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Impact of selected infectious diseases on animal welfare: a review in progress

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Background and aim

Background: Arguments for controlling infectious animal diseases have often focused on productivity and food safety. However, the new EU Animal Health Law also includes animal welfare consequences as a justification. There is therefore a need for systematic reviews to assess welfare implications of EU-regulated and individual country regulated infectious animal diseases.

Aim: To assess improvement of animal welfare through legislation supporting the control of selected infectious animal diseases in selected countries. The study focuses on non-EU-regulated diseases in cattle (BVD, Paratuberculosis, IBR and *Salmonella* Dublin) and pigs (PRRS and Aujeszky's disease).

Materials and methods

The literature was searched systematically using PubMed with the search words ([disease] or [pathogen] and ((clinical sign*) or (clinical disease) or death or mortality) and [species (cattle or cow or bovine) / (sow* or pig* or swine)]). Focus was on assessment of original descriptions/recordings of clinical disease, i.e. signs, duration, within- and between-herd prevalence and incidence of morbidity and mortality stratified by animal age.

Abstract exclusion criteria were as follows: a) not original study of clinical disease, b) not cattle /pigs; c) non-English or non-German language.

Results

The literature search revealed the following reported clinical signs for Paratuberculosis and Aujeszky's disease.

Paratuberculosis (*Mycobacterium avium* supsp. *Paratuberculosis*)

Disease stage*	Typical signs	Frequency of signs	Duration	Welfare implications
Stage III or IV	Weight loss/ Poor condition (BCS 1-2)	1/10 infected animals	3-6 months	Limited
	Chronic wasting	1/10 infected animals	3-6 months	Significant
	Intermittent diarrhoea	1/10 infected animals	3-6 months	Significant
Stage IV	Emaciation (BCS 0-1)	1/20 infected animals	Days to weeks	Very significant
	Pipe stream diarrhoea	1/20 infected animals	Days to weeks	Very significant
	Intermandibular oedema	1/20 infected animals	Days to weeks	Very significant
	Lethargic	1/20 infected animals	Days to weeks	Extremely significant
	Death	1/20 infected animals	Days to weeks	None

Stage I: Silent infection. Stage II: Subclinical disease.

Period	Case-fatality
2-1 years before onset of control	3.6% annually
1-0 years before onset of control	1.6% annually
0-1 years from onset of control	2.5% annually
1-2 years after onset of control	0.4% annually
4 years	8.8% over four years in cohort of 260 MAP exposed animals

Aujeszky's disease (Porcine herpesvirus 1)

Time of infection	Typical signs	Frequency of signs. Morbidity/mortality	Duration	Welfare implications
In utero	ENCEPHALITIS Shaking/ shivering Sudden death	Mort: 100 %	Dead within two days postpartum	Extremely significant High morbidity and mortality due to the painful consequences of encephalitis and subsequent mortality
Piglets (< 3 weeks)	FEBRILE RESPONSE ENCEPHALITIS lethargy, weakness/appetite loss, incoordination, convulsions, (vomitus, diarrhoea)	Mort: 100 %	2-3 days Death can occur within 12 hours from onset of clinical signs	Extremely significant
Weaners & finisher pigs (> 3 weeks)	FEBRILE RESPONSE ENCEPHALTIS Loss of appetite Somnolence Trembling/convulsions paralysis RESPIRATORY SIGNS Sneezing, nasal discharge, coughing, dyspnea	Mort: 10-20 % 5 % (Radostits et al., 2007)		Very significant
Adults	FEBRILE RESPONSE RESPIRATORY ENCEPHALITIS (occasionally) Incoordination of hind limbs ABORTION Vaginal discharge and mummification Agalactia leads to weak piglets	Mort: less than 5 % (depending on virulence of strain)		Limited Adults have a much lower case fatatlity (Extremely significant consequences for the offspring of infected animals – see above)

Next steps

Quantitative and qualitative assessment of the effect on animal welfare at the animal level and the herd level of application of a control program from endemic occurrence to freedom of disease.

Comparison of countries in terms of legislation and structure of control programs for BVD, Paratuberculosis, IBR, Aujeszky's disease, Salmonella Dublin and PRRS.