

Whole crop cereal silage in dairy production

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Introduction Whole-crop cereal silages (WCCS) are used to some extent in Sweden, but knowledge about the use of this feed for high yielding dairy cows is scarce. The crop is often harvested at different stages of maturity, from heading to yellow ripeness, which gives forages that differ in chemical composition. The purpose of this trial was to compare intake and milk production of dairy cows fed a WCCS based on barley harvested at three different stages of maturity.

Materials and methods Three cuts of whole-crop barley were taken at heading (BSH), milk (BSM) and dough stage (BSD) and ensiled with the additive Kofasil Ultra (4-6 l/t fresh matter) as round big bales. The grass silage (GS) consisted of timothy and red clover. The experiment was conducted as a change-over design over three periods of four weeks each, using fifteen multiparous Swedish red and white dairy cows. Average milk production at the start was 31.6 kg energy corrected milk (ECM)/d. All diets consisted of concentrate, GS, and WCCS of one of the cuts (Table 1). Two of the diets were given as a mixed ration of either 70% GS and 30% BSH (Mix 1) or 30% GS and 70% BSH (Mix 2) on a dry matter (DM) basis. Refusals were collected every morning. Milk yield and milk composition were analysed every week and the animals were weighed on two consecutive days in each period.

Table 1 Composition of the five diets (kg DM/day)

Diet	Concentrate	GS	BSH	BSM	BSD	Mix 1	Mix 2
K1	10.6	4	<i>Ad lib</i>				
K2	10.6	4		<i>Ad lib</i>			
K3	10.6	4			<i>Ad lib</i>		
M1	10.6					<i>Ad lib</i>	
M2	10.6						<i>Ad lib</i>

Results Total intake was 3.25-3.36 kg DM/100 kg of live weight, with no significant difference in intake of different diets. Milk yield was lower for animals fed diet K2 ($p<0.05$) and K3 ($p<0.001$) compared with M1, M2 and K1 (Table 2). Diet K1 gave higher lactose content than K2 ($p<0.001$) and K3 ($p<0.01$), and higher protein content than K3 ($p<0.05$). Fat content was lowest for animals fed diet K3 compared to M1 ($p<0.001$), M2, K1 and K2 ($p<0.01$). Diet M1 gave higher fat content than the other diets containing BSH (M2 and K1; $p<0.05$).

Table 2 Milk production (kg ECM/d) and milk concentration of lactose, protein and fat (g/kg milk)

Diet	ECM	Lactose	Protein	Fat
K1	30.9	47.1	37.1	49.3
K2	29.5	46.3	36.4	49.5
K3	28.2	46.5	36.0	46.5
M1	31.2	46.8	37.5	51.2
M2	31.2	46.7	37.0	49.2
SED ^a	0.6	0.2	0.4	0.8

^a SED=standard error of the difference

Conclusions Whole-crop cereal silage harvested at the dough stage gave lower milk yield and lower concentrations of fat, protein and lactose in the milk compared to animals fed WCCS harvested at heading. Higher intake of grass silage (M1) tended to increase fat content in the milk, but otherwise there were no differences in milk yield or composition between the three BSH treatments.