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A. L. Slyter
South Dakota State University

Rud Wasson

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EVALUATION OF THE EFFECT OF HIGH OIL CORN DIETS ON LAMB PERFORMANCE

A.L. Slyter and Rud Wasson
Department of Animal and Range Sciences

SHEEP 99-3

SUMMARY

Two trials were conducted to determine the effect of inclusion of high oil corn (HOC) as a replacement for regular corn (C) in lamb pre-weaning and growing-finishing diets. Twin raised Hampshire, Columbia and Finn-Dorset-Targhee (FDT) lambs were used in the pre-weaning creep trial and only FDT lambs in the growing-finishing trial. Lambs receiving the HOC pre-weaning diet gained 9.7 lb (\cong 13% increase) more during the 80 d period than those on the C diet. No difference was noted in feed consumption during this trial. No treatment differences were observed in lamb performance or feed consumption during the growing-finishing trial. Gain averaged .78 lb per day during the growing-finishing phase. HOC appears to offer potential increased gains compared to C when used in lamb pre-weaning diets, but not in diets post-weaning based on the results of these trials.

INTRODUCTION

The availability of corn varieties with higher oil content may offer an advantage as feed stuffs for various species and classes of livestock. Higher oil content increases the energy density in the feed stuff, potentially leading to improved performance and/or efficiency of gain. Additional benefits suggested are dust reduction, reduced energy for processing and improved palatability. Most research to date has been with swine and poultry diets. The object of these trials was to evaluate the effect of high oil corn compared to normal corn in pre-weaning and post-weaning diets for lambs.

EXPERIMENTAL PROCEDURES

Creep trial

Fifty twin-raised lambs were provided a creep

provided a creep with an experimental diet containing high oil corn designated as HOC. In the HOC diet the regular com (4.64% oil, DB) was replaced with HOC (6.20% oil, DB). Ewes with twin lambs were paired as nearly as possible within breed, lamb size, age and vigor and one of each pair randomly assigned to each treatment. There were a total of 16 Hampshire, 8 Columbia and 28 Finn-Dorset x Targhee ewes for a total of 104 lambs starting the trial. One lamb died in the control group from unexplained causes and therefore its dam and littermate were not included in the analyses. Lambs and ewes were weighed every two weeks and creep consumption was estimated at each weigh day. Total creep consumed was based on the total amount placed in the feeders minus any fines that were removed during the trial. Lambs ranged from 4 to 14 days of age (8.5 days median age) at the start of the trial and remained on the study for 80 days (median age 92.5 days). Data were analyzed using GLM procedures for a mixed model that included treatment, breed and sex of lamb and their interactions. Since breed and sex of lamb were equally represented in all pens and no significant interactions were detected only treatment effects are shown in the tables.

Table 1. Composition of Control Creep Diet^a

Ingredient	lb/ton
Shell com, coarse cracked	1300
Soybean meal	480
Base mix ^b	100
Molasses, liquid	100
Ground limestone	20
Thiamine Pre-mix ^c	

^aAs is basis. An equal amount of high oil corn (HOC) replaced the regular com in the experimental diet (HOC).

^bThe base mix contained 14% calcium, 5% phosphorus; 20%

NaCl; 2 ppm selenium; 20,000 IU/lb vitamin A; 4,000 IU/lb Vitamin D; 1200 IU/lb vitamin E; and 720 gm/ton decoquinat (18 mg per lb of diet).

^cProvided 50 mg thiamine per pound of finished ration.

GROWING-FINISHING TRIAL

One hundred recently weaned Finn-Dorset x Targhee lambs, 50 ewes and 50 wethers were randomly allotted within sex to one of four pens. Two pens received the control diet (Table 2) and two pens received the diet with high oil corn (HOC). In the HOC diet the standard corn was replaced by HOC as described previously. Lambs were weighed and feed consumption estimated every two weeks. The trial was terminated after 48 days when approximately one third of the lambs had reached market weight.

Table 2. Composition of Grower-Finisher Diet^a

Ingredients	lb/ton
Shell corn, coarse cracked	1205
Oats, coarse rolled	200
Grower Concentrate ^b	500
Molasses, liquid	50
Ground limestone	20
Thiamine Pre-mix ^c	

^aAs is basis.

^bThe Grower concentrate contained not less than 36% crude protein, 60 gm decoquinatone per ton (7.5 mg per lb of diet).

^cProvided 25 mg thiamine per pound of finished feed.

RESULTS AND DISCUSSION

Creep trial

Lamb growth performance is shown in Table 3. Lambs on the HOC diet gained 9.7 lb. more ($P < .001$) during the trial than those consuming the C diet. As shown in Figure 1, most of this increase came in the last 42 days of the trial. Feed consumption by period is shown in Figure 2. Lambs consumed an average of 1.05 lb. of creep per head, per day, for the total period. No difference was noted in the average daily feed consumption between treatments. Thus, it appears that lambs on the HOC diet were more efficient and/or the HOC diet provided more nutrients than the control diet. The HOC contained approximately one third more oil than the normal corn and the diet with it resulted in $\approx 13\%$ increase in gain. Ewes maintained their body weight (Table 4) during the trial with no difference noted between ewes nursing lambs on the control vs. the HOC creep. Thus, it is assumed that milk production between the groups was similar. And since feed consumption was similar between treatment groups, any difference in lamb performance

should be due to the difference in diet composition.

Table 3. The Effect of Diet on Lamb Weight (lb)

Weight date	Trial Day	Diet		P value ^a
		Control	HOC	
2-16-98	01	17.1 ± .61	17.4 ± .60	.746
2-26-98	10	23.0 ± .83	19.5 ± .82	.004
3-12-98	24	30.5 ± 1.00	33.0 ± 1.00	.084
3-26-98	38	42.7 ± 1.29	46.7 ± 1.31	.030
4-09-98	52	55.0 ± 1.57	60.9 ± 1.56	.009
4-23-98	66	67.2 ± 1.78	75.1 ± 1.77	.002
5-07-98	80	76.5 ± 1.64	86.2 ± 1.63	<.001

^aProbability of difference between treatments occurring by chance.

Table 4. Ewe Weight (lb.)^a

Weight date\ Treatment	Control	HOC	P value ^b
2-16-98	202.0 ± 4.8	202 ± 4.8	.904
2-26-98	204 ± 5.4	201 ± 5.3	.669
3-12-98	210 ± 5.6	201 ± 5.6	.284
3-26-98	212 ± 5.5	207 ± 5.5	.508
4-09-98	212 ± 5.7	204 ± 5.7	.370
4-23-98	212 ± 6.2	206 ± 6.1	.482
5-07-98b	179 ± 5.5	179 ± 5.5	.166

^aWeight taken after overnight stand without feed and water.

^bProbability of difference between treatments occurring by chance.

GROWING-FINISHING TRIAL

Lamb growth performance during the growing-finishing trial is shown in Table 5. No significant differences in performance or feed consumption were observed between lambs receiving the control and the HOC diet. Daily feed consumption averaged $2.9 \pm .22$ lb per head during the first two weeks of the trial and $4.0 \pm .04$ lb during the last two weeks of the study. Average daily gain for the study was .79 lb for control lambs and .76 lb for lambs on the HOC diet. Wether lambs were 1.7 lb heavier than the ewe lambs initially and gained more per day during the trial. Wethers finished the trial weighing 3.9 lb more compared to ewe lambs. As shown in Table 5 the growing-finishing trial was terminated at approximately 110-lb average weight. Ewe lambs in this trial were replacement females for our crossbred ewe flock, so it was important not to over-condition them. Also, the genetics of this cross (FDT) is of medium-frame size. Therefore, final weight at the proper body condition is less than when a terminal sire breed ram is mated to this type of crossbred ewe.

Table 5. Effect of Diet on Post Weaning Growth (lb)

Weight Date/Diet	Control	HOC	P value ^a
5-15-98	73.3±1.22	73.8±1.21	.78
5-28-98	85.3±1.35	85.2±1.33	.49
6-04-98	91.7±1.35	91.5±1.33	.92
6-18-98	100.3±1.34	99.8±1.33	.77
7-02-98	111.2±1.36	110.1±1.35	.55

^aProbability of difference between treatments occurring by chance.

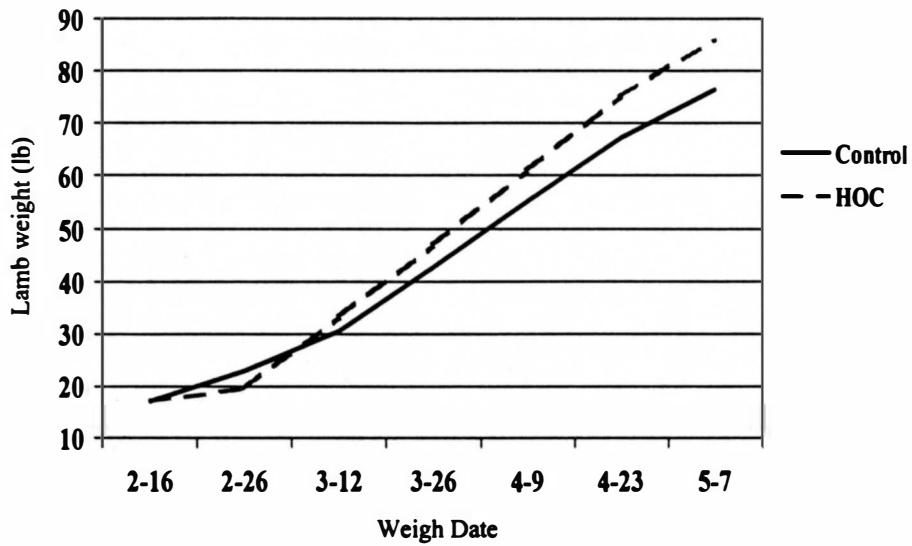


Figure 1. The Effect Of Diet On Lamb Weight

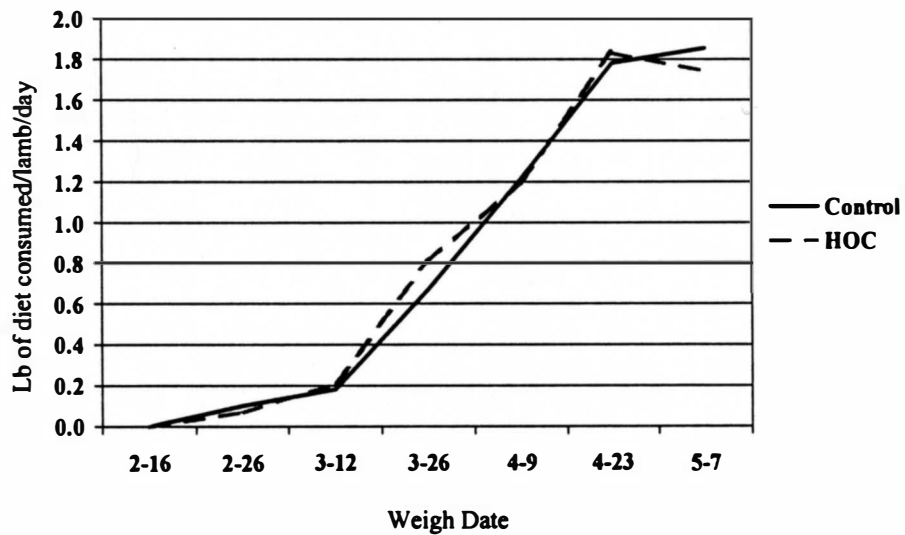


Figure 2. Creep Feed Consumption