Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 1 *Cattleman's Day (1993-2014)*

Article 1394

1973

Predicted digestible energy and protein intakes of steers grazing bluestem pastures

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Abstract

Digestible protein and energy intakes by steers grazing native bluestem pastures were estimated using prediction equations established at this station. Digestible energy intakes appear to be satisfactory for yearling steers on burned and unburned pastures. Digestible protein intake is probably grater on burned than on unburned pastures; however, that nutrient becomes limiting during the grazing season.

Keywords

Cattlemen's Day, 1973; Report of progress (Kansas State University. Agricultural Experiment Station); 568; Beef; Protein; Energy; Steers

Predicted Digestible Energy and Protein Intakes of Steers Grazing Bluestem Pastures

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Summary

Digestible protein and energy intakes by steers grazing native bluestem pastures were estimated using prediction equations established at this station. Digestible energy intakes appear to be satisfactory for yearling steers on burned and unburned pastures. Digestible protein intake is probably greater on burned than on unburned pastures; however, that nutrient becomes limiting during the grazing season.

Introduction

Determining forage consumption by a grazing farm animal has been the major obstacle to using modern nutritional knowledge to improve performance. Because animals graze selectively, hand sampling is not valid, so trial and error methods are the major means of improvement. Over the past two summer grazing seasons, we have combined recently developed experimental techniques to predict intake.

Methods

Samples of forages from esophageally-fistulated animals and regression equations developed by us and others have made it possible to predict organic matter intake and digestibility. Fron digestibility studies using hays cut at differing stages of maturity, we (KAES Bull. 557, 1972, p. 6), have estimated digestible energy and protein available.

Results

The data presented represent control and burned pastures the first grazing season. Temperature and precipitation were near expected values. We present the probable digestible energy and protein intakes, based on a 440 lb. steer gaining 1.1 lb./day. Figure 1 shows that digestible energy intake is greater from the burned pasture than from nonburned control pastures until August; after that there seems to be no difference in energy intake. Energy probably is not limiting for 1.1 lb./day gains with steer grazing systems usually used in the Flint Hills area.

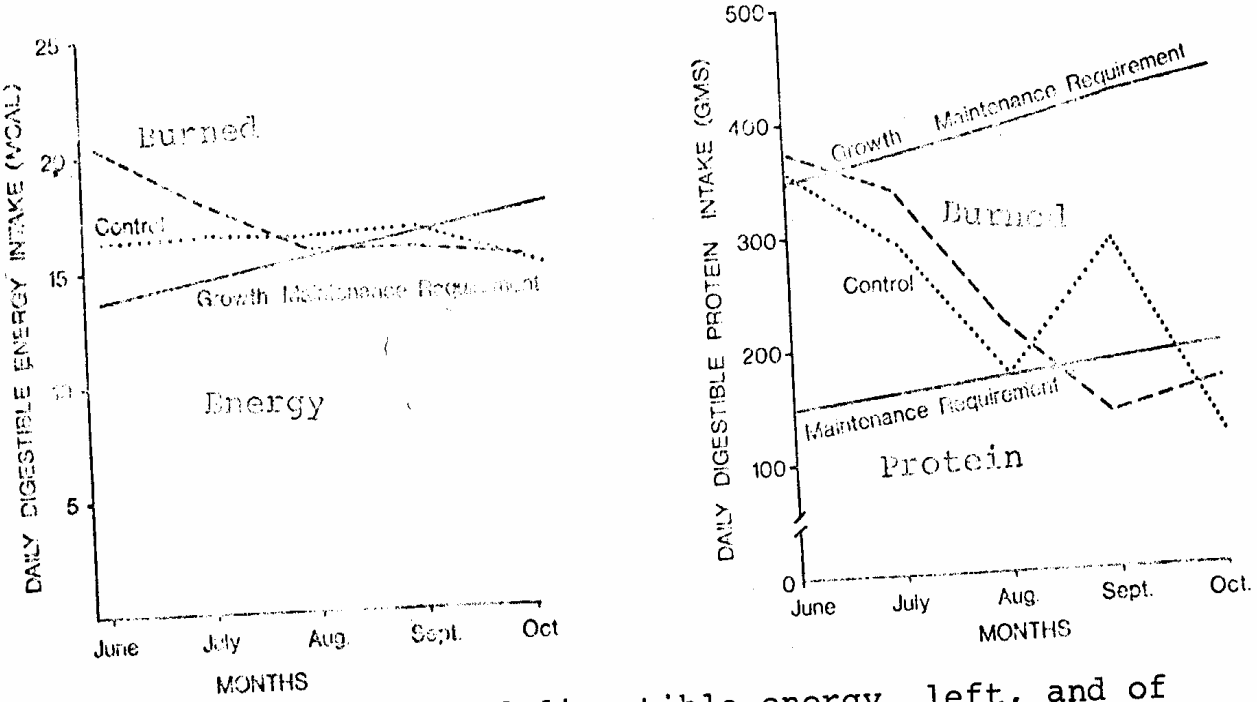

Figure 1 . Amount of digestible energy, left, and of digestible protein, right, required for maintenance plus 1.1 lb. daily gain by a 440-lb. yearling steer and the amounts range forage probably furnishes.

Figure 2 shows the theoretical digestible protein intake by steers. It is consistently higher from burned than from unburned pastures through August. By July, digestible protein intake becomes limiting in both. When protein becomes limiting cannot be determined exactly because of differences in previous pasture management, stocking rate, rainfall, etc.

Calcium and phosphorus intakes may also be important because hays cut at differing stages of maturity indicate balance changes (KAES Bull. 557, 1972, p. 9). Phosphorus balance was negative in animals fed June and September hays while calcium balance was negative when animals were fed September hay. Animals on July hay were in positive balance for both minerals. Salivary contamination prevented us from studying calcium and phosphorus so our implication of imbalances is from indirect evidence only.

Our data suggest that protein is one of the factors limiting steer growth late in the summer grazing period. Feeding protein supplements to steers from August to October usually has been successful but probably not economical (KAES circ. 335, 1956, p. 16; circ. 349, 1957, p. 28).