

DAILY VERSUS ALTERNATE FEEDING OF RANGE SUPPLEMENTS

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Much work has been done on the supplementing of growing animals while grazing crested wheatgrass ranges during the summer. Supplementation of grazing yearling cattle is an economical practice provided the correct supplement program is followed. Practical methods of feeding must be developed before range supplementation will be an accepted practice by most livestock operators. Biuret ¹/₁, a nonprotein nitrogen compound, has given good results when fed to range animals after protein content of the forage declines with plant maturity. Biuret was used in different supplement regimens to determine the feasibility of feeding these supplements in a more practical manner.

EXPERIMENTAL PROCEDURE

Forty-two yearling steers from the Station herd were grazed on crested wheatgrass pastures on the Squaw Butte experimental range. Individual feeding pens were setup for the necessary supplementation. The experimental design was a 3 x 2 factorial with three frequencies of feeding and two starting dates with six replications (Table 1). Supplements were fed daily, every other day, or every fourth day with starting dates of May 15 and July 15. A control group of steers received no supplement. Animals were neck-chained with different color tags for easy identification to treatments. The animals grazed together on crested wheatgrass pasture with free access to water, salt, and a salt-bonemeal mixture. All animals were penned each morning starting May 25, including those which began supplements July 15, in individual feeding stalls and fed their respective diets. Control animals were penned in the same manner as those receiving supplements. The cattle were weighed after an overnight restriction from feed and water just prior to the start of the trial and each four weeks thereafter for the duration of the trial. The trial was initiated on May 25 and continued through August 19.

Table 1. Experimental design

Feeding frequency	No supple- ment	Starting date		Total number of animals
		May 25	July 15	
Control	6			6
Daily		6	6	12
Every other day		6	6	12
Every fourth day		6	6	12
Total number of animals	6	18	18	42

¹/₁ Number of animals on each treatment

¹/₁ Biuret was provided by the Dow Chemical Company under the trade name "Kedlor". The Dow Chemical Company also provided financial assistance for this research.

The supplemental nitrogen and energy was fed daily in amounts to provide for approximately 2.25 pounds daily gain up to July 15. It was felt that the bulkiness of the diet of the every fourth day feeding would become a limiting factor after July 15 so supplementing beyond this date would probably provide for less gain than anticipated earlier. Table 2 shows the nitrogen and energy supplementation levels necessary to maintain 2.25 pounds during the grazing season from previous studies at Squaw Butte. This takes into consideration the decline in those nutrients provided from the forage as the forage matures. The nitrogen was supplemented as indicated in Table 2, with energy being fed at a constant rate after bulk became a factor on the "alternate days" feed. Composition of the supplements is included in Table 3 with sulphur supplied so that each animal received 0.03 pound of additional sulphur from the grain supplement and the supplemental sulphur combined. Since biuret does not contain sulphur as do the plant proteins, sulphur was added to insure adequate amounts for protein assimilation.

Table 2. Nitrogen and energy supplementation levels for different periods during the grazing season 1/

Period	Nitrogen (g./hd./day)	Digestible energy (kcal./hd./day)
Turnout - 5/30	8.7	1560
5/31 - 6/6	6.5	1170
6/7 - 6/13	4.4	780
6/14 - 6/20	9.7	750
6/21 - 6/27	17.2	1120
6/28 - 7/4	23.2	1420
7/5 - 7/11	26.5	1800
7/12 - 7/25	36.2	2390
7/26 - 8/8	46.3	3550
8/9 - 8/22	50.4	4620
8/23 - 9/5	54.2	5180
9/6 - 9/19	58.0	6150
9/20 - 10/4	62.0	7000

RESULTS AND DISCUSSION

The animals went on feed readily and after the first week of the trial were consuming their respective supplements as shown in Table 3 with little or no refusals. The average daily gain of steers starting on supplement on May 26 was 2.38, 2.03, and 2.15 pounds on the daily, every other day, and every fourth day feeding, respectively, as compared to 2.19, 1.84, and 1.90 pounds on steers receiving supplements beginning on July 17 (Table 4). Control animals gained 1.93 pounds per day over the 96 day trial. This trial was designed to run several more weeks but forage became limited and the trial had to be discontinued.

Table 3. Supplemental feed schedule 1/

Date	Barley	Biuret <u>2/</u>	Sulphur <u>3/</u>
	(lb.)	(lb.)	(lb.)
5/26 - 5/30	1.00	----	----
5/31 - 6/6	0.75	----	----
6/7 - 6/13	0.50	----	----
6/14 - 6/20	0.48	0.03	0.03
6/21 - 6/27	0.70	0.06	0.03
6/28 - 7/4	0.91	0.09	0.03
7/5 - 7/11	1.13	0.11	0.03
7/12 - 7/25	1.50	0.13	0.03
7/26 - 8/8	2.23	0.16	0.03
8/9 - 8/19 <u>4/</u>	2.23	0.18	0.03

1/ Supplemental schedule for those fed daily, with animals being fed every other day fed twice this amount per feeding and those fed every fourth day, four times this amount per feeding.

2/ A small amount of barley was fed as ground barley to premix with the biuret.

3/ Sulphur was fed to supply each animal with 0.03 pound of additional sulphur from the grain supplement and the supplemental sulphur.

4/ Bulk was becoming a factor with the every fourth day feeding, so energy level was held constant, with nitrogen continuing to increase as scheduled.

Table 4. Gain data over 96 day trial

Treatment	Initial wt. 5/25	ADG				
		Accumulative			By period	
		6/24	7/22	8/19	5/25-7/22	7/22-8/19
	(lb.)	(lb.)	(lb.)	(lb.)	(lb.)	(lb.)
Control	604	3.03	2.40	1.93	2.40	0.96
May 26 <u>2/</u>						
Daily	587	3.13	2.76	2.38	2.76	1.61
Every other day	598	3.00	2.64	2.03	2.64	0.79
Every fourth day	623	3.03	2.62	2.15	2.62	1.18
July 17 <u>2/</u>						
Daily	572	3.03	2.40	2.19	2.40	1.75
Every other day	609	2.53	2.28	1.84	2.28	0.93
Every fourth day	589	2.83	2.36	1.90	2.36	0.93

1/ Accumulative ADG from the initial weight to the date shown.

2/ Starting date for receiving supplements.

The accumulative mean data showed that steers fed daily outgained either those fed every other day or every fourth day. Gain data between every other and every fourth day was variable with little differences between the two.

All supplemented groups of animals which were started on May 26 outgained the control group. However, of the animals which were started on supplements July 17, only the daily-fed group gained more than the control group. The data suggests that in order to achieve maximum gain, supplementation should begin early in the summer.

Table 4 shows the gain data for the first 58 days and the last 38 days. All supplemented animals, which essentially would be only the animals beginning on May 26, outgained the control animals during the first 58 days. However, this difference was not maintained throughout the final 38 days. The gains over the last 38 days were similar between the two groups with little difference between those starting on May 26 and those starting on July 17. Again in the second period, animals receiving daily supplements gained more than those supplemented either every other or every fourth day during this period. Supplementation in the first 58 days had little or no effect on gains in the last 38 days.

CONCLUSIONS

The results of this trial would indicate that weight gains of yearling steers supplemented with energy and nitrogen daily while grazing crested wheatgrass would be higher than those receiving supplements less frequently. These data indicate that a method of feeding range supplements must be devised so that animals receive their supplements daily. This can be accomplished either through hand-feeding of the animals, a salt control mix which will limit their daily supplement intake, block feeding which also will limit their supplement intake, or some other possible mechanism.

MANAGEMENT OF CATTLE GRAZING NATIVE FLOOD-MEADOWS

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Previous work at the Squaw Butte Station and other range stations in the western area indicate a decline in quality of range forage from the beginning of the grazing season, in mid or late April on through the grazing season. Forage quality on the native flood-meadow, follows this same trend. Although we have little cattle gain data from these meadows the nutrient value of these forages would indicate that we would get much the same response as from range forage. Protein content of the flood-meadow forage is high in early spring dropping down to about eight percent by the early part of July, after this time the protein content drops by about one percent per week. Digestible energy values follow this same trend.