

ADAPTION OF EARLY WEANED LAMBS TO HIGH CONCENTRATE CORN, SORGHUM OR WHEAT DIETS, WITH AND WITHOUT SODIUM BICARBONATE

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Story in Brief

Rambouillet, Hampshire and Finn-Dorsett cross lambs were weaned at 30 days of age and fed diets formulated from either corn, sorghum or wheat, with and without buffer. Lambs gained similarly on the corn and sorghum based diets, but lambs fed the wheat based diets gained slower. Sodium bicarbonate buffer improved rate and efficiency of gain slightly for corn diets. Rate and efficiency of gain on sorghum and wheat diets were not affected by sodium bicarbonate.

INTRODUCTION

Early weaning of lambs is becoming a popular practice because of the following advantages: 1) reduction of the amount of high energy diet needed to maintain ewes; 2) decreased predator and parasite problems; and 3) increased ability of producers to lamb more than once a year. Previous studies indicated that sodium bicarbonate improved feed intake and rate of gain of early weaned lambs whether or not they were exposed to creep feed prior to weaning. In addition, sodium bicarbonate has been demonstrated to be beneficial in adaption of sheep to high concentrate diets. The feeding of grain sorghum has been shown to provide gains and feed efficiency comparable to corn and superior to that of wheat. Another study indicated that 60 percent wheat diets containing 30 percent alfalfa hay provided gains and feed efficiency similar to that of a 60 percent sorghum diet containing 30 percent alfalfa hay. In addition, the rate and efficiency of gain supported by a wheat based diet did not change when alfalfa was varied from 10-40 percent of the diet. The purpose of the present experiment was to examine the adaption of early weaned lambs to high concentrate diets formulated with either corn, sorghum, or wheat as grain sources and to assess the effects of sodium bicarbonate on adaption of lambs to these diets.

Materials and Methods

Lambs used in the experiment were 1983 spring lambs from yearling Rambouillet ewes that were bred to either Rambouillet, Hampshire and Finn-Dorsett Rams. Two weeks prior to weaning at 30 days of age, lambs were offered a starter ration (Table 1). Two pens of lambs (one wether and two ewes) of each breed cross were fed each diet for a total of six pens per diet. Following weaning, lambs were housed in 5 x 7' pens equipped with a self-feeder and a water bucket. Animals

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Table 1. Ration Composition (Percent of Dry Matter).

INGREDIENTS	BUFFERED			UNBUFFERED			STARTER
	CORN	SORG.	WHEAT	CORN	SORG.	WHEAT	
Corn	61.1	--	--	61.1	--	--	23.0
Sorghum	--	61.1	--	--	61.1	--	23.0
Wheat	--	--	67.1	--	--	67.1	23.0
Fish meal	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Cottonseed meal	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Soybean meal	15.0	15.0	9.0	15.0	15.0	9.0	7.0
Cottonseed Hulls	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Limestone	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Ammonium Chloride	.5	.5	.5	.5	.5	.5	.5
TM salt	.5	.5	.5	.5	.5	.5	.5
Sodium Bicarbonate ^a	+	+	+				+
Vitamin A	+	+	+	+	+	+	+

^aSodium bicarbonate added to ration to achieve a final level of 2 percent except for starter ration with 1 percent.

at 3, 7, 14, and 28 days and feed intakes recorded.

Diets were formulated using either corn, sorghum, or wheat as the energy source, with or without 2 percent sodium bicarbonate (Table 1). Grains were ground through a 1/8" hammermill screen prior to mixing. Diets were formulated to contain 17 percent crude protein. Cottonseed hulls (12 percent) were the sole source of roughage.

Results

Sorghum utilized in this study was of excellent quality with a high bushel weight and a starch content comparable to that of corn (Table 2). The wheat was contaminated with cheat; however, the quality was considered to be similar to that commercially available for feeding purposes.

Table 2. Grain Quality.

	Corn	Sorghum	Wheat
Bushel Weight lbs.	56	59	52
Crude Protein, %	9.6	9.5	12.6
Starch, %	76.7	77.8	65.3
Cheat, %	--	--	14.0

Lambs fed the sorghum diets had the highest level of intake followed by the corn and wheat diets, respectively (Table 3). The higher intake of sorghum than corn was attributed to the excellent quality of sorghum grain. Average daily gains followed a similar trend, reflecting intake. The poorer performance of lambs fed the wheat diets was attributed not only to lower intake, but also the lower level of starch in the grain which would be expected to reduce digestibility. Feed efficiency was highest for the corn diets and slightly lower for the sorghum and wheat diets.

Table 3. Animal Performance Summarized for the 28 day Trial.

	BUFFERED			UNBUFFERED		
	CORN	SORG.	WHEAT	CORN	SORG.	WHEAT
Intake lbs/day	1.63	2.04	1.58	1.83	2.07	1.64
Average Daily Gain, lbs/day	.622	.637	.483	.575	.656	.488
Feed Efficiency feed/gain	2.62	3.20	3.27	3.18	3.15	3.36

Sodium bicarbonate improved the rate of gain slightly for lambs fed the corn diets (Table 3) and improved feed efficiency; however, sodium bicarbonate did not change animal performance of animals fed either sorghum or wheat diets. Intake of lambs on the buffered corn diet was slightly below that of the unbuffered corn diet (Table 4) throughout the study; however, animals fed the buffered corn diet gained more rapidly. Animals fed the buffered sorghum diets appeared to have higher intakes than lambs fed the unbuffered sorghum diet for the first week, but the reverse was true for the remainder of the feeding period. Average feed intake of wheat diets appeared to be unaffected by buffers throughout the postweaning period.

Hampshire cross lambs consumed more feed and gained faster than the two other crosses. The Finn Dorsett cross lambs gained as fast as the Rambouillet-cross breeds, but required less feed per pound of gain than the other two breeds.

Table 4. Feed intake by Period (lbs/day).

Days Post Weaning	BUFFERED			UNBUFFERED		
	CORN	SORG	WHEAT	CORN	SORG	WHEAT
0-3	.92	1.29	.67	1.09	.99	.79
4-7	1.19	1.73	1.29	1.40	1.26	1.33
8-14	1.57	1.74	1.58	1.98	1.90	1.56
15-28	1.93	2.44	1.86	2.03	2.62	1.95

Table 5. Animal Performance by breed.

	BREED		
	Finn-Dorsett	Hampshire	Rambouillet
Intake, lbs/day	1.45	2.20	1.74
Average Daily Gain, lbs/day	.548	.652	.542
Feed Efficiency, feed/gain	2.65	3.37	3.21

In summary, high quality sorghum grain was equal to corn in early weaning diets. Wheat contaminated with cheat resulted in inferior levels of animal performance. Sodium bicarbonate as a buffer may be beneficial in the adaption of lambs to corn diet and may also be beneficial in adaption to sorghum diets for the first week. Among the three breeds used, Hampshire-cross lambs gained the fastest while Finn Dorsett-cross lambs gained more efficiently.