infected/affected with a typical or mild form of the disease or welfare condition presented for slaughter to be detected at post -mortem inspection, given age and herd level risk factors (depending on the disease) and considering only a visual inspection.

One of the objectives of this questionnaire was to capture data to evaluate the impact of a modification in the meat inspection process on the detection of a disease or welfare condition. The scenario investigated was to consider only a visual inspection. The different steps in the conventional inspection which means a procedure carried out according to current European legislation, and a procedure based only on visual inspection are presented in table 3. This table was also included, as background material, in the expert questionnaire.

1.4.2. First elicitation round

Questionnaires were submitted to the selected experts electronically (Appendix 3A). Instructions for filling in the questionnaire along with a deadline for submission of responses were clearly stated.

1.4.3. Data collation

The estimates provided by each expert were collated in one document. An initial overall estimate for each of the requested parameters was derived by combining the single expert estimates. The experts' responses were combined based on mean values. However, if the experts' answers were too divergent, they were taken forward to a second elicitation round (see 1.4.4).

1.4.4. Second elicitation round

The combined estimates were circulated anonymously among the experts who were given the opportunity to reconsider their inputs in the light of other experts' estimates, and/or give comments on the reliability of the provided estimates or the overall estimate. They were thereby asked to approve, or not approve, the combined experts' responses (Appendix 3B).

Data on which all experts agreed were considered validated at this stage. For the other data, answers of this second questionnaire were used to prepare a conference call to discuss points on which no consensus was reached. A support document for the conference call was sent to experts before the meeting (Appendix 3C).

The conclusions of the conference call were sent to the experts for a final validation (Appendix 3D).

1.4.5. Final estimates

A consensus response was finally obtained. For each parameter, the mean value of all experts' responses and the variability/uncertainty was calculated. The results were subsequently used as inputs for the stage 2 and stage 3 models (Appendix 4A).

1.4.6. Additional data collection

Additional data were needed to describe risk category proportions, herd- and animal prevalences, annual population coverage of meat inspection and – for the stage 3 models – detection probabilities for the other surveillance components. For this purpose, a French expert network was used. One or more experts were identified for each disease or welfare condition depending on his/her field of experience. The experts were asked to provide estimates based on existing literature and based on their experience.
In addition, data from the national cattle data base (BDNI) and from the NERGAL data base were used. In France, each bovine identified by ear tags is registered in the national identification database (BDNI). Each movement of each bovine is also registered. Data registered in the BDNI from 01/01/2001 to 24/02/2010 were used. In 2005 in France, the ministry of agriculture initiated the NERGAL-Abattoir project which consisted in collecting, in real time, data from ten bovine slaughterhouses (representing 20% of French slaughtered bovines). Data available in this database (1 939 519 bovine slaughtered) were used.
The data obtained are presented in Appendix 4B.

Table 3: List of ante-mortem and post-mortem inspection procedure for bovines under and over 6 weeks old according to EC 854/2004 (the current procedure) and according to the proposed changes in procedures based on visual inspection (visual-only), where **V** represents visual inspection; **I** represents incision; **P** represents palpation. Grey boxes indicate inspection points where the visual-only scenario implies a change to current procedures for bovine under and/or over 6 weeks old.

Inspection step			Inspection procedure			
			Conventional		Visual-only	
			Bovine <6 weeks	Bovine >6 weeks	Bovine <6 weeks	Bovine >6 weeks
ANTE-MORTEM INSPECTION	FOOD CHAIN INFORMATION	Diseases, morbidity and mortality on farm	V	V	V	V
	LIVE ANIMAL	General health	V	V	V	V
POST - MORTEM INSPECTION	WHOLE CARCASS	External surface	V	V	V	V
	HEAD	head and throat	V	V	V	V
		retropharyngeal LNN	I	I	V	V
		Submaxillary and parotid LNN	/	I	/	V
		External and internal masseter	/	V+I	/	V
		mouth and fauces	V	V	V	V
		Tongue	P	P	V	V
	LUNGS	Parenchyma	V +P+I[1]	V +P+I[1]	V	V
		Trachea	V + I[1]	V + I[1]	V	V
		Major bronchi	I[1]	I[1]	V	V
		Mediastinal LNN	I	I	V	V
		Bronchial LNN	I	I	V	V
	OESOPHAGUS		V	V	V	V
	HEART	Heart	V + I	V+I	V	V
		Pericardium	V	V	V	V
	DIAPHRAGM		V	V	V	V
	LIVER	Parenchyma	V+P+ I[2]	V+P+I	V	V
		Hepatic LNN (=portal)	V+P+I[2]	V+P	V	V
		Pancreatic LNN	V+ I[2]	V+P	V	V
	GI TRACT	Stomach and intestines	V	V	V	V
		Mesentery	V	V	V	V
		Gastric LNN	V + P+ I[2]	V + P+ I[2]	V	V
		Mesenteric LNN	V + P+ I[2]	V + P+ I[2]	V	V
	SPLEEN		V+P[3]	V+P[3]	V	V
	KIDNEYS	Parenchyma	V+ I[2]	V+ I[2]	V	V
		Renal LNN	V+ I[2]	V+ I[2]	V	V
	UTERUS and MAMMARY GLANDS	Uterus	/	V	/	V
		Udder	/	V+ P[3]+ I[1]	/	V
		Supramammary LNN	/	V+ P[3]+ I[2]	/	V
	PLEURA		V	V	V	V
	PERITONEUM		V	V	V	V

Inspection step	Inspection procedure			
	Conventional		Visual-only	
	Bovine <6 weeks	Bovine >6 weeks	Bovine <6 weeks	Bovine >6 weeks
UMBILICAL AREA	V+P+I[4]	/	V	/
JOINTS	V+P+I[4]	/	V	/
SYNOVIAL FLUID	V	/	V	/

2. STAGE 2: ASSESSMENT OF THE SENSITIVITY AND CASE-FINDING CAPACITY OF ABATTOIR SURVEILLANCE

The objective of stage 2 modelling was to estimate **stratum**[7]**-**specific probabilities of detection at meat inspection (hereafter denoted "abattoir surveillance"), as well as to provide an estimate of an overall measure of surveillance effectiveness. Two different effectiveness outcomes were used, depending on whether the disease or welfare condition was to be considered endemic (present) or exotic (not present); the **case-finding capacity**, estimated as the **detection fraction,** and the **component sensitivity**, respectively.
All three scenarios described in section 1.4 were evaluated, i.e. the current system, a system where meat inspection is by a visual inspection procedure only, as well as the effect of risk categorisation based on a hypothetical public health risk factor.

2.1. Model structure

The generic structure of the stage 2 scenario tree models is described in table 4. Four types of nodes are included; risk category nodes, infection nodes, detection category nodes and detection nodes. The risk category nodes allow the model to account for one risk factor at the group level, and one at the individual animal level. In this context, a risk factor is something that affects the probability of being infected and/or the probability of being detected as infected. The infection nodes capture the probabilities that a herd or an animal within a herd will be affected by the disease or welfare condition of interest. Detection category nodes are included to account for two factors influencing the probability of detection; the case type and the public health risk factor used to evaluate the risk categorisation scenario. The effect of the risk categorisation in the models is to divide the population into strata with different probability of detection at meat inspection, with the assumption that animals belonging to the high risk category would undergo a more thorough inspection and animals in the low risk category would be inspected with relatively less intensity. Finally, the two detection nodes essentially describe the steps leading to detection of a case, which in abattoirs is at ante- or post-mortem inspection.

The category nodes aim to split the population into different strata with an equal probability of having, or being detected with, the disease or welfare condition. For the "current" and "visual-only" scenarios, the different strata are defined by the farm- and animal level risk factors and by case type (for example, "Dairy / Adult / Typical case"). For the "risk categorisation" scenarios, an additional level of stratification is defined by the public health risk category.

The models follow the basic structure developed by Martin and co-workers (Martin, Cameron et al. 2007) to estimate the sensitivity of surveillance systems with the assumption of 100% specificity, where the purpose of surveillance is early detection. In order to estimate detection fraction,

[7] Bold text indicates concepts explained in the glossary.

modifications to this basic structure were made based on input from another EFSA contractor. For stage 2, where only one surveillance component (abattoir inspection) is under study, this modification meant taking stratum-specific **coverage** into consideration. For the purpose of this exercise, coverage was defined as the proportion of the population covered by the surveillance activity *during one year*.

A generic model with the structure described in table 4 was developed in Microsoft Office Excel 2007, and adapted to account for the different characteristics and needs of each of the 17 diseases and welfare conditions. The factors taken into account are described in table 5.

Table 4: Generic structure of a scenario tree model describing the abattoir inspection surveillance component in bovines, and used to assess the current effectiveness as well as the effect of proposed changes to the meat inspection procedure.

Node	Name	Node type	Outcome	Type of parameter	Next Node
1	Farm level risk factor	Risk category	X Y	**DF**[1]: Stratum-specific proportion **CS**[2]: Stratum-specific proportion / Relative Risk	2 2
2	Farm infected	Infection	Infected Not infected	**DF**: Stratum-specific prevalence **CS**: Design prevalence	3 End
3	Age	Risk category	Adult Young > 6weeks <6 weeks	**DF**: Stratum-specific proportion **CS**: Stratum-specific proportion / Relative Risk	4 4 4
4	Animal infected	Infection	Infected Not infected	**DF**: Stratum-specific prevalence **CS**: Design prevalence	5 End
5	Risk category based on public health risk	Detection category	High risk Low risk	Stratum-specific proportion (Hypothetical scenario)	6 6
6	Case type	Detection category	Typical Mild Subclinical	Stratum-specific proportion	7 7 7
7	Observed AM	Detection	Yes No	Stratum-specific probability	End 8
8	Observed PM	Detection	Yes No	Stratum-specific probability	End End

[1]DF = parameter(s) used in models estimating detection fraction, i.e. the proportion of infected or affected animals in the population successfully detected.
[2]CS = parameter(s) used in models estimating sensitivity of the surveillance component, i.e. the probability of successfully detecting one or more infected animals.

Table 5: Factors influencing the structure of and output from scenario tree models aimed at assessing the effect of potential changes to meat inspection in bovines. DF= Model estimating detection fraction, i.e. the proportion of infected or affected animals in the population successfully detected.; CS= Model estimating component sensitivity, i.e. the probability of successfully detecting one or more infected animals.

		No group level	Stage 3	Model	Case types			Detectable at inspection		
	Disease/welfare condition	**risk factor**	**assessment**	**Type**	**Typical**	**Mild**	**Subclinical**	**AM**	**PM**	**Comment**
Diseases	Echinococcus/hydatidosis			DF	X	X			X	Not seen in animals < 6 weeks of age (due to prepatent period)
	Enzootic Bovine Leukosis			CS	X	X	X	(X)	X	Mild cases not detectable AM
	Fascioliasis		X	DF	X	X	X		X	
	Granuloma/Bovine tuberculosis		X	DF	X	X	X		X	
	Necrobacillosis	X		DF	X	X		(X)	X	Mild cases not detectable AM
	Pathological lesions in the heart	X		DF	X	X		(X)	X	Mild cases not detectable AM
	Respiratory diseases			DF	X	X	X	X	X	
	Taenia saginata/Cysticercus bovis	X		DF	X	X			X	Not seen in animals < 6 weeks of age (due to prepatent period)
	Ulcerative diseases (Bluetongue)		X	CS	X	X	X	(X)	X	Mild cases not detectable AM
	Vesicular diseases (FMD)		X	CS	X	X	X	X	X	
Welfare issues	Bruising and injury-related haemorrhage			DF	X	X		(X)	X	Mild cases not detectable AM
	Cleanliness score			DF	X			X		
	DFD meat			DF	X	X			X	
	Foot-and leg disorders		X	DF	X	X		X	X	
	Fractured limb			DF	X			X	X	
	Integument alterations			DF	X	X		X		
	Low body condition score			DF	X			X	X	

2.2. Model inputs and implementation

The data collected for each disease and welfare condition (compiled in Appendix 4A and 4B) where entered as parameters in the models. Probabilities of infection were treated as design prevalences, and therefore entered as fixed values, whereas category node branch proportions and probabilities of detection were defined as Pert distributions with parameters for minimum, most likely and maximum values. Coverage estimates were based on census data (abattoir database information) and were therefore also entered as fixed values. The outputs defined for the stage 2 models were stratum-specific detection probabilities (sensitivities) at ante- and post-mortem inspection, separately (i.e. as defined by the experts) and overall (i.e. combined). The strata were defined based on the categories formed by the relevant herd- and animal level risk factors (Table 2) in combination with the detection categories (case types), as relevant to each disease or welfare condition. In addition, the component-specific detection fraction/component sensitivity was estimated. For all output distributions, the mode, 5^{th} and 95^{th} percentiles were retrieved.This set of outputs was obtained for two of the scenarios considered: current and visual-only. Risk categorisation was evaluated as described under 2.3.1. The models were implemented using @RISK for Excel (Palisade Corp., Ithaca, NY), version 5.7.0, with 10,000 iterations, using latin hypercube sampling. A seed was set at 1965.

Any statements regarding significant differences between the current and the visual-only scenario were based on non-overlapping 95% probability intervals.

2.3. Calculation of stratum-specific probabilities of detection and detection fraction

The overall **probability of detection** during the meat inspection procedure (AM and PM inspection combined) was calculated, by stratum, as

$$Se_{MI} = Se_{AM} + (1 - Se_{AM}) * Se_{PM} \quad \textbf{(1)}$$

where:

Se_{MI} is the overall probability of detection at ante- and post-mortem inspection (as provided by experts through elicitation), Se_{AM} is the probability of detection at ante-mortem inspection and Se_{PM} is the probability of detection at post-mortem inspection.

The proportion of infected animals successfully detected by the abattoir inspection surveillance component (i.e, the **detection fraction**) was calculated as

$$\sum_{i=1}^{n} \frac{(x_i * p_i * Se_{MIi} * c_i)}{P} \quad \textbf{(2)}$$

where:
x is the proportion of the population in stratum i[8], p is the animal-level prevalence of the disease or welfare condition in stratum i, Se_{MI} is the overall probability of detection at meat inspection in stratum i, c is the coverage of the surveillance activity for stratum i and P is the overall population prevalence at animal-level.

[8] Each stratum is defined by its herd- and animal level risk cateogires as well as case type

The overall population prevalence *P* was derived as a weighted average of the stratum-specific prevalences, which was calculated as:

$$\sum_{i=1}^{n} x_i * p_{HLi} * p_{ALi} \quad \textbf{(3)}$$

where:

x is the proportion of the population in stratum *i*, p_{HL} is the herd-level prevalence of the disease or welfare condition in stratum *i* and p_{AL} is the animal-level prevalence of the disease or welfare condition in stratum *i.*

Note that the **specificity** of the meat inspection procedure, i.e. the parameter influencing the proportion of animals falsely detected as positive, was not considered in this assessment.

2.3.1. Effect of risk categorisation

In order to evaluate the effect of risk categorisation based on a public health risk (PHR), a scenario was agreed with the EFSA WG where the consequences for the low risk category would be a simpler meat inspection procedure with a probability of detection equivalent to what can be seen at visual inspection. The following three scenarios for the PHR category branch proportions were evaluated in relation to the overarching group level risk factors;

1: equal proportions for the high PHR category in both group level strata (0.20 in both); 2: a lower proportion for the high PHR category in the high-risk group level strata (0.20 vs 0.80) and 3: a higher proportion for the high PHR category in the high-risk group level strata (0.80 vs 0.20). The second scenario corresponds to a situation where the public health risk categorisation counteracts the underlying animal health risk, and the third scenario corresponds to situation where the public- and animal health risks have synergies. The first scenario is neutral.

Due to the hypothetical character of the risk categorisation scenario, its effect was evaluated non-stochastically, using as output only the mode of the detection fraction and the component sensitivity for each of the three scenarios above.

3. STAGE 3: ASSESSMENT OF THE RELATIVE EFFECTIVENESS OF MEAT INSPECTION WITHIN THE OVERALL SURVEILLANCE SYSTEM

Stage 3 models were developed for four infectious diseases and one welfare condition in order to compare meat inspection with other available surveillance methods. The diseases and welfare conditions considered were vesicular diseases (specifically, foot-and-mouth disease), ulcerative disease (specifically, bluetongue), granuloma (bovine tuberculosis, bTB), fascioliasis and foot and leg disorders. The surveillance components considered in stage 3 for each of the five diseases and welfare conditions are shown in table 6.

3.1. Model structure

The Stage 3 models involved creating scenario tree modules for each of the surveillance components under consideration, with the serological survey component (used for bluetongue) as an exception. This component was assumed to be designed to achieve a pre-set sensitivity (level of confidence), corresponding to 0.99.

The generic structure of the stage 3 modules for clinical surveillance and control programme (for bTB) is given in tables 7 and 8, and uses the same terminology as described in section 2.1.

Table 6: Surveillance components included in stochastic scenario tree models aimed at assessing the effect of potential changes to meat inspection in bovines.

Disease/welfare condition	Abattoir inspection	Clinical suspicion	Serological survey[1]	Control programme
Vesicular diseases (FMD)	X	X		
Ulcerative diseases (Bluetongue)	X	X	X	
Granuloma/Bovine tuberculosis	X	X		X
Fascioliasis	X	X		
Foot-and leg disorders	X	X		

[1] The sensitivity of the serological survey component was not specifically modelled; instead it was assumed that such a survey would be designed with a certain level of confidence, corresponding to the sensitivity of this surveillance component.

Table 7: Generic structure of a scenario tree model describing the clinical surveillance component for bovines, used to assess the effectiveness of meat inspection in bovines relative to other surveillance, currently and after proposed changes to meat inspection.

Node	Name	Node type	Outcome	Type of data	Next Node
1	Farm level risk factor	Risk	X	**DF**[1]: Stratum-specific proportion **CS**[2]: Stratum-specific proportion /	2
		category	Y	Relative Risk	2
2	Farm infected	Infection	Infected	**DF**: Stratum-specific prevalence	3
			Not infected	**CS**: Design prevalence	End
3	Age	Risk	Adult	**DF**: Stratum-specific proportion	4
		category	Young > 6weeks	**CS**: Stratum-specific	4
			<6 weeks	proportion / Relative Risk	4
4	Animal infected	Infection	Infected	**DF**: Stratum-specific prevalence	5
			Not infected	**CS**: Design prevalence	End
5	Case type	Detection	Typical	Stratum-specific	6
		category	Mild	Proportion	6
			Subclinical		End
6	Vet called	Detection	Yes	Stratum-specific	7
			No	Probability	End
7	Vet takes sample for disease X	Detection	Yes No	Stratum-specific probability	8 End
8	Test outcome	Detection	Positive	Stratum-specific	End
			Negative	Probability	End

[1]DF = parameter(s) used in models estimating detection fraction, i.e. the proportion of infected or affected animals in the population successfully detected.
[2]CS = parameter(s) used in models estimating sensitivity of the surveillance component. , i.e. the probability of successfully detecting one or more infected animals

Table 8: Generic structure of a scenario tree model describing the control programme surveillance component for bovine tuberculosis , used to assess the effectiveness of meat inspection in bovines relative to other surveillance, currently and after proposed changes to meat inspection.

Node	Name	Node type	Outcome	Type of data	Next Node
1	Farm level risk factor	Risk category	X	Stratum-specific proportion	2
			Y		2
2	Farm infected	Infection	Infected	Stratum-specific prevalence	3
			Not infected		End
3	Age	Risk category	Adult	Stratum-specific proportion	4
			Young > 6weeks		4
			<6 weeks		4
4	Animal infected	Infection	Infected	Stratum-specific prevalence	5
			Not infected		End
5	Included in herd test for TB	Detection	Yes	Stratum-specific probability	6
			No		End
6	Test positive	Detection	Yes	Stratum-specific probability	End
			No		End

For the models aimed at estimating detection fraction (Table 5), output from the separate modules were combined and multiplied by a matrix describing stratum-specific population coverage for the different surveillance components. Coverage for clinical surveillance was assumed to be 100%, whereas the coverage for abattoir surveillance was given by the stratum-specific proportion of animals slaughtered in a given year. Coverage of the control programme for bovine tuberculosis was defined as the proportion of herds/animals tested during one year. Because the data needed to parameterise the models was substantial and highly inaccessible through regular literature it was deemed necessary to take a case study approach. France was used as the example country as French databases associated with a network of French experts were available to provide the data needed.Therefore, as with other population-specific estimates, these numbers represent French conditions.

3.2. Model inputs and implementation

The data collected for each disease or welfare condition (compiled in Appendix 4A and 4B) were entered as parameters in the models. Probabilities of infection as were treated as design prevalences, and therefore entered as fixed values, whereas category node branch proportions and probabilities of detection were defined as Pert distributions with parameters for minimum, most likely and maximum values. Coverage estimates were based on census data (abattoir database information) and were

therefore also entered as fixed values. Stratum-specific detection probabilities (sensitivities) were defined as outputs for the additional surveillance components in the stage 3 models, as well as component-specific and overall detection fraction/component sensitivity. The strata were defined based on the categories formed by the relevant herd- and animal level risk factors (Table 2) in combination with the detection categories (case types), as relevant to each disease or welfare condition. For all output distributions, the mode, 5^{th} and 95^{th} percentiles were retrieved.This set of output was obtained for the current as well as the visual-only scenario.

The models were implemented using @RISK for Excel (Palisade Corp., Ithaca, NY), version 5.7.0, with 10,000 iterations, using latin hypercube sampling. A seed was set at 1965.
Any statements regarding significant differences between the current and the visual-only scenario are based on non-overlapping 95% probability intervals.

3.3. Calculation of the relative effectiveness of meat inspection within the overall surveillance system

The detection fraction and component sensitivity were calculated for each of the components evaluated.

3.3.1. Detection fraction models

In assessing the case-finding capacity of the overall surveillance system (measured as **detection fraction**), the overlap in coverage between surveillance components had to be taken into account (Figure 2).
This included specifying coverage by *surveillance segment*. For a 2-component surveillance system, there are three segments: 1: the proportion of animals covered by surveillance component 1 only, 2: by component 2 only and 3: by both (the overlap). For a 3-component system, there are seven surveillance segments.

The proportion of the whole population being detected as a true positive (TP) within each surveillance segment *k* is then calculated as:

$$TP_k = \sum_{i=1}^{n} x_i * p_i * Se_i * c_i \quad \textbf{(4)}$$

where:

x is the proportion of the population in stratum *i, p* is the animal-level prevalence of the disease or welfare condition in stratum *i, Se* is the probability of detection by the test system used defined by surveillance segment *k* in stratum *i* and *c* is the coverage of the surveillance segment *k* for stratum *i*.
For the population covered by the overlap (both systems), the probability of being detected as a true positive by system 1 or 2 or both is needed, and is, for a 2-component system, calculated as:

$$P(detected\ in\ overlap) = Se_1 + Se_2 - (Se_1 * Se_2) \quad \textbf{(5)}$$

The overall detection fraction is then calculated, similar to in Eq. 2:

$$\sum_{k=1}^{n} \frac{TP_k}{P} \quad \textbf{(6)}$$

For a 3-component system, the probability of being detected in the overlap is similarly calculated as:

$$P(detected\ in\ overlap) = Se_1 + Se_2 + Se_3 - (Se_1 * Se_2) - (Se_1 * Se_3) - (Se_2 * Se_3) + (Se_1 * Se_2 * Se_3) \quad \textbf{(7)}$$

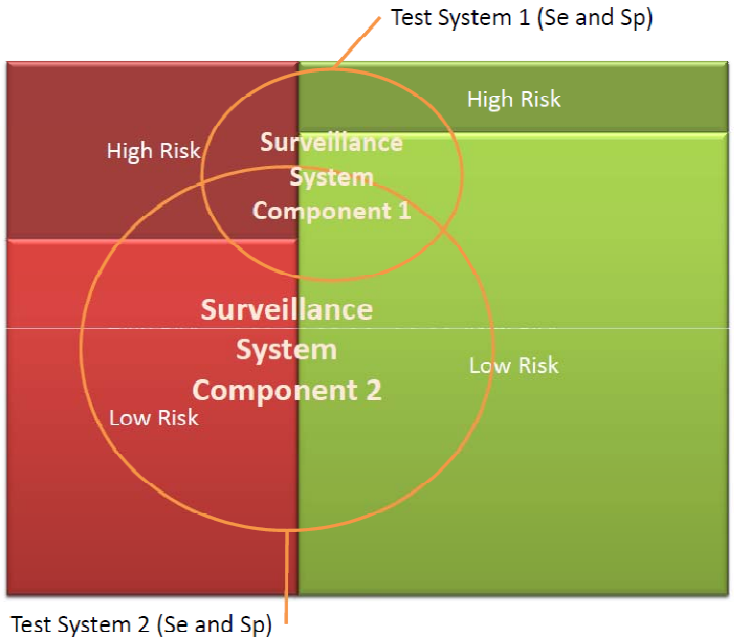

Figure 2: Representation of the overlap in surveillance activities across different population strata, for two surveillance system components (SSC) in an animal population divided into four separate strata by two different risk factors (red and green). Note that the specificity of the meat inspection procedure was not considered in this assessment.

The surveillance component-specific detection fraction was estimated by summarising the proportion of animals detected as true positives in all segments covered by the surveillance component.

Finally, an assessment of the incremental benefit of one surveillance component over the other was made by calculating the fraction detected by a surveillance component, whilst accounting for the fraction detected by another component in overlapping parts of the system.

3.3.2. Component sensitivity models

For the models aimed at estimating and comparing component sensitivity, stratum-specific unit sensitivities (SeU) were calculated as the sum of all probabilities in the scenario tree that were associated with a positive outcome (i.e. detection). Estimates were derived separately for meat inspection by the current system and for a system based on visual-only.

Component sensitivity was then estimated as:

$$CSe = 1 - \Pi(1 - SeU_i)^{n_i} \quad \textbf{(8)}$$

where *SeU* is the probability of a unit testing positive in stratum *i*, and *n* is the number of animals in stratum *i* that are processed by the surveillance component (in this case, the number of animals slaughtered during a **one month** period (for abattoir surveillance), and population size (for clinical surveillance)).

4. RESULTS

4.1. Proportion of case types within an infected or affected group of animals

The proportion of asymptomatic, mild and typical cases by disease and welfare condition, as elicited by experts is provided in Table 9 and 10. Eleven of the diseases and welfare conditions were regarded by the experts as not having a subclinical state, and for three of the welfare conditions, mild cases was considered not to exist (cleanliness score, fractured limb and poor body condition). For two diseases (enzootic bovine leucosis and ulcerative diseases, exemplified by bluetongue) the major part of infected animals were considered to be subclinical and consequently not detectable by meat inspection.

Table 9: Proportion of detectable (typical or mild) and non-detectable cases by diseases as elicited from the experts. Estimates were provided as 'minimum' (Min), 'most likely' (ML) and 'maximum' (Max) values.

Disease	**Age category**	**Proportion of case types within an infected batch**								
		Typical cases			**Mild cases**			**Non-detectable cases**		
		Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Echinococcosis/ hydatidosis[1]	All	0.05	**0.10**	0.20	0.80	**0.90**	0.95	-	**-**	-
Enzootic Bovine Leukosis	All	0.00	**0.01**	0.02	0.00	**0.03**	0.08	0.90	**0.96**	1.00
Fascioliasis	Adult	0.23	**0.40**	0.58	0.23	**0.45**	0.63	0.08	**0.15**	0.30
	Young >6w	0.19	**0.35**	0.55	0.23	**0.45**	0.63	0.08	**0.20**	0.35
Granuloma (tuberculosis, lymph nodes lesions for actinobacillosis or tumours)	Adult	0.01	**0.08**	0.15	0.08	**0.20**	0.29	0.65	**0.72**	0.89
	Young >6w	0.02	**0.08**	0.14	0.07	**0.22**	0.30	0.63	**0.70**	0.95
Necrobacillosis[1,2]	All	0.00	**0.60**	1.00	0.00	**0.40**	1.00	-	**-**	-
Pathological lesions in the heart of possible bacterial origin[1]	All	0.05	**0.23**	0.38	0.63	**0.77**	0.95	-	**-**	-
Respiratory diseases (transport fever and other causes of pneumonia and associated pleuritis)	Adult	0.02	**0.10**	0.27	0.17	**0.30**	0.50	0.27	**0.60**	0.80
	Young >6w	0.12	**0.30**	0.53	0.13	**0.37**	0.57	0.18	**0.33**	0.57
Cysticercosis *(Taenia saginata)*[1]	All	0.00	**0.20**	0.50	0.60	**0.80**	1.00	-	**-**	-
Ulcerative diseases	Adult	0.00	**0.07**	0.21	0.02	**0.12**	0.27	0.65	**0.81**	0.97
	Young >6w	0.00	**0.09**	0.25	0.02	**0.12**	0.27	0.65	**0.79**	0.95
Vesicular diseases	All	0.20	**0.50**	0.90	0.05	**0.30**	0.60	0.05	**0.20**	0.55

[1] all cases considered to be detectable per definition
[2] estimates not provided by experts, but assumed to follow the criteria used for defining typical cases

Table 10: Proportion of detectable (typical or mild) and non-detectable cases by welfare condition as elicited from the experts. Estimates were provided as 'minimum' (Min), 'most likely' (ML) and 'maximum' (Max) values.

Welfare condition	Age category	Proportion of case types within an affected batch								
		Typical cases			Mild cases			Non-detectable cases		
		Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Bruising and injuries[1]	All	0.05	**0.10**	0.15	0.85	**0.90**	0.95	-	-	-
Cleanliness score[2]	All	1.00	**1.00**	1.00	-	-	-	-	-	-
DFD meat[1]	Adult	0.01	**0.15**	0.30	0.73	**0.85**	0.96	-	-	-
	Young >6w	0.01	**0.08**	0.17	0.83	**0.92**	0.99	-	-	-
Foot and leg disorders[1]	Adult	0.20	**0.33**	0.47	0.53	**0.67**	0.80	-	-	-
	Young >6w	0.30	**0.43**	0.57	0.43	**0.57**	0.70	-	-	-
Fractured limb[2]	All	1.00	**1.00**	1.00	-	-	-	-	-	-
Integument alterations[1]	Adult	0.30	**0.42**	0.53	0.47	**0.58**	0.68	-	-	-
	Young >6w	0.35	**0.47**	0.58	0.42	**0.53**	0.63	-	-	-
Poor body condition[2]	All	1.00	**1.00**	1.00	-	-	-	-	-	-

[1] all cases considered to be detectable per definition
[2] not elicited as all cases are typical

4.2. Stage 2: Assessment of the sensitivity and case-finding capacity of abattoir surveillance

4.2.1. Probability of detection at ante- and post-mortem inspection

Stratum-specific probabilities of detection at meat inspection, for each disease or welfare condition, are summarised in Appendix 5. Note that the ante- and post-mortem probabilities of detection correspond to input distributions as elicited from the experts, whereas the combined probability of detection at ante- and post-mortem inspection was derived as an output from the scenario tree models.

4.2.2. Performance of abattoir surveillance for endemic disease surveillance

In table 11, the case-finding capacity of the abattoir surveillance component is given in terms of the detection fraction; for the current system and for a system based on visual-only inspection.

Table 11: Overall proportion of infected or affected animals successfully detected (**detection fraction**, presented as mode, 5th and 95th percentiles) for fourteen endemic diseases and welfare conditions selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance, under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. The input required to estimate the parameters was derived through elicitation of expert opinion and from the literature, using the French situation as an example.

	Disease/welfare condition	Detection fraction					
		Current			Visual-only		
		5%	**Mode**	95%	5%	**Mode**	95%
Infectious diseases	Echinococcus/hydatidosis	0.093	**0.112**	0.131	0.062	**0.078**	0.094
	Fascioliasis	0.099	**0.126**	0.151	0.073	**0.094**	0.114
	Granuloma/Bovine tuberculosis	0.032	**0.052**	0.083	0.005	**0.010**	0.017
	Necrobacillosis	0.16	**0.23**	0.33	0.14	**0.21**	0.31
	Pathological lesions in the heart	0.15	**0.18**	0.23	0.15	**0.18**	0.23
	Respiratory diseases	0.13	**0.23**	0.33	0.10	**0.19**	0.27
	Taenia saginata/Cysticercus bovis	0.074	**0.115**	0.171	0.015	**0.028**	0.045
Welfare conditions	Bruising and injury-related haemorrhage[1]	0.54	**0.60**	0.67	0.54	**0.60**	0.67
	Cleanliness score	0.21	**0.25**	0.29	0.21	**0.25**	0.29
	DFD meat[1]	0.15	**0.22**	0.29	0.16	**0.24**	0.31
	Foot-and leg disorders	0.14	**0.15**	0.17	0.14	**0.15**	0.17
	Fractured limb[1]	0.99	**0.99**	1.00	0.99	**0.99**	1.00
	Integument alterations	0.074	**0.096**	0.124	0.074	**0.096**	0.124
	Low body condition score	0.20	**0.23**	0.28	0.20	**0.23**	0.28

[1] Relates to transport-afflicted welfare conditions and the population considered is therefore animals transported to slaughterhouses.

4.2.3. Performance of abattoir surveillance for exotic disease surveillance/early detection

The estimated component sensitivities of abattoir surveillance for diseases classified as exotic, such as bluetongue, foot-and mouth disease and enzootic bovine leukosis are presented in table 12. Design prevalences of 0.002 at the herd-level, and 0.1, 0.01 and 0.1 within-herd were used, respectively.

Table 12: Probability of detecting one or more animals as infected at meat inspection during a one-month period (**component sensitivity**, presented as mode, 5th and 95th percentiles) for three infectious diseases selected by a working group under EFSA's Animal Health and Welfare Panel, and regarded as being **exotic**. The design prevalences used in the estimations are also given.

Disease	Component sensitivity						Design prevalence	
	Current			Visual-only			Herd	Within - herd
	5%	**Mode**	95%	5%	**Mode**	95%		
Enzootic Bovine Leukosis	0.061	**0.144**	0.262	0.056	**0.132**	0.242	0.002	0.01
Ulcerative diseases	0.997	**0.999**	1.000	0.996	**0.999**	1.000	0.002	0.1
Vesicular diseases	0.999	**0.999**	1.000	0.999	**0.999**	1.000	0.002	0.1

4.2.4. Effect of risk categorisation on surveillance performance

The effects of risk categorisation based on a hypothetical public health risk are presented in table 13.

Table 13: Effect of three risk categorisation scenarios on the mode of **detection fraction** and **component sensitivity** in models describing abattoir surveillance for endemic and exotic diseases, respectively.Seventeen diseases and welfare conditions selected by a working group under EFSA's Animal Health and Welfare Panel were considered. These estimates take into account the relative proportions of typical, mild *and* subclinical cases, as well as their respective probabilities of detection. For comparison, the corresponding estimates for the current inspection system are given (also in tables 11 and 12).

		Risk categorisation			
	Disease or welfare condition	**Equal prop.[1]**	**High prop. in low-risk[2]**	**High prop. in high risk[3]**	***Current***
Infectious diseases	Echinococcus/hydatidosis	0.09	0.09	0.10	*0.11*
	Enzootic Bovine Leukosis	0.15	0.14	0.14	*0.14*
	Fascioliasis	0.10	0.10	0.12	*0.13*
	Granuloma/Bovine tuberculosis	0.01	0.01	0.02	*0.05*
	Necrobacillosis	0.22	0.22	0.23	*0.23*
	Pathological lesions in the heart	0.16	0.16	0.18	*0.18*
	Respiratory diseases	0.21	0.21	0.23	*0.23*
	Taenia saginata/Cysticercus bovis	0.05	0.05	0.10	*0.12*
	Ulcerative diseases	1.00	0.95	1.00	*1.00*
	Vesicular diseases	1.00	1.00	1.00	*1.00*
Welfare conditions	Bruising and injury-related haemorrhage	0.60	0.60	0.60	*0.60*
	Cleanliness score	0.25	0.25	0.25	*0.25*
	DFD meat	0.23	0.23	0.22	*0.22*
	Foot-and leg disorders	0.15	0.15	0.15	*0.15*
	Fractured limb	0.99	0.99	1.00	*0.99*
	Integument alterations	0.09	0.09	0.09	*0.10*
	Low body condition score	0.22	0.22	0.22	*0.23*

[1]Equal category branch proportions for animals belonging to high and low risk groups with regards to an overarching farm level risk factor (the proportion of animals belonging to a high public health risk category is 0.2 for both groups).

[2]Different category branch proportions for animals belonging to high and low risk groups with regards to an overarching farm level risk factor (the proportion of animals belonging to a high public health risk category is 0.8 for the low risk group and 0.2 for the high risk group).

[3] Different category branch proportions for animals belonging to high and low risk groups with regards to an overarching farm level risk factor (the proportion of animals belonging to a high public health risk category is 0.2 for the low risk group and 0.8 for the high risk group).

4.3. Stage 3: Assessment of the relative effectiveness of abattoir surveillance within the overall surveillance system

Stage 3 modelling was conducted for four infectious disease (foot-and-mouth disease, bluetongue, tuberculosis and fascioliasis) and one welfare condition (foot and leg disorder).

For two of these (foot-and-mouth disease, bluetongue), component sensitivity was the outcome measure for comparison between surveillance components, and for the remaining three, detection fraction was used.

The results are shown in tables 14 and 15.

Table 14: Case-finding capacity of abattoir surveillance and of other surveillance components, measured by **detection fraction** (presented as mode, 5th and 95th percentiles), for the endemic diseases fascioliasis and bovine tuberculosis and the and welfare condition foot-and-leg disorders.

Disease or welfare condition	Meat inspection						Clinical surveillance			Control programme		
	Current			Visual-only								
	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
Fascioliasis	0.099	**0.126**	0.151	0.073	**0.094**	0.114	0.00	**0.00**	0.00	n.a.	n.a.	n.a.
Granuloma/ Bovine tuberculosis	0.032	**0.052**	0.083	0.005	**0.010**	0.017	0.00	**0.00**	0.00	0.63	**0.68**	0.74
Foot-and leg disorders	0.14	**0.15**	0.17	0.14	**0.15**	0.17	0.01	**0.02**	0.03	n.a.	n.a.	n.a.

n.a: not applicable

Table 15: **Sensitivity** of the abattoir surveillance component (presented as mode, 5th and 95th percentiles), and for clinical surveillance, with regards to detection of foot-and-mouth disease and bluetongue.

Disease	Meat inspection						Clinical surveillance		
	Current			Visual-only					
	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
Vesicular diseases	0.999	**0.999**	1.000	0.999	**0.999**	1.000	1.000	**1.000**	1.000
Ulcerative diseases	0.997	**0.999**	1.000	0.996	**0.999**	1.000	1.000	**1.000**	1.000

5. DISCUSSION

5.1. Methodological considerations

It should be noted that the role of meat inspection in surveillance for animal disease and welfare conditions is poorly covered in the scientific literature. Possibly, this is because meat inspection has a focus on the public health aspects rather than animal health. Another reason for the limited availability of scientific publications on animal health issues based on abattoir information can be a lack of efficient data capture in abattoirs due to a low degree of computerization.Consequently, considering the scope of this work where a large number of diseases and welfare conditions were to be covered, it was deemed necessary to use expert opinion to capture the information needed for modelling.

5.1.1. Data availability and quality

For each questionnaire, experts were asked to add comments, questions on difficulties and perceived limitations. A synthesis of all these remarks has been made at the end and was proposed to the four experts for comments. The following information is partly based on these remarks.

5.1.1.1. General remarks

In this assessment, the parameters for the probability of detection are based on **expert opinion**. There is therefore uncertainty as to the true range of these values. We used experts with significant experience in meat inspection, bovine pathology, infectious diseases and welfare. However, the number of experts was limited and not all of them were familiar with the planned models and how their input would contribute. Furthermore each expert was not expert in all fields (meat inspection, animal health and welfare). It was then difficult for experts to answer to all questions, although through using literature data and consultations with various colleagues with different fields of expertise the majority of questions were answered. However, depending on the subject area only two or three experts gave their opinion on some questions.

Detailed explanations were therefore provided but residual uncertainties on the side of the experts may have remained, potentially impacting on the accuracy of the information they provided. In general, the information elicited from experts regarding probability of detection is related to the biology of the disease or welfare condition under consideration rather than any specific geographic area. Therefore, their responses are considered to be representative for all regions of Europe that they represent.

The experts come from different countries and the situation in each country can differ widely, for example with regards to the current health situation and meat inspection practices. For instance, in several of the experts' countries there are no animals below six weeks slaughtered which made it difficult to answer questions related to this age category. Some countries are free from diseases on which we asked questions and thus the experts did not have any experience to provide either the probability of detection of these diseases or the definitions of typical or mild cases for diseases. The lack of experience in specific areas could sometimes be mitigated by consulting other experts and by discussing hypothetical scenarios, but cannot be seen as entirely compensated for.

Some definitions were not precise and could have been interpreted differently for each country. For instance, short or long transport durations can be defined differently in France and Sweden. It is the same for the expression 'multiple' lesions, which can be interpreted differently by different individuals.

Meat inspection does not aim at making a diagnosis. The main objective of meat inspection is to guarantee food safety. Thus conclusions of inspection are mostly to provide pre-diagnostic information than a formal diagnosis of diseases and welfare conditions. This means that for most of the diseases the probability of detection estimated by the model will be the probability to detect symptoms/lesions that could be linked to a disease but not the probability of detection of the disease. This is an important difference between meat inspection surveillance and other surveillance systems based on laboratory analysis.

As explained previously, a group of diseases or welfare conditions which can be considered as 'syndromes' were used for case definition and probability of detection elicited by experts such as 'vesicular diseases' or 'ulcerative diseases' but for the stage 3 modelling specific diseases were considered such as 'foot and mouth disease' and 'blue tongue'. Thus in the models there is probability of detection of a syndrome and at the same time the information on prevalence is for the specific disease. This may have created biases in the results.

5.1.1.2. Diseases definition

Some diseases identified by the WG were in fact a group of diseases combined to syndromes such as "respiratory diseases" and "vesicular diseases". This made it difficult to define a typical case and mild case in one unique definition. Indeed diseases within the same syndrome could present different symptoms or lesions, and to different degrees. It also created difficulties for the probability of detection and the partitioning between typical form, mild and subclinical forms of disease among infected animals because each disease could have a different distribution of cases. The estimates were given as an effort to amalgamate estimations for the different diseases included in each syndrome.

The definition of 'pathological lesions of the heart' was proposed to experts as 'pathological lesions in the heart of possible bacterial origin such as endocarditis or pericarditis'. As endocarditis was not included as a sign or lesion by the experts when they were asked to identify signs or lesions seen in more than 60% of affected individuals we thus deleted the term 'endocarditis' at the beginning of the definition for more clarity. However, this does not mean that endocarditis cannot be a sign of pathological lesion of the heart – only that it was regarded by the experts as less than typical.

The definition of diseases and welfare conditions are based on literature review and the opinions of four experts. The definitions used are based on a consensus among these experts obtained by a clear process detailed in 1.2. Obviously the definition of a disease or welfare condition can differ from experts notably for what is considered as the mild or typical form. The interpretation of the results have to be made in line with these definitions.

5.1.1.3. Questionnaire for data collection

For the questions on the partitioning of typical/mild/subclinical cases among infected animals, there is limited information in the literature on that subject and it was difficult for experts to estimate these probabilities based on their own experience. Consequently, it was difficult to reach a consensus on these questions. There was also some confusion with regards to time aspects (i.e. stage of infection). The questions were interpreted as 'in a group of 100 infected animals, how many would present as typical/mild/subclinical cases', for each age category. However, for some (but not all) diseases this would be dependent on when the group was infected (i.e. what stage of infection would the animals be in), and whether all animals were infected at the same time or if the disease was introduced in one animal and the spread through the group. The estimates now mostly represent how each disease would present at one (random) point in time in a group of animals exposed to the infection, they do not represent how many animals would show a mild or typical case at some (any) point in time during the course of the infection. This should be taken into account when interpreting the estimates from the model.

Furthermore, estimates on the proportion of subclinical, mild and typical cases in the population may to a larger extent be influenced by experiences specific to the geographic area where the expert is working.

There can be a lot of differences in ante-mortem inspection between abattoirs, depending on the number of veterinarians available for this inspection, on the timing of the inspection, for example when animals arrive at the abattoir, on the type of byre (if there is enough place to see animals walk) available. The experience of each expert can influence the probabilities they give regarding these aspects.

5.1.1.4. Data needed and not elicited from experts recruited

It was difficult to find data not elicited by experts because of the lack of literature on the subject for most of the questions. A French expert network was used, asking each question to an identified expert in the field in France but as no survey has been done on these specific questions, some answers are just based on experience of one expert in the field. There is obviously uncertainty in these answers but it is difficult to quantify it. We specify in Appendix-4B where the data came from and the hypotheses we made in determining these data. These uncertainties should be considered when interpreting the results. Wherever possible, population data from the French animal movement database (BDNI) and the abattoir database NERGAL were used as basis for estimates. These are likely to be highly representative for France, but not necessarily possible to extrapolate to other countries or situations. The model is available on demand and each country can use it by plugging in its own data. Thus it is possible to obtain the same kind of results as for France, here taken as a case country example.

5.1.2. Modelling assumptions

In this study, the experts estimated the compound probability of detection at ante- and post-mortem inspection. The overall probability that an abnormality would be detected during meat inspection is calculated as the probability that an abnormality would be detected at one or more stages of the meat inspection. This calculation is based on the assumption that the probabilities of detection at each step are independent. This should be a justifiable assumption in most slaughterhouses as the ante- and post-mortem inspection often is done by different individuals and at different points in time.

Another assumption applied was that the **specificity** of the meat inspection procedure was equal to 1, i.e. that all animals classified as detected with a specific syndrome were correctly classified and that there were no false positives. This is a reasonable assumption given that the diagnosis is at the pathological syndrome level rather than for a specific diagnosis. As an example, it is reasonable to assume that animals without lesions in the respiratory tract would not be classified as having a respiratory disease. Given the syndromic character of several of the case definitions, many different diseases could comply with the pathological expression described, and in no case the diagnosis was taken further than a macroscopic detection of the described lesions. In other words, any further diagnostic work-up to confirm or reject a particular diagnosis was not taken into account.

The number of diseases and welfare conditions considered in the Stage 3 analysis was limited, and they were purposively chosen to represent different aspects of interest (exotic, endemic, welfare). Considering this, the results can be regarded as being valid for the specific diseases and welfare conditions under study, but inference to a larger range of diseases or welfare conditions should be avoided. In contrast, the analysis in Stage 2 covered a broader range of relevant hazards for the respective species and is more likely to provide a comprehensive picture of how changes in meat inspection may affect detection effectiveness. Still, although the selection of hazards was subject to a systematic process, its purpose was not to produce a representative selection of diseases and welfare conditions and therefore another selection process could have generated different conclusions.

5.2. Performance of meat inspection for the surveillance of disease and welfare conditions

5.2.1. Factors influencing the probability of detection at meat inspection and effect of changing to visual-only inspection

In general, the results from stage 2 modelling show that under the current scenario **typical cases** are considered likely to be detected by meat inspection for most of the diseases and welfare conditions considered and in the age groups primarily considered (bovines > 6 weeks of age including adult animals), with sensitivities above 0.75. Exceptions are cysticercosis, integument alterations and DFD meat which are considered as having moderate to low probabilities of detection at meat inspection even with the current system; for typical cases and even more so for milder cases.

A change from the current inspection to visual-only inspection rendered a significant reduction in the probability of detection at meat inspection (combined AM and PM inspection) for respiratory diseases, cysticercosis, fascioliasis and for bovine tuberculosis. For fascioliasis this was seen primarily for milder cases. For the other thirteen diseases and welfare conditions, the experts did not express any strong opinion regarding the impact of going from the current meat inspection procedure to a visual-only inspection.

Similarly, a significant reduction in the fraction detected as positive by abattoir surveillance was seen for cysticercosis and for bovine tuberculosis.

The analysis indicates that for easily detectable welfare conditions, both on-farm and transport related, such as poor body condition, fractures, bruising and injuries, meat inspection constitutes a highly sensitive control point.

A move to visual inspection was not considered as having an impact on abattoir surveillance for the exotic diseases, at the design prevalences considered here. The overall relatively lower sensitivity for Enzootic Bovine Leukosis can largely be attributed to a lower within-herd design prevalence, set to reflect the fact that this disease is less likely to spread quickly within an infected herd than a disease such as foot-and-mouth disease.

5.2.2. Impact of public health risk-based inspection on animal health surveillance

The effects of risk categorisation by public health risk were limited in this case study. A reduction in detection fraction (point estimate reduced by 50% or more) was mainly seen for cysticercosis and bovine tuberculosis. In this scenario, the alternative inspection procedure for herds classified as having a low public health risk was “visual-only”; any effect on detection fraction therefore reflects the occasional lower sensitivity of visual inspection for these diseases. It can also be seen that when the public health risk shows synergies with the animal health risk, the effect of the less sensitive inspection procedure can to some extent be mitigated. The extent to which this will happen depends on the proportion of the population in the high animal health risk strata that also fall into the high public health risk category: the higher the proportion, the more likely the system is to remain unaffected.

It can be noted that for most diseases the system is marginally affected even when the public health risk counteracts the animal health risk. This mainly reflects the fact that visual-only inspection and current meat inspection are considered to perform equally well for several of the diseases and welfare conditions considered.

5.2.3. Relative contribution of meat inspection to over-all disease surveillance

The results of the stage 3 models show that for vesicular and ulcerative diseases like foot-and-mouth disease and bluetongue, the sensitivity of meat inspection is considered to be very high at the design prevalences considered; under French conditions and looking at a time period for the surveillance of one month. Clinical surveillance is considered to perform equally well under these conditions. It should be noted that although clinical surveillance is identified as equally sensitive to meat inspection for detecting introductions of exotic disease, meat inspection will also be important as a back-up system, in particular in situations when the awareness of exotic disease as a differential diagnosis is low. For example, this may be the situation prior to detection of an index case, in particular where there is a high prevalence of endemic diseases with similar expression as the exotic disease. This was the case in the FMD epidemic in United Kingdom, which was detected in the abattoir(Gibbens, Sharpe et al. 2001).

For the welfare condition foot-and-leg disorders, it can be noted that although the fraction of affected animals detected by meat inspection is fairly low, it is still substantially higher than for clinical surveillance. As there is no alternative surveillance component where such cases can be detected, at least no under French conditions, meat inspection play an important role in capturing cases of foot-and-leg disorders.

For fascioliasis, meat inspection is more or less the only way of detection. This means that any reduction in detection probability at meat inspection, for example by moving to a visual-only procedure, will have a direct impact on the surveillance of this disease.

With regards to granuloma (indicative of bovine tuberculosis), meat inspection plays a lesser role in removing infected animals from the population than control programme activities. However, at the same time, meat inspection plays a crucial role as a performance indicator for bTB control programmes; if a programme fails, animals showing granuloma are likely to be detected at meat inspection, at least under the current meat inspection procedure. According to the current analysis, a change to visual-only inspection is associated with a significant reduction in probability of detection and may consequently have a strong negative impact on the ability to evaluate the performance of control programmes on bTB.

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Note that additional literature references to data that were not elicited from experts are provided in Appendix 4B.

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APPENDIX 1 – QUESTIONNAIRES FOR ELICITATION OF CASE DEFINITIONS FROM EXPERTS

1 A: Questionnaire on typical case definition round 1

1 B: Questionnaire on typical case definition round 2

1 C: Questionnaire on mild case definition

Questionnaire on case definitions

Expert name:

(Note: Name will remain confidential)

Purpose

In the COMISURV project, we try to collect information and opinions on diagnosis of animal health conditions at meat inspection procedure for bovine. The diseases and animal welfare issues of interest were identified by a working group under EFSA's Animal health and Welfare Panel (AHAW) and prioritized according to their likelihood of detection, at ante- and/or post-mortem inspection. Further criteria considered were the relevance of the disease/animal welfare issue or case to bovine of slaughter age. Diseases that are predominantly zoonotic rather animal health related were excluded. Seventeen **diseases**/ **animal welfare conditions** have been selected as issues of interest for this project:

- **Necrobacillosis**
- **Enzootic Bovine Leukosis**
- **Respiratory diseases**
- **Vesicular diseases**
- **ulcerative diseases**
- **Echinococcosis**
- **Taenia saginata**
- **Fascioliasis**
- **Foot and leg disorder**
- **Low body condition**
- **Fractured limb**
- **Cleanliness score**
- **Integument alterations**
- **Bruising and injury**
- **DFD meat**
- **Granuloma**
- **Pathological lesions in the heart of possible bacterial origin**

Before we start to work on contribution of meat inspection in case detection, we want to make sure the definitions of the selected cases are consistent, correct and of common understanding.
As the work is focused on meat inspection, **we aim to obtain common descriptions of disease/ condition cases as these would be observed at the slaughterhouse** (i.e. considering that the infected animals were still fit for transport and to slaughter).

In the following questionnaire, you will be invited to select symptoms and/or lesions that are likely to be observed at slaughterhouse.
You will have to define what is called "typical case" for each disease/condition.
A typical case is defined by a list of symptoms and/or lesions that are expected to be observed in more than 60 % of the clinically infected/affected bovines arriving at slaughterhouse.

To illustrate the definition of a typical case, see below the Figure 1.

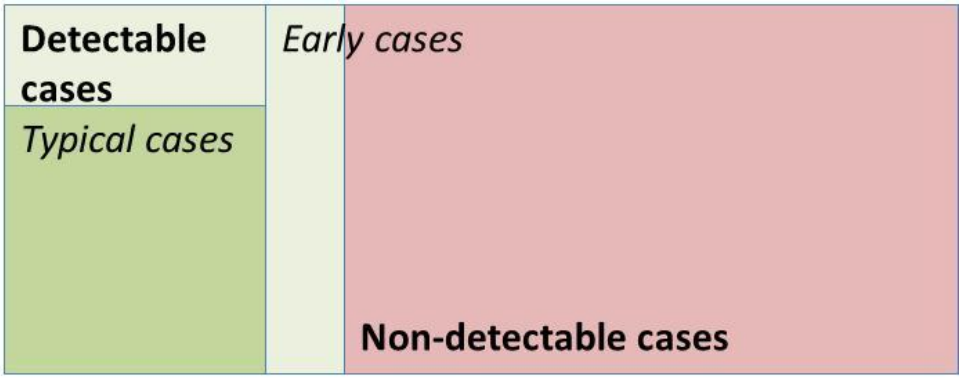


Figure 1: Different case types defined for description and analyses of the sensitivity of meat inspection. Typical case=dark green, detectable case=dark green + light green; non-detectable case=red, mild case=red + part of light green).

The list of symptoms that is proposed to you is based on disease descriptions from both literature and a meat inspection expert's advice.

How your answers will be used?

The answers of experts will be summarized and items obtaining 2 votes or more will be kept in the final definition. Once the definition of a typical case will be validated you will be invited to propose up to 2 combinations of symptoms and/or lesions describing a mild case. A mild case will have more subtle signs and may be detectable but more likely will not be detectable. We will send you a second questionnaire for this purpose.

What are the next steps of the project?

The case definition (of typical and mild case) will be used to implement a questionnaire for the evaluation of the role of current meat inspection practices in the surveillance of these conditions. You will be asked to give some probabilities for a disease/condition to be detected during the slaughtering process (ante and post mortem). The results will be presented afterwards in aggregated form without identifying the data source or disclosing confidential information.

This work is conducted under a contract with EFSA, who will have ownership to the **project report**. EFSA may, or may not, decide to make the report accessible to the public. However, the main purpose of the report is to support the AHAW working group in its assessment of the contribution of meat inspection to animal health surveillance.

How to fill in the questionnaire

To choose the symptom/list of symptoms you want, you have to cross the shaded box by double clicking on it and choose "activated box".

In addition, please feel free to add comments in red color whenever an answer needs further explanation.

Please feel free to contact us if the question is not clear to you – we then will contact you to discuss these questions together.

Depending on your field of expertise you could feel that you are not "enough expert" to answer to some questions of this questionnaire. Feel free not to answer to these questions by crossing the available green box:" ☐ **Not expert**"

Please send your filled questionnaire back to the following e-mail address: celine.dupuy@anses.fr, pascal.hendrikx@anses.fr **before 1st December.**

Thank you for your participation and for your valuable contribution to this project!

1. Necrobacillosis (liver, oral cavity): *Fusobacterium necrophorum*

Interdigital form is excluded from the definition

Here is a list of possible symptoms (AM) and lesions (PM) associated with necrobacillosis. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine clinically infected by necrobacillosis arriving at slaughterhouse.

Ante-mortem

- ☐ Hypersalivation
- ☐ Difficult breathing
- ☐ Difficult swallowing
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ ulceration in the tongue
- ☐ swollen cheek
- ☐ liver abscesses
- ☐ Others:
- ☐ **Not expert**

2. Enzootic Bovine Leukosis

Here is a list of possible symptoms (AM) and lesions (PM) associated with Enzootic Bovine Leukosis. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine clinically infected by Enzootic Bovine Leukosis arriving at slaughterhouse.

Ante-mortem

- ☐ Enlarged mandibular superficial lymph nodes
- ☐ Enlarged scapular superficial lymph nodes
- ☐ Enlarged pre-crural superficial lymph nodes
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ Superficial lymph nodes enlarged
- ☐ Abdominal-pelvic cavity lymph nodes enlarged
- ☐ Lymph nodes and a wide range of tissues are infiltrated by neoplastic cells in:
  - ☐ Heart
  - ☐ Spleen
  - ☐ Intestine
  - ☐ Liver
  - ☐ Kidney
  - ☐ Lung
  - ☐ Bone marrow
- ☐ Others:
- ☐ **Not expert**

3. Respiratory diseases

The respiratory diseases bring together transport fever (*Histophilus somni = Haemophilus somnus, Mannheimia haemolytica)* and other causes of pneumonia and associated pleuritis.

Here is a list of possible symptoms (AM) and lesions (PM) associated with respiratory diseases. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine clinically infected by respiratory diseases arriving at slaughterhouse.

Ante-mortem

- ☐ Severe pneumonia with respiratory difficulties
- ☐ Pneumonia with little respiratory difficulties
- ☐ Little sporadic cough
- ☐ Loose cough
- ☐ Mucopurulent nasal discharge
- ☐ Hyperthermia
- ☐ Anorexia
- ☐ Shallow respiration
- ☐ Rapid respiration
- ☐ Abducted elbows
- ☐ Unwillingness to move
- ☐ No visible symptoms
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ Fibrinous pneumonia
- ☐ Fibrinous pleuritis
- ☐ Suppurated bronchopneumonia
- ☐ Abscesses more or less voluminous in lung
- ☐ Purulent exudate in the pleural cavity
- ☐ Chronic bronchopneumonia
- ☐ Fibrosis pneumonia
- ☐ Fibrosis pleuritis
- ☐ Others:
- ☐ **Not expert**

4. Vesicular diseases

The vesicular diseases bring together foot and mouth disease and vesicular stomatitis.

Here is a list of possible symptoms (AM) and lesions (PM) associated with vesicular diseases. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine clinically infected by vesicular diseases arriving at slaughterhouse.

Ante-mortem

- ☐ Vesicles on nostrils or muzzle
- ☐ Profuse salivation
- ☐ Profuse nasal discharge (mucoid or mucopurulent)
- ☐ Reluctance to rise or stamping or shaking of the feet
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ Single fluid-filled vesicles or bullae from 2 mm to 10 cm in diameter in the oral cavity, feet or on pillars of the rumen.
- ☐ Multiple fluid-filled vesicles or bullae from 2 mm to 10 cm in diameter in the oral cavity, feet or on pillars of the rumen.
- ☐ Red eroded areas or ulcers (vesicle rupture)
- ☐ Heart muscle degeneration (tiger heart)
- ☐ Others:
- ☐ **Not expert**

5. Ulcerative diseases

The ulcerative diseases bring together Malignant catarrhal fever and Blue tongue.

Here is a list of possible symptoms (AM) and lesions (PM) associated with ulcerative diseases. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine clinically infected by ulcerative diseases arriving at slaughterhouse.

Ante-mortem

- ☐ ulcers of the mouth
- ☐ ulcers of the nose
- ☐ Lameness with an inflammation of the top of the hoof
- ☐ Laminitis
- ☐ hoof cracks
- ☐ Inflammation of the skin with loss of hair
- ☐ Inflammation of the skin with sloughing of patches of skin
- ☐ Presence of an exudates and crusts on the skin surface
- ☐ Ulcers on the teats and udder
- ☐ Muscular stiffness
- ☐ Shallow rapid respiration
- ☐ Excessive salivation
- ☐ Bilateral corneal opacity
- ☐ Serous oculonasal discharge or mucopurulent discharge
- ☐ Bloody urine
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ Ulcers of the oesophagus
- ☐ Ulcers of the trachea.
- ☐ Ulcers of the rumen
- ☐ Ulcers of the mouth
- ☐ Ulcers of the nose
- ☐ Multifocal hemorrhages on the lip and dental pad
- ☐ Subepicardial hemorrhages
- ☐ Generalized lymph node enlargement
- ☐ Bloody urine
- ☐ Infiltration of nonlymphoid tissues by lymphoid cells (renal cortex and periportal areas of the liver)
- ☐ Others:
- ☐ **Not expert**

6. Echinococcosis/hydatidosis :*Echinococcus granulosus* - larva in liver, lungs

Here is a list of possible symptoms (AM) and lesions (PM) associated with echinococcosis/hydatidosis. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine clinically infected by echinococcosis/hydatidosis arriving at slaughterhouse.

Ante-mortem

- ☐ Animal in bad condition
- ☐ Thin animal
- ☐ Animal with weak muscular development
- ☐ No symptoms are visible
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ Multiple Echinococcus granulosus cysts in the liver
- ☐ Multiple Echinococcus granulosus cysts in lungs
- ☐ High number of *cysts* of different sizes and shapes and they contain a clear fluid under pressure
- ☐ Limited number of *cysts* of different sizes and shapes and they contain a clear fluid under pressure
- ☐ Others:
- ☐ **Not expert**

7. Taenia saginata :*Cysticercus bovis* - larva in muscle)

Here is a list of possible symptoms (AM) and lesions (PM) associated with *Cysticercus bovis*. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine clinically infected by *Cysticercus bovis* arriving at slaughterhouse.

Ante-mortem

- ☐ No symptoms are visible
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ Large number of small white lesions in muscle tissue everywhere on the carcass
- ☐ Clear transparent bladders with Opaque and pearl like liquid
- ☐ Degeneration, caseation and calcification lesions
- ☐ Degenerative myocarditis
- ☐ Others:
- ☐ **Not expert**

8. Trematodes – Fascioliasis :*Fasciola hepatica*

Here is a list of possible symptoms (AM) and lesions (PM) associated with *Fasciola hepatica*. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine clinically infected by *Fasciola hepatica* arriving at slaughterhouse.

Ante-mortem

- ☐ Anemia
- ☐ Edema
- ☐ Chronic diarrhea
- ☐ No symptoms are visible
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ Black parasitic debris in the liver, diaphragm
- ☐ Entire fluke in the liver, diaphragm
- ☐ Eosinophilic lymph nodes (dark green) in the liver
- ☐ Others:
- ☐ **Not expert**

9. Foot and leg disorder

The definition includes foot and leg disorder linked to trouble in housing system but excluding fractured limbs.

Here is a list of possible symptoms (AM) and lesions (PM) associated with foot and leg disorders. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine affected by foot and leg disorders arriving at slaughterhouse.

Ante-mortem

- ☐ Minor lameness
- ☐ Strong reluctance to bear weight on one limb
- ☐ Strong reluctance to bear weight on more than one limb
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ Arthritis
- ☐ arthrosis
- ☐ Enlarged lymph nodes
- ☐ Serohemorrhagic infiltration
- ☐ Amyotrophy
- ☐ Whitlow
- ☐ Foot infection
- ☐ Others:
- ☐ **Not expert**

10. Low body condition score: thin body

Here is a list of possible symptoms (AM) and lesions (PM) associated with low body condition. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine presenting a low body condition arriving at slaughterhouse.

Ante-mortem

- ☐ Extreme thinness
- ☐ Cachexia
- ☐ Emaciated animal
- ☐ Animal with weak muscular development in relation to the production type[1]
- ☐ Others:
- ☐ **Not expert**

Post-mortem

Not relevant because an animal detected with a low body condition will be euthanised so there will not be any post-mortem inspection.

11. Fractured limb

Here is a list of possible symptoms (AM) and lesions (PM) associated with fractured limb that could be linked to transportation trauma. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine affected by fractured limb arriving at slaughterhouse.

Ante-mortem

- ☐ Severe lameness
- ☐ Impossible to get off the ground
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ Fractured limb
- ☐ Serohemorrhagic infiltration of all tissues around the broken bones
- ☐ Acute inflammation of lymph nodes
- ☐ Others:
- ☐ **Not expert**

[1] Only abnormal weak muscular development because it can be normal to have it for example with high productive dairy cattle

12. Cleanliness score

If we suppose a codification of cleanliness score from 0 to 4, we consider in the definition only bovine having a cleanliness score of 3 or 4.

Here is a list of possible symptoms (AM) and lesions (PM) associated with a cleanliness score of 3 or 4. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine having a cleanliness score of 3 or 4 arriving at slaughterhouse.

Ante-mortem

- ☐ Extremely heavily soiled with dried manure and/or manure armour in critical areas[2]
- ☐ Large spread of urine/manure burn marks in the skin
- ☐ Others:
- ☐ **Not expert**

Post-mortem
Not relevant because there is no inspection of the skin during post-mortem inspection.

13. Integument alterations

Here is a list of possible symptoms (AM) and lesions (PM) associated with integument alterations. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine affected by integument alterations arriving at slaughterhouse.

Ante-mortem

- ☐ Skin lesions of a minimum diameter of 2 cm
- ☐ injuries/wounds occurring at head
- ☐ injuries/wounds occurring at neck
- ☐ injuries/wounds occurring at back level
- ☐ Hock injuries
- ☐ Hyperkeratosis
- ☐ Pale hairless
- ☐ Red hairless
- ☐ phlegmon,
- ☐ Ulcerations
- ☐ Swellings
- ☐ Scabs of dried blood
- ☐ Scars, crusty skin
- ☐ Others:
- ☐ **Not expert**

Post-mortem
Not relevant because there is no inspection of the skin during post-mortem inspection.

[2] Critical areas= under surface/mid line of abdomen; under surface of chest; hook and Achilles tendon; under surface of neck; udder and genitalia; area around the anus, including rear part of udder

14. Bruising and Injury-related hemorrhage (related to transport)

Here is a list of possible symptoms (AM) and lesions (PM) associated with bruising and injury-related hemorrhage. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine affected by bruising and injury-related hemorrhage arriving at slaughterhouse.

Ante-mortem

- ☐ Lameness
- ☐ hemorrhagic skin injuries
- ☐ No visible symptoms
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ Severe flesh wounds involving whole limbs
- ☐ Severe flesh wounds involving carcass portions
- ☐ Severe flesh wounds involving whole carcass
- ☐ No visible lesions
- ☐ Others:
- ☐ **Not expert**

15. DFD meat (Dark, Firm, Dry meat)

Here is a list of possible symptoms (AM) and lesions (PM) associated with DFD meat. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine affected by DFD meat arriving at slaughterhouse.

Ante-mortem
Not relevant because it is impossible to detect at that stage of the meat inspection

Post-mortem

- ☐ The carcass meat is darker and drier than normal
- ☐ The carcass meat has a much firmer texture
- ☐ Large area or whole carcass affected
- ☐ Few muscles of the carcass affected
- ☐ Others:
- ☐ **Not expert**

16. Granuloma (in any organs)

Granuloma diseases bring together tuberculosis, lymph nodes lesions for actinobacillosis or tumors.

Here is a list of possible symptoms (AM) and lesions (PM) associated with granuloma diseases. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine infected by granuloma diseases arriving at slaughterhouse.

Ante-mortem

- ☐ Chronic intermittent hacking cough
- ☐ Pneumonia
- ☐ Difficult breathing
- ☐ Emaciation
- ☐ No visible symptoms
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ Granulomatous-necrotizing lymphadenitis
- ☐ Bronchopneumonia
- ☐ Tuberculous granuloma in the lymph nodes of the head
- ☐ Tuberculous granuloma in the lymph nodes of the lungs
- ☐ Tuberculous granuloma in the lymph nodes of the liver
- ☐ Tuberculous granuloma in the lymph nodes of the intestine
- ☐ Tuberculous granuloma in the lymph nodes of the carcass
- ☐ Granulomatous lesions in the lymph nodes
- ☐ Others:
- ☐ **Not expert**

17. Pathological lesions in the heart

Definition include pathological lesions in the heart of possible bacterial origin such as endocarditis or pericarditis.

Here is a list of possible symptoms (AM) and lesions (PM) associated with pathological lesions in the heart. Select the association of symptoms that are expected to be observed in more than 60 % of the bovine affected by pathological lesions in the heart arriving at slaughterhouse.

Ante-mortem

- ☐ Breathing with accompanied grunt
- ☐ Pallor of mucosae
- ☐ Jaundice
- ☐ Breathlessness
- ☐ No visible symptoms
- ☐ Others:
- ☐ **Not expert**

Post-mortem

- ☐ Large cauliflower-like lesions in the endocardium
- ☐ Small wart-like and verrucose lesions in the endocardium
- ☐ Embolic lesions in other organs including the lungs, spleen, kidneys etc.
- ☐ Exsudative pericarditis
- ☐ Exsudate more or less thick or purulent in pericardium
- ☐ fibrous pericarditis
- ☐ Others:
- ☐ **Not expert**

Questionnaire on case definitions: Second round

Expert name:

(Note: Name will remain confidential)

The answers of the four experts have been analyzed and it's now the second round of elicitation that aims to obtain a consensus on the definition of diseases/conditions.

When an item was chosen by at least 2 experts it was kept for the final definition. If the definition obtained didn't present any contradiction it is considered to be the final definition which will appear like this:

Final definition

However you will be able to give comments on it.

For some disease/condition, no item has been chosen by at least 2 experts. You will be asked then to choose between the different propositions of experts.

Sometimes there were two opposite items that were kept and we thus ask you to give again your opinion on it to make a choice between these two possibilities.

Feel free to add comments.

Reminder: **A typical case is defined by a list of symptoms and/or lesions that are expected to be observed in more than 60 % of the clinically infected/affected bovines arriving at slaughterhouse.**

Further steps:

The results of the "second round case definition questionnaire" will enable us to write the final definition of typical case that we will send back to you. These definitions will be used for the main questionnaire which aims to determine the probability of detection of these diseases/conditions during ante and post mortem meat inspection. This main questionnaire will be sent to you before Christmas.

You will soon receive another small questionnaire on the mild case definition.

Please send your filled questionnaire back to the following e-mail address: celine.dupuy@anses.fr, **before Tuesday 13 December.**

Thank you for your participation and for your valuable contribution to this project!

1. Necrobacillosis (liver, oral cavity): *Fusobacterium necrophorum*

Interdigital form is excluded from the definition

Ante-mortem

The typical case of necrobacillosis is assumed to present itself at ante-mortem inspection (AMI) with hypersalivation or no visible symptom.

I want to keep:
☐ Hypersalivation
☐ No symptoms
☐ **Not expert**

Comment: ……

Post-mortem

At post mortem inspection (PMI) a typical case of necrobacillosis is assumed to present itself with liver abscesses

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

2. Enzootic Bovine Leukosis

Ante-mortem

The typical case of enzootic bovine leukosis is assumed to present itself at ante-mortem inspection (AMI) with enlarged superficial lymph nodes (mandibular, scapular or pre-crural).

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

Post-mortem

At post mortem inspection (PMI) a typical case of enzootic bovine leukosis is assumed to present itself with superficial lymph nodes enlarged and / or? abdominal-pelvic cavity lymph nodes enlarged.

I want to keep in the definition:
☐ and
☐ or
☐ and/or
☐ **Not expert**

Comment: ……

3. Respiratory diseases

The respiratory diseases bring together transport fever (*Histophilus somni = Haemophilus somnus, Mannheimia haemolytica)* and other causes of pneumonia and associated pleuritis.

Ante-mortem

The typical case of respiratory diseases is assumed to present itself at ante-mortem inspection (AMI) with mucopurulent nasal discharge and rapid respiration.

☐ No comment, I agree with this definition

☐ **Not expert**
☐ Comment: ……

Post-mortem

At post mortem inspection (PMI) a typical case of respiratory diseases is assumed to present itself with fibrinous or fibrosis pleuritis associated with fibrinous or fibrosis pneumonia and abscesses more or less voluminous in lung.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

4. Vesicular diseases

Ante-mortem

The typical case of vesicular diseases is assumed to present itself at ante-mortem inspection (AMI) with vesicles on nostrils or muzzle, a hypersalivation and reluctance to rise or stamping/shaking the feet.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

Post-mortem

At post mortem inspection (PMI) a typical case of vesicular diseases is assumed to present itself with single fluid-filled vesicles or bullae from 2 mm to 10 cm in diameter in the oral cavity, feet or on pillars of the rumen associated with red eroded areas or ulcers (vesicle rupture).

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

5. Ulcerative diseases

The ulcerative diseases bring together Malignant catarrhal fever and Blue tongue.

Ante-mortem

The typical case of ulcerative diseases is assumed to present itself at ante-mortem inspection (AMI) with ulcers of the mouth, nose associated with hypersalivation.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

Post-mortem

At post mortem inspection (PMI) a typical case of ulcerative diseases is assumed to present itself with multifocal hemorrhages on the lip and dental pad associated with ulcers of oesophagus and/or rumen and/or mouth and/or nose.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

6. Echinococcosis/hydatidosis :*Echinococcus granulosus* - larva in liver, lungs

Ante-mortem

The typical case of hydatidosis is assumed to be in bad condition or will not present any visible symptom at ante-mortem inspection (AMI).

I want to keep:
☐ be in bad condition
☐ no visible symptoms
☐ **Not expert**

Comment: ……

Post-mortem

At post mortem inspection (PMI) a typical case of hydatidosis is assumed to present itself with a limited number of *cysts* of different sizes and shapes which contain a clear fluid under pressure in liver and / or? lungs.

I want to keep in the definition:
☐ and
☐ or
☐ and/or
☐ **Not expert**

Comment: ……

7. Taenia saginata :*Cysticercus bovis* - larva in muscle)

Ante-mortem

The typical case of *Taenia saginata* is assumed to present no visible symptom at ante-mortem inspection (AMI).

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

Post-mortem

At post mortem inspection (PMI) a typical case of *Taenia saginata* is assumed to present itself with either clear transparent bladders full of opaque pearl like liquid or degeneration, caseation and calcification lesions.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

8. Trematodes – Fascioliasis :*Fasciola hepatica*

The typical case of fascioliasis is assumed to present no visible symptom at ante-mortem inspection (AMI).

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

At post mortem inspection (PMI) a typical case of fascioliasis is assumed to present itself with black parasitic debris or entire fluke in the liver and enlarged/thickened ducts.

I want to keep in the definition “enlarged/thickened ducts”:
☐ Yes

☐ No
☐ **Not expert**
☐ Comment: ……

9. Foot and leg disorder

The definition includes foot and leg disorder linked to trouble in housing system but excluding fractured limbs.

Ante-mortem

The typical case of foot and leg disorder is assumed to present a minor lameness at ante-mortem inspection (AMI).

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

Post-mortem

At post mortem inspection (PMI) a typical case of foot and leg disorder is assumed to present itself with amyotrophy associated with arthritis and/or arthrosis.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

10. Low body condition score: thin body

Ante-mortem

The typical case of low body condition score is an emaciated animal presenting an extreme thinness at ante-mortem inspection (AMI).

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

Post-mortem

Initial proposition:
Not relevant because an animal detected with a low body condition will be euthanized so there will not be any post-mortem inspection.
New suggestion:
If for some reason, body condition is not noted during AMI inspection and the body condition is not as severe as requiring euthanasia, the low body condition score will be discovered during PMI.

I want to keep:
☐ the initial proposition (not relevant to define a typical post mortem case)
☐ the new suggestion (it's relevant to define a typical post mortem case)
☐ **Not expert**

If you chose the new suggestion, which post mortem lesion(s) can define a typical case?
……

11. Fractured limb

Ante-mortem

The typical case of fractured limb during ante mortem inspection is an adult cow which can't get off the ground or a calf with severe lameness.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

At post mortem inspection (PMI) a typical case of fractured limb is assumed to present itself with fractured limb and serohemorrhagic infiltration of all tissues around the broken bone.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

12. Cleanliness score

If we suppose a codification of cleanliness score from 0 to 4, we consider in the definition only bovine having a cleanliness score of 3 or 4.

Ante-mortem

The typical case of bad cleanliness score assumed to present itself with an extremely heavily soiled with dried manure and/or manure armour in critical areas[1] at ante mortem inspection.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

Post-mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

13. Integument alterations

Ante-mortem

The typical case of integument alterations is assumed to present itself with ulcerations or bedsores due to insufficient bedding and other housing problems at ante mortem inspection

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

Post-mortem

Post mortem: Not relevant because there is no inspection of the skin during post-mortem inspection.

14. Bruising and Injury-related hemorrhage (related to transport)

Ante-mortem

The typical case of bruising and injury-related hemorrhage is assumed to present itself with no visible symptom OR fresh bleeding wounds during ante-mortem inspection (AMI).

I want to keep:
☐ fresh bleeding wounds
☐ No visible symptom
☐ **Not expert**

[1] Critical areas= under surface/mid line of abdomen; under surface of chest; hook and Achilles tendon; under surface of neck; udder and genitalia; area around the anus, including rear part of udder

Comment: ……

At post mortem inspection (PMI) a typical case of bruising and injury-related hemorrhage is assumed to present itself with severe flesh wounds involving carcass portions.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

15. DFD meat (Dark, Firm, Dry meat)

Ante-mortem

Ante mortem: Not relevant because it is impossible to detect at that stage of the meat inspection

Post-mortem

At post mortem inspection (PMI) a typical case of DFD meat is assumed to have darker and drier meat than normal affecting large muscles.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

16. Granuloma (in any organs)

Granuloma diseases bring together tuberculosis, lymph nodes lesions for actinobacillosis or tumors.

Ante-mortem

The typical case of granuloma is assumed to present itself with chronic intermittent hacking cough associated with difficult breathing OR no visible symptom at ante mortem inspection

I want to keep:
☐ chronic intermittent hacking cough associated with difficult breathing
☐ No visible symptom
☐ **Not expert**

Comment: ……

Post-mortem

At post mortem inspection (PMI) a typical case of granuloma is assumed to present itself with granulomatous lesions in at least one of these locations: head, lungs, liver, intestine, carcass.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: ……

17. Pathological lesions in the heart

Definition includes pathological lesions in the heart of possible bacterial origin such as endocarditis or pericarditis.

Ante-mortem

The typical case of pathological lesions in the heart is assumed to present itself with breathlessness OR no symptoms OR hesitant to move, appears reluctant and anxious at ante mortem inspection

I want to keep:
☐ Breathlessness

☐ Hesitant to move, appears reluctant and anxious
☐ No symptoms
☐ **Not expert**

Comment: …….

Post-mortem

At post mortem inspection (PMI) a typical case of pathological lesions in the heart is assumed to present itself with fibrous pericardis.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment: …….

Questionnaire on mild case definitions

Expert name:

(Note: Name will remain confidential)

Purpose

The objective of this questionnaire is to define for each diseases/condition the definition of a mild case.

It was decided that the definition of a mild case was not relevant for low body condition, fractured limb and cleanliness score.

For the others diseases/condition we propose you to validate or not a proposition of definition. These definitions were made accounting for the typical case definitions and the first list of symptoms proposed for each disease/condition in the first questionnaire.

The mild case of a disease or condition is the form that could be seen at the early stages of the disease or at some point between the subclinical and the fully developed (i.e. "typical" form of). A mild case is neither typical nor subclinical. The animal will probably present more subtle signs than typical case.

Like in the others questionnaires, depending on your field of expertise you could feel that you are not "enough expert" to answer to some questions of this questionnaire. Feel free not to answer to these questions by crossing the available green box:" ☐ **Not expert**"

Please send your filled questionnaire back to the following e-mail address: celine.dupuy@anses.fr, **before Monday 19th December.**

Thank you for your participation and for your valuable contribution to this project!

1. Necrobacillosis (liver, oral cavity): *Fusobacterium necrophorum*

Interdigital form is excluded from the definition

Ante-mortem

The mild case of necrobacillosis is assumed to present itself at AMI with no visible symptoms.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

At PMI, the mild case of necrobacillosis is assumed to present itself with ulceration in the tongue and /or swollen cheek.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

2. Enzootic Bovine Leukosis

Ante-mortem

The mild case of enzootic bovine leukosis is assumed to present itself at AMI with no visible symptoms.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

At PMI, the mild case of enzootic bovine leukosis is assumed to present itself with a limited number of superficial lymph nodes enlarged.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

3. Respiratory diseases

The respiratory diseases bring together transport fever (*Histophilus somni = Haemophilus somnus, Mannheimia haemolytica)* and other causes of pneumonia and associated pleuritis.

Ante-mortem

The mild case of respiratory diseases is assumed to present itself at AMI with minor respiratory difficulties.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

At PMI, the mild case of respiratory diseases is assumed to present itself with fibrinous bronchopneumonia.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

4. Vesicular diseases

The vesicular diseases bring together foot and mouth disease and vesicular stomatitis.

Ante-mortem

The mild case of vesicular diseases is assumed to present itself at AMI with hypersalivation.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

At PMI, the mild case of vesicular diseases is assumed to present itself with single fluid-filled vesicles on muzzle or gums.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

5. Ulcerative diseases

The ulcerative diseases bring together Malignant catarrhal fever and Blue tongue.

Ante-mortem

The mild case of ulcerative diseases is assumed to present itself at AMI with no visible symptoms.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

The mild case of ulcerative diseases is assumed to present itself at PMI with a limited number of ulcers whatever the location.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

6. Echinococcosis/hydatidosis :*Echinococcus granulosus* - larva in liver, lungs

Ante-mortem

The mild case of echinococcosis is assumed to present itself at AMI with no visible symptoms.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

The mild case of echinococcosis is assumed to present itself at PMI with one small cyst in the liver or lungs that contains a clear fluid under pressure.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

7. Taenia saginata :*Cysticercus bovis* - larva in muscle)

Ante-mortem

The mild case of *Taenia saginata* is assumed to present itself at AMI with no visible symptoms.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

The mild case of *Taenia saginata* is assumed to present itself at PMI with a limited number of small white lesions in few muscle tissues.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

8. Trematodes – Fascioliasis :*Fasciola hepatica*

Ante-mortem

The mild case of Fasciolasis is assumed to present itself at AMI with no visible symptoms.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

The mild case of Fasciolasis is assumed to present itself at PMI with enlarged/thickened ducts.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

9. Foot and leg disorder

The definition includes foot and leg disorder linked to trouble in housing system but excluding fractured limbs.

Ante-mortem

The mild case of foot and leg disorders is assumed to present itself at AMI with no visible symptoms.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

The mild case of foot and leg disorders is assumed to present itself at PMI with arthritis associated with enlarged lymph nodes.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

10. Integument alterations

Ante-mortem

The mild case of integument alterations is assumed to present itself at AMI with a limited number of minor injuries/wounds occurring at head, neck or back level.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

11. Bruising and Injury-related hemorrhage (related to transport)

Ante-mortem

The mild case of bruising and Injury-related hemorrhage is assumed to present itself at AMI with no visible symptom.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

The mild case of bruising and Injury-related hemorrhage is assumed to present itself at API with serohemorragic infiltration involving one limited part of the carcass.

☐ No comment, I agree with this definition

☐ **Not expert**
☐ Comment/proposition: ……

12. DFD meat (Dark, Firm, Dry meat)

Ante-mortem
Not relevant because it is impossible to detect at that stage of the meat inspection

Post-mortem

At post mortem inspection (PMI) a mild case of DFD meat is assumed to have darker and drier meat than normal, affecting few and small muscles.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

13. Granuloma (in any organs)

Granuloma diseases bring together tuberculosis, lymph nodes lesions for actinobacillosis or tumors.

Ante-mortem

The mild case of granuloma is assumed to present itself at AMI with no visible symptom.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

The mild case of granuloma is assumed to present itself at API with one granulomatous lesion in one of these locations: head, lungs, liver, intestine, carcass.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

14. Pathological lesions in the heart

Definition include pathological lesions in the heart of possible bacterial origin such as endocarditis or pericarditis.

Ante-mortem

The mild case of pathological lesions in the heart is assumed to present itself at AMI with no visible symptom.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

Post-mortem

The mild case of pathological lesions in the heart is assumed to present itself at API with exsudative pericarditis.

☐ No comment, I agree with this definition
☐ **Not expert**
☐ Comment/proposition: ……

APPENDIX 2 – QUESTIONNAIRE TIMETABLE

Questionnaire	*Sent date*	*Planned return date*
Questionnaire on typical case definition round 1	25/11/2011	01/12/2011
Questionnaire on typical case definition round 2	09/12/2011	13/12/2011
Questionnaire on mild case definition	14/12/2011	19/12/2011
Questionnaire on Typical/Mild case detection round 1	21/12/2011	06/01/2012
Questionnaire on Typical/Mild case detection round 2	13/01/2011	18/01/2012
Validation of Conference call conclusions	20/01/2012	23/01/2012

APPENDIX 3 – QUESTIONNAIRE FOR DATA ELICITATION

3A: First round questionnaire for data elicitation

3 B: Second round questionnaire for data elicitation

3 C: Support document for the conference call

3 D: Conclusions of conference call

Questionnaire on detection of bovine diseases at meat inspection

NAME:
(Note: Name will remain confidential)

Purpose of this questionnaire

The COMISURV project aims to collect information and opinions on diagnosis of health conditions of bovine at meat inspection. The diseases and welfare issues presented in this questionnaire were identified by a working group under EFSA's Animal Health and Welfare Panel (AHAW) and prioritized according to their likelihood of detection, at ante- and/or post-mortem inspection. Further criteria considered were the relevance of the disease/animal welfare issue to bovine of slaughter age. Diseases that are predominantly zoonotic rather than animal health related were excluded.

With this **questionnaire** we want to collect information and opinions on **capacity of detection** of animal diseases and welfare conditions at meat inspection. Your **answers** will be used by our project team as inputs to finalize an evaluation on the role of current meat inspection practices in the surveillance of these conditions.

Introductory notes

Please read carefully before starting filling the questionnaire…

For each of the 17 diseases/conditions, you will have to answer to these questions:

1- What are the probabilities for an infected bovine, given age, to present the typical form of the disease, the mild form of the disease and no clinical sign of the disease.
2- Consider a bovine infected with a typical or mild form of the disease presented for slaughter: what are the probabilities of detection at **ante -mortem inspection**, given age and herd level risk factors (depending on the disease).
3- Consider a bovine infected with a typical or mild form of the disease presented for slaughter: what are the probabilities of detection at **post -mortem inspection**, given age and herd level risk factors (depending on the disease).
For question 2 and 3 you have to consider that the meat inspection is the conventional meat inspection which means a procedure carried out according to current European legislation (see table 1).

Table 1: List of ante-mortem and post-mortem inspection for bovine under and over 6 weeks old and tasks in bovine according to EC 854/2004 (Conventional) and according to a change in procedures leading to a procedure primarily based on visual inspection (Visual-only). (V= visual inspection; I= incision; P= palpation). Grey boxes indicate inspection points where the visual-only scenario implies a change to current procedures for bovine under and/or over 6 weeks old.

Inspection step			Inspection procedure			
			Conventional		Visual-only	
			Bovine <6 weeks	Bovine >6 weeks	Bovine <6 weeks	Bovine >6 weeks
ANTE-MORTEM INSPECTION	FOOD CHAIN INFORMATION	Diseases, morbidity and mortality on farm	V	V	V	V
	LIVE ANIMAL	General health	V	V	V	V
POST - MORTEM INSPECTION	WHOLE CARCASS	External surface	V	V	V	V
	HEAD	head and throat	V	V	V	V
		retropharyngeal LNN	I	I	V	V
		Submaxillary and parotid LNN	/	I	/	V
		External and internal masseter	/	V+I	/	V
		mouth and fauces	V	V	V	V
		Tongue	P	P	V	V
	LUNGS	Parenchyma	V +P+I[1]	V +P+I[1]	V	V
		Trachea	V + I[1]	V + I[1]	V	V
		Major bronchi	I[1]	I[1]	V	V
		Mediastinal LNN	I	I	V	V
		Bronchial LNN	I	I	V	V
	OESOPHAGUS		V	V	V	V
	HEART	Heart	V + I	V+I	V	V
		Pericardium	V	V	V	V
	DIAPHRAGM		V	V	V	V
	LIVER	Parenchyma	V+P+ I[2]	V+P+I	V	V
		Hepatic LNN (=portal)	V+P+I[2]	V+P	V	V
		Pancreatic LNN	V+ I[2]	V+P	V	V
	GI TRACT	Stomach and intestines	V	V	V	V
		Mesentery	V	V	V	V
		Gastric LNN	V + P+ I[2]	V + P+ I[2]	V	V
		Mesenteric LNN	V + P+ I[2]	V + P+ I[2]	V	V
	SPLEEN		V+P[3]	V+P[3]	V	V
	KIDNEYS	Parenchyma	V+ I[2]	V+ I[2]	V	V
		Renal LNN	V+ I[2]	V+ I[2]	V	V
	UTERUS and MAMMARY GLANDS	Uterus	/	V	/	V
		Udder	/	V+ P[3]+ I[1]	/	V
		Supramammary LNN	/	V+ P[3]+ I[2]	/	V
	PLEURA		V	V	V	V
	PERITONEUM		V	V	V	V
	UMBILICAL AREA		V+P+I[4]	/	V	/
	JOINTS		V+P+I[4]	/	V	/
	SYNOVIAL FLUID		V	/	V	/

[1] If organs are destined for human consumption; [2] incision only if it's necessary, [3] palpation only if it's necessary, [4] incision in the event of doubt.

The herd-level risk factors were identified on basis of their effect on the probability of a herd being infected/affected by the disease/condition. Thus it does not necessarily translate to differences with regards to the probability of detection of the disease/condition during meat inspection. You will have to be carefull and **think about the real impact or absence of impact** of these herd level risk factor on probability if detection during meat inspection. In case of absence of impact, you will just have to copy /paste your probabilities in both side of the table involved.
One possible reason for a herd level factor to have an impact on probability of detection could be that for instance, inspectors in a high prevalence area are more used to seeing a certain condition/disease than inspectors in a low prevalence area.

We also have to evaluate the impact of changes in meat inspection procedure. **A scenario** in which the meat inspection is **only a visual inspection** will be evaluated. The procedure of this visual inspection is detailed in table 1.

Thus you will have to answer again to the same questions as 3) (probabilities of detection during post mortem inspection) regarding this new meat inspection scenario (**question number 4**). You will not have to answer to questions on ante-mortem inspection for this scenario as it doesn't affect this part of inspection.

If you think that this modification of scenario doesn't involve any differences in the probability of detection of the disease/condition during post mortem inspection you can copy-paste your previous estimated probabilities.

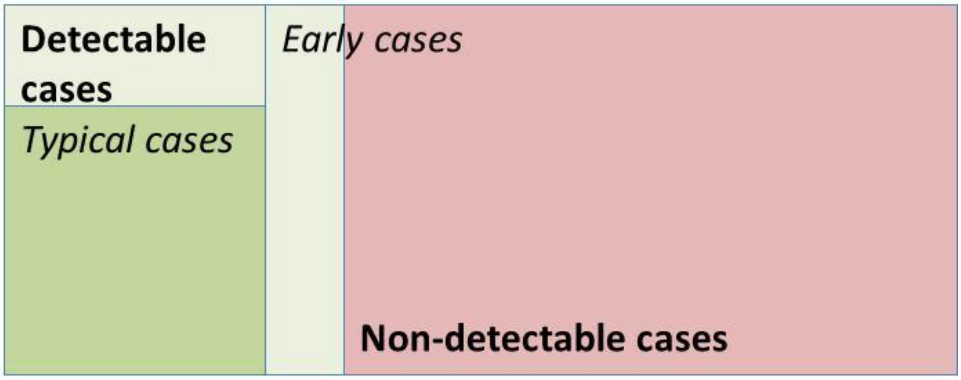
Please note that, normally, there will be different stages of disease for an infected animal. Similarly for affected animal with conditions that raise welfare concerns, these may be presented at different levels of severity and evolution stages (i.e. acute, chronic). Specifically we considered the following stages:

- **Typical cases** – infected animals showing a combination of symptoms and lesions as described in the definitions given throughout the questionnaire: an animal presenting a list of symptoms and/or lesions that are expected to be observed in more than 60 % of the **clinically infected/affected** bovines arriving at slaughterhouse.
- **Mild/early cases** – the form that could be seen at the early stages of the disease or at some point between the subclinical and the fully developed (i.e. "typical" form of). A mild case is neither typical nor subclinical. The animal will probably present more subtle signs than a typical case.

Severe cases are assumed not fit for transport and therefore would not be presented for slaughter (disposed of at farm level).

To illustrate the definition of a typical and mild/early case, see below the Figure 1.

Figure 1: Different case types defined for description and analyses of the sensitivity of meat inspection. Typical case=dark green, detectable case=dark green + light green; non-detectable case=red, mild case=red + part of light green).



For each diseases/conditions, we reminder you at the beginning of the questionnaire the definition of a typical and mild case as defined by the previous questionnaires.

How to fill in the questionnaire

The questions will ask you for a percentage. You will need to provide both a most likely percentage and a range. To indicate that you are not sure about a certain percentage please try to widen the percentage range appropriately (e.g. 10 – 50% or 0 – 60%). If you consider that a step in the meat inspection process (ante-mortem or post mortem inspection) does not contribute to case detection, insert "0%" in the "most likely" corresponding case. Please note that each question and answer table will give you the details of the population we are looking at (by age group and different herd level factors). Your estimate should refer to that population. In addition, please feel free to add comments whenever an answer needs further explanation.

If you have any further questions, please do not hesitate to contact us via email celine.dupuy@anses.fr.

Use of data

The results of this questionnaire will be presented afterwards in aggregated form without identifying the data source or disclosing confidential information. There will be an opportunity for you to revise those aggregated estimates and to discuss in order to determine the most accurate values. These data will be used as input in a scenario tree model.

This work is conducted under a contract with EFSA, who will have ownership to the **project report**. EFSA may, or may not, decide to make the report accessible to the public. However, the main purpose of the report is to support the EFSA –Animal Health animal Welfare (AHAW) working group in its assessment of the contribution of meat inspection to animal health surveillance.

Thank you for your participation and for your valuable contribution to this project!

Please send your filled questionnaire back to the following e-mail address: celine.dupuy@anses.fr, **before 6th January 2012.**

1. Necrobacillosis (liver, oral cavity): *Fusobacterium necrophorum*

Interdigital form is excluded from the definition

Typical case

Ante mortem

The typical case of necrobacillosis is assumed to present itself at ante-mortem inspection (AMI) with hypersalivation.

Post mortem

At post mortem inspection (PMI) a typical case of necrobacillosis is assumed to present itself with liver abscesses.

Mild case

Ante mortem

The mild case of necrobacillosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

At PMI, the mild case of necrobacillosis is assumed to present itself with ulceration in the tongue and /or swollen cheek.

1- In the following table please indicate what are the probabilities for a bovine infected with necrobacillosis, given age, to present:

a. the typical form of the disease
b. the mild form of the disease
c. No signs, i.e. a subclinical form of the disease

Obviously the sum of these three probabilities is 100%.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult									
Young >6weeks									
Young <6weeks									

Comments:

2- Consider a bovine infected with a typical form of necrobacillosis presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age (the question is not relevant for mild case because it assumed to present itself with no visible symptoms):

Age	Typical case		
	Min	**Most likely**	Max
Adult			
Young >6weeks			
Young <6weeks			

Comments:

3- Consider a bovine infected with a typical or mild form of necrobacillosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

4- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of necrobacillosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

2. Enzootic Bovine Leukosis

Typical case

Ante mortem

The typical case of enzootic bovine leukosis is assumed to present itself with enlarged superficial lymph nodes (mandibular, scapular or pre-crural).

Post mortem

At post mortem inspection (PMI) a typical case of enzootic bovine leukosis is assumed to present itself with superficial lymph nodes enlarged and / or abdominal-pelvic cavity lymph nodes enlarged.

Mild case

Ante mortem

The mild case of enzootic bovine leukosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

At PMI, the mild case of enzootic bovine leukosis is assumed to present itself with a limited number of superficial lymph nodes enlarged.

1) In the following table please indicate what are the probabilities for a bovine infected with enzootic bovine leukosis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult									
Young >6weeks									
Young <6weeks									

Comments:

2) Consider a bovine infected with a typical form of enzootic bovine leukosis presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and region (with respect to risk of introduction of the disease). The question is not relevant for mild case because it assumed to present itself with no visible symptom during ante-mortem inspection.

Age	Region with low risk of introduction of EBL/free since long			Region with high risk of introduction of EBL /recently free		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

3) Consider a bovine infected with a typical or mild form of enzootic bovine leukosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with respect to risk of introduction of the disease).

Age	Region with low risk of introduction of EBL/free since long						Region with high risk of introduction of EBL /recently free					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of enzootic bovine leukosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with respect to risk of introduction of the disease).

	Region with low risk of introduction of EBL/free since long						Region with high risk of introduction of EBL /recently free					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

3. Respiratory diseases

The respiratory diseases bring together transport fever (Histophilus somni = Haemophilus somnus, Mannheimia haemolytica) and other causes of pneumonia and associated pleuritis

Typical case

Ante mortem

The typical case of respiratory diseases is assumed to present itself at ante-mortem inspection (AMI) with mucopurulent nasal discharge and rapid respiration.

Post mortem

At post mortem inspection (PMI) a typical case of respiratory diseases is assumed to present itself with fibrinous or fibrosis pleuritis associated with fibrinous or fibrosis pneumonia and abscesses more or less voluminous in lung.

Mild case

Ante mortem

The mild case of respiratory diseases is assumed to present itself at AMI with minor respiratory difficulties.

Post mortem

At PMI, the mild case of respiratory diseases is assumed to present itself with fibrinous bronchopneumonia.

1) In the following table please indicate what are the probabilities for a bovine infected with respiratory diseases, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	**Typical case**			**Mild case**			**No sign (subclinical)**		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult									
Young >6weeks									
Young <6weeks									

Comments:

2) Consider a bovine infected with a typical or mild form of respiratory diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and risk area.

	Low prevalence area of immunosuppressive infection (e.g. BVDV)						**High prevalence area of immunosuppressive infection (e.g. BVDV)**					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

3) Consider a bovine infected with a typical or mild form of respiratory diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and risk area.

	Low prevalence area of immunosuppressive infection (e.g. BVDV)						**High prevalence area of immunosuppressive infection (e.g. BVDV)**					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of respiratory diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and risk area.

	Low prevalence area of immunosuppressive infection (e.g. BVDV)						**High prevalence area of immunosuppressive infection (e.g. BVDV)**					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	Most likely	Max	Min	Min	Max	Min	Most likely	Max	Min	Most likely	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

4. Vesicular diseases

The vesicular diseases bring together foot and mouth disease and vesicular stomatitis.

Typical case

Ante mortem

The typical case of vesicular diseases is assumed to present itself at ante-mortem inspection (AMI) with vesicles on nostrils or muzzle, a hypersalivation and reluctance to rise or stamping/shaking the feet.

Post mortem

At post mortem inspection (PMI) a typical case of vesicular diseases is assumed to present itself with at least one fluid-filled vesicles or bullae on muzzle and gums, feet or on pillars of the rumen associated with red eroded areas or ulcers (vesicle rupture).

Mild case

Ante mortem

The mild case of vesicular diseases is assumed to present itself at AMI with hypersalivation or trample.

Post mortem

At PMI, the mild case of vesicular diseases is assumed to present itself with single fluid-filled vesicles on muzzle or gums.

1) In the following table please indicate what are the probabilities for a bovine infected with vesicular diseases, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult									
Young >6weeks									
Young <6weeks									

Comments:

2) Consider a bovine infected with a typical or mild form of vesicular diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and herd-level risk in terms of the frequency of contacts.

	Low frequency of contacts						High frequency of contacts					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

3) Consider a bovine infected with a typical or mild form of vesicular diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and herd-level risk in terms of the frequency of contacts.

	Low frequency of contacts						High frequency of contacts					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of vesicular diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and herd-level risk in terms of the frequency of contacts.

	Low frequency of contacts						High frequency of contacts					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

5. Ulcerative diseases

The ulcerative diseases bring together Malignant catarrhal fever and Blue tongue.

Typical case

Ante mortem

The typical case of ulcerative diseases is assumed to present itself at ante-mortem inspection (AMI) with ulcers of the nose associated with hypersalivation.

Post mortem

At post mortem inspection (PMI) a typical case of ulcerative diseases is assumed to present itself with multifocal hemorrhages on the lip and dental pad associated with ulcers of oesophagus and/or rumen and/or mouth and/or nose.

Mild case

Ante mortem

The mild case of ulcerative diseases is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of ulcerative diseases is assumed to present itself at PMI with a limited number of ulcers whatever the location.

1) In the following table please indicate what are the probabilities for a bovine infected with ulcerative diseases, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult									
Young >6weeks									
Young <6weeks									

Comments:

2) Consider a bovine infected with a typical form of ulcerative diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and region (with regards to risk of introduction of bluetongue).

	Region with low risk of introduction of Bluetongue			Region with high risk of introduction of Bluetongue		
Age	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

3) Consider a bovine infected with a typical or mild form of ulcerative diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with regards to risk of introduction of bluetongue).

	Region with low risk of introduction of Bluetongue						**Region with high risk of introduction of Bluetongue**					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of ulcerative diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with regards to risk of introduction of bluetongue).

	Region with low risk of introduction of Bluetongue						**Region with high risk of introduction of Bluetongue**					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

6. Echinococcosis/hydatidosis :*Echinococcus granulosus* - larva in liver, lungs

Typical case

Ante mortem

The typical case of hydatidosis is assumed to present no visible symptom at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of hydatidosis is assumed to present itself with a limited number of *cysts* of different sizes and shapes which contain a clear fluid under pressure in liver and / or lungs.

Mild case

Ante mortem

The mild case of echinococcosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of echinococcosis is assumed to present itself at PMI with one small cyst in the liver or lungs that contains a clear fluid under pressure.

1) In the following table please indicate what are the probabilities for a bovine infected with hydatidosis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult									
Young >6weeks									
Young <6weeks									

Comments:

2) The question is not relevant for ante-mortem inspection because the typical and mild case definition of hydatidosis is assumed to present itself with no visible symptoms.

3) Consider a bovine infected with a typical or mild form of hydatidosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of hydatidosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

7. Taenia saginata :*Cysticercus bovis* - larva in muscle

Typical case

Ante mortem

The typical case of *Taenia saginata* is assumed to present no visible symptom at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of *Taenia saginata* is assumed to present itself with either clear transparent bladders full of opaque pearl like liquid or degeneration, caseation and calcification lesions.

Mild case

Ante mortem

The mild case of *Taenia saginata* is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of *Taenia saginata* is assumed to present itself at PMI with a limited number of small white lesions in focused areas of muscle tissues.

1- In the following table please indicate what are the probabilities for a bovine infected with *Taenia saginata*, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100%.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult									
Young >6weeks									
Young <6weeks									

Comments:

2- The question is not relevant for ante-mortem inspection because the typical and mild case definition of *Taenia saginata* is assumed to present itself with no visible symptoms.

3- Consider a bovine infected with a typical or mild form of *Taenia saginata* presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Min
Adult						
Young >6weeks						
Young <6weeks						

Comments:

4- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of *Taenia saginata* presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Min
Adult						
Young >6weeks						
Young <6weeks						

Comments:

8. Trematodes – Fascioliasis :*Fasciola hepatica*

Typical case

Ante mortem

The typical case of fascioliasis is assumed to present no visible symptom at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of fascioliasis is assumed to present itself with black parasitic debris or entire fluke in the liver and enlarged/thickened ducts.

Mild case

Ante mortem

The mild case of Fasciolasis is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of Fasciolasis is assumed to present itself at PMI with enlarged/thickened ducts.

1- In the following table please indicate what are the probabilities for a bovine infected with fascioliasis, given age, to present:

a. the typical form of the disease
b. the mild form of the disease
c. No signs, i.e. a subclinical form of the disease

Obviously the sum of these three probabilities is 100%.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult									
Young >6weeks									
Young <6weeks									

Comments:

2- The question is not relevant for ante-mortem inspection because the typical and mild case definition of fascioliasis is assumed to present itself with no visible symptoms.

3- Consider a bovine infected with a typical or mild form of fascioliasis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

4- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of fascioliasis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

9. Foot and leg disorder

The definition includes foot and leg disorder linked to trouble in housing system but excluding fractured limbs.

Typical case

Ante mortem

The typical case of foot and leg disorder is assumed to present itself with a minor lameness at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of foot and leg disorder is assumed to present itself with amyotrophy associated with arthritis and/or arthrosis.

Mild case

Ante mortem

The mild case of foot and leg disorders is assumed to present itself at AMI with a more hesitant and natural walk with eventually one or more foot on which the animal can't put all his weight.

Post mortem

The mild case of foot and leg disorders is assumed to present itself at PMI with bursitis of knee and/or hock associated with enlarged lymph nodes.

1) In the following table please indicate what are the probabilities for a bovine affected with foot and leg disorder, given age, to present:
    a. the typical form of the condition
    b. the mild form of the condition

    Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with foot and leg disorder can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Age	**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

2) Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and production type.

	Production type: Dairy						**Production type: Beef**					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

3) Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and production type.

	Production type: Dairy						**Production type: Beef**					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and production type.

	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

10. Low body condition score: thin body

Typical case

Ante mortem

The typical case of low body condition score is an emaciated animal presenting an extreme thinness at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of low body condition score is assumed to present a carcass abnormally lean with little body fat.

Mild case

Not relevant.

1) A bovine with a low body condition score can't present no signs or a subclinical form of the condition and in addition a mild case is also not relevant, thus the question 1) is not relevant for this condition.

2) Consider a bovine being a typical case of low body condition score presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

3) Consider a bovine being a typical case of low body condition score presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine being a typical case of low body condition score presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

11. Fractured limb

Typical case

Ante mortem

The typical case of fractured limb during ante mortem inspection is an adult cow which can't get off the ground or a calf with severe lameness.

Post mortem

At post mortem inspection (PMI) a typical case of fractured limb is assumed to present itself with a fracture of one bone of the limb and serohemorrhagic infiltration of all tissues around the broken bone.

Mild case

Not relevant.

1) A bovine with fractured limb can't present no signs or a subclinical form of the condition and in addition a mild case is also not relevant, thus the question 1) is not relevant for this condition.

2) Consider a bovine affected with a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

	Short transport			**Long transport**		
Age	**Typical case**			**Typical case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

3) Consider a bovine affected by a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

	Short transport			**Long transport**		
Age	**Typical case**			**Typical case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine affected by a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

	Short transport			**Long transport**		
Age	**Typical case**			**Typical case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

12. Cleanliness score

If we suppose a codification of cleanliness score from 0 to 4, we consider in the definition only bovine having a cleanliness score of 3 or 4.

Typical case

Ante mortem

The typical case of bad cleanliness score is assumed to present itself with an extremely heavily soiled with dried manure and/or manure armour in critical areas[1] at ante mortem inspection.

Post mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

Mild case

Not relevant.

1) A bovine with a bad cleanliness score can't present no signs or a subclinical form of the condition and in addition a mild case is also not relevant, thus the question 1) is not relevant for this condition.

2) Consider a bovine affected with a bad cleanliness score presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and production type.

	Production type: Dairy			Production type: Beef		
Age	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

3) The question is not relevant for post mortem inspection because there is no inspection of the skin during post-mortem inspection.

4) The question is not relevant for visual inspection scenario because there is no inspection of the skin during post-mortem inspection.

[1] Critical areas= under surface/mid line of abdomen; under surface of chest; hook and Achilles tendon; under surface of neck; udder and genitalia; area around the anus, including rear part of udder

13. Integument alterations

Typical case

Ante mortem

The typical case of integument alterations is assumed to present itself with a lot of injuries/wounds or bedsores due to insufficient bedding and other housing problems at ante mortem inspection.

Post mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

Mild case

Ante mortem

The mild case of integument alterations is assumed to present itself at AMI with a limited number of minor injuries/wounds occurring at head, neck or hindquarters-near the tail.

Post mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

1) In the following table please indicate what are the probabilities for a bovine with integument alterations, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with integument alterations can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

2) Consider a bovine with a typical or mild form of integument alterations presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and production type.

	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

3) The question is not relevant for post mortem inspection because there is no inspection of the skin during post-mortem inspection.

4) The question is not relevant for visual inspection scenario because there is no inspection of the skin during post-mortem inspection.

14. Bruising and Injury-related hemorrhage (related to transport)

Typical case

Ante mortem

The typical case of bruising and injury-related hemorrhage is assumed to present itself with a lot of fresh bleeding wounds during ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of bruising and injury-related hemorrhage is assumed to present itself with large serohemorragic infiltration involving carcass portions.

Mild case

Ante mortem

The mild case of bruising and Injury-related hemorrhage is assumed to present itself at AMI with no visible symptom.

Post mortem

The mild case of bruising and Injury-related hemorrhage is assumed to present itself at PMI with serohemorragic infiltration involving one limited part of the carcass.

1) In the following table please indicate what are the probabilities for a bovine affected with bruising and injury-related hemorrhage, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with bruising and injury-related hemorrhage can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Age	**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

2) Consider a bovine with a typical form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

Age	Short transport			Long transport		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

3) Consider a bovine with a typical or mild form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

Age	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine with a typical or mild form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

Age	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

15. DFD meat (Dark, Firm, Dry meat)

Typical case

Ante mortem

Not relevant because it is impossible to detect at that stage of the meat inspection.

Post mortem

At post mortem inspection (PMI) a typical case of DFD meat is assumed to have darker and drier meat than normal affecting large muscles.

Mild case

Ante mortem

Not relevant because it is impossible to detect at that stage of the meat inspection.

Post mortem

At post mortem inspection (PMI) a mild case of DFD meat is assumed to have darker and/or drier meat than normal, affecting few and small muscles.

1) In the following table please indicate what are the probabilities for a bovine having a DFD meat, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine having DFD meat can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

2) The question is not relevant for ante-mortem inspection because it is impossible to detect DFD meat at that stage of the meat inspection

3) Consider a bovine affected by a typical or mild form of DFD meat presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine affected by a typical or mild form of DFD meat presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

16. Granuloma/ Bovine tuberculosis

Granuloma diseases bring together tuberculosis, lymph nodes lesions for actinobacillosis or tumors.

Typical case

Ante mortem

The typical case of granuloma is assumed to present itself with no visible symptom at ante mortem inspection

Post mortem

At post mortem inspection (PMI) a typical case of granuloma is assumed to present itself with granulomatous lesions in at least one of these locations: head, lungs, liver, intestine, carcass.

Mild case

Ante mortem

The mild case of granuloma is assumed to present itself at AMI with no visible symptom.

Post mortem

The mild case of granuloma is assumed to present itself at PMI with one granulomatous lesion in one of these locations: head, lungs, liver, intestine, carcass.

1) In the following table please indicate what are the probabilities for a bovine infected with granuloma, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult									
Young >6weeks									
Young <6weeks									

Comments:

2) The question is not relevant for ante-mortem inspection because a typical or mild case of granuloma is assumed to present itself with no visible symptoms during ante-mortem inspection.

3) Consider a bovine infected with a typical or mild form of granuloma presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

	Low TB prevalence area						High TB prevalence area					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Min	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of granuloma presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

	Low TB prevalence area						High TB prevalence area					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult												
Young >6weeks												
Young <6weeks												

Comments:

17. Pathological lesions in the heart

Definition includes pathological lesions in the heart of possible bacterial origin such as endocarditis or pericarditis.

Typical case

Ante mortem

The typical case of pathological lesions in the heart is assumed to present itself with slight breathlessness and hesitant behavior with reluctance to move at ante mortem inspection.

Post mortem

At post mortem inspection (PMI) a typical case of pathological lesions in the heart is assumed to present itself with fibrous pericardis.

Mild case

Ante mortem

The mild case of pathological lesions in the heart is assumed to present itself at AMI with no visible symptom.

Post mortem

The mild case of pathological lesions in the heart is assumed to present itself at PMI with exsudative pericarditis.

1- In the following table please indicate what are the probabilities for a bovine infected with pathological lesions in the heart, given age, to present:

   a. the typical form of the disease
   b. the mild form of the disease

   Obviously the sum of these two probabilities is 100%.

N.B.: A bovine infected with pathological lesions in the heart can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Age	**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult						
Young >6weeks						
Young <6weeks						

Comments:

2- Consider a bovine infected with a typical form of pathological lesions in the heart presented for slaughter: indicate in the following table what are the probabilities of detection at **ante-mortem inspection**, given age:

Age	**Typical case**		
	Min	**Most likely**	Max
Adult			
Young >6weeks			
Young <6weeks			

Comments:

3- Consider a bovine infected with a typical or mild form of pathological lesions in the heart presented for slaughter: indicate in the following table what are the probabilities of detection at **post-mortem inspection**, given age:

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Min
Adult						
Young >6weeks						
Young <6weeks						

Comments:

4- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of pathological lesions in the heart presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age*:*

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Min
Adult						
Young >6weeks						
Young <6weeks						

Comments:

If there were any questions/ issues that you would like to raise concerning this questionnaire, please state those below

……
……
……
……
……

Thank you again for your participation!

Results of questionnaire on detection of bovine diseases at meat inspection

The objective of this document is to present you the results of the questionnaire and to prepare a conference call to discuss difficult points.

When answers were not too much different, the mean of all answers was made and you will see the results in a table asking you if you agree or not on these values or if you want to discuss this data during the conference call.

When answers were very different you will see "**No consensus** **"** and the answer of all experts (one line for each expert) and you will be asked to make a new proposition of value and/or to ask for add this point for the conference call.

Sometimes you will have an additional question related to one remark of an expert asking you if you agree or not with this remark.

There are a lot of differences between countries that make difficult to reach a consensus. For instance, in France there is no animal <6 weeks slaughtered which make difficult to answer to questions related to this age category. Some countries are free from diseases on which we ask questions… We will try to do our best to produce good data even if there are a lot of issues. However we will put in the report of the project these issues. We will summarize all your comments and I will send you a document that you will be able to complete.

"**NI**" in table means "**No Information**" which means than expert didn't give answer for this question.

Please send your filled questionnaire back to the following e-mail address: celine.dupuy@anses.fr, **before 17th January 2012.**

We would like to organize the conference call on 20th January. Please indicate if you are available for this date:
I'm available all the day ☐
I'm not available this day ☐
I'm available but only part of the day ☐ Specify:

1. Necrobacillosis (liver, oral cavity): *Fusobacterium necrophorum*

Interdigital form is excluded from the definition

Typical case

Ante mortem

The typical case of necrobacillosis is assumed to present itself at ante-mortem inspection (AMI) with hypersalivation.

Post mortem

At post mortem inspection (PMI) a typical case of necrobacillosis is assumed to present itself with liver abscesses.

Mild case

Ante mortem

The mild case of necrobacillosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

At PMI, the mild case of necrobacillosis is assumed to present itself with ulceration in the tongue and /or swollen cheek.

One of the expert thought that we should perhaps change the definition because hypersalivation at AMI can only be associated with ulcerations at PMI. It is the same for no symptom at AMI associated with liver abscesses at PMI. Thus perhaps the association between ante mortem and post mortem definition is not logical for typical and mild case.
Do you agree with this remark and want to change the definitions (i.e. typical case: hypersalivation at AMI and ulcerations at PMI; mild case: no symptom at AMI and liver abscesses at PMI?

Yes ☐
No ☐

1- In the following table please indicate what are the probabilities for a bovine infected with necrobacillosis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100%.

   No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	NI	NI	NI	NI	NI	NI	NI	NI	NI
	0	**2**	5	0	**5**	10	86	**93**	100
	70	**80**	90	0	**0**	10	10	**20**	30
	10	**20**	30	20	**30**	40	30	**50**	70
New proposition									
Young >6weeks	NI	NI	NI	NI	NI	NI	NI	NI	NI
	0	**1**	2	0	**2**	4	94	**97**	100
	NI	**5**	NI	NI	**80**	NI	NI	**15**	NI
	10	**20**	30	20	**30**	40	30	**50**	70
New proposition									
Young <6weeks	NI	NI	NI	NI	NI	NI	NI	NI	NI
	0	**1**	2	0	**2**	4	94	**97**	100
	NI	NI	NI	NI	NI	NI	NI	NI	NI
	10	**20**	30	20	**30**	40	30	**50**	70
New proposition									

2- Consider a bovine infected with a typical form of necrobacillosis presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age (the question is not relevant for mild case because it assumed to present itself with no visible symptoms):

Age	Typical case		
	Min	**Most likely**	Max
Adult	13	**30**	47
Young >6weeks	13	**30**	47
Young <6weeks	15	**30**	45

I agree with these data: ☐
I need to discuss it during a call conference: ☐

3- Consider a bovine infected with a typical or mild form of necrobacillosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**73**	**90**	**98**	**28**	**53**	**73**
Young >6weeks	**73**	**90**	**98**	**18**	**37**	**50**
Young <6weeks	**70**	**85**	**98**	**28**	**55**	**75**

I agree with these data: ☐
I need to discuss it during a call conference: ☐

4- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of necrobacillosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**70**	**87**	**95**	**22**	**43**	**60**
Young >6weeks	**70**	**87**	**95**	**12**	**27**	**37**
Young <6weeks	**65**	**80**	**93**	**18**	**40**	**55**

I agree with these data: ☐
I need to discuss it during a call conference: ☐

2. Enzootic Bovine Leukosis

Typical case

Ante mortem

The typical case of enzootic bovine leukosis is assumed to present itself with enlarged superficial lymph nodes (mandibular, scapular or pre-crural).

Post mortem

At post mortem inspection (PMI) a typical case of enzootic bovine leukosis is assumed to present itself with superficial lymph nodes enlarged and / or abdominal-pelvic cavity lymph nodes enlarged.

Mild case

Ante mortem

The mild case of enzootic bovine leukosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

At PMI, the mild case of enzootic bovine leukosis is assumed to present itself with a limited number of superficial lymph nodes enlarged.

1) In the following table please indicate what are the probabilities for a bovine infected with enzootic bovine leukosis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	0	**0.5**	1	NI	**1**	1.5	NI	**99.5**	100
	0	**1**	2	0	**4**	8	90	**95**	100
	40	**60**	70	10	**20**	30	10	**20**	30
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition									
Young >6weeks	NI	**0**	NI	NI	**0**	0.5	NI	**100**	100
	0	**1**	2	0	**4**	8	90	**95**	100
	40	**60**	70	10	**20**	30	10	**20**	30
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition									
Young <6weeks	NI	**0**	NI	NI	**0**	NI	NI	**100**	NI
	0	**1**	2	0	**4**	8	90	**95**	100
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition									

2) Consider a bovine infected with a typical form of enzootic bovine leukosis presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and region (with respect to risk of introduction of the disease). The question is not relevant for mild case because it assumed to present itself with no visible symptom during ante-mortem inspection.

Age	Region with low risk of introduction of EBL/free since long			Region with high risk of introduction of EBL /recently free		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**15**	**35**	**53**	**18**	**45**	**68**
Young >6weeks	**15**	**30**	**48**	**18**	**38**	**55**
Young <6weeks	**0**	**10**	**25**	**5**	**15**	**30**

I agree with these data: ☐
I need to discuss it during a call conference: ☐

3) Consider a bovine infected with a typical or mild form of enzootic bovine leukosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with respect to risk of introduction of the disease).

Age	Region with low risk of introduction of EBL/free since long						Region with high risk of introduction of EBL /recently free					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**48**	**78**	**90**	**9**	**30**	**60**	**48**	**83**	**94**	**14**	**45**	**80**
Young >6weeks	**40**	**68**	**84**	**5**	**28**	**55**	**45**	**73**	**87**	**5**	**38**	**69**
Young <6weeks	**15**	**45**	**70**	**5**	**20**	**35**	**20**	**55**	**75**	**5**	**25**	**45**

I agree with these data: ☐
I need to discuss it during a call conference: ☐

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of enzootic bovine leukosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with respect to risk of introduction of the disease).

	Region with low risk of introduction of EBL/free since long						Region with high risk of introduction of EBL /recently free					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	**43**	**65**	**75**	**8**	**28**	**53**	**48**	**73**	**83**	**13**	**38**	**68**
Young >6weeks	**28**	**55**	**73**	**3**	**23**	**50**	**30**	**63**	**78**	**3**	**30**	**58**
Young <6weeks	**15**	**45**	**70**	**5**	**20**	**35**	**20**	**55**	**75**	**5**	**25**	**45**

I agree with these data: ☐
I need to discuss it during a call conference: ☐

3. Respiratory diseases

The respiratory diseases bring together transport fever (Histophilus somni = Haemophilus somnus, Mannheimia haemolytica) and other causes of pneumonia and associated pleuritis

Typical case

Ante mortem

The typical case of respiratory diseases is assumed to present itself at ante-mortem inspection (AMI) with mucopurulent nasal discharge and rapid respiration.

Post mortem

At post mortem inspection (PMI) a typical case of respiratory diseases is assumed to present itself with fibrinous or fibrosis pleuritis associated with fibrinous or fibrosis pneumonia and abscesses more or less voluminous in lung.

Mild case

Ante mortem

The mild case of respiratory diseases is assumed to present itself at AMI with minor respiratory difficulties.

Post mortem

At PMI, the mild case of respiratory diseases is assumed to present itself with fibrinous bronchopneumonia.

1) In the following table please indicate what are the probabilities for a bovine infected with respiratory diseases, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	0	**10**	20	10	**50**	70	30	**40**	90
	0	**5**	10	0	**10**	20	65	**85**	100
	60	**70**	80	10	**20**	30	0	**10**	20
	5	**10**	30	20	**30**	50	40	**60**	75
New proposition									
Young >6weeks	20	**60**	80	20	**30**	50	5	**10**	20
	0	**5**	10	0	**10**	20	65	**85**	100
	60	**70**	80	10	**20**	30	0	**10**	20
	15	**20**	40	20	**40**	60	30	**40**	60
New proposition									
Young <6weeks	50	**90**	100	5	**10**	20	0	**0**	5
	0	**10**	20	0	**20**	40	50	**70**	100
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
	20	**30**	40	25	**40**	60	20	**30**	50
New proposition									

2) Consider a bovine infected with a typical or mild form of respiratory diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and risk area.

	Low prevalence area of immunosuppressive infection (e.g. BVDV)						High prevalence area of immunosuppressive infection (e.g. BVDV)					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**29**	**44**	**58**	**0**	**9**	**20**	**30**	**46**	**59**	**0**	**9**	**20**
Young >6weeks	**35**	**53**	**68**	**0**	**13**	**25**	**38**	**55**	**68**	**0**	**13**	**25**
Young <6weeks	**43**	**57**	**72**	**3**	**15**	**23**	**45**	**60**	**72**	**3**	**15**	**23**

I agree with these data: ☐
I need to discuss it during a call conference: ☐

3) Consider a bovine infected with a typical or mild form of respiratory diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and risk area.

	Low prevalence area of immunosuppressive infection (e.g. BVDV)						High prevalence area of immunosuppressive infection (e.g. BVDV)					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**70**	**85**	**96**	**41**	**60**	**83**	**70**	**85**	**96**	**41**	**63**	**83**
Young >6weeks	**75**	**89**	**96**	**45**	**68**	**88**	**75**	**89**	**96**	**45**	**70**	**88**
Young <6weeks	**73**	**88**	**95**	**37**	**63**	**85**	**73**	**88**	**95**	**37**	**67**	**85**

I agree with these data: ☐
I need to discuss it during a call conference: ☐

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of respiratory diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and risk area.

	Low prevalence area of immunosuppressive infection (e.g. BVDV)						High prevalence area of immunosuppressive infection (e.g. BVDV)					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Min	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	**46**	**65**	**81**	**25**	**40**	**56**	**46**	**65**	**81**	**25**	**40**	**56**
Young >6weeks	**50**	**70**	**84**	**28**	**48**	**63**	**50**	**70**	**84**	**28**	**48**	**63**
Young <6weeks	**53**	**77**	**92**	**20**	**47**	**63**	**53**	**77**	**92**	**20**	**47**	**63**

I agree with these data: ☐
I need to discuss it during a call conference: ☐

4. Vesicular diseases

The vesicular diseases bring together foot and mouth disease and vesicular stomatitis.

Typical case

Ante mortem

The typical case of vesicular diseases is assumed to present itself at ante-mortem inspection (AMI) with vesicles on nostrils or muzzle, a hypersalivation and reluctance to rise or stamping/shaking the feet.

Post mortem

At post mortem inspection (PMI) a typical case of vesicular diseases is assumed to present itself with at least one fluid-filled vesicles or bullae on muzzle and gums, feet or on pillars of the rumen associated with red eroded areas or ulcers (vesicle rupture).

Mild case

Ante mortem

The mild case of vesicular diseases is assumed to present itself at AMI with hypersalivation or trample.

Post mortem

At PMI, the mild case of vesicular diseases is assumed to present itself with single fluid-filled vesicles on muzzle or gums.

1) In the following table please indicate what are the probabilities for a bovine infected with vesicular diseases, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	25	**50**	90	10	**30**	60	10	**20**	50
	0	**<1**	1	0	**<1**	1	>99	**99**	100
	40	**70**	100	0	**30**	60	0	**0**	0
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition									
Young >6weeks	25	**50**	90	10	**30**	60	10	**20**	50
	0	**<1**	1	0	**<1**	1	>99	**99**	100
	40	**70**	100	0	**30**	60	0	**0**	0
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition									
Young <6weeks	25	**50**	90	10	**30**	60	10	**20**	50
	0	**<1**	1	0	**<1**	1	>99	**99**	100
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition									

2) Consider a bovine infected with a typical or mild form of vesicular diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and herd-level risk in terms of the frequency of contacts.

	Low frequency of contacts						High frequency of contacts					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**50**	**68**	**86**	**30**	**50**	**71**	**58**	**73**	**92**	**33**	**58**	**79**
Young >6weeks	**50**	**68**	**86**	**30**	**50**	**71**	**58**	**73**	**92**	**33**	**58**	**79**
Young <6weeks	**53**	**70**	**88**	**27**	**47**	**68**	**63**	**77**	**96**	**30**	**57**	**78**

I agree with these data: ☐
I need to discuss it during a call conference: ☐

3) Consider a bovine infected with a typical or mild form of vesicular diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and herd-level risk in terms of the frequency of contacts.

	Low frequency of contacts						High frequency of contacts					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**58**	**78**	**92**	**35**	**58**	**74**	**63**	**79**	**94**	**43**	**65**	**83**
Young >6weeks	**58**	**78**	**92**	**35**	**58**	**74**	**63**	**79**	**94**	**43**	**65**	**83**
Young <6weeks	**63**	**83**	**96**	**33**	**57**	**72**	**70**	**85**	**98**	**43**	**67**	**83**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of vesicular diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and herd-level risk in terms of the frequency of contacts.

	Low frequency of contacts						High frequency of contacts					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	**55**	**75**	**90**	**35**	**55**	**73**	**58**	**76**	**91**	**40**	**63**	**78**
Young >6weeks	**55**	**75**	**90**	**35**	**55**	**73**	**58**	**76**	**91**	**40**	**63**	**78**
Young <6weeks	**60**	**80**	**93**	**33**	**53**	**70**	**63**	**82**	**95**	**40**	**63**	**77**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

5. Ulcerative diseases

The ulcerative diseases bring together Malignant catarrhal fever and Blue tongue.

Typical case

Ante mortem

The typical case of ulcerative diseases is assumed to present itself at ante-mortem inspection (AMI) with ulcers of the nose associated with hypersalivation.

Post mortem

At post mortem inspection (PMI) a typical case of ulcerative diseases is assumed to present itself with multifocal hemorrhages on the lip and dental pad associated with ulcers of oesophagus and/or rumen and/or mouth and/or nose.

Mild case

Ante mortem

The mild case of ulcerative diseases is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of ulcerative diseases is assumed to present itself at PMI with a limited number of ulcers whatever the location.

1) In the following table please indicate what are the probabilities for a bovine infected with ulcerative diseases, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**0**	**7**	**21**	**2**	**12**	**27**	**65**	**81**	**97**
Young >6weeks	**0**	**9**	**25**	**2**	**12**	**27**	**65**	**79**	**95**
Young <6weeks	**0**	**7**	**18**	**2**	**8**	**20**	**45**	**51**	**60**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

2) Consider a bovine infected with a typical form of ulcerative diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and region (with regards to risk of introduction of bluetongue).

Age	Region with low risk of introduction of Bluetongue			Region with high risk of introduction of Bluetongue		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**21**	**45**	**63**	**45**	**73**	**93**
Young >6weeks	**21**	**45**	**65**	**45**	**73**	**93**
Young <6weeks	**28**	**53**	**73**	**40**	**70**	**90**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

3) Consider a bovine infected with a typical or mild form of ulcerative diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with regards to risk of introduction of bluetongue).

	Region with low risk of introduction of Bluetongue						Region with high risk of introduction of Bluetongue					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**30**	**50**	**60**	**8**	**28**	**41**	**40**	**58**	**69**	**10**	**33**	**45**
Young >6weeks	**30**	**50**	**60**	**8**	**28**	**41**	**40**	**58**	**69**	**10**	**33**	**45**
Young <6weeks	**40**	**67**	**80**	**10**	**37**	**55**	**53**	**77**	**92**	**13**	**43**	**60**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of ulcerative diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with regards to risk of introduction of bluetongue).

	Region with low risk of introduction of Bluetongue						Region with high risk of introduction of Bluetongue					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	**25**	**48**	**58**	**8**	**23**	**35**	**35**	**54**	**65**	**10**	**28**	**38**
Young >6weeks	**25**	**48**	**58**	**8**	**23**	**35**	**35**	**54**	**65**	**10**	**28**	**38**
Young <6weeks	**25**	**48**	**58**	**8**	**23**	**35**	**35**	**54**	**65**	**10**	**28**	**38**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

6. Echinococcosis/hydatidosis :*Echinococcus granulosus* - larva in liver, lungs

Typical case

Ante mortem

The typical case of hydatidosis is assumed to present no visible symptom at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of hydatidosis is assumed to present itself with a limited number of *cysts* of different sizes and shapes which contain a clear fluid under pressure in liver and / or lungs.

Mild case

Ante mortem

The mild case of echinococcosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of echinococcosis is assumed to present itself at PMI with one small cyst in the liver or lungs that contains a clear fluid under pressure.

1) In the following table please indicate what are the probabilities for a bovine infected with hydatidosis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

There was a suggestion that the subclinical form of the disease doesn't exist: you have a cyst or you don't have a cyst.

Do you agree with this remark?

Yes ☐

No ☐

If yes take it into account for your new proposition

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	0	**50**	70	0	**40**	80	0	**10**	50
	0	**5**	20	0	**5**	10	80	**90**	100
	0	**10**	20	80	**90**	100	0	**0**	0
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition									
Young >6weeks	0	**30**	50	0	**40**	80	0	**30**	60
	0	**3**	20	0	**3**	10	80	**94**	100
	0	**10**	20	80	**90**	100	0	**0**	0
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition									
Young <6weeks	NI	**0**	NI	NI	**0**	NI	NI	**100**	NI
	0	**3**	20	0	**3**	10	80	**94**	100
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition									

2) The question is not relevant for ante-mortem inspection because the typical and mild case definition of hydatidosis is assumed to present itself with no visible symptoms.

3) Consider a bovine infected with a typical or mild form of hydatidosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

There was a suggestion that calves <6 weeks are too young for lesions to have time to develop then for this age category there is only suclinical form and no typical or mild form thus detection of typical or mild cases for young < 6 weeks is not relevant.

Do you agree with this remark?

Yes ☐

No ☐

	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**55**	**78**	**94**	**20**	**40**	**60**	**58**	**80**	**95**	**30**	**53**	**73**
Young >6weeks	**55**	**75**	**89**	**18**	**40**	**58**	**58**	**78**	**90**	**28**	**53**	**70**
Young <6weeks	See remark above						See remark above					

I agree with these data: ☐

I need to discuss it during a call conference: ☐

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of hydatidosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	**40**	**70**	**81**	**8**	**28**	**43**	**43**	**71**	**83**	**15**	**35**	**50**
Young >6weeks	**38**	**68**	**79**	**8**	**28**	**43**	**40**	**69**	**80**	**15**	**35**	**47**
Young <6weeks	See remark question 3)						See remark question 3)					

I agree with these data: ☐

I need to discuss it during a call conference: ☐

7. Taenia saginata :*Cysticercus bovis* - larva in muscle

Typical case

Ante mortem

The typical case of *Taenia saginata* is assumed to present no visible symptom at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of *Taenia saginata* is assumed to present itself with either clear transparent bladders full of opaque pearl like liquid or degeneration, caseation and calcification lesions.

Mild case

Ante mortem

The mild case of *Taenia saginata* is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of *Taenia saginata* is assumed to present itself at PMI with a limited number of small white lesions in focused areas of muscle tissues.

1) In the following table please indicate what are the probabilities for a bovine infected with *Taenia saginata*, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100%.

There was a suggestion that the subclinical form of the disease doesn't exist: there is a cyst/lesion or there isn't a cyst/lesion.

Do you agree with this remark?

Yes ☐

No ☐

If yes take it into account for your new proposition

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	0	**50**	90	0	**40**	90	5	**10**	50
	0	**5**	20	0	**5**	10	80	**90**	100
	5	**10**	15	85	**90**	95	0	**0**	0
	NI	NI	NI	NI	NI	NI	NI	NI	NI
New proposition									
Young >6weeks	0	**40**	80	0	**50**	90	0	**10**	70
	0	**3**	20	0	**3**	10	80	**94**	100
	5	**10**	15	85	**90**	95	0	**0**	0
	NI	NI	NI	NI	NI	NI	NI	NI	NI
New proposition									
Young <6weeks	0	**0**	0	0	**0**	1	99	**100**	100
	0	**3**	20	0	**3**	10	80	**94**	100
	NI	NI	NI	NI	NI	NI	NI	NI	NI
	NI	NI	NI	NI	NI	NI	NI	NI	NI
New proposition									

2- The question is not relevant for ante-mortem inspection because the typical and mild case definition of *Taenia saginata* is assumed to present itself with no visible symptoms.

3- Consider a bovine infected with a typical or mild form of *Taenia saginata* presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**40**	**58**	**79**	**13**	**28**	**48**
Young >6weeks	**40**	**58**	**79**	**13**	**28**	**48**
Young <6weeks	**40**	**60**	**85**	**10**	**27**	**53**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

4- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of *Taenia saginata* presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**13**	**23**	**36**	**0**	**4**	**11**
Young >6weeks	**13**	**23**	**36**	**0**	**4**	**11**
Young <6weeks	**13**	**20**	**31**	**0**	**4**	**10**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

8. Trematodes – Fascioliasis :*Fasciola hepatica*

Typical case

Ante mortem

The typical case of fascioliasis is assumed to present no visible symptom at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of fascioliasis is assumed to present itself with black parasitic debris or entire fluke in the liver and enlarged/thickened ducts.

Mild case

Ante mortem

The mild case of Fasciolasis is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of Fasciolasis is assumed to present itself at PMI with enlarged/thickened ducts.

1- In the following table please indicate what are the probabilities for a bovine infected with fascioliasis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100%.

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	20	**40**	70	20	**50**	70	5	**10**	50
	0	**10**	20	0	**10**	20	60	**80**	100
	40	**50**	60	40	**50**	60	0	**0**	0
	10	**20**	50	10	**30**	50	30	**50**	80
New proposition									
Young >6weeks	10	**30**	60	20	**50**	70	10	**20**	70
	0	**10**	20	0	**10**	20	60	**80**	100
	40	**50**	60	40	**50**	60	0	**0**	0
	10	**20**	50	10	**30**	50	30	**50**	80
New proposition									
Young <6weeks	NI	**0**	NI	NI	**0**	NI	NI	**100**	NI
	0	**10**	20	0	**10**	20	60	**80**	100
	NI	NI	NI	NI	NI	NI	NI	NI	NI
	10	**20**	50	10	**30**	50	30	**50**	80
New proposition									

2- The question is not relevant for ante-mortem inspection because the typical and mild case definition of fascioliasis is assumed to present itself with no visible symptoms.

3- Consider a bovine infected with a typical or mild form of fascioliasis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

Age	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	**53**	**75**	**90**	**40**	**55**	**75**	**58**	**80**	**92**	**43**	**65**	**80**
Young >6weeks	**53**	**75**	**90**	**40**	**55**	**75**	**58**	**80**	**92**	**43**	**65**	**80**
Young <6weeks	**30**	**53**	**63**	**15**	**30**	**45**	**33**	**55**	**65**	**18**	**38**	**48**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

4- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of fascioliasis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

Age	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	**33**	**58**	**73**	**25**	**34**	**45**	**35**	**65**	**80**	**28**	**45**	**55**
Young >6weeks	**33**	**58**	**73**	**25**	**34**	**45**	**35**	**65**	**80**	**28**	**45**	**55**
Young <6weeks	**17**	**43**	**57**	**7**	**14**	**25**	**20**	**50**	**63**	**10**	**27**	**37**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

9. Foot and leg disorder

The definition includes foot and leg disorder linked to trouble in housing system but excluding fractured limbs.

Typical case

Ante mortem

The typical case of foot and leg disorder is assumed to present itself with a minor lameness at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of foot and leg disorder is assumed to present itself with amyotrophy associated with arthritis and/or arthrosis.

Mild case

Ante mortem

The mild case of foot and leg disorders is assumed to present itself at AMI with a more hesitant and natural walk with eventually one or more foot on which the animal can't put all his weight.

Post mortem

The mild case of foot and leg disorders is assumed to present itself at PMI with bursitis of knee and/or hock associated with enlarged lymph nodes.

1) In the following table please indicate what are the probabilities for a bovine affected with foot and leg disorder, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with foot and leg disorder can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**20**	**33**	**47**	**53**	**67**	**80**
Young >6weeks	**30**	**43**	**57**	**43**	**57**	**70**
Young <6weeks	**25**	**40**	**55**	**45**	**60**	**75**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

2) Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and production type.

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4	**8**	12	5	**16**	25	0	**2**	4	0	**4**	8
	80	**90**	100	30	**50**	70	80	**90**	100	30	**50**	70
	10	**25**	35	0	**10**	20	0	**20**	30	0	**10**	20
New proposition												
Young >6weeks	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	0	**2**	4	0	**2**	4	0	**2**	4	0	**2**	4
	80	**90**	100	30	**50**	70	80	**90**	100	30	**50**	70
	10	**30**	40	0	**20**	30	0	**20**	30	0	**10**	20
New proposition												
Young <6weeks	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	0	**1**	2	0	**1**	2	0	**1**	2	0	**1**	2
	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	20	**35**	45	15	**25**	40	20	**35**	45	15	**25**	40
New proposition												

3) Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and production type.

	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	47	67	80	23	43	63	47	67	80	23	40	63
Young >6weeks	47	67	80	23	43	63	47	67	80	23	40	63
Young <6weeks	30	55	70	20	40	60	30	55	70	20	35	60

I agree with these data: ☐

I need to discuss it during a call conference: ☐

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and production type.

	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	47	67	80	23	43	63	47	67	80	23	40	63
Young >6weeks	47	67	80	23	43	63	47	67	80	23	40	63
Young <6weeks	30	55	70	20	40	60	30	55	70	20	35	60

I agree with these data: ☐

I need to discuss it during a call conference: ☐

10. Low body condition score: thin body

Typical case

Ante mortem

The typical case of low body condition score is an emaciated animal presenting an extreme thinness at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of low body condition score is assumed to present a carcass abnormally lean with little body fat.

Mild case

Not relevant.

1) A bovine with a low body condition score can't present no signs or a subclinical form of the condition and in addition a mild case is also not relevant, thus the question 1) is not relevant for this condition.

2) Consider a bovine being a typical case of low body condition score presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	Most likely	Max	Min	Most likely	Max
Adult	46	59	71	56	68	74
Young >6weeks	45	58	68	55	66	73
Young <6weeks	40	57	70	40	53	63

I agree with these data: ☐

I need to discuss it during a call conference: ☐

3) Consider a bovine being a typical case of low body condition score presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	Most likely	Max	Min	Most likely	Max
Adult	74	85	91	76	88	94
Young >6weeks	74	85	91	76	88	94
Young <6weeks	62	73	82	62	73	82

I agree with these data: ☐

I need to discuss it during a call conference: ☐

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine being a typical case of low body condition score presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	Most likely	Max	Min	Most likely	Max
Adult	71	84	93	74	86	95
Young >6weeks	71	84	93	74	86	95
Young <6weeks	60	72	85	60	72	85

I agree with these data: ☐

I need to discuss it during a call conference: ☐

11. Fractured limb

Typical case

Ante mortem

The typical case of fractured limb during ante mortem inspection is an adult cow which can't get off the ground or a calf with severe lameness.

Post mortem

At post mortem inspection (PMI) a typical case of fractured limb is assumed to present itself with a fracture of one bone of the limb and serohemorrhagic infiltration of all tissues around the broken bone.

Mild case

Not relevant.

1) A bovine with fractured limb can't present no signs or a subclinical form of the condition and in addition a mild case is also not relevant, thus the question 1) is not relevant for this condition.

2) Consider a bovine affected with a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

	Short transport			Long transport		
Age	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	NI	**100**	NI	NI	**100**	NI
	0	**1**	2	0	**1**	2
	90	**100**	100	90	**100**	100
	50	**75**	90	50	**75**	90
New proposition						
Young >6weeks	80	**90**	100	90	**99**	100
	0	**1**	2	0	**1**	2
	90	**100**	100	90	**100**	100
	50	**75**	90	50	**75**	90
New proposition						
Young <6weeks	70	**90**	100	80	**90**	100
	0	**1**	2	0	**1**	2
	NI	NI	NI	NI	NI	NI
	70	**90**	100	70	**90**	100
New proposition						

3) Consider a bovine affected by a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

	Short transport			Long transport		
Age	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**93**	**96**	**100**	**93**	**96**	**100**
Young >6weeks	**93**	**96**	**100**	**93**	**96**	**100**
Young <6weeks	**90**	**95**	**100**	**90**	**95**	**100**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine affected by a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

Age	Short transport			Long transport		
	Typical case			Typical case		
	Min	Most likely	Max	Min	Most likely	Max
Adult	**91**	**96**	**100**	**91**	**96**	**100**
Young >6weeks	**91**	**96**	**100**	**91**	**96**	**100**
Young <6weeks	**88**	**94**	**100**	**88**	**94**	**100**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

12. Cleanliness score

If we suppose a codification of cleanliness score from 0 to 4, we consider in the definition only bovine having a cleanliness score of 3 or 4.

Typical case

Ante mortem

The typical case of bad cleanliness score is assumed to present itself with an extremely heavily soiled with dried manure and/or manure armour in critical areas[1] at ante mortem inspection.

Post mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

Mild case

Not relevant.

1) A bovine with a bad cleanliness score can't present no signs or a subclinical form of the condition and in addition a mild case is also not relevant, thus the question 1) is not relevant for this condition.

2) Consider a bovine affected with a bad cleanliness score presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	Most likely	Max	Min	Most likely	Max
Adult	**75**	**88**	**99**	**73**	**83**	**98**
Young >6weeks	**75**	**88**	**99**	**73**	**83**	**98**
Young <6weeks	**70**	**83**	**100**	**70**	**83**	**100**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

3) The question is not relevant for post mortem inspection because there is no inspection of the skin during post-mortem inspection.

4) The question is not relevant for visual inspection scenario because there is no inspection of the skin during post-mortem inspection.

[1] Critical areas= under surface/mid line of abdomen; under surface of chest; hook and Achilles tendon; under surface of neck; udder and genitalia; area around the anus, including rear part of udder

13. Integument alterations

Typical case

Ante mortem

The typical case of integument alterations is assumed to present itself with a lot of injuries/wounds or bedsores due to insufficient bedding and other housing problems at ante mortem inspection.

Post mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

Mild case

Ante mortem

The mild case of integument alterations is assumed to present itself at AMI with a limited number of minor injuries/wounds occurring at head, neck or hindquarters-near the tail.

Post mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

1) In the following table please indicate what are the probabilities for a bovine with integument alterations, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with integument alterations can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**30**	**42**	**53**	**47**	**58**	**68**
Young >6weeks	**35**	**47**	**58**	**42**	**53**	**63**
Young <6weeks	**15**	**30**	**45**	**55**	**70**	**83**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

2) Consider a bovine with a typical or mild form of integument alterations presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and production type.

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

	Production type: Dairy						Production type: Beef					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	60	**90**	100	40	**70**	90	60	**80**	100	40	**60**	90
	0	**6**	12	0	**26**	52	0	**4**	8	0	**4**	8
	80	**90**	100	0	**10**	20	80	**90**	100	0	**10**	20
	10	**40**	60	0	**20**	30	10	**40**	60	0	**20**	30
New proposition												
Young >6weeks	60	**90**	100	40	**70**	90	60	**80**	100	40	**60**	90
	0	**6**	12	0	**10**	20	0	**2**	4	0	**2**	4
	80	**90**	100	0	**10**	20	80	**90**	100	0	**10**	20
	10	**40**	60	0	**20**	30	10	**40**	60	0	**20**	30
New proposition												
Young <6weeks	60	**90**	100	60	**80**	90	60	**90**	100	60	**80**	90
	0	**3**	6	0	**3**	6	0	**1**	2	0	**1**	2
	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	20	**60**	80	10	**30**	50	20	**60**	80	10	**30**	50
New proposition												

3) The question is not relevant for post mortem inspection because there is no inspection of the skin during post-mortem inspection.

4) The question is not relevant for visual inspection scenario because there is no inspection of the skin during post-mortem inspection.

14. Bruising and Injury-related hemorrhage (related to transport)

Typical case

Ante mortem

The typical case of bruising and injury-related hemorrhage is assumed to present itself with a lot of fresh bleeding wounds during ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of bruising and injury-related hemorrhage is assumed to present itself with large serohemorragic infiltration involving carcass portions.

Mild case

Ante mortem

The mild case of bruising and Injury-related hemorrhage is assumed to present itself at AMI with no visible symptom.

Post mortem

The mild case of bruising and Injury-related hemorrhage is assumed to present itself at PMI with serohemorragic infiltration involving one limited part of the carcass.

1) In the following table please indicate what are the probabilities for a bovine affected with bruising and injury-related hemorrhage, given age, to present:
    a. the typical form of the condition
    b. the mild form of the condition

    Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with bruising and injury-related hemorrhage can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	NI	NI	NI	NI	NI	NI
	30	**50**	70	30	**50**	70
	85	**90**	95	5	**10**	15
	2	**5**	10	90	**95**	98
New proposition						
Young >6weeks	NI	NI	NI	NI	NI	NI
	30	**50**	70	30	**50**	70
	85	**90**	95	5	**10**	15
	2	**5**	10	90	**95**	98
New proposition						
Young <6weeks	NI	NI	NI	NI	NI	NI
	30	**50**	70	30	**50**	70
	NI	NI	NI	NI	NI	NI
	2	**5**	10	90	**95**	98
New proposition						

2) Consider a bovine with a typical form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

Age	Short transport			Long transport		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	60	**90**	100	70	**95**	100
	30	**50**	70	40	**60**	80
	80	**90**	100	0	**10**	20
	0	**10**	20	0	**10**	20
New proposition						
Young >6weeks	60	**90**	100	70	**95**	100
	30	**50**	70	40	**60**	80
	80	**90**	100	0	**10**	20
	0	**10**	20	0	**10**	20
New proposition						
Young <6weeks	70	**90**	100	80	**95**	100
	30	**50**	70	40	**60**	80
	NI	NI	NI	NI	NI	NI
	0	**30**	20	0	**30**	20
New proposition						

3) Consider a bovine with a typical or mild form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

Age	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**70**	**89**	**100**	**39**	**56**	**71**	**73**	**90**	**100**	**41**	**56**	**71**
Young >6weeks	**70**	**89**	**100**	**39**	**56**	**71**	**73**	**90**	**100**	**41**	**56**	**71**
Young <6weeks	**70**	**88**	**100**	**52**	**72**	**88**	**73**	**90**	**100**	**55**	**72**	**88**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine with a typical or mild form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

Age	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	**70**	**90**	**100**	**39**	**56**	**71**	**73**	**91**	**100**	**41**	**56**	**71**
Young >6weeks	**70**	**90**	**100**	**39**	**56**	**71**	**73**	**91**	**100**	**41**	**56**	**71**
Young <6weeks	**70**	**89**	**100**	**52**	**72**	**88**	**73**	**91**	**100**	**55**	**72**	**88**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

15. DFD meat (Dark, Firm, Dry meat)

Typical case

Ante mortem

Not relevant because it is impossible to detect at that stage of the meat inspection.

Post mortem

At post mortem inspection (PMI) a typical case of DFD meat is assumed to have darker and drier meat than normal affecting large muscles.

Mild case

Ante mortem

Not relevant because it is impossible to detect at that stage of the meat inspection.

Post mortem

At post mortem inspection (PMI) a mild case of DFD meat is assumed to have darker and/or drier meat than normal, affecting few and small muscles.

1) In the following table please indicate what are the probabilities for a bovine having a DFD meat, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine having DFD meat can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**1**	**15**	**30**	**73**	**85**	**96**
Young >6weeks	**1**	**8**	**17**	**83**	**92**	**99**
Young <6weeks	**1**	**5**	**10**	**90**	**95**	**99**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

2) The question is not relevant for ante-mortem inspection because it is impossible to detect DFD meat at that stage of the meat inspection

3) Consider a bovine affected by a typical or mild form of DFD meat presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**37**	**57**	**73**	**3**	**18**	**33**	**37**	**57**	**73**	**3**	**18**	**33**
Young >6weeks	**37**	**57**	**73**	**3**	**18**	**33**	**37**	**57**	**73**	**3**	**18**	**33**
Young <6weeks	**25**	**45**	**60**	**5**	**18**	**30**	**25**	**45**	**60**	**5**	**18**	**30**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine affected by a typical or mild form of DFD meat presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	**37**	**58**	**75**	**3**	**20**	**35**	**37**	**58**	**75**	**3**	**20**	**35**
Young >6weeks	**37**	**58**	**75**	**3**	**20**	**35**	**37**	**58**	**75**	**3**	**20**	**35**
Young <6weeks	**17**	**32**	**42**	**3**	**13**	**22**	**17**	**32**	**42**	**3**	**13**	**22**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

16. Granuloma/ Bovine tuberculosis

Granuloma diseases bring together tuberculosis, lymph nodes lesions for actinobacillosis or tumors.

Typical case

Ante mortem

The typical case of granuloma is assumed to present itself with no visible symptom at ante mortem inspection

Post mortem

At post mortem inspection (PMI) a typical case of granuloma is assumed to present itself with granulomatous lesions in at least one of these locations: head, lungs, liver, intestine, carcass.

Mild case

Ante mortem

The mild case of granuloma is assumed to present itself at AMI with no visible symptom.

Post mortem

The mild case of granuloma is assumed to present itself at PMI with one granulomatous lesion in one of these locations: head, lungs, liver, intestine, carcass.

1) In the following table please indicate what are the probabilities for a bovine infected with granuloma, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**1**	**8**	**15**	**8**	**22**	**29**	**65**	**72**	**89**
Young >6weeks	**2**	**8**	**14**	**7**	**25**	**30**	**63**	**70**	**95**
Young <6weeks	**2**	**10**	**7**	**5**	**23**	**30**	**66**	**75**	**95**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

2) The question is not relevant for ante-mortem inspection because a typical or mild case of granuloma is assumed to present itself with no visible symptoms during ante-mortem inspection.

3) Consider a bovine infected with a typical or mild form of granuloma presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

	Low TB prevalence area						High TB prevalence area					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**55**	**78**	**90**	**28**	**48**	**63**	**65**	**84**	**94**	**48**	**65**	**85**
Young >6weeks	**55**	**78**	**90**	**28**	**48**	**63**	**65**	**84**	**94**	**48**	**65**	**85**
Young <6weeks	**47**	**73**	**83**	**27**	**47**	**67**	**60**	**80**	**90**	**37**	**53**	**80**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of granuloma presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

	Low TB prevalence area						High TB prevalence area					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	0	**20**	50	0	**5**	20	0	**30**	50	0	**5**	30
	80	**90**	100	20	**40**	60	80	**90**	100	20	**40**	60
	0	**10**	20	0	**0**	0	0	**10**	20	0	**0**	0
	20	**50**	60	15	**30**	50	30	**40**	70	20	**35**	50
New proposition												
Young >6weeks	0	**20**	50	0	**5**	20	0	**30**	50	0	**5**	30
	80	**90**	100	20	**40**	60	80	**90**	100	20	**40**	60
	0	**10**	20	0	**0**	0	0	**10**	20	0	**0**	0
	20	**50**	60	15	**30**	50	30	**40**	70	20	**35**	50
New proposition												
Young <6weeks	0	**20**	50	0	**5**	20	0	**30**	50	0	**5**	30
	80	**90**	100	20	**40**	60	80	**90**	100	20	**40**	60
	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	20	**50**	60	15	**30**	50	30	**40**	70	20	**35**	50
New proposition												

17. Pathological lesions in the heart

Definition includes pathological lesions in the heart of possible bacterial origin such as endocarditis or pericarditis.

Typical case

Ante mortem

The typical case of pathological lesions in the heart is assumed to present itself with slight breathlessness and hesitant behavior with reluctance to move at ante mortem inspection.

Post mortem

At post mortem inspection (PMI) a typical case of pathological lesions in the heart is assumed to present itself with fibrous pericardis.

Mild case

Ante mortem

The mild case of pathological lesions in the heart is assumed to present itself at AMI with no visible symptom.

Post mortem

The mild case of pathological lesions in the heart is assumed to present itself at PMI with exsudative pericarditis.

1- In the following table please indicate what are the probabilities for a bovine infected with pathological lesions in the heart, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease

   Obviously the sum of these two probabilities is 100%.

N.B.: A bovine infected with pathological lesions in the heart can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

No consensus: you can give a new proposition (in green boxes) or crossed the following box if you want to discuss the point during a conference call: ☐

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	NI	NI	NI	NI	NI	NI
	0	**20**	40	60	**80**	100
	70	**80**	90	10	**20**	30
	10	**25**	35	65	**75**	90
New proposition						
Young >6weeks	NI	NI	NI	NI	NI	NI
	0	**20**	40	60	**80**	100
	70	**80**	90	10	**20**	30
	10	**25**	35	65	**75**	90
New proposition						
Young <6weeks	NI	NI	NI	NI	NI	NI
	0	**20**	40	60	**80**	100
	NI	NI	NI	NI	NI	NI
	5	**15**	25	75	**85**	95
New proposition						

2- Consider a bovine infected with a typical form of pathological lesions in the heart presented for slaughter: indicate in the following table what are the probabilities of detection at **ante-mortem inspection**, given age:

Age	Typical case		
	Min	**Most likely**	Max
Adult	**0**	**19**	**35**
Young >6weeks	**0**	**19**	**35**
Young <6weeks	**2**	**30**	**50**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

3- Consider a bovine infected with a typical or mild form of pathological lesions in the heart presented for slaughter: indicate in the following table what are the probabilities of detection at **post-mortem inspection**, given age:

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**73**	**86**	**97**	**58**	**73**	**89**
Young >6weeks	**73**	**89**	**97**	**58**	**75**	**89**
Young <6weeks	**67**	**85**	**96**	**47**	**67**	**85**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

4- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of pathological lesions in the heart presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age:

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Min
Adult	**73**	**86**	**97**	**58**	**73**	**89**
Young >6weeks	**73**	**86**	**97**	**58**	**73**	**89**
Young <6weeks	**67**	**85**	**96**	**47**	**67**	**85**

I agree with these data: ☐

I need to discuss it during a call conference: ☐

If there were any questions/ issues that you would like to raise concerning this questionnaire or concerning the following conference call, please state those below

……
……
……

Thank you again for your participation!

Preparation of the conference call

All of you had difficulties to answer to question 1 for each disease and that's why it was difficult to reach a consensus on these questions. Most of the points to discuss during the conference call are on question 1). There seemed to be two difficulties: i) difficulties to well understand the question and there seemed to be different interpretation depending on expert. The question was probably not enough clear ii) Even if the question was well understood it was difficult to answer because of the lack of information on the subject even if you have experience in the disease/condition.
The final data (data on which everybody agreed) are in blue and will not be discussed during the conference call. You have these data in this document to make you inform of the results.
We will go through this document during the conference call.

1. Necrobacillosis (liver, oral cavity): *Fusobacterium necrophorum*

You all agreed on the fact that we should change the definition of typical and mild case. Thus we switched the post mortem definition of typical and mild case as you can see below. We also switch the probability of detection that you all estimated for post mortem inspection between typical and mild case to take into account these new definitions.

Interdigital form is excluded from the definition

Typical case

Ante mortem

The typical case of necrobacillosis is assumed to present itself at ante-mortem inspection (AMI) with hypersalivation.

Post mortem

At PMI, the mild case of necrobacillosis is assumed to present itself with ulceration in the tongue and /or swollen cheek.

Mild case

Ante mortem

The mild case of necrobacillosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

At post mortem inspection (PMI) a typical case of necrobacillosis is assumed to present itself with liver abscesses.

1- In the following table please indicate what are the probabilities for a bovine infected with necrobacillosis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100%.

You wanted to discuss this point on the conference call.

As you will see below, one expert made a new proposition.

We need to discuss on that point and try to reach a consensus on a final proposition

1) **General discussion on the question "type 1)"**
2) **Discussion on question 1) for necrobacillosis**

Age	N° expert	Typical case			Mild case			No sign (subclinical)		
		Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	NI	NI	NI	NI	NI	NI	NI	NI	NI
	2	0	**2**	5	0	**5**	10	86	**93**	100
	3	70	**80**	90	0	**0**	10	10	**20**	30
	4	10	**20**	30	20	**30**	40	30	**50**	70
New proposition (of 1 expert)	**3**		**80**			**20**			**0**	
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young >6weeks	1	NI	NI	NI	NI	NI	NI	NI	NI	NI
	2	0	**1**	2	0	**2**	4	94	**97**	100
	3	NI	**5**	NI	NI	**80**	NI	NI	**15**	NI
	4	10	**20**	30	20	**30**	40	30	**50**	70
New proposition (of 1 expert)	3		**20**			**80**			**0**	
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young <6weeks	1	NI	NI	NI	NI	NI	NI	NI	NI	NI
	2	0	**1**	2	0	**2**	4	94	**97**	100
	3	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4	10	**20**	30	20	**30**	40	30	**50**	70
New proposition (of 1 expert)	3									
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			

2) Consider a bovine infected with a typical form of necrobacillosis presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age (the question is not relevant for mild case because it assumed to present itself with no visible symptoms):

Age	Typical case		
	Min	**Most likely**	Max
Adult	13	**30**	47
Young >6weeks	13	**30**	47
Young <6weeks	15	**30**	45

3) Consider a bovine infected with a typical or mild form of necrobacillosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	28	**53**	73	73	**90**	98
Young >6weeks	18	**37**	50	73	**90**	98
Young <6weeks	28	**55**	75	70	**85**	98

We just switch results of typical and mild case to take into account the change in the definition

4) **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of necrobacillosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	22	**43**	60	70	**87**	95
Young >6weeks	12	**27**	37	70	**87**	95
Young <6weeks	18	**40**	55	65	**80**	93

2. Enzootic Bovine Leukosis

Typical case

Ante mortem

The typical case of enzootic bovine leukosis is assumed to present itself with enlarged superficial lymph nodes (mandibular, scapular or pre-crural).

Post mortem

At post mortem inspection (PMI) a typical case of enzootic bovine leukosis is assumed to present itself with superficial lymph nodes enlarged and / or abdominal-pelvic cavity lymph nodes enlarged.

Mild case

Ante mortem

The mild case of enzootic bovine leukosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

At PMI, the mild case of enzootic bovine leukosis is assumed to present itself with a limited number of superficial lymph nodes enlarged.

1) In the following table please indicate what are the probabilities for a bovine infected with enzootic bovine leukosis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

You wanted to discuss this point on the conference call.

As you will see below, two experts made a new proposition.

We need to discuss on that point and try to reach a consensus on a final proposition

Age	N° expert	Typical case			Mild case			No sign (subclinical)		
		Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	0	**0.5**	1	NI	**1**	1.5	NI	**99.5**	100
	2	0	**1**	2	0	**4**	8	90	**95**	100
	3	40	**60**	70	10	**20**	30	10	**20**	30
	4	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition	1	0	**1**	2	0	**3**	8	90	**96**	100
	3		**1**			**1**			**98**	
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young >6weeks	1	NI	**0**	NI	NI	**0**	0.5	NI	**100**	100
	2	0	**1**	2	0	**4**	8	90	**95**	100
	3	40	**60**	70	10	**20**	30	10	**20**	30
	4	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition	1	0	**1**	2	0	**3**	8	90	**96**	100
	3		**1**			**1**			**98**	
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young <6weeks	1	NI	**0**	NI	NI	**0**	NI	NI	**100**	NI
	2	0	**1**	2	0	**4**	8	90	**95**	100
	3	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
	4	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition	1	0	**1**	2	0	**3**	8	90	**96**	100
	3									
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			

2) Consider a bovine infected with a typical form of enzootic bovine leukosis presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and region (with respect to risk of introduction of the disease). The question is not relevant for mild case because it assumed to present itself with no visible symptom during ante-mortem inspection.

	Region with low risk of introduction of EBL/free since long			**Region with high risk of introduction of EBL /recently free**		
Age	**Typical case**			**Typical case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**15**	**35**	**53**	**18**	**45**	**68**
Young >6weeks	**15**	**30**	**48**	**18**	**38**	**55**
Young <6weeks	**0**	**10**	**25**	**5**	**15**	**30**

3) Consider a bovine infected with a typical or mild form of enzootic bovine leukosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with respect to risk of introduction of the disease).

4)

	Region with low risk of introduction of EBL/free since long						Region with high risk of introduction of EBL /recently free					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**48**	**78**	**90**	**9**	**30**	**60**	**48**	**83**	**94**	**14**	**45**	**80**
Young >6weeks	**40**	**68**	**84**	**5**	**28**	**55**	**45**	**73**	**87**	**5**	**38**	**69**
Young <6weeks	**15**	**45**	**70**	**5**	**20**	**35**	**20**	**55**	**75**	**5**	**25**	**45**

5) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of enzootic bovine leukosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with respect to risk of introduction of the disease).

	Region with low risk of introduction of EBL/free since long						Region with high risk of introduction of EBL /recently free					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	**43**	**65**	**75**	**8**	**28**	**53**	**48**	**73**	**83**	**13**	**38**	**68**
Young >6weeks	**28**	**55**	**73**	**3**	**23**	**50**	**30**	**63**	**78**	**3**	**30**	**58**
Young <6weeks	**15**	**45**	**70**	**5**	**20**	**35**	**20**	**55**	**75**	**5**	**25**	**45**

3. Respiratory diseases

The respiratory diseases bring together transport fever (Histophilus somni = Haemophilus somnus, Mannheimia haemolytica) and other causes of pneumonia and associated pleuritis

Typical case

Ante mortem

The typical case of respiratory diseases is assumed to present itself at ante-mortem inspection (AMI) with mucopurulent nasal discharge and rapid respiration.

Post mortem

At post mortem inspection (PMI) a typical case of respiratory diseases is assumed to present itself with fibrinous or fibrosis pleuritis associated with fibrinous or fibrosis pneumonia and abscesses more or less voluminous in lung.

Mild case

Ante mortem

The mild case of respiratory diseases is assumed to present itself at AMI with minor respiratory difficulties.

Post mortem

At PMI, the mild case of respiratory diseases is assumed to present itself with fibrinous bronchopneumonia.

1) In the following table please indicate what are the probabilities for a bovine infected with respiratory diseases, given age, to present:
   a. the typical form of the disease

b. the mild form of the disease

c. No signs, i.e. a subclinical form of the disease

Obviously the sum of these three probabilities is 100 %.

You wanted to discuss this point on the conference call.

As you will see below, two experts made a new proposition.

<u>We need to discuss on that point and try to reach a consensus on a final proposition</u>

Age	N° expert	Typical case			Mild case			No sign (subclinical)		
		Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	0	**10**	20	10	**50**	70	30	**40**	90
	2	0	**5**	10	0	**10**	20	65	**85**	100
	3	60	**70**	80	10	**20**	30	0	**10**	20
	4	5	**10**	30	20	**30**	50	40	**60**	75
New proposition	1	0	**10**	30	10	**30**	50	30	**60**	90
	2	0	**10**	20	20	**30**	50	10	**60**	75
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young >6weeks	1	20	**60**	80	20	**30**	50	5	**10**	20
	2	0	**5**	10	0	**10**	20	65	**85**	100
	3	60	**70**	80	10	**20**	30	0	**10**	20
	4	15	**20**	40	20	**40**	60	30	**40**	60
New proposition	1	10	**50**	80	10	**30**	50	5	**20**	50
	2	10	**20**	40	10	**40**	60	20	**40**	60
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young <6weeks	1	50	**90**	100	5	**10**	20	0	**0**	5
	2	0	**10**	20	0	**20**	40	50	**70**	100
	3	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
	4	20	**30**	40	25	**40**	60	20	**30**	50
New proposition	1	20	**60**	80	5	**20**	40	5	**20**	40
	2	20	**30**	40	20	**40**	60	20	**30**	50
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			

2) <u>Consider a bovine infected with a typical or mild form of respiratory diseases</u> presented for slaughter: indicate in the following table what are the probabilities of detection at **<u>ante -mortem inspection</u>**, given age and risk area.

Age	Low prevalence area of immunosuppressive infection (e.g. BVDV)						High prevalence area of immunosuppressive infection (e.g. BVDV)					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	29	**44**	58	0	**9**	20	30	**46**	59	0	**9**	20
Young >6weeks	35	**53**	68	0	**13**	25	38	**55**	68	0	**13**	25
Young <6weeks	43	**57**	72	3	**15**	23	45	**60**	72	3	**15**	23

3) <u>Consider a bovine infected with a typical or mild form of respiratory diseases</u> presented for slaughter: indicate in the following table what are the probabilities of detection at **<u>post -mortem inspection</u>**, given age and risk area.

	Low prevalence area of immunosuppressive infection (e.g. BVDV)						High prevalence area of immunosuppressive infection (e.g. BVDV)					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**70**	**85**	**96**	**41**	**60**	**83**	**70**	**85**	**96**	**41**	**63**	**83**
Young >6weeks	**75**	**89**	**96**	**45**	**68**	**88**	**75**	**89**	**96**	**45**	**70**	**88**
Young <6weeks	**73**	**88**	**95**	**37**	**63**	**85**	**73**	**88**	**95**	**37**	**67**	**85**

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of respiratory diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and risk area.

	Low prevalence area of immunosuppressive infection (e.g. BVDV)						High prevalence area of immunosuppressive infection (e.g. BVDV)					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	46	**65**	81	25	**40**	56	46	**65**	81	25	**40**	56
Young >6weeks	50	**70**	84	28	**48**	63	50	**70**	84	28	**48**	63
Young <6weeks	53	**77**	92	20	**47**	63	53	**77**	92	20	**47**	63

4. Vesicular diseases

The vesicular diseases bring together foot and mouth disease and vesicular stomatitis.

Typical case

Ante mortem

The typical case of vesicular diseases is assumed to present itself at ante-mortem inspection (AMI) with vesicles on nostrils or muzzle, a hypersalivation and reluctance to rise or stamping/shaking the feet.

Post mortem

At post mortem inspection (PMI) a typical case of vesicular diseases is assumed to present itself with at least one fluid-filled vesicles or bullae on muzzle and gums, feet or on pillars of the rumen associated with red eroded areas or ulcers (vesicle rupture).

Mild case

Ante mortem

The mild case of vesicular diseases is assumed to present itself at AMI with hypersalivation or trample.

Post mortem

At PMI, the mild case of vesicular diseases is assumed to present itself with single fluid-filled vesicles on muzzle or gums.

1) In the following table please indicate what are the probabilities for a bovine infected with vesicular diseases, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

You wanted to discuss this point on the conference call.

As you will see below, two experts made a new proposition.

<u>We need to discuss on that point and try to reach a consensus on a final proposition</u>

Age	N° expert	Typical case			Mild case			No sign (subclinical)		
		Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	25	**50**	90	10	**30**	60	10	**20**	50
	2	0	**<1**	1	0	**<1**	1	>99	**99**	100
	3	40	**70**	100	0	**30**	60	0	**0**	0
	4	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition	1	20	**50**	90	0	**30**	60	0	**20**	60
	2	20	**50**	90	10	**30**	60	10	**20**	50
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young >6weeks	1	25	**50**	90	10	**30**	60	10	**20**	50
	2	0	**<1**	1	0	**<1**	1	>99	**99**	100
	3	40	**70**	100	0	**30**	60	0	**0**	0
	4	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition	1	20	**50**	90	0	**30**	60	0	**20**	60
	2	20	**50**	90	10	**30**	60	10	**20**	50
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young <6weeks	1	25	**50**	90	10	**30**	60	10	**20**	50
	2	0	**<1**	1	0	**<1**	1	>99	**99**	100
	3	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
	4	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition	1	20	**50**	90	0	**30**	60	0	**20**	60
	2	20	**50**	90	10	**30**	60	10	**20**	50
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			

2) <u>Consider a bovine infected with a typical or mild form of vesicular diseases</u> presented for slaughter: indicate in the following table what are the probabilities of detection at **<u>ante - mortem inspection</u>**, given age and herd-level risk in terms of the frequency of contacts.

Age	Low frequency of contacts						High frequency of contacts					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	50	**68**	86	30	**50**	71	58	**73**	92	33	**58**	79
Young >6weeks	50	**68**	86	30	**50**	71	58	**73**	92	33	**58**	79
Young <6weeks	53	**70**	88	27	**47**	68	63	**77**	96	30	**57**	78

3) <u>Consider a bovine infected with a typical or mild form of vesicular diseases</u> presented for slaughter: indicate in the following table what are the probabilities of detection at **<u>post - mortem inspection</u>**, given age and herd-level risk in terms of the frequency of contacts.

Age	Low frequency of contacts						High frequency of contacts					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	58	**78**	92	35	**58**	74	63	**79**	94	43	**65**	83
Young >6weeks	58	**78**	92	35	**58**	74	63	**79**	94	43	**65**	83
Young <6weeks	63	**83**	96	33	**57**	72	70	**85**	98	43	**67**	83

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of vesicular diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and herd-level risk in terms of the frequency of contacts.

	Low frequency of contacts						High frequency of contacts					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	55	**75**	90	35	**55**	73	58	**76**	91	40	**63**	78
Young >6weeks	55	**75**	90	35	**55**	73	58	**76**	91	40	**63**	78
Young <6weeks	60	**80**	93	33	**53**	70	63	**82**	95	40	**63**	77

5. Ulcerative diseases

The ulcerative diseases bring together Malignant catarrhal fever and Blue tongue.

Typical case

Ante mortem

The typical case of ulcerative diseases is assumed to present itself at ante-mortem inspection (AMI) with ulcers of the nose associated with hypersalivation.

Post mortem

At post mortem inspection (PMI) a typical case of ulcerative diseases is assumed to present itself with multifocal hemorrhages on the lip and dental pad associated with ulcers of oesophagus and/or rumen and/or mouth and/or nose.

Mild case

Ante mortem

The mild case of ulcerative diseases is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of ulcerative diseases is assumed to present itself at PMI with a limited number of ulcers whatever the location.

1) In the following table please indicate what are the probabilities for a bovine infected with ulcerative diseases, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	**Typical case**			**Mild case**			**No sign (subclinical)**		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**0**	**7**	**21**	**2**	**12**	**27**	**65**	**81**	**97**
Young >6weeks	**0**	**9**	**25**	**2**	**12**	**27**	**65**	**79**	**95**
Young <6weeks	**0**	**7**	**18**	**2**	**8**	**20**	**45**	**51**	**60**

2) Consider a bovine infected with a typical form of ulcerative diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and region (with regards to risk of introduction of bluetongue).

3)

Age	Region with low risk of introduction of Bluetongue			Region with high risk of introduction of Bluetongue		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	21	**45**	63	45	**73**	93
Young >6weeks	21	**45**	65	45	**73**	93
Young <6weeks	28	**53**	73	40	**70**	90

4) Consider a bovine infected with a typical or mild form of ulcerative diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with regards to risk of introduction of bluetongue).

Age	Region with low risk of introduction of Bluetongue						Region with high risk of introduction of Bluetongue					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**30**	**50**	**60**	**8**	**28**	**41**	**40**	**58**	**69**	**10**	**33**	**45**
Young >6weeks	**30**	**50**	**60**	**8**	**28**	**41**	**40**	**58**	**69**	**10**	**33**	**45**
Young <6weeks	**40**	**67**	**80**	**10**	**37**	**55**	**53**	**77**	**92**	**13**	**43**	**60**

5) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of ulcerative diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with regards to risk of introduction of bluetongue).

Age	Region with low risk of introduction of Bluetongue						Region with high risk of introduction of Bluetongue					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	25	**48**	58	8	**23**	35	35	**54**	65	10	**28**	38
Young >6weeks	25	**48**	58	8	**23**	35	35	**54**	65	10	**28**	38
Young <6weeks	25	**48**	58	8	**23**	35	35	**54**	65	10	**28**	38

6. Echinococcosis/hydatidosis :*Echinococcus granulosus* - larva in liver, lungs

Typical case

Ante mortem

The typical case of hydatidosis is assumed to present no visible symptom at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of hydatidosis is assumed to present itself with a limited number of *cysts* of different sizes and shapes which contain a clear fluid under pressure in liver and / or lungs.

Mild case

Ante mortem

The mild case of echinococcosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of echinococcosis is assumed to present itself at PMI with one small cyst in the liver or lungs that contains a clear fluid under pressure.

1) In the following table please indicate what are the probabilities for a bovine infected with hydatidosis, given age, to present:
    a. the typical form of the disease
    b. the mild form of the disease
    c. No signs, i.e. a subclinical form of the disease

    Obviously the sum of these three probabilities is 100 %.

You are 3/4 to agree on the suggestion that the subclinical form of the disease doesn't exist: you have a cyst or you don't have a cyst.

Discussion on this point (do we keep or not a subclinical form?) and try to reach a consensus on proposition

Age	N° expert	Typical case			Mild case			No sign (subclinical)		
		Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	0	**50**	70	0	**40**	80	0	**10**	50
	2	0	**5**	20	0	**5**	10	80	**90**	100
	3	0	**10**	20	80	**90**	100	0	**0**	0
	4	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition	1	0	**20**	50	0	**50**	70	0	**30**	50
	3		**10**			**90**				
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young >6weeks	1	0	**30**	50	0	**40**	80	0	**30**	60
	2	0	**3**	20	0	**3**	10	80	**94**	100
	3	0	**10**	20	80	**90**	100	0	**0**	0
	4	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition	1	0	**15**	30	0	**30**	70	0	**55**	90
	3		**10**			**90**				
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young <6weeks	1	NI	**0**	NI	NI	**0**	NI	NI	**100**	NI
	2	0	**3**	20	0	**3**	10	80	**94**	100
	3	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
	4	NI	**NI**	NI	NI	**NI**	NI	NI	**NI**	NI
New proposition	1	0	**0**	0	0	**0**	0	100	**100**	100
	3									
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			

2) The question is not relevant for ante-mortem inspection because the typical and mild case definition of hydatidosis is assumed to present itself with no visible symptoms.

3) Consider a bovine infected with a typical or mild form of hydatidosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

You all agreed on the suggestion that calves <6 weeks are too young for lesions to have time to develop then for this age category there is only subclinical form and no typical or mild form thus detection of typical or mild cases for young < 6 weeks is not relevant.

Age	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**55**	**78**	**94**	**20**	**40**	**60**	**58**	**80**	**95**	**30**	**53**	**73**
Young >6weeks	**55**	**75**	**89**	**18**	**40**	**58**	**58**	**78**	**90**	**28**	**53**	**70**
Young <6weeks	Not relevant						Not relevant					

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of hydatidosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

	Low prevalence area						High prevalence area					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	40	**70**	81	8	**28**	43	43	**71**	83	15	**35**	50
Young >6weeks	38	**68**	79	8	**28**	43	40	**69**	80	15	**35**	47
Young <6weeks	Not relevant						Not relevant					

7. Taenia saginata :*Cysticercus bovis* - larva in muscle

Typical case

Ante mortem

The typical case of *Taenia saginata* is assumed to present no visible symptom at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of *Taenia saginata* is assumed to present itself with either clear transparent bladders full of opaque pearl like liquid or degeneration, caseation and calcification lesions.

Mild case

Ante mortem

The mild case of *Taenia saginata* is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of *Taenia saginata* is assumed to present itself at PMI with a limited number of small white lesions in focused areas of muscle tissues.

1) In the following table please indicate what are the probabilities for a bovine infected with *Taenia saginata*, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100%.

You are3/4 to agree on the suggestion that the subclinical form of the disease doesn't exist: there is a cyst/lesion or there isn't a cyst/lesion.

Discussion on this point (do we keep or not a subclinical form?) and try to reach a consensus on proposition

Age	N° expert	Typical case			Mild case			No sign (subclinical)		
		Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	0	**50**	90	0	**40**	90	5	**10**	50
	2	0	**5**	20	0	**5**	10	80	**90**	100
	3	5	**10**	15	85	**90**	95	0	**0**	0
	4	NI	NI	NI	NI	NI	NI	NI	NI	NI
New proposition	1	0	**20**	50	0	**40**	90	0	**40**	90
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young >6weeks	1	0	**40**	80	0	**50**	90	0	**10**	70
	2	0	**3**	20	0	**3**	10	80	**94**	100
	3	5	**10**	15	85	**90**	95	0	**0**	0
	4	NI	NI	NI	NI	NI	NI	NI	NI	NI
New proposition	1	0	**20**	50	0	**30**	70	0	**50**	70
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young <6weeks	1	0	**0**	0	0	**0**	1	99	**100**	100
	2	0	**3**	20	0	**3**	10	80	**94**	100
	3	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4	NI	NI	NI	NI	NI	NI	NI	NI	NI
New proposition	1	0	**1**	2	0	**1**	2	90	**98**	100
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			

2) The question is not relevant for ante-mortem inspection because the typical and mild case definition of *Taenia saginata* is assumed to present itself with no visible symptoms.

3) Consider a bovine infected with a typical or mild form of *Taenia saginata* presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	40	**58**	79	13	**28**	48
Young >6weeks	40	**58**	79	13	**28**	48
Young <6weeks	40	**60**	85	10	**27**	53

4) **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of *Taenia saginata* presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	13	**23**	36	0	**4**	11
Young >6weeks	13	**23**	36	0	**4**	11
Young <6weeks	13	**20**	31	0	**4**	10

8. Trematodes – Fascioliasis :*Fasciola hepatica*

Typical case

Ante mortem

The typical case of fascioliasis is assumed to present no visible symptom at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of fascioliasis is assumed to present itself with black parasitic debris or entire fluke in the liver and enlarged/thickened ducts.

Mild case

Ante mortem

The mild case of Fasciolasis is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of Fasciolasis is assumed to present itself at PMI with enlarged/thickened ducts.

1- In the following table please indicate what are the probabilities for a bovine infected with fascioliasis, given age, to present:

a. the typical form of the disease
b. the mild form of the disease
c. No signs, i.e. a subclinical form of the disease

Obviously the sum of these three probabilities is 100%.

There was no consensus on this point and you wanted to discuss it.

Age	N° expert	Typical case			Mild case			No sign (subclinical)		
		Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	20	**40**	70	20	**50**	70	5	**10**	50
	2	0	**10**	20	0	**10**	20	60	**80**	100
	3	40	**50**	60	40	**50**	60	0	**0**	0
	4	10	**20**	50	10	**30**	50	30	**50**	80
New proposition	1	20	**40**	60	10	**40**	60	10	**20**	50
	2	20	**40**	60	20	**50**	70	0	**10**	20
	4	10	**30**	50	20	**40**	60	20	**30**	50
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young >6weeks	1	10	**30**	60	20	**50**	70	10	**20**	70
	2	0	**10**	20	0	**10**	20	60	**80**	100
	3	40	**50**	60	40	**50**	60	0	**0**	0
	4	10	**20**	50	10	**30**	50	30	**50**	80
New proposition		5	**20**	50	10	**40**	60	10	**40**	70
		20	**40**	60	20	**50**	70	0	**10**	20
		10	**30**	50	20	**40**	60	20	**30**	50
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			
Young <6weeks	1	NI	**0**	NI	NI	**0**	NI	NI	**100**	NI
	2	0	**10**	20	0	**10**	20	60	**80**	100
	3	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4	10	**20**	50	10	**30**	50	30	**50**	80
New proposition		0	**1**	2	0	**1**	2	90	**98**	100
		0	**0**	0	0	**0**	0	100	**100**	100
		0	**10**	20	0	**10**	20	60	**80**	100
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**			

2) The question is not relevant for ante-mortem inspection because the typical and mild case definition of fascioliasis is assumed to present itself with no visible symptoms.

3) Consider a bovine infected with a typical or mild form of fascioliasis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

Age	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	53	**75**	90	40	**55**	75	58	**80**	92	43	**65**	80
Young >6weeks	53	**75**	90	40	**55**	75	58	**80**	92	43	**65**	80
Young <6weeks	30	**53**	63	15	**30**	45	33	**55**	65	18	**38**	48

4) **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of fascioliasis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

Age	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	33	**58**	73	25	**34**	45	35	**65**	80	28	**45**	55
Young >6weeks	33	**58**	73	25	**34**	45	35	**65**	80	28	**45**	55
Young <6weeks	17	**43**	57	7	**14**	25	20	**50**	63	10	**27**	37

9. Foot and leg disorder

The definition includes foot and leg disorder linked to trouble in housing system but excluding fractured limbs.

Typical case

Ante mortem

The typical case of foot and leg disorder is assumed to present itself with a minor lameness at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of foot and leg disorder is assumed to present itself with amyotrophy associated with arthritis and/or arthrosis.

Mild case

Ante mortem

The mild case of foot and leg disorders is assumed to present itself at AMI with a more hesitant and natural walk with eventually one or more foot on which the animal can't put all his weight.

Post mortem

The mild case of foot and leg disorders is assumed to present itself at PMI with bursitis of knee and/or hock associated with enlarged lymph nodes.

1) In the following table please indicate what are the probabilities for a bovine affected with foot and leg disorder, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with foot and leg disorder can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	20	**33**	47	53	**67**	80
Young >6weeks	30	**43**	57	43	**57**	70
Young <6weeks	25	**40**	55	45	**60**	75

2) Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and production type.

There was no consensus on this point and you wanted to discuss it.

Age	N° expert	Production type: Dairy						Production type: Beef					
		Typical case			Mild case			Typical case			Mild case		
		Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	2	4	**8**	12	5	**16**	25	0	**2**	4	0	**4**	8
	3	80	**90**	100	30	**50**	70	80	**90**	100	30	**50**	70
	4	10	**25**	35	0	**10**	20	0	**20**	30	0	**10**	20
New proposition	2	30	**50**	70	10	**20**	30	30	**50**	70	10	**20**	30
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**						
Young >6weeks	1	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	2	0	**2**	4	0	**2**	4	0	**2**	4	0	**2**	4
	3	80	**90**	100	30	**50**	70	80	**90**	100	30	**50**	70
	4	10	**30**	40	0	**20**	30	0	**20**	30	0	**10**	20
New proposition	2	30	**50**	70	10	**20**	30	30	**50**	70	10	**20**	30
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**						
Young <6weeks	1	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	2	0	**1**	2	0	**1**	2	0	**1**	2	0	**1**	2
	3	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4	20	**35**	45	15	**25**	40	20	**35**	45	15	**25**	40
New proposition	2	30	**50**	70	10	**20**	30	30	**50**	70	10	**20**	30
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**						

3) Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and production type.

4)

Age	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	47	**67**	80	23	**43**	63	47	**67**	80	23	**40**	63
Young >6weeks	47	**67**	80	23	**43**	63	47	**67**	80	23	**40**	63
Young <6weeks	30	**55**	70	20	**40**	60	30	**55**	70	20	**35**	60

5) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and production type.

Age	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	47	**67**	80	23	**43**	63	47	**67**	80	23	**40**	63
Young >6weeks	47	**67**	80	23	**43**	63	47	**67**	80	23	**40**	63
Young <6weeks	30	**55**	70	20	**40**	60	30	**55**	70	20	**35**	60

10. Low body condition score: thin body

Typical case

Ante mortem

The typical case of low body condition score is an emaciated animal presenting an extreme thinness at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of low body condition score is assumed to present a carcass abnormally lean with little body fat.

Mild case

Not relevant.

1) A bovine with a low body condition score can't present no signs or a subclinical form of the condition and in addition a mild case is also not relevant, thus the question 1) is not relevant for this condition.

2) Consider a bovine being a typical case of low body condition score presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	46	**59**	71	56	**68**	74
Young >6weeks	45	**58**	68	55	**66**	73
Young <6weeks	40	**57**	70	40	**53**	63

3) Consider a bovine being a typical case of low body condition score presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	74	**85**	91	76	**88**	94
Young >6weeks	74	**85**	91	76	**88**	94
Young <6weeks	62	**73**	82	62	**73**	82

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine being a typical case of low body condition score presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	71	**84**	93	74	**86**	95
Young >6weeks	71	**84**	93	74	**86**	95
Young <6weeks	60	**72**	85	60	**72**	85

11. Fractured limb

Typical case

Ante mortem

The typical case of fractured limb during ante mortem inspection is an adult cow which can't get off the ground or a calf with severe lameness.

Post mortem

At post mortem inspection (PMI) a typical case of fractured limb is assumed to present itself with a fracture of one bone of the limb and serohemorrhagic infiltration of all tissues around the broken bone.

Mild case

Not relevant.

1) A bovine with fractured limb can't present no signs or a subclinical form of the condition and in addition a mild case is also not relevant, thus the question 1) is not relevant for this condition.

2) Consider a bovine affected with a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

One of the expert add very different value but he suggested new one that are closer to the other experts, thus we suggested you a "final proposition" as mean of these new values. Discussion to agree or not on this final proposition

Age	N° expert	Short transport			Long transport		
		Typical case			Typical case		
		Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	NI	**100**	NI	NI	**100**	NI
	2	0	**1**	2	0	**1**	2
	3	90	**100**	100	90	**100**	100
	4	50	**75**	90	50	**75**	90
New proposition	2	70	**80**	90	70	**80**	90
Final proposition		**70**	**89**	**95**	**70**	**89**	**95**
Young >6weeks	1	80	**90**	100	90	**99**	100
	2	0	**1**	2	0	**1**	2
	3	90	**100**	100	90	**100**	100
	4	50	**75**	90	50	**75**	90
New proposition	2	70	**80**	90	70	**80**	90
Final proposition		**73**	**86**	**95**	**75**	**89**	**95**
Young <6weeks	1	70	**90**	100	80	**90**	100
	2	0	**1**	2	0	**1**	2
	3	NI	NI	NI	NI	NI	NI
	4	70	**90**	100	70	**90**	100
New proposition	2	70	**80**	90	70	**80**	90
Final proposition		**70**	**87**	**97**	**73**	**87**	**97**

3) Consider a bovine affected by a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

Age	Short transport			Long transport		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	93	**96**	100	93	**96**	100
Young >6weeks	93	**96**	100	93	**96**	100
Young <6weeks	90	**95**	100	90	**95**	100

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine affected by a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

Age	Short transport			Long transport		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	91	**96**	100	91	**96**	100
Young >6weeks	91	**96**	100	91	**96**	100
Young <6weeks	88	**94**	100	88	**94**	100

12. Cleanliness score

If we suppose a codification of cleanliness score from 0 to 4, we consider in the definition only bovine having a cleanliness score of 3 or 4.

Typical case

Ante mortem

The typical case of bad cleanliness score is assumed to present itself with an extremely heavily soiled with dried manure and/or manure armour in critical areas[1] at ante mortem inspection.

Post mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

Mild case

Not relevant.

1) A bovine with a bad cleanliness score can't present no signs or a subclinical form of the condition and in addition a mild case is also not relevant, thus the question 1) is not relevant for this condition.

2) Consider a bovine affected with a bad cleanliness score presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and production type.

	Production type: Dairy			Production type: Beef		
Age	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	75	**88**	99	73	**83**	98
Young >6weeks	75	**88**	99	73	**83**	98
Young <6weeks	70	**83**	100	70	**83**	100

3) The question is not relevant for post mortem inspection because there is no inspection of the skin during post-mortem inspection.

4) The question is not relevant for visual inspection scenario because there is no inspection of the skin during post-mortem inspection.

[1] Critical areas= under surface/mid line of abdomen; under surface of chest; hook and Achilles tendon; under surface of neck; udder and genitalia; area around the anus, including rear part of udder

13. Integument alterations

Typical case

Ante mortem

The typical case of integument alterations is assumed to present itself with a lot of injuries/wounds or bedsores due to insufficient bedding and other housing problems at ante mortem inspection.

Post mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

Mild case

Ante mortem

The mild case of integument alterations is assumed to present itself at AMI with a limited number of minor injuries/wounds occurring at head, neck or hindquarters-near the tail.

Post mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

1) In the following table please indicate what are the probabilities for a bovine with integument alterations, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with integument alterations can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	30	**42**	53	47	**58**	68
Young >6weeks	35	**47**	58	42	**53**	63
Young <6weeks	15	**30**	45	55	**70**	83

2) Consider a bovine with a typical or mild form of integument alterations presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and production type.

There was no consensus on this point and there still is no consensus with the new propositin. Wa need to discuss this point.

Age	N° expert	Production type: Dairy						Production type: Beef					
		Typical case			Mild case			Typical case			Mild case		
		Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	60	**90**	100	40	**70**	90	60	**80**	100	40	**60**	90
	2	0	**6**	12	0	**26**	52	0	**4**	8	0	**4**	8
	3	80	**90**	100	0	**10**	20	80	**90**	100	0	**10**	20
	4	10	**40**	60	0	**20**	30	10	**40**	60	0	**20**	30
New proposition	1	50	**80**	100	0	**30**	60	50	**80**	100	0	**20**	50
	2	40	**60**	80	0	**20**	40	40	**60**	80	0	**20**	40
	4	10	**20**	30	5	**10**	20	10	**20**	30	5	**10**	20
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**						
Young >6weeks	1	60	**90**	100	40	**70**	90	60	**80**	100	40	**60**	90
	2	0	**6**	12	0	**10**	20	0	**2**	4	0	**2**	4
	3	80	**90**	100	0	**10**	20	80	**90**	100	0	**10**	20
	4	10	**40**	60	0	**20**	30	10	**40**	60	0	**20**	30
New proposition	1	50	**80**	100	0	**30**	60	50	**80**	100	0	**20**	50
	2	40	**60**	80	0	**20**	40	40	**60**	80	0	**20**	40
	4	10	**20**	30	5	**10**	20	10	**20**	30	5	**10**	20
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**						
Young <6weeks	1	60	**90**	100	60	**80**	90	60	**90**	100	60	**80**	90
	2	0	**3**	6	0	**3**	6	0	**1**	2	0	**1**	2
	3	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4	20	**60**	80	10	**30**	50	20	**60**	80	10	**30**	50
New proposition	1	50	**80**	100	0	**40**	60	50	**80**	100	0	**40**	60
	2	40	**60**	80	0	**20**	40	40	**60**	80	0	**20**	40
	4	10	**20**	30	5	**10**	20	10	**20**	30	5	**10**	20
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**						

3) The question is not relevant for post mortem inspection because there is no inspection of the skin during post-mortem inspection.

4) The question is not relevant for visual inspection scenario because there is no inspection of the skin during post-mortem inspection.

14. Bruising and Injury-related hemorrhage (related to transport)

Typical case

Ante mortem

The typical case of bruising and injury-related hemorrhage is assumed to present itself with a lot of fresh bleeding wounds during ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of bruising and injury-related hemorrhage is assumed to present itself with large serohemorragic infiltration involving carcass portions.

Mild case

Ante mortem

The mild case of bruising and Injury-related hemorrhage is assumed to present itself at AMI with no visible symptom.

Post mortem

The mild case of bruising and Injury-related hemorrhage is assumed to present itself at PMI with serohemorragic infiltration involving one limited part of the carcass.

1) In the following table please indicate what are the probabilities for a bovine affected with bruising and injury-related hemorrhage, given age, to present:
    a. the typical form of the condition
    b. the mild form of the condition

    Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with bruising and injury-related hemorrhage can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Expert 3 made a mistake by switching its answer of typical and mild case, thus the old values are shaded and new one are in the green part. There still big differences among experts. We need to discuss this point.

Age	N° expert	Typical case			Mild case		
		Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	NI	NI	NI	NI	NI	NI
	2	30	**50**	70	30	**50**	70
	3	85	**90**	95	5	**10**	15
	4	2	**5**	10	90	**95**	98
New proposition	3	5	**10**	15	85	**90**	95
	4	20	**30**	50	40	**70**	90
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**
Young >6weeks	1	NI	NI	NI	NI	NI	NI
	2	30	**50**	70	30	**50**	70
	3	85	**90**	95	5	**10**	15
	4	2	**5**	10	90	**95**	98
New proposition	3	5	**10**	15	85	**90**	95
	4	20	**30**	50	40	**70**	90
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**
Young <6weeks	1	NI	NI	NI	NI	NI	NI
	2	30	**50**	70	30	**50**	70
	3	NI	NI	NI	NI	NI	NI
	4	2	**5**	10	90	**95**	98
New proposition	3	**NI**	**NI**	**NI**	**NI**	**NI**	**NI**
	4	5	**20**	40	60	**80**	90
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**

2) Consider a bovine with a typical form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

Expert 3 made a mistake by switching its answer of typical and mild case, thus the old values are shaded and new one are in the green part. There still big differences among experts even with the new propositions. We need to discuss this point.

Age	N° expert	Short transport			Long transport		
		Typical case			Typical case		
		Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	60	**90**	100	70	**95**	100
	2	30	**50**	70	40	**60**	80
	3	80	**90**	100	0	**10**	20
	4	0	**10**	20	0	**10**	20
New proposition	1	40	**80**	100	50	**80**	100
	3	80	**90**	100	80	**90**	100
	4	20	**40**	60	20	**40**	60
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**
Young >6weeks	1	60	**90**	100	70	**95**	100
	2	30	**50**	70	40	**60**	80
	3	80	**90**	100	0	**10**	20
	4	0	**10**	20	0	**10**	20
New proposition	1	40	**80**	100	50	**80**	100
	3	80	**90**	100	80	**90**	100
	4	20	**40**	60	20	**40**	60
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**
Young <6weeks	1	70	**90**	100	80	**95**	100
	2	30	**50**	70	40	**60**	80
	3	NI	NI	NI	NI	NI	NI
	4	0	**30**	20	0	**30**	20
New proposition	1	40	**80**	100	50	**80**	100
	3	NI	NI	NI	NI	NI	NI
	4	30	**60**	80	30	**60**	80
Final proposition		**to**	**find**	**during**	**the**	**conf**	**call**

3) Consider a bovine with a typical or mild form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

Age	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	70	**89**	100	39	**56**	71	73	**90**	100	41	**56**	71
Young >6weeks	70	**89**	100	39	**56**	71	73	**90**	100	41	**56**	71
Young <6weeks	70	**88**	100	52	**72**	88	73	**90**	100	55	**72**	88

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine with a typical or mild form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

Age	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	70	**90**	100	39	**56**	71	73	**91**	100	41	**56**	71
Young >6weeks	70	**90**	100	39	**56**	71	73	**91**	100	41	**56**	71
Young <6weeks	70	**89**	100	52	**72**	88	73	**91**	100	55	**72**	88

15. DFD meat (Dark, Firm, Dry meat)

Typical case

Ante mortem

Not relevant because it is impossible to detect at that stage of the meat inspection.

Post mortem

At post mortem inspection (PMI) a typical case of DFD meat is assumed to have darker and drier meat than normal affecting large muscles.

Mild case

Ante mortem

Not relevant because it is impossible to detect at that stage of the meat inspection.

Post mortem

At post mortem inspection (PMI) a mild case of DFD meat is assumed to have darker and/or drier meat than normal, affecting few and small muscles.

1) In the following table please indicate what are the probabilities for a bovine having a DFD meat, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine having DFD meat can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	**15**	30	73	**85**	96
Young >6weeks	1	**8**	17	83	**92**	99
Young <6weeks	1	**5**	10	90	**95**	99

2) The question is not relevant for ante-mortem inspection because it is impossible to detect DFD meat at that stage of the meat inspection

3) Consider a bovine affected by a typical or mild form of DFD meat presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	37	**57**	73	3	**18**	33	37	**57**	73	3	**18**	33
Young >6weeks	37	**57**	73	3	**18**	33	37	**57**	73	3	**18**	33
Young <6weeks	25	**45**	60	5	**18**	30	25	**45**	60	5	**18**	30

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine affected by a typical or mild form of DFD meat presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	37	**58**	75	3	**20**	35	37	**58**	75	3	**20**	35
Young >6weeks	37	**58**	75	3	**20**	35	37	**58**	75	3	**20**	35
Young <6weeks	17	**32**	42	3	**13**	22	17	**32**	42	3	**13**	22

16. Granuloma/ Bovine tuberculosis

Granuloma diseases bring together tuberculosis, lymph nodes lesions for actinobacillosis or tumors.

Typical case

Ante mortem

The typical case of granuloma is assumed to present itself with no visible symptom at ante mortem inspection

Post mortem

At post mortem inspection (PMI) a typical case of granuloma is assumed to present itself with granulomatous lesions in at least one of these locations: head, lungs, liver, intestine, carcass.

Mild case

Ante mortem

The mild case of granuloma is assumed to present itself at AMI with no visible symptom.

Post mortem

The mild case of granuloma is assumed to present itself at PMI with one granulomatous lesion in one of these locations: head, lungs, liver, intestine, carcass.

1) In the following table please indicate what are the probabilities for a bovine infected with granuloma, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	**8**	15	8	**22**	29	65	**72**	89
Young >6weeks	2	**8**	14	7	**25**	30	63	**70**	95
Young <6weeks	2	**10**	7	5	**23**	30	66	**75**	95

2) The question is not relevant for ante-mortem inspection because a typical or mild case of granuloma is assumed to present itself with no visible symptoms during ante-mortem inspection.

3) Consider a bovine infected with a typical or mild form of granuloma presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

Age	Low TB prevalence area						High TB prevalence area					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	55	**78**	90	28	**48**	63	65	**84**	94	48	**65**	85
Young >6weeks	55	**78**	90	28	**48**	63	65	**84**	94	48	**65**	85
Young <6weeks	47	**73**	83	27	**47**	67	60	**80**	90	37	**53**	80

1) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of granuloma presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

Taking into account the new proposition of experts 1,2,3 and keeping the first estimation of expert 4 make us able to suggest you a "final proposition" as mean of these new values. Discussion to agree or not on this final proposition

Age	N° expert	Low TB prevalence area						High TB prevalence area					
		Typical case			Mild case			Typical case			Mild case		
		Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	1	0	**20**	50	0	**5**	20	0	**30**	50	0	**5**	30
	2	80	**90**	100	20	**40**	60	80	**90**	100	20	**40**	60
	3	0	**10**	20	0	**0**	0	0	**10**	20	0	**0**	0
	4	20	**50**	60	15	**30**	50	30	**40**	70	20	**35**	50
New proposition	1	0	**40**	60	0	**20**	50	0	**50**	60	0	**20**	50
	2	20	**50**	60	15	**30**	50	30	**40**	70	20	**35**	50
	3		**50**			**30**			**40**			**30**	
Final proposition	**13**	**48**	**60**	**10**	**28**	**50**	**20**	**43**	**67**	**13**	**30**	**50**	**13**
Young >6weeks	1	0	**20**	50	0	**5**	20	0	**30**	50	0	**5**	30
	2	80	**90**	100	20	**40**	60	80	**90**	100	20	**40**	60
	3	0	**10**	20	0	**0**	0	0	**10**	20	0	**0**	0
	4	20	**50**	60	15	**30**	50	30	**40**	70	20	**35**	50
New proposition	1	0	**40**	60	0	**20**	50	0	**50**	60	0	**20**	50
	2	20	**50**	60	15	**30**	50	30	**40**	70	20	**35**	50
	3		**49**			**30**			**40**			**30**	
Final proposition	**13**	**47**	**60**	**10**	**28**	**50**	**20**	**43**	**67**	**13**	**30**	**50**	**13**
Young <6weeks	1	0	**20**	50	0	**5**	20	0	**30**	50	0	**5**	30
	2	80	**90**	100	20	**40**	60	80	**90**	100	20	**40**	60
	3	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	4	20	**50**	60	15	**30**	50	30	**40**	70	20	**35**	50
New proposition	1	0	**40**	60	0	**20**	50	0	**50**	60	0	**20**	50
	2	20	**50**	60	15	**30**	50	30	**40**	70	20	**35**	50
Final proposition	**13**	**47**	**60**	**10**	**27**	**50**	**20**	**43**	**67**	**13**	**30**	**50**	**13**

17. Pathological lesions in the heart

Definition includes pathological lesions in the heart of possible bacterial origin such as endocarditis or pericarditis.

Typical case

Ante mortem

The typical case of pathological lesions in the heart is assumed to present itself with slight breathlessness and hesitant behavior with reluctance to move at ante mortem inspection.

Post mortem

At post mortem inspection (PMI) a typical case of pathological lesions in the heart is assumed to present itself with fibrous pericardis.

Mild case

Ante mortem

The mild case of pathological lesions in the heart is assumed to present itself at AMI with no visible symptom.

Post mortem

The mild case of pathological lesions in the heart is assumed to present itself at PMI with exsudative pericarditis.

1- In the following table please indicate what are the probabilities for a bovine infected with pathological lesions in the heart, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease

   Obviously the sum of these two probabilities is 100%.

N.B.: A bovine infected with pathological lesions in the heart can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Taking into account the new proposition of experts 3 and keeping the first estimation of the other experts we are able to suggest you a "final proposition" as mean of these new values. Discussion to agree or not on this final proposition

Age	N° expert	Typical case			Mild case		
		Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	NI	NI	NI	NI	NI	NI
	2	0	**20**	40	60	**80**	100
	3	70	**80**	90	10	**20**	30
	4	10	**25**	35	65	**75**	90
New proposition	3		25			75	
Final proposition		**5**	**23**	**38**	**63**	**77**	**95**
Young >6weeks	1	NI	NI	NI	NI	NI	NI
	2	0	**20**	40	60	**80**	100
	3	70	**80**	90	10	**20**	30
	4	10	**25**	35	65	**75**	90
New proposition	3		25			75	
Final proposition		**5**	**23**	**38**	**63**	**77**	**95**
Young <6weeks	1	NI	NI	NI	NI	NI	NI
	2	0	**20**	40	60	**80**	100
	3	NI	NI	NI	NI	NI	NI
	4	5	**15**	25	75	**85**	95
New proposition							
Final proposition		**3**	**18**	**33**	**68**	**83**	**98**

1- Consider a bovine infected with a typical form of pathological lesions in the heart presented for slaughter: indicate in the following table what are the probabilities of detection at **ante-mortem inspection**, given age:

Age	Typical case		
	Min	**Most likely**	Max
Adult	0	**19**	35
Young >6weeks	0	**19**	35
Young <6weeks	2	**30**	50

2- Consider a bovine infected with a typical or mild form of pathological lesions in the heart presented for slaughter: indicate in the following table what are the probabilities of detection at **post-mortem inspection**, given age:

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	73	**86**	97	58	**73**	89
Young >6weeks	73	**89**	97	58	**75**	89
Young <6weeks	67	**85**	96	47	**67**	85

3- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of pathological lesions in the heart presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age*:*

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Min
Adult	73	**86**	97	58	**73**	89
Young >6weeks	73	**86**	97	58	**73**	89
Young <6weeks	67	**85**	96	47	**67**	85

Conclusions of the conference call

Date of conference call: 20th January 2012 from 11.45 to 13.35
Participants:

- Susanna STERNBERG LEWERIN
- Joop LENSINK
- Sami SUOMINEN
- Pascal HENDRIKX
- Céline DUPUY

Dr Demont can't be present but sent its comment to Céline DUPUY before the conference call.

This document presents you the conclusions of our conference call. Fill free to add comments (in red color) if you disagree with some conclusions or if you want to add information.

During the conference call, we discussed about the issue of "question 1)" because of difficulty to interpret this question and also because of difficulty to find answers even if there were no more difficulties to understand the question.

We reminded that all "question 1)" for each disease should be understood as the percentage of typical case/mild case/subclinical case among infected bovines. That means it's totally different from the prevalence of the disease. Thus the question is : among 100 **infected bovines** how many bovines will present a typical form/ mild form/ subclinical form of the disease.
We all agreed on the fact that even if the question was now well understood it was still difficult to answer it because of the lack of existing knowledge on the subject.

1. Necrobacillosis (liver, oral cavity): *Fusobacterium necrophorum*

Everybody agreed on these new definitions for typical and mild case:

Interdigital form is excluded from the definition

Typical case

Ante mortem

The typical case of necrobacillosis is assumed to present itself at ante-mortem inspection (AMI) with hypersalivation.

Post mortem

At PMI, the mild case of necrobacillosis is assumed to present itself with ulceration in the tongue and /or swollen cheek.

Mild case

Ante mortem

The mild case of necrobacillosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

At post mortem inspection (PMI) a typical case of necrobacillosis is assumed to present itself with liver abscesses.

1- In the following table please indicate what are the probabilities for a bovine infected with necrobacillosis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

Obviously the sum of these three probabilities is 100%.

We all agreed that experts were not enough "expert" on this specific disease to be able to give correct estimation. Thus we will ask to a specific expert of necrobacillosis to give us estimations.

2. Enzootic Bovine Leukosis

1) In the following table please indicate what are the probabilities for a bovine infected with enzootic bovine leukosis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

We agreed to take, as final value, the mean of the new propositions of expert 1 and 3 with the previous proposition of expert 2. The results are presented below.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	0	**1**	2	0	**3**	8	90	**96**	100
Young >6weeks	0	**1**	2	0	**3**	8	90	**96**	100
Young <6weeks	0	**1**	2	0	**3**	8	90	**96**	100

Comments:

3. Respiratory diseases

1) In the following table please indicate what are the probabilities for a bovine infected with respiratory diseases, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

We all agreed to calculate the final value as the mean of the new propositions of expert 1 and 2 and the previous proposition of expert 4. Expert 2 decided to modified the value for typical case for young<6 weeks from 30 to 60. The results are presented below.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	2	**10**	27	17	**30**	50	27	**60**	80
Young >6weeks	12	**30**	53	13	**37**	57	18	**33**	57
Young <6weeks	20	**50**	53	17	**27**	53	15	**23**	47

Comments:

4. Vesicular diseases

1) In the following table please indicate what are the probabilities for a bovine infected with vesicular diseases, given age, to present:
    a. the typical form of the disease
    b. the mild form of the disease
    c. No signs, i.e. a subclinical form of the disease

    Obviously the sum of these three probabilities is 100 %.

We agreed to take, as final value, the mean of the new propositions of expert 1 and 2. The results are presented below.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	20	**50**	90	5	**30**	60	5	**20**	55
Young >6weeks	20	**50**	90	5	**30**	60	5	**20**	55
Young <6weeks	20	**50**	90	5	**30**	60	5	**20**	55

Comments:

5. Ulcerative diseases

We already reached consensus on all points.

6. Echinococcosis/hydatidosis :*Echinococcus granulosus* - larva in liver, lungs

1) In the following table please indicate what are the probabilities for a bovine infected with hydatidosis, given age, to present:
    a. the typical form of the disease
    b. the mild form of the disease
    c. No signs, i.e. a subclinical form of the disease

    Obviously the sum of these three probabilities is 100 %.

We all agreed to delete the subclinical form of the disease but we will specify in the report that we didn't take into account the prepatent period of the disease to do the estimation.

We agreed on the fact that it was not relevant to consider the disease for bovine < 6 weeks because of the prepatent period of the disease: animals of this age category don't have time to develop the disease.

After discussion, we agreed on the values below.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	5	**10**	20	80	**90**	95
Young >6weeks	5	**10**	20	80	**90**	95
Young <6weeks	Not relevant					

Comments:

Comments

7. Taenia saginata :*Cysticercus bovis* - larva in muscle

1) In the following table please indicate what are the probabilities for a bovine infected with *Taenia saginata*, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100%.

We all agreed to delete the subclinical form of the disease but we will specify in the report that we didn't take into account the prepatent period of the disease to do the estimation.

We agreed on the fact that it was not relevant to consider the disease for bovine < 6 weeks because of the prepatent period of the disease: animals of this age category don't have time to develop the disease. Thus estimations on the detection of this infection for animals < 6 weeks will be deleted to take this point into account.

After discussion, we agreed on the values below.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	0	**20**	50	60	**80**	100
Young >6weeks	0	**20**	50	60	**80**	100
Young <6weeks	Not relevant					

Comments:

8. Trematodes – Fascioliasis :*Fasciola hepatica*

1- In the following table please indicate what are the probabilities for a bovine infected with fascioliasis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100%.

We agreed to take as final value the mean of the new propositions of expert 1; 2 and 4 and the previous value of expert 3 for adult and young > 6 weeks. We decided to propose new values based on consensus among experts for bovine < 6 weeks. The results are presented below.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most**	Max	Min	**Most**	Max	Min	**Most**	Max

		likely			likely			likely	
Adult	23	**40**	58	23	**45**	63	8	**15**	30
Young >6weeks	19	**35**	55	23	**45**	63	8	**20**	35
Young <6weeks	0	**1**	10	0	**1**	10	96	**98**	100

Comments:

9. Foot and leg disorder

2) Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and production type.

We agreed to calculate the final value based on the new estimation of expert 2 and previous estimations of the other experts. The results are presented below.

Age	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	40	**57**	68	13	**27**	40	37	**55**	67	13	**27**	40
Young >6weeks	40	**58**	70	13	**30**	43	37	**55**	67	13	**27**	40
Young <6weeks	25	**45**	58	13	**23**	35	25	**45**	58	13	**23**	35

Comments:

10. Low body condition score: thin body

We already reached consensus on all points.

11. Fractured limb

2) Consider a bovine affected with a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

We agreed on the proposition of final value that was made in the support document of the conference call. You can see the results below.

	Short transport			Long transport		
Age	Typical case			Typical case		
	Min	Most likely	Max	Min	Most likely	Max
Adult	70	**89**	95	70	**89**	95
Young >6weeks	73	**86**	95	75	**89**	95
Young <6weeks	70	**87**	97	73	**87**	97

Comments:

12. Cleanliness score

We already reached consensus on all points.

13. Integument alterations

2) Consider a bovine with a typical or mild form of integument alterations presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and production type.

We agreed to calculate the final value based on the new estimations of experts 1; 2 and 4 and previous estimations of expert 3 for the mild case and to have 60% for typical case. The results are presented below.

	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	45	**60**	80	1	**18**	35	45	**60**	80	1	**15**	33
Young >6weeks	45	**60**	80	1	**18**	35	45	**60**	80	1	**15**	33
Young <6weeks	45	**60**	80	1	**18**	35	45	**60**	80	1	**15**	33

Comments:

14. Bruising and Injury-related hemorrhage (related to transport)

1) In the following table please indicate what are the probabilities for a bovine affected with bruising and injury-related hemorrhage, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with bruising and injury-related hemorrhage can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

After discussion, we agreed on the following values

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	5	**10**	15	85	**90**	95
Young >6weeks	5	**10**	15	85	**90**	95
Young <6weeks	2	**5**	10	90	**95**	98

Comments:

2) Consider a bovine with a typical form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

After discussion we agreed to keep 80% as the final value. The results are presented bellow

Age	Short transport			Long transport		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	50	**80**	100	50	**80**	100
Young >6weeks	50	**80**	100	50	**80**	100
Young <6weeks	50	**80**	100	50	**80**	100

Comments:

15. DFD meat (Dark, Firm, Dry meat)

We already reached consensus on all points.

16. Granuloma/ Bovine tuberculosis

4) We now suppose that only visual inspection is performed for post mortem inspection. Consider a bovine infected with a typical or mild form of granuloma presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

After discussion we agreed on the following values

	Low TB prevalence area						High TB prevalence area					
Age	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	0	**20**	50	0	**5**	20	0	**30**	50	0	**5**	30
Young >6weeks	0	**20**	50	0	**5**	20	0	**30**	50	0	**5**	30
Young <6weeks	0	**20**	50	0	**5**	20	0	**30**	50	0	**5**	30

Comments:

17. Pathological lesions in the heart

1- In the following table please indicate what are the probabilities for a bovine infected with pathological lesions in the heart, given age, to present:

a. the typical form of the disease
b. the mild form of the disease

Obviously the sum of these two probabilities is 100%.

N.B.: A bovine infected with pathological lesions in the heart can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

We agreed on the proposition of final value that was made in the support document of the conference call. You can see the results below

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	5	**23**	38	63	**77**	95
Young >6weeks	5	**23**	38	63	**77**	95
Young <6weeks	3	**18**	33	68	**83**	98

Comments:

APPENDIX 4 – INPUT STAGE 2 AND STAGE 3 MODELS

4 A: Data from expert elicitation on probability of detection

4 B:Other data needed and not elicited from experts recruited

Appendix-4A: Results of questionnaire on detection of bovine diseases at meat inspection

1. Necrobacillosis (liver, oral cavity): *Fusobacterium necrophorum*

Interdigital form is excluded from the definition

Typical case

Ante mortem

The typical case of necrobacillosis is assumed to present itself at ante-mortem inspection (AMI) with hypersalivation.

Post mortem

At PMI, the mild case of necrobacillosis is assumed to present itself with ulceration in the tongue and /or swollen cheek.

Mild case

Ante mortem

The mild case of necrobacillosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

At post mortem inspection (PMI) a typical case of necrobacillosis is assumed to present itself with liver abscesses.

1- In the following table please indicate what are the probabilities for a bovine infected with necrobacillosis, given age, to present:

a. the typical form of the disease
b. the mild form of the disease
c. No signs, i.e. a subclinical form of the disease

Obviously the sum of these three probabilities is 100%.

NOTE: This information could not be obtained from the experts. Instead it was decided to use the % of typical cases as provided for eliciting case definitions, i.e. 60% as the most likely value. The minimum and maximum values of the distribution were set to 0 and 100.

2- Consider a bovine infected with a typical or mild form of necrobacillosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**28**	**53**	**73**	**73**	**90**	**98**
Young >6weeks	**18**	**37**	**50**	**73**	**90**	**98**
Young <6weeks	**28**	**55**	**75**	**70**	**85**	**98**

3- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of necrobacillosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**22**	**43**	**60**	**70**	**87**	**95**
Young >6weeks	**12**	**27**	**37**	**70**	**87**	**95**
Young <6weeks	**18**	**40**	**55**	**65**	**80**	**93**

2. Enzootic Bovine Leukosis

Typical case

Ante mortem

The typical case of enzootic bovine leukosis is assumed to present itself with enlarged superficial lymph nodes (mandibular, scapular or pre-crural).

Post mortem

At post mortem inspection (PMI) a typical case of enzootic bovine leukosis is assumed to present itself with superficial lymph nodes enlarged and / or abdominal-pelvic cavity lymph nodes enlarged.

Mild case

Ante mortem

The mild case of enzootic bovine leukosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

At PMI, the mild case of enzootic bovine leukosis is assumed to present itself with a limited number of superficial lymph nodes enlarged.

1) In the following table please indicate what are the probabilities for a bovine infected with enzootic bovine leukosis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	0	**1**	2	0	**3**	8	90	**96**	100
Young >6weeks	0	**1**	2	0	**3**	8	90	**96**	100
Young <6weeks	0	**1**	2	0	**3**	8	90	**96**	100

2) Consider a bovine infected with a typical form of enzootic bovine leukosis presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and region (with respect to risk of introduction of the disease). The question is not relevant for mild case because it assumed to present itself with no visible symptom during ante-mortem inspection.

Age	Region with low risk of introduction of EBL/free since long			Region with high risk of introduction of EBL /recently free		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**15**	**35**	**53**	**18**	**45**	**68**
Young >6weeks	**15**	**30**	**48**	**18**	**38**	**55**
Young <6weeks	**0**	**10**	**25**	**5**	**15**	**30**

3) Consider a bovine infected with a typical or mild form of enzootic bovine leukosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with respect to risk of introduction of the disease).

Age	Region with low risk of introduction of EBL/free since long						Region with high risk of introduction of EBL /recently free					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**48**	**78**	**90**	**9**	**30**	**60**	**48**	**83**	**94**	**14**	**45**	**80**
Young >6weeks	**40**	**68**	**84**	**5**	**28**	**55**	**45**	**73**	**87**	**5**	**38**	**69**
Young <6weeks	**15**	**45**	**70**	**5**	**20**	**35**	**20**	**55**	**75**	**5**	**25**	**45**

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of enzootic bovine leukosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with respect to risk of introduction of the disease).

Age	Region with low risk of introduction of EBL/free since long						Region with high risk of introduction of EBL /recently free					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	**43**	**65**	**75**	**8**	**28**	**53**	**48**	**73**	**83**	**13**	**38**	**68**
Young >6weeks	**28**	**55**	**73**	**3**	**23**	**50**	**30**	**63**	**78**	**3**	**30**	**58**
Young <6weeks	**15**	**45**	**70**	**5**	**20**	**35**	**20**	**55**	**75**	**5**	**25**	**45**

3. Respiratory diseases

The respiratory diseases bring together transport fever (Histophilus somni = Haemophilus somnus, Mannheimia haemolytica) and other causes of pneumonia and associated pleuritis

Typical case

Ante mortem

The typical case of respiratory diseases is assumed to present itself at ante-mortem inspection (AMI) with mucopurulent nasal discharge and rapid respiration.

Post mortem

At post mortem inspection (PMI) a typical case of respiratory diseases is assumed to present itself with fibrinous or fibrosis pleuritis associated with fibrinous or fibrosis pneumonia and abscesses more or less voluminous in lung.

Mild case

Ante mortem

The mild case of respiratory diseases is assumed to present itself at AMI with minor respiratory difficulties.

Post mortem

At PMI, the mild case of respiratory diseases is assumed to present itself with fibrinous bronchopneumonia.

1) In the following table please indicate what are the probabilities for a bovine infected with respiratory diseases, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	2	**10**	27	17	**30**	50	27	**60**	80
Young >6weeks	12	**30**	53	13	**37**	57	18	**33**	57
Young <6weeks	20	**50**	53	17	**27**	53	15	**23**	47

2) Consider a bovine infected with a typical or mild form of respiratory diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and risk area.

Age	Low prevalence area of immunosuppressive infection (e.g. BVDV)						High prevalence area of immunosuppressive infection (e.g. BVDV)					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	29	**44**	58	0	**9**	20	30	**46**	59	0	**9**	20
Young >6weeks	35	**53**	68	0	**13**	25	38	**55**	68	0	**13**	25
Young <6weeks	43	**57**	72	3	**15**	23	45	**60**	72	3	**15**	23

3) Consider a bovine infected with a typical or mild form of respiratory diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and risk area.

Age	Low prevalence area of immunosuppressive infection (e.g. BVDV)						High prevalence area of immunosuppressive infection (e.g. BVDV)					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**70**	**85**	**96**	**41**	**60**	**83**	**70**	**85**	**96**	**41**	**63**	**83**
Young >6weeks	**75**	**89**	**96**	**45**	**68**	**88**	**75**	**89**	**96**	**45**	**70**	**88**
Young <6weeks	**73**	**88**	**95**	**37**	**63**	**85**	**73**	**88**	**95**	**37**	**67**	**85**

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of respiratory diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and risk area.

Age	Low prevalence area of immunosuppressive infection (e.g. BVDV)						High prevalence area of immunosuppressive infection (e.g. BVDV)					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	46	**65**	81	25	**40**	56	46	**65**	81	25	**40**	56
Young >6weeks	50	**70**	84	28	**48**	63	50	**70**	84	28	**48**	63
Young <6weeks	53	**77**	92	20	**47**	63	53	**77**	92	20	**47**	63

4. Vesicular diseases

The vesicular diseases bring together foot and mouth disease and vesicular stomatitis.

Typical case

Ante mortem

The typical case of vesicular diseases is assumed to present itself at ante-mortem inspection (AMI) with vesicles on nostrils or muzzle, a hypersalivation and reluctance to rise or stamping/shaking the feet.

Post mortem

At post mortem inspection (PMI) a typical case of vesicular diseases is assumed to present itself with at least one fluid-filled vesicles or bullae on muzzle and gums, feet or on pillars of the rumen associated with red eroded areas or ulcers (vesicle rupture).

Mild case

Ante mortem

The mild case of vesicular diseases is assumed to present itself at AMI with hypersalivation or trample.

Post mortem

At PMI, the mild case of vesicular diseases is assumed to present itself with single fluid-filled vesicles on muzzle or gums.

1) In the following table please indicate what are the probabilities for a bovine infected with vesicular diseases, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	20	**50**	90	5	**30**	60	5	**20**	55
Young >6weeks	20	**50**	90	5	**30**	60	5	**20**	55
Young <6weeks	20	**50**	90	5	**30**	60	5	**20**	55

2) Consider a bovine infected with a typical or mild form of vesicular diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and herd-level risk in terms of the frequency of contacts.

Age	Low frequency of contacts						High frequency of contacts					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	50	**68**	86	30	**50**	71	58	**73**	92	33	**58**	79
Young >6weeks	50	**68**	86	30	**50**	71	58	**73**	92	33	**58**	79
Young <6weeks	53	**70**	88	27	**47**	68	63	**77**	96	30	**57**	78

3) Consider a bovine infected with a typical or mild form of vesicular diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and herd-level risk in terms of the frequency of contacts.

Age	Low frequency of contacts						High frequency of contacts					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	58	**78**	92	35	**58**	74	63	**79**	94	43	**65**	83
Young >6weeks	58	**78**	92	35	**58**	74	63	**79**	94	43	**65**	83
Young <6weeks	63	**83**	96	33	**57**	72	70	**85**	98	43	**67**	83

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of vesicular diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and herd-level risk in terms of the frequency of contacts.

Age	Low frequency of contacts						High frequency of contacts					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	55	**75**	90	35	**55**	73	58	**76**	91	40	**63**	78
Young >6weeks	55	**75**	90	35	**55**	73	58	**76**	91	40	**63**	78
Young <6weeks	60	**80**	93	33	**53**	70	63	**82**	95	40	**63**	77

5. Ulcerative diseases

The ulcerative diseases bring together Malignant catarrhal fever and Blue tongue.

Typical case

Ante mortem

The typical case of ulcerative diseases is assumed to present itself at ante-mortem inspection (AMI) with ulcers of the nose associated with hypersalivation.

Post mortem

At post mortem inspection (PMI) a typical case of ulcerative diseases is assumed to present itself with multifocal hemorrhages on the lip and dental pad associated with ulcers of oesophagus and/or rumen and/or mouth and/or nose.

Mild case

Ante mortem

The mild case of ulcerative diseases is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of ulcerative diseases is assumed to present itself at PMI with a limited number of ulcers whatever the location.

1) In the following table please indicate what are the probabilities for a bovine infected with ulcerative diseases, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**0**	**7**	**21**	**2**	**12**	**27**	**65**	**81**	**97**
Young >6weeks	**0**	**9**	**25**	**2**	**12**	**27**	**65**	**79**	**95**
Young <6weeks	**0**	**7**	**18**	**2**	**8**	**20**	**45**	**51**	**60**

2) Consider a bovine infected with a typical form of ulcerative diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and region (with regards to risk of introduction of bluetongue).

Age	Region with low risk of introduction of Bluetongue			Region with high risk of introduction of Bluetongue		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	21	**45**	63	45	**73**	93
Young >6weeks	21	**45**	65	45	**73**	93
Young <6weeks	28	**53**	73	40	**70**	90

3) Consider a bovine infected with a typical or mild form of ulcerative diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with regards to risk of introduction of bluetongue).

Age	Region with low risk of introduction of Bluetongue						Region with high risk of introduction of Bluetongue					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	**30**	**50**	**60**	**8**	**28**	**41**	**40**	**58**	**69**	**10**	**33**	**45**
Young >6weeks	**30**	**50**	**60**	**8**	**28**	**41**	**40**	**58**	**69**	**10**	**33**	**45**
Young <6weeks	**40**	**67**	**80**	**10**	**37**	**55**	**53**	**77**	**92**	**13**	**43**	**60**

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of ulcerative diseases presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and region (with regards to risk of introduction of bluetongue).

	Region with low risk of introduction of Bluetongue						**Region with high risk of introduction of Bluetongue**					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	25	**48**	58	8	**23**	35	35	**54**	65	10	**28**	38
Young >6weeks	25	**48**	58	8	**23**	35	35	**54**	65	10	**28**	38
Young <6weeks	25	**48**	58	8	**23**	35	35	**54**	65	10	**28**	38

6. Echinococcosis/hydatidosis :*Echinococcus granulosus* - larva in liver, lungs

Typical case

Ante mortem

The typical case of hydatidosis is assumed to present no visible symptom at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of hydatidosis is assumed to present itself with a limited number of *cysts* of different sizes and shapes which contain a clear fluid under pressure in liver and / or lungs.

Mild case

Ante mortem

The mild case of echinococcosis is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of echinococcosis is assumed to present itself at PMI with one small cyst in the liver or lungs that contains a clear fluid under pressure.

1) In the following table please indicate what are the probabilities for a bovine infected with hydatidosis, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

It was decided to delete the subclinical form of the disease. It was decided to consider as not relevant the disease for bovine < 6 weeks because of the prepatent period of the disease: animals of this age category don't have time to develop the disease.

These estimations didn't take into account the prepatent period of the disease.

Age	**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	5	**10**	20	80	**90**	95
Young >6weeks	5	**10**	20	80	**90**	95
Young <6weeks	Not relevant					

2) The question is not relevant for ante-mortem inspection because the typical and mild case definition of hydatidosis is assumed to present itself with no visible symptoms.

3) Consider a bovine infected with a typical or mild form of hydatidosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

Experts agreed on the fact that calves <6 weeks are too young for lesions to have time to develop then for this age category there is only subclinical form and no typical or mild form thus detection of typical or mild cases for young < 6 weeks is not relevant.

	Low prevalence area						High prevalence area					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	55	**78**	94	20	**40**	60	58	**80**	95	30	**53**	73
Young >6weeks	55	**75**	89	18	**40**	58	58	**78**	90	28	**53**	70
Young <6weeks	Not relevant						Not relevant					

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of hydatidosis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

Experts agreed on the fact that calves <6 weeks are too young for lesions to have time to develop then for this age category there is only subclinical form and no typical or mild form thus detection of typical or mild cases for young < 6 weeks is not relevant.

	Low prevalence area						High prevalence area					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	40	**70**	81	8	**28**	43	43	**71**	83	15	**35**	50
Young >6weeks	38	**68**	79	8	**28**	43	40	**69**	80	15	**35**	47
Young <6weeks	Not relevant						Not relevant					

7. Taenia saginata :*Cysticercus bovis* - larva in muscle

Typical case

Ante mortem

The typical case of *Taenia saginata* is assumed to present no visible symptom at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of *Taenia saginata* is assumed to present itself with either clear transparent bladders full of opaque pearl like liquid or degeneration, caseation and calcification lesions.

Mild case

Ante mortem

The mild case of *Taenia saginata* is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of *Taenia saginata* is assumed to present itself at PMI with a limited number of small white lesions in focused areas of muscle tissues.

1) In the following table please indicate what are the probabilities for a bovine infected with *Taenia saginata*, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100%.

It was decided to delete the subclinical form of the disease. It was decided to consider as not relevant the disease for bovine < 6 weeks because of the prepatent period of the disease: animals of this age category don't have time to develop the disease. Thus estimations on the detection of this infection for animals < 6 weeks will be deleted to take this point into account.
These estimations didn't take into account the prepatent period of the disease.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	0	**20**	50	60	**80**	100
Young >6weeks	0	**20**	50	60	**80**	100
Young <6weeks	Not relevant					

2- The question is not relevant for ante-mortem inspection because the typical and mild case definition of *Taenia saginata* is assumed to present itself with no visible symptoms.

3- Consider a bovine infected with a typical or mild form of *Taenia saginata* presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	40	**58**	79	13	**28**	48

Young >6weeks	40	**58**	79	13	**28**	48
Young <6weeks	40	**60**	85	10	**27**	53

4- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of *Taenia saginata* presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age.

Age	**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	13	**23**	36	0	**4**	11
Young >6weeks	13	**23**	36	0	**4**	11
Young <6weeks	13	**20**	31	0	**4**	10

8. Trematodes – Fascioliasis :*Fasciola hepatica*

Typical case

Ante mortem

The typical case of fascioliasis is assumed to present no visible symptom at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of fascioliasis is assumed to present itself with black parasitic debris or entire fluke in the liver and enlarged/thickened ducts.

Mild case

Ante mortem

The mild case of Fasciolasis is assumed to present itself at AMI with no visible symptoms.

Post mortem

The mild case of Fasciolasis is assumed to present itself at PMI with enlarged/thickened ducts.

1- In the following table please indicate what are the probabilities for a bovine infected with fascioliasis, given age, to present:

a. the typical form of the disease
b. the mild form of the disease
c. No signs, i.e. a subclinical form of the disease

Obviously the sum of these three probabilities is 100%.

Age	**Typical case**			**Mild case**			**No sign (subclinical)**		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	23	**40**	58	23	**45**	63	8	**15**	30
Young >6weeks	19	**35**	55	23	**45**	63	8	**20**	35
Young <6weeks	0	**1**	10	0	**1**	10	96	**98**	100

2- The question is not relevant for ante-mortem inspection because the typical and mild case definition of fascioliasis is assumed to present itself with no visible symptoms.

3- Consider a bovine infected with a typical or mild form of fascioliasis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

Age	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	53	**75**	90	40	**55**	75	58	**80**	92	43	**65**	80
Young >6weeks	53	**75**	90	40	**55**	75	58	**80**	92	43	**65**	80
Young <6weeks	30	**53**	63	15	**30**	45	33	**55**	65	18	**38**	48

4- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of fascioliasis presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

Age	Low prevalence area						High prevalence area					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	33	**58**	73	25	**34**	45	35	**65**	80	28	**45**	55
Young >6weeks	33	**58**	73	25	**34**	45	35	**65**	80	28	**45**	55
Young <6weeks	17	**43**	57	7	**14**	25	20	**50**	63	10	**27**	37

9. Foot and leg disorder

The definition includes foot and leg disorder linked to trouble in housing system but excluding fractured limbs.

Typical case

Ante mortem

The typical case of foot and leg disorder is assumed to present itself with a minor lameness at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of foot and leg disorder is assumed to present itself with amyotrophy associated with arthritis and/or arthrosis.

Mild case

Ante mortem

The mild case of foot and leg disorders is assumed to present itself at AMI with a more hesitant and natural walk with eventually one or more foot on which the animal can't put all his weight.

Post mortem

The mild case of foot and leg disorders is assumed to present itself at PMI with bursitis of knee and/or hock associated with enlarged lymph nodes.

1) In the following table please indicate what are the probabilities for a bovine affected with foot and leg disorder, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with foot and leg disorder can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	20	**33**	47	53	**67**	80
Young >6weeks	30	**43**	57	43	**57**	70
Young <6weeks	25	**40**	55	45	**60**	75

2) Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and production type.

Age	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	40	**57**	68	13	**27**	40	37	**55**	67	13	**27**	40
Young >6weeks	40	**58**	70	13	**30**	43	37	**55**	67	13	**27**	40
Young <6weeks	25	**45**	58	13	**23**	35	25	**45**	58	13	**23**	35

3) Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and production type.

Age	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	47	**67**	80	23	**43**	63	47	**67**	80	23	**40**	63
Young >6weeks	47	**67**	80	23	**43**	63	47	**67**	80	23	**40**	63
Young <6weeks	30	**55**	70	20	**40**	60	30	**55**	70	20	**35**	60

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine affected by a typical or mild form of foot and leg disorder presented for slaughter: indicate in the following table what are the probabilities of detection at **post - mortem inspection**, given age and production type.

Age	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	47	**67**	80	23	**43**	63	47	**67**	80	23	**40**	63
Young >6weeks	47	**67**	80	23	**43**	63	47	**67**	80	23	**40**	63
Young <6weeks	30	**55**	70	20	**40**	60	30	**55**	70	20	**35**	60

10. Low body condition score: thin body

Typical case

Ante mortem

The typical case of low body condition score is an emaciated animal presenting an extreme thinness at ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of low body condition score is assumed to present a carcass abnormally lean with little body fat.

Mild case

Not relevant.

1) A bovine with a low body condition score can't present no signs or a subclinical form of the condition and in addition a mild case is also not relevant, thus the question 1) is not relevant for this condition.

2) Consider a bovine being a typical case of low body condition score presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	46	**59**	71	56	**68**	74
Young >6weeks	45	**58**	68	55	**66**	73
Young <6weeks	40	**57**	70	40	**53**	63

3) Consider a bovine being a typical case of low body condition score presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	74	**85**	91	76	**88**	94
Young >6weeks	74	**85**	91	76	**88**	94
Young <6weeks	62	**73**	82	62	**73**	82

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine being a typical case of low body condition score presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and production type.

Age	Production type: Dairy			Production type: Beef		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	71	**84**	93	74	**86**	95
Young >6weeks	71	**84**	93	74	**86**	95
Young <6weeks	60	**72**	85	60	**72**	85

11. Fractured limb

Typical case

Ante mortem

The typical case of fractured limb during ante mortem inspection is an adult cow which can't get off the ground or a calf with severe lameness.

Post mortem

At post mortem inspection (PMI) a typical case of fractured limb is assumed to present itself with a fracture of one bone of the limb and serohemorrhagic infiltration of all tissues around the broken bone.

Mild case

Not relevant.

1) A bovine with fractured limb can't present no signs or a subclinical form of the condition and in addition a mild case is also not relevant, thus the question 1) is not relevant for this condition.

2) Consider a bovine affected with a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

Age	Short transport			Long transport		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	70	**89**	95	70	**89**	95
Young >6weeks	73	**86**	95	75	**89**	95
Young <6weeks	70	**87**	97	73	**87**	97

3) Consider a bovine affected by a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

Age	Short transport			Long transport		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	93	**96**	100	93	**96**	100
Young >6weeks	93	**96**	100	93	**96**	100
Young <6weeks	90	**95**	100	90	**95**	100

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine affected by a typical form of fractured limb presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which the animal arrived at the abattoir.

Age	Short transport			Long transport		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max

Adult	91	**96**	100	91	**96**	100
Young >6weeks	91	**96**	100	91	**96**	100
Young <6weeks	88	**94**	100	88	**94**	100

12. Cleanliness score

If we suppose a codification of cleanliness score from 0 to 4, we consider in the definition only bovine having a cleanliness score of 3 or 4.

Typical case

Ante mortem

The typical case of bad cleanliness score is assumed to present itself with an extremely heavily soiled with dried manure and/or manure armour in critical areas[1] at ante mortem inspection.

Post mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

Mild case

Not relevant.

1) A bovine with a bad cleanliness score can't present no signs or a subclinical form of the condition and in addition a mild case is also not relevant, thus the question 1) is not relevant for this condition.

2) Consider a bovine affected with a bad cleanliness score presented for slaughter: indicate in the following table what are the probabilities of detection at **ante -mortem inspection**, given age and production type.

	Production type: Dairy			**Production type: Beef**		
Age	**Typical case**			**Typical case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	75	**88**	99	73	**83**	98
Young >6weeks	75	**88**	99	73	**83**	98
Young <6weeks	70	**83**	100	70	**83**	100

3) The question is not relevant for post mortem inspection because there is no inspection of the skin during post-mortem inspection.

4) The question is not relevant for visual inspection scenario because there is no inspection of the skin during post-mortem inspection.

[1] Critical areas= under surface/mid line of abdomen; under surface of chest; hook and Achilles tendon; under surface of neck; udder and genitalia; area around the anus, including rear part of udder

13. Integument alterations

Typical case

Ante mortem

The typical case of integument alterations is assumed to present itself with a lot of injuries/wounds or bedsores due to insufficient bedding and other housing problems at ante mortem inspection.

Post mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

Mild case

Ante mortem

The mild case of integument alterations is assumed to present itself at AMI with a limited number of minor injuries/wounds occurring at head, neck or hindquarters-near the tail.

Post mortem

Not relevant because there is no inspection of the skin during post-mortem inspection.

1) In the following table please indicate what are the probabilities for a bovine with integument alterations, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with integument alterations can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	30	**42**	53	47	**58**	68
Young >6weeks	35	**47**	58	42	**53**	63
Young <6weeks	15	**30**	45	55	**70**	83

2) Consider a bovine with a typical or mild form of integument alterations presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and production type.

	Production type: Dairy						Production type: Beef					
	Typical case			Mild case			Typical case			Mild case		
Age	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	45	**63**	78	1	**18**	35	45	**63**	78	1	**15**	33
Young >6weeks	45	**63**	78	1	**18**	35	45	**63**	78	1	**15**	33
Young <6weeks	33	**53**	70	2	**23**	40	33	**53**	70	2	**23**	40

3) The question is not relevant for post mortem inspection because there is no inspection of the skin during post-mortem inspection.

4) The question is not relevant for visual inspection scenario because there is no inspection of the skin during post-mortem inspection.

14. Bruising and Injury-related hemorrhage (related to transport)

Typical case

Ante mortem

The typical case of bruising and injury-related hemorrhage is assumed to present itself with a lot of fresh bleeding wounds during ante-mortem inspection (AMI).

Post mortem

At post mortem inspection (PMI) a typical case of bruising and injury-related hemorrhage is assumed to present itself with large serohemorragic infiltration involving carcass portions.

Mild case

Ante mortem

The mild case of bruising and Injury-related hemorrhage is assumed to present itself at AMI with no visible symptom.

Post mortem

The mild case of bruising and Injury-related hemorrhage is assumed to present itself at PMI with serohemorragic infiltration involving one limited part of the carcass.

1) In the following table please indicate what are the probabilities for a bovine affected with bruising and injury-related hemorrhage, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine affected with bruising and injury-related hemorrhage can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	5	**10**	15	85	**90**	95
Young >6weeks	5	**10**	15	85	**90**	95
Young <6weeks	2	**5**	10	90	**95**	98

2) Consider a bovine with a typical form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **ante - mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

Age	Short transport			Long transport		
	Typical case			Typical case		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	50	**80**	100	50	**80**	100
Young >6weeks	50	**80**	100	50	**80**	100
Young <6weeks	50	**80**	100	50	**80**	100

3) Consider a bovine with a typical or mild form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

Age	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	70	**89**	100	39	**56**	71	73	**90**	100	41	**56**	71
Young >6weeks	70	**89**	100	39	**56**	71	73	**90**	100	41	**56**	71
Young <6weeks	70	**88**	100	52	**72**	88	73	**90**	100	55	**72**	88

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine with a typical or mild form of bruising and injury-related hemorrhage presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

Age	Short transport						Long transport					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	70	**90**	100	39	**56**	71	73	**91**	100	41	**56**	71
Young >6weeks	70	**90**	100	39	**56**	71	73	**91**	100	41	**56**	71
Young <6weeks	70	**89**	100	52	**72**	88	73	**91**	100	55	**72**	88

15. DFD meat (Dark, Firm, Dry meat)

Typical case

Ante mortem

Not relevant because it is impossible to detect at that stage of the meat inspection.

Post mortem

At post mortem inspection (PMI) a typical case of DFD meat is assumed to have darker and drier meat than normal affecting large muscles.

Mild case

Ante mortem

Not relevant because it is impossible to detect at that stage of the meat inspection.

Post mortem

At post mortem inspection (PMI) a mild case of DFD meat is assumed to have darker and/or drier meat than normal, affecting few and small muscles.

1) In the following table please indicate what are the probabilities for a bovine having a DFD meat, given age, to present:
   a. the typical form of the condition
   b. the mild form of the condition

   Obviously the sum of these two probabilities is 100 %.

N.B.: A bovine having DFD meat can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case

Age	Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max

Adult	1	**15**	30	73	**85**	96
Young >6weeks	1	**8**	17	83	**92**	99
Young <6weeks	1	**5**	10	90	**95**	99

2) The question is not relevant for ante-mortem inspection because it is impossible to detect DFD meat at that stage of the meat inspection

3) Consider a bovine affected by a typical or mild form of DFD meat presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

	Short transport						**Long transport**					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	37	**57**	73	3	**18**	33	37	**57**	73	3	**18**	33
Young >6weeks	37	**57**	73	3	**18**	33	37	**57**	73	3	**18**	33
Young <6weeks	25	**45**	60	5	**18**	30	25	**45**	60	5	**18**	30

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine affected by a typical or mild form of DFD meat presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and duration of the transport by which animal arrived at the abattoir.

	Short transport						**Long transport**					
Age	**Typical case**			**Mild case**			**Typical case**			**Mild case**		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	37	**58**	75	3	**20**	35	37	**58**	75	3	**20**	35
Young >6weeks	37	**58**	75	3	**20**	35	37	**58**	75	3	**20**	35
Young <6weeks	17	**32**	42	3	**13**	22	17	**32**	42	3	**13**	22

16. Granuloma/ Bovine tuberculosis

Granuloma diseases bring together tuberculosis, lymph nodes lesions for actinobacillosis or tumors.

Typical case

Ante mortem

The typical case of granuloma is assumed to present itself with no visible symptom at ante mortem inspection

Post mortem

At post mortem inspection (PMI) a typical case of granuloma is assumed to present itself with granulomatous lesions in at least one of these locations: head, lungs, liver, intestine, carcass.

Mild case

Ante mortem

The mild case of granuloma is assumed to present itself at AMI with no visible symptom.

Post mortem

The mild case of granuloma is assumed to present itself at PMI with one granulomatous lesion in one of these locations: head, lungs, liver, intestine, carcass.

1) In the following table please indicate what are the probabilities for a bovine infected with granuloma, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease
   c. No signs, i.e. a subclinical form of the disease

   Obviously the sum of these three probabilities is 100 %.

Age	Typical case			Mild case			No sign (subclinical)		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	1	**8**	15	8	**20**	29	65	**72**	89
Young >6weeks	2	**7.5**	14	7	**22.5**	30	63	**70**	95
Young <6weeks	2	**10**	7	5	**23**	30	66	**75**	95

2) The question is not relevant for ante-mortem inspection because a typical or mild case of granuloma is assumed to present itself with no visible symptoms during ante-mortem inspection.

3) Consider a bovine infected with a typical or mild form of granuloma presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

	Low TB prevalence area						High TB prevalence area					
Age	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	55	**78**	90	28	**48**	63	65	**84**	94	48	**65**	85
Young >6weeks	55	**78**	90	28	**48**	63	65	**84**	94	48	**65**	85
Young <6weeks	47	**73**	83	27	**47**	67	60	**80**	90	37	**53**	80

4) **We now suppose that only visual inspection is performed for post mortem inspection**. Consider a bovine infected with a typical or mild form of granuloma presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age and risk area.

	Low TB prevalence area						High TB prevalence area					
Age	Typical case			Mild case			Typical case			Mild case		
	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	0	**20**	50	0	**5**	20	0	**30**	50	0	**5**	30
Young >6weeks	0	**20**	50	0	**5**	20	0	**30**	50	0	**5**	30
Young <6weeks	0	**20**	50	0	**5**	20	0	**30**	50	0	**5**	30

17. Pathological lesions in the heart

Definition includes pathological lesions in the heart of possible bacterial origin such as endocarditis or pericarditis.

Typical case

Ante mortem

The typical case of pathological lesions in the heart is assumed to present itself with slight breathlessness and hesitant behavior with reluctance to move at ante mortem inspection.

Post mortem

At post mortem inspection (PMI) a typical case of pathological lesions in the heart is assumed to present itself with fibrous pericardis.

Mild case

Ante mortem

The mild case of pathological lesions in the heart is assumed to present itself at AMI with no visible symptom.

Post mortem

The mild case of pathological lesions in the heart is assumed to present itself at PMI with exsudative pericarditis.

1- In the following table please indicate what are the probabilities for a bovine infected with pathological lesions in the heart, given age, to present:
   a. the typical form of the disease
   b. the mild form of the disease

   Obviously the sum of these two probabilities is 100%.

N.B.: A bovine infected with pathological lesions in the heart can't present no signs or a subclinical form of the condition, thus the question 1) contains only two possibilities: typical or mild case.

Age	**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	5	**23**	38	63	**77**	95
Young >6weeks	5	**23**	38	63	**77**	95
Young <6weeks	3	**18**	33	68	**83**	98

2- Consider a bovine infected with a typical form of pathological lesions in the heart presented for slaughter: indicate in the following table what are the probabilities of detection at **ante-mortem inspection**, given age:

Age	**Typical case**		
	Min	**Most likely**	Max
Adult	0	**19**	35
Young >6weeks	0	**19**	35
Young <6weeks	2	**30**	50

3- Consider a bovine infected with a typical or mild form of pathological lesions in the heart presented for slaughter: indicate in the following table what are the probabilities of detection at **post-mortem inspection**, given age:

Age	**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Max
Adult	73	**86**	97	58	**73**	89

Young >6weeks	73	**89**	97	58	**75**	89
Young <6weeks	67	**85**	96	47	**67**	85

4- **We now suppose that only visual inspection is performed for post mortem inspection.** Consider a bovine infected with a typical or mild form of pathological lesions in the heart presented for slaughter: indicate in the following table what are the probabilities of detection at **post -mortem inspection**, given age*:*

Age	**Typical case**			**Mild case**		
	Min	**Most likely**	Max	Min	**Most likely**	Min
Adult	73	**86**	97	58	**73**	89
Young >6weeks	73	**86**	97	58	**73**	89
Young <6weeks	67	**85**	96	47	**67**	85

Appendix 4B: Other data needed and not elicited from experts recruited

NB. All parameters are defined by their minimum, most likely and maximum value (in order to define Pert distributions) unless "fixed value" is specified.

1. Common data for several diseases/conditions

1.1. Age category

- Age distribution **within** cattle herds

  - In the slaughtered population

	Proportion			Diseases/condition involved	Reference
	Min	Most likely	Max		
Adult (%)	0	**98.83**	100	- Necrobacillosis - Taenia saginata - Pathological lesions in the heart	BDNI, data from all bovine slaughtered in France from 01/01/2001 to 24/02/2010 (48 562 671). The most likely is the median of the proportion of each category within cattle herds
Young > 6 weeks (%)	0	**1.17**	100		
Young < 6 weeks (%)	0	**0**	0		

  - In a representative sample of the population

	Proportion			Diseases/condition involved	Reference
	Min	Most likely	Max		
Adult (%)	0	**84.56**	100	- Necrobacillosis - Taenia saginata - Pathological lesions in the heart	BDNI, data from all bovine alive in France from the 24/02/2010 (19 450 956). The most likely is the median of the proportion of each category within cattle herds
Young > 6 weeks (%)	0	**11.70**	100		
Young < 6 weeks (%)	0	**1.46**	8.08		

1.2. Age category and production type

- Proportion of **cattle herds** in **a representative sample of the population** by production type

We considered as dairy herd a herd with more than 50% of dairy cow.

	Proportion of cattle herds			Diseases/condition involved	Reference
	Min	Most likely	Max		
Dairy	Not relevant	**40.77**	Not relevant	- Foot and leg disorder - Low body condition - Cleanliness score - Integument alterations	BDNI, data from all bovine alive in France the 24/02/2010 (19 450 956). The proportion of cattle herd is thus an exact number. Min and Max is not relevant as data are exhaustive
Beef	Not relevant	**59.23**	Not relevant		

- Age distribution **within** cattle herds given production type:

  - In the slaughtered population

Production type	Age category	Proportion			Diseases/condition involved	Reference
		Min	Most likely	Max		
Dairy	Adult	0	**97.09**	100	- Foot and leg disorder - Low body condition - Cleanliness score - Integument alterations	BDNI data from all bovine slaughtered in France from 01/01/2001 to 24/02/2010 (48 562 671). The most likely is the median of the proportion of each category within cattle
	Young > 6 weeks	0	**2.91**	100		
	Young < 6 weeks	0	**0**	0		
Beef	Adult	0	**99.91**	100		
	Young > 6 weeks	0	**0.09**	100		
	Young < 6 weeks	0	**0**	0		

						herds

- In a representative sample of the population

Production type	Age category	Proportion			Diseases/condition involved	Reference
		Min	Most likely	Max		
Dairy	Adult	0	**84.38**	100	- Foot and leg disorder - Low body condition - Cleanliness score - Integument alterations	BDNI, data from all bovine alive in France the 24/02/2010 (19 450 956). The most likely is the median of the proportion of each category within cattle herds
	Young > 6 weeks	0	**12.63**	100		
	Young < 6 weeks	0	**1.85**	5.88		
Beef	Adult	0	**84.78**	100		
	Young > 6 weeks	0	**10.47**	100		
	Young < 6 weeks	0	**0.77**	9.91		

1.3. Age category and transport duration

- Proportion of transport being of long or short duration.

	Proportion of transports			Diseases/condition involved	Reference
	Min	Most likely	Max		
Being of long duration	40,7	**66,6**	80,3	- Fractured limb - Bruising and injury - DFD Meat	NERGAL (10 French abattoirs considering that a short transport is a transport within the department of the abattoir)
Being of short duration	19,7	**33,4**	59,4		

- Age distribution **within** transports given duration:

- In the slaughtered population

Duration of transport	Age category	Proportion			Diseases/condition involved	Reference
		Min	Most likely	Max		
Long	Adult	0	**85.25**	100	- Fractured limb - Bruising and injury - DFD Meat	NERGAL (10 French abattoirs considering that a short transport is a transport within the department of the abattoir)
	Young > 6 weeks	0	**14.75**	100		
	Young < 6 weeks	0	**0**	0.01[1]		
Short	Adult	0	**89.88**	100		
	Young > 6 weeks	0	**10.12**	100		
	Young < 6 weeks	0	**0**	0		

[1]during long transport there can be calving and thus young <6weeks arriving in the slaughterhouse but these animals will not be slaughtered.

2. Specific data

2.1. Necrobacillosis

Probabilities of infection (=scenario prevalences, fixed values)

- Probability of a herd being infected/having cases of necrobacillosis:

Probability	Reference
0.001 %	Nergal database (1 bovine with necrobacillosis on 1 939 519 slaughtered animals from 98 123 herds thus the probability at the herd level can be estimated as 1/ 98 123= 0.001%)

Comments: It was impossible to find data on this disease, thus we used data from Nergal database. This disease is extremely rare in France.

- Probability of an animal having necrobacillosis (within herd prevalence), given age:

	Probability	Reference
Adult (%)	**20%**	(Nagaraja and Lechtenberg 2007)
Young > 6 weeks (%)	**22%**	
Young < 6 weeks (%)	**1%**	

2.2. Enzootic Bovine Leukosis (EBL)

Category branch proportions

- Proportion of **cattle herds** in area with a high risk of introduction
  We considered as high risk area, the departments Landes (40), Gironde (33), Pyrénées Atlantique (64), Dordogne (24) (ref: B. Dufour).

	Proportion of cattle herds			Reference
	Min	Most likely	Max	
In a representative sample of the population	Not relevant	**6.25%**	Not relevant	BDNI, data from all bovine alive in France the 24/02/2010 (19 450 956). The proportion of cattle herd is thus an exact number. Min and Max is not relevant as data are exhaustive

- Mean of the number of animals slaughtered by month from 01/01/2001 to 24/02/2010.

Region	Age category	Mean number by month	Reference
High EBL risk	Adult	**25 350**	BDNI data from all bovine slaughtered in France from 01/01/2001 to 24/02/2010 (48 562 671).
	Young > 6 weeks	**7 117**	
	Young < 6 weeks	**0**	
Low EBL risk	Adult	**276 264**	
	Young > 6 weeks	**131 462**	
	Young < 6 weeks	**0**	

- Age distribution **within** cattle herds given region:
  - In the slaughtered population

Region	Age category	Proportion			Reference
		Min	**Most likely**	Max	
High EBL risk	Adult	0	**72.54**	100	BDNI data from all bovine slaughtered in France from 01/01/2001 to 24/02/2010 (48 562 671). The most likely is the median of the proportion of each category within cattle herds
	Young > 6 weeks	0	**27.27**	100	
	Young < 6 weeks	0	**0**	0	
Low EBL risk	Adult	0	**99.09**	100	
	Young > 6 weeks	0	**0.91**	100	
	Young < 6 weeks	0	**0**	0	

  - In a representative sample of the population

Region	Age category	Proportion			Reference
		Min	**Most likely**	Max	
High EBL risk	Adult	0	**85.98**	100	BDNI, data from all bovine alive in France from the 24/02/2010 (19 450 956). The most likely is the median of the proportion of each category within cattle herds
	Young > 6 weeks	0	**10.11**	100	
	Young < 6 weeks	0	**3.03**	8.33	
Low EBL risk	Adult	0	**84.44**	100	
	Young > 6 weeks	0	**11.76**	100	
	Young < 6 weeks	0	**1.49**	8.06	

Category node branch risks

- Relative risk of a herd being infected if it is in a high risk geographical region vs low risk region:

Relative risk			Reference
Min	Most likely	Max	
0.9	**1**	1.1	(Fediaevsky and Perrin 2010; Fediaevsky and Perrin 2011) France is free of EBL and the annual incidence rate is very low: 0.014% [0;005-0;034] and all the cases were latent form thus we can estimate that the relative risk of been infected depending on the region is low and probably not significant.

- Relative risks of an animal being infected given age: Adult **vs** Young>6weeks **vs** Young<6weeks (with the lowest risk group (young < 6 weeks) as baseline = 1)

	Relative risk			Reference
	Min	Most likely	Max	
Adult vs young < 6 weeks	3	**4**	5	B. Dufour
Young > 6 weeks vs young < 6 weeks	0.8	**1.1**	1.3	

Probabilities of infection

- Herd level design prevalence

Prevalence			Reference
Min	Most likely	Max	
0%	**1%**	1,5%	(Fediaevsky and Perrin 2010; Fediaevsky and Perrin 2011) France is free of EBL and the annual incidence rate is very low: 0.014% [0;005-0;034] and all the cases were latent form thus we can estimate that the relative risk of been infected depending on the region is low and probably not significant.

- Animal level design prevalence (within-herd design prevalence)

Prevalence			Reference
Min	Most likely	Max	
0%	**1%**	1,5%	(Fediaevsky and Perrin 2010; Fediaevsky and Perrin 2011) France is free of EBL and the annual incidence rate is very low: 0.014% [0;005-0;034] and all the cases were latent form thus we can estimate that the relative risk of been infected depending on the region is low and probably not significant.

2.3. Respiratory diseases

Category branch proportions

- Proportion of **cattle herds** coming from high BVDV prevalence areas

The high risk area is all the territory of France except Bretagne and Pays de Loire (R. Maillard).

	Proportion of cattle herds			Reference
	Min	Most likely	Max	
In a representative sample of the population	Not relevant	**78.49**	Not relevant	BDNI, data from all bovine alive in France the 24/02/2010 (19 450 956). The proportion of cattle herd is thus an exact number. Min and Max is not relevant as data are exhaustive

- Age distribution **within** cattle herds given BVDV prevalence in the region:
  - In the slaughtered population

Region	Age category	Proportion			Reference
		Min	Most likely	Max	
High BVDV prevalence	Adult	0	**98.82**	100	BDNI data from all bovine slaughtered in France from 01/01/2001 to 24/02/2010
	Young > 6 weeks	0	**1.18**	100	
	Young < 6 weeks	0	**0**	0	

Low BVDV prevalence	Adult	0	**98.88**	100	(48 562 671). The most likely is the median of the proportion of each category within cattle herds
	Young > 6 weeks	0	**1.12**	100	
	Young < 6 weeks	0	**0**	0	

- In a representative sample of the population

Region	Age category	Proportion			Reference
		Min	Most likely	Max	
High BVDV prevalence	Adult	0	**84.33**	100	BDNI, data from all bovine alive in France from the 24/02/2010 (19 450 956). The most likely is the median of the proportion of each category within cattle herds
	Young > 6 weeks	0	**11.73**	100	
	Young < 6 weeks	0	**1.41**	8.6	
Low BVDV prevalence	Adult	0	**85.11**	100	
	Young > 6 weeks	0	**11.65**	100	
	Young < 6 weeks	0	**1.59**	6.32	

Probabilities of infection (=scenario prevalences, fixed values)

- Probability of a herd having respiratory disease in a high BVDV prevalence area:

Probability	Reference
80%	R. Maillard

- Probability of a herd having respiratory disease in a low BVDV prevalence area:

Probability	Reference
70%	R. Maillard

- Probability of an animal having a respiratory infection **within** a herd with respiratory disease problems, given region (within-herd prevalence):

Region	Age category	Proportion	Référence
High BVDV prevalence	Adult	**10%**	(Assié, Bouet et al. 2001; Lemarchand, Fanuel et al. 2010)
	Young > 6 weeks	**80%**	
	Young < 6 weeks	**80%**	
Low BVDV prevalence	Adult	**10%**	
	Young > 6 weeks	**80%**	
	Young < 6 weeks	**80%**	

2.4. Vesicular diseases/FMD

Category branch proportions

- Proportion of **cattle herds** with a high frequency of contacts

We used for this part the results of a study on the relation between cattle in France in 2009 (Bernard 2011). During this period 119 135 herds were involved in bovine movement in France. We considered as a high frequency of contact cattle that have more than 7 introductions of animals from distinct herds in one year (10% of the cattle in France).

	Proportion of cattle herds			Reference
	Min	Most likely	Max	
In a representative sample of the population	5	**10**	15	(Bernard 2011)

- Mean of the number of animals slaughtered by month from 01/01/2001 to 24/02/2010.

Frequence of contacts	Age category	Mean number by month	Reference
High	Adult	**70 229**	BDNI data from bovine slaughtered in France from 01/01/2001 to 24/02/2010 in the 119 135 herds for which we have data on frequency of contact
	Young > 6 weeks	**87 471**	
	Young < 6 weeks	**0**	
Low	Adult	**186 056**	
	Young > 6 weeks	**24 242**	

	Young < 6 weeks	**0**	

- Age distribution **within** cattle herds given frequency of contacts:

As the level of contacts (high or low) has been defined before, we used data from the French cattle national database.

  - In the slaughtered population

Frequence of contacts	Age category	Proportion			Reference
		Min	Most likely	Max	
High	Adult	0	**98.57**	100	Data from BDNI (bovines slaughtered from herds on which we have data about frequency of contacts, 191 135 herds, animals slaughtered from 01/01/2001 to 24/02/2010)
	Young > 6 weeks	0	**1.43**	100	
	Young < 6 weeks	0	**0**	0	
Low	Adult	0	**97.83**	100	
	Young > 6 weeks	0	**2.17**	100	
	Young < 6 weeks	0	**0**	0	

Number of animals slaughtered by age from 01/01/2001 to 24/02/2010

Frequence of contacts	Age category	Number From 01/01/2001 to 24/02/2010	Estimation by month (divided by 110)	Reference
High	Adult	7 725 233	70 229	Data from BDNI (bovines slaughtered from herds on which we have data about frequency of contacts, 191 135 herds, animals slaughtered from 01/01/2001 to 24/02/2010)
	Young > 6 weeks	9 621 817	87 471	
	Young < 6 weeks	0	0	
Low	Adult	20 466 208	186 056	
	Young > 6 weeks	2 666 687	24 243	
	Young < 6 weeks	0	0	

  - In a representative sample of the population

Frequence of contacts	Age category	Proportion			Reference
		Min	Most likely	Max	
High	Adult	0	**82.5**	100	Data from BDNI (17 713 678 bovines from herds on which we have data about frequency of contacts, 191 135 herds)
	Young > 6 weeks	0	**14.29**	100	
	Young < 6 weeks	0	**1.22**	6.82	
Low	Adult	0	**87.5**	100	
	Young > 6 weeks	0	**12.5**	100	
	Young < 6 weeks	0	**1.92**	8.40	

Category node branch risks

- Relative risk of a herd being infected if it has a high frequency of contacts vs low frequency :

Relative risk			Reference
Min	Most likely	Max	
			Séverine Rautureau

- Relative risks of an animal being infected given age: Adult **vs** Young>6weeks **vs** Young<6weeks (with the lowest risk group (young < 6 weeks) as baseline = 1)

	Relative risk			Reference
	Min	Most likely	Max	
Adult vs young < 6 weeks	0.8	**0.9**	0.99	S. Zientara
Young > 6 weeks vs young < 6 weeks	0.2	**0.6**	0.8	

Probabilities of infection

- Herd level design prevalence

Prevalence			Reference
Min	Most likely	Max	
			Séverine Rautureau

- Animal level design prevalence (within-herd design prevalence)

Prevalence			Reference
Min	Most likely	Max	
			Séverine Rautureau

ADDITIONAL INFORMATION NEEDED FOR STAGE 3 MODELLING

Meat inspection component

- Probability that samples for FMD are taken in the slaughterhouse, given region, age and case type:

Case type	High frequency of contacts									Low frequency of contacts								
	Adult			Young >6weeks			Young <6 weeks			Adult			Young >6weeks			Young <6 weeks		
	min	Most likely	max	Min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max
Typical	0	**1**	2	0	**1**	2	0	**0**	0	0	**1**	2	0	**1**	2	0	**0**	0
Mild	0	**1**	2	0	**1**	2	0	**0**	0	0	**1**	2	0	**1**	2	0	**0**	0

- Sensitivity of FMD testing, given age and case type

Case type	Age category	Sensitivity			Reference
		Min	Most likely	Max	
Typical	Adult	95	**95.4**	97.7	(King, Ferris et al. 2006)
	Young > 6 weeks	95	**95.4**	97.7	
	Young < 6 weeks	95	**95.4**	97.7	
Mild	Adult	95	**95.4**	97.7	
	Young > 6 weeks	95	**95.4**	97.7	
	Young < 6 weeks	95	**95.4**	97.7	

Clinical surveillance component

- Probability that veterinarian is called by the farmer for a clinical case, given region, age and case type:

We used data from the Thesis of Séverine Rautureau (Rautureau 2012) who used a Delphi method to elicit probabilities from 11 French experts. She asked them what was the probability that a farmer detect FMD and called its veterinarian depending on the number of animals affected in its herd (1 animal, 2 animals or 10 animals). We considered that a typical case as defined in this project can be compared to 10 animals infected in the herd and that the mild case can be compared to 1 animal infected in the herd. We considered that the probability was the probability for a farmer to call its veterinarian for the first case of FMD (first outbreak).

Case type	High frequency of contacts									Low frequency of contacts								
	Adult			Young >6weeks			Young <6 weeks			Adult			Young >6weeks			Young <6 weeks		
	min	Most likely	max	Min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max
Typical	90	**95**	100	90	**95**	100	90	**95**	100	90	**95**	100	90	**95**	100	90	**95**	100
Mild	5	**10**	20	5	**10**	20	5	**10**	20	5	**10**	20	5	**10**	20	5	**10**	20

- Probability that veterinarian takes sample for FMD, given region, age and case type:

We used data from the Thesis of Séverine Rautureau (Rautureau 2012) who used a Delphi method to elicit probabilities from 11 French experts. She asked them what was the probability that a veterinarian raised the alarm. This question can be assimilated to the probability that a veterinarian took sample for FMD.

Case type	High frequency of contacts									Low frequency of contacts								
	Adult			Young >6weeks			Young <6 weeks			Adult			Young >6weeks			Young <6 weeks		
	min	most	max	Min	most	max	min	most	max	min	most	max	min	most	max	min	most	max
Typical	**90**	**95**	**100**	**90**	**95**	**100**	**90**	**95**	**100**	**90**	**95**	**100**	**90**	**95**	**100**	**90**	**95**	**100**
Mild	**20**	**50**	**60**	**20**	**50**	**60**	**20**	**50**	**60**	**20**	**50**	**60**	**20**	**50**	**60**	**20**	**50**	**60**

- Sensitivity of FMD testing, given age and case type*)

Same data as for meat inspection component

2.5. Ulcerative diseases/Bluetongue

Category branch proportions

- Proportion of **cattle herds** in area with a high risk of introduction

The high risk areas are regions which had more than 500 outbreaks during bluetongue epizooty in 2007 or 2008 (data from CIRAD): Mayenne(53), Creuse (23),Pas de Calais (62), Nord (59), Somme (80), Aisne (02), Ardennes (08), Meuse (55), Meurthe et Moselle (54), Moselle (57), Haute-Marne (52), Côte d'Or (21), Nièvre (58). Thus the results for this disease must be considered as if we were in 2007.

	Proportion of cattle herds			Reference
	Min	Most likely	Max	
In a representative sample of the population	Not relevant	**16.82**	Not relevant	BDNI, data from all bovine alive in France the 24/02/2010 (19 450 956). The proportion of cattle herd is thus an exact number. Min and Max is not relevant as data are exhaustive

- Mean of the number of animals slaughtered by month from 01/01/2001 to 24/02/2010.

Region	Age category	Mean number by month	Reference
High Bluetongue risk	Adult	**68 090**	BDNI data from all bovine slaughtered in France from 01/01/2001 to 24/02/2010 (48 562 671).
	Young > 6 weeks	**9 907**	
	Young < 6 weeks	**0**	
Low Bluetongue risk	Adult	**233 524**	
	Young > 6 weeks	**128 673**	
	Young < 6 weeks	**0**	

- Age distribution **within** cattle herds given region:
  - In the slaughtered population

Region	Age category	Proportion			Reference
		Min	Most likely	Max	
High Bluetongue risk	Adult	0	**94.2**	100	BDNI data from all bovine slaughtered in France from 01/01/2001 to 24/02/2010 (48 562 671). The most likely is the median of the proportion of each category within cattle herds
	Young > 6 weeks	0	**5.8**	100	
	Young < 6 weeks	0	**0**	0	
Low Bluetongue risk	Adult	0	**98.08**	100	
	Young > 6 weeks	0	**1.92**	100	
	Young < 6 weeks	0	**0**	0	

  - In a representative sample of the population

Region	Age category	Proportion			Reference
		Min	Most likely	Max	
High Bluetongue risk	Adult	0	**83.04**	100	BDNI, data from all bovine alive in France from the 24/02/2010 (19 450 956). The most likely is the median of the proportion of each category within cattle herds
	Young > 6 weeks	0	**13.73**	100	
	Young < 6 weeks	0	**1.49**	7.14	
Low Bluetongue risk	Adult	0	**84.85**	100	
	Young > 6 weeks	0	**11.29**	100	
	Young < 6 weeks	0	**1.45**	8.33	

Category node branch risks

- Relative risk of a herd being infected if it is in a high risk geographical region vs low risk region:

The relative risk are estimated as if we were in 2007, during the BT outbreak

Relative risk			Reference
Min	Most likely	Max	
6	**10**	14	(Santman-Berends, Bartels et al. 2010)

- Relative risks of an animal being infected given age: Adult **vs** Young>6weeks **vs** Young<6weeks (with the lowest risk group (young < 6 weeks) as baseline = 1)

The relative risk are estimated as if we were in 2007, during the BT outbreak

	Relative risk			Reference
	Min	Most likely	Max	
Adult vs young < 6 weeks	7	**10**	15	(Thiry, Saegerman et al. 2006)
Young > 6 weeks vs young < 6 weeks	0.5	**1.5**	2	(Dal Pozzo, Saegerman et al. 2009)

Probabilities of infection

- Herd level design prevalence

Situation in the Netherland during 2007 outbreak

Prevalence			Reference
Min	Most likely	Max	
0	**30**	60	(van Schaik, Berends et al. 2008)

- Animal level design prevalence (within-herd design prevalence)

Situation in the during 2007 outbreak

Prevalence			Reference
Min	Most likely	Max	
0.2	**2.9**	4	(van Schaik, Berends et al. 2008) (Le Gal, Dufour et al. 2008)

ADDITIONAL INFORMATION NEEDED FOR STAGE 3 MODELLING

Meat inspection component

- Probability that samples for bluetongue are taken in the slaughterhouse, given region, age and case type:

Case type	High Bluetongue risk area									Low Bluetongue risk area								
	Adult			Young >6weeks			Young <6 weeks			Adult			Young >6weeks			Young <6 weeks		
	min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max
Typical	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0
Mild	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	0

Comment: samples are never taken for bluetongue in the slaughterhouse.

- Sensitivity of bluetongue testing, given age and case type

Case type	Age category	Sensitivity			Reference
		Min	Most likely	Max	
Typical	Adult				NOT RELEVANT It is not relevant as no test are performed during meat inspection process
	Young > 6 weeks				
	Young < 6 weeks				
Case type	Adult				
	Young > 6 weeks				
	Young < 6 weeks				

Clinical surveillance component

- Probability that veterinarian is called by the farmer for a clinical case, given region, age and case type (S. Zientara)::

Case type	High Bluetongue risk area									Low Bluetongue risk area								
	Adult			Young >6weeks			Young <6 weeks			Adult			Young >6weeks			Young <6 weeks		
	min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max
Typical	70	**90**	95	50	**70**	80	40	**50**	60	20	**50**	60	10	**40**	50	5	**30**	40
Mild	50	**70**	80	40	**50**	60	30	**40**	50	10	**40**	50	5	**30**	40	5	**30**	40

- Probability that veterinarian takes sample for bluetongue, given region, age and case type (S. Zientara):

Case type	High Bluetongue risk area									Low Bluetongue risk area								
	Adult			Young >6weeks			Young <6 weeks			Adult			Young >6weeks			Young <6 weeks		
	min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max	min	Most likely	max
Typical	80	**95**	100	80	**90**	100	50	**70**	80	30	**60**	70	30	**50**	70	5	**30**	40
Mild	80	**90**	100	80	**90**	100	50	**70**	80	30	**50**	70	10	**40**	50	5	**30**	40

- Sensitivity of bluetongue testing, given age and case type*)

Case type	Age category	Sensitivity			Reference
		Min	Most likely	Max	
Typical	Adult	98	**99**	100	S. Zientara and (Vandenbussche, Vanbinst et al. 2008)
	Young > 6 weeks	98	**99**	100	
	Young < 6 weeks	98	**99**	100	
Case type	Adult	98	**99**	100	
	Young > 6 weeks	98	**99**	100	
	Young < 6 weeks	98	**99**	100	

*) In case this is different from the test under "Meat inspection component" above, e.g. if the type of samples taken are likely to be different.

Serological surveillance component

Will be considered to be implemented with sensitivity (confidence level) according to legislation, not subject to modeling!

2.6. Echinococcus granulosus (EG)

Category branch proportions

- Proportion of **cattle herds** coming from high EG prevalence areas

We considered as high EG prevalence area, the department of Corse (Umhang and Boué 2010; Umhang and Boué 2010)

	Proportion of cattle herds			Reference
	Min	Most likely	Max	
In a representative sample of the population	Not relevant	**0.53%**	Not relevant	(Umhang and Boué 2010; Umhang and Boué 2010) BDNI, data from all bovine alive in France the 24/02/2010 (19 450 956). The proportion of cattle herd is thus an exact number. Min and Max is not relevant as data are exhaustive

- Age distribution **within** cattle herds given EG prevalence in the region:
  - In the slaughtered population

Region	Age category	Proportion			Reference
		Min	**Most likely**	Max	
High EG prevalence	Adult	0	**81.08**	100	BDNI data from all bovine slaughtered in France from 01/01/2001 to 24/02/2010 (48 562 671). The most likely is the median of the proportion of each category within cattle herds
	Young > 6 weeks	0	**18.92**	100	
	Young < 6 weeks	0	**0**	0	
Low EG prevalence	Adult	0	**98.83**	100	
	Young > 6 weeks	0	**1.16**	100	
	Young < 6 weeks	0	**0**	0	

  - In a representative sample of the population

Region	Age category	Proportion			Reference
		Min	**Most likely**	Max	
High EG prevalence	Adult	0	**89.74**	100	BDNI, data from all bovine alive in France from the 24/02/2010 (19 450 956). The most likely is the median of the proportion of each category within cattle herds
	Young > 6 weeks	0	**6.45**	46.66	
	Young < 6 weeks	0	**2.86**	10	
Low EG prevalence	Adult	0	**84.56**	100	
	Young > 6 weeks	0	**11.70**	100	
	Young < 6 weeks	0	**1.46**	8.08	

Probabilities of infection (=scenario prevalences, fixed values)

- Probability of a herd being infected with EG in a high EG prevalence area: **2%** (Umhang and Boué 2010)
- Probability of a herd being infected with EG in a low EG prevalence area: **0.01%** (Frank Boué)
- Probability of an animal being infected with EG **within** an EG infected herd, given region (within-herd prevalence):

Region	Adult (%)	Young > 6 weeks (%)	Young < 6 weeks (%)	Reference
High EG prevalence	**1.5**	**0**	**0**	Frank Boué (Umhang and Boué 2010)
Low EG prevalence	**1**	**0**	**0**	

2.7. Cysticercosis

Probabilities of infection (=scenario prevalences, fixed values)

- Probability of a herd being infected/having cases of Taenia saginata: **3.1%** (Morlot 2011), BDNI
- Probability of an animal having infection with Taenia saginata, given age (within-herd prevalence):

Adult (%)	Young > 6 weeks (%)	Young < 6 weeks (%)	Reference
0.88%	**1.2%**	**0.6%**	(Morlot 2011)

2.8. Fascioliasis (FH)

Category branch proportions

- Proportion of **cattle herds** coming from high FH prevalence areas

Based on a survey (Alzieu, Bosquet et al. 2007) on 520 cattle in France in 17 French departments we considered as high FH prevalence area the 7 departments (Correze (19), Manche (50), Morbihan (56), Nièvre (58), Puy de Dome (63), Deux-Sèvres (79), Haute-Vienne (87)) among 17 having a percentage of herd affected by FH higher than 66% (the 25% of department most affected). A herd is infected when at least one animal have a positive coproscopy. The 10 other departments (Ain (1), Ardennes (8), Ariège (9), Aveyron (12), Finistère (29), Pas de Calais (62), Saone et Loire (71), Seine Maritime (76), Vienne (86), Vosges (88)) are considered as low FH prevalence area.

	Proportion of cattle herds			Reference
	Min	Most likely	Max	
In a representative sample of the population	Not relevant	**14.95**	Not relevant	BDNI, data from all bovine alive in France the 24/02/2010 (19 450 956). The proportion of cattle herd is thus an exact number. Min and Max is not relevant as data are exhaustive. (Alzieu, Bosquet et al. 2007)

- Age distribution **within** cattle herds given FH prevalence in the region:
  - In the slaughtered population

Region	Age category	Proportion			Reference
		Min	Most likely	Max	
High FH prevalence	Adult	0	**97.6**	100	BDNI data from all bovine slaughtered in France from 01/01/2001 to 24/02/2010 (48 562 671). The most likely is the median of the proportion of each category within cattle herds. (Alzieu, Bosquet et al. 2007)
	Young > 6 weeks	0	**2.4**	100	
	Young < 6 weeks	0	**0**	0	
Low FH prevalence	Adult	0	**98.07**	100	
	Young > 6 weeks	0	**1.93**	100	
	Young < 6 weeks	0	**0**	0	

  - In a representative sample of the population

Region	Age category	Proportion			Reference
		Min	Most likely	Max	
High FH prevalence	Adult	0	**84.85**	100	BDNI, data from all bovine alive in France from the 24/02/2010 (19 450 956). The most likely is the median of the proportion of each category within cattle herds. (Alzieu, Bosquet et al. 2007)
	Young > 6 weeks	0	**11.36**	100	
	Young < 6 weeks	0	**1.52**	8.20	
Low FH prevalence	Adult	0	**84.85**	100	
	Young > 6 weeks	0	**11.29**	100	
	Young < 6 weeks	0	**1.45**	8.33	

Probabilities of infection (=scenario prevalences, fixed values)

- Probability of a herd being infected in a high FH prevalence area: **90%** (OGD 2005)
- Probability of a herd being infected in a low FH prevalence area**: 3% (**P. Dorchies)
- Probability of an animal being infected, given region:

Region	Adult (%)	Young > 6 weeks (%)	Young < 6 weeks (%)	Reference
High FH prevalence	**90**	**0**	**0**	P. Dorchies
Low FH prevalence	**5**	**0**	**0**	

ADDITIONAL INFORMATION NEEDED FOR STAGE 3 MODELLING

It is assumed that for the meat inspection component, fascioliasis is a macroscopic diagnosis and no other testing is needed if it is detected during meat inspection.

Clinical surveillance component

For clinical surveillance of fascioliasis, the herd is considered to be the unit of surveillance

- Probability of an infected herd having a typical **vs** mild **vs** no clinical expression of signs of fascioliasis:

Typical case			Mild case			No sign (subclinical)			Reference
Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	
40	**50**	60	10	**30**	50	5	**20**	40	Probability based on E. Colin comment (see below) and data from experts (question 1 of the main questionnaire for fascioliasis)

It's very difficult to answer to this question; it depends on a lot of factors. It depends on the prevalence of the infection within herd. The less the prevalence is, the less typical case there is. It also depends on the prophylaxis strategy of the herd. A herd using treatment for long will have less typical case (E. Colin)

- Probability that veterinarian is called to the herd by the farmer for clinical problems related to fascioliasis, given region, case type (at the herd level, see above):

Region	Case type	Probability			Reference
		Min	Most likely	Max	
High FH prevalence	Typical	0	**0**	1	E. Colin: This event is very rare because it's extremely rare that animal infected by fascioliasis have clinical symptom.
	Mild	0	**0**	1	
Low FH prevalence	Typical	0	**0**	1	
	Mild	0	**0**	1	

- Probability that veterinarian takes sample to diagnose fascioliasis, given region and case type:

Region	Case type	Probability			Reference
		Min	Most likely	Max	
High FH prevalence	Typical	0	**0**	1	This event is very rare based on the previous question
	Mild	0	**0**	1	
Low FH prevalence	Typical	0	**0**	1	
	Mild	0	**0**	1	

Coverage of different surveillance components, by population stratum (in %), fixed value

Coverage should be regarded as the percentage of the population that is covered by the surveillance component during 1 year.

Surveillance component A = Meat inspection

Surveillance component B = Clinical surveillance

Sum of each column much be equal to 100

Presence in surveillance component	High FH prevalence area			Low FH prevalence area		
	Adult	Young >6weeks	Young <6 weeks	Adult	Young >6weeks	Young <6 weeks
	Coverage	Coverage	Coverage	Coverage	Coverage	Coverage
A only	0	0	0	0	0	0
B only	78.9	57.4	100	75.5	67.7	100
A **and** B	21.1	42.6	0	24.5	32.4	0
Neither	0	0	0	0	0	0

Reference: We used data from BDNI. We considered data of bovine slaughtered in 2009 to calculate the value.

2.9. Foot-and-leg disorders

Probabilities of infection (=scenario prevalences, fixed values)

- Probability of a **dairy herd** having foot-and-leg disorders: **100%** (J. Lensink

Each dairy herd had a minimum of one animal affected by foot and leg disorder (J. Lensink)

- Probability of a **beef herd** having foot-and-leg disorders: **80%(**J. Lensink)
- Probability of an animal having a foot-and leg disorder, given production type:

Production type	Adult (%)	Young > 6 weeks (%)	Young < 6 weeks (%)	Reference
Dairy	**10-25%**	**1-2%**	**<1%**	(Faye and Barnouin 1988) (Fourichon, Beaudeau et al. 2001; Fourichon, Seegers et al. 2001) (Somers, Frankena et al. 2003) (Bach, Dinarés et al. 2007)
Beef	**5-10%**	**1-2%**	**<1%**	

ADDITIONAL INFORMATION NEEDED FOR STAGE 3 MODELLING

It is assumed that for the meat inspection component, foot- and leg disorders is a macroscopic diagnosis and no other testing is needed if it is detected during meat inspection.

Clinical surveillance component

- Probability that veterinarian is called by the farmer for a clinical case of foot and leg disorders, given production type, age and case type:

Case type	Production type	Age category	Probability			Reference
			Min	Most likely	Max	
Typical	Dairy	Adult	0	**5**	10	J. lensink
		Young > 6 weeks	0	**5**	10	
		Young < 6 weeks	0	**5**	10	
	Beef	Adult	0	**2**	4	
		Young > 6 weeks	0	**2**	4	
		Young < 6 weeks	0	**2**	4	
Mild	Dairy	Adult	0	**2**	4	
		Young > 6 weeks	0	**2**	4	
		Young < 6 weeks	0	**2**	4	
	Beef	Adult	0	**2**	4	
		Young > 6 weeks	0	**2**	4	

		Young < 6 weeks	0	**2**	4	

- Probability that veterinarian makes clinical diagnosis of foot and leg disorder (i.e. correctly concludes the animal is suffering from a foot/leg disorder), given production type, age and case type:

Case type	Production type	Age category	Probability			Reference
			Min	Most likely	Max	
Typical	Dairy	Adult	60	**70**	80	J. lensink
		Young > 6 weeks	60	**70**	80	
		Young < 6 weeks	60	**70**	80	
	Beef	Adult	60	**70**	80	
		Young > 6 weeks	60	**70**	80	
		Young < 6 weeks	60	**70**	80	
Mild	Dairy	Adult	60	**70**	80	
		Young > 6 weeks	60	**70**	80	
		Young < 6 weeks	60	**70**	80	
	Beef	Adult	60	**70**	80	
		Young > 6 weeks	60	**70**	80	
		Young < 6 weeks	60	**70**	80	

Coverage of different surveillance components, by population stratum (in %), fixed value

Coverage should be regarded as the percentage of the population that is covered by the surveillance component during 1 year.

Surveillance component A = Meat inspection

Sum of each column much be equal to 100

Presence in surveillance component	Dairy			Beef		
	Adult	**Young >6weeks**	**Young <6 weeks**	**Adult**	**Young >6weeks**	**Young <6 weeks**
	Coverage	Coverage	Coverage	Coverage	Coverage	Coverage
A only	0	0	0	0	0	0
B only	79.37	38.98	100	78.18	67.07	100
A **and** B	20.63	61.02	0	24.82	32.93	0
Neither	0	0	0	0	0	0

Reference: We used data from BDNI. We considered data of bovine slaughtered in 2009 to calculate the value.

2.10. low body condition score

Probabilities of infection (=scenario prevalences, fixed values)

- Probability of a **dairy herd** having thin cows: **60%** (J. Lensink)
- Probability of a **beef herd** having thin cows: **30% (**J. Lensink)
- Probability of an animal being thin, given production type (within-herd prevalence):

Production type	Adult (%)	Young > 6 weeks (%)	Young < 6 weeks (%)	Reference
Dairy	10%	3%	50%	J. Lensink
Beef	2%	2%	30%	

2.11. Fractured limb

Probabilities of trauma (=scenario prevalences, fixed values)

- Probability of a **transportation of long duration** to have any cattle with fractured limbs: **0,7%** (Grandin 2001)
- Probability of a **transportation of short duration** to have any cattle with fractured limbs: **0,3%** (J. Lensink)
- Probability of an animal having a fractured limb, given duration of transportation (within-transport prevalence):

Duration of	Adult (%)	Young > 6	Young < 6 weeks	Reference

transport		weeks (%)	(%)	
Long	**1%**	**1%**	**1%**	J. Lensink
Short	**1%**	**1%**	**1%**	

2.12. Cleanliness score

Probabilities of infection (=scenario prevalences, fixed values)

- Probability of a **dairy herd** having (any) dirty cows: **50%**
- Probability of a **beef herd** having (any) dirty cows: **70%**
- Probability of an animal being dirty, given production type (within-herd prevalence):

We used data from the French Institut de l'élevage (Guéguen, Cartier et al. 2005) considering as dirty cow, cow with a cleanliness score of C or D (score scale from A to D)

Production type	Adult (%)	Young > 6 weeks (%)	Young < 6 weeks (%)	Reference
Dairy	**9,15**	**18,78**	**18,78**	(Guéguen, Cartier et al. 2005; Bastien 2010)
Beef	**17,20**	**18,4**	**18,4**	

2.13. Integument alterations

Probabilities of infection (=scenario prevalences, fixed values)

- Probability of a **dairy herd** having (any) cows with integument alterations: **77 %** (Rutherford, Langford et al. 2008; Potterton, Green et al. 2011), J. Lensink. This value is a mean of the probability of a dairy herd having (any) cow with integument alterations in a herd with cow cubicle and in a herd with mulched area.
- Probability of a **beef herd** having (any) cows with integument alterations: **50 %** (J. Lensink)
- Probability of an animal having integument alterations, given production type (within-herd prevalence):

Production type	Adult (%)	Young > 6 weeks (%)	Young < 6 weeks (%)	Reference
Dairy	**20%**[1]	**8%**	**2%**	(Potterton, Green et al. 2011), J. Lensink
Beef	**6%**	**3%**	**1%**	J. Lensink

[1]This value was obtained using the same method as for the probability of a **dairy herd** having (any) cows with integument alterations.

2.14. Bruising and Injury-related hemorrhage (related to transport)

Probabilities of trauma (=scenario prevalences, fixed values)

- Probability of a **transportation of long duration** to have any cattle with bruising and injury-related hemorrhage: **50%** (McKenna, Roebert et al. 2002)
- Probability of a **transportation of short duration** to have any cattle with bruising and injury-related hemorrhage: **10 %** (J. Lensink)
- Probability of an animal having bruising and injury-related hemorrhage, given duration of transportation (within-transport prevalence):

Duration of transport	Adult (%)	Young > 6 weeks (%)	Young < 6 weeks (%)	Reference
Long	**4%**	**5%**	**1%**	J. Lensink
Short	**2%**	**3%**	**1%**	

2.15. DFD Meat

Probabilities of trauma (=scenario prevalences, fixed values)

- Probability of a **transportation of long duration** to have any cattle with DFD: **2.5 %** (P. Demont)
- Probability of a **transportation of short duration** to have any cattle with DFD: **0.1%** (P. Demont)

- Probability of an animal having DFD, given duration of transportation (within-transport prevalence):

Duration of transport	Adult (%)	Young > 6 weeks (%)	Young < 6 weeks (%)	Reference
Long	**2.5**	**15**	No bovine of this age category slaughtered in France	P. Demont (Anonyme 2006)
Short	**0.03**	**0.03**	No bovine of this age category slaughtered in France	

2.16. Granuloma diseases-Tuberculosis

Category branch proportions

- Proportion of **cattle herds** coming from high TB prevalence areas

The high TB prevalence areas in France are departments Hérault (34), Gard (30), Bouches du Rhône (13), Côte d'Or (21), Dordogne (24), Pyrénées-Atlantiques (64), Landes (40), Ariège (09), Seine-et-Marne (71). (Rieffel 2006)

	Proportion of cattle herds			Reference
	Min	Most likely	Max	
In a representative sample of the population	Not relevant	**51.89**	Not relevant	BDNI, data from all bovine alive in France the 24/02/2010 (19 450 956). The proportion of cattle herd is thus an exact number. Min and Max is not relevant as data are exhaustive

- Age distribution **within** cattle herds given TB prevalence in the region:
  - In the slaughtered population

Region	Age category	Proportion			Reference
		Min	Most likely	Max	
High TB prevalence	Adult	0	**92.31**	100	BDNI data from all bovine slaughtered in France from 01/01/2001 to 24/02/2010 (48 562 671). The most likely is the median of the proportion of each category within cattle herds
	Young > 6 weeks	0	**7.61**	100	
	Young < 6 weeks	0	**0**	0	
Low TB prevalence	Adult	0	**99.03**	100	
	Young > 6 weeks	0	**0.97**	100	
	Young < 6 weeks	0	**0**	0	

  - In a representative sample of the population

Region	Age category	Proportion			Reference
		Min	Most likely	Max	
High TB prevalence	Adult	0	**85.71**	100	BDNI, data from all bovine alive in France from the 24/02/2010 (19 450 956). The most likely is the median of the proportion of each category within cattle herds
	Young > 6 weeks	0	**9.50**	100	
	Young < 6 weeks	0	**1.49**	10	
Low TB prevalence	Adult	0	**84.43**	100	
	Young > 6 weeks	0	**11.91**	100	
	Young < 6 weeks	0	**1.45**	7.83	

Probabilities of infection (=scenario prevalences, fixed values)

- Probability of a herd being infected in a high TB prevalence area: **0.47%** (A. Fediaesky for the number of infected herds and BDNI, we calculated the percentage of herds infected in high TB prevalence area)
- Probability of a herd being infected in a low TB prevalence area: **0.01%** (A. Fediaesky for the number of infected herds and BDNI, we calculated the percentage of herds infected in high TB prevalence area)
- Probability of an animal being infected, given region (within herd prevalence):

Region	Adult (%)	Young > 6 weeks (%)	Young < 6 weeks (%)	Reference
High TB prevalence	2.2	1.1	0	JJ. Benet (Rieffel 2006) A. Fediaesky
Low TB prevalence	1.0	0.5	0	

ADDITIONAL INFORMATION NEEDED FOR STAGE 3 MODELLING

Meat inspection component

- Probability that samples for TB are taken, given region, age and case type:

This question can be assimilated as the probability of detection of tuberculosis during meat inspection as each suspicion will lead to a sample. Thus data from expert elicitation were used.

Age	Low TB prevalence area						High TB prevalence area					
	Typical case			Mild case			Typical case			Mild case		
	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max	Min	Most likely	Max
Adult	55	**78**	90	28	**48**	63	65	**84**	94	48	**65**	85
Young >6weeks	55	**78**	90	28	**48**	63	65	**84**	94	48	**65**	85
Young <6weeks	47	**73**	83	27	**47**	67	60	**80**	90	37	**53**	80

- Sensitivity of TB testing, given age and case type

Case type	Age category	Sensitivity			Reference
		Min	Most likely	Max	
Typical	Adult	25	**28.5**	30	(Schiller, RayWaters et al. 2011)
	Young > 6 weeks	25	**28.5**	30	
	Young < 6 weeks	25	**28.5**	30	
Mild	Adult	25	**28.5**	30	
	Young > 6 weeks	25	**28.5**	30	
	Young < 6 weeks	25	**28.5**	30	

Clinical surveillance component

- Probability that veterinarian is called by the farmer for a clinical case of TB, given region, age and case type:

Case type	Region	Age category	Probability			Reference
			Min	Most likely	Max	
Typical	High TB prevalence area	Adult	0	**0**	0	**There is no clinical form of tuberculosis in France**
		Young > 6 weeks	0	**0**	0	
		Young < 6 weeks	0	**0**	0	
	Low TB prevalence area	Adult	0	**0**	0	
		Young > 6 weeks	0	**0**	0	
		Young < 6 weeks	0	**0**	0	
Mild	High TB prevalence area	Adult	0	**0**	0	
		Young > 6 weeks	0	**0**	0	
		Young < 6 weeks	0	**0**	0	
	Low TB prevalence area	Adult	0	**0**	0	
		Young > 6 weeks	0	**0**	0	
		Young < 6 weeks	0	**0**	0	

Comment: There is no clinical form of tuberculosis in France

- Probability that veterinarian takes sample for TB, given region, age and case type:

Case type	Region	Age category	Probability			Reference
			Min	Most likely	Max	
Typical	High TB prevalence area	Adult	0	**0**	0	**There is no clinical form of tuberculosis in France**
		Young > 6 weeks	0	**0**	0	
		Young < 6 weeks	0	**0**	0	
	Low TB prevalence area	Adult	0	**0**	0	
		Young > 6 weeks	0	**0**	0	

		Young < 6 weeks	0	**0**	0	
Mild	High TB prevalence area	Adult	0	**0**	0	
		Young > 6 weeks	0	**0**	0	
		Young < 6 weeks	0	**0**	0	
	Low TB prevalence area	Adult	0	**0**	0	
		Young > 6 weeks	0	**0**	0	
		Young < 6 weeks	0	**0**	0	

<u>Comment</u>: There is no clinical form of tuberculosis in France

- Sensitivity of TB testing, given age and case type*)

Case type	Age category	Sensitivity			Reference
		Min	Most likely	Max	
Typical	Adult	10	**80**	90	(Schiller, RayWaters et al. 2011)
	Young > 6 weeks	10	**80**	90	
	Young < 6 weeks	10	**80**	90	
Mild	Adult	10	**80**	90	
	Young > 6 weeks	10	**80**	90	
	Young < 6 weeks	10	**80**	90	

*) In case this is different from the test under "Meat inspection component" above, e.g. if the type of samples taken are likely to be different.

<u>Control programme surveillance component</u>

- Probability that an animal (in a herd in the control programme) will be tested in conjunction with a herd test for TB, given region, age:

Region	Age category	Probability			Reference
		Min	Most likely	Max	
High TB prevalence area	Adult	90	**95**	100	(Fediaevsky, Dufour et al. 2010) (Ministry in charge of agriculture 2003)
	Young > 6 weeks	90	**95**	100	
	Young < 6 weeks	0	**0**	0	
Low TB prevalence area	Adult	31	**32**	33	
	Young > 6 weeks	31	**32**	33	
	Young < 6 weeks	0	**0**	0	

Comment: In France, in high TB prevalence area, in each herd, each animal over 6 weeks is tested annually. In low TB area, 1/3 herd is tested, all animals over 6 weeks are tested in each herd tested.

- Sensitivity of TB testing, given age and case type*)

Case type	Age category	Sensitivity			Reference
		Min	Most likely	Max	
Typical	Adult	0.66	**0.71**	0.84	JJ Benet (Rieffel 2006)
	Young > 6 weeks	0.66	**0.71**	0.84	
	Young < 6 weeks	0	**0**	0	
Mild	Adult	0.66	**0.71**	0.84	
	Young > 6 weeks	0.66	**0.71**	0.84	
	Young < 6 weeks	0	**0**	0	

Comment: There is no test in France on animal under 6 weeks.

*) In case this is different from the test under "Meat inspection component" above, e.g. if the type of samples taken are likely to be different.

Coverage of different surveillance components, by population stratum (in %), fixed value

Coverage should be regarded as the percentage of the population that is covered by the surveillance component during 1 year.

Surveillance component A = Meat inspection

Surveillance component B = Clinical surveillance

Surveillance component C = Control programme

Sum of each column much be equal to 100

Presence in surveillance component	High TB prevalence area			Low TB prevalence area		
	Adult	**Young >6weeks**	**Young <6 weeks**	**Adult**	**Young >6weeks**	**Young <6 weeks**
	Coverage	Coverage	Coverage	Coverage	Coverage	Coverage
A only	0	0	0	0	0	0
B only	0	0	100	50.88	37.63	100
C only	0	0	0	0	0	0
A **and** B *not* C	0	0	0	15.78	29.04	0
A **and** C *not* B	0	0		0	0	0
B **and** C *not* A	83.66	32.08	0	25.45	18.81	0
A **and** B **and** C	16.34	67.92	0	7.89	14.52	0
Neither	0	0	0	0	0	0

Reference: We used data from BDNI. We considered data of bovine slaughtered in 2009 to calculate the value. There is no bovine <- weeks slaughtered in France. There is no bovine <6 weeks included in the control program of tuberculosis (Ministry in charge of agriculture 2003).In high prevalence area the control program is annual for all bovine over 6 weeks. In low prevalence area the control program is triennial for all bovine over 6 weeks.

2.17. Pathological lesions of the heart

Probabilities of infection (=scenario prevalences, fixed values)

- Probability of a herd having cases of endocarditis/pericarditis: **6.51 %** (Nergal database, median of the proportion of endocarditis/pericarditis within herds)
- Probability of an animal having endocarditis/pericarditis, given age:

Adult (%)	Young > 6 weeks (%)	Young < 6 weeks (%)	Reference
0.48	**0.11**	**0**	Data from the Nergal Database. Proportion of cattle having endocarditis or pericarditis in abattoir in each age category (1 939 428 cattle slaughtered)

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APPENDIX 5 - RESULTS STAGE 2 MODELS

Table 1: Stratum-specific probabilities of detection for meat inspection when used to detect necrobacillosis; by ante-mortem inspection, post-mortem inspection and combined. This disease was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance, under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only, i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for ante- and post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Necrobacillosis	Ante-mortem inspection			Post-mortem inspection						Combined AM and PM inspection					
				Current			Visual-only			Current			Visual-only		
Name	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
Young <6weeks / Typical case	0.21	**0.30**	0.39	0.76	**0.85**	0.93	0.71	**0.80**	0.88	0.85	**0.89**	0.94	0.81	**0.86**	0.90
Young <6weeks / Mild case	0.00	**0.00**	0.00	0.39	**0.54**	0.68	0.27	**0.39**	0.50	0.44	**0.54**	0.64	0.31	**0.39**	0.47
Young >6 weeks / Typical case	0.19	**0.30**	0.41	0.80	**0.88**	0.95	0.77	**0.86**	0.92	0.88	**0.92**	0.96	0.86	**0.90**	0.94
Young >6 weeks / Mild case	0.00	**0.00**	0.00	0.26	**0.36**	0.45	0.18	**0.26**	0.34	0.29	**0.36**	0.43	0.21	**0.26**	0.32
Adult / Typical case	0.19	**0.30**	0.41	0.80	**0.89**	0.95	0.77	**0.86**	0.92	0.88	**0.92**	0.96	0.86	**0.90**	0.94
Adult / Mild case	0.00	**0.00**	0.00	0.38	**0.52**	0.66	0.30	**0.42**	0.54	0.42	**0.52**	0.62	0.34	**0.42**	0.51

Table 2: Stratum-specific probabilities of detection for meat inspection when used to detect enzootic bovine leukosis; by ante-mortem inspection, post-mortem inspection and combined. This disease was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the sensitivity of abattoir surveillance, under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only, i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for ante- and post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Enzootic Bovine Leukosis

	Ante-mortem inspection			Post-mortem inspection						Combined AM and PM inspection					
				Current			Visual-only			Current			Visual-only		
Risk of EBL introduction / Age / Case type	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
High risk / Young <6weeks / Typical case	0.08	**0.16**	0.24	0.35	**0.52**	0.68	0.35	**0.52**	0.68	0.49	**0.60**	0.70	0.49	**0.60**	0.70
High risk / Young <6weeks / Mild case	0.00	**0.00**	0.00	0.13	**0.25**	0.37	0.13	**0.25**	0.37	0.16	**0.25**	0.34	0.16	**0.25**	0.34
High risk / Young >6 weeks / Typical case	0.26	**0.38**	0.49	0.57	**0.71**	0.82	0.44	**0.60**	0.73	0.75	**0.82**	0.87	0.67	**0.75**	0.82
High risk / Young >6 weeks / Mild case	0.00	**0.00**	0.00	0.18	**0.38**	0.57	0.13	**0.30**	0.47	0.24	**0.38**	0.52	0.18	**0.30**	0.42
High risk / Adult / Typical case	0.29	**0.44**	0.60	0.64	**0.79**	0.91	0.59	**0.70**	0.80	0.82	**0.88**	0.93	0.78	**0.84**	0.88
High risk / Adult / Mild case	0.00	**0.00**	0.00	0.25	**0.46**	0.66	0.22	**0.39**	0.56	0.31	**0.46**	0.60	0.27	**0.39**	0.51
Low risk / Young <6weeks / Typical case	0.03	**0.11**	0.19	0.27	**0.44**	0.61	0.27	**0.44**	0.61	0.39	**0.50**	0.61	0.39	**0.50**	0.61
Low risk / Young <6weeks / Mild case	0.00	**0.00**	0.00	0.11	**0.20**	0.29	0.11	**0.20**	0.29	0.13	**0.20**	0.27	0.13	**0.20**	0.27
Low risk / Young >6 weeks / Typical case	0.20	**0.30**	0.41	0.52	**0.66**	0.79	0.39	**0.53**	0.67	0.69	**0.76**	0.83	0.60	**0.68**	0.75
Low risk / Young >6 weeks / Mild case	0.00	**0.00**	0.00	0.13	**0.29**	0.44	0.10	**0.24**	0.39	0.18	**0.29**	0.40	0.14	**0.24**	0.35
Low risk / Adult / Typical case	0.23	**0.35**	0.46	0.61	**0.75**	0.86	0.53	**0.63**	0.72	0.77	**0.84**	0.89	0.70	**0.76**	0.81
Low risk / Adult / Mild case	0.00	**0.00**	0.00	0.16	**0.32**	0.48	0.15	**0.29**	0.43	0.21	**0.32**	0.43	0.19	**0.29**	0.39

Table 3: Stratum-specific probabilities of detection for meat inspection when used to detect respiratory diseases; by ante-mortem inspection, post-mortem inspection and combined. This syndrome was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance, under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only, i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for ante- and post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Respiratory diseases

	Ante-mortem inspection			Post-mortem inspection						Combined AM and PM inspection					
				Current			Visual-only			Current			Visual-only		
Prevalence of BVDV in area / Age / Case type	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
High / Young <6weeks / Typical case	0.51	**0.59**	0.68	0.80	**0.87**	0.93	0.64	**0.76**	0.87	0.92	**0.95**	0.97	0.86	**0.90**	0.94
High / Young <6weeks / Mild case	0.08	**0.14**	0.20	0.50	**0.65**	0.79	0.31	**0.45**	0.58	0.61	**0.70**	0.79	0.45	**0.53**	0.61
High / Young >6 weeks / Typical case	0.45	**0.54**	0.63	0.81	**0.88**	0.94	0.58	**0.69**	0.79	0.92	**0.94**	0.97	0.82	**0.86**	0.90
High / Young >6 weeks / Mild case	0.05	**0.13**	0.21	0.55	**0.69**	0.82	0.36	**0.47**	0.58	0.64	**0.73**	0.81	0.46	**0.54**	0.61
High / Adult / Typical case	0.36	**0.46**	0.54	0.76	**0.84**	0.92	0.53	**0.65**	0.75	0.88	**0.91**	0.95	0.76	**0.81**	0.85
High / Adult / Mild case	0.03	**0.09**	0.16	0.49	**0.63**	0.76	0.31	**0.40**	0.50	0.57	**0.66**	0.75	0.39	**0.46**	0.53
Low / Young <6weeks / Typical case	0.48	**0.57**	0.66	0.80	**0.87**	0.93	0.63	**0.76**	0.87	0.92	**0.94**	0.96	0.85	**0.90**	0.93
Low / Young <6weeks / Mild case	0.08	**0.14**	0.20	0.47	**0.62**	0.77	0.31	**0.45**	0.58	0.58	**0.68**	0.77	0.44	**0.53**	0.61
Low / Young >6 weeks / Typical case	0.42	**0.52**	0.63	0.81	**0.88**	0.94	0.58	**0.69**	0.79	0.93	**0.96**	0.98	0.81	**0.85**	0.89
Low / Young >6 weeks / Mild case	0.05	**0.13**	0.21	0.54	**0.67**	0.81	0.36	**0.47**	0.58	0.56	**0.64**	0.71	0.46	**0.54**	0.61
Low / Adult / Typical case	0.35	**0.44**	0.53	0.76	**0.84**	0.92	0.53	**0.64**	0.75	0.88	**0.91**	0.94	0.75	**0.80**	0.85
Low / Adult / Mild case	0.03	**0.09**	0.16	0.48	**0.61**	0.74	0.31	**0.40**	0.50	0.56	**0.64**	0.73	0.39	**0.46**	0.52

Table 4: Stratum-specific probabilities of detection for meat inspection when used to detect vesicular diseases such as foot-and-mouth disease; by post-mortem inspection and combined with ante-mortem. This syndrome was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance, under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only, i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Vesicular diseases including foot-and-mouth disease	Ante-mortem inspection			Post-mortem inspection						Combined AM and PM inspection					
				Current			Visual-only			Current			Visual-only		
Frequency of introductions / Age / Case type	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
High / Young <6weeks / Typical case	0.68	**0.78**	0.88	0.76	**0.85**	0.93	0.71	**0.81**	0.90	0.95	**0.97**	0.98	0.94	**0.96**	0.98
High / Young <6weeks / Mild case	0.41	**0.56**	0.70	0.53	**0.66**	0.77	0.50	**0.61**	0.72	0.79	**0.85**	0.90	0.77	**0.83**	0.88
High / Young >6 weeks / Typical case	0.63	**0.74**	0.84	0.69	**0.79**	0.88	0.65	**0.75**	0.86	0.92	**0.94**	0.97	0.91	**0.94**	0.96
High / Young >6 weeks / Mild case	0.43	**0.57**	0.71	0.52	**0.64**	0.76	0.49	**0.62**	0.73	0.79	**0.85**	0.90	0.78	**0.84**	0.89
High / Adult / Typical case	0.63	**0.74**	0.84	0.69	**0.79**	0.88	0.65	**0.75**	0.86	0.92	**0.94**	0.97	0.91	**0.94**	0.96
High / Adult / Mild case	0.43	**0.57**	0.71	0.52	**0.64**	0.76	0.49	**0.62**	0.73	0.79	**0.85**	0.90	0.78	**0.84**	0.89
Low / Young <6weeks / Typical case	0.59	**0.70**	0.81	0.71	**0.82**	0.91	0.68	**0.79**	0.88	0.92	**0.95**	0.97	0.91	**0.94**	0.96
Low / Young <6weeks / Mild case	0.34	**0.47**	0.60	0.43	**0.56**	0.67	0.41	**0.52**	0.64	0.70	**0.76**	0.82	0.69	**0.75**	0.81
Low / Young >6 weeks / Typical case	0.57	**0.68**	0.79	0.66	**0.77**	0.87	0.63	**0.74**	0.85	0.89	**0.93**	0.95	0.88	**0.92**	0.95
Low / Young >6 weeks / Mild case	0.37	**0.50**	0.63	0.44	**0.57**	0.68	0.43	**0.55**	0.66	0.72	**0.78**	0.84	0.71	**0.77**	0.83
Low / Adult / Typical case	0.57	**0.68**	0.79	0.66	**0.77**	0.87	0.63	**0.74**	0.85	0.89	**0.93**	0.95	0.88	**0.92**	0.95
Low / Adult / Mild case	0.37	**0.50**	0.63	0.44	**0.57**	0.68	0.43	**0.55**	0.66	0.72	**0.78**	0.84	0.71	**0.77**	0.83

Table 5: Stratum-specific probabilities of detection for meat inspection when used to detect ulcerative diseases such as bluetongue; by post-mortem inspection and combined with ante-mortem. This syndrome was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Ulcerative diseases including bluetongue	Ante-mortem inspection			Post-mortem inspection						Combined AM and PM inspection					
				Current			Visual-only			Current			Visual-only		
Geographical area / Age / Case type	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
High risk / Young <6weeks / Typical case	0.52	**0.68**	0.83	0.63	**0.75**	0.87	0.43	**0.53**	0.61	0.88	**0.92**	0.96	0.79	**0.85**	0.90
High risk / Young <6weeks / Mild case	0.00	**0.00**	0.00	0.26	**0.41**	0.54	0.18	**0.27**	0.35	0.30	**0.41**	0.51	0.20	**0.27**	0.33
High risk / Young >6 weeks / Typical case	0.56	**0.72**	0.86	0.47	**0.57**	0.65	0.43	**0.53**	0.61	0.83	**0.88**	0.92	0.81	**0.87**	0.92
High risk / Young >6 weeks / Mild case	0.00	**0.00**	0.00	0.20	**0.31**	0.41	0.18	**0.27**	0.35	0.23	**0.31**	0.38	0.20	**0.27**	0.33
High risk / Adult / Typical case	0.56	**0.72**	0.86	0.47	**0.57**	0.65	0.43	**0.53**	0.61	0.83	**0.88**	0.92	0.81	**0.87**	0.92
High risk / Adult / Mild case	0.00	**0.00**	0.00	0.20	**0.31**	0.41	0.18	**0.27**	0.35	0.23	**0.31**	0.39	0.20	**0.27**	0.32
Low risk / Young <6weeks / Typical case	0.38	**0.52**	0.66	0.52	**0.65**	0.76	0.35	**0.46**	0.55	0.77	**0.83**	0.88	0.67	**0.74**	0.80
Low risk / Young <6weeks / Mild case	0.00	**0.00**	0.00	0.21	**0.36**	0.49	0.14	**0.22**	0.31	0.25	**0.35**	0.45	0.16	**0.22**	0.28
Low risk / Young >6 weeks / Typical case	0.30	**0.44**	0.58	0.39	**0.48**	0.57	0.35	**0.46**	0.55	0.65	**0.71**	0.77	0.63	**0.70**	0.76
Low risk / Young >6 weeks / Mild case	0.00	**0.00**	0.00	0.16	**0.27**	0.36	0.14	**0.23**	0.31	0.19	**0.27**	0.34	0.16	**0.23**	0.28
Low risk / Adult / Typical case	0.31	**0.44**	0.57	0.39	**0.48**	0.57	0.35	**0.46**	0.55	0.65	**0.71**	0.77	0.63	**0.70**	0.76
Low risk / Adult / Mild case	0.00	**0.00**	0.00	0.16	**0.27**	0.36	0.14	**0.22**	0.31	0.20	**0.27**	0.34	0.16	**0.22**	0.28

Table 6: Stratum-specific probabilities of detection for meat inspection when used to detect *Echinococcus granulosus*; by post-mortem inspection and combined with ante-mortem. This disease was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Echinococcosis

	Post-mortem inspection						Combined AM and PM inspection					
	Current			Visual-only			Current			Visual-only		
Name	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
High / Young >6 weeks / Typical case	0.66	**0.77**	0.86	0.53	**0.66**	0.77	0.69	**0.77**	0.83	0.57	**0.66**	0.74
High / Young >6 weeks / Mild case	0.38	**0.52**	0.64	0.23	**0.34**	0.43	0.42	**0.52**	0.61	0.26	**0.34**	0.40
High / Adult / Typical case	0.67	**0.79**	0.90	0.55	**0.68**	0.79	0.71	**0.79**	0.87	0.59	**0.68**	0.76
High / Adult / Mild case	0.39	**0.53**	0.66	0.23	**0.34**	0.45	0.43	**0.53**	0.62	0.26	**0.34**	0.42
Low / Young >6 weeks / Typical case	0.63	**0.74**	0.84	0.52	**0.65**	0.76	0.66	**0.74**	0.81	0.56	**0.65**	0.73
Low / Young >6 weeks / Mild case	0.27	**0.39**	0.51	0.16	**0.27**	0.38	0.30	**0.39**	0.48	0.19	**0.27**	0.35
Low / Adult / Typical case	0.64	**0.77**	0.88	0.54	**0.67**	0.78	0.68	**0.77**	0.85	0.58	**0.67**	0.75
Low / Adult / Mild case	0.28	**0.40**	0.52	0.16	**0.27**	0.38	0.31	**0.40**	0.49	0.19	**0.27**	0.35

Table 7: Stratum-specific probabilities of detection for meat inspection when used to detect *Cysticercus bovis*; by post-mortem inspection and combined with ante-mortem. This disease was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Cysticercosis

	Post-mortem inspection						Combined AM and PM inspection					
	Current			Visual-only			Current			Visual-only		
Age / Case type	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
Young >6 weeks / Typical case	0.47	**0.59**	0.71	0.17	**0.24**	0.31	0.50	**0.58**	0.67	0.18	**0.24**	0.29
Young >6 weeks / Mild case	0.18	**0.29**	0.40	0.01	**0.05**	0.08	0.21	**0.29**	0.37	0.02	**0.05**	0.07
Adult / Typical case	0.47	**0.59**	0.71	0.17	**0.23**	0.31	0.50	**0.59**	0.67	0.19	**0.24**	0.29
Adult / Mild case	0.18	**0.29**	0.40	0.01	**0.05**	0.08	0.21	**0.29**	0.37	0.02	**0.05**	0.07

Table 8: Stratum-specific probabilities of detection for meat inspection when used to detect *Fasciola hepatica*; by post-mortem inspection and combined with ante-mortem. This disease was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Fascioliasis

	Post-mortem inspection						Combined AM and PM inspection					
	Current			Visual-only			Current			Visual-only		
Prevalence in area / Age / Case type	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
High / Young <6weeks / Typical case	0.43	**0.53**	0.62	0.33	**0.47**	0.59	0.46	**0.53**	0.60	0.38	**0.47**	0.56
High / Young <6weeks / Mild case	0.27	**0.36**	0.45	0.17	**0.26**	0.34	0.30	**0.36**	0.42	0.20	**0.26**	0.31
High / Young >6 weeks / Typical case	0.67	**0.78**	0.88	0.48	**0.62**	0.75	0.71	**0.78**	0.85	0.52	**0.62**	0.72
High / Young >6 weeks / Mild case	0.52	**0.64**	0.75	0.35	**0.44**	0.52	0.56	**0.64**	0.72	0.38	**0.44**	0.50
High / Adult / Typical case	0.67	**0.78**	0.88	0.48	**0.62**	0.75	0.71	**0.78**	0.85	0.52	**0.62**	0.72
High / Adult / Mild case	0.52	**0.64**	0.75	0.35	**0.44**	0.52	0.56	**0.64**	0.72	0.38	**0.44**	0.50
Low / Young <6weeks / Typical case	0.40	**0.51**	0.60	0.28	**0.41**	0.52	0.44	**0.51**	0.57	0.32	**0.41**	0.49
Low / Young <6weeks / Mild case	0.21	**0.30**	0.39	0.09	**0.15**	0.20	0.23	**0.30**	0.37	0.11	**0.15**	0.19
Low / Young >6 weeks / Typical case	0.62	**0.74**	0.85	0.43	**0.56**	0.68	0.66	**0.74**	0.82	0.47	**0.56**	0.65
Low / Young >6 weeks / Mild case	0.45	**0.56**	0.67	0.28	**0.34**	0.41	0.48	**0.56**	0.64	0.30	**0.34**	0.39
Low / Adult / Typical case	0.62	**0.74**	0.85	0.43	**0.56**	0.68	0.66	**0.74**	0.82	0.47	**0.56**	0.65
Low / Adult / Mild case	0.45	**0.56**	0.67	0.28	**0.34**	0.41	0.48	**0.56**	0.64	0.30	**0.34**	0.39

Table 9: Stratum-specific probabilities of detection for meat inspection when used to detect foot and leg disorders; by ante-mortem inspection. post-mortem inspection and combined. This welfare condition was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for ante- and post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Foot and leg disorders

	Ante-mortem inspection			Post-mortem inspection						Combined AM and PM inspection					
				Current			Visual-only			Current			Visual-only		
Production type / Age / Case type	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
Dairy / Young <6weeks / Typical case	0.33	**0.44**	0.53	0.40	**0.53**	0.65	0.40	**0.53**	0.65	0.68	**0.74**	0.79	0.67	**0.74**	0.79
Dairy / Young <6weeks / Mild case	0.17	**0.23**	0.30	0.28	**0.40**	0.52	0.28	**0.40**	0.52	0.47	**0.54**	0.61	0.46	**0.54**	0.61
Dairy / Young >6 weeks / Typical case	0.47	**0.57**	0.66	0.55	**0.66**	0.75	0.55	**0.66**	0.75	0.81	**0.85**	0.89	0.81	**0.85**	0.89
Dairy / Young >6 weeks / Mild case	0.20	**0.29**	0.38	0.31	**0.43**	0.55	0.31	**0.43**	0.55	0.52	**0.60**	0.67	0.52	**0.60**	0.67
Dairy / Adult / Typical case	0.47	**0.56**	0.64	0.55	**0.66**	0.75	0.55	**0.66**	0.75	0.81	**0.85**	0.89	0.81	**0.85**	0.89
Dairy / Adult / Mild case	0.18	**0.27**	0.35	0.31	**0.43**	0.55	0.31	**0.43**	0.55	0.51	**0.58**	0.65	0.51	**0.58**	0.65
Beef / Young <6weeks / Typical case	0.33	**0.44**	0.53	0.40	**0.53**	0.65	0.40	**0.53**	0.65	0.67	**0.74**	0.79	0.68	**0.74**	0.79
Beef / Young <6weeks / Mild case	0.17	**0.23**	0.30	0.25	**0.37**	0.50	0.25	**0.37**	0.50	0.44	**0.51**	0.59	0.44	**0.51**	0.59
Beef / Young >6 weeks / Typical case	0.44	**0.54**	0.63	0.55	**0.66**	0.75	0.55	**0.66**	0.75	0.80	**0.84**	0.88	0.80	**0.84**	0.88
Beef / Young >6 weeks / Mild case	0.18	**0.27**	0.35	0.29	**0.41**	0.54	0.29	**0.41**	0.54	0.49	**0.57**	0.64	0.50	**0.57**	0.64
Beef / Adult / Typical case	0.44	**0.54**	0.63	0.55	**0.66**	0.75	0.55	**0.66**	0.75	0.80	**0.84**	0.88	0.80	**0.84**	0.88
Beef / Adult / Mild case	0.18	**0.27**	0.35	0.29	**0.41**	0.54	0.29	**0.41**	0.54	0.50	**0.57**	0.64	0.50	**0.57**	0.64

Table 10: Stratum-specific probabilities of detection for meat inspection when used to detect thin cattle; by ante-mortem inspection. post-mortem inspection and combined. This welfare condition was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for ante- and post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Low body condition score	Ante-mortem inspection			Post-mortem inspection						Combined AM and PM inspection					
				Current			Visual-only			Current			Visual-only		
Production type / Age	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
Dairy / Young <6weeks	0.47	**0.56**	0.65	0.66	**0.73**	0.79	0.64	**0.72**	0.80	0.85	**0.88**	0.91	0.85	**0.88**	0.91
Dairy / Young >6 weeks	0.50	**0.58**	0.64	0.79	**0.84**	0.89	0.76	**0.83**	0.90	0.91	**0.93**	0.95	0.91	**0.93**	0.95
Dairy / Adult	0.51	**0.59**	0.67	0.79	**0.84**	0.89	0.76	**0.83**	0.90	0.92	**0.93**	0.95	0.91	**0.93**	0.95
Beef / Young <6weeks	0.45	**0.53**	0.59	0.66	**0.73**	0.79	0.64	**0.72**	0.80	0.84	**0.87**	0.89	0.84	**0.87**	0.90
Beef / Young >6 weeks	0.60	**0.65**	0.71	0.81	**0.87**	0.92	0.79	**0.86**	0.92	0.94	**0.95**	0.97	0.93	**0.95**	0.97
Beef / Adult	0.61	**0.67**	0.72	0.81	**0.87**	0.92	0.79	**0.85**	0.92	0.94	**0.96**	0.97	0.94	**0.95**	0.97

Table 11: Stratum-specific probabilities of detection for meat inspection when used to detect cattle with fractured limbs; by ante-mortem inspection. post-mortem inspection and combined. This welfare condition was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for ante- and post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Fractured limb	Ante-mortem inspection			Post-mortem inspection						Combined AM and PM inspection					
				Current			Visual-only			Current			Visual-only		
Duration of transport / Age	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
Long / Young <6weeks	0.79	**0.86**	0.93	0.92	**0.95**	0.98	0.90	**0.94**	0.98	0.99	**0.99**	1.00	0.99	**0.99**	1.00
Long / Young >6 weeks	0.81	**0.88**	0.93	0.94	**0.96**	0.98	0.93	**0.96**	0.99	0.99	**1.00**	1.00	0.99	**0.99**	1.00
Long / Adult	0.79	**0.87**	0.93	0.94	**0.96**	0.98	0.93	**0.96**	0.99	0.99	**0.99**	1.00	0.99	**0.99**	1.00
Short / Young <6weeks	0.77	**0.86**	0.94	0.92	**0.95**	0.98	0.90	**0.94**	0.98	0.99	**0.99**	1.00	0.99	**0.99**	1.00
Short / Young >6 weeks	0.78	**0.85**	0.92	0.94	**0.96**	0.98	0.93	**0.96**	0.99	0.99	**0.99**	1.00	0.99	**0.99**	1.00
Short / Adult	0.79	**0.87**	0.93	0.94	**0.96**	0.98	0.93	**0.96**	0.99	0.99	**0.99**	1.00	0.99	**0.99**	1.00

Table 12: Stratum-specific probabilities of detection for meat inspection when used to detect dirty cattle; by ante-mortem inspection and combined. This welfare condition was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for ante- and post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Cleanliness score	Ante-mortem inspection			Combined AM and PM inspection					
				Current			Visual-only		
Production type / Age	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
Dairy / Young <6weeks	0.75	**0.84**	0.93	0.77	**0.84**	0.90	0.77	**0.84**	0.90
Dairy / Young >6 weeks	0.80	**0.88**	0.95	0.82	**0.88**	0.93	0.82	**0.88**	0.93
Dairy / Adult	0.80	**0.88**	0.95	0.82	**0.88**	0.93	0.82	**0.88**	0.93
Beef / Young <6weeks	0.75	**0.84**	0.93	0.77	**0.84**	0.90	0.77	**0.84**	0.90
Beef / Young >6 weeks	0.76	**0.84**	0.92	0.78	**0.84**	0.89	0.79	**0.84**	0.89
Beef / Adult / Typical case	0.76	**0.84**	0.92	0.79	**0.84**	0.89	0.78	**0.84**	0.89

Table 13: Stratum-specific probabilities of detection for meat inspection when used to detect cattle with integument alterations; by ante-mortem inspection and combined. This welfare condition was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for ante- and post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Integument alterations	Ante-mortem inspection			Combined AM and PM inspection					
				Current			Visual-only		
Production system / Age / Case type	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
Dairy / Young <6weeks / Typical case	0.41	**0.53**	0.64	0.44	**0.53**	0.61	0.44	**0.53**	0.61
Dairy / Young <6weeks / Mild case	0.10	**0.22**	0.34	0.14	**0.22**	0.31	0.14	**0.22**	0.31
Dairy / Young >6 weeks / Typical case	0.52	**0.63**	0.73	0.55	**0.63**	0.70	0.55	**0.62**	0.70
Dairy / Young >6 weeks / Mild case	0.07	**0.18**	0.29	0.11	**0.18**	0.26	0.10	**0.18**	0.26
Dairy / Adult / Typical case	0.52	**0.63**	0.73	0.55	**0.63**	0.70	0.55	**0.63**	0.70
Dairy / Adult / Mild case	0.07	**0.18**	0.29	0.11	**0.18**	0.25	0.10	**0.18**	0.26
Beef / Young <6weeks / Typical case	0.41	**0.52**	0.64	0.44	**0.52**	0.60	0.44	**0.52**	0.61
Beef / Young <6weeks / Mild case	0.10	**0.22**	0.34	0.14	**0.22**	0.31	0.14	**0.22**	0.31
Beef / Young >6 weeks / Typical case	0.52	**0.63**	0.73	0.55	**0.62**	0.70	0.55	**0.63**	0.70
Beef / Young >6 weeks / Mild case	0.06	**0.16**	0.26	0.09	**0.16**	0.23	0.09	**0.16**	0.23
Beef / Adult / Typical case	0.52	**0.62**	0.73	0.55	**0.63**	0.70	0.55	**0.62**	0.70
Beef / Adult / Mild case	0.06	**0.16**	0.26	0.09	**0.16**	0.23	0.09	**0.16**	0.23

Table 14: Stratum-specific probabilities of detection for meat inspection when used to detect cattle with bruising and injury-related haemorrhage; by ante-mortem inspection, post-mortem inspection and combined. This welfare condition was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for ante- and post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Brusing and injury-related haemorrhage	Ante-mortem inspection			Post-mortem inspection						Combined AM and PM inspection					
				Current			Visual-only			Current			Visual-only		
Duration of transport / Age / Case type	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
Long / Young <6weeks / Typical case	0.62	**0.78**	0.93	0.80	**0.89**	0.97	0.81	**0.89**	0.97	0.95	**0.98**	0.99	0.96	**0.98**	0.99
Long / Young <6weeks / Mild case	0.00	**0.00**	0.00	0.62	**0.72**	0.82	0.62	**0.72**	0.82	0.64	**0.72**	0.79	0.64	**0.72**	0.79
Long / Young >6 weeks / Typical case	0.62	**0.78**	0.93	0.80	**0.89**	0.97	0.81	**0.90**	0.97	0.96	**0.98**	0.99	0.96	**0.98**	0.99
Long / Young >6 weeks / Mild case	0.00	**0.00**	0.00	0.47	**0.56**	0.65	0.47	**0.56**	0.65	0.49	**0.56**	0.63	0.49	**0.56**	0.63
Long / Adult / Typical case	0.62	**0.78**	0.93	0.80	**0.89**	0.97	0.81	**0.90**	0.97	0.96	**0.98**	0.99	0.96	**0.98**	0.99
Long / Adult / Mild case	0.00	**0.00**	0.00	0.47	**0.56**	0.65	0.47	**0.56**	0.65	0.49	**0.56**	0.63	0.49	**0.56**	0.63
Short / Young <6weeks / Typical case	0.62	**0.78**	0.93	0.77	**0.87**	0.96	0.78	**0.88**	0.96	0.95	**0.97**	0.99	0.95	**0.97**	0.99
Short / Young <6weeks / Mild case	0.00	**0.00**	0.00	0.60	**0.71**	0.82	0.60	**0.71**	0.82	0.63	**0.71**	0.79	0.63	**0.71**	0.79
Short / Young >6 weeks / Typical case	0.62	**0.78**	0.93	0.78	**0.88**	0.96	0.79	**0.88**	0.97	0.95	**0.97**	0.99	0.95	**0.97**	0.99
Short / Young >6 weeks / Mild case	0.00	**0.00**	0.00	0.46	**0.56**	0.65	0.46	**0.56**	0.65	0.49	**0.56**	0.63	0.49	**0.56**	0.63
Short / Adult / Typical case	0.62	**0.78**	0.93	0.78	**0.88**	0.96	0.79	**0.88**	0.97	0.95	**0.97**	0.99	0.95	**0.97**	0.99
Short / Adult / Mild case	0.00	**0.00**	0.00	0.46	**0.56**	0.65	0.46	**0.56**	0.65	0.49	**0.56**	0.63	0.49	**0.56**	0.63

Table 15: Stratum-specific probabilities of detection for meat inspection when used to detect cattle that have developed DFD (Dark-Firm-Dry) meat; by ante-mortem inspection. post-mortem inspection and combined. This welfare condition was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for ante- and post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

DFD meat

	Post-mortem inspection						Combined AM and PM inspection					
	Current			Visual-only			Current			Visual-only		
Duration of transport / Age / Case type	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
Long / Young <6weeks / Typical case	0.33	**0.44**	0.55	0.23	**0.31**	0.39	0.36	**0.44**	0.52	0.26	**0.31**	0.36
Long / Young <6weeks / Mild case	0.10	**0.18**	0.26	0.07	**0.13**	0.19	0.12	**0.18**	0.23	0.09	**0.13**	0.17
Long / Young >6 weeks / Typical case	0.45	**0.56**	0.67	0.45	**0.57**	0.69	0.48	**0.56**	0.64	0.49	**0.57**	0.66
Long / Young >6 weeks / Mild case	0.09	**0.18**	0.27	0.10	**0.20**	0.29	0.11	**0.18**	0.25	0.12	**0.20**	0.27
Long / Adult / Typical case	0.45	**0.56**	0.67	0.45	**0.57**	0.69	0.48	**0.56**	0.64	0.49	**0.57**	0.66
Long / Adult / Mild case	0.09	**0.18**	0.27	0.10	**0.20**	0.29	0.11	**0.18**	0.25	0.13	**0.20**	0.27
Short / Young <6weeks / Typical case	0.33	**0.44**	0.55	0.23	**0.31**	0.39	0.36	**0.44**	0.52	0.26	**0.31**	0.36
Short / Young <6weeks / Mild case	0.10	**0.18**	0.26	0.07	**0.13**	0.19	0.12	**0.18**	0.23	0.09	**0.13**	0.17
Short / Young >6 weeks / Typical case	0.45	**0.56**	0.67	0.45	**0.57**	0.69	0.48	**0.56**	0.64	0.49	**0.57**	0.66
Short / Young >6 weeks / Mild case	0.09	**0.18**	0.27	0.10	**0.20**	0.29	0.11	**0.18**	0.25	0.13	**0.20**	0.27
Short / Adult / Typical case	0.45	**0.56**	0.67	0.45	**0.57**	0.69	0.48	**0.56**	0.64	0.49	**0.57**	0.66
Short / Adult / Mild case	0.09	**0.18**	0.27	0.10	**0.20**	0.29	0.11	**0.18**	0.25	0.13	**0.20**	0.27

Table 16: Stratum-specific probabilities of detection for meat inspection when used to detect granuloma indicative of bovine tuberculosis; by ante-mortem inspection. post-mortem inspection and combined. This disease was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for ante- and post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Granuloma / Bovine tuberculosis	Post-mortem inspection						Combined AM and PM inspection					
	Current			Visual-only			Current			Visual-only		
Prevalence in area / Age / Case type	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
High / Young <6weeks / Typical case	0.69	**0.78**	0.87	0.12	**0.28**	0.43	0.72	**0.78**	0.84	0.17	**0.28**	0.39
High / Young <6weeks / Mild case	0.42	**0.55**	0.69	0.01	**0.08**	0.18	0.46	**0.55**	0.65	0.03	**0.08**	0.15
High / Young >6 weeks / Typical case	0.73	**0.82**	0.91	0.12	**0.28**	0.43	0.76	**0.82**	0.89	0.17	**0.28**	0.39
High / Young >6 weeks / Mild case	0.54	**0.66**	0.77	0.01	**0.08**	0.18	0.57	**0.66**	0.74	0.03	**0.08**	0.15
High / Adult / Typical case	0.73	**0.82**	0.91	0.12	**0.28**	0.43	0.76	**0.82**	0.88	0.17	**0.28**	0.39
High / Adult / Mild case	0.54	**0.65**	0.77	0.01	**0.08**	0.18	0.57	**0.66**	0.74	0.03	**0.08**	0.15
Low / Young <6weeks / Typical case	0.59	**0.70**	0.80	0.07	**0.22**	0.38	0.62	**0.70**	0.77	0.11	**0.22**	0.33
Low / Young <6weeks / Mild case	0.35	**0.47**	0.59	0.02	**0.07**	0.13	0.38	**0.47**	0.56	0.03	**0.07**	0.11
Low / Young >6 weeks / Typical case	0.65	**0.76**	0.86	0.07	**0.22**	0.38	0.68	**0.76**	0.83	0.11	**0.22**	0.33
Low / Young >6 weeks / Mild case	0.36	**0.47**	0.58	0.02	**0.07**	0.13	0.39	**0.47**	0.55	0.03	**0.07**	0.11
Low / Adult / Typical case	0.65	**0.76**	0.86	0.07	**0.22**	0.38	0.68	**0.76**	0.83	0.11	**0.22**	0.33
Low / Adult / Mild case	0.36	**0.47**	0.58	0.02	**0.07**	0.13	0.39	**0.47**	0.55	0.03	**0.07**	0.11

Table 17: Stratum-specific probabilities of detection for meat inspection when used to detect pathological lesions in the heart; by ante-mortem inspection. post-mortem inspection and combined. This syndrome was selected by a working group under EFSAs Animal Health and Welfare Panel for the assessment of the case-finding capacity of abattoir surveillance. under the current system (in line with European legislation) and with a system based on meat inspection by visual examination only. i.e. where incision and palpation tasks are removed. The estimated probabilities of detection for ante- and post-mortem inspection are model inputs derived through elicitation of expert opinion and the combined estimates were derived as outputs from scenario-tree models.

Pathological lesions in the heart	Ante-mortem inspection			Post-mortem inspection						Combined AM and PM inspection					
				Current			Visual-only			Current			Visual-only		
Age / Case type	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%	5%	**Mode**	95%
Young <6weeks / Typical case	0.13	**0.31**	0.43	0.74	**0.85**	0.92	0.74	**0.85**	0.92	0.83	**0.88**	0.93	0.83	**0.88**	0.93
Young <6weeks / Mild case	0.00	**0.00**	0.00	0.55	**0.66**	0.78	0.55	**0.67**	0.78	0.58	**0.67**	0.75	0.58	**0.67**	0.75
Young >6 weeks / Typical case	0.07	**0.19**	0.29	0.80	**0.89**	0.94	0.78	**0.86**	0.93	0.86	**0.90**	0.94	0.84	**0.89**	0.93
Young >6 weeks / Mild case	0.00	**0.00**	0.00	0.65	**0.75**	0.84	0.64	**0.74**	0.83	0.68	**0.73**	0.81	0.66	**0.74**	0.80
Adult / Typical case	0.07	**0.18**	0.29	0.78	**0.86**	0.93	0.78	**0.86**	0.93	0.89	**0.92**	0.96	0.89	**0.93**	0.96
Adult / Mild case	0.00	**0.00**	0.00	0.64	**0.74**	0.83	0.64	**0.74**	0.83	0.58	**0.65**	0.71	0.58	**0.65**	0.71

GLOSSARY AND ABBREVIATIONS

abattoir surveillance	: surveillance by meat inspection in abattoirs
AHAW	: Animal Health and Animal Welfare
AM	: Ante-Mortem
Anses	: French Agency for Food, Environmental and Occupational Health and Safety
bTB	: Bovine tuberculosis
case-finding capacity	: characteristic of a surveillance system for endemic disease, describing the ability of the system to identify infected or affected herds or individuals, so that a control action can (potentially) be taken. The detection fraction is a measure of the case-finding capacity.
clinical surveillance	: surveillance based on clinical observations in the field.
component sensitivity	: the probability that one or more infected animals will be detected by the surveillance component during a specified time period, given that the disease is present at a level defined by the design prevalence.
coverage	: the proportion of the population covered by the surveillance activity in question during a specified time period. Stratum-specific coverage refers to coverage by subgroup in the population, see stratum.
detection fraction	: the proportion of infected or affected units that are successfully detected by the surveillance system.
EFSA	: European Food Safety Authority
EU	: European Union
PHR	: Public health risk
PM	: Post-Mortem
RVC	: Royal Veterinary College

stratum	: subgroup in the population defined by different levels of herd- and animal level risk factors and detection categories, for example “Dairy herd / Adult animal / Typical case”
SVA	: National Veterinary Institute, Sweden
WG	: Working Group