

Annual report 2015 to SLU EkoForsk

## **Total mixed ration for dairy cows – An economic feeding strategy for organic farmers with automatic milking??**

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### Experiments

In the spring of 2015, the first part of the study was conducted on 40 cows in the barn with automatic milking at Lövsta Research Centre, SLU, Uppsala. The purpose of the study was to investigate how the feeding system affects the cows' motivation to go to the milking robot. Two strategies for feeding were applied, half the cows were fed a mix of silage and concentrates and half of the cows had separate feeding of silage and concentrates. The cows had a three-week adjustment period to the change of feed and cow traffic system and the following six weeks were measurement period. The mix contained 35% concentrate on dry matter (DM) basis and therefore had higher levels of metabolizable energy (ME), crude protein and starch compared to the pure silage (Table 1). The cows had free access to either silage or mix and the total amount of concentrates was

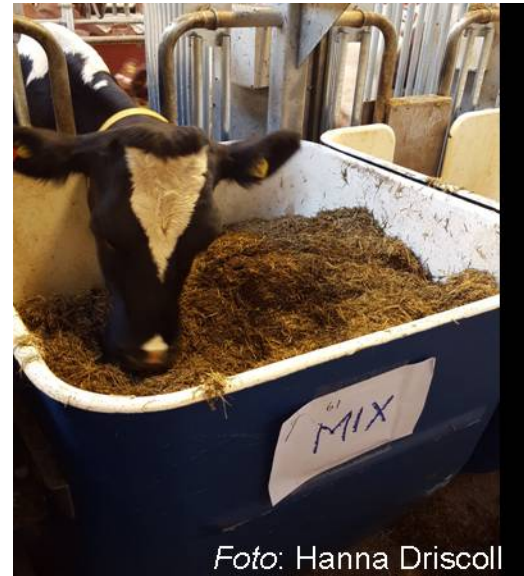


Foto: Hanna Driscoll

adjusted to the intake of roughage in order not to exceed the maximum level under organic production standards, i.e. cows > 90 days in lactation were fed 40% of total DM intake and cows ≤ 90 days, maximum 50%. All cows received a portion of the concentrates in the milking robot to motivate them to enter the milking unit. Cow traffic was partially controlled so that the cows were milked after feeding, "feed first." In total there were 59 cows in the barn to get a realistic utilization of the milking unit. Each milking was recorded and the milk was analyzed for fat, protein and lactose every two weeks during the measurement period. The preliminary results from the study show that there were no statistically significant differences between the groups in either the feed intake or milk production parameters (Table 2). Additional analyzes of the data is currently underway.

Table1 Mean values for the chemical composition of the feeds

	Silage	Concentrate	Mix
Dry matter, DM %	33	88	42
Metabolizable energy, MJ/kg DM	11,7	13,2	12,2
Crude protein, g/kg DM	156	183	165
Ash, g/ kg DM	84	56	74
NDF, g/kg DM	433	176	343
Starch, g/kg DM	-	389	217

Table 2 LS-means for production parameters by cow and day in "feed first" cow traffic system using two feeding strategies, mix (MIX) or separate feeding (SEPARATE) of silage and concentrate

Parameters by cow and day	MIX	SEPARATE	Significance
Total feed intake ≤90 days, kg DM	25,6	24,2	NS
Total feed intake >90 dagar, kg DM	24,4	24,6	NS
Concentrate intake, ≤90 dagar, kg DM	11,7	11,1	NS
Concentrate intake, >90 dagar, kg DM	9,8	10,0	NS
<i>Results based on data from milking robot<sup>1</sup></i>			
Milk yield, kg	36,9	37,9	NS
<i>Analyses from test milkings<sup>2</sup></i>			
Milk yield, kg	32,8	34,4	NS
Milk yield, kg energy corrected (ECM)	31,9	34,2	NS
Milk fat, %	3,88	4,04	NS
Milk protein, %	3,16	3,35	NS
Lactose, %	4,89	4,89	NS
Number of milkings per day	2,49	2,43	NS

<sup>1</sup>LSmeans daily averages by week during the measurement period

<sup>2</sup>LSmeans for test milking days (N=4)

NS, non-significant (P>0,05)

The second part of the study is currently running and finishes in November 2015. The third study will be conducted in March-May 2016.

### Field study

A field study has also been conducted on a total of 11 farms in two Swedish regions located in the middle and northern part of the country. The field study is being conducted by Maja Blom as a Master Thesis project with Torbjörn Lundborg and Eva Spörndly as supervisors. All the farms in the field study had automatic milking and used mixed feed in the diet. Cow traffic was registered on all the farms with the standard feed-mix used on the farm. Thereafter, the feed-mix was modified and new registrations of cow traffic took place after one week after changes in the feed mix had been introduced. The cow diet and feed quality on the farms were registered before and after the changes in the feed-mix took place. Statistical analyses were performed based on comparisons of cow traffic and feed composition before and after the change was implemented on each farm. The plan is that the analysis and writing of the report from the field study (Master Thesis) will be completed during the spring of 2016. The report will then be forwarded to EkoForsk together with a summary of the results for posting on the home page.