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Summary of Reports . . .

LIVESTOCK FIELD DAY

Eastern Oregon Experiment Station, Union



Special Report 152

May 1963

Agricultural Experiment Station • Oregon State University • Corvallis

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Wintering Replacement Heifers for Beef Production

J.A.B. McArthur and B.R. Eller

Raising of replacement heifers can be divided into four periods: suckling, wintering as a weaned calf, summer grazing as a yearling, and wintering as a bred long yearling. If a heifer is of sufficient size at two years of age to produce a normal calf, she must grow continuously from birth to calving. These gains must be made economically. Considerable research has indicated that cheapest gains are made when an animal is under one year old, and that forage is generally more economical than concentrates. If winter gains made by a weaner calf are too high, there is a negative correlation between them and gains made the following summer on good pasture. Research data indicate that as winter gains increase above 1.5 pounds per day, subsequent summer gains will decrease. It is necessary, therefore, to strike a balance in the level of winter feeding in order to make the most economical use of summer grazing and still grow an animal to sufficient size to calve as a 2-year-old.

Winter gains between 1.0 and 1.4 pounds per day do not depress summer gains significantly and still result in a growthy heifer at 18 months of age. Research on wintering levels of replacement heifers conducted at the Union station was designed to give some indication of what might be the most economical winter gains when related to total winter plus subsequent summer gains. It is important to realize that gains made on summer pasture are greatly influenced by type of summer pasture (grass, grass-legume, legume, dry, or irrigated) and length of grazing period.

Procedure

Over a period of six years, 1957 to 1962 inclusive, 178 replacement Hereford heifer calves were raised to two years of age. The heifers were wintered on alfalfa-grass hay with varying amounts of grain supplementation. As yearling heifers the animals grazed during summer on either or both non-irrigated and irrigated pastures at the main station and/or foothill range at the Hall Ranch. The heifers were pasture bred as yearlings to calve at two years of age.

Since the calves used in this wintering study were sired by bulls of four different Hereford lines, the heifers were stratified as to line and randomly allotted to five different dietary regimes. The level of supplementation was 0, 2, or 4 pounds daily of a grain cube in the first winter, followed by 2 pounds daily of the grain cube in the second winter; or, 2 pounds daily of a grain cube in the first winter, followed by 0, 2, or 4 pounds daily of the grain cube in the second winter.

Individual data were collected on the weights of animals as weaner calves, yearlings, long-yearlings, and two-year-olds; winter gains, summer gains, animals bred and conceived, and calving performance as two-year-old heifers as well as amounts of hay and grain consumed per group.

Results

The results of this experiment are tabulated in Table 1.

Hay fed during the six years varied from 9 to 12 percent in crude protein content and the grain cube varied from 15 to 17.5 percent in crude protein content. Under all methods of feeding, animals reached a satisfactory 24-month weight of 971 to 1,032 pounds. As the amount of supplementation fed increased, either as a weaner calf or as a bred long-yearling, the cost of wintering and total cost of raising the animal to two years of age increased. There was a spread of about \$17.50 per animal between the most economical method of raising the replacement heifer and the most expensive method.

Good calving percentages were obtained under all levels of concentrate fed; however, more calving troubles were experienced as the level of concentrate increased.

Discussion

Data collected from this experiment indicate that replacement heifers can be raised successfully to calve as two-year-olds in northeastern Oregon by making maximum use of good quality hay during wintering periods and providing productive pasture during the summer grazing periods. Total grain supplementation per animal for two wintering periods can be as low as 226 pounds with most of the grain fed in the second winter. It would appear that a winter gain of approximately 1.0 pound daily as a weaner calf is satisfactory and allows the animal to make economical gains on summer pasture. However, if weaner calves cannot make approximately 1.0 pound daily gain during their first winter on hay alone, a supplement should be fed to enable them to make such a gain. Winter gains of up to 1.38 pounds daily as weaner calves in northeastern Oregon were not detrimental, although they did depress summer gains slightly and increased the cost of raising the animal when supplementation was necessary to make such gains. With the short breeding season of six weeks at the Union station, we thing 65% to 70% calf crop from heifers calving as two-year-olds is good.

All animals fed over the six years of this experiment are being kept for at least two calf crops to determine the effect of the feeding regime on mature weight and productivity of animals.

TABLE 1. WINTERING REPLACEMENT HEIFERS IN NORTHEAST OREGON--1957-1962

<u>Winter ration</u>		1st	2nd	1st	2nd	1st	2nd	1st	2nd
		<u>Med. Low</u>		<u>Med. High</u>		<u>Low Med.</u>		<u>Med. High</u>	
No. head		26	29	28		31	31	31	33
Avg. weaning weight, lbs.		423.3	419.1	412.2		386.1	389.2	389.2	382.2
Daily suckling gain, lbs.		1.54	1.56	1.54		1.45	1.46	1.46	1.45
Avg. yearling weight, lbs.		600.8	601.0	609.8		516.3	563.1	563.1	599.9
Daily gain first winter (149 days)		1.19	1.22	1.32	(147 days)	0.81	1.12	1.12	1.38
Avg. daily cubes, lbs.		2	2	2		0	2	2	4
Avg. daily hay, lbs.		12.04	12.04	12.04		12.44	11.34	11.34	9.71
Summer daily gain on grass									
(213 days), lbs.		1.15	1.12	1.12	(221 days)	1.33	1.17	1.17	1.12
Long-yearling weight, lbs.		846.5	839.8	848.6		811.1	822.6	822.6	847.5
Two-year-old weight, lbs.		970.8	984.2	1020.8		1001.2	998.2	998.2	1032.2
Daily gain second winter (111 days)		1.12	1.30	1.55	(113 days)	1.68	1.55	1.55	1.63
Avg. daily cubes, lbs.		0	2	4		2	2	2	2
Avg. daily hay, lbs.		21.56	20.20	19.08		20.86	20.86	20.86	20.86
Total gain, weaning to two years, lbs.									
Avg. total grain fed, lbs.		547.5	565.1	608.6		615.1	609.0	609.0	650.0
Avg. total hay fed, lbs.		298	520	742		226	520	520	814
Total cost of ration for two wintering periods		4,187	4,036	3,912		4,186	4,024	4,024	3,784
Total cost of raising heifer to 2 years of age (including pasture)*		\$63.75	\$70.37	\$77.32		\$60.99	\$70.22	\$70.22	\$78.48
		\$89.31	\$95.93	\$102.88		\$87.51	\$96.74	\$96.74	\$105.00
No. head bred		25	28	27		31	31	31	33
No. head calving		18	16	18		25	23	23	28
Percent calving		72	57	67		81	74	74	85
Percent helped during calving		33	31	56		28	35	35	43
No. calves lost at birth		0	3	3		2	2	2	3
Percent calves lost at birth		0	19	17		8	9	9	11

TABLE 1. WINTERING REPLACEMENT HEIFERS IN NORTHEAST OREGON--1957-1962 (Continued)

Low ration -- alfalfa-grass hay.
 Medium ration -- alfalfa-grass hay plus 2 pounds grain cube daily.
 High ration -- alfalfa-grass hay plus 4 pounds grain cube daily.

Analyses of hay: Lowest, 9% crude protein; highest, 12% crude protein.

Composition of cube: 60% barley)
 25% L.O.M.) Varied in crude protein
 10% beet pulp) from 15 - 17.5%
 5% molasses)

	<u>Price per ton</u>	<u>Cost per pound</u>
Hay	\$25.00	1.25 cents
Barley	45.00)	
L.O.M.	100.00)	
Beet pulp	46.00)	3.83 cents
Molasses	40.00)	

Pasture: 12 cents per head per day as a yearling.

*No pasture charged to animal as suckling calf.

Comparison of Columbia and Targhee Sheep Managed for Farm Flock Production

B.R. Eller and J.A.B. McArthur

The Columbia and Targhee are comparatively new breeds of sheep. The primary objectives of their development in Wyoming and Idaho respectively, were aimed at increasing the productivity of range sheep in the mountainous areas of the northwest. Only a short time after the Columbia and Targhee breeds became popular and entered into production as range sheep, however, range sheep numbers started to decline and farm flock numbers increased. As a result, both Columbia and Targhee sheep have become adapted to farm-flock production.

Prior to 1955, Columbia and Targhee sheep at the Union station were managed for production as range sheep. Since that time, the number of sheep has been reduced to approximately 270 breeding ewes, and they have been managed as a farm flock.

Management of farm flock

Under the normal management of the farm flock at this station, the breeding season begins about August 15 and lasts through the first week in October. During this period of time, the ewe flock is divided into single sire groups of 30 ewes each for the first 34 days of the breeding season. For the remainder of the breeding season, they are grouped according to breed and a cover ram is turned with each group.

Performance-tested rams are used as sires after they have been fertility tested.

The wintering period normally begins the first part of November and lasts around 150 days. The ewes are fed 4 pounds per head daily of second-cutting alfalfa-grass hay plus $\frac{1}{4}$ pound of supplement (50% cottonseed meal, 50% ground barley) during the six-week pre-lambing period. Following the lambing period, which lasts from January 15 to March 1, the allowance of hay is increased to 6 pounds per head daily, and the rate of supplement feeding is held at $\frac{1}{4}$ pound per ewe daily.

Lambs are supplied with additional feed in creeps from the time they are two weeks of age until the second week in June, at which time they are weaned. Third-cutting alfalfa hay is fed ad lib., and a quarter of a pound daily of supplement (80% whole oats or barley and 20% cottonseed meal) per lamb is supplied in the creeps.

Fenced irrigated pastures of orchardgrass with ladino clover and Alta fescue with ladino clover supply spring, summer, and fall grazing for the entire flock.

These pastures are normally lush enough so that additional feed to flush the ewes before breeding has not been necessary.

A mixture of salt and steamed bonemeal is made available to the sheep at all times.

Other procedures involved in the management of the farm flock at this station include crutching ewes four to six weeks before lambing, trimming the feet of all sheep at least four times a year, using a copper sulphate footbath when feet are trimmed and when the sheep are moved to new pastures, drenching all sheep two times each year, and spraying once each year following shearing.

The sheep are drenched with 2 ounces per head of purified fine-particle phenothiazine the last of November or first of December when they are crutched. They are drenched again in May prior to being sprayed with .05 percent Toxaphene for tick control.

The time of shearing is normally scheduled for the last week in April or the first week in May.

Now that both Columbia and Targhee sheep have been introduced into farm flocks, a study has been made to determine which of the two breeds would be more productive under conditions of farm-flock management.

Procedure

Data were collected over a four-year-period (1957-1960) and involved 480 ewes--240 of each breed. Data from ewes bred in 1959, however, were considered unreliable due to the marked reduction of conception rate of Columbia ewes following an attack by dogs. The actual comparisons, therefore, are based upon data collected from ewes bred in 1957, 1958, and 1960.

The productive traits and physical characteristics used to compare the Columbias with the Targhees were conception rate of the ewes, percent lamb crop, suckling gain of lambs, pounds of lamb produced per ewe exposed to the ram, weight of the ewes within 24 hours following parturition, ewe hardiness, and wool production. Gross return per ewe was also calculated.

Results

The rate of conception of Columbia ewes was almost exactly the same as for Targhee ewes (Table 1). The number of lambs born per ewe exposed to the ram was approximately the same for ewes of the two breeds, which indicates that twinning is equal in both breeds. Targhee ewes weaned 2.7% more lambs than did Columbia ewes.

A small difference was observed in the birth weights of the lambs (Table 2). Columbia lambs weighed an average of 10.02 pounds, while Targhee lambs averaged 9.77 pounds.

TABLE 1. CONCEPTION RATE BETWEEN COLUMBIA AND TARGHEE EWES

Breed	Columbia	Targhee
Number of ewes exposed	179	177
Number of ewes lamb ^{1/}	164	163
Number of lambs born:		
All ^{2/}	289	287
Live	276	276
Percent lambing based on number of ewes exposed:		
All	161.5	162.2
Live	154.2	155.9
Percent lambs weaned of: ^{3/}		
Ewes exposed	121.8	124.9
Ewes lamb ^{1/}	132.9	135.6

^{1/} Does not include aborted lambs.

^{2/} Includes dead and live lambs.

^{3/} Does not include orphan or grafted lambs.

TABLE 2. PERFORMANCE OF LAMBS FROM COLUMBIA AND TARGHEE EWES

Breed	Columbia	Targhee
Avg. birth weight of lambs (lbs.)	10.02	9.77
Avg. suckling gain of lambs (lbs./day)	.454	.460
Avg. age of lambs at time of weaning (days)	151.1	147.7
Avg. weaning weight of lambs (lbs.)	78.80	77.71
Avg. lbs. of lamb produced per ewe exposed	95.97	97.03
Avg. weight of ewes within 24 hours after lambing (lbs.)	174.5	174.0
Number of ewes removed from flock for reasons other than age or accidental death	34	36
Avg. pounds of grease wool per ewe ^{1/}	12.57	12.04
Avg. staple length of wool (cms.) ^{2/}	10.97	9.57
Avg. grade of wool ^{2/}	54.63 (1/4 to 3/8 blood)	59.36 (3/8 to 1/2 blood)
Avg. gross return per ewe (dollars) ^{3/} :		
From lambs	15.36	15.52
From wool	7.86	7.53
Total	23.22	23.05

^{1/} Crutchings and tags not included.

^{2/} Includes only 1958 and 1959 shearing data.

^{3/} Lambs 16¢ per pound; wool 62.5¢ per pound.

Lambs of the Columbia breed gained .454 pound per day during an average suckling period of 151.1 days. The suckling gain of Targhee lambs was .460 pound per day for 147.7 days. The average weight of lambs at the time of weaning was 78.80 pounds for Columbia lambs compared to 77.71 pounds for Targhee lambs. The average of total pounds of lamb produced per ewe exposed was 95.97 pounds for Columbias and 97.03 pounds for Targhees (Table 2.)

All ewes were weighed within 24 hours following parturition. Recorded body weights show no difference between the two breeds in the size of ewes. Columbia ewes averaged 174.5 pounds compared to 174.0 pounds for Targhee ewes.

Another factor considered in the comparison of the two breeds was ewe hardiness. Ewes culled from the flock for reasons other than age or accidental death were recorded. During the three years, 34 Columbia ewes fell into this group and 36 Targhee ewes. Both breeds appeared to be equal when evaluated on this basis.

The production of wool from the ewes of the two breeds was also studied. It was observed that the average Columbia ewe produced only .53 pound more grease wool annually than the average Targhee ewe. Fleeces from Columbia ewes had 1.4 cms. more length of staple than those from Targhee ewes; Targhee fleeces, however, were finer and graded 3/8 to 1/2 blood compared to grades of 1/4 to 3/8 blood for Columbia fleeces.

A small difference was observed in the calculated gross return per ewe. Lambs were priced at 16 cents per pound and the national average price of grease wool was used--62.5 cents per pound. On these bases, Columbia ewes grossed \$23.22 per ewe compared to \$23.05 for Targhee ewes.

Summary

In a comparison study of Columbia and Targhee sheep managed under farm-flock conditions, both breeds were observed to be equal in production. Targhee ewes produced one pound more lamb per ewe exposed than Columbia ewes, but Columbia ewes had a slight advantage in average grease fleece weight. As a result there was only a 17-cent difference in the yearly gross return per ewe in favor of the Columbia ewes.

Increasing Wool Production
by Selection and Management

B.R. Eller and J.A.B. McArthur

The sale of wool accounts for approximately 30% of the total income derived from sheep in eastern Oregon. This fact emphasizes the importance of considering the production of wool in a selection and management program for the farm flock.

Each year when sheep are shorn at the Union Station, data are collected from fleeces of all yearling rams and yearling ewes. Analyses of these data provide information needed in the selection of future breeding animals to improve the average production of wool.

The data collected include grease fleece weights, clean fleece weights, length of staple, and fineness as determined by grade.

As a result of using a selection program which includes the production of wool, improvement in this trait has been observed for the entire farm flock at this station.

Wool data collected during the years 1958-62 illustrate the improvement which has been made. These data are summarized in Tables 1, 2, and 3.

Production has increased in pounds of both grease and clean wool per head. However, staple length was only increased in wool from rams. The slight decrease in staple length accompanied by an increase in average fleece weights from yearling ewes possibly indicates an increase in the density of the fleece.

Even though a slight reduction has occurred in the grade of wool from all yearling sheep, the 1962 clip still graded high 1/4 to 3/8 blood.

Average grease weights of fleeces from mature ewes in 1956 were 12.51 pounds and 11.84 pounds per ewe for Columbia and Targhee ewes, respectively. In 1962, average fleece weights from Columbia and Targhee ewes were 15.41 and 14.60 pounds per ewe, respectively. During the six-year period, average fleece weights per ewe were increased 2.90 pounds for mature Columbia ewes and 2.76 pounds for mature Targhee ewes.

Summarizing these data illustrates the improvement which can be made in the production of wool by flocks where good selection and management are practiced.

TABLE 1. WOOL PRODUCTION OF RAMS USED AS SIRES AT UNION

<u>Year</u>	<u>Breed</u>	<u>Fleece weight</u>		<u>Staple length</u> <u>cms.</u>	<u>Grade</u> ^{2/}
		<u>Grease</u> ^{1/} <u>lbs.</u>	<u>Clean</u> <u>lbs.</u>		
1958	Columbia	13.91	7.23	10.30	57.0
	Targhee	14.61	7.24	8.84	59.0
1962	Columbia	15.50	9.20	12.17	54.7
	Targhee	16.45	9.10	11.65	55.0
Difference					
1958-62	Columbia	+1.59	+1.97	+1.87	-2.3
	Targhee	+1.84	+1.86	+2.81	-4.0

^{1/} Excludes 2 pounds crutchings.

^{2/} Spinning count: 60's-62's, 1/2 blood; 56's-58's, 3/8 blood; 48's-54's, 1/4 blood.

TABLE 2. WOOL PRODUCTION OF ALL RAMS PERFORMANCE-TESTED AT UNION

<u>Year</u>	<u>Breed</u>	<u>Fleece weight</u>		<u>Staple length</u> <u>cms.</u>	<u>Grade</u> ^{2/}
		<u>Grease</u> ^{1/} <u>lbs.</u>	<u>Clean</u> <u>lbs.</u>		
1958	Columbia	13.14	6.88	10.45	56.4
	Targhee	14.24	7.43	10.02	57.0
1962	Columbia	14.47	8.09	11.15	54.0
	Targhee	15.96	8.49	10.63	55.0
Difference					
1958-62	Columbia	+1.33	+1.21	+1.70	-2.4
	Targhee	+1.72	+1.06	+1.61	-2.0

^{1/} Excludes 2 pounds crutchings.

^{2/} Spinning count: 60's-62's, 1/2 blood; 56's-58's, 3/8 blood; 48's-54's, 1/4 blood.

TABLE 3. WOOL PRODUCTION OF ALL YEARLING EWES AT UNION

<u>Year</u>	<u>Breed</u>	<u>Fleece weight</u>		<u>Staple length</u> <u>cms.</u>	<u>Grade</u> ^{2/}
		<u>Grease</u> ^{1/} <u>lbs.</u>	<u>Clean</u> <u>lbs.</u>		
1958	Columbia	8.76	5.12	11.12	56.5
	Targhee	8.26	4.78	9.96	58.7
1962	Columbia	10.27	6.13	10.92	54.6
	Targhee	9.99	5.78	9.37	57.3
Difference					
1958-62	Columbia	+1.51	+1.01	-.20	-1.9
	Targhee	+1.73	+1.00	-.59	-1.4

^{1/} Excludes 1.25 pounds crutchings.

^{2/} Spinning count: 60's-62's, 1/2 blood; 56's-58's, 3/8 blood; 48's-54's, 1/4 blood.

REPRODUCTIVE PERFORMANCE FROM CROSSBRED AND PUREBRED EWES

C. W. Fox and J. A. B. McArthur

The concept of crossbreeding has been generally accepted for the purpose of producing market lambs. In many geographic sections of the United States a crossbred market lamb is produced by crossing a black-face ram with white-face ewes. Besides showing increased milk production, crossbred ewes generally excel purebred ewes in fertility. Whitehurst et al. (1947) reported that Cheviot-Romney ewes produced 31% more lambs than Romney ewes. Similar studies in New Zealand by Phillips (1951) and Hewitt (1951) indicated the superiority of lambing percentage for Cheviot-Romney ewes over Romney ewes. More studies are needed to compare lamb production from crossbred and purebred ewes when both kinds have been selected for similar traits as weanling lambs. Also, data are needed on the level of fertility from crossbred and purebred females when bred as lambs.

The study to be reported pertains to a comparison of reproductive performance from selected crossbred and purebred ewes.

Flushing and Breeding of Ewe Lambs

Following weaning, all groups of ewe lambs were kept together on a similar plane of nutrition. During the flushing and breeding period the lambs were on an increasing plane of nutrition. Each year the breeding period was started about the middle of September. Two breeding groups of equal number of crossbred and purebred ewe lambs were joined with each of two rams. A semen sample was obtained from both rams used in the study prior to turning them in with the ewes. The per cent of live sperm and motility score indicated that each ram possessed semen of good quality. The length of the breeding period was the same for both groups of ewe lambs. From the end of the breeding period until lambing both groups were together. Any ewe which did not lamb was placed with the "dry" flock. Ewes with lambs were pastured together until their lambs were weaned.

Lambing Results when Bred as Lambs

Both groups of ewe lambs increased in body weight from the start of the flushing to end of the breeding period. This increase in body weight was approximately the same for the two groups. The lambing results for 3 years are presented in table 1.

Table 1. Bred As Ewe Lambs at the Corvallis Station

Kind of ewe	Hampshire- Columbia Crossbreds	Columbia & Targhee Purebreds	Hampshire Purebreds	All Purebreds
Number exposed	44	16	48	64
Number of ewes lambing	38	13	28	41
Number of lambs born	53	15	35	50
Ewes lambing (%)	84	81	58	64%
Lambs born of ewes exposed (%)	120	94	73	78%
Lambs born of ewes lambing (%)	143	115	125	122%

Summary

Comparisons were made between purebred and crossbred ewe lambs for per cent lambing, per cent of multiple births and average date of lambing. All groups of ewe lambs were selected on the basis of heavy weaning weight. The genetic background of the crossbred ewes was Hampshire rams crossed with Columbia or Targhee ewes. The Hampshire rams used to sire the crossbred ewes had been selected for heavy weaning weight. Also, the purebred ewe lambs were sired by selected rams.

When bred as ewe lambs, a much higher percentage of the purebred Columbia, Targhee and crossbred females lambd than did the purebred Hampshire females. However, based on lambs born from ewes lambing, the selected crossbred females were superior to all purebred females. The higher per cent of multiple births from the crossbred ewes for all years would indicate that this increase was due to non-additive gene action.

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EVALUATION OF RAMS AS DETERMINED FROM A CARCASS EVALUATION OF THEIR OFFSPRING

C. W. Fox and J. A. B. McArthur

INTRODUCTION

Today the livestock industry is being asked to produce a product which will have more lean meat and less fat. Most sheepmen are looking for a ram which will produce the "ideal" lamb. "Ideal" in that the producer, to stay in business, must make an adequate profit from sale of this lamb. For the packer the "ideal" lamb should grade Choice, and yield sufficiently high that more than 50% of the purchased live weight can be sold to a retailer. The retailer can only merchandize the kind of carcass purchased from the packer. Finally, the consuming public will consistently buy that meat which they can afford. It should be quite evident that there is no universal agreement on what constitutes this "ideal" lamb. However, we must not lose sight of the fact that the consuming public will determine the fate of the "ideal" lamb.

In a comparable span of five years a ram, by natural service, will produce 30 or 40 times more offspring than a ewe. Therefore, research workers have been attempting to determine the genetic ability of rams to transmit to their offspring those hereditary units which will permit development of desirable lambs, including carcasses of high merit.

MATERIAL AND METHODS

During the 1960 breeding season, four registered Hampshire rams were loaned by Hampshire breeders to the Department of Animal Science. Two ram lambs from each of these four sires were chosen for progeny testing from the upper half of the lamb crop, based on adjusted weaning weight. That fall, 16 whiteface ewes were allotted at random to each of the eight ram lambs. The whiteface ewes were either of the Columbia or Targhee breed and were maintained here at the Eastern Oregon Branch Experiment Station of Union. The crossbred progeny from this cross was weaned early in June, 1962. From each of the eight sires the three heaviest wether lambs were slaughtered. For these 24 crossbred lambs the average age at slaughter was 140 ± 2 days, and the average shorn weight was 91.8 ± 6 pounds. From these 24 carcasses various subjective and objective measurements were made on amounts of lean meat and fat. These carcasses had an average cold weight of 45.1 ± 4.8 pounds.

To establish a basis for evaluating the value of any lamb carcass, a shoulder, rack, loin, and leg were selected by a retail merchant from the best twenty-four carcasses. These selected cuts had a maximum amount of lean meat and no more than 1/4 inch of external fat covering over the rack and loin. The shoulder and legs possessed only sufficient finish to prevent their dehydration during a transit shipment, or as a retail cut displayed for

sale. These primal cuts that were selected as "very desirable" from a retail evaluation were given a subjective score of 5. It was determined from boning and trimming the primal cuts from all 24 carcasses that for each numerical score above 5 the excess fat trim was 3%. Therefore, a loin having a subjective score of 9 would have 12% of excess fat. Using this scoring system, it was possible to obtain an estimated value for each carcass that would approach the monetary value a retail merchant could anticipate to receive for each carcass. Also, a carcass having a subjective score of 5 for its primal cuts would yield 82-85 per cent of the carcass weight as salable retail cuts. The non-salable parts making up the other 12-15 per cent would consist of bones, kidneys, kidney fat, fat trim, and scraps. A standard retail mark-up of 25 per cent was made for a carcass price of \$43.00 cwt. for U.S.D.A. Prime and Choice and \$41.00 cwt. for U.S.D.A. Good. At 140 days of age a carcass from a twin was 1.2 pounds lighter in weight than from a single.

SUMMARY

The data in table 1 relate to the average of three carcasses per sire.

Table 1. Carcass data from three wether lambs of eight sires.

Sire number	1-67	1-51	1-19	1-41	1-9	1-37	1-13	1-7
Weaning wt. lb. ¹	90	100	99	92	90	93	98	83
Actual age, days	141	137	147	143	143	144	138	134
Retail value ²	\$56.72	\$56.56	\$57.81	\$56.42	\$56.63	\$57.93	\$56.14	\$57.72
Rib-eye area ³	1.91	1.84	1.93	1.64	1.82	1.94	2.01	1.73
Tenderness score ⁴	6.2	5.9	6.1	6.0	6.4	6.1	6.4	6.6

¹Adjusted to 140 days and single birth for the 3 wethers.

²25% markup and based on 100 pounds.

³Measured at 11th rib (longissimus dorsi) and adjusted to 140 days and a single birth.

⁴The higher the value, the more tender the meat.

It is evident from the data in table 1 that there was little difference in retail value between the 8 sires. However, the three wether lambs from each sire had been selected because they were the heaviest in weight at weaning, and only a small number of lambs was used in the evaluation. For the adjusted rib-eye area there was no significant difference between the 8 sire groups. The rib-eye area (longissimus dorsi measured at the 11th rib) for twins born and raised as twins was 0.2 square inches smaller than that for singles.

By U.S.D.A. grade the retail carcass value per 100 pounds was \$53.45 for Prime and \$57.34 for Choice and Good--a difference of 7 per cent in favor of the lower grades.

Correlations of retail carcass value with rib-eye area and retail value of trimmed legs were 0.39 and 0.78, respectively. This would indicate that the rib-eye area is not as important in carcass value as are the legs.

A 6-rib roast from each carcass was cooked and scored for tenderness, juiciness, flavor of lean and fat, and overall desirability. Between these 8 sire groups there was no significant differences for any of the flavor scores. At these young ages tenderness score was not significantly correlated with rib-eye area, carcass grade, or age of lamb at slaughter. There was a correlation of 0.50 between tenderness and juiciness.

Current Beef Cattle Research at the Eastern Oregon
Experiment Station

J.A.B. McArthur and B.R. Eller

1. The use of Angus and Hereford bulls in breeding yearling Hereford heifers.

Some beef cattle producers experience considerable trouble calving two-year-old heifers. Because Angus calves are smaller at birth than Hereford calves some producers use Angus bulls to breed the yearling heifers as a means of reducing calving troubles. Since this management practice is highly controversial, the Union station set up a project in which each year one-half of the yearling Hereford heifers are bred to an Angus bull and the other half bred to a Hereford bull. Data are being collected from both breeding groups on weight of calves at birth, assistance given the heifers during calving, suckling gain, weaning weight, and feedlot performance of the calves.

2. The use of artificial insemination on beef cattle.

With the advent of frozen semen from performance tested beef bulls and improved techniques in inseminating beef cows, many beef cattle producers are contemplating the use of artificial insemination to improve the type of animals they are raising, increase their percent calf crop, and cut down the expense of buying and maintaining breeding bulls. Although artificial insemination has proved highly successful in dairy cattle, little information, especially of an economic nature, is available regarding the use of artificial breeding in a beef cattle operation. To gather information on this subject the Union station has set up a project in which 20 cows are to be bred artificially each year.

3. Drenching suckling and weaner calves.

To study the effect of drenching for internal parasites, the Union station has a project under way in which calves are drenched midway in the suckling period and at weaning time. Data are being collected on the effect of drenching on weaning weight, performance of weaner calves in the feedlot, and performance of weaner calves on a growing ration when they are being raised as replacement heifers.

4. Vitamin A supplementation for calves and mature pregnant cows.

The Union station has set up a study on the value of injecting newborn calves with 200,000 I.U. of injectable vitamin A. Data will be collected on suckling gains and general health of the calves, especially the occurrence of scours. In conjunction with the wintering of pregnant cows on different levels of nutrition, injectable vitamin A will be used on these animals to find out if this management practice has a beneficial effect on the newborn calves.

5. Wintering levels for pregnant cows.

This study was started in the fall of 1962 with three lots of cows on three levels of wintering rations. In 1963 the number of groups will be

increased to six. Data are being collected to find the most economical ration that may be used. Since wintering rations for pregnant cows can influence condition of the cow, condition of the calf at birth, calving troubles, ability of the cow to come in estrus and ability of the cow to conceive, these factors are also being studied.

6. Time of castration and its effect on performance of weaners in the feedlot.

Starting with the 1962 calves, the Union station initiated a study on time of castration. Bull calves are castrated at three different times; e.g., at birth, midway in the suckling period, and at weaning. These steer calves along with a comparable group of bull calves are put in the feedlot and fed to a slaughter weight of approximately 1,000 pounds. One-half of the animals in each group are implanted with stilbestrol. Data are being collected on: birth weight, suckling gain, weaning weight, feed efficiency, and daily rate of gain in the feedlot. At slaughter, information on selling price, carcass grade, lean-to-fat ratio, cut-out, tenderness, marbling, and eating quality will be evaluated.

Other Research in Sheep Management

B.R. Eller and J.A.B. McArthur

A study of different wintering programs for pregnant ewes was begun this winter. Ewes were supplemented at different stages of pregnancy to study the effects of nutrition upon birth weights of lambs, lambing difficulty, suckling and weaning weights of lambs, and gains and losses in weight by pregnant and lactating ewes.

Estrus cycles of ewes in this environment are also being studied. The information collected will be used to evaluate the possibility of breeding ewes to produce an average of more than one crop of lambs per year.

Feeder lambs will be drenched with Thibenzole to study the effects of this new drug on internal parasites in fattening lambs. Digestive tracts of treated and nontreated lambs will be collected for laboratory analysis.

Selecting and Performance Testing Rams

B.R. Eller and J.A.B. McArthur

Columbia and Targhee rams have been performance tested at this station since 1957. Our facilities enable us to test six rams of each breed every year.

Selection of the rams for testing begins when they are approximately 80 days old. At this time all Columbia and Targhee ram lambs are inspected for inherited physical defects. Only individuals which are free of inherited defects and have above-average suckling gains are left uncastrated.

When the ram lambs reach approximately 10 months of age, selection is made for conformation, size, and breed character. Six top-ranking ram lambs of each breed are then performance tested.

Data collected during the period of testing are used to rate the individual rams. Ratings are based upon average daily gain, pounds of feed required per pound of gain, and body weight. The performance-tested rams are then evaluated on wool production and semen fertility before being considered for use as sires.

A marked improvement in the average daily gain and size has been made in the performance of ram lambs since testing began in 1957.

Average daily gains during the 1957-58 test period were .648 pound for Columbia rams and .523 pound for Targhee rams. During the 1962-63 testing period, Columbia and Targhee rams gained an average rate of .913 and .852 pound per day, respectively. This is an increase in average daily gain of .265 pound per day for Columbia rams and .329 pound per day for Targhee rams.

A substantial increase has been made in the off-test weights of rams of both breeds. Columbia rams completing the 1957-58 testing period weighed an average of 177.4 pounds and Targhee rams averaged 153.0 pounds. Average weights of rams completing the 1962-63 testing period were 222.5 pounds for Columbia rams and 199.6 pounds for Targhee rams. After only six years of selecting and performance testing, the average weight of Columbia rams has increased 45.1 pounds and of the Targhee rams 46.6 pounds.

The top-performing ram of the Columbia breed during the 1962-63 testing period had an average daily gain of 1.05 pounds and weighed 247 pounds at the conclusion of the test. The top-performing Targhee ram for the same period had an average daily gain of .97 pound and completed the test weighing 209 pounds.

As a result of this program of selection and performance testing, the rams used as sires now have the ability to gain more rapidly and are larger in size than were the rams in 1957. They still, however, maintain the good characteristics of conformation and fleece quality for the Columbia and Targhee breeds.