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QUALITY OF THE DIET AND INTAKE OF STEERS GRAZING A FOREST CLEARCUT

M. Vavra and R.F. Miller

Extensive areas in northeastern Oregon, Washington and Idaho are forested, privately owned lands that serve the dual purpose of timber production and grazing by livestock and big game.

Since multiple use is an important factor on these lands, methods of timber harvest and subsequent management must maximize not only future forest production but also forage production for cattle and big game.

In 1963 a mixed-conifer site on the Eastern Oregon Experiment Station's Hall Ranch was clear cut. The slash was broadcast over the cut area and burned one year later. Following the burn, the area was seeded to blue wildrye, mountain bromegrass, orchardgrass, tall oatgrass, Manchar smooth brome, timothy and white Dutch clover. In 1965 two and three-year-old seedlings of ponderosa pine, Douglas fir, western larch, western white pine, Engelmann spruce and lodgepole pine were planted.

Following the burn, fifteen acres of the clearcut were divided into three, 5-acre pastures. Pasture 1 was fenced to exclude game; the other two had standard cattle fence construction. Grazing by cattle began in 1966 at the rate of 5 yearling heifers per unit for one month. Pastures 2 and 3 were grazed in common by cattle and big game. In 1972 cattle were excluded from pasture 3. During the period 1966 - 1971, average daily gain was 1½ to 2 pounds per head.

Frequency of occurrence of selected plant species sampled prior to grazing suggested a difference between pastures 1 and 2. It was inferred from these data that the difference was due to previous grazing management of cattle and big game.

The following study, concluded in 1972, was initiated to determine if the difference in frequency of occurrence of those plants would influence the selection and quality of the diet selected by cattle.

EXPERIMENTAL PROCEDURE

Five steers, two equipped with esophageal forage collection devices, and two equipped with fecal collection bags grazed in each pasture. The steers grazed the clearcut from July 6 until August 9, 1972. Esophageal fistula samples were collected from the steers on two afternoons per week. Twenty-four hour fecal collections were also made twice a week. Collected fistula samples were analyzed for percent crude protein, acid detergent fiber, lignin, cellulose and *in vitro* digestibility. Intake was estimated from the fecal collections and corrected *in vitro* digestibility values. The steers were weighed on and off the clearcut.

RESULTS AND DISCUSSION

Chemical composition and intake data are listed in Table 2. Percent crude protein in the diets was similar in both pastures. Percentage of crude protein in the forage exceeded levels recommended by the National Research Council for both yearling cattle and pregnant lactating cows. Pregnant cows with suckling calves are the most common type of stock grazing similar range in northeastern Oregon.

Cattle in pasture 1 consumed a diet that was slightly higher in percent fiber, lignin and cellulose. Pasture 2 animals consumed a diet that was slightly more digestible, probably due to the lower fiber, lignin and cellulose content. However, differences between pastures for the chemical constituents measured were not great.

Daily dry matter intake per animal was about one pound greater for the steers grazing in pasture 1. The steers used in both pastures weighed approximately 900 pounds. Steers in both groups gained 1.2 pounds per day while on the clearcut. Steers in this trial gained less than animals used in previous years; perhaps because they were larger and in better condition at the start of the trial. However, fecal collection procedures may have depressed gains.

The absence of big game grazing and hence changes in plant frequency and possibly diet had little effect on nutrient quality of steer diets. Apparently, steers in pasture 1 were still able to select a diet comparable to those in pasture 2. The data indicate that similar clearcut and reseeded areas would provide sufficient nutrients for pregnant lactating cows grazing at this time of year.

Table 1. Frequency of occurrence of selected plant species in pastures 1 and 2.

GRASSES	Pasture 1	Pasture 2
orchardgrass	26.0	18.5
timothy	21.0	18.0
blue wildrye	22.0	15.0
tall oatgrass	11.5	8.5
smooth brome	3.0	12.5
Kentucky bluegrass	14.0	20.0
mountain brome	12.5	3.5
cheatgrass brome	12.5	7.5
elk sedge	7.5	25.5
Northwestern sedge	14.5	22.5
BROWSE		
snowbrush	2.0	4.0
red stem ceanothus	15.0	1.0
ninebark	5.5	0
little wildrose	2.0	0
snowberry	6.0	1.5
Scouler's willow	3.5	3.0
birchleaf spirea	11.0	4.0

Table 2. Chemical composition of the diet, digestibility and intake of steers grazing in pastures 1 and 2.

	Percent protein	Percent fiber	Percent lignin	Percent cellulose	Percent digesti-bility	Dry matter intake (lb/day)
Past. 1	9.7	48.3	14.4	28.1	56.0	16.9
Past. 2	9.0	47.5	14.0	26.5	57.0	15.6

SUMMER USE BY CATTLE ON FOOTHILL RANGELANDS IN NORTHEASTERN OREGON

Richard F. Miller and William C. Krueger

Forested foothills in northeastern Oregon have been used as summer cattle range for many years. Besides providing an important forage resource these lands also provide timber, water, recreation, big game and fish. The purpose of this study was to evaluate the importance of several plant communities for summer cattle use. To effectively manipulate the development of vegetation we need to know where cattle are feeding, and what and how much they consume. The major objectives were to determine forage production of plant species and the amount utilized by cattle in specific plant communities; to define environmental factors influencing the use of different plant communities by cattle; and to evaluate the importance of seeded clearcut communities for summer cattle range.

EXPERIMENTAL PROCEDURE

Plant communities were delineated by frequency transects placed throughout the study area. Soils, percent tree canopy cover, distance to water and salt, slope, aspect and production of palatable species were also measured in each of eight plant communities. Production and utilization were measured by the ocular weight estimate method with periodic clipping to check for accuracy. Exclosures were also set up in each community to measure production and utilization not apparent from ocular estimates. Cattle were turned onto a 360 acre pasture July 31. The herd was composed of 94 cows and 90 calves. The cattle were removed from the pasture August 21 to wean calves. On August 27, 88 cows were turned back on the pasture until September 12.

RESULTS AND DISCUSSION

Plant communities in the study area were typical of those found in northeastern Oregon, eastern Washington and northern Idaho. The bunchgrass communities were represented by a Sandberg's bluegrass-kellogg onion (Poa sandbergii-Allium anceps) stand and a ponderosa pine-bluebunch wheatgrass (Pinus ponderosa-Agropyron spicatum) stand. Production averaged 312 pounds per acre, and tree canopy cover was less than four percent (Table 1). The forested communities were made up of a ponderosa pine-snowberry (Pinus ponderosa-Symphoricarpos albus) stand, a Douglas fir-elk sedge (Pseudotsuga menziesii-Carex geyeri) stand and a grand fir-adenocaulon (Abies grandis-Adenocaulon bicolor) stand. Production ranged from 63 to 125 pounds per acre with a tree canopy cover of 55 percent or greater. Prior to logging the clearcut contained three major plant communities which included ponderosa pine-snowberry, Douglas fir-elk sedge and grand fir-adenocaulon stands. The clearcut communities were logged in 1969, broadcast burned and seeded to timothy (Phleum pratense), orchardgrass (Dactylis glomerata), blue wildrye (Elymus glaucus), tall oatgrass (Arrhenatherum elatius), smooth brome (Bromus inermis), and Dutch white clover (Trifolium repens). Production ranged between 513 and 565 pounds per acre.

Table 1. Production and utilization for each plant community.

	Production (LBS/A)	Utilization (LBS/A)
Bunchgrass Communities		
Sandberg's bluegrass-kellogg onion	314	63
Ponderosa pine-bluebunch wheatgrass	311	41
Forest Communities		
Ponderosa pine-snowberry	124	20
Douglas fir-elk sedge	123	8
Grand fir-adenocaulon	63	4
Clearcut Sites		
Ponderosa pine-snowberry	513	56
Douglas fir-elk sedge	564	63
Grand fir-adenocaulon	565	209

On these foothill communities moisture and light were the two most important environmental factors determining forage production. Soil depth and canopy cover accounted for 96 percent of the variability in understory production. Soil depth was assumed to be an indirect measure of soil water potential. As soil depth increased and canopy cover decreased, forage production increased. Forested sites on these foothill rangelands had a high potential for forage production after cutting. The grand fir-adenocaulon communities had the greatest potential for producing high yields of seeded forage. Moisture availability was relatively higher on these sites, and competition from established species lower than on other forested communities. Success of establishment and production of timothy and orchardgrass was very high. However, on the logged ponderosa pine-snowberry and Douglas fir-elk sedge sites, establishment of seeded species was lower than on the grand fir-adenocaulon site. This was probably a result of increased competition from already established plants and lower water availability on these two sites as compared to the more mesic grand fir-adenocaulon site. Production of preferred forage species was also highly correlated with soil depth and canopy cover. Forage production on the non-logged communities was greatest on both bunchgrass sites.

Utilization of forage by cattle was variable among communities. Forage use ranged from three pounds per acre in the grand fir-adenocaulon stand to 209 pounds per acre on the logged and seeded grand fir-adenocaulon site (Table 1). The heaviest levels of utilization by cattle were on the seeded clearcut sites. The three logged sites provided about 64 percent of the forage consumed by cattle (Table 2). The most important forages on these communities were seeded grass species. Seeded grasses accounted for 55 percent of the cows' diet. Grass and grasslike species made up almost 96 percent of the forage consumed from the pasture. Forbs were less than one percent and browse about four percent of the animals' diet. Forbs were generally unavailable at this time and browse only made up five percent of the understory composition. Cattle removed about 50 pounds of herbaceous forage per acre on the bunchgrass communities and less than 50 pounds per acre on the forested communities. Bunchgrass stands provided 30 percent of the forage consumed. The most important species in the cows' diet on bunchgrass communities were Sandberg's bluegrass and bluebunch wheatgrass. Although forested communities accounted for 41 percent of the study area, they provided only six percent of the total forage consumed.

Environmental characteristics that accounted for most of the variability in pounds of forage removed from a community were distance to water, distance to salt, soil depth, and percent tree canopy cover. Distances to salt and water facilities strongly influenced the amount of forage used in plant communities by cattle. As distances to salt and water decreased, forage intake increased. The relationship of soil depth and tree canopy cover to forage use were probably indirect through their affects on forage production. Cattle use was probably influenced more directly by the amount of available forage in a community which related to soil depth and tree canopy cover. Communities with high levels of understory production received the heaviest use.

Table 2. Percent forage consumed by cattle from each plant community (July 31 - September 12, 1973)

	Percent Forage Contributed			
	Grasses	Forbs	Browse	Total
Bunchgrass Communities				
Sandberg's bluegrass-kellogg onion	9.6	0.0	0.0	9.6
Ponderosa pine-bluebunch wheatgrass	18.2	0.0	0.8	19.0
TOTAL				28.6
Forested Communities				
Ponderosa pine-snowberry	2.9	0.0	0.8	3.7
Douglas fir-elk sedge	2.8	0.0	1.0	3.8
Grand fir-adenocaulon	0.1	0.0	0.1	0.2
TOTAL				7.7
Clearcut Sites				
Ponderosa pine-snowberry	9.0	0.1	0.2	9.3
Douglas fir-elk sedge	18.3	0.0	0.6	18.9
Grand fir-adenocaulon	34.7	0.6	0.2	35.5
TOTAL				63.7
TOTAL	95.6	0.7	3.7	

Cattle diets were determined from utilization measurements. Preference of cattle for each plant species was evaluated with a relative preference index. This was a ratio between the percent composition of a plant in the animals' diet to percent composition of that same plant on the range. Grass species made up almost the entire diet (Table 3). By late summer availability of forbs was very low. Plant species generally did not reflect high palatability during late summer. Availability played a primary role in what and how much animals consumed of each plant species. Forbs would probably be more important for cattle during the spring and early summer on foothill rangelands when availability is high.

CONCLUSIONS

Factors related to distribution of livestock on foothill rangelands were availability of salt and water, soil depth and percent tree canopy cover. Forage production and utilization were greatest on clearcut communities. Seeded grasses made up 55 percent of the cows' diet. Timothy and orchardgrass were the most productive seeded grass species. Forage production and utilization were low in forested communities. Utilization can be increased on the less preferred forested communities by strategically locating water and salt facilities. Additional work with big game did not indicate forage competition between deer and elk, and cattle.

Table 3. Percent composition of plant species in the diet of cattle and their preference rating (July 31 - September 12, 1973).

SPECIES	% DIET	RPI[1]
GRASSES		
Orchardgrass	28	2.4
Timothy	16	1.7
Kentucky bluegrass	11	1.5
Sandberg's bluegrass	7	1.2
Tall oatgrass	6	1.5
Elk sedge	6	0.5
Idaho fescue	6	1.3
Blue wildrye	5	2.3
Bluebunch wheatgrass	4	1.8
Field woodrush	2	2.6
Ross sedge	2	0.8
Foxtail	1	0.6
Smooth brome	T	
Northwestern sedge	T	
Rattail fescue	T	
Cheatgrass	T	
Tall trisetum	T	
FORBS		
Douglas knotweed	T	
Bull thistle	T	
Prickly lettuce	T	
Yarrow	T	
Wyeth buckwheat	T	
Goldenrod	T	
Sheep sorrel	T	
Canada milkvetch	T	
BROWSE		
Shinyleaf spiraea	1	0.7
Snowberry	1	1.6
Ninebark	1	1.2
Redstem ceanothus	T	
Oceanspray	T	
Scouler's willow	T	
Big huckleberry	T	

[1] $RPI = \frac{\% \text{ Diet}}{\% \text{ Range Composition}}$

FEEDING GRASS STRAW TO WINTERING BEEF COWS

R.L. Phillips, M. Vavra and J.A.B. McArthur

Grass straw, a by-product of the grass seed industry, has had little value or use as a livestock feed in the past. New laws that restrict field burning have made it necessary to remove the straw from the fields by other means. The use of grass straw for wintering beef cattle would provide beef producers with a cheap source of roughage and grass seed producers could recover the cost of removing the straw. The purpose of this study was to determine if pregnant beef cows could be wintered on these straws with a limited amount of supplement. This report covers the completed 1972-73 trial and the 1973-74 feeding trial.

PROCEDURE

There was considerable difference in crude protein content of the Hard Fescue between the two years (Table 1). However, Hard Fescue fed in 1972 was raised under dry land conditions while that fed in 1973 was produced under irrigation. The Merion Bluegrass straw fed in 1972 was higher in crude protein than the 1973 crop. The orchardgrass-alfalfa hay used in both trials was harvested in 1972 from irrigated land.

During the 1972-73 feeding trial, Hard Fescue and Merion Bluegrass straws were fed in sufficient quantity that it was continually available to the animals. Orchardgrass-alfalfa hay was fed at the rate of 25 pounds per head daily and served as a control. Each cow in the Hard Fescue and Merion Bluegrass fed groups was supplemented daily with 1.3 and 0.5 pounds of cottonseed meal, respectively. Protein was supplemented liberally because at that time daily intake was not known. All groups received iodized salt and dicalcium phosphate mineral mix free choice.

On November 29, 1972, twenty pregnant Hereford cows were allotted to each of the roughage treatments. They ranged in age from 4 to 10 years. The cows were fed at these levels until January 30, 1973 (63 days on feed) with the exception that the cows receiving Hard Fescue were given an additional supplement of two pounds of barley per head per day from January 1 to 30, 1973. It was felt that the increase in energy intake might alleviate the problem of compaction that occurred in one cow.

The 1973-74 feeding trial was started on December 5, 1973 and twenty pregnant Hereford cows ranging in age from 5 to 11 years were allotted to each of the three roughage groups. Cows were allotted to the same treatment as the previous year. If a cow died or was culled during the first year, a replacement of the same age was made. Each cow was injected with one million I.U. of vitamin A. Intake and digestion data from a preliminary trial using steers indicated that wintering cows could not consume enough straw to meet their nutritional requirements. Cows fed the Hard Fescue were supplemented daily with 0.67 pounds of cottonseed meal and 1.33 pounds of oats per head. The

cows fed Merion Bluegrass were supplemented with 0.33 pounds of cottonseed meal and 0.67 pounds of oats per head daily. Cows were fed and handled the same as the previous year.

RESULTS AND DISCUSSION

Results of the 1972-73 study showed that cows fed Merion Bluegrass straw ate 7 pounds more straw than those fed Hard Fescue straw. Cows fed Merion Bluegrass gained the most (1.87 lbs/day) followed by cows fed orchardgrass-alfalfa hay (1.42 lbs/day) and cows fed Hard Fescue (0.73 lbs/day), (Table 2). Average birth weight of calves from the straw fed cows was the same, but the average birth weight of calves from the control cows was slightly higher. Practically speaking, there was no difference in weaning weights of the calves from the three groups of cows. There was a 100% conception rate for the cows fed Merion Bluegrass straw and orchardgrass-alfalfa hay, while 89% of the cows fed Hard Fescue straw conceived. With the limited number of cows in this study, it would be difficult to draw any conclusion concerning difference in percent conception between the groups.

Several problems occurred in the Hard Fescue group. One cow became compacted; another died of unknown causes; and a third cow appeared to be in a stupor, was unsteady on her feet and had a temperature of 105° F. Also, one calf was born weak and died after three days. A second calf was born with an apparent vitamin A deficiency, but responded to treatment.

Intake data and weight data for the 1973-74 trial are given in Table 3. Cows were on trial from December 5, 1973 to January 30, 1974 (57 days on feed). One cow from the Merion Bluegrass group aborted, however, there was no indication that abortion was related to treatment.

Cows fed Hard Fescue straw did not consume as much straw as did the cows fed Merion Bluegrass straw. The average weight change for all cows was small. One cow fed Hard Fescue died of a compacted abomasum two weeks after the end of the trial. Feed in the abomasum had not been sufficiently digested by rumen microbes, indicating a possible energy deficiency. The other cows were in good condition and should breed back.

In light of the problems that occurred when feeding Hard Fescue, more basic information is needed. A digestion trial using mature sheep is planned to determine the digestibility of the energy and protein. Also, more information is needed concerning the variation in straw quality raised under dry land or irrigation. Due to the yearly variation in protein it would seem necessary to have Hard Fescue analyzed for protein before an estimate of supplementation level necessary to meet cattle requirements could be made. The limited information presented in this report indicates that Merion Bluegrass can be fed to wintering beef cattle with no harmful side effects.

Table 1. Chemical analysis of Hard Fescue and Merion Bluegrass straw for the 1972 and 1973 crops.

	Crude protein	Acid detergent fiber
	%	%
Hard Fescue straw (1972)	4.36	46.37
Hard Fescue straw (1973)	5.76	48.21
Merion Bluegrass straw (1972)	7.55	34.63
Merion Bluegrass straw (1973)	6.34	44.17
Orchardgrass-alfalfa hay (1972)	10.78	38.67
Orchardgrass-alfalfa hay (1973)	10.78	38.67

Table 2. Results of feeding Merion Bluegrass, Hard Fescue, and orchardgrass-alfalfa hay to pregnant cows during the winter of 1972-73.

	Daily consumption (lbs.)	Weight on test 11-29-72 (lbs.)	Weight off test 1-30-73 (lbs.)	Average daily gain (lbs.)	Calf birth weight (lbs.)	Percent conception of cows
Merion Bluegrass straw	29.5	1176.5	1294.5	1.87	76.5	100
Hard Fescue straw	22.5	1179.5	1225.5	0.73	76.5	89
Orchardgrass-alfalfa hay	26.0	1186.0	1275.5	1.42	80.0	100

Table 3. Results of feeding Merion Bluegrass, Hard Fescue, and orchardgrass-alfalfa hay to pregnant cows during the winter of 1973-74.

	Average daily consumption of hay (lbs.)	Weight on test 12-5-73 (lbs.)	Weight off test 1-30-74 (lbs.)	Average daily gain (lbs.)
Merion Bluegrass straw	25.4	1267.3	1277.1	.18
Hard Fescue straw	20.1	1240.3	1219.6	-.37
Orchardgrass-alfalfa hay	25.4	1263.4	1296.8	.60

THE PERFORMANCE OF INDUCED CRYPTORCHIDS AND STEERS

M. Vavra, J.A.B. McArthur and M.M. Wing

During the past two years there has been much controversy over the use of Diethylstilbestrol (DES). First, oral consumption of DES by livestock was banned and then a year later it was prohibited as an implant. In January of 1974 the U.S. Court of Appeals ruled that the Food and Drug Administration had acted illegally in banning DES. The current status of DES and other growth promoting compounds is even more confusing. Therefore, it seems necessary to seek alternative methods of achieving the increase in cattle gains and feed efficiency that DES produced.

One alternative is feeding bulls. However, bulls are more difficult to manage, have trouble grading, and develop undesirable secondary sex characteristics. The new bull grading system, whereby bulls under 16 months of age are termed "bullock", has been in use since July 1, 1973. Whether this new category has been successful is yet to be determined.

Inducing cryptorchidism may be a way to alter bulls so that the undesirable characteristics of bulls are decreased while rate of gain and increased efficiency are retained. Cryptorchidism is accomplished by pushing the testicles into the body cavity and placing a rubber band around the empty scrotum. The empty sac will then fall off and the testicles will remain in or next to the body cavity. It is most desirable to get the testicles inside the body cavity as far as possible.

EXPERIMENTAL PROCEDURE

Male calves of the 1972 and 1973 calf crops were allotted to five treatments: (1) made cryptorchid at birth, (2) steer at birth and 6 mg of DES, (3) steer at birth, (4) steer at 60 days, and (5) cryptorchid at 60 days. The DES implanted steers also received 15 mg implants at 60 days, upon entering the feedlot, and after 80 days on feed. In 1973, DES implants were banned so Zeranol implants were substituted at a rate of 36 mg per implant.

Suckling gain, post-weaning gain and feedlot performance have been evaluated. Yield grade and USDA grade were also recorded at slaughter.

RESULTS AND DISCUSSION

Preliminary data on the 1972 calf crop were reported in the 15th Annual Beef Cattle Day Report (OSU Sp. Rep. 384). At 60 days of age the steers receiving DES were the heaviest and the two groups of steers (non-implanted) were the lightest.

Feedlot performance and carcass data are presented in Table 1. In the feedlot the animals were fed a ration consisting of barley, and a high protein supplement in addition to a limited hay ration. The two lots of cryptorchids gained more rapidly than the three pens of steers. Steers implanted with DES gained only slightly less than the cryptorchids.

Both implanted steers and cryptorchids were more efficient in feed conversion than were the two lots of non-implanted steers. The cryptorchids were slightly more efficient than the DES implanted steers. The cryptorchids and implanted steers required 34 fewer days on feed to reach a marketable weight.

None of the cryptorchids were marbled sufficiently to grade Choice, while 5 implanted steers and all but 2 of the non-implanted steers graded Choice. All of the cryptorchids had a yield grade of 2. The implanted steers were fatter than the cryptorchids but not as fat as the steers that received no implants. All of the cryptorchids did, however, have sufficient conformation to score as Choice.

The cryptorchids were graded as steers and brought steer prices. Price received for Choice was $0.725 per pound while Good brought one cent less. Based on this price spread, the cryptorchids brought more money than the steers even though none of them graded Choice. The Average price received for implanted steers was comparable to that received for cryptorchids. However, nearly half of the implanted steers graded Choice and those sold for one cent more per pound. Cryptorchids returned more cash per animal than the steers. When feed and yardage costs are subtracted from the selling price, the amount returned per animal further favored the cryptorchids since they spent less time on feed and gained more weight per pound of feed.

The same 5 treatments were applied to calves of the 1973 calf crop. Zeranol was implanted instead of DES. Data in Table 2 show that the cryptorchids have performed similarly to 1972 calves. When the calves were weighed at 50 days of age there was a 26 pound difference in average weight among groups. Steers implanted were the lightest but also the youngest. Animals were stratified by treatment at birth so that ages would be approximately the same. However, there was an 11-day difference between the average ages of treatments 2 and 3. Treatment 1, 4 and 5 animals averaged 3, 5 and 8 days older, respectively, than those in treatment 2.

At weaning, the implanted steers were again the lightest group. However, among all treatments suckling gains were similar. After 84 days in the feedlot the cryptorchids had the highest daily gains and were more efficient than the three groups of steers. Thus far, Zeranol has not produced the increase in gain and efficiency that was observed with DES. As the amount of energy is increased in the finishing ration, the implanted steers may improve in their production.

Preliminary data indicate that:

1. Cryptorchids gain more rapidly than steers and as well as DES implanted steers;
2. Cryptordhids gain more efficiently than steers and as well as DES implanted steers;
3. Cryptorchids produce carcasses with superior yield grades;
4. At 1000 - 1100 pounds cryptorchids do not have enough marbling to grade USDA Choice.

These observations pose several questions. Do factors 1 through 3, above, make up for the loss in carcass grade? Will cryptorchids always be graded as steers or as bulls or "bullocks"?

Table 1. Feedlot performance and carcass data of 1972 calves.

Treatment	On feed weight 11-15-72	Final weight	Days on feed	Ave. daily gains	Lb. of feed per lb. gain	Carcass grades No. of Good	Choice	Ave. yield grade	Ave. warm carcass weight	Ave. price rec'd per head*
Crypt, birth	483	1118	218	2.91	6.10	8	0	2.00	655	$468.13
Steer + DES	500	1081	218	2.66	6.65	4	5	2.44	627	451.61
Steer, birth	433	918	252	2.17	7.11	1	7	2.57	576	416.43
Steer, 60 days	459	964	252	2.26	6.92	2	7	2.67	603	435.66
Crypt, 60 days	476	1063	218	2.69	6.19	9	0	2.00	631	451.00

* based on $0.725 for Choice (price per pound of warm carcass) and $0.715 for Good.

Table 2. Average weights and daily gains of 1973 calves during various intervals.

Treatment	50 day weight	Ave age	Ave daily gain	Weaning weight days	Ave daily gain	Wt. on 11-7-73	Post weaning daily gain	Wt. on 1-30-74	Ave daily gain	Lb. feed per lb of gain
Crypt at birth	168.1	50	1.62	378.8	1.94	466.2	1.12	632.8	1.98	7.23
Steer + Zeranol	153.8	47	1.58	359.4	1.89	449.4	1.15	585.6	1.62	8.27
Steer at birth	179.0	58	1.68	389.8	1.92	476.0	1.11	620.8	1.72	7.99
Steer at 60 days	170.2	52	1.61	376.4	1.91	466.7	1.16	599.1	1.58	8.36
Crypt at 60 days	179.2	55	1.78	388.0	1.97	477.6	1.15	649.6	2.05	6.75

RESEARCH IN PROGRESS

TITLE Beef production on irrigated pastures.

OBJECTIVES

1. To determine seasonal changes in the quality of grass, clover, and grass-clover pastures.
2. To determine the feasibility of supplementing yearlings on pasture.
3. To determine stocking rates.
4. To determine proper management to maximize pounds of beef per acre.

TITLE Supplementation of grass straw.

OBJECTIVES

1. To determine the digestibility of hard fescue and Merion bluegrass straws.
2. To evaluate various levels of energy and protein supplementation.
3. To observe yearly variation in straw quality.

TITLE Diet analysis of steers grazing a forest clearcut.

OBJECTIVES

1. To determine the various plant species consumed and the amount of each.

PREVIOUS REPORTS

These reports are available upon request from the Eastern Oregon Experiment Station, P.O. Box E, Union, Oregon 97883.