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Comparative intake of bone meal and calcium phosphate mineral mixtures as phosphorus sources for grazing steers and lactating cows

Abstract

Steers on native grass consumed equal amounts of mixtures containing 50% trace mineralized salt and either 50% bone meal or 50% calcium phosphate. Lactating cows consumed about 60% more of the bone meal:salt mixture. This research verifies that both products are palatable supplemental phosphorus sources and that choice of product should be a function of cost per unit of phosphorus.

Keywords

Cattlemen's Day, 1983; Report of progress (Kansas State University. Agricultural Experiment Station); 427; Beef; Bone meal; Calcium phosphate; Steers; Lactating cows

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Comparative Intake of Bone Meal and Calcium Phosphate
Mineral Mixtures as Phosphorus Sources for Grazing
Steers and Lactating Cows

Frank Brazle,¹ Gerry Kuhl,
Ted Wary² and Dale Lanham³

Summary

Steers on native grass consumed equal amounts of mixtures containing 50% trace mineralized salt and either 50% bone meal or 50% calcium phosphate. Lactating cows consumed about 60% more of the bone meal:salt mixture. This research verifies that both products are palatable supplemental phosphorus sources and that choice of product should be a function of cost per unit of phosphorus.

Introduction

Steamed bone meal and phosphates are popular sources of highly available phosphorus in livestock mineral mixtures. Both are relatively palatable and can be fed free-choice. These two trials compared the phosphorus consumption of cattle having free access to a loose mixture containing 50% trace mineralized salt and 50% of either bone meal or calcium phosphate.

Experimental Design

Trial 1: One hundred thirty crossbred steers averaging 600 lbs were randomly allotted to two native grass pastures on the Dick Pringle Ranch, Yates Center, KS. Cattle in one pasture were offered a mixture of 50% bone meal and 50% salt, while the other group received a 50% calcium phosphate and 50% salt mix. Mineral mixes were switched between pastures once a month to eliminate pasture effects. Intake was monitored weekly. The trial ran from May 19 to July 28.

The 50% bone meal mixture averaged 6% phosphorus, 14.5% calcium and 50% salt, while the 50% calcium phosphate (mono- and di-calcium forms, Farmland CoPhos®) mix averaged 10.5% phosphorus, 9% calcium and 50% salt.

Trial 2: Thirty-six Simmental cow-calf pairs were divided between two late fall K-31 Fescue pastures at the Dave Meyers Farm, Columbus, KS. Pastures were fertilized and stocked similarly. The mineral mixtures were the same as in Trial 1. Intake was checked weekly.

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Results

Average daily intake of the two mineral mixtures and the calculated daily phosphorus consumption of the steers and cow-calf pairs are shown in Table 28.1. The steers ate nearly identical amounts of the two mineral mixtures. Because the calcium phosphate mixture contained more phosphorus, steers fed this free choice mixture consumed nearly twice as much phosphorus as those fed the bone meal mixture. Since research has not shown a phosphorus deficiency in steers grazing native grasses in Kansas, the steers were probably satisfying their salt appetite, which was similar for both groups. Monthly grass clippings of the two pastures were similar in calcium, phosphorus, sodium and potassium levels.

The lactating cows on fescue pasture consumed 2 to 4 times more total mineral than the steers in Trial 1, due to their higher requirements and differences in grass type. Cows having access to the bone meal mixture consumed about 60% more total mineral than cows on the calcium phosphate mix. The increased intake compensated for the lower phosphorus content of the bonemeal mixture, resulting in similar phosphorus intakes from both mixtures. Considering the high phosphorus requirements for lactation, these data suggest that the cows were attempting to meet their need for This nutrient.

Table 28.1. Daily Total Mineral and Phosphorus Intake of Steers and Cow-Calf Pairs

| Mineral mixture | Steers on native grass | | Cows on fall fescue | |
|--|------------------------|----------------------|---------------------|----------------------|
| | Mineral lb/day | Phosphorus lb/day | Mineral lb/day | Phosphorus lb/day |
| 50% calcium phosphate: 50% trace mineral salt | .079 | .0083 | .19 | .020 |
| 50% bone meal: 50% trace mineral salt | .076 | .0045 | .30 | .018 |