

## LAMB PERFORMANCE AT VARIOUS LEVELS OF WHEAT IN THE DIET

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### Story in Brief

As the amount of wheat grain in the lamb finishing diet was increased from 0 to 100%, feed intake and average daily gain decreased but the conversion of feed to gain was not affected. For each 10 percentage units of wheat grain addition to the diet, feed intake and average daily gain was decreased by 1% each. Therefore one limitation in using wheat in a finishing diet for lambs is lower feed intake.

(Key Words: Feedlot, Sheep, Corn, Finish, Gain, Intake)

### Introduction

Abundant supplies of wheat grain have decreased the market value of the raw product and has again placed emphasis on developing alternate vehicles through which wheat grain can be marketed. The ruminant animal can convert surplus grain and forages into a marketable commodity. However feeding wheat grain to a ruminant can cause digestive disorders since it is a rapidly fermented grain (Fulton et al., 1979; Morrison and Bolsen, 1985). Feeding wheat in combination with a slower fermenting grain, such as corn, has been shown to mitigate this problem (Stock, 1984). The objective of this study was to determine the feed intake and average daily gains of lambs fed a finishing diet with 0, 50 or 100% of the corn grain being replaced with wheat.

### Materials and Methods

Rambouillet lambs were weaned at approximately 10 weeks of age, grouped by age and randomly assigned within age group to one of the three diets described in Table 1. To prevent digestive disorders the lambs were adapted to the three diets by increasing the proportion of grain from 50% to 70% of the diet over a 24 day period. All diets were formulated to be equal in crude protein and energy density. The diets were pelleted to prevent sorting and contained an ionophore at 30 grams/ton of diet. Ammonium chloride was added at 1% of the ration during the last month of the finishing period. Cost of each ingredient in table 1 is based on the delivered price at the research facility during the experiment but does not include process cost.

All lambs were treated for internal parasites and vaccinated for enterotoxemia at weaning. Lambs were housed in partially (50%) covered concrete lots and had ad libitum access to the diets. Body weights were taken at 14 or 28 day intervals before the morning feeding and were considered finished once they reached 100 lbs. The data were analyzed as a randomized complete block design and differences

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**Table 1. Composition and cost of lamb feedlot finishing diets.**

Ingredient	Diet <sup>a</sup>			Cost <sup>b</sup>
	No wheat	50% wheat	100% Wheat	
Wheat hay, %	28.0	27.8	27.9	2.0
Wheat, %	--	27.8	58.6	4.5
Corn, %	52.8	27.8	--	3.9
Soybean meal, %	17.2	14.5	11.4	8.6
Limestone, %	.6	.6	.6	4.0
Diet cost, cents/lb	4.28	4.32	4.36	

<sup>a</sup>Expressed as a percent of the dry matter.

<sup>b</sup>Cost as cents per pound.

among the means were determined by the Honest Significant Difference Procedures (HSD).

### Results and Discussion

Lambs weighed an average of 35 lbs at the beginning of the experiment (table 2) and required 166 days to reach 103 lbs. As the amount of wheat in the diet was increased from 0 to 100% the final weight declined because the lambs ate less feed and gained at a slower rate than lambs fed a diet with no wheat. Although feed intake and average daily gain were altered by adding wheat to the diet, feed conversion was not because as feed intake declined so did average daily gain. For each 10 percentage units of wheat grain added to the diet feed intake and average daily gain decreased by 1%. Therefore a 100% wheat diet resulted in a 10% decline in feed intake and average daily gain. Although feed cost per lb of gain were .7¢ higher in the 100% wheat diet as compared to no wheat, fixed cost would also be higher because the number of days on feed would be greater with the wheat diet. From these data it appears that one limitation in feeding wheat to lambs is lower feed intake, resulting in lower performance and a longer feeding period.

**Table 2. Performance of lambs fed different levels of wheat grain.**

Daily feed intake, kg	Diets			Mean±SEM
	No wheat	50% wheat	100% wheat	
Initial weight, lb	34.5	34.5	36.3	35.4 ± 1.1
Final weight, lb	104.9 <sup>a</sup>	102.1 <sup>b</sup>	101.0 <sup>b</sup>	102.5 ± 1.3
Days on feed	164.9	165.2	167.8	165.9 ± 1.5
Average daily gain, lb	.427 <sup>a</sup>	.407 <sup>ab</sup>	.383 <sup>b</sup>	.405 ± .009
Daily feed intake, lb	2.71	2.60	2.44	2.60 ± .04
Feed/gain	6.34	6.38	6.38	6.37

<sup>ab</sup>Means in the same row with different superscripts are different,  $p < .05$ .

<sup>c</sup>Expressed as 90% dry matter.

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