Bovine Viral Diarrhea:
The current situation of Canadian dairy farms.

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INTRODUCTION

Bovine viral diarrhea (BVD) is an endemic infectious disease, leading to significant economic losses due to reproductive disorders and immunosuppressive effects. Since 2004, the epidemiological situation of BVD in Canada is unknown.

OBJECTIVES

1. Assess the diagnostic performance of commercial antibody ELISA using data from Belgium
2. Measure the seroprevalence of BVD in Canadian dairy herds using young unvaccinated animals.

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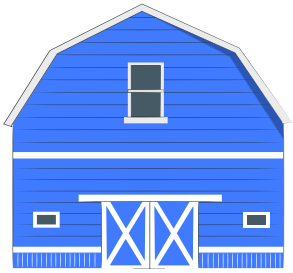
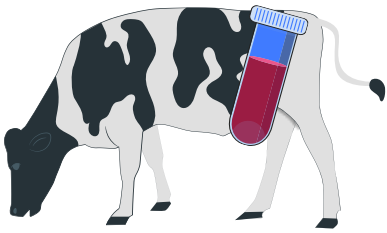
MATERIALS & METHODS

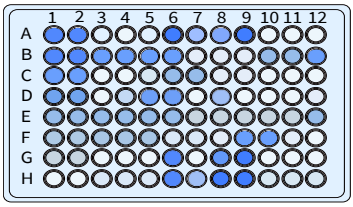
1 Assess the diagnostic performance of commercial antibody ELISA using data from Belgium



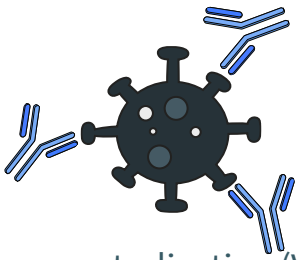
19 Dairy herds from Belgium



664 unvaccinated animals



IDEXX BVD total antibody test



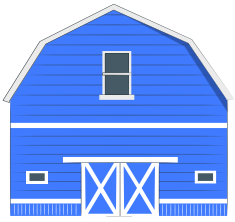
Virus neutralization (VNT)

Herds	ELISA + VNT +	ELISA + VNT -	ELISA - VNT +	ELISA - VNT -
1	1	1	0	68
2	21	0	0	14
3	11	7	0	80
...				
19	12	2	0	3
Total	**143**	**29**	**3**	**489**

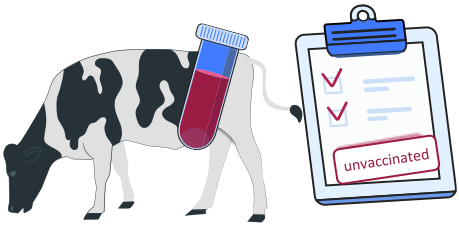
The sensitivity and specificity of the ELISA and VNT were estimated using a hierarchical Bayesian latent class model.

MATERIALS & METHODS

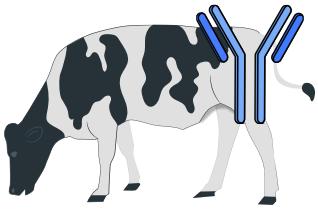
2 Measure the seroprevalence of BVD in Canadian dairy herds using young unvaccinated animals.



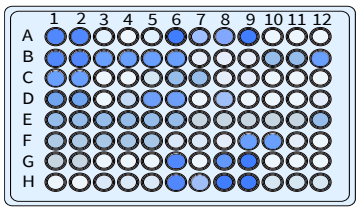
328 dairy herds
3 provinces in Canada



10 animals/herd (4-18 months)



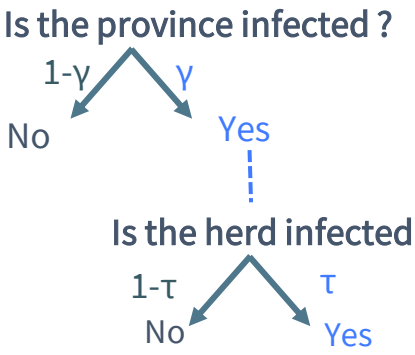
Detection of transient infection

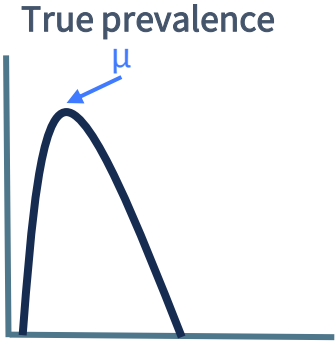


IDEXX BVD total antibody test

We will use a three-level hierarchical Bayesian latent class model, incorporating the Se and Sp estimates obtained from our first objective as priors.

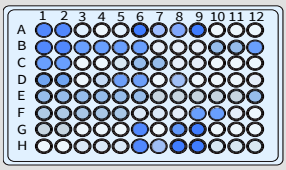
This model will estimate:
(1) the probability that the **province is free** of BVD (1-γ)
(2) the probability that **a given herd is free** of BVD
(3) the prevalence of infected herds in Canada (τ)
(4) the true prevalence of positive animals in infected herds (μ)
(5) the average prevalence of infected herds within the infected provinces





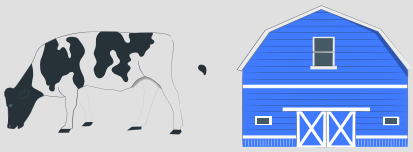
PRELIMINARY RESULTS

ELISA diagnostic performance



Se: 97.5 (BC 95%: 89.6-99.9)
Sp: 94.6 (BC 95%: 87.0-97.5)

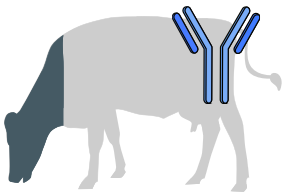
Unvaccinated animals from Canadians dairy herds



1390 animals

210 herds

Apparent animal-level prevalence



13%

Apparent herd-level prevalence

(≥ 2 positive animals per herd)

17%

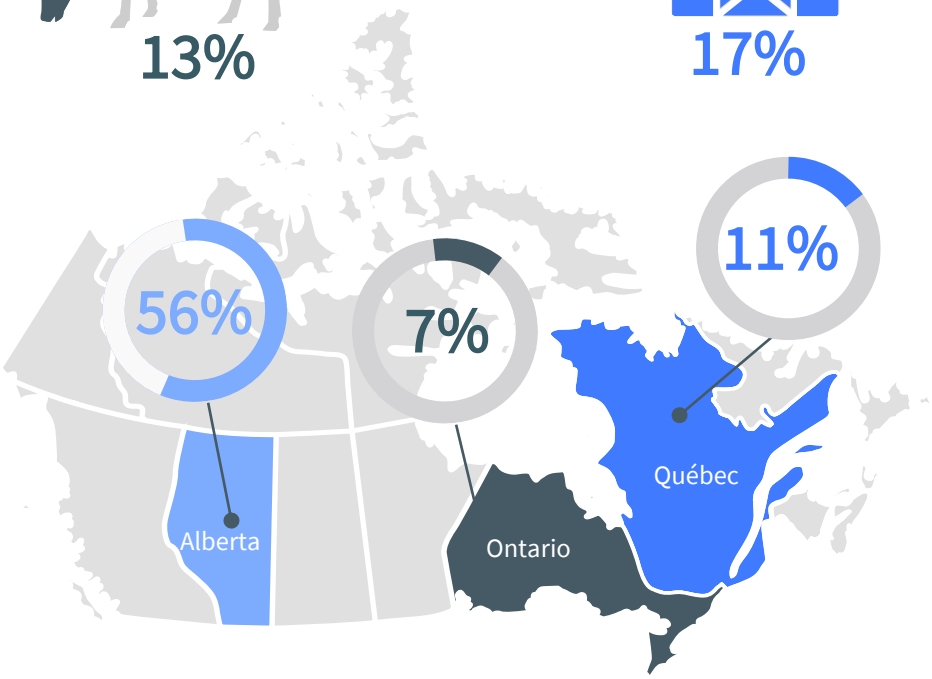


Figure 1 : Apparent animal-level prevalence of unvaccinated animals aged 4-18 months against BVD virus.

CONCLUSION

These preliminary results suggested a low seroprevalence of BVD in Ontario and Québec, and a relatively high seroprevalence in Alberta. Further analyses are underway and will provide updated information on the epidemiological situation of BVD in Canada, including the true prevalence using the validated ELISA.

Contact me !