

Ovulation in ewe lambs given a diet containing  
high glucosinolate rapeseed meal

J. A. Stedman, Sharon Pittam and R. Hill  
The Royal Veterinary College (University of London)  
Boltons Park, POTTERS BAR, Herts, ENGLAND.

In a preliminary experiment on the effects of a rapeseed meal (RSM) diet on reproductive efficiency in ewes (Thériez, personal communication), there was a strong trend towards reduced number of lambs born to ewes given the rapeseed meal diet. In the experiment described here, the relation between rapeseed meal and reproductive efficiency was studied with ewe lambs: Observations were made on the activity of the ovaries of lambs given a concentrate diet containing high glucosinolate rapeseed meal as the sole protein supplement.

Groups of weaned Welsh mountain ewe lambs weighing about 20kg. and Suffolk crossbred ewe lambs weighing about 37kg. were each divided into 4 pens of six lambs. Two groups of each breed or cross of lamb were given a diet containing RSM and another two groups, a diet containing soyabean meal (SBM) in place of RSM. The diets were balanced for energy and protein by the replacement of some of the barley in the SBM diet with wheat and oil in the RSM diet (Table 1) These diets were given ad libitum plus 100g of chopped hay daily for 9 weeks.

The RSM used was from an autumn sown variety grown in Britain and contained 7.90mg/g oxazolodine-thione, a hydrolysis product of the glucosinolate, progoitrin.

Table 1The Composition of the Diets

<u>Ingredient %</u>	<u>Sbm</u>	<u>Rsm</u>
Barley	69.00	40.75
Wheat	-	20.00
Soyabean meal	23.66	-
Rapeseed meal	-	32.16
Molassine meal	5.00	5.00
Oil	-	1.00
Salt	0.25	0.25
Limestone	0.70	0.82
Dicalcium phosphate	1.05	-
Calcined magnesite	0.32	-
Trace elements + vitamins	0.02	0.02
	<u>100.00</u>	<u>100.00</u>

Feeding a diet containing rapeseed meal to the ewe lamb resulted in a significantly lower ( $P < 0.01$ ) daily live weight gain than was achieved by lambs fed the SBM diet (Table 2). The lowland Suffolk cross ewe lambs grew at a significantly ( $P < 0.001$ ) greater rate than the Welsh mountain lambs, but there was no interaction between diet and breed.

Table 2 Daily rate of liveweight gain (g/lamb) and number of Corpora lutea of lambs given diets containing soyabean meal (Sbm) or British rapeseed meal (Brsm)

Dietary Treatment	Breed or Cross	n	Rate of gain	No. of Corpora lutea per lamb
Sbm	Welsh	2	158.4	1.25
	Suffolk X	2	247.6	1.33
Brsm	Welsh	2	120.5	1.92
	Suffolk X	2	205.4	1.34
Sbsm		4	203.0	1.29
Rsm		4	163.0	1.63
	Welsh	4	139.4	1.59
	Suffolk X	4	226.5	1.34

Statistical Analysis

Dietary treatment or breed	S.E.D.	7.79	-
Dietary treatment	P	<0.01	NS
Breed	P	<0.001	NS

Examination of the ovaries of the slaughtered ewe lambs showed that all the lambs had ovulated during the trial. The number of 'corpora lutea' per lamb was not significantly affected by the diet. This suggests that the feeding of high glucosinolate RSM did not markedly depress sexual development.

The inclusion of RSM in the diet produced a highly significant ( $P < 0.001$ ) increase in thyroid weight and decrease in plasma thyroxine level (Table 3). In neither case was there a significant interaction between breed and diet. These results reflect the goitrogenic property of high glucosinolate RSM, but as indicated earlier, this was not associated with delay in sexual maturity.

Table 3 Thyroid weight (mg/kg body weight) and plasma thyroxine concentration (g/100ml) of Welsh and Suffolk crossbred lambs given diets containing soyabean meal (Sbm), or British rapeseed meal (Brsm)

		n	Thyroid weight	Plasma Thyroxine g/100ml
Sbm	Welsh	12	69	7.5
	Suffolk X	12	57	9.1
Brsm	Welsh	12	108	6.7
	Suffolk X	12	91	6.4
Sbm			63	8.3
Rsm			100	6.6
Welsh			88	7.1
Suffolk			73	7.8
SE difference between means +			6.5	0.46
Significance of difference (P)				
Rsm v Sbm			<0.001	<0.001
Welsh v Suffolk			<0.05	NS