Association of seroprevalence of respiratory pathogens and herd-level management factors with inflammatory markers in dairy cattle

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Supplemental Materials

This file contains additional tables summarising herd-level and mean within-herd seroprevalence (%) of bovine herpesvirus 1 (BHV-1), bovine respiratory syncytial virus (BRSV), bovine coronavirus (BCV), bovine adenovirus (BAV), bovine parainfluenza virus 3 (PIV-3), bovine viral diarrhea virus (BVDV), and *Mycoplasma bovis* among Estonian dairy herds (cows and heifers; Tables S1–S2). Tables S3–S4 provide herd-level categorical variables for cows and heifers, respectively, which were used to investigate associations with serum amyloid A (SAA) and haptoglobin (Hp) concentrations.

Table S1. Herd-level and mean within-herd prevalence (%) of respiratory viruses and *Mycoplasma bovis* antibodies among cows from 95 Estonian dairy farms

Infection	*n* of herds	%	95% CI
BHV-1 (bovine herpesvirus 1)			
Herd prevalence	95	61.1	50.5-70.9
Mean within-herd prevalence in positive herds	58	32.1	24.6-39.6
BRSV (bovine respiratory syncytial virus)			
Herd prevalence	95	81.1	71.7-88.3
Mean within-herd prevalence in positive herds	77	59.3	50.9-67.6
Mycoplasma bovis			
Herd prevalence	95	36.8	27.2-47.4
Mean within-herd prevalence in positive herds	35	29.5	25.7-33.3

Table S2. Herd-level and mean within-herd prevalence (%) of respiratory viruses and *Mycoplasma bovis* antibodies among heifers from 94 Estonian dairy herds

Infection	*n* of herds	%	95% CI
BHV-1 (bovine herpesvirus-1)			
Herd prevalence	94	40.4	30.4-51.0
Mean within-herd prevalence in positive herds	38	32.3	21.6-43.0
BRSV (bovine respiratory syncytial virus)			
Herd prevalence	94	54.3	43.7-64.6
Mean within-herd prevalence in positive herds	51	31.5	23.4-39.7
BCV (bovine coronavirus)			
Herd prevalence	94	93.6	86.6-97.6
Mean within-herd prevalence in positive herds	88	79.7	72.8-86.6
BAV (bovine adenovirus)			
Herd prevalence	94	98.9	94.2-100
Mean within-herd prevalence in positive herds	93	64.9	60.7-69.0
PIV-3 (bovine parainfluenza virus 3)			
Herd prevalence	94	93.6	86.6-97.6
Mean within-herd prevalence in positive herds	88	80.0	74.4-85.6
BVDV (bovine viral diarrhea virus)			
Herd prevalence	94	19.1	11.8-28.6
Mean within-herd prevalence in positive herds	18	69.2	52.8-85.6
Mycoplasma bovis			
Herd prevalence	94	100	96.2-100
Mean within-herd prevalence in positive herds	94	51.9	48.1-55.6

Table S3. Herd-level (herds n = 95) categorical variables used to investigate their associations with cows' serum amyloid A (SAA) and haptoglobin (Hp) concentrations

Variable	Definition of the variable categories	*n* of herds
Within-herd prevalence of **BHV-1** in cows	0%	37
	1-50%	26
	>50%	32
Herd ***M. bovis*** status in cows	Negative	60
	Positive	35
Within-herd prevalence of **BRSV** in cows	0%	18
	1-50%	21
	>50%	56
Herd **BVDV** PI status	No	82
	Yes	13
Veterinarian is an employee of the farm	No	75
	Yes	20
AI-technician is an employee of the farm	No	52
	Yes	43
AI-technician provides service to other farms	No	27
	Yes	68
Use of a breeding bull in heifers	No	60
	Yes	35
Farm purchased new animals within the last three years	No	45
	Yes	50
Keeping young stock together with cows	Together	49
	In separate building from 6 months until pregnancy	46
Housing system for cows	Tie stall	68
	Free stall	27
Herd size	<50	24
	50-99	14
	100-199	14
	200-399	22
	>399	21

Abbreviations: BHV-1 - bovine herpesvirus 1; BRSV - bovine respiratory syncytial virus; BVDV - bovine viral diarrhoea virus; PI - persistent infection; *Mycoplasma* (*M.*) *bovis*.

Table S4. Herd-level (herds n = 94) categorical variables used to investigate their associations with heifers' serum amyloid A (SAA) and haptoglobin (Hp) concentrations

Variable	Definition of the variable categories	*n* of herds
Within-herd prevalence of **BHV-1** in heifers	0%	56
	1-50%	27
	>50%	11
Within-herd prevalence of ***M. bovis*** in heifers	0-30%	13
	31-50%	36
	>50%	45
Within-herd prevalence of **BRSV** in heifers	0%	43
	1-50%	38
	>50%	13
Within-herd prevalence of **BVDV**	0%	76
	1-50%	4
	>50%	14
Herd **BVDV** PI status	No	82
	Yes	12
Within-herd prevalence **PIV-3** in heifers	0-30%	13
	31-50%	11
	>50%	70
Within-herd prevalence **BCV** in heifers	0%	22
	1-50%	8
	>50%	64
Within-herd prevalence **BAV** in heifers	0%	8
	1-50%	19
	>50%	67
Use of a breeding bull in heifers	No	60
	Yes	34
Farm purchased new animals within the last three years	No	45
	Yes	49
Housing system for heifers	Tie stall	24
	Free stall	24
	Mixed	46
Grazing heifers	No	7
	Yes	87
Vaccination for **BHV-1** in heifers	No	92
	Yes	2[1]

Abbreviations: BHV-1 - bovine herpesvirus 1; BRSV - bovine respiratory syncytial virus; PIV-3 - bovine parainfluenza virus 3; BCV - bovine coronavirus; BAV - bovine adenovirus; BVDV - bovine viral diarrhoea virus; PI - persistent infection; *Mycoplasma* (*M.*) *bovis*.

[1] These farms used vaccination against BHV-1 in past but not during 1 year before and at the time of sampling.