Carcass Traits of Wethers Produced by Crossbred Dams of Rambouillet, Dorset and Finnsheep Breeding and Slaughtered at Two Weights

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Story in Brief

Carcass characteristics of 60 wether lambs born in January and February, 1974, from matings of blackfaced rams with crossbred ewes of Rambouillet (R), Dorset (D), and Finnsheep (F) breeding were evaluated by slaughter at approximately 100 or 125 pounds live weight. The breeding of the five dam breed combinations was as follows: ¼F½D¼R, ¼F¼D½R, ¼F¾R, ½D½R, and ¼D¾R.

When slaughtered at approximately 100 pounds, there was little difference among the lambs produced by the five dam breed combinations in measures of external finish and percent major trimmed cuts. There was a slight tendency for lambs produced by ¼ Finnsheep ewes to have smaller loin eye areas and a greater percent kidney, heart and pelvic fat than lambs from dams of Dorset and Rambouillet breeding only. There was also a tendency for lambs from one-half Dorset dams to exceed lambs from one-quarter Dorset dams in most measures of fatness.

When slaughtered at approximately 125 pounds, the differences among the lambs produced by the five dam breed combinations were larger and significant for some of the traits studied. Lambs from ¼F¾R dams had loin eye areas significantly smaller than those of lambs from ¼D¾R, and ¼F½D¼R dams. Lambs from ¼F¼D½R and ¼F¾R dams had significantly greater percent kidney, heart and pelvic fat than lambs from ½D½R dams. ½D½R dams also produced lambs that had a

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significantly greater fat probe over the rump, a smaller hind saddle specific gravity and a greater percent fat trim from the major cuts.

When the thirty 100 pound lambs were compared with the thirty 125 pound lambs, significant differences were found for all carcass traits studied. The heavier lambs produced carcasses that were fatter, yielded a lower percent trimmed major cuts, and had larger loin eye areas than carcasses produced by lighter lambs. However, both the light and heavy lambs yielded about the same proportion of their respective live weights in pounds of trimmed major wholesale cuts.

Introduction

The improvement of reproductive efficiency which results in more lambs born per ewe maintained is of great economic concern to the commercial sheepman. Recent studies of the Finnish Landrace (Finnsheep) breed of sheep and some of their crosses in the United States has shown them to be younger at sexual maturity and to give birth to more lambs per ewe lambing under spring lambing conditions than the domestic breeds with which they have been compared. Thus, in an attempt to increase profit, commercial sheepman may be tempted to infuse their flocks with Finnsheep germ plasma without first considering the subsequent effects, if any, on the quality and quantity of wool and lamb produced.

The purpose of this study is to evaluate the carcass characteristics of lambs produced by mating blackfaced rams to crossbred ewes of Rambouillet, Dorset and Finnsheep breeding when slaughtered at approximately 100 or 125 pounds live weight.

Materials and Methods

These data include the carcass characteristics of 60 wether lambs born in January and February, 1974, at the Ft. Reno Livestock Research Station, El Reno. They were produced from crossbred ewes of five combinations of Rambouillet (R), Dorset (D), and Finnsheep (F) breeding involved in a study to evaluate lifetime reproductive performance under Oklahoma conditions. Twelve lambs were randomly selected from dams of each of the following five breed combinations: ¼F½D¼R, ¼F¼D½R, ¼F¾R, ½D½R and ¼D¾R. Six of the lambs selected from dams of each breed combination were designated for slaughter at approximately 100 pounds full weight and the remaining six at 125 pounds. The lambs were sired by 2 Hampshire and 4 Suffolk sires with 10 lambs produced from each sire (one lamb for each of the 10 dam breed combination—slaughter weight classes).

The lambs were docked and castrated prior to one week of age, allowed access to early spring wheat pasture with their dams and fed a ground creep ration containing the following ingredients:

Alfalfa	40 percent
Milo	45 percent
Molasses	5 percent
Soybean Oil Meal	10 percent

They were weaned at approximately 70 days of age and finished in drylot on a ration similar to the creep ration but with the soybean oil meal deleted and the alfalfa and milo each increased by 5 percent.

All test lambs were weighed full each week and sheared when reaching 100 pounds. Upon reaching their designated slaughter weight of 100 or 125 pounds, the lambs were trucked to Stillwater and slaughtered at the O.S.U. Meats Laboratory after a 24-hour shrink period. Twenty-four hours post slaughter the carcasses were ribbed between the 12th and 13th rib perpendicular to the line of the back, loin eye area tracings taken, fat thicknesses measured over the loin eye, a fat probe taken over the rump approximately three inches below the base of the dock and a specific gravity reading of the hind saddle recorded.

Forty-eight hours postslaughter the carcasses were divided into wholesale cuts. The four major wholesale cuts (shoulder, rack, loin, and leg) of the left side were trimmed to an average of 0.2 inches of fat. All subcutaneous fat of these same cuts of the right side was removed and in addition, the shoulder and leg were completely boned. The breasts, shanks and flanks of both sides were handled similarly with the shanks and flanks being completely separated into lean trim, fat trim and bone and with the breasts having all subcutaneous fat removed and being partially boned. Both the front and rear cannon bones of each side were completely trimmed of soft tissue and weighed.

Results and Dicsussion[1]

At the present time the majority of the fat lambs in the United States are slaughtered at approximately 100 pounds, but in recent years there has been increased interest in carrying lambs to heavier weights. With this interest in mind, the lambs from the five dam breed combinations were evaluated at two different weights. Tables 1 and 2 give the mean values of some general carcass traits of lambs produced by the five dam breed combinations when the lambs were slaughtered at either the traditional 100 pounds or a heavier weight or 125 pounds.

[1] It is highly likely that many of the differences in carcass traits are not real, but due to chance. Where there is strong evidence to suggest that a difference is real, the word "significant" or "significantly" is used to denote this difference.

The three dam breed combinations of ¼F½D¼R, ¼F¼D½R and ¼F¾R show a progressive substitution of one-quarter Rambouillet for one-quarter Dorset. We would thus expect the lambs produced by ¼F¼D½R dams to be intermediate for the carcass traits studied when compared with lambs from the other two dam breed combinations. This is generally the case with the 125 pound lambs as shown in Table 2. At 100 pounds, however, the lambs from the ¼F¼D½R dams are superior to lambs from the other two dam breed combinations in most measures of leanness and trimness. Since there is no logical explanation for this, it is thought that by chance, the lambs chosen from this group were leaner than the average of the breed group as a whole.

Table 1 indicates that the breed combination of the ewes had little influence on most of the traits studied when the lambs were slaughtered at 100 pounds. Lambs produced from all dam breed combinations were acceptable in quality; grading either average or high choice. Leg conformation scores were also acceptable with all groups scoring average choice except lambs produced from ¼D¾R dams.

Lambs produced by ¼F½D¼R dams had greater dressing percents than lambs produced by any other dam breed combination. It would appear that the higher dressing percent of these lambs is due to a tendency for lambs of this breeding to have the highest percent kidney, heart and

Table 1. Carcass Traits of Lambs Produced by Crossbred Dams of Rambouillet, Dorset and Finnsheep Breeding and Slaughtered at Approximately 100 pounds.*

Carcass Trait	Breed Combination of Dam				
	¼F½D¼R	¼F¼D½R	¼F¾R	½D½R	¼D¾R
Quality Grade**	12.00	11.67	11.17	11.83	11.50
Dressing %	49.16[1]	46.73[2]	47.45[1,2]	47.18[1,2]	47.80[1,2]
Leg Conf. Score**	11.00	11.67	11.17	11.67	10.83
Loin Eye Area (in.²)	2.07	2.03	1.98	2.18	2.11
% K H P Fat	3.95	3.20	3.30	3.02	2.96
Fat Thick. over Loin Eye (in.)	0.24	0.17	0.23	0.23	0.21
Fat Probe over Rump (in.)	0.44	0.39	0.44	0.57	0.45
Hind Saddle Specific Gravity	1.0423	1.0504	1.0472	1.0478	1.0472
Cannon Bone Wt. (lb.)	0.328[1,2]	0.357[1]	0.322[1,2]	0.308[2]	0.331[1,2]
% Trimmed Major Cuts of Right Side	57.35	58.92	57.41	58.30	58.40
% Fat Trim from Major Cuts of Right Side	12.71	11.11	12.50	12.42	11.44

* Different Superscripts in the same row indicate significance at the $P<.05$ level meaning that the differences are probably indicative of real differences.
** 10 = Low Choice, 11 = Average Choice, 12 = High Choice.

pelvic fat and a high degree of external finish as indicated by the percent fat trim from the major wholesale cuts of the right side. These data also indicate a tendency for lambs from dams containing one-half Dorset blood to be fatter than lambs from one-quarter Dorset dams.

Also, interesting to note, is that the lambs produced by dams with some Finnsheep breeding tended to have a higher percent kidney, heart and pelvic fat and smaller loin eye areas than lambs from Dorset and Rambouillet breeding only. The differences were small, however.

The weight of the four cannon bones, a good indicator of total carcass bone, was significantly greater for lambs from ¼F¼D½R dams than for lambs from ½D½R dams. This finding is very interesting since the Finnsheep breed is thought to be "lighter-boned" than most of our domestic breeds. A similar relationship existed between dam's breed combination and cannon bone weight for the lambs slaughtered at about 125 pounds.

The percent trimmed major cuts of right side, our best indicator of percent lean, was not significantly different among the five dam breed combinations. These data would indicate that lambs produced by all five dam breed combinations were similar in the carcass traits studied when slaughtered at 100 pounds.

Table 2 presents the mean values of general carcass traits of lambs produced by the five dam breed conmbinations and slaughtered at approximately 125 pounds. More of the mean values of the various carcass traits were significantly different among dam breed combinations at 125 pounds than at 100 pounds. This suggests that the five groups of lambs may mature at different rates with some groups depositing excess fat at lighter weights than others.

Carcass quality grades were significantly greater for lambs produced by ¼D¾R and ¼F¼D½R dams when compared with lambs produced by ¼F½D¼R dams. These differences are, however, of little practical significance since lambs from all five dam breed combinations averaged high choice or low prime in quality grade. Leg conformation scores were very acceptable with all five groups of lambs having scores of average or high choice.

Dressing percents were not significantly different among the five groups, but lambs from ½D½R dams exceeded others in this trait. These lambs also had a significantly greater fat probe over the rump, a lower hind saddle specific gravity reading and a greater percent fat trim from the major wholesale cuts of the right side when compared with lambs from the other four dam breed combinations. These are all indicators that the lmabs from ½D½R dams mature earlier and tend to deposit more fatty tissue subcutaneously at 125 pounds than lambs of the other

Table 2. Carcass Traits of Lambs Produced by Crossbred Dams of Rambouillet, Dorset and Finnsheep Breeding and Slaughtered at Approximately 125 Pounds.*

Carcass	Breed Combination of Dam				
	¼F½D¼R	¼F¼D½R	¼F¾R	½D½R	¼D¾R
Quality Grade**	12.00[a]	13.33[b,c]	12.83[a,b]	12.83[a,b]	13.83[c]
Dressing %	50.28	50.75	50.90	51.65	50.84
Leg Conf. Score**	12.83	11.67	11.67	11.83	12.17
Loin Eye Area (in.²)	2.47[a]	2.40[a,b]	2.20[b]	2.53[a]	2.48[a]
% K H P Fat	4.90[a,b]	5.45[a]	5.66[a]	4.28[b]	4.71[a,b]
Fat Thick. over Loin Eye (in.)	0.31	0.34	0.38	0.38	0.32
Fat Probe over Rump (in.)	0.66[b]	0.80[a]	0.72[a]	1.00[a]	0.72[b]
Hind Saddle Specific Gravity	1.0369	1.0367	1.0358	1.0340	1.0362
Cannon Bone Wt. (lb.)	0.371[a]	0.387[a]	0.368[a,b]	0.333[b]	0.370[a]
% Trimmed Major Cuts of Right Side	54.80	53.76	52.64	53.42	54.94
% Fat Trim from Major Cuts of Right Side	14.34[a]	15.29[a,b]	16.03[a,b]	17.55[a]	15.15[a,b]

* Different Superscripts in the same row indicate significance at the $P<.05$ level meaning that the differences are probably indicative of real differences.
** 11 = Average Choice, 12 = High Choice, 13 = Low Prime.

groups. Also, lambs produced by ½D½R ewes were not exceeded in fat thickness over the loin eye by lambs of any other group.

Lambs from ¼F¼D½R and ¼F¾R dams had significantly greater percent kidney, heart and pelvic fat than lambs from ½D½R dams. The fact that lambs from ½D½R dams equaled or exceeded all other groups in measures of external finish, but were exceeded by lambs from dams with some Finnsheep breeding in percent kidney, heart and pelvic fat is very interesting. Other researchers working with pure, one-half and one-quarter Finnsheep wethers have also shown that wethers of Finnsheep breeding exceed wethers of domestic breeding in percent kidney, heart and pelvic fat. The lambs in this study of Finnsheep breeding are one-eighth Finnsheep, and they also exhibit this tendency. The Finnsheep breed is evidently very prepotent for this trait.

Lambs from ½D½R, ¼D¾R and ¼F½D¼R dams had significantly larger loin eye areas than lambs from ¼F¾R dams. These data imply that acceptable loin eye areas can be maintained in lambs from one-quarter Finnsheep ewes if they also contain at least a quarter Dorset. The lambs from ¼F¾R dams also had the lowest percent trimmed major wholesale cuts of the right side.

Weight of the four cannon bones was significantly greater for lambs from ¼F¼D½R, ¼F½D¼R and ¼D¾R dams than for lambs from

½D½R dams. This ranking of the dam breed combinations as to cannon bone weight agrees quite well with the data from the 100 pound lambs.

These results indicate that when slaughtered at 125 pounds, lambs from ¼F¾R dams had the greatest percent kidney, heart and pelvic fat, the smallest loin eye areas and the least percent trimmed major wholesale cuts of right side. Lambs from ½D½R dams had the greatest fat probe over the rump and the greatest percent fat trim from the major wholesale cuts of right side. Lambs from ¼D¾R, ¼F¼D½R and ¼F ½D¼R dams were comparable in many carcass traits and produced the most acceptable carcasses of the five groups when slaughtered at 125 pounds.

Slaughter Weight

Table 3 gives the mean values of various carcass traits of wether lambs slaughtered at approximately 100 or 125 pounds live weight and averaged over the five dam breed combinations. It is quite evident that

Table 3. Carcass Traits of Crossbred Lambs Slaughtered at Approximately 100 or 125 Pounds.

Carcass Trait	Approximate Slaughter Weight** 100 Pounds	125 Pounds	Percent Change
Actual Slaughter Wt. (lb.)	101.57	125.90	+24.0
Quality Grade*	11.63	12.97	+11.5
Dressing %	47.67	50.88	+ 6.7
Leg. Conf. Score*	11.27	12.03	+ 6.7
Loin Eye Area (in.²)	2.07	2.42	+16.9
% K H P Fat	3.28	5.00	+52.4
Fat Thick. over Loin Eye (in.)	0.22	0.34	+54.5
Fat Probe over Rump (in.)	0.46	0.78	+69.6
Hind Saddle Specific Gravity	1.0470	1.0360	— 1.1
Cannon Bone Wt. (lb.)	0.329	0.366	+11.2
Trimmed Major Cuts of Right Side (lb.)	13.88	17.07	+23.0
% Trimmed Major Cuts of Right Side of Carcass	58.07	53.91	— 7.2
% Trimmed Major Cuts of Slaughter Wt.	27.33	27.12	— 0.8
Fat Trim from Major Cuts of Right Side (lb.)	2.89	4.96	+71.6
% Fat Trim from Major Cuts of Right Side of Carcass	12.04	15.67	+30.1
% Fat Trim from Major Cuts of Slaughter Wt.	5.69	7.88	+38.5

* 11 = Average Choice, 12 = High Choice.
** All differences among weight groups are significantly different at the $P<.05$ level except "% Trimmed Major Cuts of Slaughter Wt."

increasing slaughter weight by approximately 25 pounds had a definite effect on these traits. All but one of the mean values of the various traits were significantly different among the two weight groups with lambs slaughtered at 125 pounds possessing more fatty tissue than lambs slaughtered at 100 pounds. This resulted in a greater percent fat trim from the major wholesale cuts of the right side and a lower percent trimmed major wholesale cuts of the right side for lambs slaughtered at 125 pounds.

The heavy lambs were, however, superior to the lighter lambs in quality grade, leg conformation score (probably due to increased fat deposition) and loin eye area. Increased loin eye area is of economic importance to the sheep industry in order to gain consumer acceptance of the high priced retail loin cuts. However, increasing loin eye areas by increasing slaughter weights of wether lambs from populations that have been selected to finish properly at lighter weights has been shown to lower percent trimmed major wholesale cuts, (edible portion).

Table 3 also shows changes in carcass composition as the slaughter weight went from 100 to 125 pounds. Considered on a percentage of carcass weight basis trimmed major cuts of right side decreased and fat trim from these cuts increased when slaughter weights increased. If we consider these two measurements to be good indicators of carcass lean and fat, then lean in the carcass increased at a slower rate between 100 and 125 pounds live weight than did fat. When these two measurements are expressed as a percentage of live weight, however, there is less difference between the two weight groups in the proportion of lean as indicated by trimmed major cuts or fat as indicated by the fat trim.

These data indicate that crossbred lambs sired by blackfaced rams will yield about the same proportion of their live weight in pounds of trimmed major cuts at live weights of 100 and 125 pounds. The 125 pound lambs' carcasses will be fatter, however, because between 100 and 125 pounds the lambs add relatively more fat which increases the dressing percentage and the carcass fat trim. This is why meat marketing personnel often object to heavy lamb carcasses as being too wasteful.
