The relationship between the milk flow, quantity of drained milk and somatic cell count in milk of Holstein and Simmental cattle breed in Croatia

P. Mijic[1], I. Knezevic[1], M. Domacinovic[1], A. Ivankovic[2] & Z. Ivkic[3]

[1]Faculty of Agriculture Osijek, Trg sv. Trojstva 3, 31000, Osijek, Croatia
E-mail: pmijic@pfos.hr

[2]Faculty of Agriculture, Svetosimunska c. 25, 10000 Zagreb, Croatia

[3]Croatian Livestock Center, Ilica 101, 10000 Zagreb, Croatia

Summary

Although machine milking has significantly increased the efficiency of working operations in everyday's process of a milking farm, a specific lack of coordination has been observed between the machine and animals. For health udder, a short lasting milking is favourable, at which a maximum milk flow is achieved quickly and held through a longer period of time. The possibilities of treating cow's udder from mastitis are being limited. Research has shown that the least somatic cell count is at Holstein breed cows in first (LSCC = 2,77) and second lactation (LSCC = 3.04) during MMF 2.7-3.6 kg/min, and MQM of 8.94, that is 9.35 kg. The Simmental cows showed at second, third and further lactations the least LSCC = 2.57 and 3.60, at MMF 2.7-3.6 kg/ min and MQM of 7.79 that is 8.76 kg.

Key words: *Milk flow, somatic cell count, health udder, cattle*

Introduction, material and methods

An increasing introduction of milking machines into the production process of milking farms has shown a specific lack of coordination between the machine and animals. The milk flow is an indicator of milking speed at specific quantity of drained milk. The research wanted to show specific relationship between specific milking characteristics, milk quantity and health udder. Research was conducted on 457 Holstein and 61 Simmental cows in Croatia from the 50th to 180th lactation day. The Lacto-Corder machine was used for measuring whereby data for

milk quantity per milking (MQM) and maximum milk flow (MMF) were measured. The somatic cell count (SCC) is logarithmically transformed LSCC = (log2 (SCC/100.000) +3).

Results

The least somatic cell count in milk of Holstein cows was in the first (LSCC = 2.77) and second lactation (LSCC = 3.04) at MMF of 2.7 to 3.6 kg/min and MQM of 8.94, in other words 9.35 kg (table 1), and the largest (LSCC = 4.77) at MMF higher than 4.5 kg/min and MQM of 13.50 kg. For Simmental first lactation cows the least SCC in milk (LSSC = 1.47) was observed at the slowest MMF (<2.7 kg/min) and the least MQM (5.24 kg). Cows in second, third and further lactations had the least SCC (LBSS = 2.57 and 3.60) at MMF of 2.7 to 3.6 kg/min and MQM of 7.79 and 8.76 respectively. The largest SCC (LBSS = 4.79 and 4.25) was at MMF of 2.7 and larger than 3.6 kg/min. Milking research has a future for it shows a favourable way of genetic improvement to cow's adjustability to milking machines and its connection to health udder. It is necessary for milking characteristics of cows involved in research to be widely and systematically observed. This specially refers to Simmental breed in Croatia, which the primary productive characteristics have not been developed at yet.

Table 1. Correlation between somatic cell count in milk (LSCC), quantity of drained milk (MQM) and maximal milk flow (MMF) for investigation cattle breeds.

MMF (kg/min)	Lak.	n*	Holstein				n*	Simmental			
			LSCC		MQM			LSCC		MQM	
			$\bar{x}$	s	$\bar{x}$	s		$\bar{x}$	s	$\bar{x}$	s
< 2.7	1	45	2.90	1.93	8.76	3.30	6	1.47	1.73	5.24	1.14
	2	30	3.23	1.91	9.19	3.96	11	3.53	2.57	7.08	2.41
	≥ 3	42	3.94	2.27	8.02	4.08	15	4.79	1.76	7.37	2.37
2.7 - 3.6	1	74	2.77	2.04	8.94	2.85	9	3.47	2.09	7.58	2.21
	2	44	3.04	2.63	9.35	3.61	4	2.57	0.42	7.79	3.08
	≥ 3	67	3.31	2.08	11.20	3.48	4	3.60	2.47	8.76	4.13
3.6 - 4.5	1	21	2.91	1.92	11.04	2.58	4	4.02	1.57	8.00	2.16
	2	20	3.53	2.49	10.21	2.98	4	3.21	3.43	9.45	2.95
	≥ 3	32	3.20	2.50	11.98	2.83	4	4.25	2.63	10.77	1.95
> 4.5	1	17	3.54	2.06	9.46	1.94					
	2	19	3.79	1.75	11.64	3.37					
	≥ 3	46	4.77	2.44	13.50	3.38					

*n = no. of cattle