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SORGHUM GRAIN PROCESSING FOR EARLY AND LATE LACTATION COWS

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Common methods for processing grains prior to incorporation in commercial supplements for dairy cows are dry rolling, pelleting and steam flaking prior to pelleting. An experiment was designed for a commercial company (QCMA Rural, Qld.) to compare these 3 processing methods for differences in milk yield or composition. Treatments were daily concentrate allowances of 5 kg dry rolled grain meal (5M), 5 kg of a pelleted grain meal (5P), 5 kg of a steam flaked grain pellet (5SP) and 8 kg of steam flaked pellet (8SP).

The experiment ran for 12 weeks from November 1990 to January 1991 and used 24 late lactation cows that calved in May 1990 and 12 early lactation cows that calved in October 1990. Cows were blocked on milk yield, stage of lactation, milkfat % and liveweight and randomly assigned to 4 treatments of a 4 x 4 latin square. Experimental periods were of 3 weeks duration consisting of 1 week standardisation and 2 weeks of measurement. Each tonne of concentrate comprised 750 kg sorghum grain, 190 kg cottonseed meal, 30 kg sodium bicarbonate, 20 kg dicalcium phosphate, and 10 kg limestone. The mean chemical composition of concentrate offered was 88% dry matter (DM), 17.8% crude protein (CP), 1.13% Ca, 0.82% P and 0.24% Mg. Feed was offered twice daily to individual cows and reject supplement weighed after each feed. Cows grazed as a single herd on 7.2 ha of a tropical grass sward (*Chloris gayana* cv. Callide) and 7.2 ha of white clover (*Trifolium repens* cv. Haifa).

There was a significant increase ($P < 0.01$) in milk yield of cows offered the pellet (5P) or steam flaked pellet (5SP) over those fed the meal (5M). Milk yield of 8SP cows was higher than 5M and 5P ($P < 0.01$) and 5SP ($P < 0.05$). The increase in milk yield due to pelleting compared with the meal was 2.2 kg/day for early lactation cows and 0.86 kg/day for late lactation cows. Late lactation cows showed no differences in milk composition between treatments while protein % in early lactation cows was higher ($P < 0.05$) in 8SP cows than those fed 5P and 5M (Table 1).

Table 1. Milk production from sorghum grain supplement processed by 3 different methods

Treatment	Amount (kg/day)	Stage of lactation	Milk (kg/day)	Milkfat (%)	Protein (%)	Lactose (%)	Faecal starch (% DM)
Rolled meal	5	Early	18.9	3.39	3.09	4.91	18.4
		Late	16.1	3.56	3.26	4.87	
Pellet	5	Early	21.1	3.26	3.06	4.96	2.8
		Late	17.0	3.47	3.25	4.86	
Steam flaked pellet	5	Early	21.0	3.24	3.10	4.90	4.0
		Late	17.0	3.49	3.28	4.85	
	8	Early	21.9	3.22	3.18	4.95	3.9
		Late	17.8	3.45	3.31	4.88	
SED		Early	0.60	0.116	0.037	0.040	0.75
		Late	0.69	0.023	0.009	0.006	

Higher faecal starch in cows fed 5M ($P < 0.01$) indicated there was better utilisation of starch where sorghum was pelleted or steam flaked. These results are in agreement with Moore *et al.* (1992) who obtained higher milk yields with steam flaking compared with dry rolling of sorghum and this was attributed to increased starch hydrolysis and digestibility of starch.

MOORE, J.A., POORE, H.H., ECK, T.P., SWINGLE, R.S., HUBER, J.T. and ARANA, M.J. (1992). *J. Dairy Sci. 75: 3465-72.*