
Automatic milking with Austrian Simmental and Brown Swiss Cows

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In this investigation the milking performance of double purpose breeds (Austrian Simmental and Brown Swiss Cows) was compared between an automatic milking and a parlour milking system. Both systems resulted in similar milk yield and feed intake after correction for lactation number. Feed intake of cows also show no differences between parlour and robot system. A higher selection rate occurred in the robot system due to udder conformation and character of cows. Costs of investment were higher with AMS compared to the parlour, the robot system owned a potential to save about 60% of milking related labour time.

Key words: Automatic milking, feed intake, milk yield, costs

In 2000 a research project started to compare an automatic milking system with a conventional milking parlour at the Agricultural Research Station in Wieselburg, Austria. The experiments started in July 2001 and lasted until December 2003. The aim of the project was to compare both milking techniques according to economical values, aspects of labour and milk quality.

In addition to a 2x6 herringbone parlour (HAPPEL, Germany; control) a single box automatic milking system (LELY IND., The Netherlands; AMS) was installed. Two groups of 30 cows each were formed according to age, breed (Brown Swiss and Simmental) and days in lactation. Both groups had an average milk yield of about 7.500 kg milk. One group was milked in the parlour, the other group was milked in the AMS. Feed intake was measured using a Calan feeding system (CALAN Inc., USA).

Milk yield and feed intake of cows were measured daily, milk constituents were measured weekly. Data about working hours and number of culled cows were collected additionally.

Summary

Introduction

Material and methods

Results

Milk yield corrected for lactation number showed no differences between the two milking systems. Number of culled cows was significantly higher for the AMS system. The reasons were character (nervous) and udder conformation (high somatic cell content).

Age of cows was significantly higher in the parlour system than in the robot system after three years of investigation.

Total feed intake was not different between the groups, concentrate intake was higher in the control group and roughage intake was higher in the AMS group.

Table 3 shows the costs of the conventional (parlour) and the AMS system. Total costs were higher for robotic milking, mainly due to higher costs of investment. In dependence on the number of milked cows in the robot system the extra costs of AMS were between 215 • (60 cows) and 381 • (40 cows). On the other hand our data indicate a save of labour time of about 60 % of total milking related work time.

Conclusion

Milking with robots results in similar milk yield and feed intake for cows with an average yield of about 7.500 kg per cow and year. If the farmer has the possibility to use the saved labour time for alternative income ressources the family income can be increased.

Table1. Results of milk yield from the trial of cows in the 1 st and 2 nd lactation.

	AMS		Control	
	Lactation 1	Lactation 2	Lactation 1	Lactation 2
Milk yield (45 weeks)	20,4	25,9	20,7	25,1
Standard deviation	4,7	6,1	4,2	6,3
Minimum	7,1	7,4	5,3	8,2
Maximum	36,5	43,3	32,5	40,5
N	16	14	16	21
n	710	704	728	672

Table 2. Concentrate-, TMR- and Total Feed Intake of both groups (2001-2003 n = 53; 58).

Year	Concentrate Intake		TMR Intake		Total Feed Intake	
	AMS	Control	AMS	Control	AMS	Control
2001	1,41 ^a ± 1,28	2,12 ^b ± 2,51	16,44 ^b ± 2,25	15,42 ^a ± 2,61	17,86 ^a ± 2,66	17,54 ^a ± 2,35
2002	1,38 ^a ± 1,32	2,02 ^b ± 1,71	18,07 ^c ± 2,04	17,86 ^c ± 2,60	19,45 ^b ± 2,48	19,88 ^b ± 2,74
2003	1,27 ^a ± 0,85	1,34 ^a ± 0,92	16,28 ^b ± 1,63	16,11 ^b ± 1,58	17,55 ^a ± 1,95	17,45 ^a ± 1,15
Total	1,35 ± 1,34	1,83 ± 2,64	16,93 ± 2,35	16,46 ± 2,64	18,29 ± 2,70	18,29 ± 2,81

* Values with different indices are significantly different (p < 0,05).

Table 3. Costs of Automatic Milking versus Conventional Milking (•).

		Number of milking cows		
		40	50	60
AMS	Writing-off	15.500	15.500	15.500
	Payment off	3.100	3.100	3.100
	Maintenance	4.000	4.000	4.000
	Repair	250	250	250
	Total	22.850	22.850	22.850
Parlour	Writing-off	6.400	6.400	8.300
	Payment of	1.280	1.280	1.660
	Repair	1.280	1.280	1.660
	Total	8.960	8.960	11.620
Extra costs of AMS	Investment and Repair	13.890	13.890	11.230
	Operation stock	1.365	1.605	1.685
	Total per cow	15.255	15.495	12.915
		381	310	215
AMS Saved labour time		60 %	60 %	60%