Supplement

Prevalence of disorders in preweaned dairy calves from 731 dairies in Germany: A cross-sectional study

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Supplement 1. Overall Prevalence of symptoms for 14,164 pre-weaned dairy calves.

Symptom	Crude ¹		Region-adjusted ²	Survey-adjusted ³
	n ⁴	% (95% CI)	% (95% CI)	% (95% CI)
Fever (F)	1006 ^a	7.1 (6.7 – 7.6)	7.2 (6.3 – 8.1)	7.2 (6.6 – 7.9)
Under temperature (UT)	447 ^a	3.2 (2.8 – 3.5)	2.2 (0.0 – 4.5)	1.5 (1.2 – 1.8)
Aggravated breathing (AB)	5281 ^b	37.4 (36.6 – 38.3)	44.5 (28.4 – 60.6)	49.7 (48.4 – 50.9)
Attenuated breathing (ATB)	41 ^b	0.3 (0.2 – 0.4)	0.2 (0.0 – 0.5)	0.2 (0.0 – 0.3)
Abnormal sounds (AS)	548 ^b	3.9 (3.5 – 4.3)	4.5 (2.5 – 6.5)	5.0 (4.4 – 5.6)
Tubular breathing (TB)	315 ^b	2.2 (2.0 – 2.5)	2.1 (1.5 – 2.7)	2.0 (1.6 – 2.4)
Liquid or soft faeces (LSF)	2680 ^c	19.5 (18.8 – 20.2)	18.5 (13.8 – 23.2)	17.8 (16.8 – 18.8)
Navel abnormalities (NA)	2985 ^d	21.1 (20.4 – 21.9)	20.8 (8.1 – 33.5)	20.4 (19.5 – 21.3)
Unequal loading of limbs (UL)	119 ^e	0.8 (0.7 – 1.1)	1.0 (0.5 – 1.6)	1.2 (0.9 – 1.5)

¹Actually measured data.

²Region-adjusted prevalence (linear mixed model; weighting was equal in all regions).

³Survey adjusted prevalence (bootstrap method; weighting was according to the number of calves in the region).

⁴Calves with clinical signs.

^aIncludes all calves with information about rectal temperature, n = 14,119.

^bIncludes all calves with information about auscultation of the lungs, n = 14,117.

^cIncludes all calves with information about faeces, n = 13,731.

^dIncludes all calves with information about navel palpation, n = 14,115.

^eIncludes all calves with information about weight bearing, n = 14,094.

Supplement 2. Overall Prevalence of disorders and multimorbidity for 13,659 pre-weaned dairy calves.

Disorder	Crude ¹		Region-adjusted ²	Survey-adjusted ³
	n ⁴	% (95% CI)	% (95% CI)	% (95% CI)
Respiratory Disease (RD)	1,100	8.1 (7.6 – 8.6)	8.7 (6.7 – 10.7)	9.4 (8.6 – 10.2)
RD_Multimorbidity ⁵	348 ⁶	2.5 ⁶ (2.2 – 2.9)	2.7 ⁶ (2.1 – 3.3)	3.0 ⁶ (2.4 – 3.4)
Diarrhea (D)	2,670	19.6 (18.8 – 20.3)	18.5 (13.7 – 23.2)	17.9 (16.8 – 18.9)
D_Multimorbidity ⁵	787 ⁶	5.8 ⁶ (6.3 – 6.2)	5.4 ⁶ (4.2 – 6.6)	5.0 ⁶ (4.4 – 5.6)
Abnormal Weight Bearing (AWB)	116	0.8 (0.7 – 1.1)	1.0 (0.5 – 1.6)	1.2 (0.9 – 1.6)
AWB_Multimorbidity ⁵	59 ⁶	0.4 ⁶ (0.3 – 0.6)	0.4 ⁶ (0.3 – 0.6)	0.5 ⁶ (0.3 – 0.7)
Omphalitis (O)	2,680	21.1 (20.3 – 21.8)	20.9 (7.8 – 33.9)	20.3 (19.4 – 21.3)
O_Multimorbidity ⁵	819 ⁶	6.0 ⁶ (5.6 – 6.5)	5.9 ⁶ (3.6 – 8.1)	5.6 ⁶ (5.1 – 6.3)
Multimorbidity (M)	987	7.2 (6.8 – 7.7)	7.1 (5.7 – 8.5)	6.9 (6.2 – 7.5)

¹Actually measured data.

²Region-adjusted prevalence (linear mixed model; weighting was equal in all regions).

³Survey adjusted prevalence (bootstrap method; weighting was according to the number of calves in the region).

⁴Number of calves with clinical signs of diseases.

⁵Calves with additional characteristic clinical signs of other disorders.

⁶Each subset of superordinate group: RD, D, AWB and O.

Supplement 3. Age in days of pre-weaned dairy calves at day of the farm visit depending on the most common breeds and sex stratified by region.

median (IQR) ¹				
		Region ²		
		North	East	South
male				
Holstein Friesian	14.0 (8.0, 39.0)	23.0 (9.0, 55.0)	13.0 (8.0, 31.0)	20.0 (11.8, 37.25)
Simmental	24.0 (11.0, 38.0)	31.0 (13.5, 44.5)	16.0 (10.0, 28.5)	23.5 (11.0, 38.0)
Brown Swiss	20.0 (7.0, 35.5)	n.a. ³	64.0 (64.0, 64.0)	20.0 (7.0, 32.8)
Red Holstein	21.0 (9.0, 56.0)	39.0 (10.0, 62.0)	12.5 (8.0, 20.8)	n.a. ³
Crossbreed milk x beef ⁴	21.0 (10.0, 48.0)	26.0 (10.0, 70.0)	15.0 (9.0, 38.0)	21.0 (9.0, 25.0)
Crossbreed milk x milk ⁵	31.0 (13.0, 53.0)	26.0 (10.0, 70.0)	15.0 (9.0, 38.0)	21.0 (9.0, 25.0)
female				
Holstein Friesian	44.0 (23.0, 65.0)	48.0 (25.0, 71.0)	42.0 (22.0, 64.0)	35.5 (20.8, 57.5)
Simmental	40.0 (20.0, 66.0)	36.5 (16.3, 61.0)	43.5 (24.8, 67.0)	40.0 (20.0, 66.0)
Brown Swiss	51.0 (24.0, 76.5)	46.0 (30.0, 69.5)	24.0 (23.0, 39.0)	51.0 (24.0, 7.0)
Red Holstein	43.0 (20.0, 71.0)	46.5 (19.0, 75.3)	40.0 (21.0, 64.0)	104.0 (90.5, 117.5)
Crossbreed milk x beef ³	31.0 (12.0, 61.0)	29.0 (11.0, 76.5)	33.0 (12.0, 57.3)	25.0 (14.0, 47.8)
Crossbreed milk x milk ⁴	38.5 (20.3, 58.0)	45.0 (28.0, 58.0)	34.5 (19.0, 58.0)	47.0 (22.0, 88.0)

¹interquartile range

²Northern region: medium-sized farms (median 90 milking cows, often full-time family business, partly with external workers). Eastern region: large farms (median 251 milking cows, agricultural enterprise with employees). Southern region: small farms (median 39 milking cows, often traditional family business, some of which are part-time businesses).

³Not available.

⁴Cross between a dairy and a beef breed.

⁵Cross between 2 different dairy breeds.