Table S1. The impact of the analyzed factors on the variability of total lifetime productivity

Factor	Groups	Total lifetime milk productivity, kg ECM	
		RB	HB
Birth year	2010 – 2012	24,642.0±90.49[a]	26,091.1±74.95[a]
	2013 – 2015	21,164.2±107.31[b]	23,728.1±66.72[b]
	2016 – 2019	13,484.1±116.98[c]	16,482.3±56.32[c]
AFC, months	< 22	23,077.6±295.27[a]	23,720.9±132.56[a]
	22.1 – 24	23,739.3±155.21[ab]	23,799.2±83.84[a]
	24.1 – 26	23,080.7±136.63[a]	23,091.3±84.24[ab]
	26.1 – 28	22,711.6±154.86[a]	22,407.7±101.69[b]
	28.1 – 30	21,408.0±177.08[c]	21,561.5±125.11[c]
	30.1 – 32	20,740.3±210.64[d]	20,892.9±157.81[d]
	> 32	19,432.1±159.99[e]	19,081.3±116.02[e]
Farm size, no of cows per year	< 20	22,149.6±88.30[a]	21,582.4±62.69[a]
	21 – 100	21,825.4±124.21[a]	23,142.6±70.20[b]
	101 – 200	22,681.7±167.02[b]	24,969.8±111.50[c]
	201 – 500	24,644.1±337.74[c]	21,980.9±140.79[a]
	> 500	17,636.1±923.40[d]	17,813.0±182.91[d]

RB – red breed cows; HB – Holstein breed cows; AFC – age at first calving; ECM – Energy corrected milk; Significant differences noted with different superscripted letters ($p<0.05$).

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Table S2. The average AFC in farms with different number of cows

Farm size	Unit	RB		HB	
		n	AFC	n	AFC
<20	Days	27,736	835.7±0.89	57,399	833.7±0.62
	Months		27.9±0.03		27.8±0.02
21 – 100	Days	14,698	844.8±1.07	51,928	801.9±0.54
	Months		28.2±0.04		26.8±0.02
101 – 200	Days	8,919	823.9±0.99	23,674	754.9±0.58
	Months		27.5±0.03		25.2±0.02
201 – 500	Days	2,162	739.2±1.23	12,845	737.3±0.74
	Months		24.7±0.04		24.6±0.02
> 500	Days	143	742.6±4.84	4,627	739.1±0.85
	Months		24.8±0.16		24.6±0.03

RB – red breed cows; HB – Holstein breed cows; AFC – age at first calving;

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Table S3. Number of RB cows in different AFC and farm size groups.

AFC	Number of RB cows in different farm size groups				
	< 20	**21 – 100**	**101 – 200**	**201 – 500**	**> 500**
< 22	1,856	612	199	73	3
22.1 – 24	5,492	2,284	1,140	1,251	74
24.1 – 26	6,317	3,056	2,467	536	44
26.1 – 28	4,378	2,801	2,257	198	15
28.1 – 30	3,036	2,260	1,478	66	4
30.1 – 32	2,234	1,540	747	26	3
> 32	4,423	2,145	631	12	

RB – red breed cows; HB – Holstein breed cows; AFC – age at first calving;

Table S4. The LS and PL of RB cows depending on their AFC in farms with different number of cows.

AFC	< 20		21 – 100		101 – 200		201 – 500		> 500	
	LS	**PL**	**LS**	**PL**	**LS**	**PL**	**LS**	**PL**	**LS**	**PL**
< 22	2,073.9±19.54	1,427.0±19.54	1,739.4±29.15	1,089.3±29.19	1,587.8±40.86	933.8±40.82	1,655.3±73.69	1,004.5±73.62	1,238.7±168.09	587.3±154.77
22.1 – 24	2,097.9±11.11	1,389.3±11.11	1,822.0±14.59	1,114.0±14.58	1,701.1±18.86	991.4±18.82	1,820.5±17.66	1,111.3±17.65	1,389.1±41.61	683.4±41.47
24.1 – 26	2,113.9±9.94	1,350.7±9.94	1,891.5±12.89	1,127.0±12.89	1,782.1±12.87	1,016.6±12.86	1,829.0±27.07	1,071.2±27.02	1,498.3±79.44	741.3±79.25
26.1 – 28	2,148.6±12.00	1,326.2±12.01	1,964.3±13.53	1,140.8±13.53	1,843.3±13.57	1,020.0±13.57	1,758.9±42.10	939.7±42.19	1,564.1±101.46	743.9±101.04
28.1 – 30	2,132.3±14.10	1,249.4±14.10	1,983.4±14.71	1,100.8±14.71	1,865.4±16.18	983.7±16.15	1,806.0±65.42	926.5±65.54	1,625.5±342.59	732.5±340.63
30.1 – 32	2,190.5±16.32	1,247.4±16.31	2,021.1±17.36	1,078.6±17.36	1,853.6±21.80	912.5±21.83	1,668.8±108.39	730.6±108.41	1,792.3±77.68	847.3±80.96
> 32	2,287.8±11.18	1,184.9±11.20	2,116.9±14.49	1,038.6±14.42	1,865.7±23.90	826.1±24.09	1,682.2±187.67	643.4±189.35		

RB – red breed cows; AFC – age at first calving; LS – total lifespan, days; PL – productive life, days;

Table S5. The MPD and MPPD of RB cows depending on their AFC in farms with different number of cows.

AFC	< 20		21 – 100		101 – 200		201 – 500		> 500	
	MPD	**MPPD**	**MPD**	**MPPD**	**MPD**	**MPPD**	**MPD**	**MPPD**	**MPD**	**MPPD**
< 22	10.3±0.10	16.7±0.11	11.1±0.20	19.9±0.21	13.5±0.39	24.9±0.32	11.2±0.53	20.2±0.51	10.2±2.51	21.8±3.63
22.1 – 24	10.2±0.06	17.1±0.06	11.2±0.10	20.3±0.10	12.8±0.16	24.2±0.14	12.8±0.13	22.6±0.11	11.4±0.48	25.3±0.5
24.1 – 26	9.9±0.05	17.2±0.06	10.8±0.08	20.1±0.09	11.6±0.10	22.5±0.09	12.3±0.20	22.8±0.19	10.9±0.76	25.1±0.74
26.1 – 28	9.6±0.06	17.3±0.07	10.3±0.09	19.8±0.09	11.0±0.10	22.0±0.10	10.9±0.35	22.6±0.31	10.6±0.95	23.3±0.78
28.1 – 30	9.0±0.07	17.3±0.09	9.5±0.09	19.1±0.11	10.6±0.12	22.1±0.11	10.5±0.58	22.3±0.61	8.8±3.03	22.0±1.95
30.1 – 32	8.7±0.08	17.2±0.10	9.0±0.11	18.8±0.14	9.9±0.17	22.3±0.16	8.1±0.92	21.2±1.05	11.3±1.3	23.9±2.45
> 32	7.6±0.06	16.6±0.07	8.5±0.09	19.4±0.11	8.9±0.19	22.7±0.20	8.2±1.78	25.7±1.30		

RB – red breed cows; AFC – age at first calving; MPD – milk productivity per life day, kg ECM; MPPD – milk productivity per productive life day kg ECM.

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Table S6. Number of HB cows in different AFC and farm size groups.

AFC	Number of HB cows in different farm size groups				
	< 20	**21 – 100**	**101 – 200**	**201 – 500**	**> 500**
< 22	4,061	4,734	3,891	2,836	323
22.1 – 24	11,532	12,161	7,595	4,669	2,320
24.1 – 26	12,718	12,949	5,801	2,692	1,282
26.1 – 28	9,193	8,751	3,272	1,477	475
28.1 – 30	6,430	1,643	1,643	667	160
30.1 – 32	4,521	3,228	837	303	54
> 32	8,944	4,656	608	201	13

HB – Holstein breed cows; AFC – age at first calving

Table S7. The LS and PL of HB cows depending on their AFC in farms with different number of cows.

AFC	< 20		21 – 100		101 – 200		201 – 500		> 500	
	LS	**PL**	**LS**	**PL**	**LS**	**PL**	**LS**	**PL**	**LS**	**PL**
< 22	1,837.1±11.97	1,190.7±11.96	1,514.7±8.31	866.8±8.29	1,485.2±8.29	835.3±8.29	1,478.0±10.06	829.4±10.06	1,183.0±18.06	518.9±18.00
22.1 – 24	1,911.7±7.08	1,203.6±7.08	1,645.2±5.42	938.5±5.42	1,587.6±6.45	883.5±6.44	1,540.1±7.95	836.2±7.95	1,370.9±9.02	664.6±8.99
24.1 – 26	1,937.7±6.61	1,174.6±6.61	1,718.9±5.37	956±5.36	1,658.0±7.52	896.0±7.51	1,565.2±10.46	803.6±10.45	1,436.5±12.93	677.5±12.93
26.1 – 28	1,973.3±7.68	1,150.7±7.68	1,774.7±6.65	952.3±6.65	1,700.7±9.79	879.8±9.79	1,585.5±13.76	765.3±13.76	1,490.1±22.20	670.6±22.22
28.1 – 30	1,997.4±8.98	1,114.8±8.98	1,765.1±14.15	884.3±14.13	1,765.2±14.15	884.3±14.13	1,636.7±21.16	754.5±21.16	1,494.8±37.22	615.7±37.10
30.1 – 32	2,033.2±10.74	1,090.8±10.74	1,858.8±10.79	916.8±10.78	1,797.3±20.29	856.5±20.32	1,646.4±28.29	707.3±28.24	1,511.6±46.93	573.9±47.37
> 32	2,125.1±7.33	1,023.1±7.34	1,986.4±9.09	900.1±8.96	1,855.7±22.22	814.8±22.32	1,778.4±36.78	734.2±36.88	1,632.8±145.73	626.4±143.82

HB – Holstein breed cows; AFC – age at first calving; LS – total lifespan, days; PL – productive life, days;

Table S8. The MPD and MPPD of HB cows depending on their AFC in farms with different number of cows.

AFC	< 20		21 – 100		101 – 200		201 – 500		> 500	
	MPD	**MPPD**	**MPD**	**MPPD**	**MPD**	**MPPD**	**MPD**	**MPPD**	**MPD**	**MPPD**
< 22	11.1±0.08	19.4±0.09	13.7±0.09	26.8±0.09	15.9±0.11	31.0±0.10	13.9±0.12	27.2±0.12	10.5±0.27	26.4±0.3
22.1 – 24	10.9±0.04	19.5±0.05	13.3±0.05	25.9±0.06	14.7±0.07	29.2±0.07	13.1±0.09	26.8±0.09	11.7±0.11	27.1±0.10
24.1 – 26	10.5±0.04	19.5±0.05	12.4±0.05	24.9±0.05	13.2±0.08	27.2±0.08	12.1±0.11	26.3±0.11	11.3±0.15	27.1±0.15
26.1 – 28	10.0±0.05	19.3±0.06	11.7±0.06	24.5±0.06	12.3±0.09	26.5±0.11	11.2±0.14	26.1±0.15	10.7±0.25	27.3±0.23
28.1 – 30	9.5±0.05	19.3±0.07	11.7±0.13	26.1±0.15	11.7±0.13	26.1±0.15	10.3±0.22	25.5±0.22	9.7±0.44	27.9±0.43
30.1 – 32	8.9±0.06	19.1±0.08	10.2±0.09	23.4±0.10	11.1±0.19	26.1±0.21	9.8±0.30	25.8±0.34	9.9±0.66	28.8±0.71
> 32	7.7±0.04	18.4±0.06	9.1±0.07	22.8±0.09	10.5±0.21	26.7±0.25	9.5±0.35	25.9±0.37	8.7±1.68	27.3±1.10

HB – Holstein breed cows; AFC – age at first calving; MPD – milk productivity per life day, kg ECM; MPPD – milk productivity per productive life day kg ECM.

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