CA18105

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Risk-based meat inspection and integrated meat safety assurance

Introducing the concept of risk analysis with focus on risk assessment

Lis Alban | 14-Jun-23 | Virtual training school

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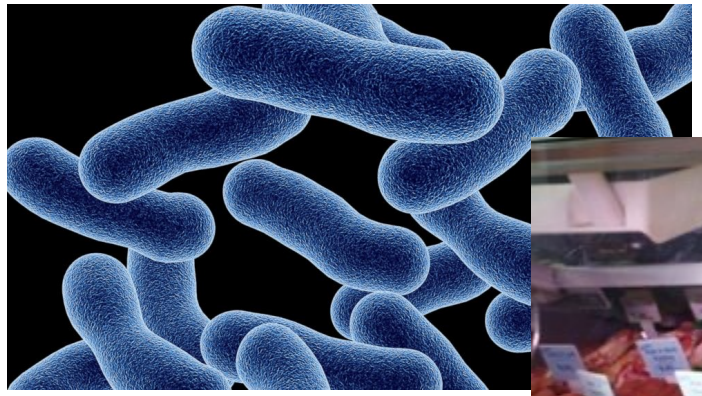
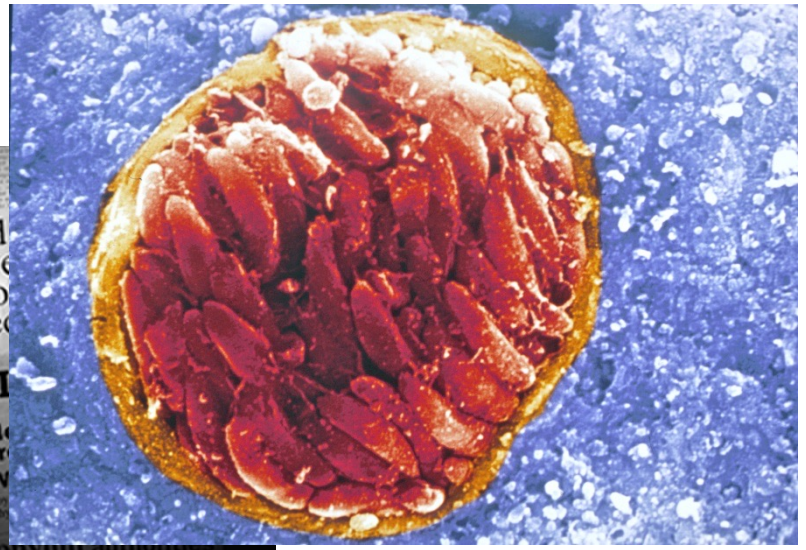
Challenges regarding food safety are plenty



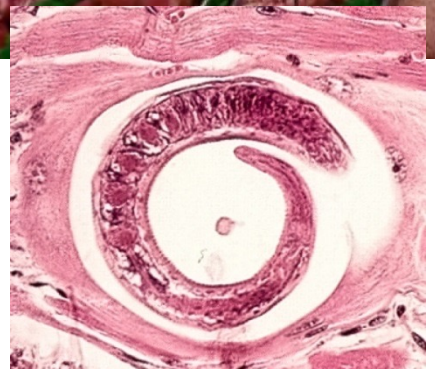
Salmonella

Lack of hygiene



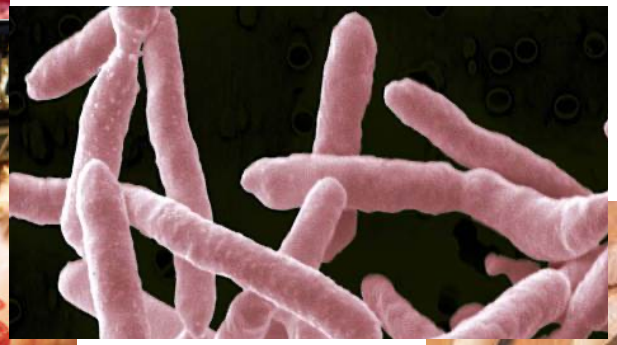
Toxoplasma gondii

Food fraud



Trichinella

Inspection fraud



Yersinia enterocolitica

Taenia solium

Zero risk impossible

Production of food always comes with a risk

- Despite many consumers expect food to be safe

Livestock harbour zoonotic bacteria

- Hence, food safety risk in meat cannot be zero
- Although intention to constantly improve food safety and minimize risk
- Only zero risk if radiation is used

But we can see how we can reduce the risk

- If judged as unacceptable high

In the ideal world with unlimited resources…

Surveillance in place for all potential hazards

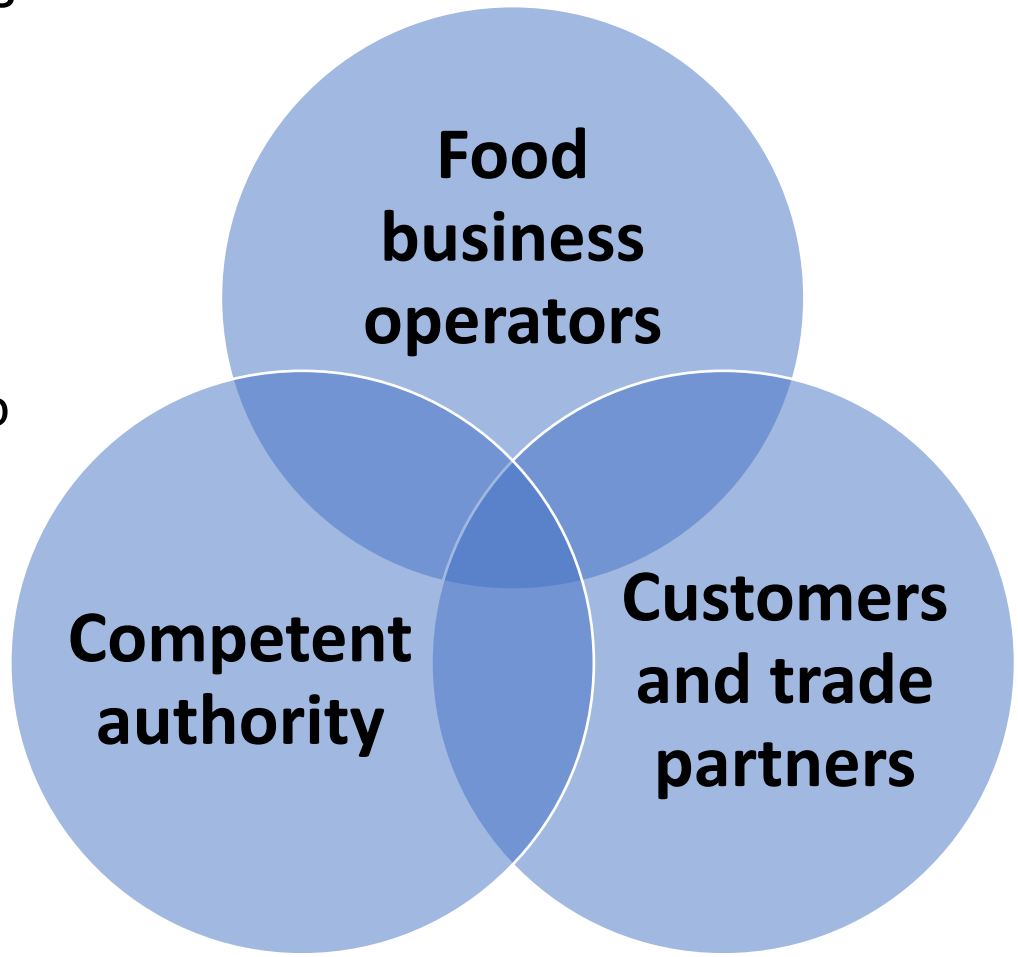
- But world is far from ideal, and resources are scarce

Risk managers need to take decisions

- On which hazards and activities to prioritise to use existing resources efficiently

Such processes are complicated

- How to avoid trade barriers?



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Risk Analysis – It began with a trade agreement

In 1995, the World Trade Organisation made treaty about removal of trade barriers

- Agreement on Sanitary and Phytosanitary measures (SPS-agreement)

The countries have a right to protect their populations against hazards that might be introduced through imported goods

- Even if this implies a trade barrier

Decisions should be based on risk analysis

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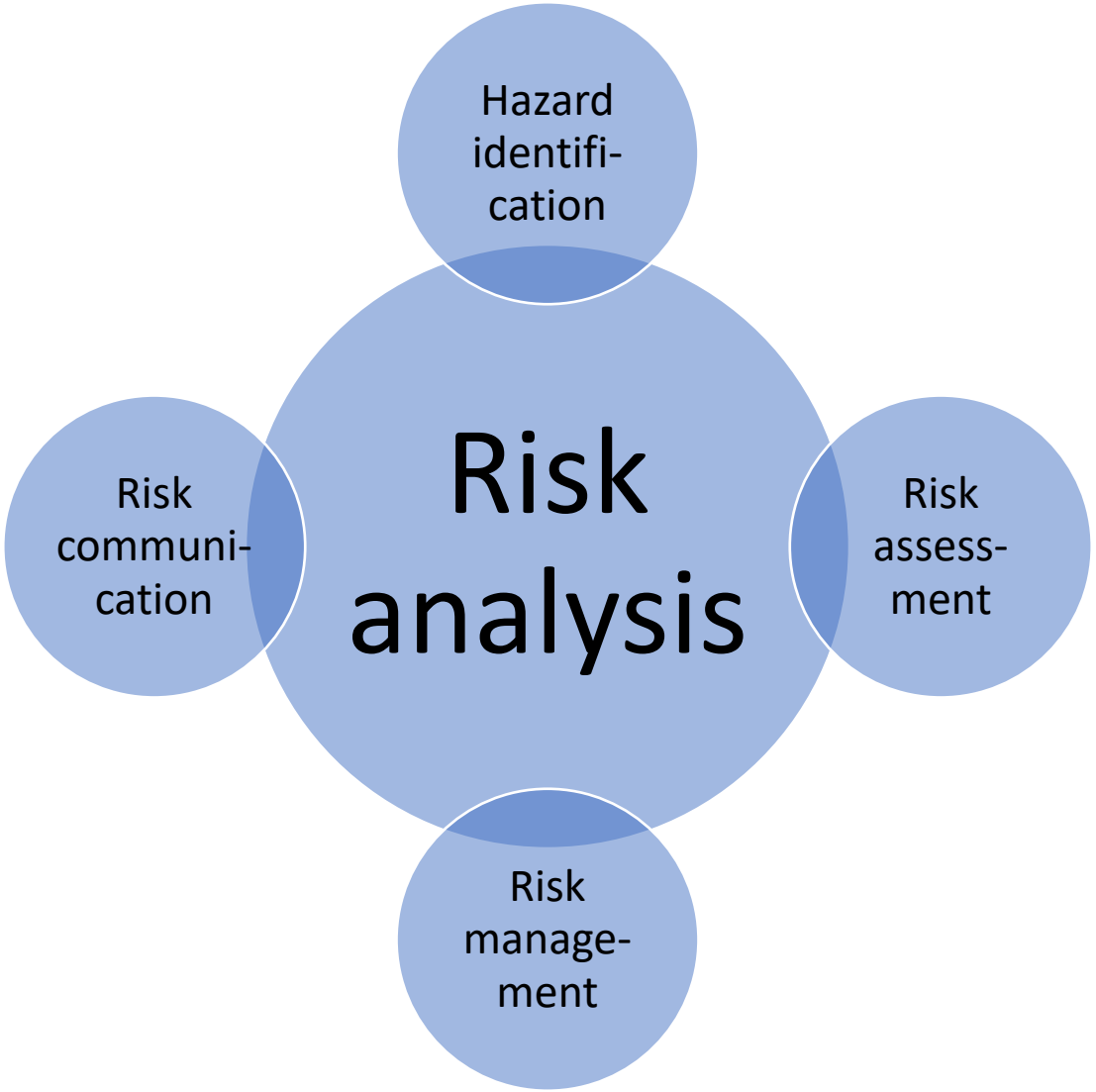
Risk Analysis – what is it?

Different elements

- which will be described in the next slides



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Hazard – an unwanted event

An event that is potentially harmful for humans, animals, plants or the environment

Examples:

- Depositing waste in the environment
- Presence of Salmonella in meat

No hazard means no risk

- Horse meat sold as beef is food fraud
- But horse meat in itself is not a risk

– unless it contains e.g., drug residues

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Risk

Requires that a hazard has been identified

Risk = Probability * Consequence

Probability that the unwanted event happened

Size and type of consequence of event

The next step is to estimate the probability and the concequences of the event

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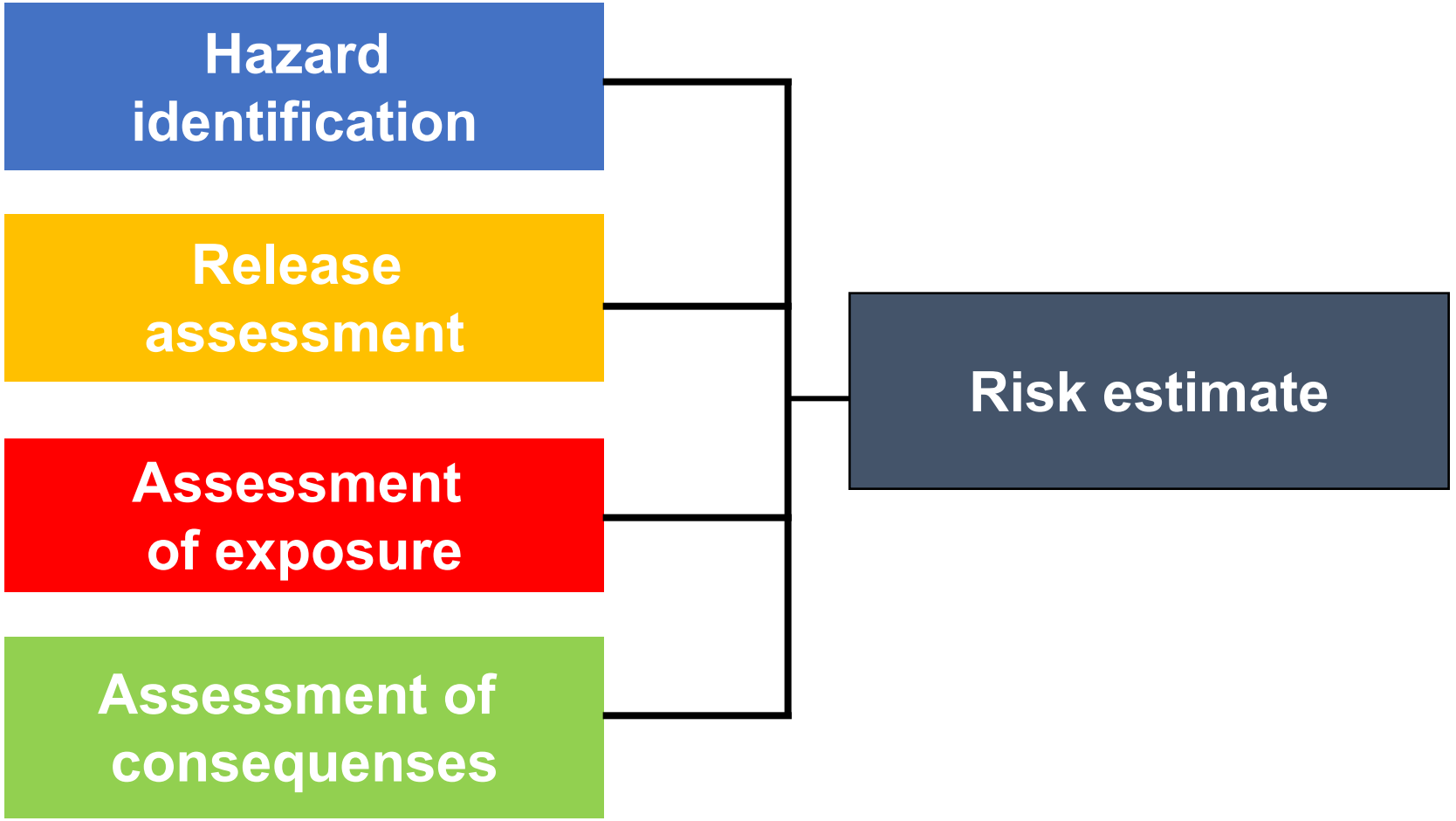
Risk assessment – the science part



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According to the model of OIE/WOAH

Risk assessment - continued

Process that involves an evaluation of the probability of a hazard occurring and its consequences

A risk assessment can be covering all elements – or only parts

- Risk-release, Assessment of exposure, Consequence assessment

Different types of output:

- Qualitative, semi-quantitative or quantitative
- Depending on available data, purpose of study and time constraints

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Two sets of guidelines in the veterinary area

International Organisation for Animal Health (OIE/WOAH)

- Initially developed for import risk questions
- Preferred by many epidemiologis
- 1992: International Animal Health Code on mammals, birds and bees

Codex Alimentarius

- Initially developed by the standardising organisation Codex Alimentarius for food safety questions
- Preferred by many microbiologist

Main difference related to the order of the elements

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Acceptable risk

How do we agree on what an acceptable risk is?

- Issues that are acceptable for one group are often unaccetable for another group
- Those who are at risk are maybe not he ones that will profit from the action of interest

Example

- How many human cases of campylobacteriosis can we accept due to consumption of meat of poultry meat of national origin?
- While importing poultry from countries with higher prevalence of Campylobacter in poultry compared to your country

Risk communication important to reach consensus

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Approval and transparency

Risk assessment should be subject to peer-review to ensure acceptance

- Or similar type of approval process

Transparency considered an equally important element of risk analysis/assessments

Therefore, risk assessments should be made available to interested parties,

- E.g. through publication on the web or in scientific journals

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Acceptable risk - continued

Example: Test for Salmonella in pork

Testing few samples from a large batch

- Low probability of finding positive batches
- The sensitivity of the programme is low

Testing high number of samples from a batch

- Maybe every batch is found test-positive

We know Salmonella is present in pork at a low prevalence

- More relevant to identify load or within-batch prevalence?

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Risk management: policy-based

Includes evaluation of impact of what the risk is

- Mitigate if risk is unacceptable
- Assess likely size of effect of an individual intervention & costs

Often several interventions are evaluated and compared

- Effect and economic values are used in comparison
- Ethical issues might be included
- Aim is to balance all pros and cons

Used to make a decision and formulate a policy

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Risk communication - an interactive process

Exchange of views and opinions about relevant issues

- Between the stakeholders and the risk assessors
- To ensure, accept and understand that assumptions, data and models are used correctly

Process ensures confidence in work being carried out

- Increases likelihood of successful implementation of recommendations and interventions

Example

- One man wants to import pigs
- But many farmers are at risk of introduction of notifiable disease because of import

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Risk communication – continued

People's perception of risk varies

- Depending on time, place and socio-economic issues

Usually danger is percived

= I might be eaten by a crocodille

- But not the probability (how likely is this?)

All aspects need to be taken into account to obtain consensus

- Trust-worthy, if government/industry act transparently
- No hidding of unpleasant facts

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Approach – Step 1

Investigate precisely which hazards are of interest

- Phrase the risk question
- Preferable in collaboration with the risk manager and maybe other stakeholders

Example

- What is the probability of presence of Salmonella in sausages made from pig meat from Country X?
- What are the loads of Salmonella in positive servings?

Step 2

Risk assessment should be conducted by a group

- One person is the risk assessor
- Remaining group consists of experts within relevant areas
- Such as statistics, epidemiology, feeding, physiology and virology

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Step 3

Describe the pathways that consist of events that might lead to the unwanted event

- Describe which kind of information that is needed to describe the probability for each step in the pathways that it might take place

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Step 4

Collect the necessary information from the literature

- All data used need to be referred and used logically

Expert opinion can be used

- If documented data are unavailable

Studies can be put in place to collect the needed data

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Step 5

Estimation of the risk

Decide on which kind of details for the output

- Qualitative, quantitative or semi-quantitative

Choice depends on needs, qualifications in group, time, kind of data and feasibility

Decide on whether full risk assessment is needed or a partial will do

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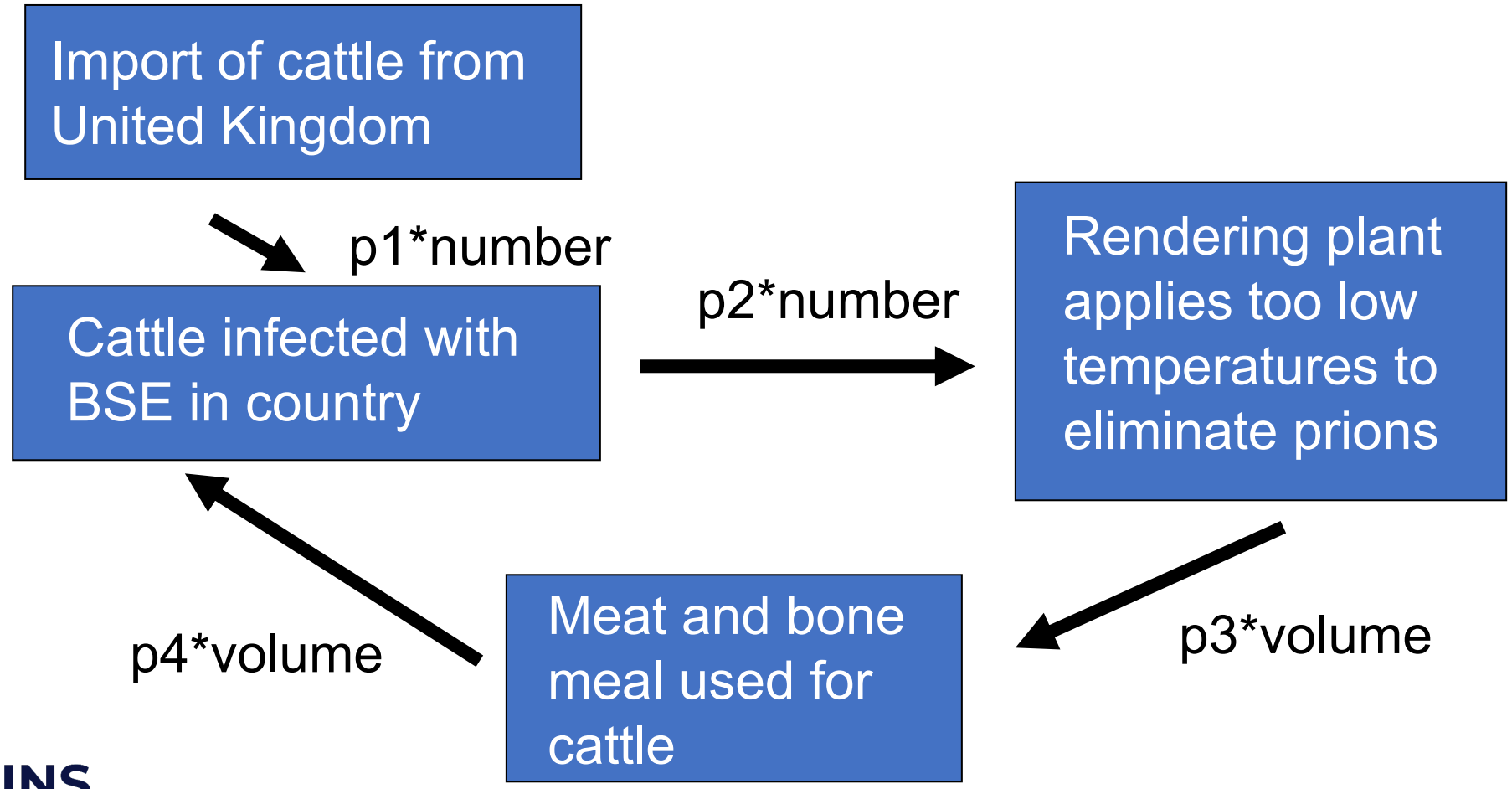
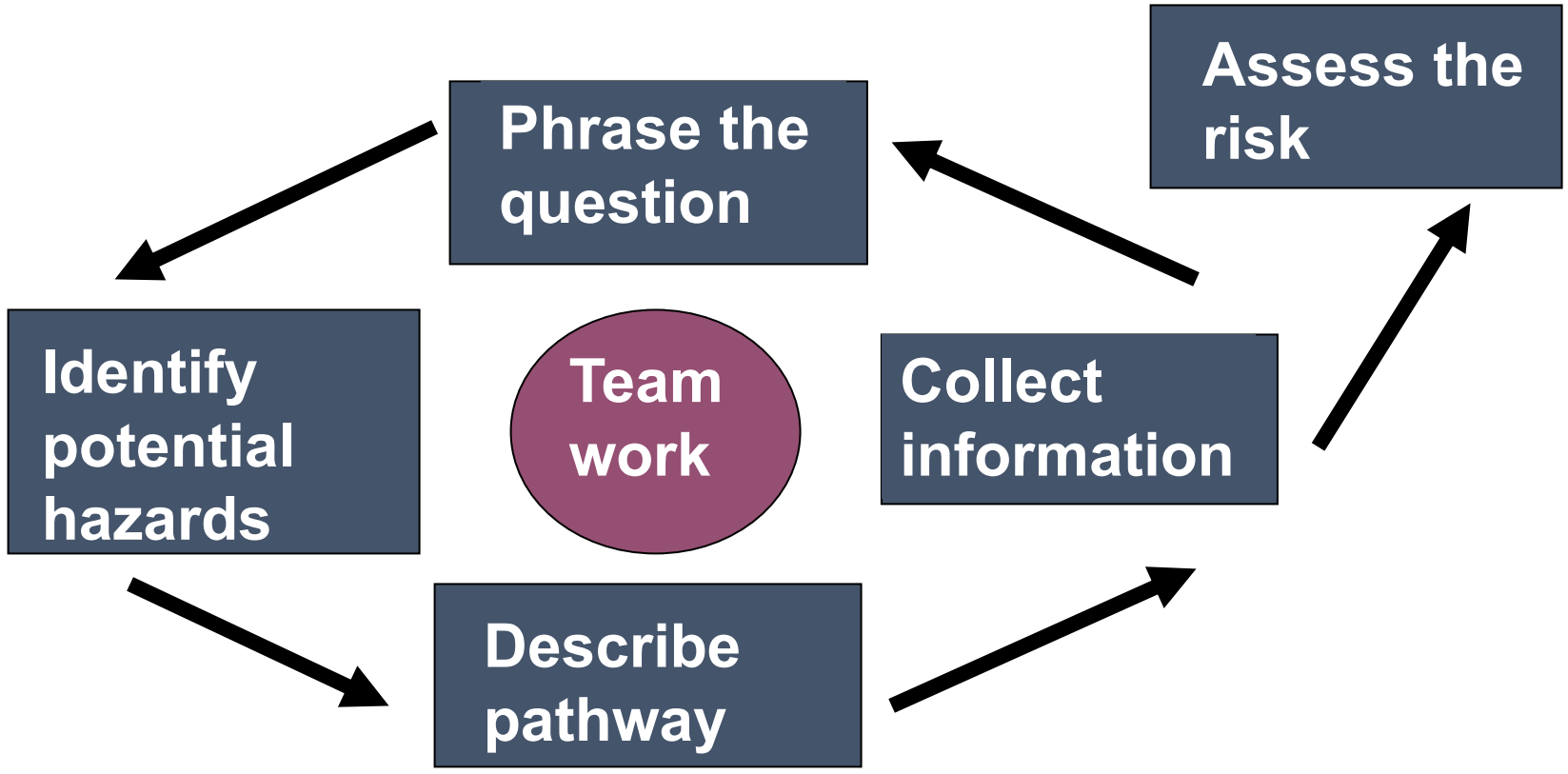
Example: Mad cow disease (BSE)



Risk assessment process



Summary

Risk analysis is a systematic approach that will assist in decision-making

Veterinary relevance related to assessment and management of risks related to

- Food
- Import of animals and products thereof
- Biological products such as vaccines

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