Effect of Fertilization on the Nitrogen, Calcium, and Phosphorus Contents of Pasture Herbage

F. W. Sherwood, J. O. Halverson, W. W. Woodhouse, and F. H. Smith

In recent years considerable emphasis has been placed on the soil-plant-animal relationship. Many instances of nutritional failure of animals have been traced to soil deficiencies. Even in areas where the nutritive status of grazing animals is apparently normal, rather marked variations in the chemical composition of the forage have been observed. What the nutritional significance of these variations may be has not been adequately tested by carefully planned feeding experiments.

Abundant evidence exists which shows a complex interrelationship between the composition of pasture plants and the type and characteristics of the soil, the amount and availability of plant nutrients, the climatic conditions, including amount of precipitation and its distribution, the species and variety of plant and its stage of maturity, the frequency of cutting, and other cultural practices. The literature on the various phases of soil-plant-animal relationships is too voluminous to cite here. Those parts of the subject that are particularly pertinent have been reviewed by Beeson (2), Browne (3), Kraus (7), and Russell (10). Numerous contributions to one or more phases of this subject have appeared since some of these reviews were written, but they only offer additional evidence and do not alter the interpretation of the older data.

Pasture soils in general, particularly in humid regions, are apt to be deficient in phosphorus. In some localities, the deficiency is so acute that cattle subsisting exclusively, or nearly so, on the native forage suffer from aphosphorosis. The application of phosphatic fertilizers to most pasture soils results in an increased yield of dry matter which may contain a larger percentage of phosphorus and nitrogen (crude protein).