



# PUBLISHED SCIENTIFIC OPINIONS

- **Modernisation of meat inspection** (2011 – 2013)
  - EFSA publishes **six scientific opinions** on public hazards linked to meat inspection.
  - Considering domestic swine, poultry, bovine, domestic sheep and goats, farmed game and domestic solipeds.
  - EFSA ranks hazards and recommends possible improvements or alternative methods for meat inspection at EU level.



- **Delayed meat inspection** (2020)
  - EFSA evaluates the potential effects of delayed post-mortem inspection of **ungulates** on public health and monitoring of animal health and welfare.



# Modernisation of meat inspection in the EU



# TERMS OF REFERENCE

- Identify and **rank main public health (PH) risks** addressed by meat inspection
- Assess **strengths and weaknesses** of the current methodology and recommend alternative methods
- Recommend **additional inspection methods** in case other previously not considered hazards have been identified
- Recommend possible **alternative methods** and adaptations of inspection methods that provide an equivalent level of protection

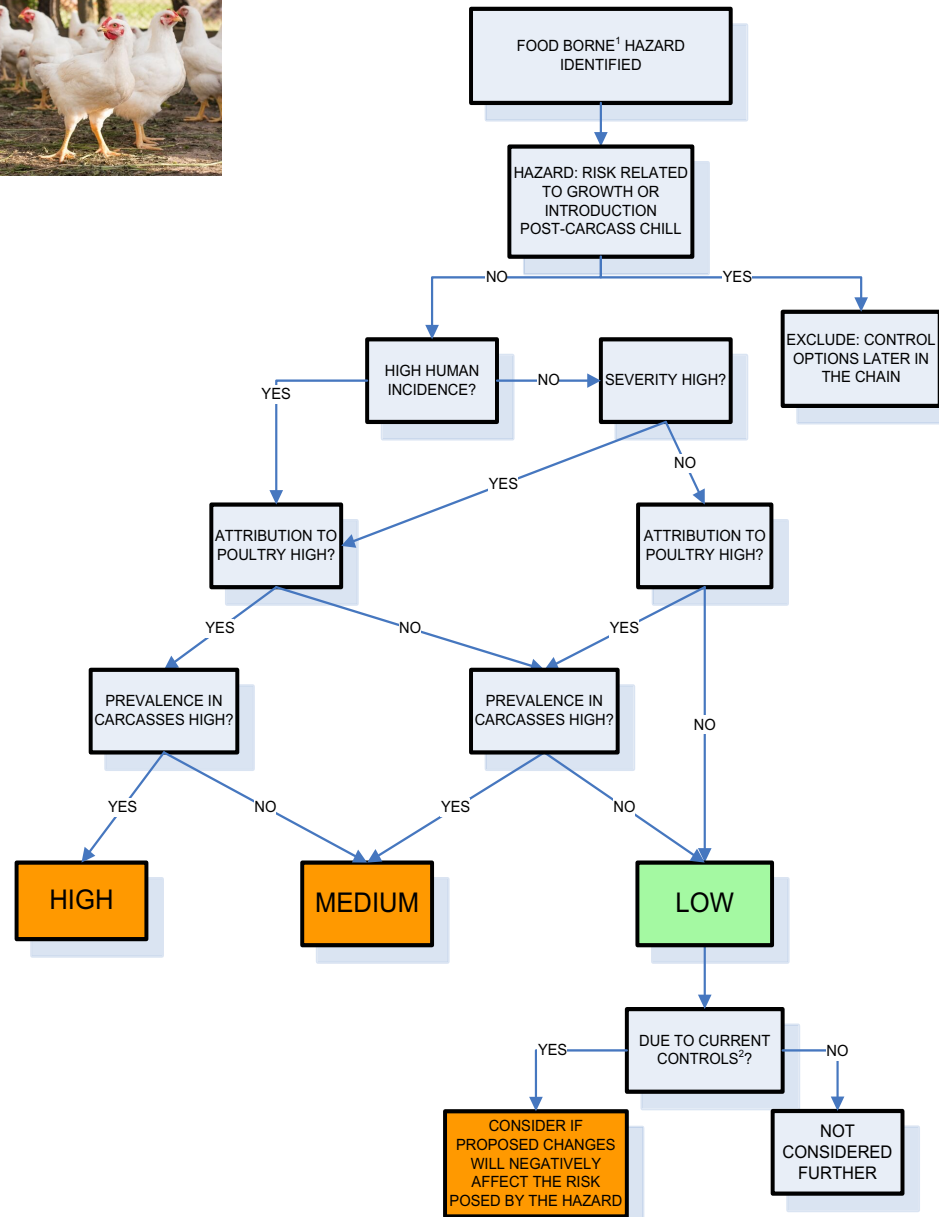


# APPROACH TAKEN BY BIOHAZ PANEL

(not showing assessments from AHAW and CONTAM Panels)

- Hazards were ranked qualitatively using **a decision tree**, based on:
  - incidence and severity in humans,
  - prevalence on carcasses,
  - meat from these species as a risk factor for human disease
- **Resulting in a shortlist of hazards**
- Following an assessment of current methods of meat inspection, alternatives/improvements were recommended





# Decision tree for risk ranking

<sup>1</sup> Risk of infection through handling, preparation or consumption of poultry meat.

<sup>2</sup> Current controls: any hazard-specific control measures implemented at farm and/or slaughterhouse level before chilling of the carcasses.



Species	Main biological hazards
Swine	<i>Salmonella</i> , <i>Toxoplasma</i> , <i>Trichinella</i> and <i>Yersinia</i>
Poultry	<i>Campylobacter</i> , <i>Salmonella</i> , ESBL-AmpC <sup>1</sup> carrying <i>Escherichia coli</i> and <i>Salmonella</i>
Cattle	Verocytotoxin-producing <i>E. coli</i> (VTEC), <i>Salmonella</i>
Sheep and goats	VTEC, <i>Toxoplasma</i>
Solipeds	<i>Trichinella</i>
Farmed game (Deer)	<i>Toxoplasma</i>
Farmed game (Wild boar)	<i>Salmonella</i> , <i>Toxoplasma</i>
Farmed game (Reindeer, rabbits and ostriches)	None



## STRENGTHS & WEAKNESSES OF CURRENT MEAT INSPECTION?

- Food chain information (FCI) provides information on disease occurrence and veterinary treatments, enabling a **focused inspection** of animals with problems;
- *Ante-mortem* inspection allows the detection of observable **abnormalities** and of animals **heavily contaminated with faeces**;
- *Post-mortem* inspection enables the detection of **carcass faecal contamination**, which is an indicator of slaughter hygiene.

- **The use FCI for food safety purposes is limited** because the data that it contains is very general and does not address specific hazards of public health importance;
- Current *ante-* or *post-mortem* visual inspection are **not able to detect any of the public health hazards identified as the main concerns** for food safety;
- Palpation and incision techniques used during *post-mortem* inspection can cause **bacterial cross-contamination**.





## SELECTED CONCLUSIONS ON HAZARDS CURRENTLY NOT COVERED BY MEAT INSPECTION

- To ensure effective control of the hazards of relevance, **a comprehensive meat safety assurance**, combining measures applied on-farm and at-abattoir, is necessary.
- A prerequisite for this system is **setting targets** for these hazards to be achieved by food business operators at carcass level.
- To meet these targets, a variety of **control options** for the main hazards are available, at both farm and abattoir level.

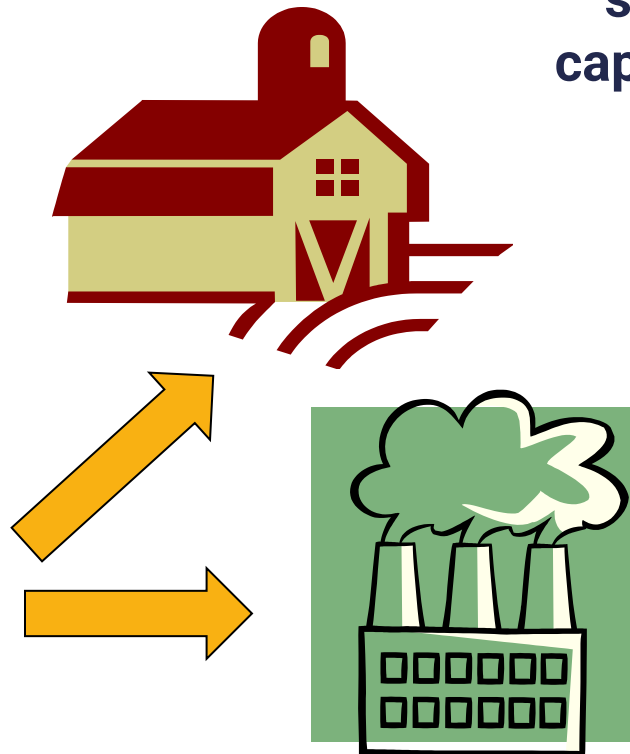


# INTEGRATED MEAT SAFETY ASSURANCE SYSTEM

**1. Risk-Categorisation of batches/herds/flocks /farms for the main hazards:** based on on-farm indicators and FCI

**2. Risk-Categorisation of slaughterhouses according to their capacity to control the hazard:** based on data from process hygiene assessments, HACCP

**3. Control measures both on farm and at the slaughterhouse**



# REVISION OF REGULATION (EC) NO 854/2004

8.3.2014

EN

Official Journal of the European Union

L 69/99

## COMMISSION REGULATION (EU) No 219/2014

of 7 March 2014

**amending Annex I to Regulation (EC) No 854/2004 of the European Parliament and of the Council as regards the specific requirements for post-mortem inspection of domestic swine**

**(Text with EEA relevance)**

- (5) In view of the EFSA Opinion, it is appropriate to amend the specific requirements for the post-mortem inspection of domestic swine set out in Part B of Chapter IV of Section IV of Annex I to Regulation (EC) No 854/2004.
- (6) Where the epidemiological or other data from the holding of provenance of the animals, the food chain information or the findings of ante-mortem inspection or post-mortem visual detection of relevant abnormalities indicate possible risks to public health, animal health or animal welfare, the official veterinarian should have the possibility to decide which palpations and incisions must be carried out during post-mortem inspection in order to decide if the meat is fit for human consumption.





# EVALUATION OF PUBLIC AND ANIMAL HEALTH RISKS IN CASE OF A DELAYED POST-MORTEM INSPECTION IN UNGULATES

#OpenEFSA



# BACKGROUND

- Revised meat inspection procedures took into account the BIOHAZ Panel Opinions on public health hazards to be covered by inspection

Requests have been made for the possibility to delay post-mortem inspection (PMI)

- Carrying out PMI of animals **slaughtered on the day before** when ante-mortem inspection has been carried out on the animals slaughtered that day;
- Carrying out PMI on wild game in **game-handling** establishment **after the weekend** on carcasses arriving on Friday evening or Saturday.
- Obligation remains of chilling immediately after slaughter



# TERMS OF REFERENCE

- EFSA is asked to assess the effectiveness of PMI (in terms of **its sensitivity in detecting the diseases/conditions** listed below) when carried in both the following delays:
  - a) up to **24 hours** after slaughter or arrival in the game-handling establishment, or
  - b) up to **72 hours** after slaughter or arrival in the game-handling establishment,
- **in comparison** to when it is carried out immediately after slaughter or arrival in the game handling establishment.



# TERMS OF REFERENCE

- Animal diseases Art. 5 Reg (EU) 2016/429 in all ungulates
- Septicaemia, pyaemia, toxaemia, viraemia in all ungulates
- Cysticercosis in domestic bovine animals and Suidae
- Glanders in solipeds
- Tuberculoid lesions in all ungulates
- *Brucella* in all ungulates
- *Trichinella* in Suidae and solipeds
- TSEs in cattle, sheep, goats and cervids
- *Salmonella* spp. (PHC on carcasses) in all ungulates
- Chemical residues and contaminants in all ungulates

AHAW

BIOHAZ

CONTAM



# DATA AND METHODOLOGY

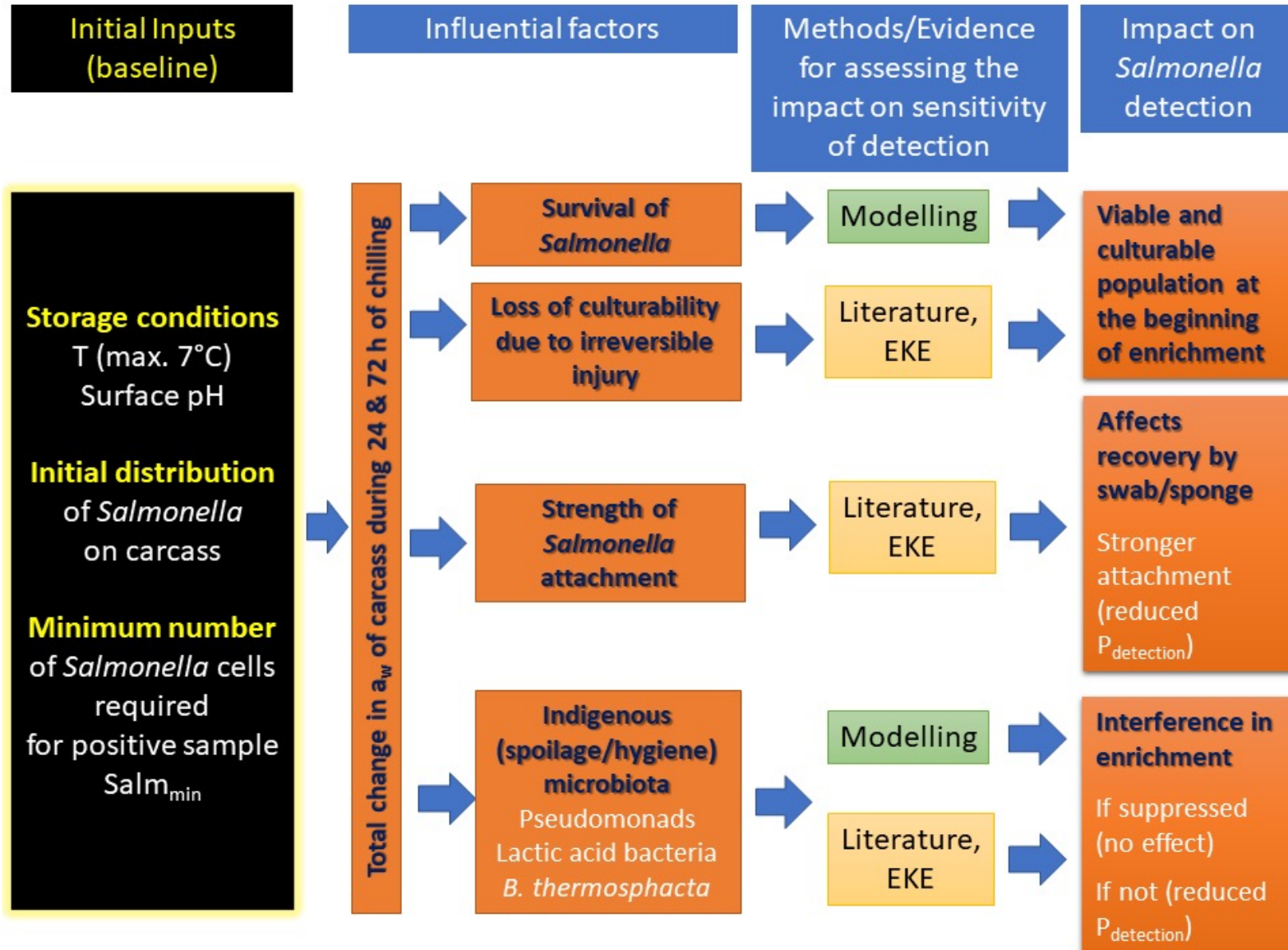
- Literature search
- Disease map: summary table with main lesions
- Lesion map: connecting animal species with organs with lesions and corresponding disease
- Questionnaire meat inspectors and reference laboratories (bTB)
- Predictive model for *Salmonella*
- Expert knowledge elicitation (EKE) to assess uncertainty

	B	C	D	E
	organ	lesion	disease	Notes
1				
2	lymph nodes	enlargement	anthrax	
3	lymph nodes	enlargement	anthrax (asymptomatic)	
4	general condition	generalised septicaemia	anthrax (clinical)	Detection on farm or AMI
5	mouth	hemorrhages	anthrax (clinical)	Detection on farm or AMI
6	head	hemorrhages (nose)	anthrax (clinical)	Detection on farm or AMI
7	spleen	enlargement with a 'blackberry	anthrax (clinical - sudden death)	Detection on farm or AMI
8	CNS	necrosis	Aujeszky	Not detectable at PMI
9	spleen	necrosis	Aujeszky	
10	liver	necrosis	Aujeszky	
11	lungs	necrosis	Aujeszky	
12	lymph nodes	swelling	Aujeszky	
13	lymph nodes	haemorrhages	Aujeszky	
14	generalized	necrosis (multifocal)	Aujeszky	
15	respiratory tract (upper)	necrosis	Aujeszky	
16	tonsils	inflammation (necrotic)	Aujeszky	
17	lungs	oedema	bluetongue (clinical form)	
18	lungs	haemorrhages (base of	bluetongue (clinical form)	
19	thoracic cavity	hyperaemia	bluetongue (clinical form)	
20	thoracic cavity	liquid (pleural effusion) fibrin	bluetongue (acute phase)	
21	head	oedema of the face, eyelids and	bluetongue (clinical form)	Detection on farm or AMI
22	mucous membranes	hemorrhages and erosions	bluetongue (clinical form)	
23	mouth	tongue (hyperhaemia, oedema,	bluetongue (clinical form)	Detection on farm or AMI
24	muscles, general appearance	severe muscle degeneration	bluetongue (clinical form)	
25	pericardium	hemorrhages and/or fibrin	bluetongue (acute phase)	
26	pericardium	hyperaemia	bluetongue (clinical form)	
27	none	none	bluetongue (asymptomatic)	No lesions detectable at PM
28	none	none	bovine genital campylobacteriosis	No lesions detectable at PM
29	muscles, general appearance	arthritis, bursitis	brucellosis	Detection on farm or AMI
30	muscles, general appearance	arthritis, bursitis	brucellosis	Detection on farm or AMI
31	muscles, general appearance	arthritis, bursitis	brucellosis	Detection on farm or AMI
32	reproductive tract	orchitis	brucellosis	
33	reproductive tract	vaginal discharges	brucellosis	
34	reproductive tract	orchitis	brucellosis	
35	reproductive tract	vaginal discharges	brucellosis	
36	none	none	brucellosis (inapparent form)	No lesions detectable at PM
37	lungs	pneumonia - interstitial	BVD	
38	lungs	alveolar necrosis/haemorrhage	BVD	
39	lungs/pleura	pleuropneumonia - fibrinous	BVD	
40	nasal cavity/muzzle	erosions/ucérations/necrosis	BVD	
41	oral cavity	erosions/ucérations/necrosis	BVD	





# SALMONELLA MODEL



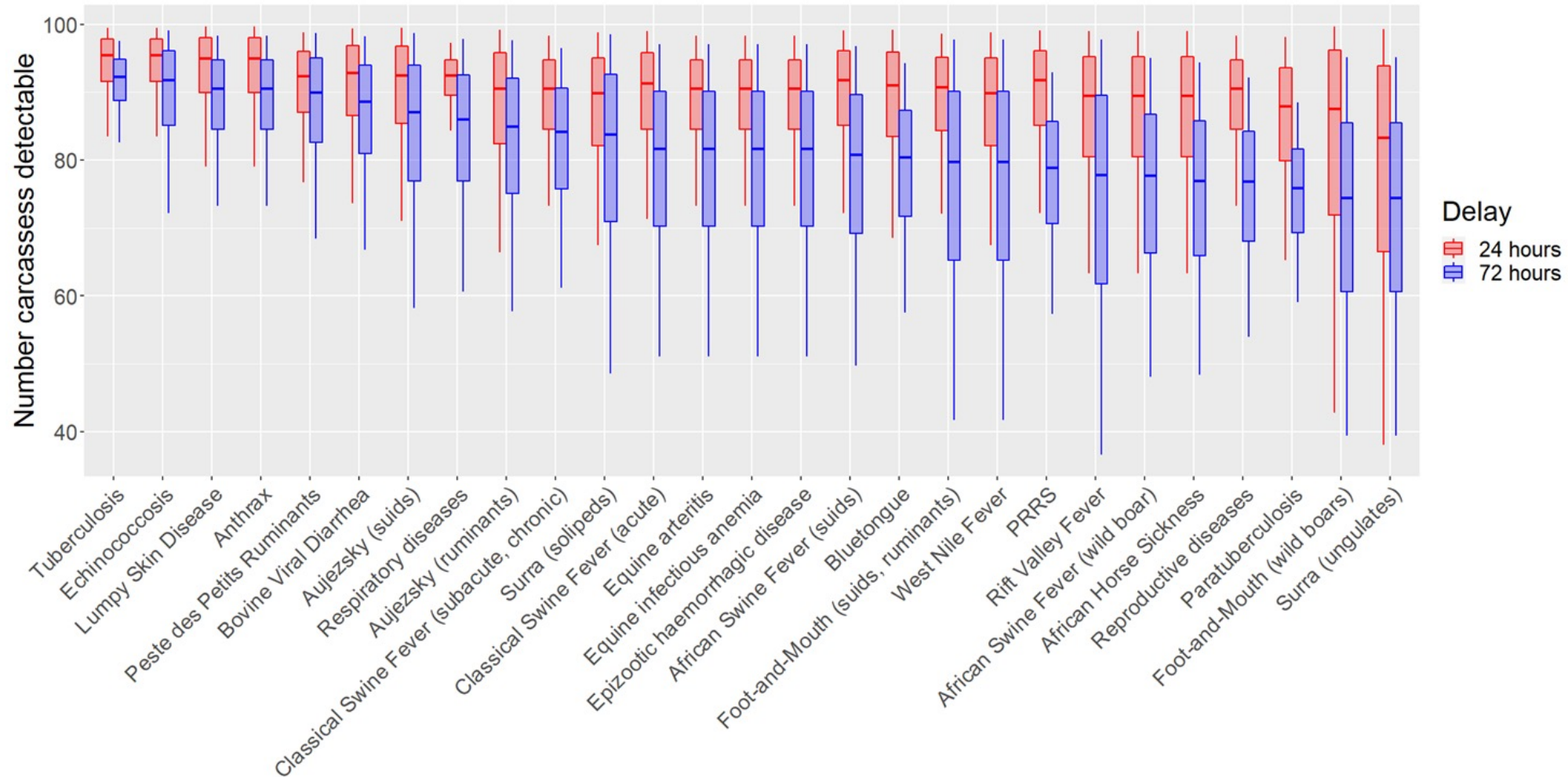
# DETECTION OF CHEMICAL RESIDUES AND CONTAMINANTS

Species	High potential concern	Medium potential concern
<b>Farmed game</b>	/	<ul style="list-style-type: none"> <li>Prohibited substance: chloramphenicol, nitrofurans and nitroimidazoles</li> <li>Contaminants: cadmium</li> </ul>
<b>Swine</b>	<ul style="list-style-type: none"> <li>Contaminants: dioxins and DL-PCBs</li> <li>Prohibited substance: chloramphenicol,</li> </ul>	<ul style="list-style-type: none"> <li>Prohibited veterinary medicinal products: nitroimidazoles and nitrofurans</li> <li>Contaminants: NDL-PCBs, PBDEs, cadmium, mercury and lead, mycotoxins (OTA)</li> </ul>
<b>Cattle</b>	<ul style="list-style-type: none"> <li>Contaminants: dioxins and DL-PCBs</li> </ul>	<ul style="list-style-type: none"> <li>Prohibited substances: stilbenes, thyrostats, gonadal (sex) steroids, resorcylic acid lactones, <math>\beta</math>-agonists, chloramphenicol and nitrofurans</li> <li>Contaminants: NDL-PCBs, cadmium, mercury and lead</li> </ul>
<b>Sheep and goats</b>	<ul style="list-style-type: none"> <li>Contaminants: dioxins, DL-PCBs</li> </ul>	<ul style="list-style-type: none"> <li>Prohibited substances: stilbenes, thyrostats, gonadal (sex) steroids, resorcylic acid lactones, <math>\beta</math>-agonists, chloramphenicol and nitrofurans</li> <li>Contaminants: NDL-PCBs, cadmium, mercury and lead</li> </ul>
<b>Solipeds</b>	<ul style="list-style-type: none"> <li>Prohibited substance: phenylbutazone</li> <li>Contaminants: cadmium</li> </ul>	/

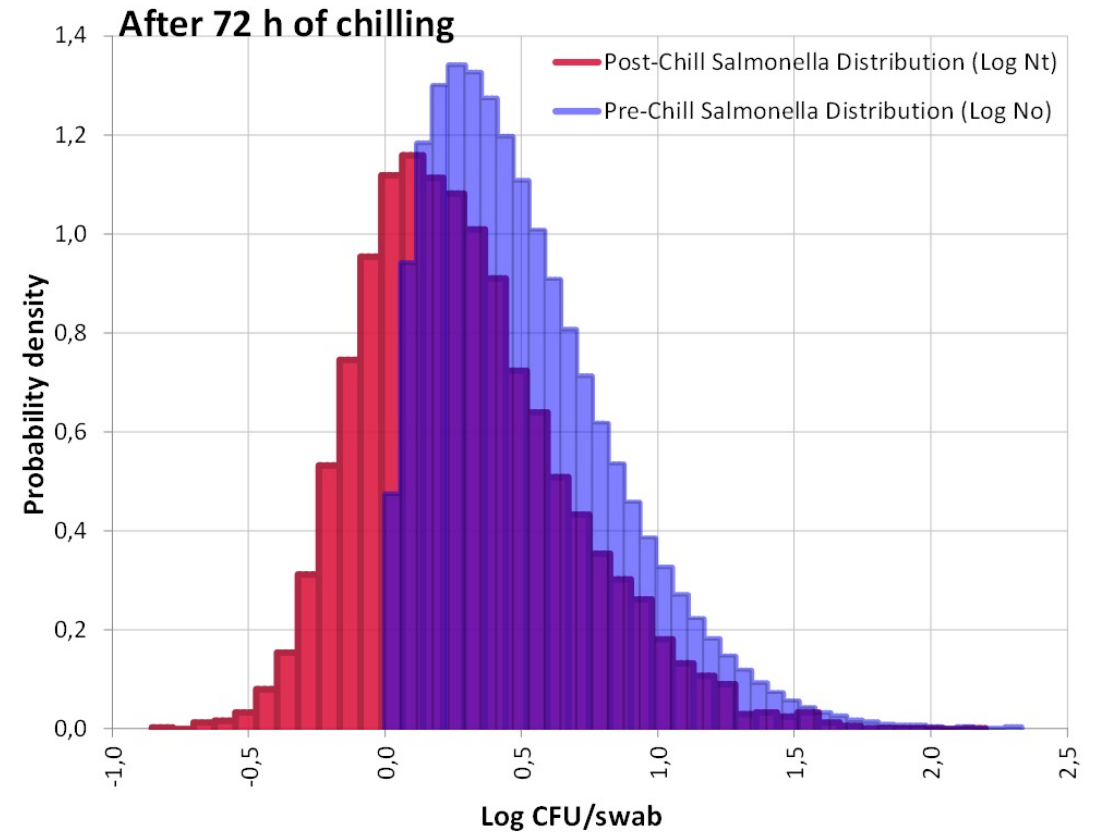
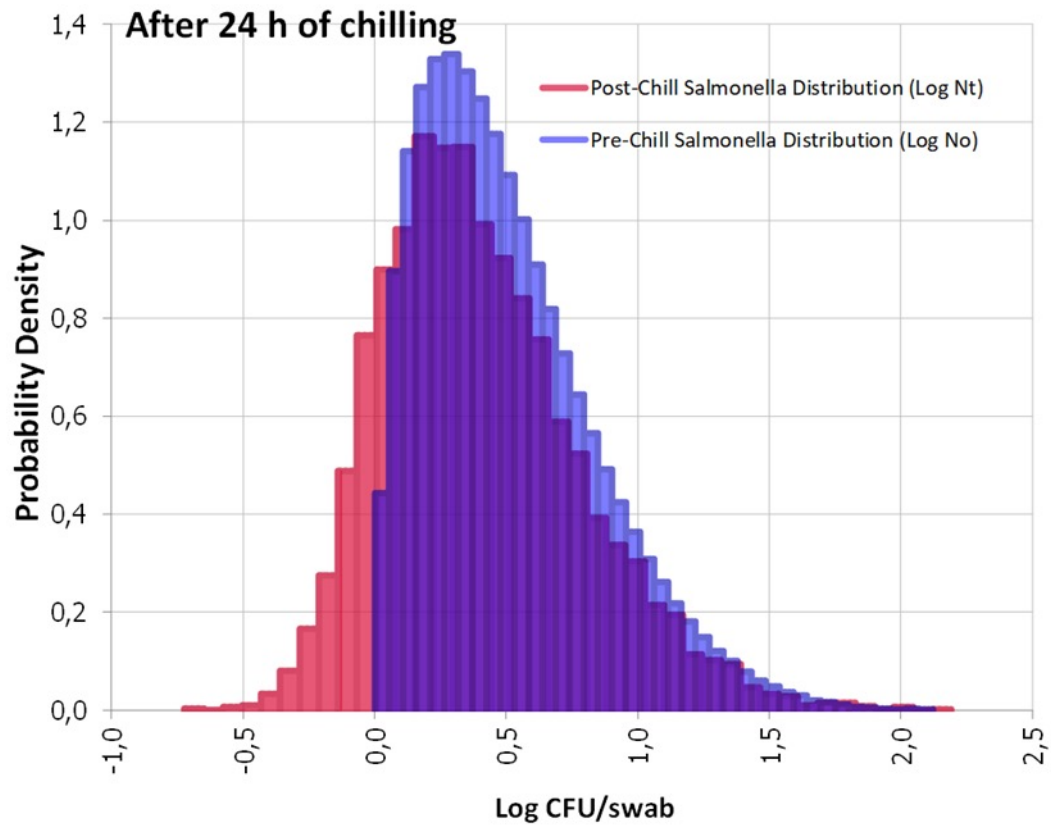


# RESULTS AHL

- Consensus distribution about mean number of carcasses with a given target disease still detectable at 24-h or 72-h delayed PMI



# RESULTS SALMONELLA



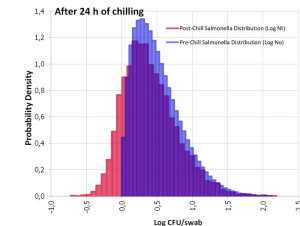
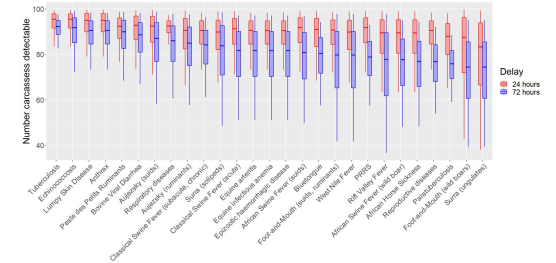
# CUMULATIVE PROBABILITIES OF REDUCTION IN SENSITIVITY OF SALMONELLA DETECTION AFTER 24- AND 72-H OF CHILLED STORAGE

Percentage of reduction (%)	After 24 h		After 72 h	
	Cumulative probability	Probability of greater reduction	Cumulative probability	Probability of greater reduction
10	0.15	0.85	0.09	0.91
20	0.2	0.8	0.12	0.88
30	0.25	0.75	0.14	0.86
40	0.31	0.69	0.17	0.83
50	0.37	0.63	0.20	0.8
60	0.44	0.56	0.23	0.77
70	0.53	0.47	0.27	0.73
80	0.63	0.37	0.33	0.67
90	0.75	0.25	0.43	0.57



# SELECTED CONCLUSIONS

- The ability to detect the diseases (AHL) is expected to **decrease**, the reduction in sensitivity is highly **variable** and depends on the type of lesions
- Delays could reduce **TSE** diagnostic sensitivity but would not exceed tolerance for fallen stock surveillance sampling.
- For the detection of **Trichinella** the panel did not find any evidence that would suggest a decrease in sensitivity
- For the detection of **Salmonella**, a median reduction in sensitivity is expected
  - 66.5% after 24 h and
  - 94% after 72 h



# ACKNOWLEDGMENTS

- EFSA Panel on Biological Hazards and WGs
- EFSA Panel on Contaminants in the Food Chain and WGs
- EFSA Panel on Animal Health and Welfare and WGs
- EFSA staff from various Units
- Stakeholders that provided data on request
- European Commission



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