



# Farm risk categorisation & Pre-harvest strategies



**Meemken, D. <sup>1</sup>; Li, T.-T. <sup>1</sup>; Langkabel, N. <sup>1</sup>; Langforth, S. <sup>1</sup>; Isbrandt, R. <sup>1</sup>;  
Rodrigues da Costa, D. <sup>2</sup>; Pessoa, J. <sup>3</sup>; Nesbakken, T. <sup>4</sup>**

<sup>1</sup>Freie Universität Berlin, Institute of Food Hygiene and Food Safety

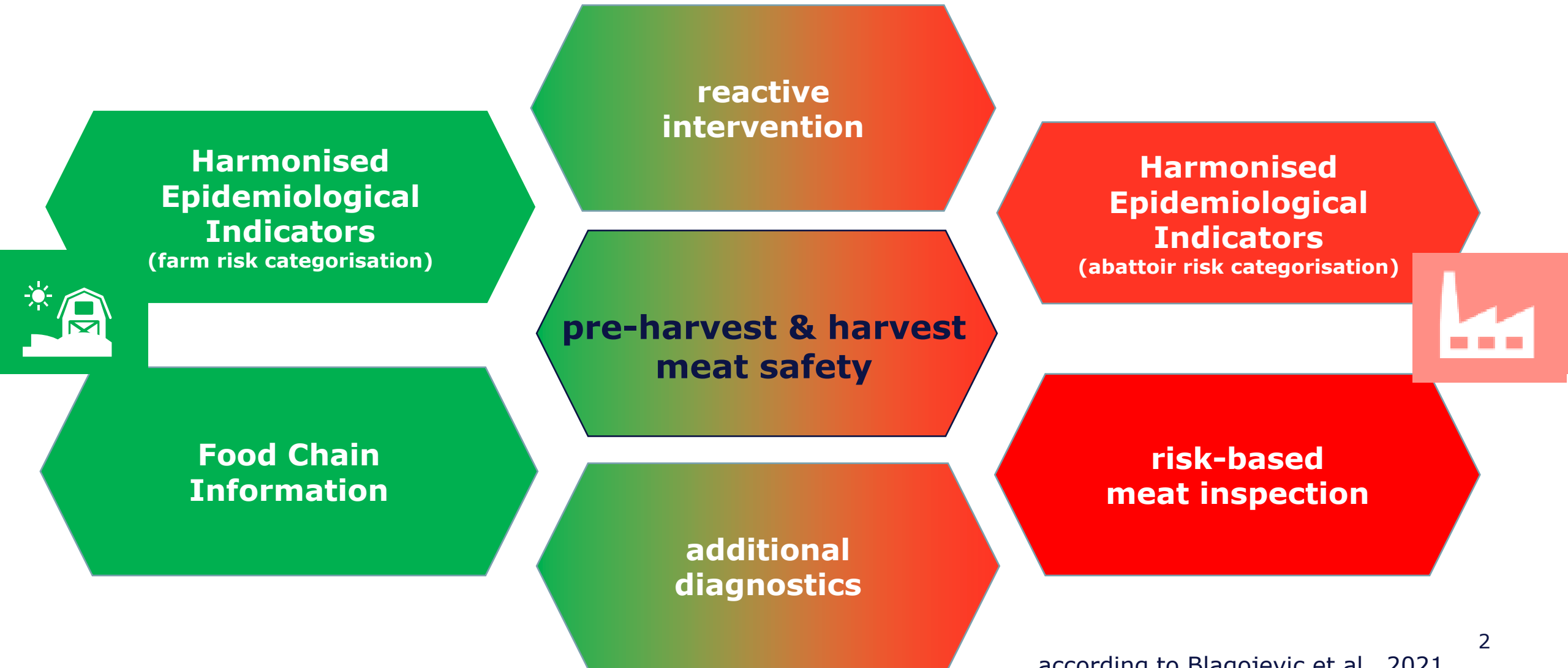
<sup>2</sup>Scotland's Rural College, Centre for Epidemiology and Planetary Health

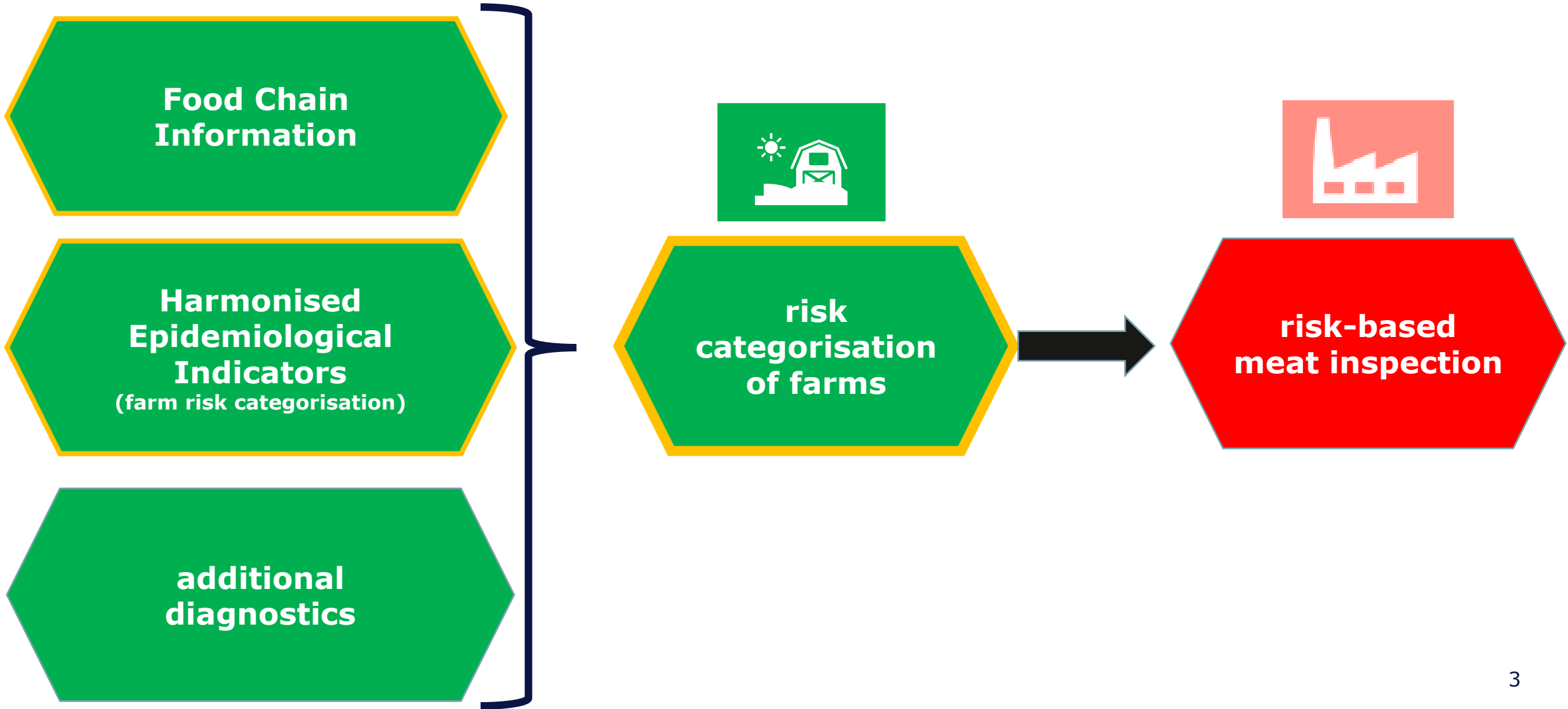
<sup>3</sup>Ghent University, Veterinary Epidemiology Unit

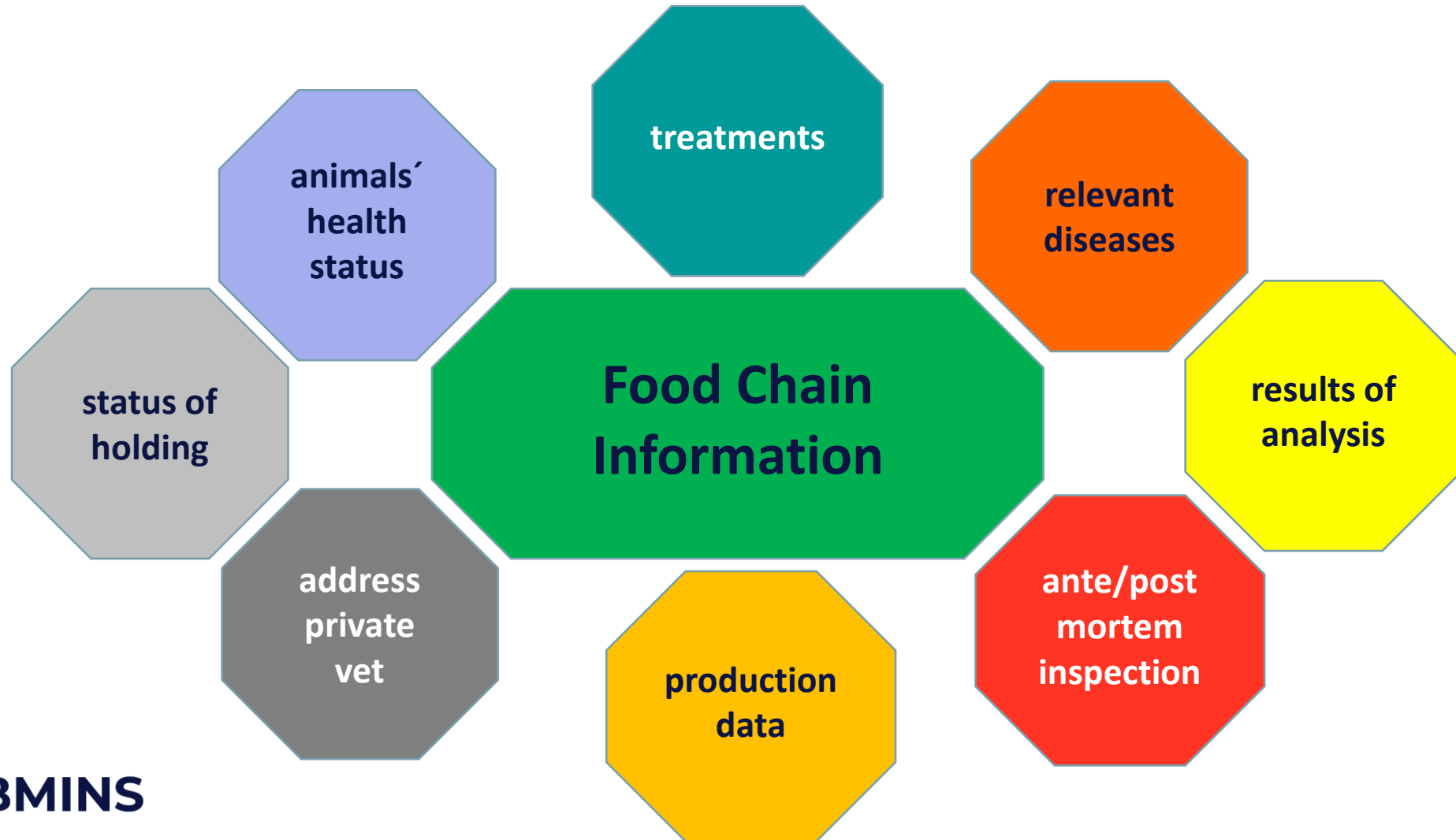
<sup>4</sup>Norwegian University of Life Sciences, Department of Production Animal Clinical Sciences

# Key components of RB-MSAS

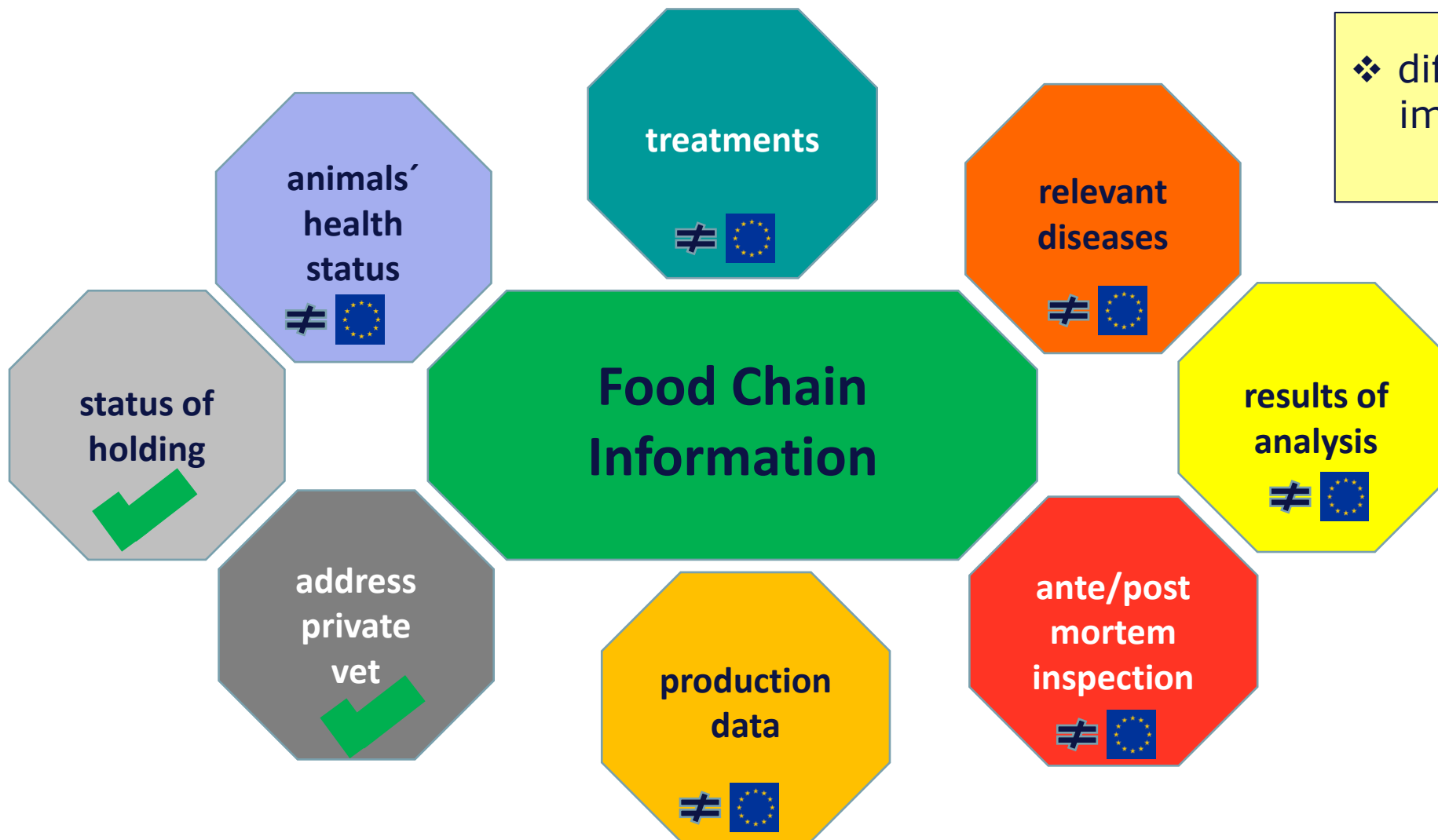
(RB-MSAS: Risk-Based Meat Safety Assurance System)



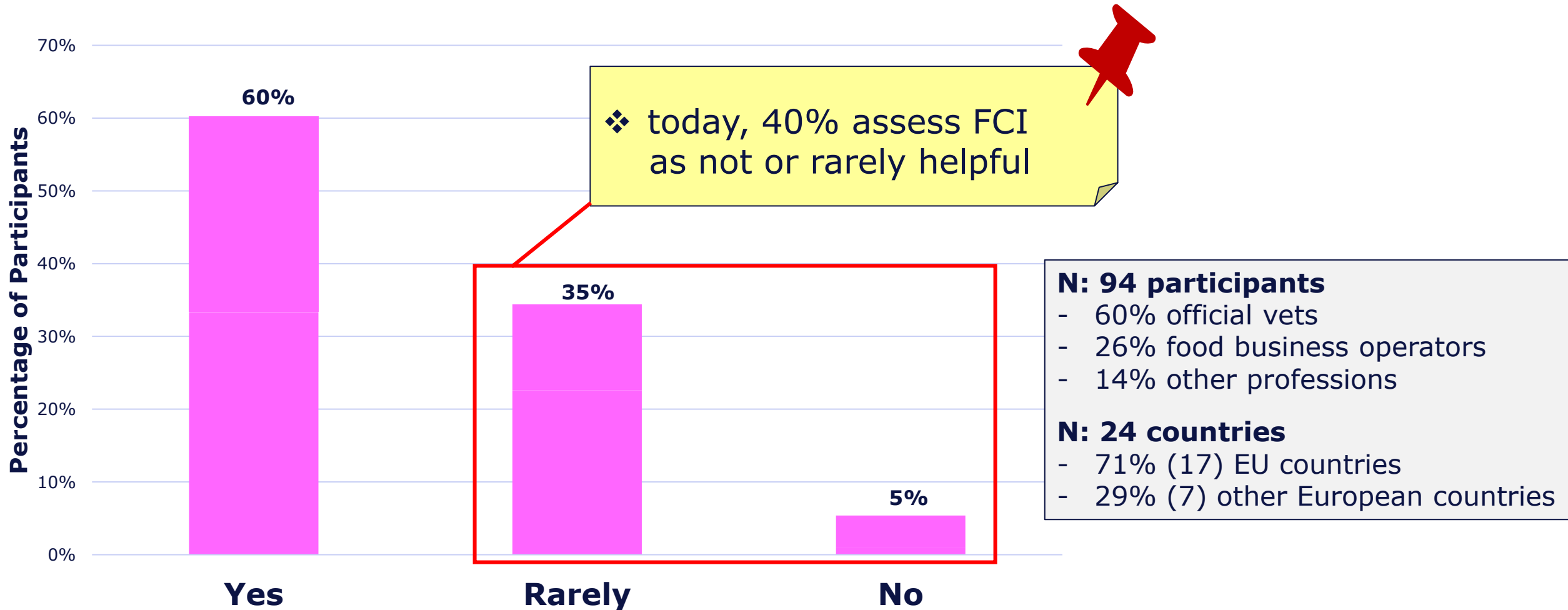




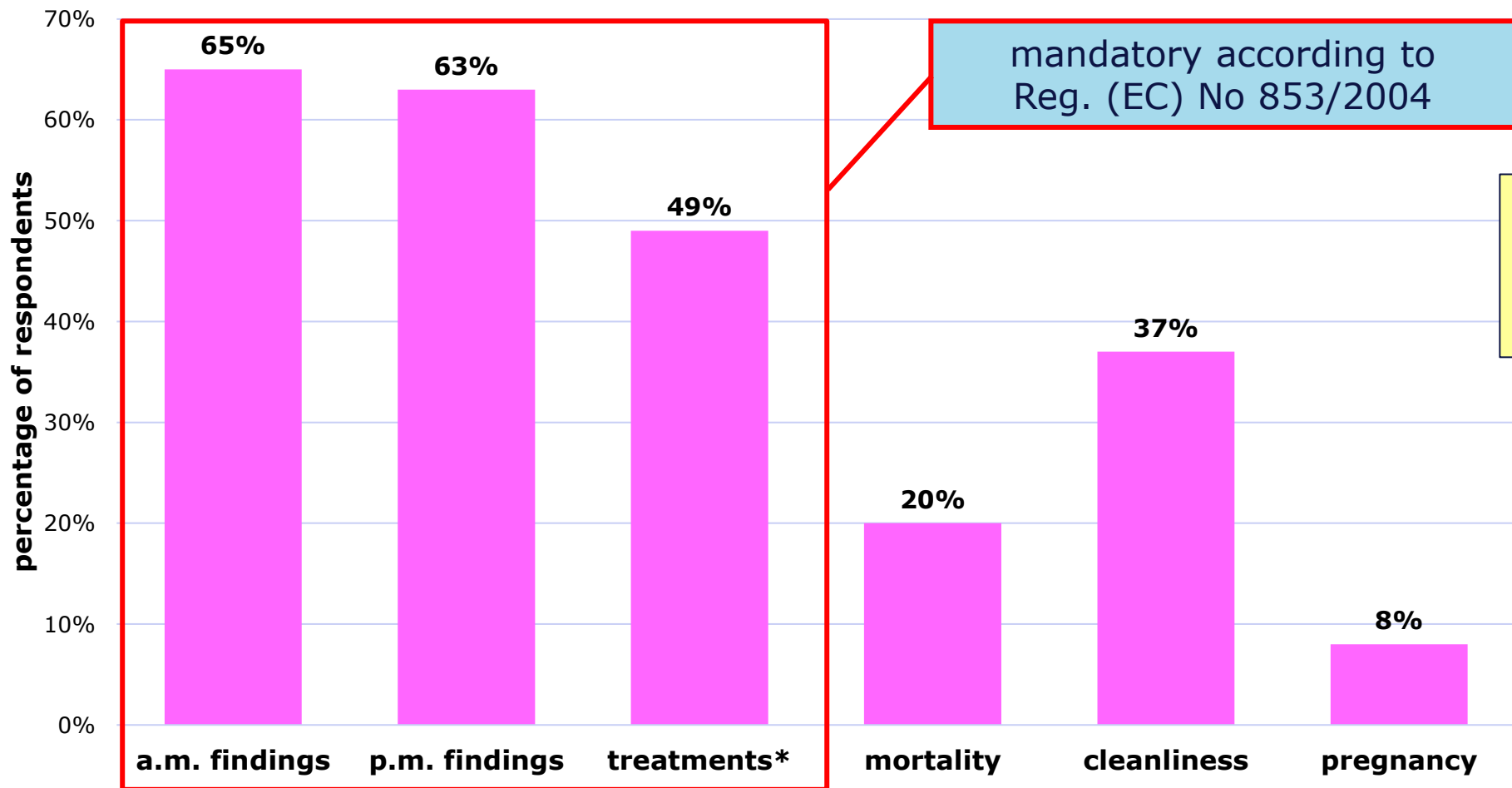
# Results of our online survey in Europe: **Degree of implementation**



**Does FCI help you in decision-making regarding food safety?**



**Which information do you currently receive as part of FCI?**

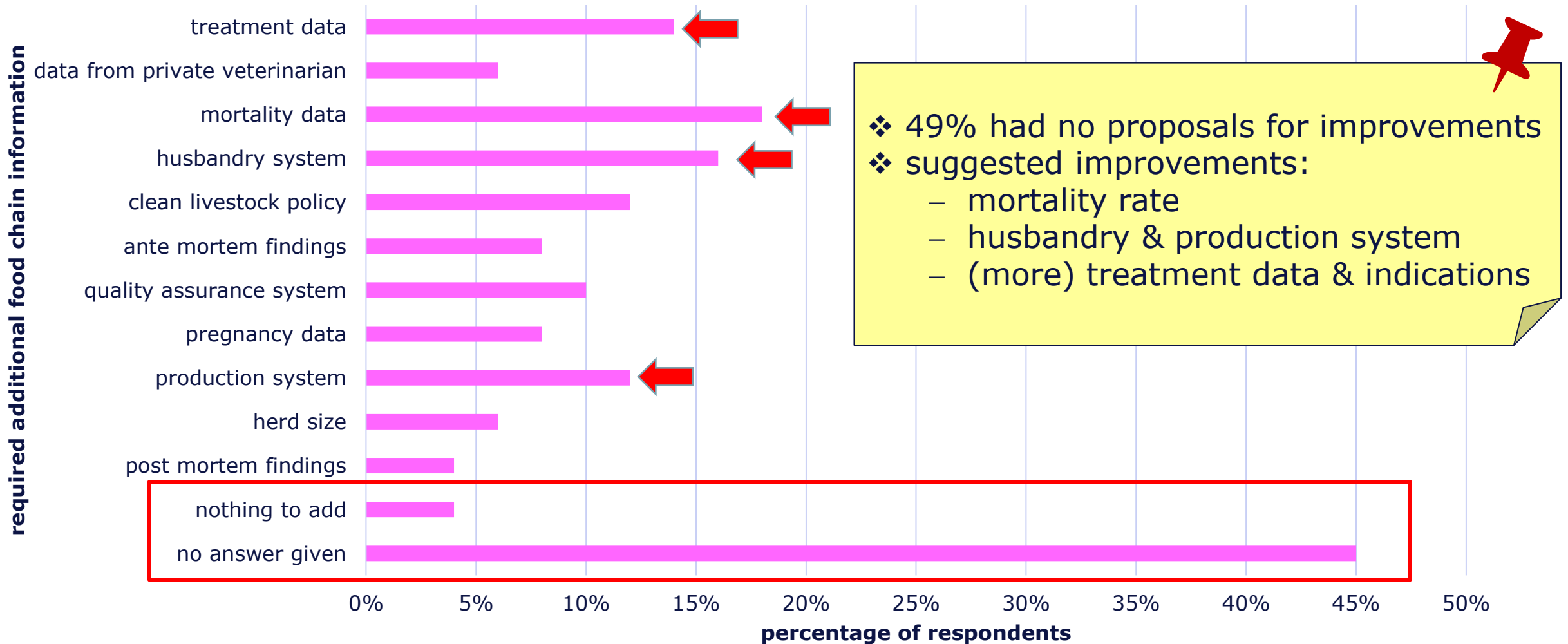


mandatory according to  
Reg. (EC) No 853/2004

❖ legally required  
information is missing

\* treatments with a withdrawal period > 0 days in the relevant period

**Which additional information do you suggest?**

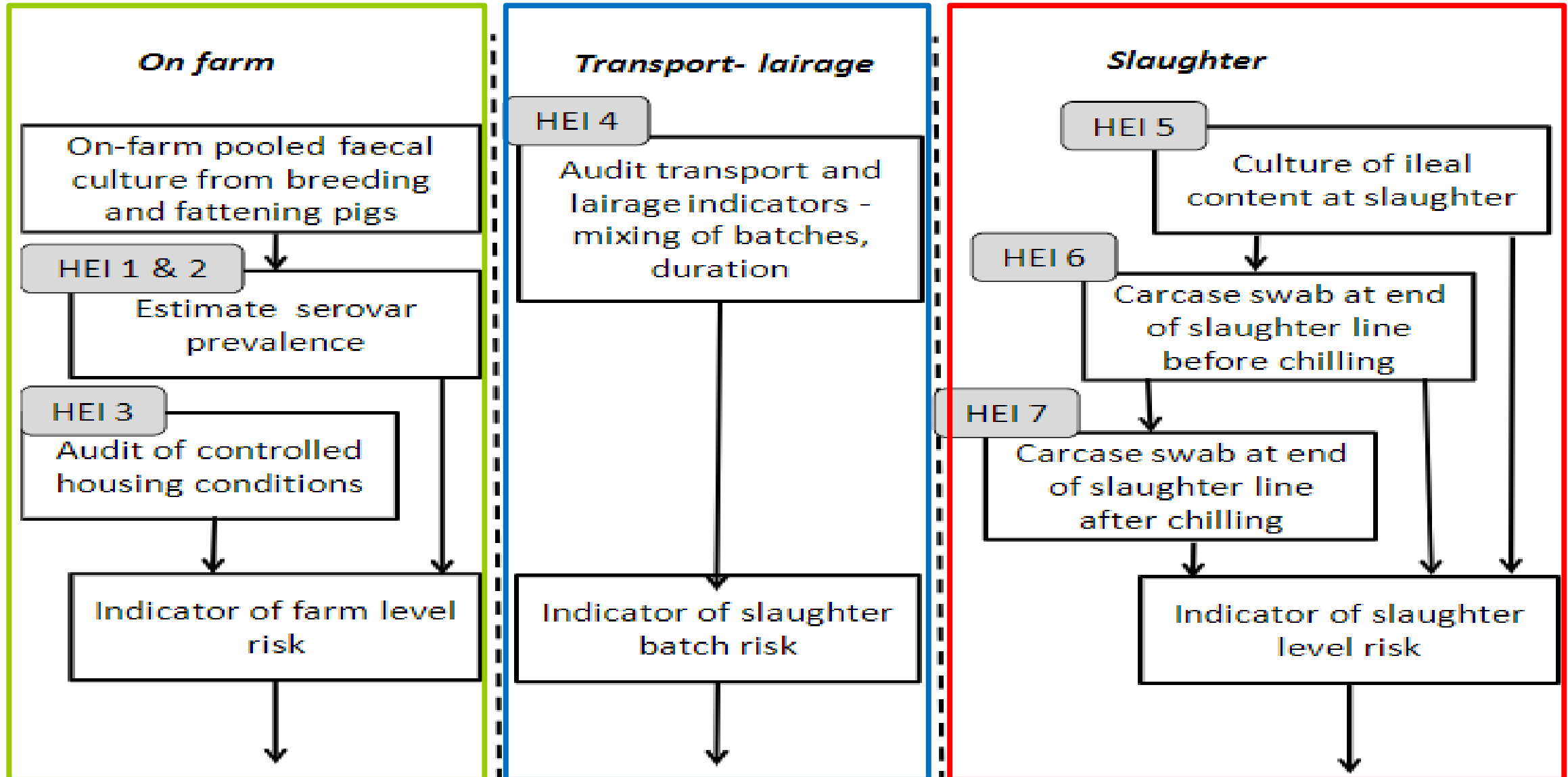




## **Harmonised Epidemiological Indicators (HEIs)**

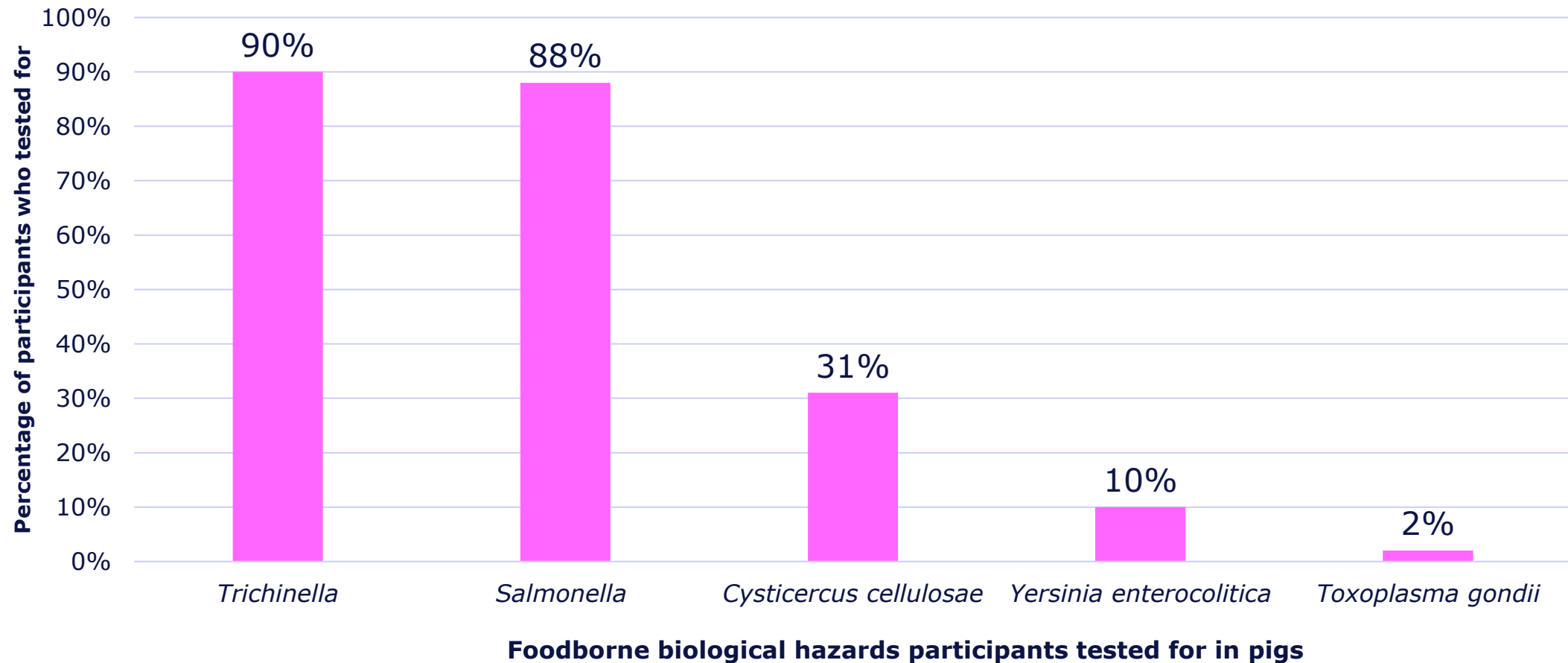
according to EFSA, 2011, 2012, 2013

**Prevalence or incidence of the hazard at a certain stage of the food chain that correlates to a human health risk caused by the hazard  
&  
Indirect measure of the hazard (such as audits on farms or transports)**



## Monitoring and Surveillance Systems (MOSSs)

**For which pathogen do you have a MOSS in place?**



## Harmonised Epidemiological Indicators (HEIs)

- HEIs are **useful** as part of the risk-based meat safety assurance system (RB-MSAS)
  - HEIs **enable risk categorisation** of farms and abattoirs
- HEIs for pigs that are **equivalent to testing regulated by law were mostly implemented**
  - e.g. Reg (EU) No 2073/2005: Process Hygiene Criteria (*Salmonella* testing before chilling)
- additional HEIs for pigs are **underutilised** and not implemented properly in Europe
  - HEIs at **farm** level are **rarely applied**
- main implemented consequences: **raising awareness, farm categorisation, feedback to farmers**
- **more training is needed in HEIs application**



# Pre-harvest strategies (selection)



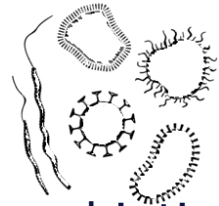
access restriction/quarantine



SPF herds



diet manipulation



probiotics



vaccines



cleaning & disinfection



bacteriophages



genetics



rules/management



feed/water

SPF: specific pathogen free

## WG2

## Results of the systematic literature review

PubMed® & Web of Science on June 7<sup>th</sup> 2020

Pathogen	records identified	records after <b>duplicates' removal</b>	records retained <b>after abstract screening</b>	records retained <b>after full text screening</b>
<i>Clostridium botulinum</i>	3	3	0	0
<i>Clostridioides difficile</i>	8	7	0	0
<b><i>Clostridium perfringens</i></b>	<b>43</b>	<b>33</b>	<b>9</b>	<b>5</b>
<b><i>Campylobacter spp.</i></b>	<b>156</b>	<b>115</b>	<b>3</b>	<b>2</b>
Hepatitis virus type E	101	77	0	0
<i>Listeria monocytogenes</i>	12	11	0	0
<b>MRSA</b>	<b>194</b>	<b>139</b>	<b>9</b>	<b>1</b>
<b><i>Mycobacterium avium</i></b>	<b>27</b>	<b>23</b>	<b>3</b>	<b>1</b>
<b><i>Salmonella spp.</i></b>	<b>785</b>	<b>555</b>	<b>57</b>	<b>43</b>
<i>Sarcocystis spp.</i>	9	7	0	0
<i>Taenia solium</i>	12	12	0	0
<i>Toxoplasma gondii</i>	101	77	2	0
<i>Trichinella spiralis</i>	63	50	2	0
VTEC	5	5	1	0
<i>Yersinia enterocolitica</i>	87	66	1	0
<b>TOTAL</b>	<b>1606</b>	<b>1180</b>	<b>87</b>	<b>52</b>

- 43 out of the 52 analysed publications dealt with *Salmonella*
- 76% (65/86) of the trials assessed reported **positive** results.
  - in-feed and/or water treatments, and vaccination were the most tested interventions and were, overall, successful (72% and 87%)



feed/water



vaccine

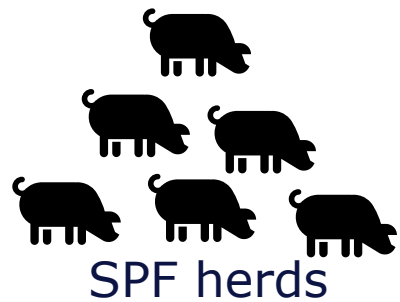


diet manipulation

- only 1 out of the 8 trials tested the efficacy of **antimicrobials** had positive results



- **missing of effective interventions due to applied eligibility criteria**
  - e.g. control group mandatory



&amp;



most successful pre-harvest measures



- **high herd health** coupled with **good management** and **biosecurity** were effective to control or prevent most foodborne pathogens in pork at the **pre-harvest level**



herd health



rules/management



cleaning &amp; disinfection

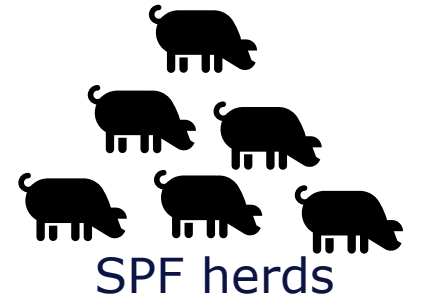


feed/water

- some foodborne pathogens appear to be **best controlled at post-harvest level** as risk of disease **does not correlate with the occurrence in raw meat**
  - ***Campylobacter* spp., *Clostridium perfringens***

- ***Yersinia enterocolitica***

- *second* most important hazard in pork
- **SPF-programs seem to work – although not included in our study**



- ***Toxoplasma gondii***

- particularly important in outdoor pigs (not included in this study)
- **control of cat population and pest control are helpful measure**



- **Hepatitis E**



- new research in recent years, no papers meeting criteria defined
- **vaccination trails show promising results**





*Systematic Review*

## **A Systematic Review on the Effectiveness of Pre-Harvest Meat Safety Interventions in Pig Herds to Control *Salmonella* and Other Foodborne Pathogens**

Maria Rodrigues da Costa <sup>1</sup>, Joana Pessoa <sup>2,3,4</sup>, Diana Meemken <sup>5,\*</sup> and Truls Nesbakken <sup>6</sup>



## Conclusions

### Farm categorisation:

**effective tools are available** like FCI, HEIs, diagnostics, but ...

**need for ...**

- precise definitions of requested information
- will of consistent implementation
- monetary incentives for farmers

**However,**

- risk categorisation might fail as „exceptions confirm rules“

### Farm interventions:

**effective interventions are proven** like C&D, SPF, vaccines, biosecurity, but ...

**need for ...**

- monetary incentives for farmers
- strict legal requirements
- innovation supporting legislation

**However,**

- some pathogens need to be (additionally) controlled at harvest/post harvest stages

Thank you for the attention.  
Please join us at



**RIBMINS**



Funded by the 2020 Framework Programme  
of the European Union

[www.cost.eu](http://www.cost.eu)

[www.ribmins.com](http://www.ribmins.com)  
scan this

