

# Laboratory findings suggesting an association between BoHV-4 and bovine abortions in southern Belgium

DELOOZ L. (1,2), CZAPLICKI G. (1), HOUTAIN J.Y. (1), DAL POZZO F. (2,3) et SAEGERMAN C. (2,3)

(1) Association Regionale d'Santé et d'Identification Animales, Department of Animal Health, Ciney, Belgium; (2) Fundeamental and Applied Research for Animal and Health, Faculty of Veterinary Medicine, Ulg, Belgium

## BACKGROUND

Abortions cause heavy economic losses for the bovine sector. The use of a standardized panel of analyses covering a large spectrum of pathogens responsible of abortion in cattle, allowed demonstrating the direct involvement of at least one pathogen in 57% of analysed abortions in the southern part of Belgium. This result suggests a margin of improvement in the diagnostic efficacy.

## MATERIALS ET METHODS

In order to evaluate the interest to broaden the list of pathogens included in the panel of analyses, the implication of bovine herpesvirus 4 (BoHV-4) in abortion was assessed by two different studies. In the first study, coupled serology was performed after abortion on 714 dams to identify specific seroconversion against BoHV-4 by indirect ELISA (BioX Diagnostics, Rochefort, Belgium). The second study investigated the virus ability to infect the foetus. In this study, 368 cases of bovine abortions were specifically tested for BoHV-4, using PCR on foetus tissues and indirect ELISA (BioX Diagnostics, Rochefort, Belgium) on dam and foetus sera.

### RESULTS (study 1)

**Table 1:** The seropositivity against BoHV-4 measured in dams after abortion depending on the number of parity

Parity	First serology						Total	Seropositivity (%)
	-	+	++	+++	++++	+++++		
1	101	38	25	24	10	5	203	50.2%
2	84	42	49	38	11	9	233	63.9%
3	38	30	29	28	10	5	140	72.9%
>= 4	28	27	35	17	6	4	117	76.1%
N.D.	7	1	5	5	3		21	66.7%
Total	258	138	143	112	40	23	714	

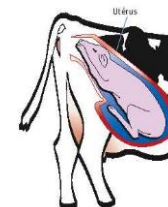
**Figure 1:** Risk factor\* of seropositivity are time occurrence and type of breed

Variable		OR (95% CI)#	P-value
Time of occurrence of abortion (quarter)	Quarter 4 of 2007	Reference	-
	Quarter 1 of 2008	1.06 (0.60-1.88)	0.84
	Quarter 2 of 2008	2.62 (1.28-5.39)	0.009*
	Quarter 3 of 2008	1.82 (0.85-3.94)	0.13
	Quarter 4 of 2008	1.28 (0.68-2.41)	0.44
	Quarter 1 of 2009	0.46 (0.23-0.92)	0.03*
	Quarter 2 of 2009	0.73 (0.26-2.07)	0.56
	Quarters 3 and 4 of 2009	0.42 (0.12-1.51)	0.19
Type of breed	Beef	Reference	-
	Dairy	0.45 (0.27-0.77)	0.003*

### RESULTS (study 2)

**Table 1:** Seroconversion (coupled serology) against BoHV-4 in dams after abortion = 19.5%

Second serology		First serology						Total
		-	+	++	+++	++++	+++++	
Second serology	-	201	21	3	0	1	0	226
	+	31	35	10	2	0	0	78
	++	12	33	43	6	3	1	98
	+++	7	23	42	40	5	0	117
	++++	7	22	38	45	21	5	138
	+++++	0	4	7	19	10	17	57
Total		258	138	143	112	40	23	714



The second study investigated the virus ability to infect the foetus. In this study, 368 cases of bovine abortions were specifically tested for BoHV-4, using PCR on foetus tissues and ELISA on dam and foetus sera. The results showed a maternal seroprevalence of 64.7%, a foetal seroprevalence of 0.8% and a PCR prevalence in foetuses of 1.1%, demonstrating the ability of BoHV-4 to infect the foetus.

## CONCLUSIONS

Despite the fact that the role of BoHV-4 as etiologic agent of a specific entity remains a matter of controversy, these two studies showed a high seroconversion for this pathogen in bovine at abortion, the proof of a foetal immunity response and the direct diagnosis of this virus in foetal spleen. These results constitute arguments of the possible involvement of BoHV-4 in abortion in the southern part of Belgium.