Five endemic pathogens of British cattle

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Introduction

Five worldwide & economically important cattle pathogens:

•**Bovine Viral Diarrhoea virus (BVDV)** – a pestivirus closely related to the viruses that cause classical swine fever in pigs & border disease in sheep. BVDV causes a complex of diseases including reproductive problems & can lead to fatal mucosal disease (MD)

•**Bovine Herpes virus type 1 (BHV-1)** – causes the acute virus disease Infectious Bovine Rhinotracheitis (IBR) that principally affects the upper respiratory tract & can cause fatal pneumonia

•***Mycobacterium avium* subsp. *Paratuberculosis* (MAP)** – causes Johne's disease a contagious wasting condition. Infection affects the small intestine causing weight loss & diarrhoea with normal appetite & is fatal

•***Neospora caninum*** – a protozoan parasite first recognised in the 1980s. It is now considered an important cause of sudden abortions & neonatal morbidity in both dairy & beef cattle worldwide

•***Leptospira hardjo*** – following infection, bacteria localise in the reproductive tract & kidneys causing abortions, stillbirths, infertility & loss of milk production in cattle

Project Outline

•Longitudinal study on 5 endemic pathogens in cattle herds in SW England

•Most herds were visited 3 times

•Herds with a BVDV antigen positive sample were visited up to 5 times

•For each herd visit all animals ⩾ 2 yrs of age were blood sampled, unless a herd had a confirmed BVD virus persistently infected animal then the whole herd was blood sampled

•Each sample was tested for antibodies against the agents described

•Samples negative for anti-BVDV antibodies (Ab) were subsequently tested for BVDV antigen (E^{rns})

•Blood samples were collected from 15,736 cattle from 114 herds between December 2002 & April 2006

•A total of 29,782 serum samples were collected, of which 26,207 (91%) were from the 3 planned visits & from cattle ⩾ 2 yrs of age

Objectives

To develop a understanding of the seroepidemiology of 5 different pathogens (e.g. viral, bacterial & protozoan) in a sample of British cattle herds

Results

Mean & median herd sizes were approx: 188 & 171 (range 3-847). Herds consisted of 38 (33%) suckler, 46 (40%) dairy, 10 (9%) dairy/beef & 20 (18%) suckler/beef. 70 herds did not vaccinate against any disease: 2 herds = 1 disease, 2 herds = 2 diseases, 7 herds = 3 diseases, 14 herds = 4 diseases & 45 had all 5 diseases.

Herd prevalence

-Only non-vaccinated herds. Positive herd = herd with ⩾1 animals with positive Ab titre

	Positive herds Number (%)
BVDV	97 (100)
BHV-1	89 (83)
MAP	101 (89)
N. caninum	107 (94)
L. hardjo	71 (91)

Animal prevalence

-Only animals from non-vaccinated positive herds

	Always Negative Number (%)	Ever Positive Number (%)	Positive & Negative Number (%)
BVDV	3541 (30)	8138 (70)	1481 (13)
BHV-1	6993 (49)	7250 (51)	1194 (8)
MAP	14164 (90)	1572 (10)	896 (6)
N. caninum	13697 (87)	2039 (13)	733 (5)
L. hardjo	3932 (55)	3218 (45)	426 (6)

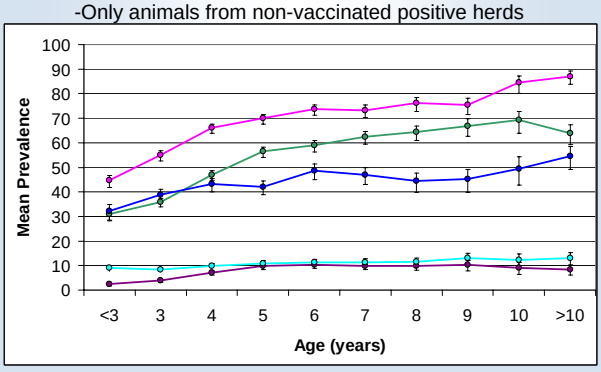
Within herd prevalence

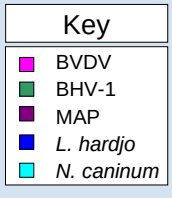
-Only non-vaccinated positive herds

	Mean prevalence	Median prevalence	Range
BVDV	65.4	71.6	1.3-100.0
BHV-1	43.1	40.0	0.9-99.2
MAP	7.1	5.9	0.4-26.2
N. caninum	11.6	9.7	0.7-56.1
L. hardjo	44.1	42.0	1.1-100.0

Age profile

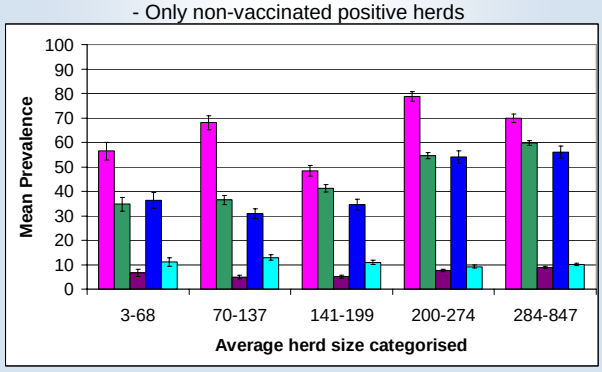
-Only animals from non-vaccinated positive herds





Average herd size profile

- Only non-vaccinated positive herds



Conclusions

•All 5 pathogens were found to be endemic within the sampled population, however the within herd prevalence for all 5 pathogens differed greatly

•Larger herds had higher BHV-1 seropositivity, this may be explained by the herd type or other management factors influencing infectious contacts

•Seropositivity of BVDV, BHV-1, *L. hardjo* increased with age

•These are unique data that will allow better understanding of the transmission dynamics & control of these infections

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