REPRODUCTION AND MILK PRODUCTION IN EWES UNAFFECTED BY RAPESEED MEAL

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To investigate the suitability of using high levels of British (high-glucosinolate) rapeseed meal (RSM), 80 adult Suffolk-Mule ewes of mean live-weight 64.8 kg (s.e. 0.5) were divided into 4 balanced groups. Three of the groups were allocated to a concentrate diet containing 20% RSM as the major protein supplement: extracted (B), expeller (C) and extruded (D). The control group (A) was given a diet containing 16.5% soyabean meal (SBM) as the only protein supplement. The remainder of these pelleted diets consisted of barley, molassine meal, oat husks, minerals and vitamins. All 4 diets contained similar levels of protein and energy. Ewes of groups A, B, C and D were given these diets from just prior to mating to the end of the sixth week of lactation and ewes of groups A and B were maintained on their respective diets for a further complete reproduction cycle.

The ewes were fed 0.7 kg/day during maintenance, 1 kg/day during mating and increasing amounts from late pregnancy to a maximum of 2.5 kg/day during lactation. Barley straw was available ad libitum. The ewes were weighed twice monthly. Jugular blood samples were taken monthly for thyroxine (T_4) and thiocyanate (^-SCN) analyses of plasma, also every 5 days during mating and the first 2 months of pregnancy for profiles of progesterone in plasma. The ewes were exposed to raddled entire rams for 6 weeks during November and December. Lambs were weighed at birth, then weekly, and were weaned at 42 days old. They were creep-fed diets similar to the dams' lactation diets. Milk yield (Peart, 1968 a, b) and composition were determined in 5 twin-bearing ewes from each group in the first year and 6 from each group in the second. These ewes suckled their lambs for almost 8 weeks to provide further milk samples for analysis. There were no effects of the RSM diets on ewe live-weight, nor on progesterone profiles, nor on reproduction (Table 1). In the first year a mean of 1.6 lambs were reared per ewe mated and 58% of ewes lambing reared twins. Single lambs weighed 5.0-6.5 kg at birth and gained over 300 g/d; twins weighed 4-5 kg at birth and gained over 250 g/d. There were no significant dietary effects on reproductive performance nor on lamb weights. In the second year a mean of 1.8 lambs were reared per ewe mated and 79% of ewes reared twins. Lamb weights were similar to those of the first year and, again, there were no significant effects of dietary treatment on either reproductive performance nor lamb weights. In general, the lambs were clinically healthy and there were no differences in health of lambs among treatment groups in either year.

Milk yield data are given in Table 2. These were all satisfactorily high for ewes suckling twins and there were no significant effects of dietary treatment either during the first or second year.

In Figure 1, values are shown for the fat (i) and protein (ii) contents of milk in year 1. There were fairly large variations in fat contents among weeks and treatment groups: in weeks 5 and 6 the fat content of milk from ewes given diet D (extruded RSM) was significantly lower than that from the other groups. In Figure 1, each weekly mean for the fat of group A milk was greater than that of group B milk: this trend was repeated in results for the second year and for week 2 of year 2 the difference was significant ($P<0.05$).

The protein content of milk in the first year (Figure 1, ii) was significantly greater for group A ewes than for ewes of groups B, C and D at 4 of the 6 weekly samplings. In the second year, each of the 6 weekly samples had a greater protein content for group A than B, but none of the differences was significant statistically: the overall means were 6.50% for group A and 6.14% for group B.

The lactose content of milk was unaffected by dietary treatment.

Figure 2 shows the concentration of thiocyanate in plasma during the first year. Values for ewes given RSM, groups B, C and D were significantly greater than those for control ewes, group A, and in groups B, C and D the concentration reflected the quantity of RSM that was given. Values for the second year were very similar to those for the first.

The concentration of thiocyanate in milk is shown in Figure 3. Values for samples from groups B, C and D were uniformly greater than those for group A: these differences were significant statistically. Values for year 2 were similar to those for year 1.

Plasma T_4 values were similar regardless of diet, ranging from 71 to 116 nmol/l.

From these results it is evident that a compound feed containing 20% high-glucosinolate RSM (up to 100 umol/g), when fed with barley straw as the only roughage, to ewes over 2 complete reproductive cycles, gave production in terms of number of lambs born and reared, as well as milk production and weight gain of the lambs, that was equal to that given by a similar compound feed in which soyabean meal replaced the RSM.

REFERENCES

Peart, J.N. (1968a). Lactation studies with Blackface ewes and their lambs. Journal of Agricultural Science, Cambridge, 70: 87-94.

Peart, J.N. (1968b). Some effects of live weight and body condition on the milk production of Blackface ewes. Journal of Agricultural Science, Cambridge, 70: 331-338.

Table 1 Reproductive Data

	Dietary group	No. ewes lambing	No. viable lambs born	No. lambs alive after 24 h	No. ewes rearing twins	No. ewes rearing triplets
Year 1	A	19	30	29	12	0
	B	20	32	29	10	0
	C	20	35	34	11	2
	D	20	34	33	13	0
Year 2	A	19	35	33	15	0
	B	20	38	37	17	0

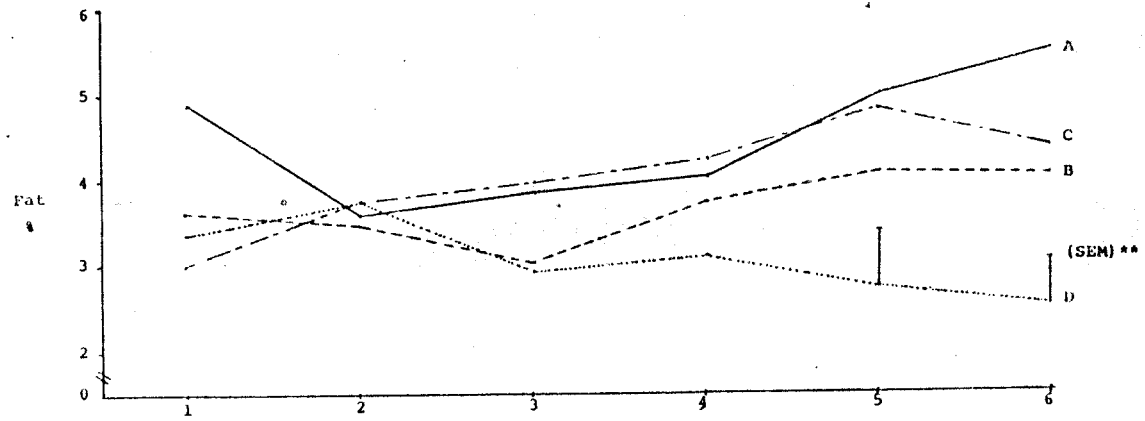
Table 2 Mean (± s.e.) Milk Yields (l/d)

	Dietary group	Lamb age (d) at Week 1	Week 1		Week 2		Week 3		Week 4	
Year 1	A	9	3.08	0.21*	3.34	0.09	3.40	0.17	2.64	0.33
	B	9	3.18	0.17	3.36	0.11	3.35	0.22	2.76	0.25
	C	11	3.42	0.17	3.27	0.13	3.00	0.14	2.89	0.09
	D	11	3.16	0.24	3.25	0.27	3.38	0.25	2.92	0.23
Year 2	A	8	3.07	0.21	3.53	0.20	3.22	0.36	2.82	0.20
	B	6	3.21	0.16	3.75	0.13	3.50	0.23	2.91	0.23

*s.e.

i)

Figure 1 **Percentage of Fat (i) and Protein (ii) in Milk**



ii)

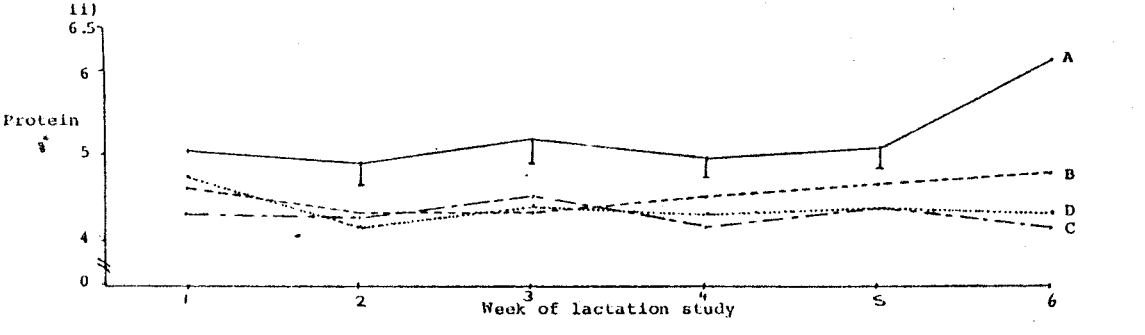


Figure 2. Thiocyanate /$^{-}$SCN/ Levels / mmol/l / in Plasma

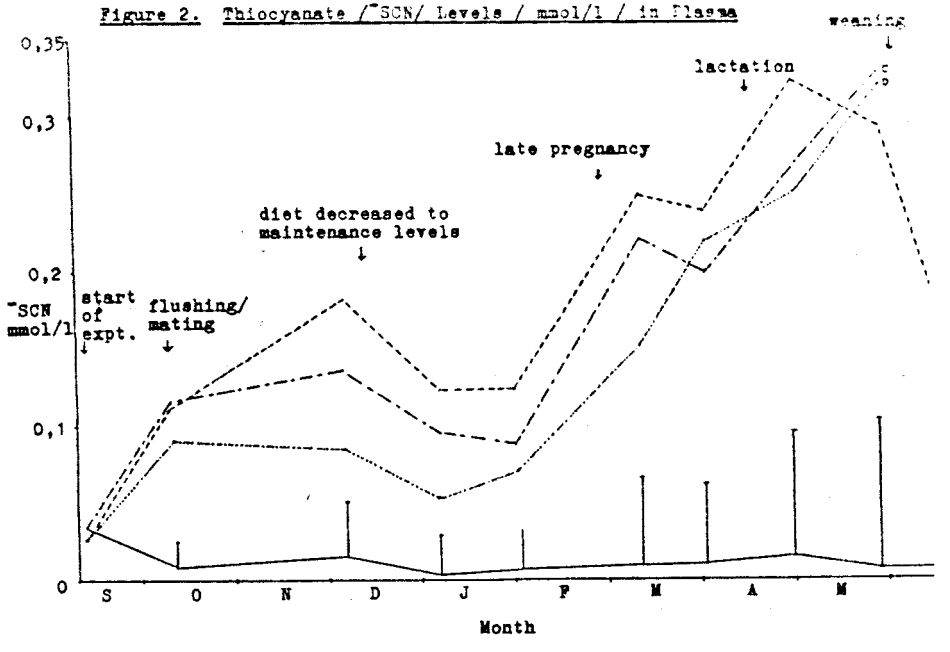


Figure 3. Thiocyanate /$^{-}$SCN/ Levels / mmol/l / in Milk