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Niacin Supplementation of Growing and Finishing Lambs

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Summary

A growing-finishing trial of 123 days was conducted using forty feeder lambs. The lambs were fed a diet consisting of rolled high-moisture corn, alfalfa brome haylage and a supplement fortified with minerals and vitamin A. Lambs fed a supplement containing 100 ppm of niacin[b] added to the diet gained essentially the same rate and consumed similar amounts of total dry feed as lambs not receiving the vitamin. Feed requirements were slightly higher for the lambs fed the niacin supplement. These results suggest that diets containing corn and alfalfa brome haylage are likely to contain enough niacin to meet the needs of lambs of this weight.

(Key Words: Niacin, Growing-finishing lambs).

Introduction

Historically, B vitamins have been considered to be synthesized in the rumen by ruminal microorganisms in sufficient amounts to meet animal requirements. As feeding programs become more intensified and with anticipated acceleration of production rates, the potential for supplemental niacin has added significance.

Shields et al. (1981) found that supplemental niacin in the diet during adaptation of lambs to urea-nitrogen containing diets improved nitrogen utilization by increasing the percentage of absorbed nitrogen retained. Growing and finishing lambs fed 100 ppm of added niacin gained more rapidly and required less feed per unit of gain than unsupplemented lambs (Shields and Perry, 1981). Byers (1980) in reviewing niacin for ruminants stated that the vitamin functions in co-enzyme systems related to carbohydrate, protein and lipid metabolism and that these activities have particular implications in rate of growth, production and lactation.

The purpose of this study was to investigate the effect of supplemental niacin (100 ppm, dry matter basis) on growing and fattening lambs fed high-moisture corn diets.

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Procedures

A 123-day growing-finishing trial was conducted with forty crossbred wether lambs averaging 62 lb. The lambs were ear tagged, implanted with 12 mg of zeranol, vaccinated for overeating disease, dewormed and sheared prior to the start of the trial. Initial and final weights were recorded following an overnight stand without feed and water. Intermediate weights were on a fill weight basis. The lambs were allotted to four groups of 10 lambs each. Five lambs in each group were fed a control supplement and 5 lambs were fed a supplement containing niacin. All lambs were housed indoors in individual pens equipped with a feed box and water container.

The diet consisted of 60% high-moisture corn (75.5% dry matter), 24% alfalfa-bromegrass haylage (41.5% dry matter) and 16% protein supplement. The composition of the supplement was 85.9% soybean meal (50% crude protein), 7.1% ground limestone, 2.0% dicalcium phosphate and 5.0% trace mineral salt. Vitamin A was included in the supplement to provide 1500 IU of the vitamin per lamb daily. The niacin diets contained 100 ppm of the vitamin on a dry basis.

The corn used in the basal diet was harvested from the 1983 crop and contained 24.6% moisture at storage. It was rolled and ensiled in four experimental tower-type silos each containing about 5000 lb. of wet corn. Two silos of corn were treated with a microbial additive and two silos were not treated. The corn and haylage were placed in steel barrels, closed with lids, transported to the Animal Science Complex and stored under refrigeration for feeding. The corn was in storage 180 days before the silos were opened for feeding.

Samples of corn, haylage and supplement were collected during the feeding period. Moisture and crude protein determinations were made on all samples. Niacin content of the feeds was not determined.

Statistical treatment of main effects (niacin, microbial additive) and interactions (niacin x microbial additive) were conducted. These results showed no significant ($P>.05$) interaction effect between niacin and the microbial additive used to treat the high-moisture corn. The data, therefore, have been pooled to show only the effect of niacin supplementation.

Results

Supplemental niacin to lamb diets containing high-moisture corn, alfalfa-bromegrass haylage and supplement resulted in performance that was about the same as for diets which did not contain niacin. For the control and niacin supplement treatments, average daily gains were .419 and .411 lb. per day (table 1); feed intakes, 2.23 and 2.22 per day (table 2) and feed required per pound of gain, 5.32 and 5.41 lb. (table 3), respectively. The diets used in this study appear to contain adequate quantities of niacin to satisfy the requirements of lambs of this weight. The diets used by the Purdue workers contained some corn cobs which are relatively low in niacin.

Literature Cited

Byers, Floyd. 1980. Niacin for ruminants. Feed Management.

Shields, D. R. and T. W. Perry. 1981. Effect of supplemental niacin on protein digestion in growing and finishing lambs. Sheep Field Day Report. Purdue University.

Shields, D. R., T. W. Perry and D. M. Schaefer. 1981. Niacin supplementation in lamb diets during adaptation to urea. Sheep Field Day Report. Purdue University.

TABLE 1. DAILY GAIN FOR GROWING AND FINISHING LAMBS FED NIACIN SUPPLEMENTS

	Control	Niacin[a]
No. of lambs	19	19
Initial wt., lb.	61.6	61.6
Final wt., lb.	112.9	111.7
Average daily gain by period, lb.		
Period I, 46 days	.320	.307
Period II, 43 days	.528	.507
Period III, 34 days	.417	.430
Average daily gain, lb.		
Overall	.419	.411

[a] Supplied by Lonza, Inc., Fair Lawn, NJ.

TABLE 2. DAILY DRY FEED FOR GROWING AND FATTENING LAMBS FED NIACIN SUPPLEMENTS

	Control	Niacin[a]
Average daily feed intake by period, lb.		
Period I, 46 days	2.01	2.01
Period II, 43 days	2.32	2.30
Period III, 34 days	2.42	2.43
Average daily feed intake, lb.		
Overall	2.23	2.22

[a] Supplied by Lonza, Inc., Fair Lawn, NJ.

TABLE 3. FEED EFFICIENCY FOR GROWING AND FINISHING LAMBS FED NIACIN SUPPLEMENTS

	Control	Niacin[a]
Feed per lb. gain by period, lb.		
Period I, 46 days	6.61	7.16
Period II, 43 days	4.46	4.60
Period III, 34 days	6.11	5.80
Feed per lb. gain, lb.		
Overall, 123 days	5.32	5.41

[a] Supplied by Lonza, Inc., Fair Lawn, NJ.