

CA18105



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Risk-based meat inspection and
integrated meat safety assurance

CASE STUDY:

**Quantitative risk assessments to evaluate the effects of abattoir
interventions in reducing risks for consumers**

Case Study 3 group, led by Catherine McCarthy:

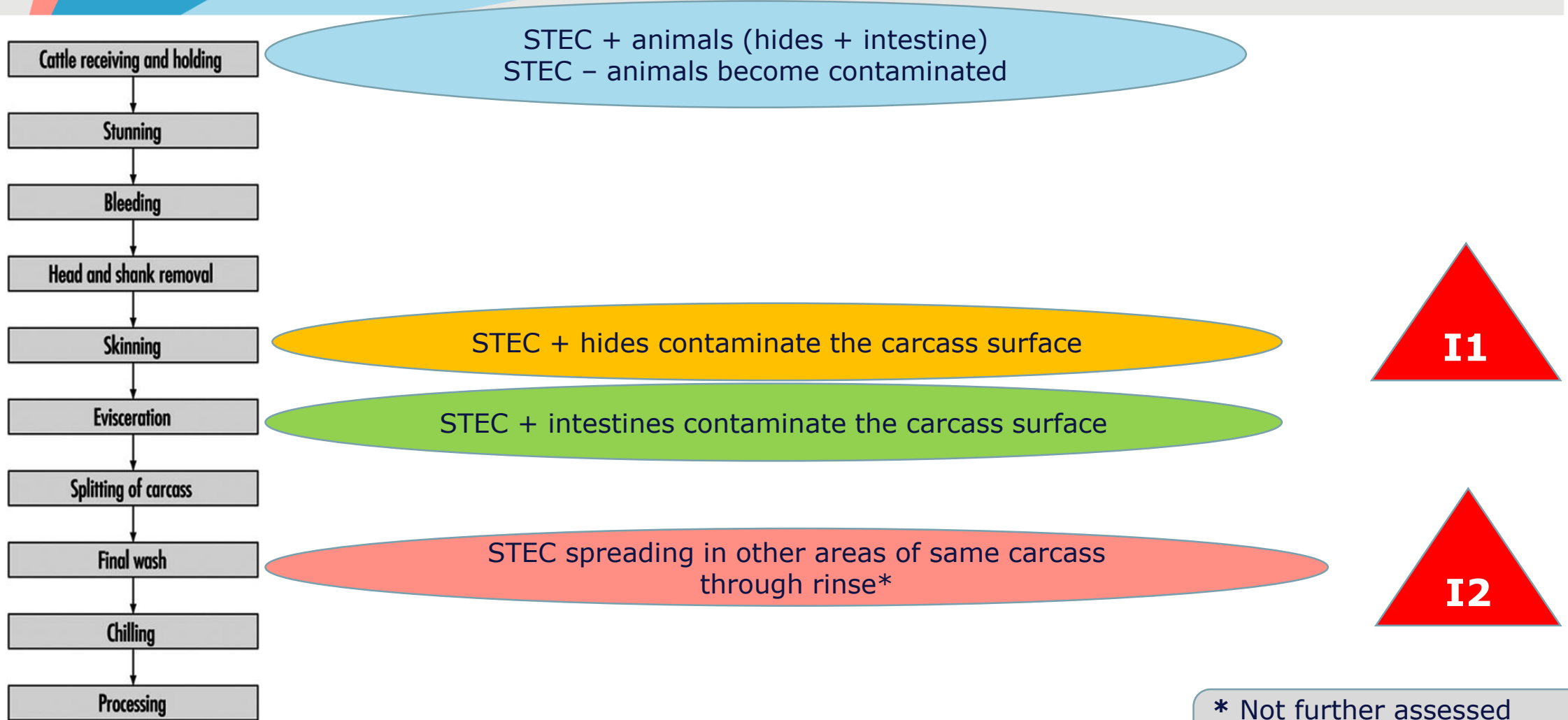
Thomai Lazou -pptx-, Astrid Soyaland, Natasa Kokotovic and Ester Arrieta Pena –presenting-.

| 30-Jun-22 |

Risk question

- ***How many beef carcasses would be prevented from being contaminated with STEC O157, if hot water washes or shellac spray hide coatings were to be used in a beef abattoir, compared to no interventions?***

The risk pathway



Parameters

Fake data!!!

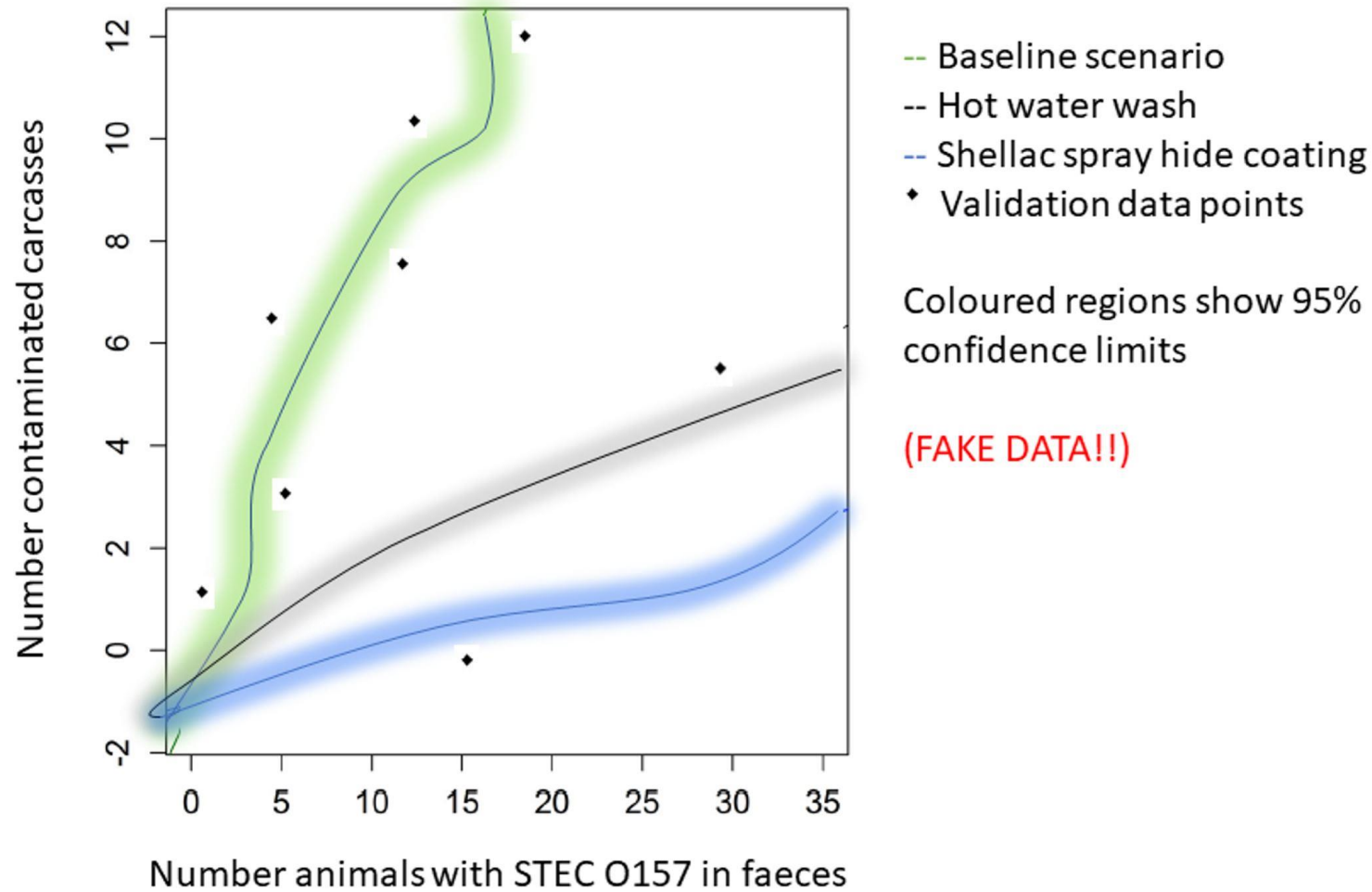
Parameter	Annotation	Value
Prevalence of fecal STEC+ cattle		Between 0-35%
Prevalence of hide STEC+ cattle		Between 30-80%
Cross-contamination rate at lairage (STEC- animals becoming contaminated)		Average 0.5 (min 0.1, max 0.8)
Rate of transfer of STEC from hide to carcass (self contamination)		Baseline average 0.3 (min 0.2, max 0.6) I1- Shellac average 0.1 (min 0.05, max 0.3)
Cross-contamination rate at skinning (hides STEC+ contaminate subsequent carcass' surfaces)		Baseline average 0.13 (min 0.1, max 0.2) I1- Shellac average 0.06 (min 0.03, max 0.12)
Rate of transfer of STEC from intestinal content to carcass		Average 0.4 (min 0.2, max 0.6)
Rate of STEC Contamination reduction through Shellac coating Rate of STEC contamination reduction through hot water wash		0 (baseline) Hot water wash average 0.02 (min 0.01, max 0.03)

Assumptions, Group Decision-Making and Conclusion:

- **Assumption:** Every carcass contaminated with STEC was considered irrespective of the actual concentration of the pathogen.
- **Group decision-making:**
 - firstly, the group decided on the different **risk pathways of STEC contamination** related to the abattoir generic processing of bovine, being at lairage, at skinning-hide removal and at evisceration.
 - the group then agreed on **the main parameters to study** at the different steps where STEC contamination is possible, being Prevalence of contaminated animals at lairage, Rate of contamination without interventions (baseline) and rate of contamination reduction when Interventions are applied.
 - in this case study, we have concluded that due to the lack of precise data in literature, particularly, and high uncertainty, **a stochastic model** would be best to respond to the risk question rather than a deterministic model, where a range of value is considered rather than precise data.
 - a range of values for each parameter has been provided which is “fake data” to facilitate the discussion and understand the **baseline effect, without interventions, and effects with interventions**, represented in the graphic.

Conclusion: a quantitative stochastic model can be run with different values producing different outcomes. In this way it **provides an insight into the study and a numeric estimate of the overall effect of the interventions at abattoir level.**

QMRA results



Thank you for the attention.
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