THE SOILS OF NEW HAMPSHIRE AS RELATED TO A DEFICIENCY IN CATTLE RESPONDING TO COBALT

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For many years a nutritional deficiency in cattle has been observed on many farms in Carroll County, N. H., and within the past two years it has been found that this deficiency responds to the feeding of cobalt (6) This, or a similar deficiency, occurs also in some parts of Massachusetts, Michigan, Wisconsin, North Carolina, and Florida (1), and in some other parts of the world (8). During the past two years this deficiency has been found to occur on some farms in other parts of New Hampshire. The deficiency is sufficiently widespread and is of such importance to the individual dairyman that since about July 1, 1945, many of the feed manufacturers serving New Hampshire have been adding cobalt to dairy feeds. Inasmuch as a large portion of these concentrates fed in New Hampshire are mixed commercially, it is probable that the deficiency will not be of particular importance hereafter and it will not be possible to observe the locations where such deficiencies are most likely to occur.

During the year just before cobalt was added to the commercially mixed feeds, 126 farms were located in the state on which the deficiency in cattle occurred and considerable information regarding these farms was obtained. It is the purpose of this paper to report on the relationship that exists between the deficiency and the soils on these farms.

LOCATING DEFICIENT FARMS

Requests for cobalt were received at the Experiment Station by letter, personal calls, and through county agricultural agents, feed dealers, and veterinarians. Some had heard of results of cobalt feeding through neighbors or news stories, while others were simply writing for help. Chemically pure cobaltous sulfate was furnished with the recommendation that it be dissolved in water at the rate of 1 ounce to 1 gallon of water and this solution fed in the most convenient way to mature cattle at the rate of two tablespoons per day for the first week and one tablespoon per day for several weeks thereafter. Calves were fed at one-third of the above rate.

This study cannot be taken as an intensive survey of the conditions throughout the state. It was not intended to be. It simply represents the cases that were voluntarily brought to the attention of the Experiment Station staff. However, since all cases were observed and since practically all of the cases were admitted, it is believed that this study gives a fairly representative picture.

Although cobaltous sulfate was sent to 126 farms, reports were not obtained from all of them. This study is based on reports from 137 farms of which two of these cobalt was not used because the affected animal was sold or for some other reason. In these cases this was predicted because of characteristic symptoms, but the owner still chose to try the cobalt treatment. In the remaining cases very definite beneficial results were reported. The results were usually observed within 3 to 5 days. Personal visits were made to these farms whenever possible, but information about the results obtained also through county agricultural agents and other responsible persons.

IDENTIFICATION OF SOILS

The soils upon which most of the hay and land is located were identified from recently published soil maps in the case of Coos and counties (7, 9); from unpublished recent soil maps in the case of Cheshire, Hillsboro, Strafford, van, and part of Rockingham counties; and personal examination of the individual farms by the authors in the remaining area. The soil type and the number of the farms occurring on these soils are listed in Table 1. The important distinguishing characteristics of all the soil series mentioned in this report are shown in Table 2.

DISCUSSION

Fig. 1 shows the location of the farms imposed on a generalized map showing associations of the soils of New Hampshire. This map was compiled from published and unpublished recent soil maps and from observations and notes made by the authors on the area where recent maps were available.

The names of the most prevalent soil series are used to identify the various soil associations. This map also shows the kind of rocks from which the parent materials of the most prevalent of the associations are derived.

The most striking feature of this map is the relationship between the location of the farms.