Feed Efficiency and Carcass Characteristics of Ram and Ewe Lambs Slaughtered at Two Live Weights

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Story in Brief

Forty ram and 40 ewe lambs were used to study the feed efficiency and carcass characteristics of 100 pound and 125 pound slaughter lambs. The animals were obtained from an eight month lambing interval project in progress at the Southwestern Livestock and Forage Research Station, El Reno, Oklahoma. Lambs were progeny of crossbred dams of various levels of Rambouillet, Dorset and Finnsheep breeding mated to Hampshire, Suffolk or Hampshire X Suffolk rams.

Feed efficiency data were calculated for the ram and ewe lambs for two different weight gain intervals; 70 to 100 pounds and 100 to 125 pounds live weight. Carcass measurements were taken and carcass composition data obtained at two slaughter weights (100 and 125 pounds) for the lambs.

The average pounds of feed required per pound of gain for rams was lower than for ewe lambs within their respective weight gain intervals. Ram and ewe lambs fed from 70 to 100 pounds required about two pounds less feed per pound of gain than ram and ewe lambs fed from 100 to 125 pounds. Ram lambs gained about 0.2 of a pound per day more than ewes in both weight gain intervals. Ram and ewe lambs fed from 70 to 100 pounds gained about 0.1 of a pound per day faster than ram and ewe lambs fed from 100 to 125 pounds.

From slaughter and carcass data it was observed that ram lambs were three to five percent lower in dressing percentage and about one-third of a grade lower in quality grade, but trimmer in all fat measurements than ewe lambs. Light weight slaughter rams were about two-thirds of a grade lower in quality grade and about three percent lower in dressing percentage than heavy ram lambs. However, light ewe lambs were over a full grade lower in quality grade, but only about 1.4 percent lower in dressing percentage than were heavy ewe lambs. It was observed from carcass composition data that rams yield about four percent more of their carcass weights in closely trimmed major wholesale cuts than ewe lambs. The data also indicate that heavier ram lambs yield two percent less in percent trimmed wholesale cuts than lighter ram lambs; whereas, heavier ewe lambs yield three percent less in percent major wholesale cuts of carcass weight than lighter ewe lambs. *However, when*

In cooperation with U.S.D.A., Agricultural Research Service, Southern Region.

closely trimmed major wholesale cuts were expressed as a percent of live weight, there was little or no difference observed for this trait between ram and ewe lambs (30.0 percent for rams and 30.0 percent for ewes) *or between weight groups within sex.*

Introduction

Lamb, as a meat source, is the most sought after product there is today. This fact is reflected in the price of market lambs sold through lamb markets and in the retail price for lamb in food stores. If the theory behind the law of supply and demand and how this relationship affects price holds true, then along with the high demand for lamb, there must be a *low supply* to cause this high price for lamb. This is in fact the case.

There are many reasons why lamb is in short supply in the retail counter. Factors such as seasonality of the product, distance to slaughter lamb markets and a high number of predatory animals are all detrimental to the supply of lamb. An improvement in any one of these factors could be considered as a possibility for increasing the production of lamb. However, an improvement in any one of these areas would require a long period of time to increase lamb meat supply. There is one alternative to these possibilities that would be much quicker and easier and that is simply to increase the slaughter weight of lambs above the traditional 100 pounds.

Even though increasing slaughter weight provides a quick way for increasing the supply of lamb, there are many problems generated when lambs are fed to heavier weights. Among the most influential problems is the fact that as slaughter weight is increased, the amount of fat deposited and the amount of feed needed to obtain the extra pounds of lamb are also increased.

Whether or not heavier lambs will increase the supply of lamb efficiently will depend on the amount of feed required per extra pound of edible portion and if the increase in fat content in the heavier lamb results in a less desirable cut to the consumer.

The objectives of this study were: (1) to determine the amount of extra feed required per pound of extra live weight gain for ram and ewe lambs fed from 70 to 100 pounds as compared to ram and ewe lambs fed from 100 to 125 pounds, and (2) to determine how much of an effect slaughter weight has on the yield of percent closely trimmed major wholesale cuts of ram and ewe lambs.

Materials and Methods

Crossbred ram and ewe lambs, produced from the matings of Suffolk, Hampshire or Suffolk X Hampshire sires with dams of various levels of Rambouillet, Dorset and Finnsheep breeding were selected from an eight month lambing interval project in progress at the Southwestern Livestock and

Forage Research Station at El Reno, Oklahoma. Dams of these breed groups have been previously shown to not have an appreciable effect on differences in carcass composition of their lambs.

Twenty ram and 20 ewe lambs were selected from a 1975 late fall crop of lambs and an additional 20 ram and 20 ewe lambs were selected from the late-spring, early-summer lambing season of 1976. In each season, there were two pens of 10 rams per pen, and two pens of 10 ewes per pen selected (one ewe lamb from the fall crop of lambs prolapsed and was eliminated from the study).

Each pen of lambs was selected from the experimental flock when 10 rams or 10 ewes were found such that the average weight of the pen was approximately 70 pounds and each lamb in the pen weighed as close to 70 pounds as possible. As each group of 10 lambs was selected, that group was placed in drylot and fed a ration formulation of approximately 45 percent alfalfa, 50 percent milo and 5 percent molasses.

During the early part of the feeding period, individual weights were obtained on a weekly basis. When the average weight of the pen neared 100 pounds, individual weights were obtained twice weekly in order to slaughter a group of five lambs at an average weight as close to 100 pounds as possible. When the average weight of the pen of lambs reached 100 pounds, five of the lambs that would represent the average weight of the pen (100 pounds) were selected for shipment to the OSU Meat Laboratory for slaughter. The remaining five lambs were sheared, then fed and weighed in the same manner as above from an initial weight of 100 pounds to a slaughter weight of 125 pounds minus their wool weights.

A total of four pens of rams and four pens of ewes were fed over two seasons. Feed efficiency values were calculated for each pen rather than for individual lambs; therefore, there were eight observations from which feed efficiency values were computed.

After slaughter, the carcasses were chilled for 24 hours at 34°F. Carcasses were then wrapped with two layers of beef shrouds to decrease dehydration of the lamb carcasses until carcasses were cut.

U.S.D.A. quality grades were determined prior to cutting the carcass. Other carcass data obtained included dressing percent, rib eye area, U.S.D.A. yield grade factors (12th rib fat thickness, percent kidney and pelvic fat and leg conformation score) from which actual U.S.D.A. yield grades were calculated.

The right side of each carcass was broken into the major wholesale cuts to be used to obtain carcass composition data. Each major wholesale cut was trimmed to a retail trim (approximately 0.2 in.) and weighed. After the retail trim the wholesale cut was closely trimmed and re-weighed. The leg and shoulder were then physically lean, fat and bone separated. Yield of trimmed and boned leg and shoulder, closely trimmed rack and loin, and closely trimmed major cuts were calculated on both a carcass and live weight basis.

Results and Discussion

Feed Efficiency

Charcteristic of greatest interest for determining the production efficiency of light and heavy ram and ewe lambs was the amount of feed required per unit of live weight gain. However, since feed per unit of gain is a function of daily feed intake and average daily gain, these two values are also presented. Averages for daily feed intake, average daily gain, and pounds of feed per pound of gain are presented in Table 1 for ram and ewe lambs fed for two different weight gain intervals.

Daily feed intake was 0.4 pounds greater for the rams than for the ewes between 70 and 100 pounds. However, after reaching 100 pounds, the rams increased their daily intake by almost one pound; whereas, the ewes increased their daily feed consumption by only one-third of a pound. Average daily gain was about 0.2 pounds greater for rams than for ewes. Average daily gain decreased by 0.1 pound in rams after they reached 100 pounds; whereas, average daily gain decreased 0.15 pounds. Feed efficiency was much more favorable for the ram lambs than for the ewe lambs within each weight interval.

The data in Table 1 suggest that ram and ewe lambs of this type can be fed to heavier weights without requiring excessive amounts of feed per pound of gain beyond the traditional slaughter weight of 100 pounds. However, the ewe lambs are approaching the point of non-desirability when they are fed to 125 pounds.

Carcass Characteristics

Average for carcass measurements and evaluations taken prior to cutting are presented in Table 2. Data in this table are in close agreement with similar studies on the effects of sex and weight on the characteristics of slaughter lambs. Ram lambs were about two-thirds of a grade lower in quality grade and 1.5 percent lower in dressing percent, but trimmer in all fat measurements and about one full grade lower in yield grade than ewe lambs. (The reader is reminded that the most desirable yield grade is a #1 and the most undesirable yield grade is a #5.) Lighter ram lambs were trimmer in all fat measurements,

Table 1. Averages of feedlot performance of ram and ewe lambs fed for two different weight gain intervals

	Ram lambs		Ewe lambs	
	wt. gain interval(lbs)		wt. gain interval(lbs)	
Item	70 to 100	100 to 125	70 to 100	100 to 125
Daily feed intake (lbs.)	4.35	5.31	3.93	4.27
Avg. daily gain (lbs.)	0.81	0.71	0.61	0.46
Lbs. feed/lb. gain	5.27	7.27	6.48	8.81

Table 2. Averages for fat measurements, yield grade, quality grade, rib eye area and dressing percent for ram and ewe lambs

Item	100	125	100	125
12th rib fat th. (in.)	0.17	0.25	0.32	0.46
% K & P fat	2.92	3.83	4.44	5.44
U.S.D.A. yield grade	2.98	3.68	4.29	5.45
U.S.D.A. quality grade[1]	11.45	12.00	12.15	13.57
Rib eye area (sq. in.)	2.12	2.48	2.15	2.44
Dressing percentage	48.39	52.49	53.99	55.37

[1]14=Ave. Prime; 13=Low Prime; 12=High Choice; 11=Ave. Choice

and two-thirds of a grade lower in yield and quality grade, and four percent lower in dressing percent than heavier ram lambs. Lighter ewe lambs were lower by one percent and one-half quality grade, one and one-third yield grade, and 1.4 percent lower in dressing percent than heavier ewe lambs, but were trimmer in all fat measurements. Rib eye areas were the same for both ram and ewe lambs (2.3 sq. in.) but differed between weight groups within sex. Heavier ram lambs had 0.36 sq. in. more rib eye area than lighter ram lambs; whereas, heavier ewe lambs had 0.29 sq. in. more rib eye area than lighter ewe lambs.

Tables 3 and 4 present the yields of trimmed and boned leg and shoulder, trimmed rack and loin, and percent trimmed major cuts on a carcass and live weight basis. When expressed as a percentage of carcass weight (Table 3), percent trimmed and boned shoulder and leg decreased for both ram and ewe lambs from a 100 pound slaughter weight to a 125 pound slaughter weight. Lighter ram lambs were higher in percent trimmed rack (0.2 percent) and loin (0.72 percent) than heavier rams; whereas, lighter ewe lambs were lower in

Table 3. Averages for percent trimmed major cuts of carcass weight of ram and ewe lambs slaughtered at two live weights

	Ram lambs		Ewe lambs	
	approx. live wt.(lbs)		approx. live wt.(lbs)	
Carcass cut (percent)	100	125	100	125
Trimmed and boned shoulder[1]	15.29	14.88	13.61	12.91
Trimmed rack[2]	8.09	7.88	7.59	7.86
Trimmed loin[2]	13.83	13.11	13.31	12.75
Trimmed and boned leg[1]	18.71	17.54	17.36	16.04
Trimmed major cuts[2]	67.41	65.74	63.65	60.68

[1]Completely lean, fat and bone separated.
[2]Closely trimmed and bone in.

Table 4. Average for percent trimmed major cuts of live weight for ram and ewe lambs slaughtered at two live weights

Carcass cut (percent)	Ram lambs		Ewe lambs	
	approx. live wt.(lbs)		approx. live wt.(lbs)	
	100	125	100	125
Trimmed and boned shoulder[1]	6.75	6.85	6.48	6.46
Trimmed rack[2]	3.57	.366	3.62	3.94
Trimmed loin[2]	6.09	6.09	6.34	6.37
Trimmed and boned leg[1]	8.26	8.08	8.26	8.03
Trimmed major cuts[2]	29.75	30.30	30.30	30.40

[1]Completely lean, fat and bone separated.
[2]Closely trimmed and bone in.

trimmed rack (0.3 percent), but higher in percent trimmed loin (0.56 percent) than heavier ewe lambs. Ram lambs yielded 4.2 percent more of their carcass weight in trimmed major cuts than ewe lambs. Lighter ram lambs were 1.7 percent higher in trimmed major cuts than heavier rams; whereas, lighter ewes were 3 percent higher in percent trimmed major cuts than heavier ewes.

Table 4 represents the same carcass traits as Table 3, but they are expressed as a percent of live weight rather than carcass weight. These data indicate that when percentages of carcass cuts were calculated on a live weight basis, little or no differences were observed for these carcass traits between ram and ewe lambs or between slaughter weight groups within or between sexes. The data in this table suggest that ram and ewe lambs can be slaughtered at heavier weights without decreasing the percent closely trimmed major wholesale cuts of *live weight*. This fact should be of economical importance to the producer in that it could influence his decision of whether to feed his lambs to heavier market weights.