

STEAM-FLAKED LUPINS FOR DAIRY CALVES

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Complex, expensive calf starters are available for rearing dairy calves. Steam-rolled lupins were examined as a cheaper component of rations for calves up to 10 weeks of age. Four calf-starter diets were fed; 1) 100% commercial pelleted ration (CP) with 0% steam-flaked lupins (SFL), 2) 67% CP with 33% SFL, 3) 33% CP with 67% SFL and 4) 100% SFL, to 6-8 individually housed calves/diet. Week-old Friesian calves were bought from a sale-yard; the experiment was delayed for 2 weeks while an outbreak of rota-virus diarrhoea was controlled. Multi-mineral salt blocks and fresh water were available at all times. The feeding system involved milk-replacer alone for week 1, milk-replacer at 510 g dry matter (DM)/day plus calf-starter for weeks 2-5, weaning, calf-starter with a small amount of straw for weeks 6-10, grazing short fresh ryegrass pasture for weeks 11-15. Digestibility was measured in weeks 5, 7 and 10, using lignin as a marker. Blood samples were drawn in weeks 2, 4, 6, 8 and 10 and rumen contents in weeks 4, 6, 8, and 10.

There were no differences between starter diets 1, 2 and 3 in intake pre- or post-weaning, liveweight gain, feed conversion ratio, plasma glucose, plasma and rumen volatile fatty acids (VFAs) or growth on pasture. Plasma VFAs increased from 14 mg/L to 35 mg/L from weeks 4 to 12. Digestibility of DM, nitrogen and neutral detergent fibre (NDF) decreased as lupin intake increased; NDF digestibility increased with age. Intake of diet 4 was significantly lower and in week 8, most calves stopped eating. Lucerne and grain diets were needed to restore appetite. Subsequent growth rate on pasture was not impaired.

Table 1. Performance of calves fed steam-flaked lupins

	0%	Proportion of lupins in calf-starter		
		33%	67%	100%
Weeks 2-5				
Milk replacer intake (kg/day)	0.49 ^a	0.49 ^a	0.49 ^a	0.47 ^b
Calf starter intake (kg/day)	0.49 ^a	0.52 ^a	0.49 ^a	0.38 ^b
Liveweight gain (kg/day)	0.66	0.68	0.64	0.58
Weeks 6-10				
Calf starter intake (kg/day)	2.42	2.63	2.40	n.d. ^A
Liveweight gain (kg/day)	0.97	1.06	0.94	n.d.
Weeks 11-15				
Liveweight gain (kg/day)	0.55	0.61	0.56	0.59
Dry matter digestibility (%)				
Week 5	68.2 ^a	66.6 ^a	57.7 ^b	51.7 ^b
Week 7	62.9 ^a	61.0 ^a	48.5 ^b	n.d.
Week 10	62.3 ^a	58.9 ^b	53.9 ^c	n.d.
Neutral detergent fibre digestibility (%)				
Week 5	24.7 ^a	19.5 ^{ab}	17.8 ^{bc}	13.6 ^c
Week 7	35.0 ^a	33.7 ^a	18.0 ^b	n.d.
Week 10	32.1 ^a	26.1 ^a	18.1 ^b	n.d.
Means with different superscripts differ at P < 0.05.				
^A n.d. not determined				

We conclude that steam-flaked lupins can be a satisfactory component of the diet of young calves at up to 67% but not 100% of the ration.