Mink Production - Health, Disease Prevention, and Disease Eradication at a National, Regional and Farm Level

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WHOLE LOT OF SCIENCE GOING ON

"…an important step towards regulatory and preventive zoonotic diseases, protection of food safety of animal products, establishment of modern veterinary medical techniques, identification of animal welfare issues as well as enhancement of laboratory-animal knowledge. It is also essential to develop the veterinary specialties system and continuing education."

Cit: http://www.vm.ntu.edu.tw/DVM_Eng/

TAIWAN

Thanks for the invitation to visit Taiwan and join you for the 15th Asian Association of Veterinary Schools Congress.

THE WORLD

EUROPEAN UNION

Content of this presentation

Introduction

- status on important livestock diseases in Denmark
- the Danish cooperative system

Production of mink

Prevalent diseases in mink

- distemper virus infection in mink and harbour seals
- parvo virus infectioni n mink

Eradication of diseases

- examples of eradicated diseases in man and animals
- Aleutian Disease in mink

Prevention of diseases in mink

- biosafety and biosecurity
- vaccination

Introduction

- status on important livestock diseases in Denmark
- the Danish cooperative system

Danish livestock diseases status

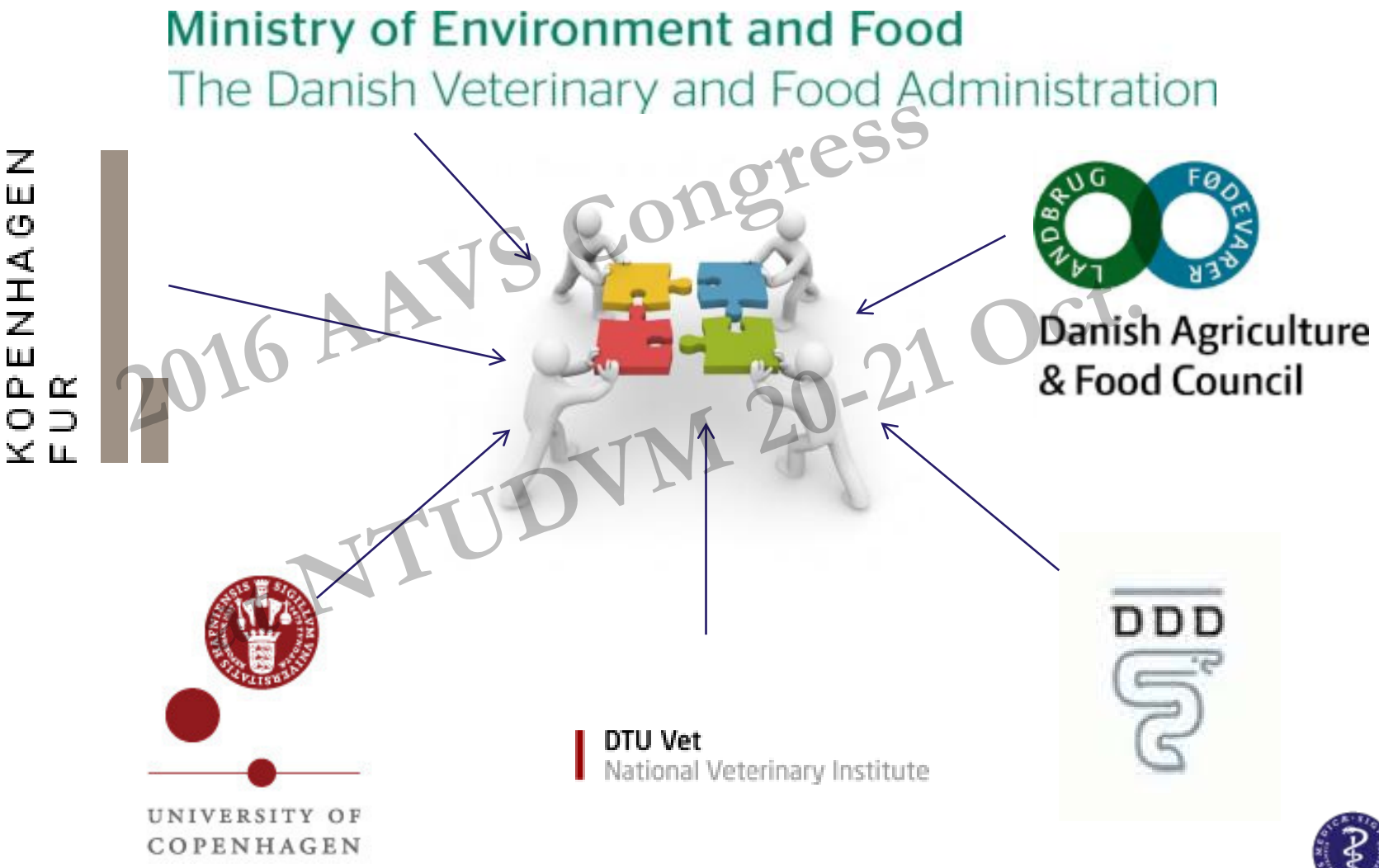
OIE Listed diseases

The following diseases **do not** occur in Denmark:

World Organisation for Animal Health

Foot and mouth disease	**1983**
Vesicular stomatitis	**(never recorded)**
Swine vesicular disease	**(never recorded)**
Rinderpest	**1782**
Peste des petits ruminants	**(never recorded)**
Contagious bovine pleuropneumonia	**1886**
Lumpy skin disease	**(never recorded)**
Rift Valley fever	**(never recorded)**
Bluetongue	**2008 (BTV 8)**
Sheep pox and goat pox	**1879**
African horse sickness	**(never recorded)**
African swine fever	**(never recorded)**
Classical swine fever (hog cholera)	**1933**
Highly pathogenic avian influenza (Fowl plague)	**2006**
Low pathogenic avian influenza	**2013**
Newcastle disease	**2005**

Cooperative partners in the ″The Danish ″model



Cooperation between stakeholders

"The Danish Model"

Good and trustful cooperation between industry (pig, cattle, milk, poultry, mink), universities and authorities for decades:

- Regular meetings
- Working groups
- R & D
- Network and personal contacts

Benefits of the co-operative system

Commercial interest of producers "beyond the farm gate"

Trust/stable relationship between producer and next step in the value chain

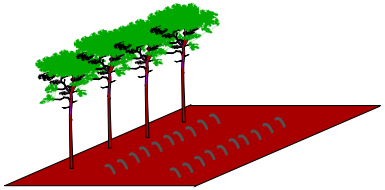
Joint Research Programmes

Excellent communication, information flow

Easy assimilation of quality initiatives

INTEGRATED PRODUCTION SYSTEM

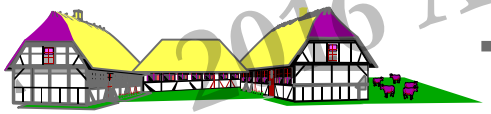
Focus - from farm to consumer
Danish pigs as an example



Soil

Feeding stuffs

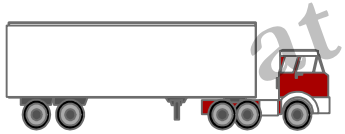
Pig



Farm

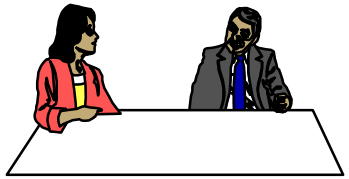
Transport

Slaughterhouse



Distribution

Sale



Table

Cornerstones in the Danish veterinary system

Harmonised EU legislation on animal health area

Quarantine of farms with suspected disease

Culling of infected farms

Tracing of contacts

Cleaning and disinfection

National stand-still for live animals

Ban on export of live animals of susceptible species

Protection and surveillance zones

Emergency Vaccination is a possibility

Compensation payments to owners

National Veterinary Institute – reference lab for animal diseases

Contingency plans

Danish veterinary legislation

Veterinary health control in all herds

Herd health advisory agreements

Antibiotics must be prescribed by a veterinary practitioner

Veterinarians are not allowed to sell medicine to farmers

All medicines are supplied via pharmacies



A very high level of Animal Health in Denmark



Production of mink

Distribution of mink farms in Denmark

Life cycle of mink (*Neovison vison*)

Mating starts in March

The puppies are born between 25 April and 10 May

When the puppies are 8 weeks old, they are weaned

In November the animals are killed by means of carbon monoxide or carbon dioxide.

The end product – Danish fur

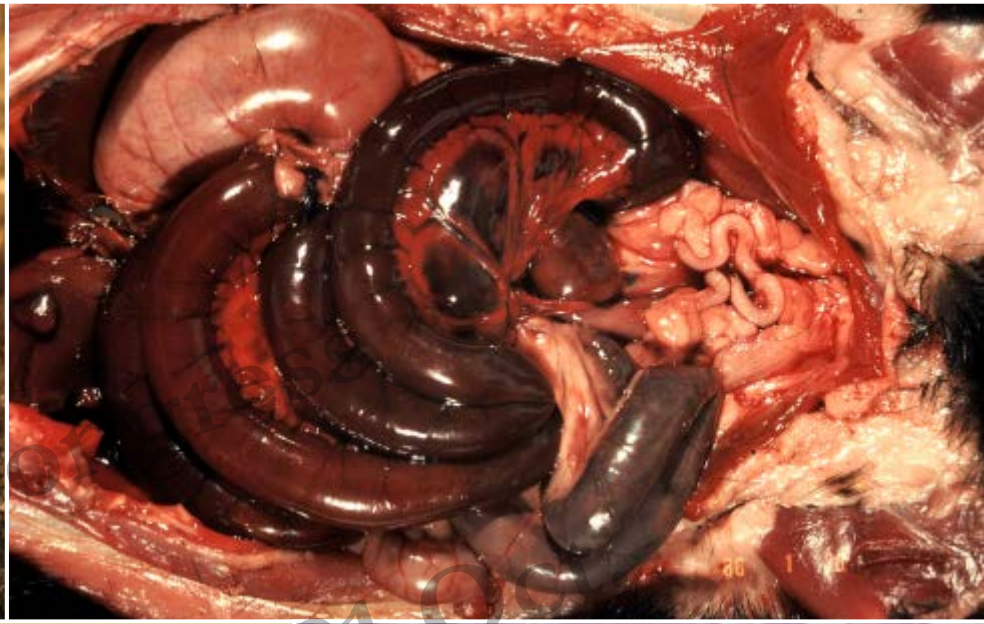
Prevalent diseases in mink

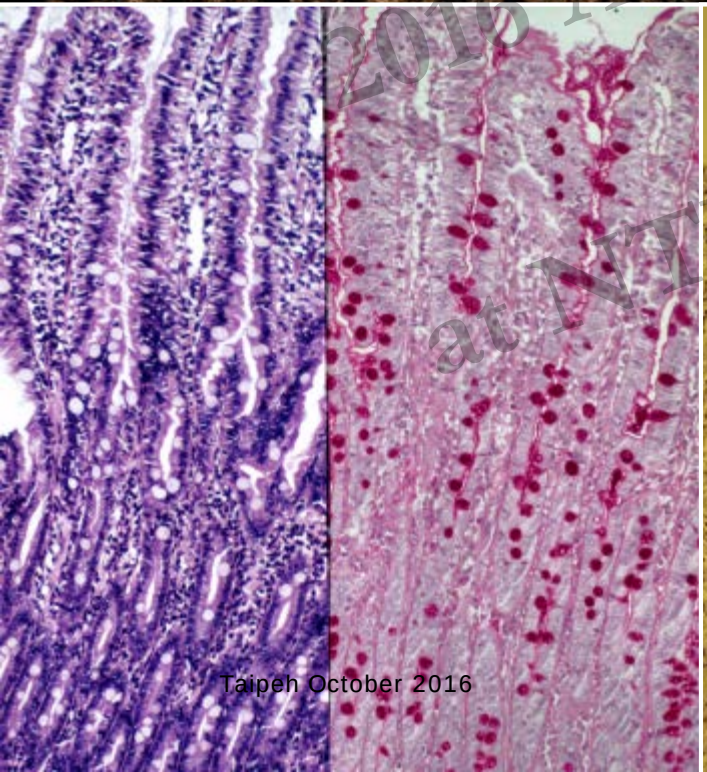
Parvo virus infection in mink

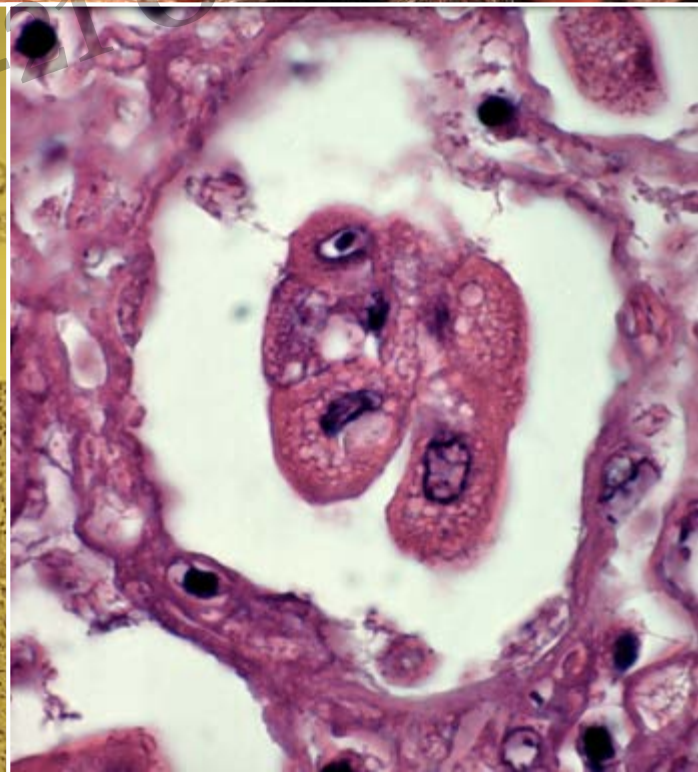
Distemper virus infection in mink and harbour seals

Mink Virus Enteritis

- A parvo virus infection
- Haemorrhagic diarrhoea
- Necrotizing enteritis with "balloon cells"
- Highly varying morbidity and mortality
- Diagnosed histologically and with an antigen ELISA







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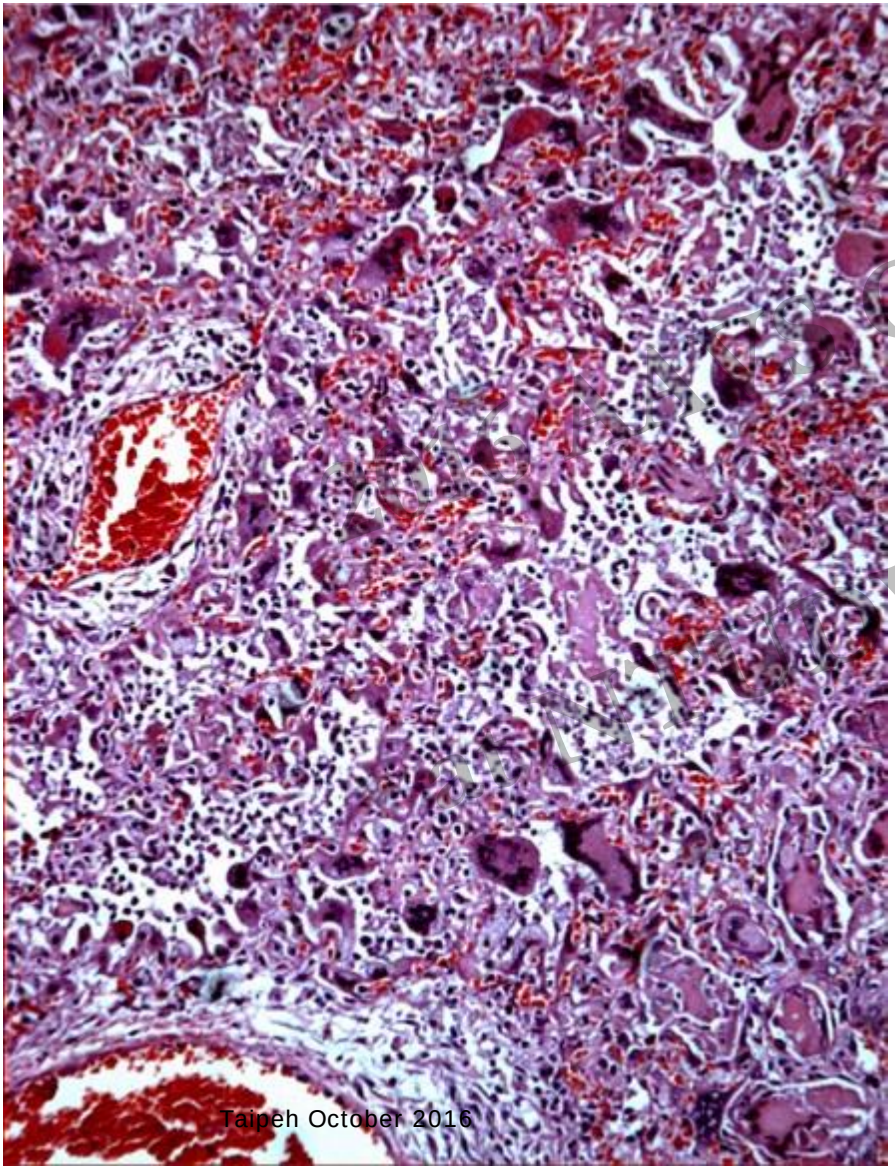
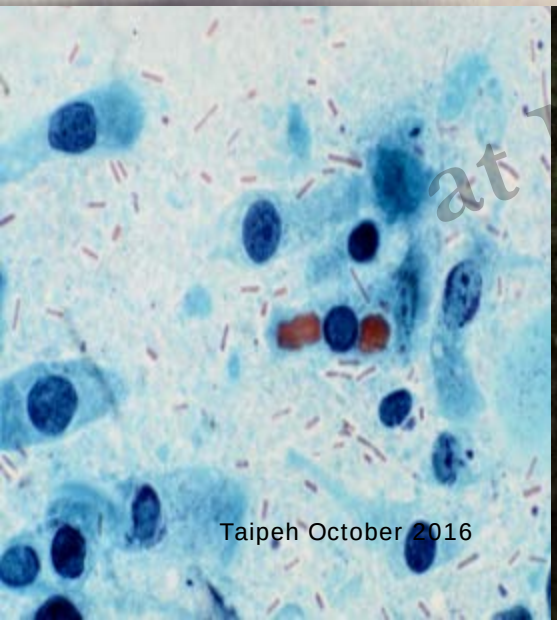
Distemper



- A very serious morbilli virus infection
- Varying incubation period
- Vaccine effective if correctly administered
- Giant cell pneumonia in prolonged cases
- Hard pad disease in prolonged cases



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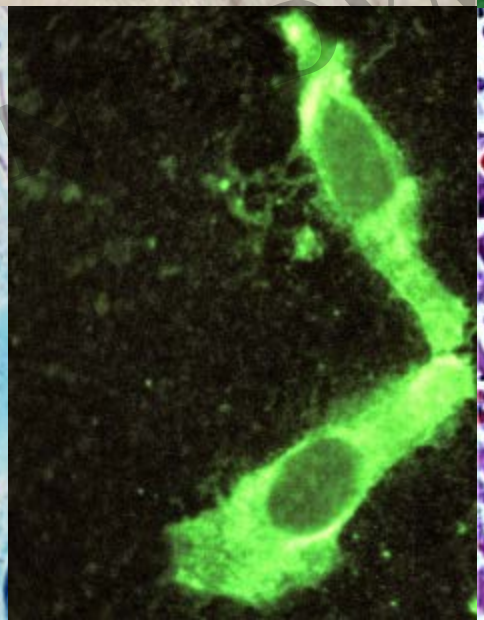

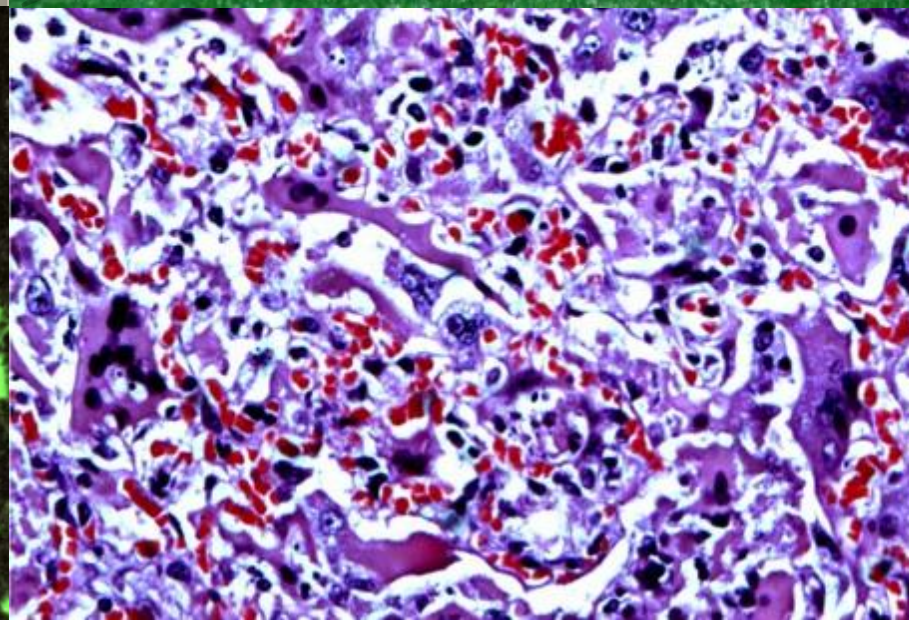

First signs of PDV infection 2002

The 2002 phocine distemper outbreak in harbour seals started at the same location as the 1988 epidemic. In that year, the disease spread from Anholt in April to the Wadden Sea by May, to the southern Baltic Sea by July, and to the waters around the United Kingdom by August, killing approximately 18 000 animals. **Jensen, Bildt, Dietz, Andersen, Hammer, Kuiken, Osterhaus**, *Science, 2002*

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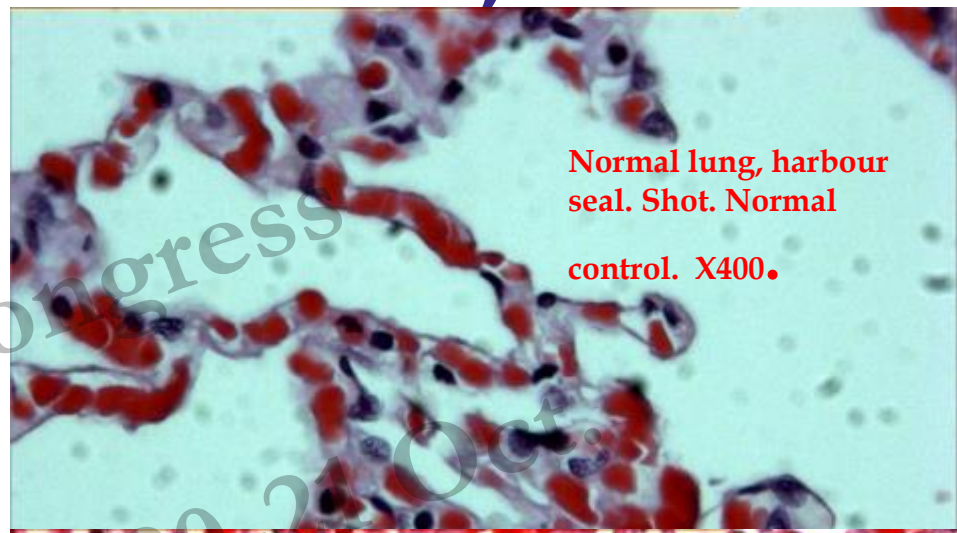
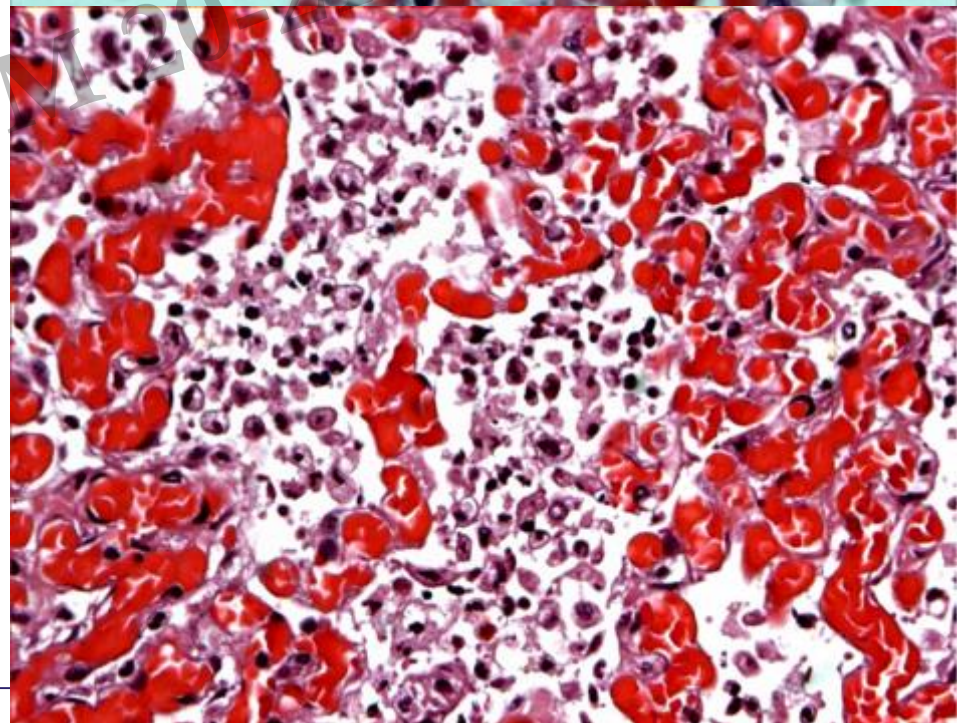
Pneumonia, harbour seal, 2002





Necrotizing pneumonia, harbour seal, PDV-positive (RT-PCR). X250

Eradication of diseases

Examples of eradicated diseases in man and animals

- rinderpest in cattle - 2011
- smallpox in man - 1979

Example of eradication procedures in mink

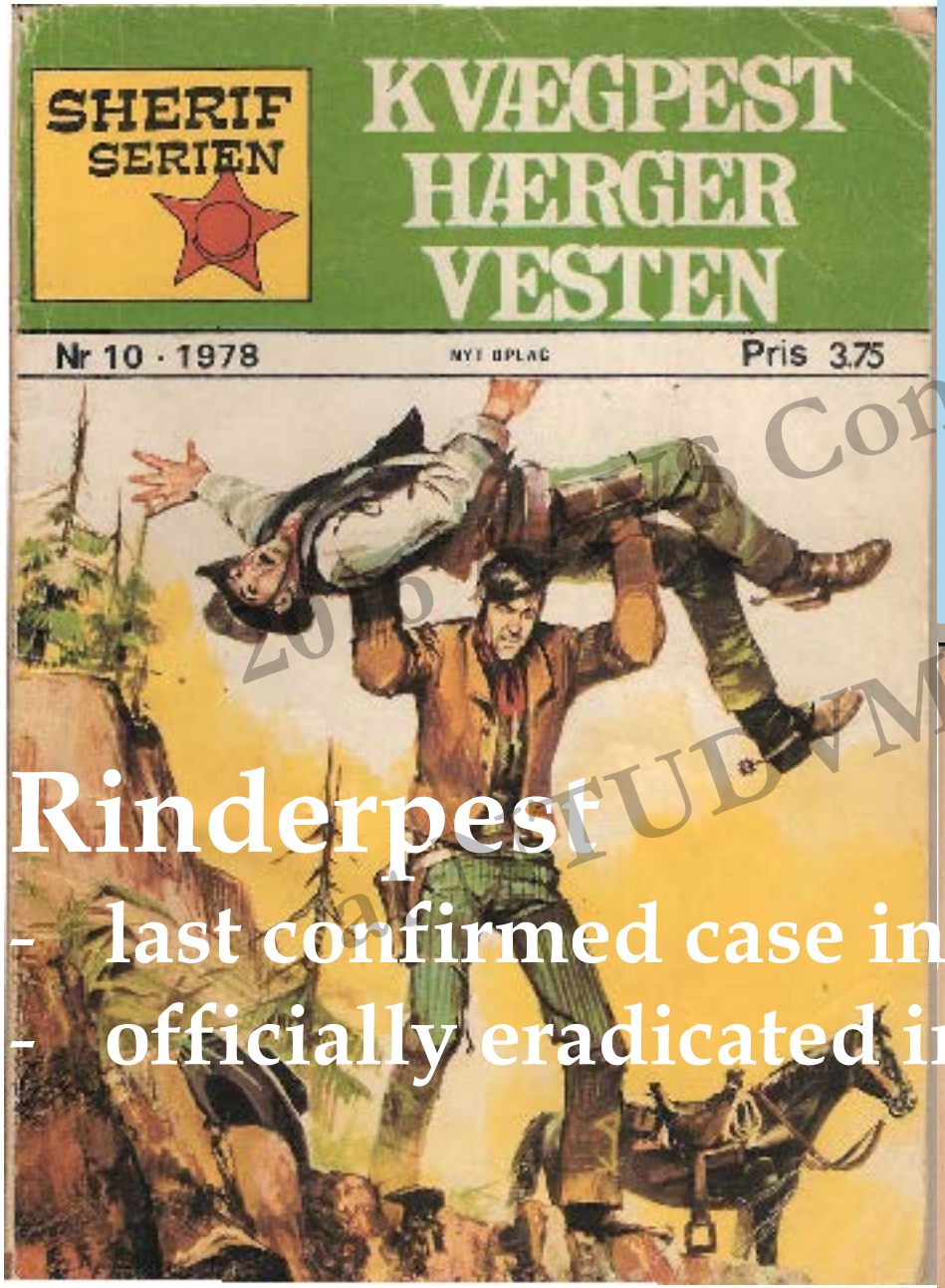
- Aleutian Disease in mink

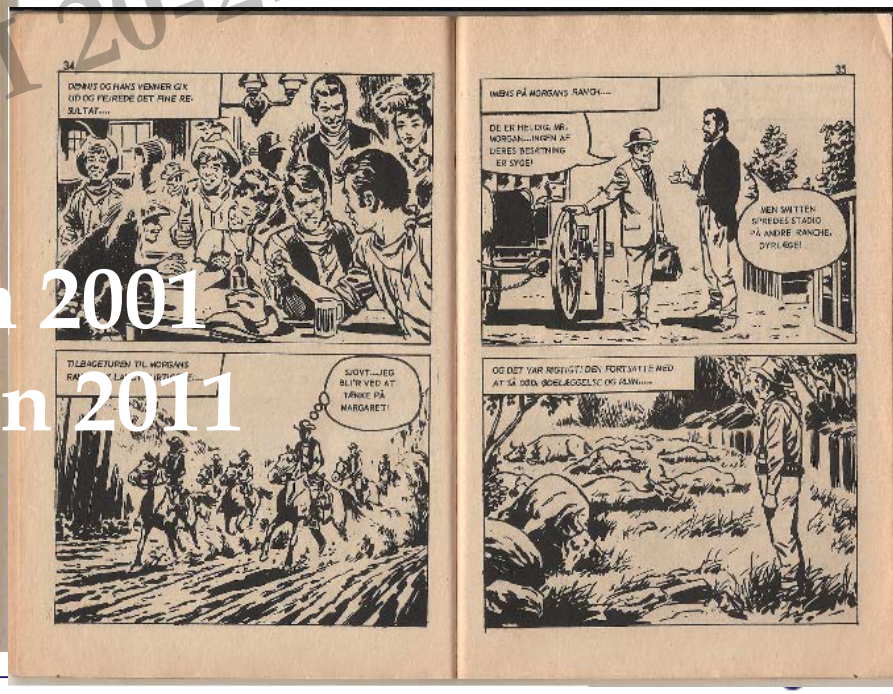
The first recorded veterinary research

Shalihotra (c. 2350 BC) the son of a Brahmin is considered the founder of veterinary sciences. He may have lived in Uttar Pradesh, India.
His work is focused on horse and elephant anatomy, physiology, surgery and diseases

Training of the first veterinary students

The first veterinary school was founded in Lyon, France in 1761 by Claude Bourgelat to combat cattle plaque (Rinderpest).
In the following years a number of veterinary schools in European countries established similar veterinary schools.
The veterinary school in Copenhagen was founded in 1773.





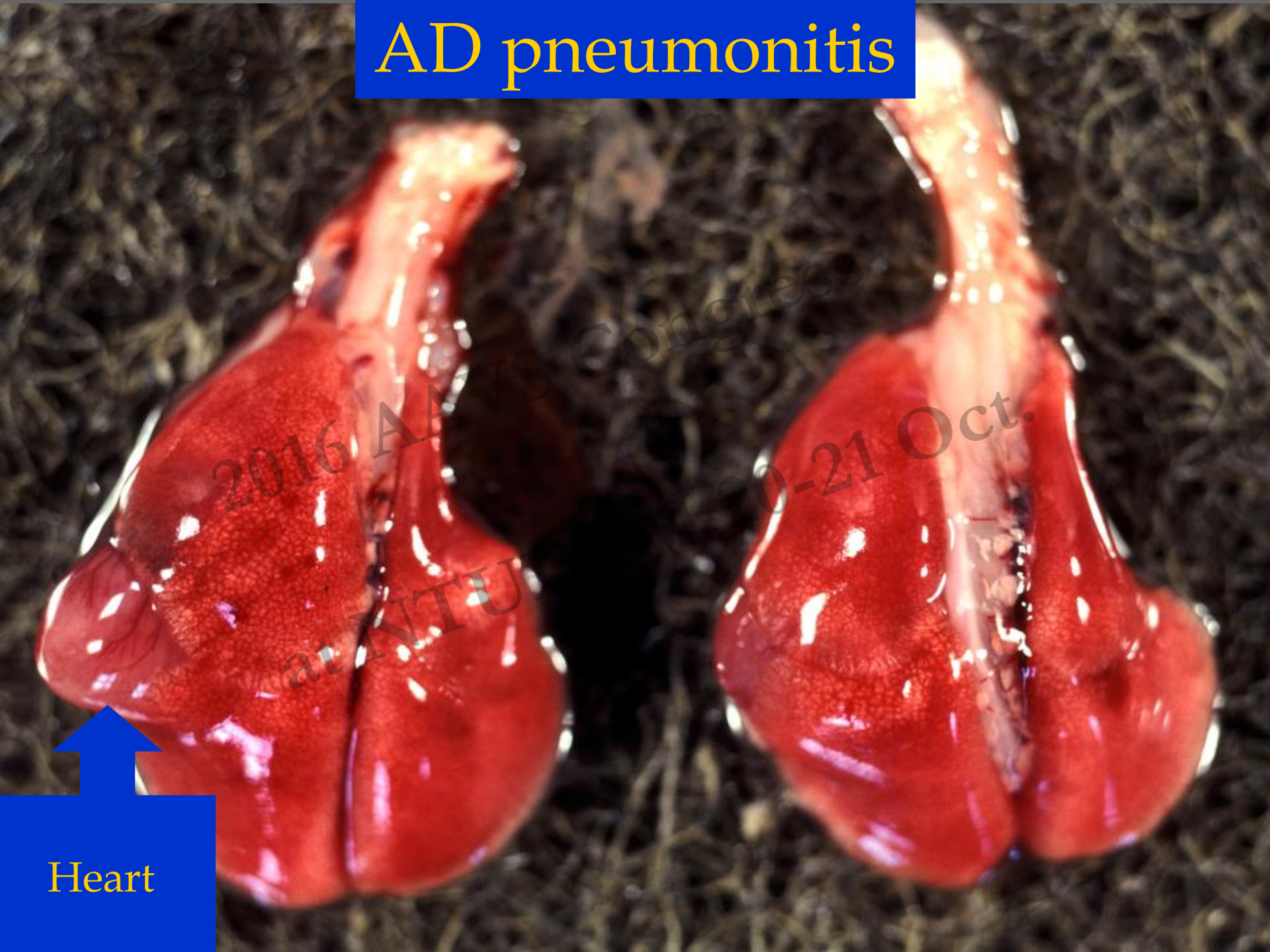
Rinderpest

- last confirmed case in 2001
- officially eradicated in 2011

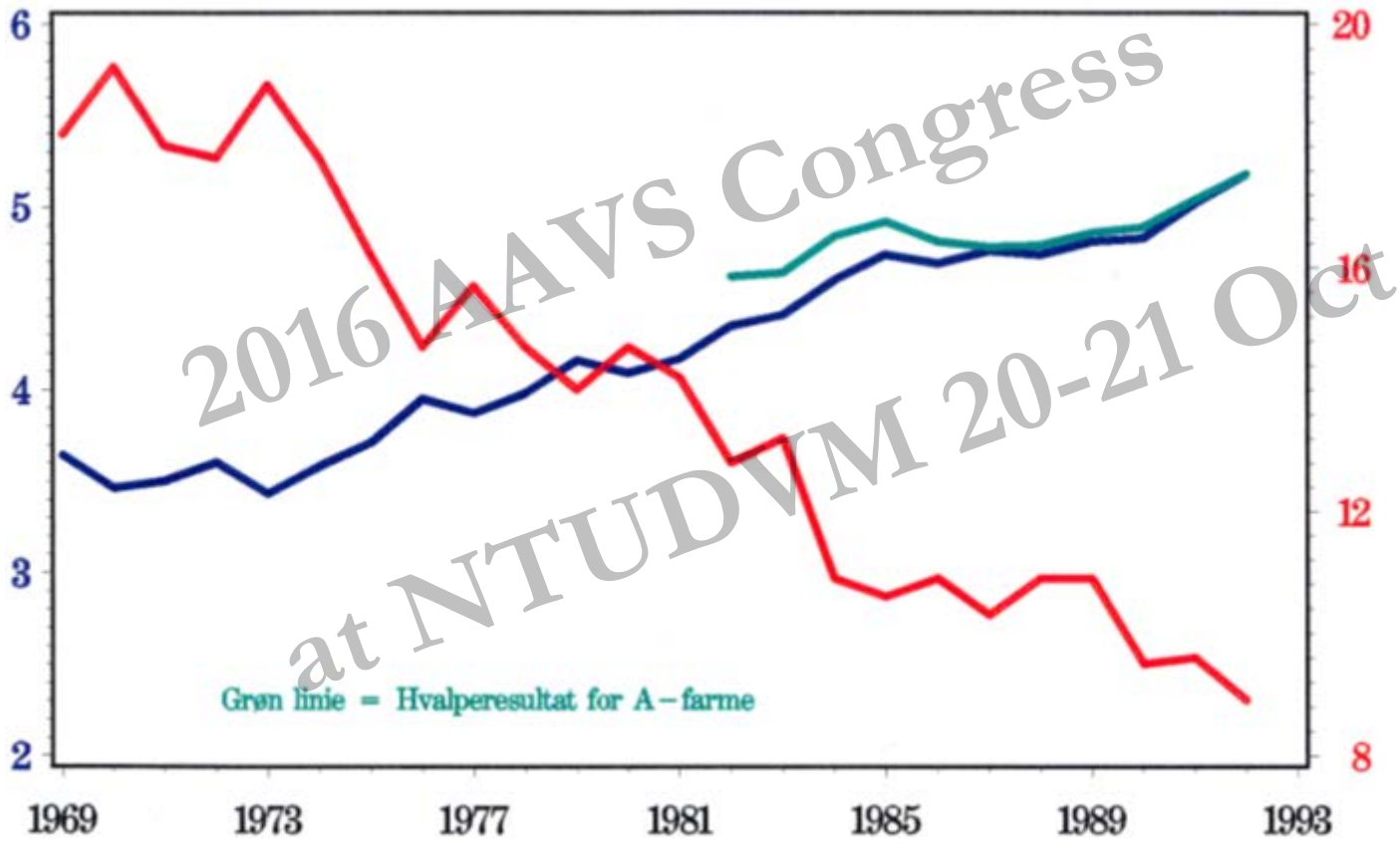
Aleutian Disease/Plasmacytosis

- Chronic infection in mink
- Caused by a very stable parvo virus
- Affects all colour types at all ages
- Causes a constantly high production of antibodies
- No vaccine available
- Animals die from chronic infection and disease changes in the kidneys, liver, lung, brain and other organs
- Different disease courses in kits and adults

AD pneumonitis



Inverse connection between breeding result and barren females in the beginning of an eradication programme



Blue: Kits born/female. Red: Barren females in percent

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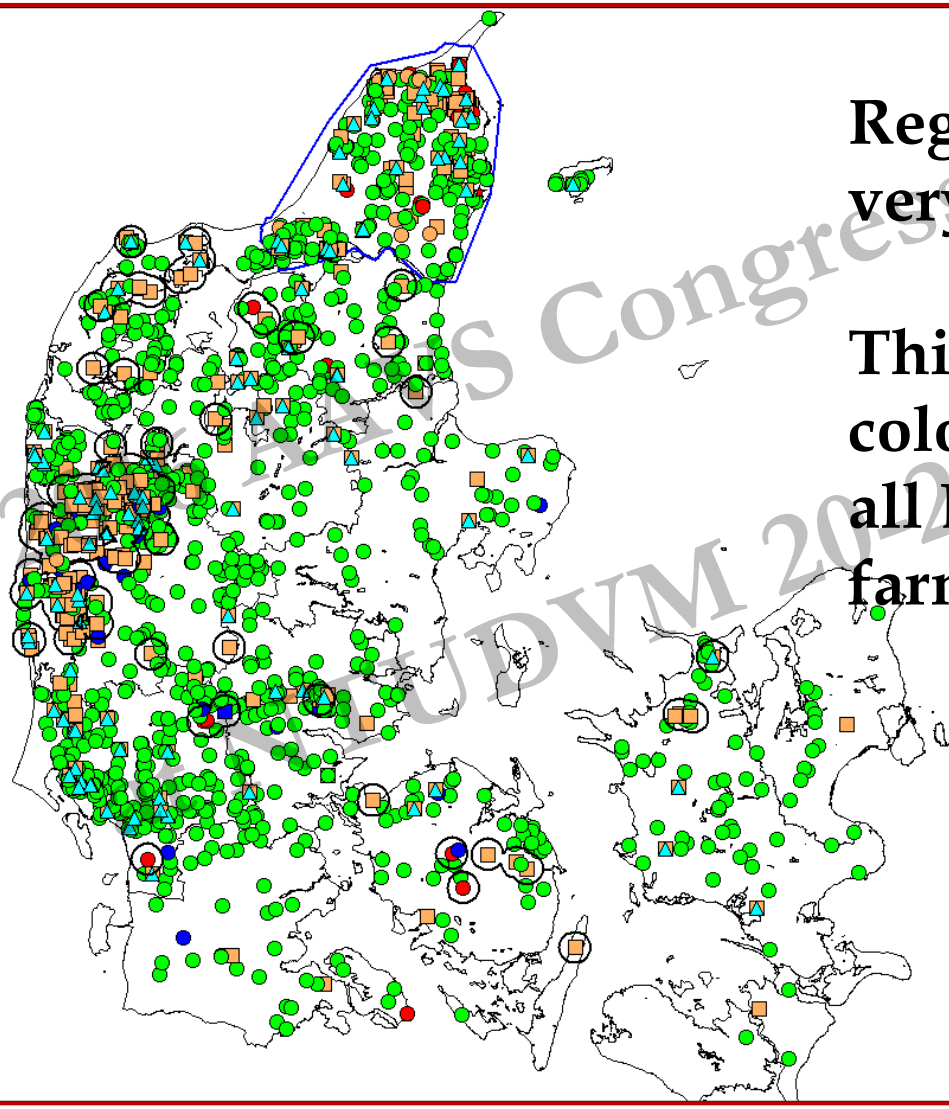
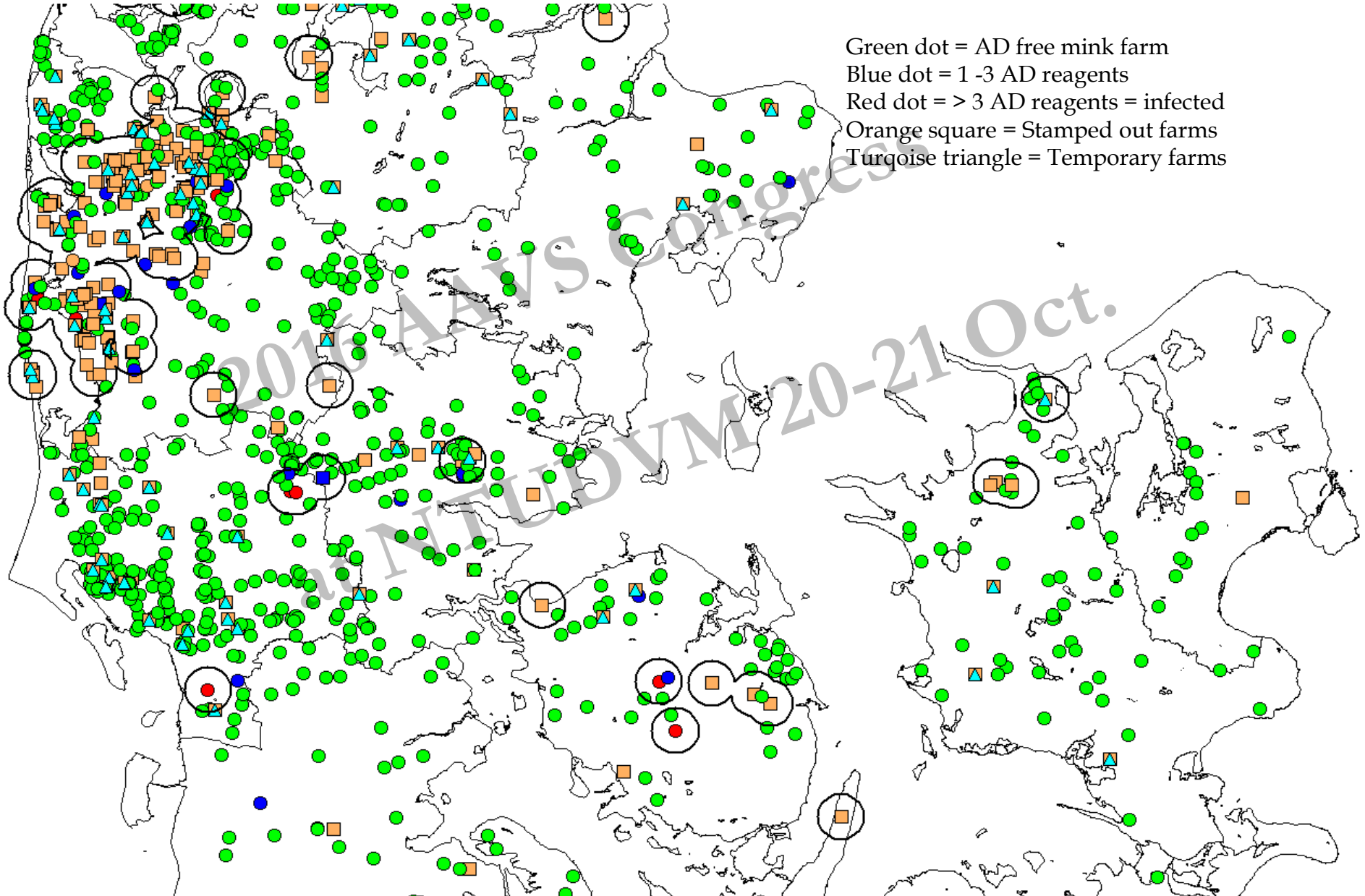
How to eradicate a disease?



Register all farms very carefully!

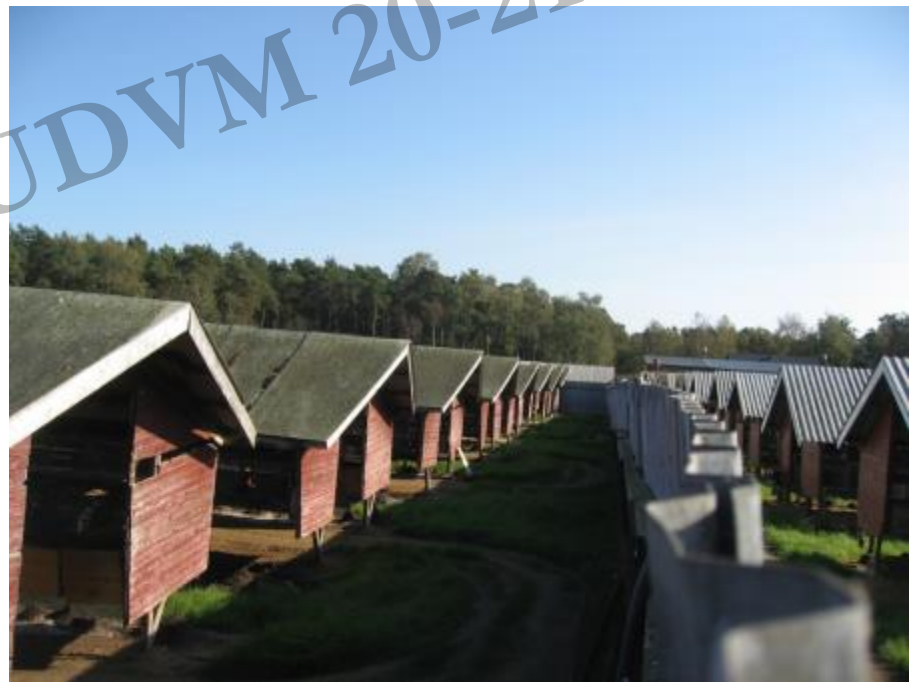
This map shows (one colored dot = 1 farm) all Danish mink farms.

Prevention of diseases



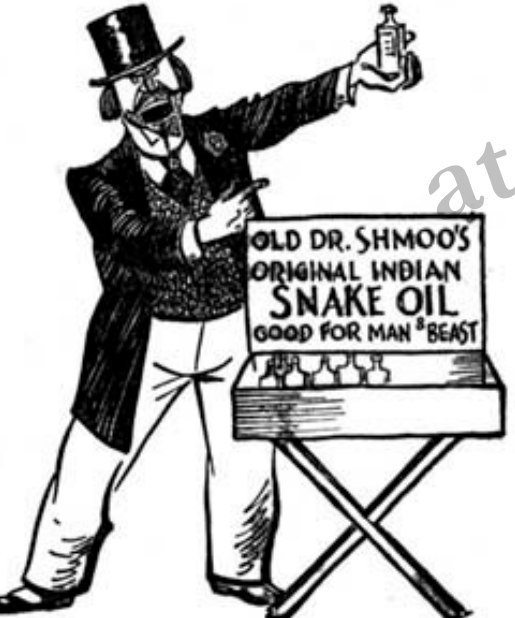
Prevention of diseases

- biosafety and biosecurity
- vaccination
- research



Research - in recent times

How far was research from practical treatment of diseases in 1772?



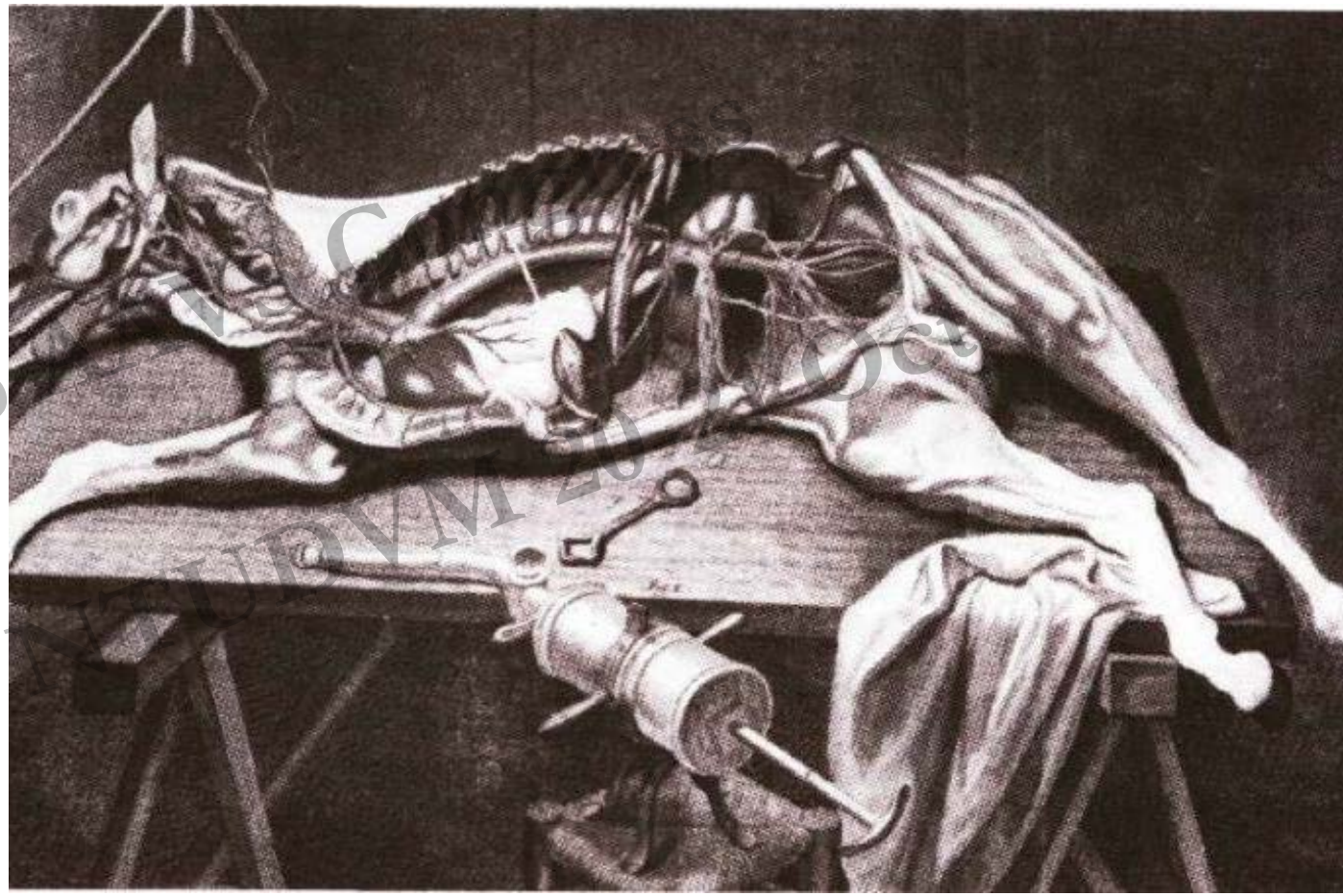
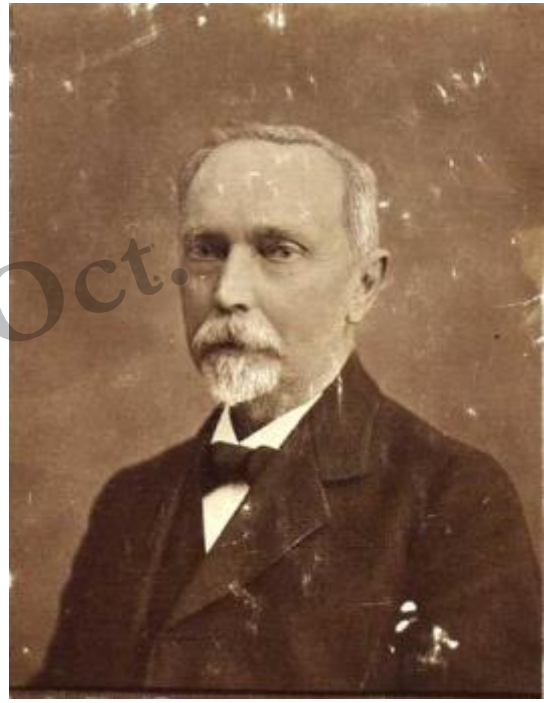


Illustration of the technique for exhibiting blood vessels.
Copper plate (Lafosse 1772)

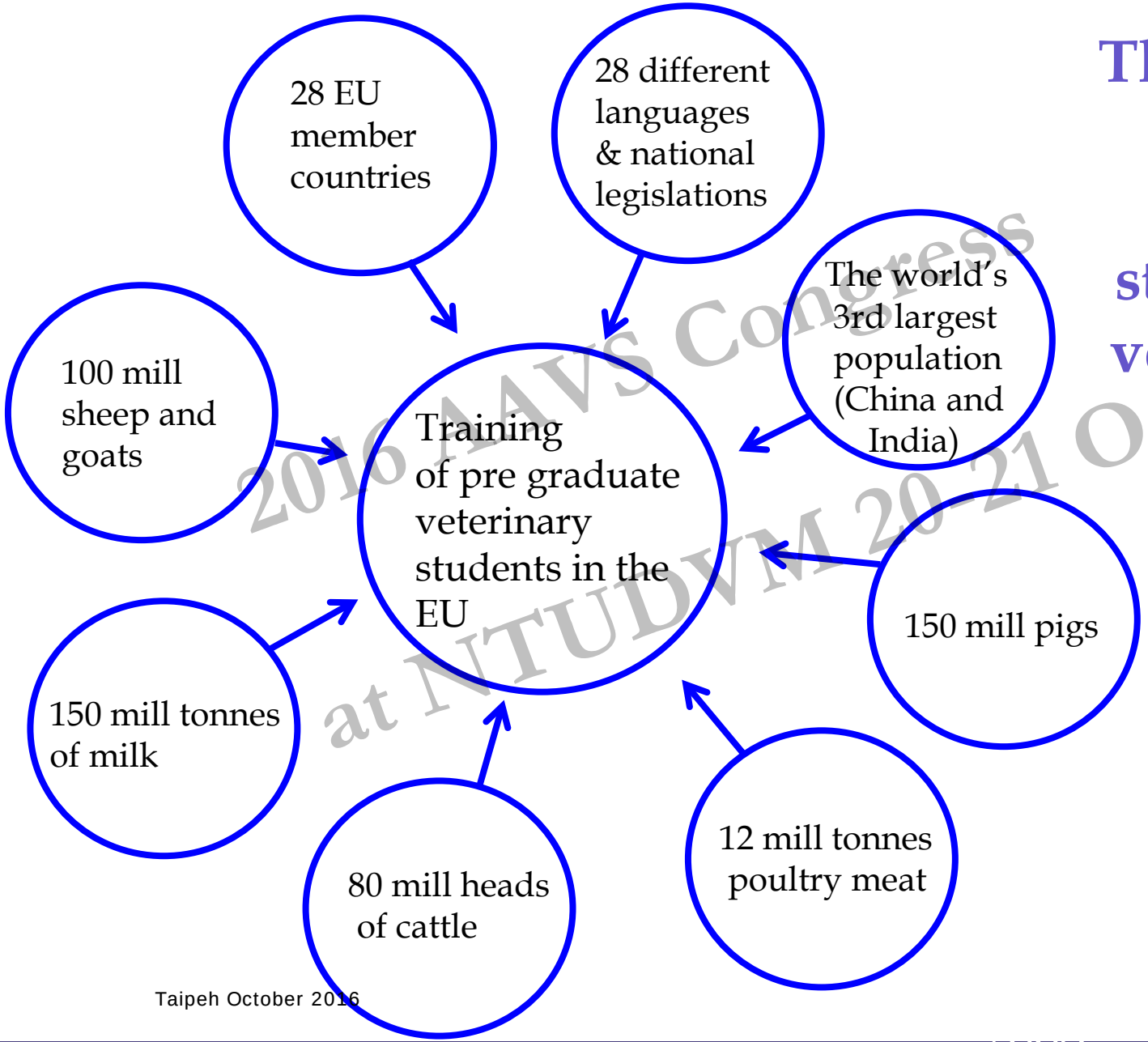
Research 100 years ago

In 1897 Bernhard Bang (MD, DVM, 1848 - 1932) was the first scientist to use tuberculin on cattle, and realised its importance in identifying infected animals. He went on to develop control measures for bovine tuberculosis that led to a dramatic decrease in the incidence of the disease. In 1897, Bang also discovered the bacterium *Brucella abortus* to be the cause of "undulant fever" in cattle. This organism can also infect and cause chronic disease in humans.



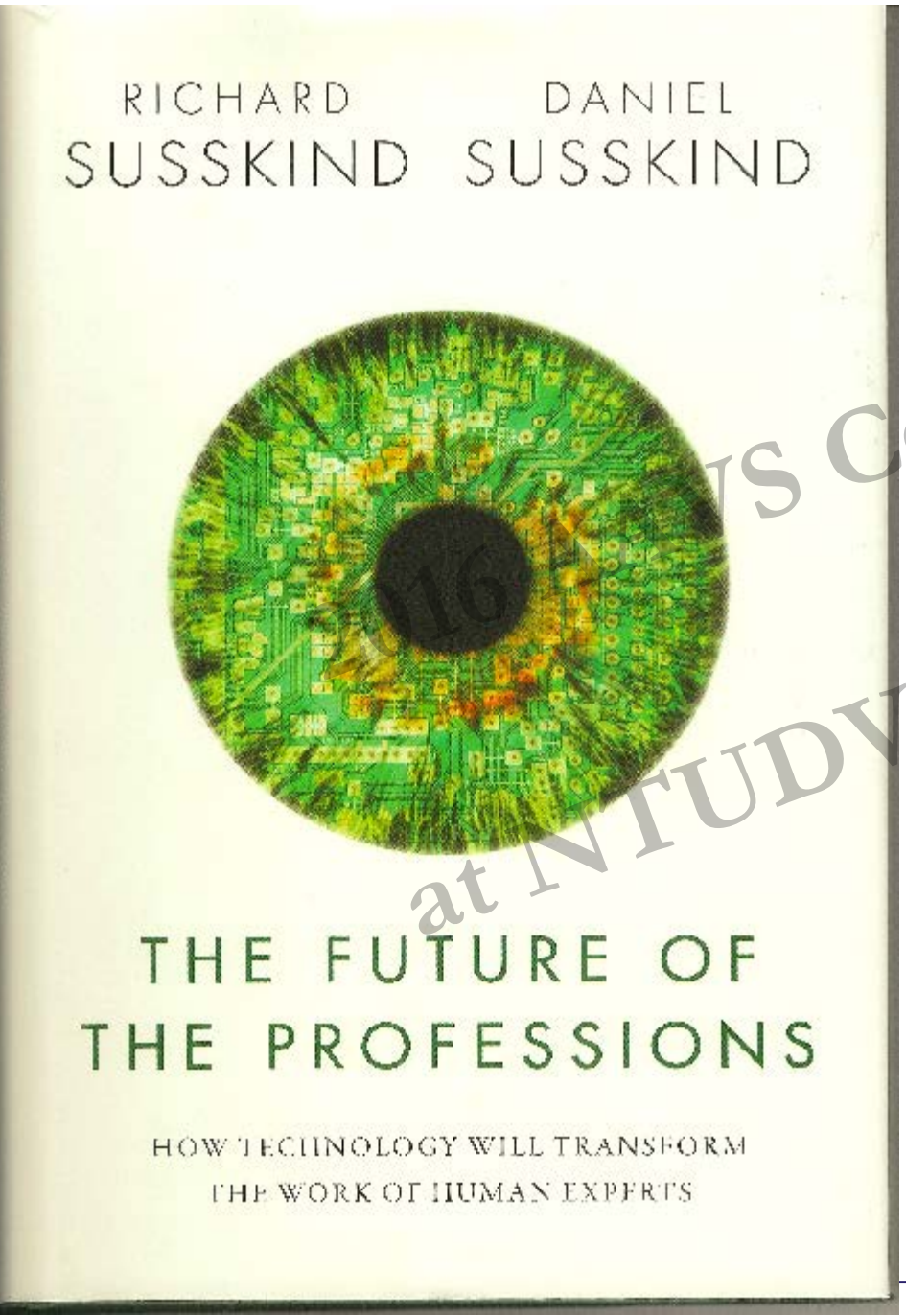
One Health 119 years ago?

The European scene for veterinary students and veterinarians



What's our priority in animal production?

Antibiotic free production? Maximum production to satisfy the global needs? Sustainability or maximum profit? Quantity or quality? Control or trust? Animal welfare? Disease free production? Insects? Global or local cooperation?



The future is unpredictable but Susskind imagines at least 2 different ways

<u>More of the same</u> - but more efficient and including new technology

<u>A transformation</u> of the individual veterinarian to technological systems

Some issues don't change for veterinarians

Infectious diseases

Emerging and re-emerging diseases

Zoonoses

One Health

Herd health management (preventive veterinary medicine)

Thank you for your attention

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