

Addition of Minerals

to a beef cattle ration

Thirteen mineral elements are essential to animals, and must be present in their diet: calcium, chlorine, cobalt, copper, iodine, iron, magnesium, manganese, phosphorus, potassium, sodium, sulfur, and zinc. Under certain conditions or in certain limited areas, livestock production has been greatly improved by addition of one or more of these essential elements to the animals' diet. This finding has led to the extensive use of mineral supplements in livestock feeding even in areas where specific deficiencies have never been shown to exist. It is important that livestockmen know definitely the conditions and areas under which one or more minerals is likely to be lacking so that expenditures for unnecessary feed supplements for specific situations can be avoided.

Approximately one-third of all California's feedlot cattle are in the irrigated desert valleys of Imperial and Riverside counties. These animals are fed widely varying rations. Generally, however, the major components of the rations are produced in the desert areas. A trial was con-

ducted to determine if additional minerals would be beneficial to Hereford steers on a fattening ration the components of which were produced in the Imperial Valley.

Two groups of steers were fed, for 152 days, a basal ration of 40% alfalfa hay, 45% barley, and 15% molasses dried beet pulp—ration analyzed 14.6% protein, 3.6% lignin. One group received, in addition, a complex mineral supplement mixed with the basal ration at the rate of two pounds of supplement to 98 pounds of ration. The supplement was composed of 1.5 grams of cobalt sulfate and the following percentages of minerals: dicalcium phosphate, 45.5; iodized salt, 30.4; magnesium sulfate, 21.2; fer-

ric citrate, 1.8; manganese sulfate, 0.4; zinc sulfate, 0.4; copper sulfate, 0.3.

No significant differences were found in average daily gains or carcass yields. The control animals had significantly fatter carcasses than did those fed extra minerals although all animals were sufficiently well finished to be graded choice. Analysis of the feed intake data indicated a very significant decrease in consumption of the mineral-fortified ration. It could not be determined from the data whether this indicates a decrease in ration palatability due to the mineral supplement or is simply a result of animal variation.

The results of the trial indicate that rations made up of feedstuffs produced in the Imperial Valley, which are adequate in content of other nutrients, will also supply sufficient minerals to permit maximum utilization of the feed by beef cattle.

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Gains, Feed Consumption, and Carcass Data of Control and Mineral-Supplemented Steers

Treatment	Steers per lot	Initial weight lbs.	Total gain lbs.	Daily gain lbs.	Daily feed* lbs.	Feed/lbs. gain	Carcass yield† %	Body fat‡ %
Control	9	596	375	2.46	20	8.1	59.5	26.3
Minerals	8	591	365	2.40	19	7.9	60.6	24.6

* Dry basis.

† Warm carcass weight divided by final experimental weight.

‡ Live weight basis.

CLOVERS

Continued from preceding page

Ten pounds per acre of pure viable sub-clover seed were used as the standard rate with the seeding rate for the other species adjusted accordingly on a per viable seed basis.

Herbicide treatments consisted of 0.3 and 3.0 pounds per acre of 2,4-D ester—Esteron 10-10. Two volumes of spray material were tested at both 2,4-D rates—10 and 100 gallons per acre—including one gallon per acre of Diesel oil at both spray volumes.

Spray treatments were made with a hand-pump type sprayer equipped with a three-nozzle hand boom. For the 10-gallon per acre volume, Monarch No. 20—.0020-inch diameter—tips with 100-mesh screens were used. For the 100-gallon

per acre volume, No. 59—.0059-inch diameter—tips with 40-mesh screens were used. Pressure was maintained as nearly as possible at 30 pounds as indicated by a pressure gauge at the pump valve.

Spray treatments were made on April 17, 1958, and May 22, 1958. At the first date the subclover was in a very early bloom stage, the crimson clover was in the immediate pre-bud stage, and the rose clover was still in a vegetative condition. At the second date the subclover was still flowering. The crimson clover was about 90% to 95% past full bloom, with most seed heads browned. The rose clover was about 50% past full bloom with 50% of the heads at full bloom. The plot area was sprinkler irrigated once on May 9, 1958, to alleviate the harmful effects of a prolonged dry spell. To eliminate possible effect of weed populations resulting

from treatments, weeds were removed several times by hand hoeing.

Harvests were made during the first week of July, in the early morning hours. Eight feet of row were harvested from the center of each plot. In the case of the mixed rose and subclover rows, the two species were separated at time of harvest. The plant material was air-dried for several days and then weighed. The seed was threshed, cleaned, and germinated as in the previous experiment.

The second part of this article will be published in August.

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