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In vitro digestibility of Flint Hill rangeland forages

Abstract

We used an in vitro digestibility technique to determine the nutritive value of predominately native bluestem forage on burned and nonburned Flint Hills pastures. We also collected forage samples via esophageal fistulas to get what the animals consumed while grazing selectively. Summary Dry matter (DM) digestibilities for 11 months by both techniques followed changes in climatic conditions. The lowest DM digestibility averaged about 65% in October, 1975, and June, 1976; the highest (about 80%) was between February and March 1976. The grass selected by animals was usually more digestible than that harvested by hand. However, in vitro digestibility of the extrusa may be higher than actual digestibility in the animals when both solid and liquid fractions of the extrusa are collected.

Keywords

Report of progress (Kansas State University. Agricultural Experiment Station); 291; Cattlemen's Day, 1977; Beef; In vitro; Digestibility

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In Vitro Digestibility of Flint Hill Rangeland Forages

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D. Boggs, and J. Whitney

Summary

We used an *in vitro* digestibility technique to determine the nutritive value of predominately native bluestem forage on burned and nonburned Flint Hills pastures. We also collected forage samples via esophageal fistulas to get what the animals consumed while grazing selectively.

Dry matter (DM) digestibilities for 11 months by both techniques followed changes in climatic conditions. The lowest DM digestibility averaged about 65% in October, 1975, and June, 1976; the highest (about 80%) was between February and March 1976. The grass selected by animals was usually more digestible than that harvested by hand. However, *in vitro* digestibility of the extrusa may be higher than actual digestibility in the animals when both solid and liquid fractions of the extrusa are collected.

Introduction

Range pasture varies widely in quality and botanical composition. Most US rangelands are semi-arid with seasonal variation in precipitation and temperature. The growth characteristics, quality, and availability of grass govern the time animals graze. Various factors have been recommended to measure forage quality, growth characteristics, and availability.

The esophageal fistula permits sampling the grazed forage. In this report, *in vitro* digestibility of esophageal fistulated grass samples was used to assess forage quality of Flint Hills rangeland.

Experimental Procedure

The rangeland used is 4 miles northwest of Manhattan. Most of the pastures are grazed by Hereford beef-cows with calves. In 1975, 9 pastures totaling 492 acres were selected for burned and nonburned treatments. Five were burned April 22, 1975. Two esophageal fistulated steers were used to collect grass samples once a month from one burned and one nonburned pasture. The steers were fasted 24 hours before entering pastures for grazing/sampling. Canvas bags with wire-mesh bottoms were suspended below the esophageal fistulas to collect the grass as they grazed. The samples were dried at 55F, ground, and used for *in vitro* digestibility of dry matter (DM) and organic matter (OM) measurements. 1975, sampling started in October and continued into 1976.

In the spring of 1976, burned pastures were burned April 23. Sampling continued as in 1975. Burning in 1976 was sporadic because most of the pasture had already turned green, which permitted continuous sampling.

Results and Discussion

Preliminary results of the *in vitro* digestibility studies are summarized in Figure 15.1.

The figures appear rather high but *in vitro* digestibility figures are higher than actual digestion, when the extrusa used to determine the digestibility contains both solid and liquid fractions. Also, grazing animals usually select more nutritive and more digestible grass than that randomly harvested by hand.

The trend in Figure 15.1 shows how the DM digestibility varied with seasons and climatic conditions. In burned and nonburned pastures digestibility gradually increased from November to January and on to a peak between March and April, 1976. The first spring lush grass harvested was responsible for the peak. Then digestibility declined to the lowest point between June and July, the hottest months of the year. Autumn regrowth started in August after the only good rainfall in August.

On the whole, DM digestibility of the burned pasture exceeded that of the nonburned pastures.

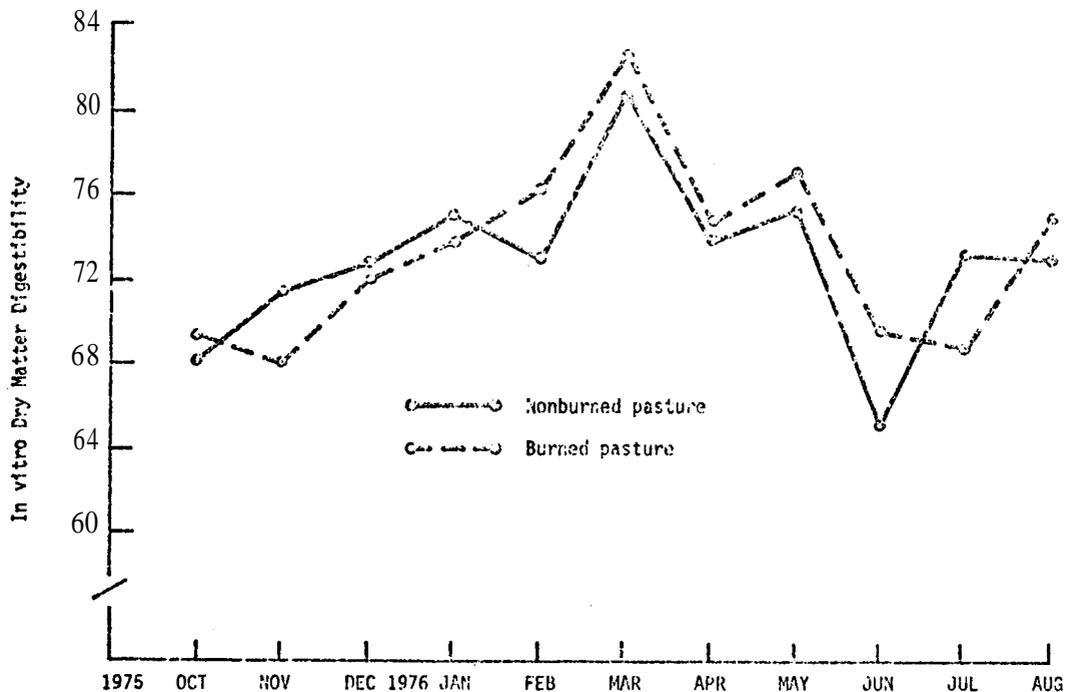


Figure 15.1. Effect of month on steer digestibility of native range.