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Factors affecting reproductive performance of dairy cows in a pasture-based, automatic milking system research farm: a retrospective, single-cohort study

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Table S1. Univariable analyses of factors affecting the interval from calving to first oestrus in dairy cows in a pasture-based automatic milking system research herd based on Cox proportional regression model analyses

Predictor variables	Class	HR	95% CI	*P*-value
Year	Year 1	1.00*	-	<0.001
	Year 2	1.32	0.9-1.8	
	Year 3	0.88	0.6-1.3	
	Year 4	0.54	0.4-0.8	
	Year 5	0.32	0.2-0.5	
Parity	1	1.00*	-	0.001
	2	1.63	1.1-2.4	
	3	2.01	1.4-2.9	
	4	1.89	1.2-2.9	
	5	2.45	1.6-3.8	
	≥6	1.56	1.0-2.3	
100 d milking frequency	≤1.5	1.00*	-	0.001
	1.6 to 1.9	1.72	1.2-2.5	
	2.0 to 2.2	1.69	1.2-2.4	
	≥2.3	2.07	1.4-3.0	
100 d milk yield (kg)	≤ 1950	1.00*	-	0.005
	1950 to 2521	1.70	1.2-2.5	
	2522 to 3044	1.89	1.3-2.7	
	>3044	1.63	1.2-2.4	

Results are presented as (HR), confidence interval (CI) and probability values.

* Reference category.

Table S2. Univariable analyses of factors affecting the interval (days) from calving to first insemination in dairy cows in a pasture-based automatic milking system research herd

Predictor variables	Class	n	LSM	SEM	95% CI	*P*-value
Interval from calving to first oestrus, days	Continuous*	669	0.007[a]	0.0004[b]	0.0004-0.007	<0.001
Season of calving	Summer	180	89.1	2.4	84.6-90.0	<0.001
	Autumn	209	72.2	1.8	68.8-75.9	
	Spring	111	84.3	2.9	78.8-90.2	
	Winter	169	81.2	2.3	76.9-85.8	
Season of insemination	Summer	96	89.1	3.3	82.8-95.9	0.013
	Autumn	252	77.5	1.8	74.0-81.1	
	Spring	173	79.8	2.2	75.5-84.3	
	Winter	148	82.6	2.5	77.8-87.6	
100 d milking frequency	≤1.5	148	86.8	2.6	81.9-92.1	0.055
	1.6 to 1.9	185	80.7	2.2	76.6-85.1	
	2.0 to 2.2	157	80.6	2.3	76.1-85.3	
	≥2.3	144	77.4	2.3	72.9-82.1	
100 d milk yield (kg)	≤ 1950	153	85.7	2.5	80.8-90.8	0.13
	1950 to 2521	156	80.3	2.4	75.8-85.1	
	2522 to 3044	159	77.8	2.3	73.4-82.3	
	>3044	155	81.0	2.4	76.5-85.8	

Results are presented as least square means (LSM), confidence interval (CI) and probability values.

[a] Represents estimate

[b] Represents standard error

Table S3. Univariable analyses of factors affecting the interval from calving to conception in dairy cows in a pasture-based automatic milking system research herd[A] based on Cox proportional regression model analyses

Predictor variables	Class	HR	95% CI	*P*-value
Interval from calving to first oestrus, days	Continuous	0.994	0.991-0.996	<0.001
Season of calving	Summer	1.00*	-	0.005
	Autumn	1.31	1.1-1.6	
	Spring	0.96	0.8-1.2	
	Winter	0.98	0.8-1.2	
100 d milking frequency	≤1.5	1.00*	-	0.72
	1.6 to 1.9	1.08	0.9-1.3	
	2.0 to 2.2	0.99	0.8-1.2	
	≥2.3	1.09	0.8-1.4	
100 d milk yield (kg)	≤ 1950	1.00*	-	0.63
	1950 to 2521	1.14	0.9-1.4	
	2522 to 3044	1.07	0.9-1.3	
	>3044	1.03	0.8-1.3	

Results are presented as hazard ratio (HR), confidence interval (CI) and probability values.
* Reference category.

Table S4. Univariable analyses of factors affecting number of inseminations per conception in dairy cows in a pasture-based automatic milking system research herd

Predictor variables	Class	n	LSM	SEM	95% CI	*P*-value
Season of conception	Summer	93	1.7	0.1	1.5-2.1	<0.001
	Autumn	208	1.4	0.1	1.3-1.6	
	Spring	170	1.6	0.1	1.5-1.8	
	Winter	240	1.8	0.1	1.6-2.0	
Twin	Yes	23	2.2	0.4	1.6-3.5	0.015
	No	688	1.6	0.1	1.5-3.7	
100 d milk yield (kg)	≤ 1950	163	1.5	0.1	1.4-1.7	0.055
	1950 to 2521	169	1.6	0.1	1.4-1.7	
	2522 to 3044	168	1.8	0.1	1.6-2.0	
	>3044	165	1.6	0.1	1.5-1.8	
100 d milking frequency	≤1.5	160	1.6	0.1	1.4-1.8	0.78
	1.6 to 1.9	195	1.7	0.1	1.5-1.9	
	2.0 to 2.2	166	1.7	0.1	1.5-1.9	
	≥2.3	155	1.6	0.1	1.4-1.8	

Results are presented as least square means (LSM), confidence interval (CI) and probability values.

Table S5. Univariable analyses of factors affecting submission by 80 days in milk in dairy cows in a pasture-based automatic milking system research herd

Predictor variables	Class	n	OR	95% CI	*P*-value
Season of calving	Summer	184	1.00*	-	<0.001
	Autumn	214	2.88	1.9-4.3	
	Spring	117	1.18	0.7-1.9	
	Winter	171	1.43	0.9-2.2	
Season of first insemination	Summer	98	1.00*	-	0.018
	Autumn	260	2.03	1.3-3.3	
	Spring	178	1.48	0.9-2.5	
	Winter	150	1.4	0.8-2.3	
100 d milk yield (kg)	≤ 1950	169	1.00*	-	0.076
	1950 to 2521	174	1.28	0.8-2.0	
	2522 to 3044	175	1.78	1.2-2.8	
	>3044	168	1.43	0.9-2.2	
100 d milking frequency	≤1.5	162	1.00*	-	0.070
	1.6 to 1.9	197	1.66	1.1-2.6	
	2.0 to 2.2	171	1.50	1.0-2.4	
	≥2.3	156	1.71	1.1-2.7	

Results are presented as odd ratio (OR), confidence interval (CI) and probability values.
* Reference category.

Table S6. Univariable analyses of factors affecting conception by 100 days in milk in dairy cows in a pasture-based automatic milking system research herd

Predictor variables	Class	n	OR	95% CI	*P*-value
Year	Year 1	131	1.00*	-	<0.01
	Year 2	131	0.69	0.4-1.1	
	Year 3	115	0.61	0.4-1.0	
	Year 4	143	0.35	0.2-0.6	
	Year 5	166	0.41	0.3-0.6	
Season of calving	Summer	184	1.00*	-	<0.01
	Autumn	214	1.97	1.3-3.0	
	Spring	117	0.85	0.5-1.4	
	Winter	171	1.15	0.8-1.8	
100 d milking frequency	≤1.5	153	1.00*	-	0.31
	1.6 to 1.9	188	1.19	1.8-1.9	
	2.0 to 2.2	162	0.99	0.6-1.6	
	≥2.3	147	1.45	0.9-2.3	
100 d milk yield (kg)	≤ 1950	157	1.00*	-	0.89
	1950 to 2521	162	1.17	0.8-1.8	
	2522 to 3044	163	1.07	0.7-1.7	
	>3044	157	1.00	0.6-1.6	

Results are presented as odd ratio (OR), confidence interval (CI) and probability values.

* Reference category.