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Lamb preference for commercial and grain-soybean meal based creep diets during the preweaning season

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Summary

The objective of this study was to evaluate lamb preference for specific commercial and grain-soybean meal based creep diets during the preweaning period. Lambs preferred the commercial pellet and crumble diets over two grain-soybean meal based mixtures up to approximately 40 days of age. After this the lambs favored the crumble over the other diets and the relative increase in consumption rate of one grain-soybean meal diet was greater than for the pellet diet. The least favored diet throughout the trial was the second grain-soybean meal diet. The overall consumption of this diet was almost half that reported for the other diets. These data for the grain-soybean meal based diets show that for diets with the same ingredients and physical characteristics lamb preference can be substantially different. Generally the diet preferences shown by the lambs in this study agree with the NRC (1985) for physical diet preference by lamb age.

Introduction

In the Upper Midwest, the majority of winter-born lambs are offered creep feed until they are weaned. Creep diets are intended to supplement the nutrients supplied by ewe's milk. Lactating ewes normally reach their peak in milk production about 4 weeks postpartum. Beyond this daily milk production declines independent of the diet offered. Lambs typically begin to consume creep feed at 10 to 14 days of age. The amount consumed is inversely proportional

to the amount of milk consumed. The amount of creep feed consumed by young lambs, 2 to 6 weeks of age, is affected by the palatability of the ration, both composition and physical form. A highly palatable, nutrient dense creep diet enables lambs to meet their genetic growth potential and take advantage of the greater efficiency of gain associated with younger animals. According to the NRC (1985), young lambs initially prefer ground creep rations to pelleted rations. After 4 or 5 weeks of age, lambs show a preference for pelleted rations. After 6 weeks of age, they should be fed unground grains. However, little current information is available on lamb preference for specific types of commercial and grain-soybean meal based creep diets during the preweaning period. The objective of this research was to examine creep diet preference of purebred Hampshire lambs from 10 days of age to weaning.

Experimental Procedures

Fifty mature purebred Hampshire ewes and their newborn lambs (February) were used in a 56-day creep feed palatability study. Ewes and their nursing lambs were divided into two groups of 25 ewes each, one group had 50 lambs and the other 47 (male lambs were left intact). At the start of the study, the average age of the lambs was 10 ± 5 days. Each pen of lambs had access to an indoor creep area, approximately 12 feet x 15 feet, with a metal roller type of creep gate. Lambs were offered four dietary treatments in cafeteria style; commercial pellet (3/16 in.

diameter), commercial crumble, grain-SBM I, and grain-SBM II. The grain-SBM diets contained the same ingredients (Table 1), but the source of the grains and soybean meal and location for formulation were different. The specific ingredient composition of the commercial products was not available. The crude protein level for the diets used in this study ranged from 17 to 20% (as-is basis). Lasalocid (Bovatec) was included in all diets as a coccidiostat at 15 mg/lb. These diets were offered ad libitum in identical, individual, wooden baby pig creep feeders mounted in each pen at a height of 12 inches above the floor and spaced approximately 15 inches apart. A rubber coated mesh flooring raised 6 inches off the ground was used in the feeder area to accommodate collection of feed waste. No supplemental forage was offered to lambs in the creep feeding area. However, they did have access to the ewes' diet.

Table 1. Composition of grain-soybean meal mixtures (I and II)^a

	%
Shelled corn, coarsely cracked	47
Oats, whole	12
Soybean meal	31
Base mix ^b	5
Molasses, liquid	5

^a As-is basis.

^b Contains 14% calcium; .5% phosphorus; 20% NaCl; 2 ppm selenium; 20,000 IU/lb vitamin A; 4,000 IU/lb vitamin D, and 1,200 IU/lb vitamin E.

Ewes were offered a diet which met or exceeded NRC (1985) requirements for protein and energy during lactation. It consisted of corn silage, ground alfalfa hay, and shelled corn. The diet was fed with a self-unloading mixing wagon into concrete fence-line feeders located outside. All animals had free-choice access to a commercial sheep salt mineral mixture and automatic waterers.

At least twice weekly, diets were added to the feeders. Feed refusal and waste were removed and stored for subsequent dry matter determination. Feeders were monitored daily to insure free flow of diet. Diet intake was determined by using the pounds of diet offered less the feed refusal and feed waste. The amount of each diet consumed was determined on 2-week intervals. All data are reported on a dry matter basis. Also, the data from this study are reported as averages of the pen replicates.

Results and Discussion

Creep feed intake results are shown in Table 2. The highest overall feed intake was with the crumble treatment. Lambs consumed .31 lb per head daily of the crumble compared to .26 lb for the pellet and grain-SBM I and .15 for grain-SBM II. In the context of total pounds of diet, the lambs consumed 840 lb of the crumble during the 56-day trial which was 120 lb more than the pellet or grain-SBM I and 450 lb more than grain-SBM II. Therefore, over the entire 56-day trial, each lamb consumed 2.4 fewer pounds of the pellet and grain-SBM I but nearly 10 lb less for grain-SBM II.

Theoretically, the feed to gain ratio for these lambs was 1.3 lb of feed per pound of gain (this does take into account the contribution of gain from ewe's milk). Therefore, the contribution to weight gain for the pellet and grain-SBM I would be approximately 2 lb less than for the crumble diet. For grain-SBM II, the difference would be almost 8 lb less. More weight gain during the preweaning phase of growth should result in more efficient overall gain and fewer days on feed to reach market weight.

Lambs seemed to favor the commercial complete diets (pellet and crumble) over the two grain-soybean mixtures through period 2 (Table 2). During period 3, the lambs consumed .50 lb of the crumbles per head daily compared to .40 for the pellet and grain-SBM I and .20 for grain-SBM II. During the final 2 weeks of the trial (period 4), the most significant changes in diet preference by the lambs were the relative

Table 2. Effect of creep diet on lamb preference during a 56-day preweaning period

Diet	Period 1 (0-2 weeks)	Period 2 (3-4 weeks)	Period 3 (5-6 weeks)	Period 4 (7-8 weeks)	Overall daily feed intake
Pellet	.02	.17	.40	.51	.26
Crumble	.01	.15	.50	.68	.31
Grain-SBM I	.01	.10	.40	.69	.26
Grain-SBM II	.01	.07	.20	.39	.15
Total feed intake, lb/head/day	.05	.49	1.50	2.27	.98

increase in consumption of grain-SBM I and the lower relative increase for the pellet (Figure 1). In period 4, lamb preference for the crumble and grain-SBM I was equal. Grain-SBM II remained the least favored product followed by the pellet diet.

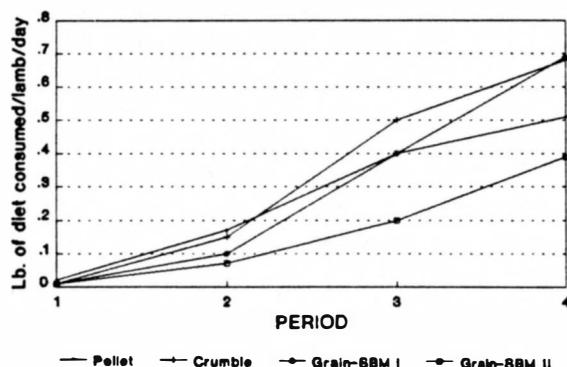


Figure 1. Creep feed consumption data.

Overall daily intake of all diets for the lambs in this 56-day study was .98 lb (Table 2). Feed intake increased from .05 lb per head per day in period 1 to 2.27 lb head day in period 4. Consumption increased 10-fold between periods 1 and 2, .05 to .49. Yet from period 2 to 3, intake increased by 1 lb per head per day. The dramatic increase in creep feed intake noted between periods 2 and 3 occurred when the average age of the lambs was between 38 and

52 days. Ewe milk production peaks about the fourth week of lactation. Beyond this, the lamb increasingly relies on supplemental sources of nutrients to reach their potential for maximum growth rate. Therefore, we would expect lamb appetite to increase in response to decreasing amounts of nutrients supplied by ewe's milk and added needs for body growth. A properly balanced creep diet can be an excellent source of supplemental nutrients for lambs; but, unless it is highly palatable as indicated by consumption pattern, it has little value to the lamb. All of the diets offered to the lambs in this study were palatable. However, the results show that diet palatability differs within and across periods.

Average daily gain (ADG) for the lambs on test was .75 lb per day, the weight per day of age (WDA) was .96 lb per day. The lamb preweaning growth performance was higher than for lambs in similar studies reported in the literature (Jordan, 1990; Jordan and Hanke, 1987).

Many variables can affect lamb growth performance including genetics, nutrition, environment, temperature, health conditions, and others. Yet one has to wonder whether allowing lambs to choose among different diets improved overall feed intake. It is unlikely that all lambs prefer the same type of diet even when lamb age is similar. Possibly, preference is also a function

of lamb weight. The average lamb weaning weight in this study was 73 lb, yet the range was 43 to 93 lb. Offering several diets with different physical characteristics may better satisfy individual lamb diet preference and therefore possibly improve growth performance of an entire group of lambs.

According to the NRC (1985), finely ground feeds are favored during the early stages of growth. As they become more mature, preference shifts to diets with larger particle size. Based on observations of feed refusal for the grain-soybean meal diets in this study, lambs selectively chose the finer ground dietary components leaving more whole grains through period 2, whereas in later periods, they left the fines. Producers often find a similar lamb eating pattern develops when using grain-soybean and grain-pelleted supplement diets. Most diets are formulated with the assumption that an animal consumes a homogenous product with each mouthful. However, when lambs sort various ingredients from their diet for consumption, this assumption becomes invalid. The main concern with sorting of ingredients is what nutrients or

important feed additives are left unconsumed. For instance in this study, during periods 3 and 4, the lamb feed refusal and waste consisted of mostly fines. Likely, the residues contained soybean meal, the source of supplemental protein, and premix which provides essential minerals and vitamins plus a coccidiostat. In essence the correct choice of a creep diet goes beyond the amount consumed daily but also how well it provides a balance of nutrients.

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