Risk assessment a tool for science based decisions

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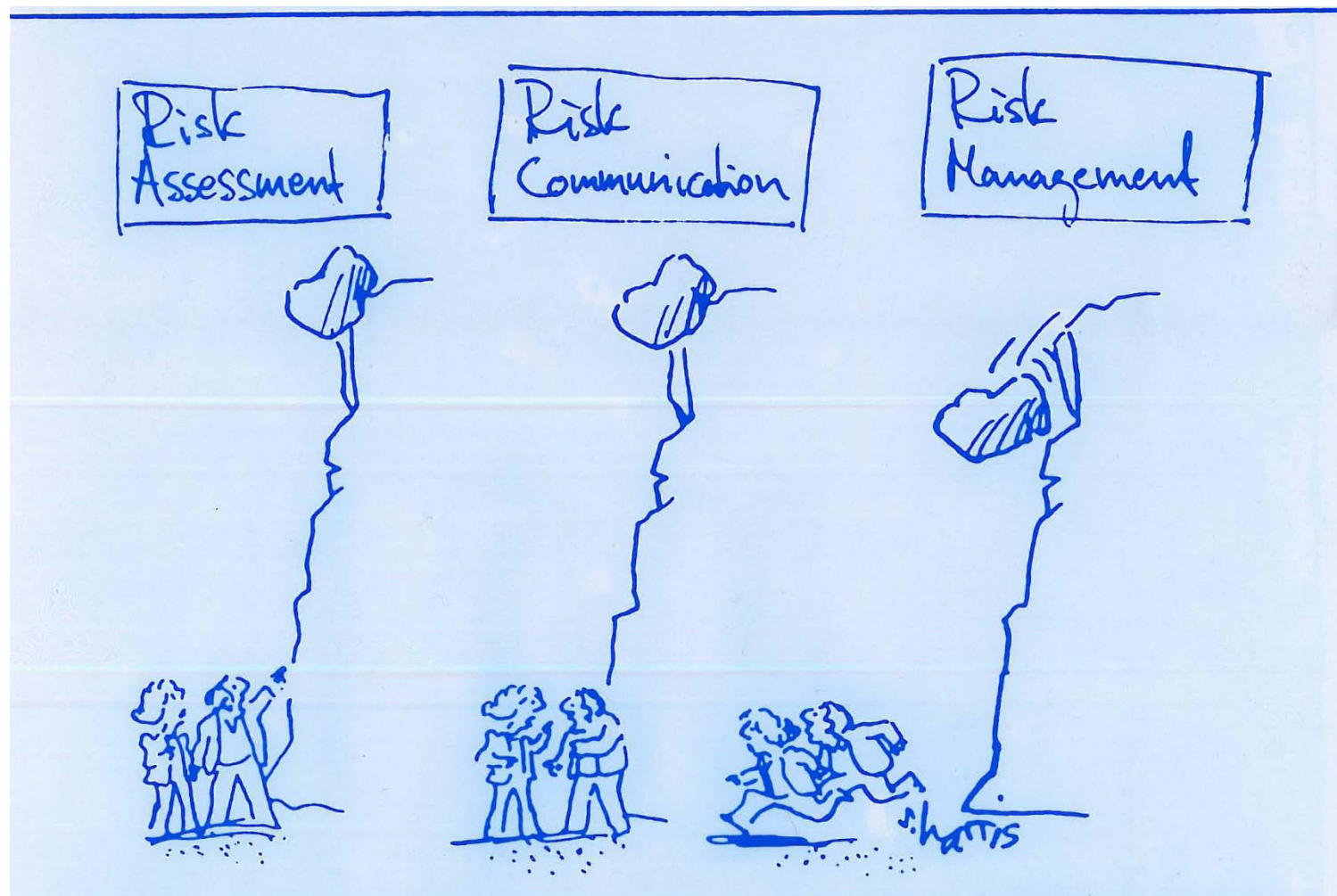
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Outline

- Risks - different perspectives
- Purpose of assessment is management
- Qualitative vs quantitative vs benefit cost
- Final remarks - future wishes

Risk – different perspectives gives different answers
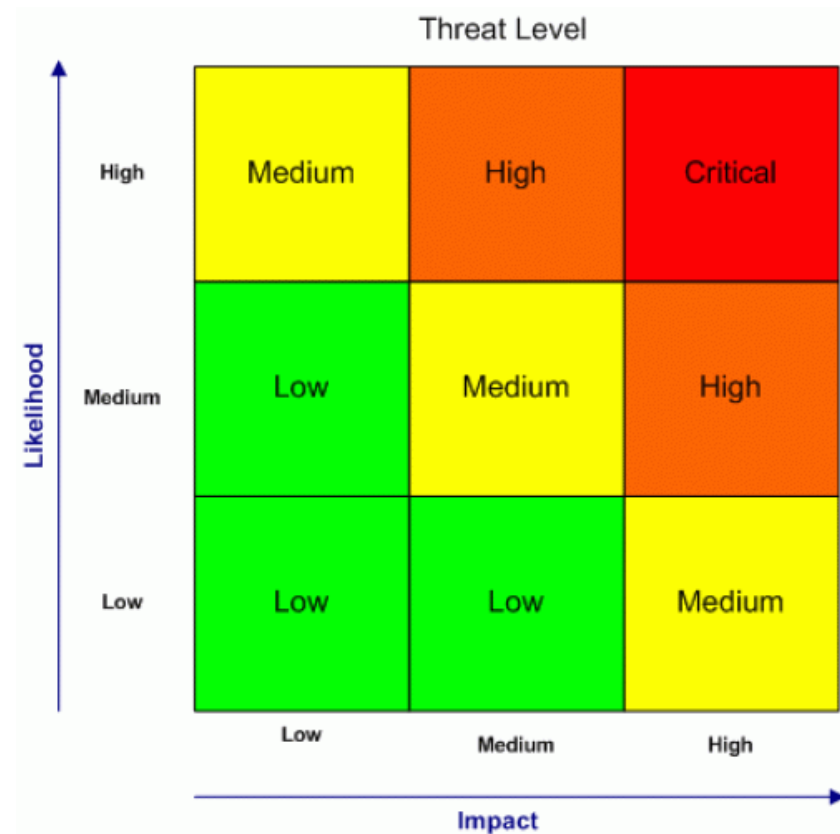
Assessment   + Communication   = Management

Risk assessment

- Product of probability and consequences
- Hard part is communication
- Difficult
  - negligible probabilities and catastrophically large consequences
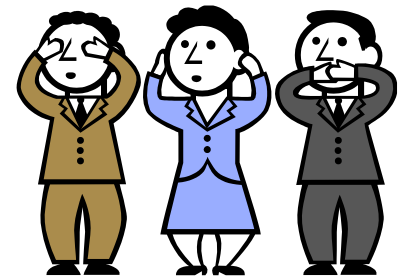 - Systemic risks or domino effects

A simple model

Threat Level		
Medium	High	Critical
Low	Medium	High
Low	Low	Medium

Likelihood: High, Medium, Low

Impact: Low, Medium, High
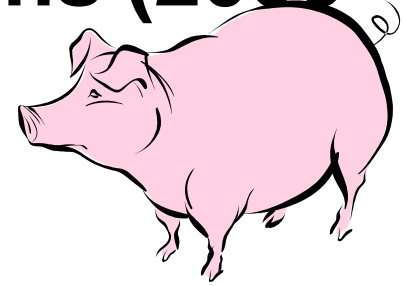
Risk communication

- Most important part of risk assessment

- Does anybody listen?

- Does risk managers hear the same message that you try to tell them?

- How to communicate uncertainty, black swans, negligible probabilities and huge consequences as risks .

Qualitative vs quantative assessments Salmonella in pigs - EFSA opinions (2006 and 2010)

- **Qualitative assessment**
  - Risk assessment and mitigation options of *Salmonella in pig production", The EFSA Journal (2006), 341, 1-131*

- Pork, after eggs and poultry meat, a major source of human foodborne salmonellosis

- All serovars possible hazard for public health

- No universal mitigation option capable of eliminating *Salmonella entirely*

- Control *preventive* actions throughout food chain

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Qualitative answers

- Prevent
  - introduction of *Salmonella into the herd,*
  - *in-herd transmission,*
 - increase of the resistance to the infection.

- transport-lairage
  - by separation of batches,
  - Good Hygiene Practices (GHP)

- Slaughter and dressing
  - Hazard Analysis and Critical Control Points (HACCP) principles in association with GHP
  - avoid direct or indirect faecal/intestinal contamination of carcasses.
  - Logistic slaughter is a further option for reducing the pathogen load on the carcasses
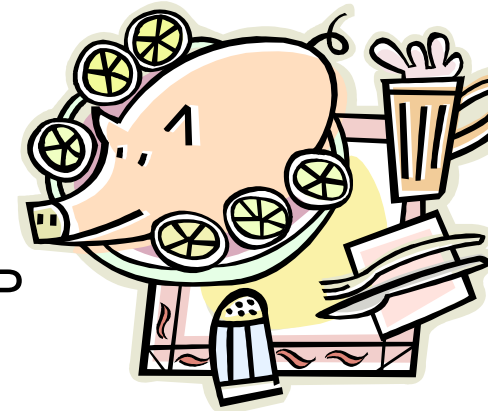
Qualitative answers post harvest

- Meat/carcass decontamination may be considered
- Risk mitigation during processing requires maintenance of the cold chain and the application of the so-called "hurdle concept" and the implementation of GHP and the principles of HACCP.

Quantitative answers

- 10-20% of human *Salmonella infections attributable to* pigs
- An 90% reduction lymph node prevalence comparable reduction in the number of human cases
- Hierarchy of control measures suggested
  - a high prevalence in breeder pigs to be addressed first,
  - followed by control of feed
  - then control of environmental contamination.

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Quantitative answers – pre-harvest

- Breeder pigs are *Salmonella-free*
  - *Reduction of 70-80% in high PV MSs*
  - *Reduction of 10-20% in low PV MSs*

- *Salmonella-free feedstuffs,*
  - *Reduction of 10-20% in high PV MSs*
  - Reduction of 60-70% in low prevalence MSs can be foreseen;

- Biosecurity of pig herds *(i.e. rodents and birds)*
  - *a reduction of 10-20% in all MS*

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Quantitative answer
post harvest

- A reduction of **two logs (99%) of *Salmonella* numbers** on contaminated carcasses would result in more than **90% reduction of the number of human salmonellosis cases** attributable to pig meat consumption.

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Benefit cost analysis Salmonella control EU

- BCA **did not show an economic benefit** from any intervention.

- Sensitivity analyses did not change the results markedly

  – However, a sensitivity analysis based on optimistic assumptions of a reduction of 6% in human health losses and a 6% constant rate of reduction in pigs affected by *Salmonella, did show a **small positive B/C ratio 1.07 and an NPV of €21 million.***

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Final remarks – future wishes

- Risk assessments good way of summing up our knowledge and lack thereof

- Quantitative analyses more precise answers – but prone to errors

- In future
  - Integrate benefit cost analyses in the risk analysis process
  - Robust tools such as risk ranking - quicker answers

- Wish – integrate Codex and OIE outlines for risk analysis