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Risk-based meat inspection and integrated meat safety assurance

Abattoir case 2 - Hazard-based vs GHP-based interventions - how to evaluate the interventions' effectiveness against specific hazards

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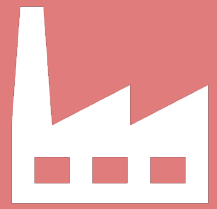

WG3 Abattoir level: controls + risk categorization

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Abattoir case 2 - Hazard-based vs GHP-based interventions - how to evaluate the interventions' effectiveness against specific hazards

Focus on microbiological validation

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Abattoir case 2 - Hazard-based vs GHP-based interventions - how to evaluate the interventions' effectiveness against specific hazards

General Impressions on the interventions in Cattle and Pig slaughter based on a quick screening of 68 papers (from 90s untill now – several countries)

- Interventions/GHP that are most effective are also those that seem logical and expected, especially the ones that **are already in place** like scalding and singeing
- **Multiple interventions** are more effective than single ones
- Some interesting interventions, though most of them on general parameters, are **hygiene practice based**

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Key points of consideration in the microbiological validation of an intervention

- **Type of bacteria:** (general, pathogens, indicators), what pathogens => is there a relation between them: is an effect on microbiota also an effect on a pathogen?
- **Sampling method:** destructive / non-destructive => is there a correlation? why always skin? Maybe lymph nodes ? what sampling material? Sponge, cotton swab; Initial validation by v ongoing verification (i.e. monitoring)
- **Sampling site**: where exactly (most dirty parts?), sampling area
- **When to sample:** relation with the intervention or just practical? Need for neutralizing the sample in the case of the use of chemicals
- **Methods used** + if inoculum studies: what test bacteria (how they were prepared, traceable, going for worst case? already intervention tolerance …)

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What about sampling and methodology used in research?!

Remember that our focus in on microbiological validation!!! So what did we find out:

Many variables and many different parameters in 68 papers

Species	No of papers screened	Sampling method	Sampling materials	Bacteria analysed: general (TVC, Enterobacteriaceae, E.coli etc.) v pathogens v both
Cattle	**16**	14 non destructive	10 sponges, 3 swabs , 1 not defined	9 general
		2 destructive		7 pathogens
				3 both
Pig	**62**	29 non destructive	16 sponge	16 general
			19 other swabs: 4 cotton, 2 gauze, 13 not defined	21 pathogen
		19 destructive (excision)		
		3 other (GI tract/feaces, LNs, water etc.)	1 contact film	14 both

Variations regarding sampling sites, methods, materials, bacteria

Conclusion

- **Microbiological validation**

Is the method solid? Does it contain enough information on number of samples, sampling method, analysis methods etc. ? If not, the effects of an interventions are not directly comparable

- **Studies variations**

Within as study, as long as no variations in the performance are between the samples, then the bias or underestimation can be considered as constant => **relative impact is validated**

- **Standardization of sampling methods**

Important to be able to compare results between studies.

Without standardization, there is currently no real scientific based way to **correlate or extrapolate results** e.g. between destructive and non-destructive sampling, etc.

Conclusion

- **Hazard vs indicator based validation**

Validations should **preferably be hazard-based** as there is no real evidence that if the number of *E. coli* drops due to an intervention (not due to GHP) this has the same impact on the pathogen (could be e.g. more cold-tolerant …)

- **Commercial conditions vs in vitro.**

Testing in commercial settings is not allowed in inoculum studies (bringing in the pathogen), and therefore a huge amount of carcass samples have to be collected before a statistical difference can be achieved

Thank you for the attention.

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