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What are the stakes with biosecurity, vaccination, and culling practices?

Is it really necessary to cull all the animals on an affected farm?

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Anses

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To cull or not : a key question

The continuation of systematic slaughter, ‘stamping out’ :
complex and controversial issue in animal disease management in Europe.

It presents authorities with **a dilemma** between :
- the imperative of public health and economic stability (exports),
- ethical, social and animal welfare concerns.

Regulation (EU) 2016/429 on animal health often requires total slaughter for **certain diseases classified as high risk**.

Slaughtering dates back to ancient times

- **Protecting human health** (public health):

Zoonoses, such as TB or brucellosis,

transmitted / consumption of animal products or contact.

- **Protecting the agricultural economy**:

Economic losses for livestock farmers and

Food security

Period / context	Disease / problem	Isolation and disposal practices
Ancient time	Diseases preventing ritual sacrifice	Animals intended for slaughter without defects or diseases
Biblical/Talmudic period	Foodborne/ritual illnesses	Religious laws: no consumption of meat from animals with certain diseases
Middle Ages	Rinderpest (devastating epizootics)	Compulsory slaughter and burial of dead or sick animal carcasses to halt the spread of disease
XVII-XVIII Centuries	Rinderpest and others / Anthrax	Strict quarantines imposed at borders and on affected farms. Infected animals often slaughtered and burned.

Cases where systematic slaughter is the rule

- for highly contagious or exotic (non-endemic) diseases in order to prevent them from becoming established on a long-term basis.
  - FMD : Immediately eliminate the source to prevent rapid and uncontrollable spread that would paralyse the livestock economy (4M animals in UK in 2001).
  - Classical Swine fever : eradicating the virus and maintaining the country's disease-free status, essential for international trade. (13 M already)
  - African Swine fever: No vaccine or treatment; rapid elimination and strict control of movements, including in wildlife (wild boar)
  - HPAI: highly contagious and zoonotic; prevent transmission to humans (epidemic potential) and rapid spread between livestock farms

- **A rank** (Animal Health Law) : Diseases not present in the EU or present in a few countries, but with a high potential for rapid spread requiring immediate eradication (PPR, African horse sickness, CBPP)

Cases where selective culling or other measures are applied

- For endemic diseases that progress slowly, or where carrier status can be accurately identified, culling may be more targeted or combined with other measures.

  - Brucellosis (BDE): selective slaughtering / regular screening and culling of only seropositive or clinically ill animals, as well as high-risk ‘contact’ animals
  - IBR (CDE) : Selective culling and vaccination: Many European countries with eradication programmes / culling of animals carrying the virus (often detected by serology). In areas with high prevalence, vaccination is used to control the disease pending eradication.

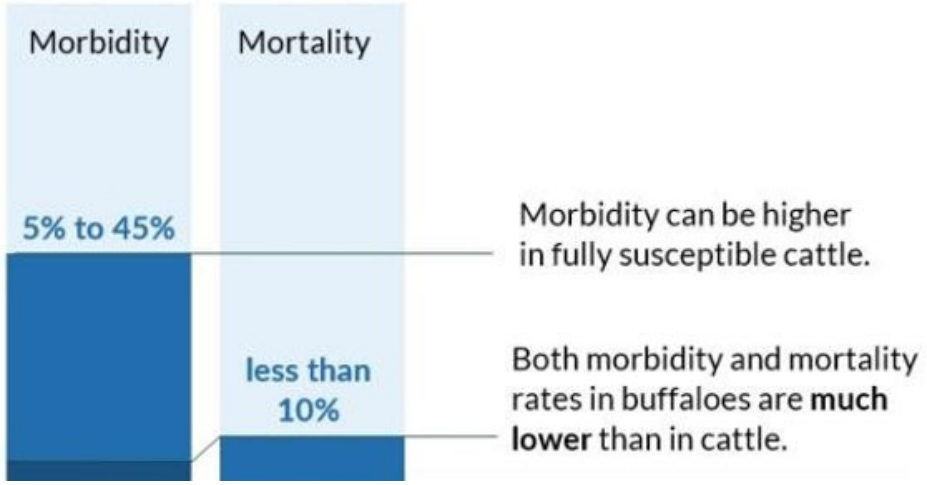
Cases where the appropriateness of total culling is highly debated

- Total slaughter is a source of tension when health justifications are challenged by ethical considerations, the availability of alternatives, or the devastating impact on farmers.

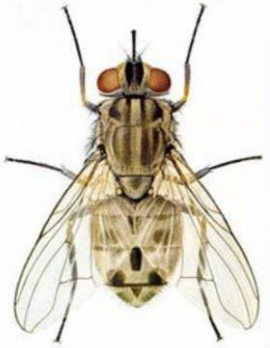
  - TB : controversy about the role of wildlife (mainly badgers in the UK). Question: Targeted culling of infected cattle in livestock farming. But programmes to cull badgers based on the assumption that wildlife is a reservoir / subject of scientific and ethical debate.
  - LSD : Rank A = immediate eradication but controversy about culling since indirect transmission (stable flies); a call for the exclusive use of vaccination and the targeted slaughter of only sick animals?

Lumpy Skin Disease

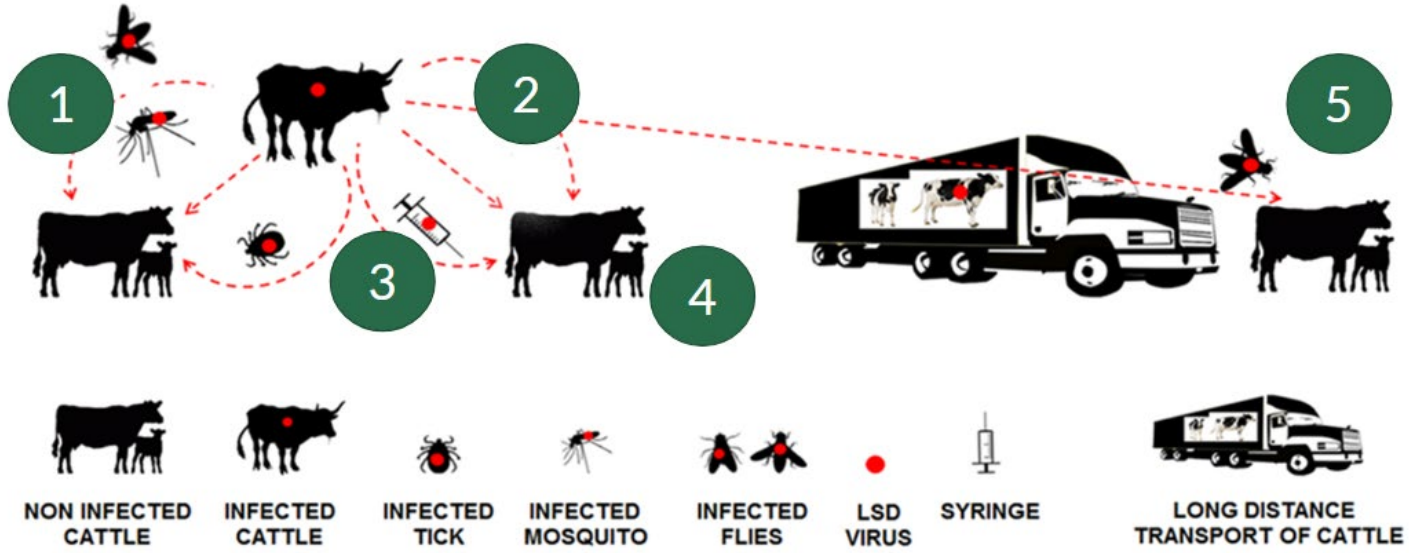
- viral disease of livestock caused by a virus belonging to the Poxviridae family, genus Capripoxvirus.
- characterised by the appearance of numerous nodules on the skin and internal mucous membranes.
- Incubation: 4 to 14 days - up to 5 weeks in the field.
- Classic clinical signs include hyperthermia, ocular and nasal discharge, decreased milk production and skin nodules.



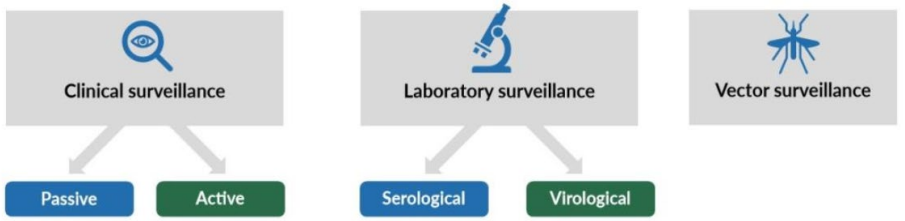
LSD - Epidemiology



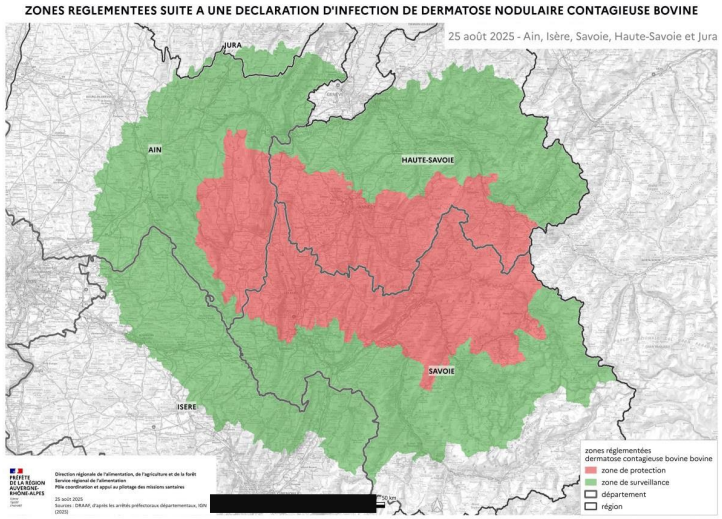
- Combination: susceptible animals, vectors and uncontrolled movements = a winning prize for the emergence of new outbreaks.
- The first case is often linked to the introduction of an infected animal.
- Favourable months = hot and humid.



LSD - Strategy

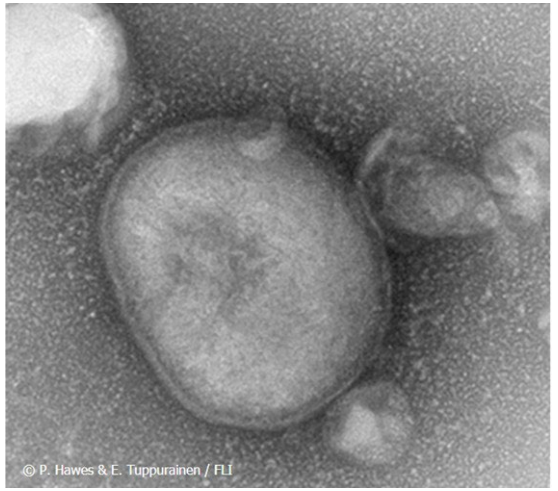


- Control :
  - Culling (dry up the source of viruses), Clinical surveillance
  - Vaccination: create immune protection all around
  - Biosecurity measures (control of movements)



- Total or selective slaughtering?
  - Incubation : 4 d to 5 wks
  - Viremia : 1 to 2, 3 wks
  - Asymptomatic animals (1/3 of the herd)
  - Transmission: direct + flying syringes

LSD - conclusion



- Total culling : virus source suppression

- Selective culling :
  - International trade = Loss of the free status / with exposed or incubating animals in the herd, incompatibility with international (Woah Terrestrial Code) and European regulations ≠ eradication.
  - Export : Market closures = Third countries / import live cattle or genetic material and risk perception.
  - Viral persistence: because of asymptomatic and in incubation animals…
  - Management complexity: need for a precise, repeated and individual diagnosis; strict and prolonged control of movements on the farm in order to manage the evolution of cases.

Conclusion

- Culling or not : a question of balance
  - Immediate containment and eradication :
    - Free area / exotic disease
    - Highly contagious
    - Public health / zoonoses

  - Lack of a usable alternative:
    - ASF
    - HPAI : vaccination not yet widespread / emergency vaccination too slow

  - Maintaining International trade status (Woah)
    - to achieve "disease-free" status faster after an outbreak than vaccination = requires long, intense surveillance periods (the DIVA strategy)

Thank you for your attention