

Prairie Hay as Source of Vitamin A

By DONALD W. BOLIN¹, EARLE W. KLOSTERMAN², and CHRISTIAN JENSEN³

Does prairie hay contain enough carotene to be a good source of vitamin A for livestock? The answer to this question is yes, if good haying practices are followed.

During the 1948-1949 feeding season, samples of alfalfa and prairie hay were taken for carotene analyses in connection with a project on vitamin A studies in dairy cows. An attempt was made to purchase the best quality alfalfa hay on the local market; however no attempt was made to purchase the best quality prairie hay. It is felt, therefore,

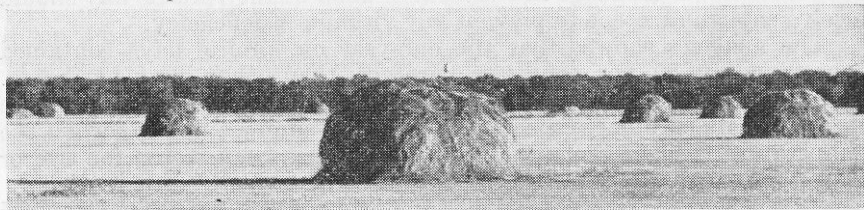


Fig. 1. Prairie hay is an important crop in North Dakota. Pictured are stacks north of Towner, in McHenry county.

that the carotene content of the alfalfa samples analyzed should represent the better quality alfalfa. The results of these carotene analyses are as follows:

	Number of Samples	Average Carotene Content-mg./lb.
Alfalfa Hay	29	7.72
Prairie Hay	29	20.43
Prairie Hay (1 yr. old).....	27	11.35

The above results show that prairie hay averages much higher in carotene than alfalfa hay samples. These findings are contrary to general opinion. Alfalfa hay that is properly cared for during haying time has been and is still considered by most feeders as a better source of carotene than most grass hays.

The length of time required for the hay to dry has a marked effect on its carotene content. The longer the time the hay is in the process of drying the greater is the loss of carotene. Fresh green alfalfa, especially the leaves, will contain more carotene than fresh green prairie hay. Alfalfa is one of the hay crops that is difficult to dry under normal haying weather conditions. It dries slowly and has to remain in the field longer than prairie hay before it is dry enough for storage. It is during this initial drying period that a large percentage of carotene in the alfalfa is lost due to enzymatic action. These enzymes are very active at this early stage of drying, especially when the temperature is high and the moisture content of the hay is between 40 and 70 per cent. Under the very best conditions of field drying approximately 80 per cent of the carotene in alfalfa is lost by the time the moisture content has been reduced below 40 per cent.

¹Associate Nutritionist.

²Associate Animal Nutritionist.

³Dairy Technologist.

Prairie hay is a relatively different type of forage than alfalfa with respect to its drying and curing properties. The initial moisture content is lower, it has a finer stem, and its yield per acre is less than alfalfa. These properties are conducive to rapid drying and curing. Thus the percentage loss of initial carotene content is much less than that of alfalfa.

Although prairie hay may contain a lesser amount of carotene in the fresh green stage than alfalfa, a smaller percentage of carotene is lost due to the rapid rate of drying. Consequently a hay with a relatively high carotene content is obtained. The results of the carotene analyses verify this statement. These results also show that an animal receiving one-fourth of its roughage in the form of good quality prairie hay should receive enough carotene to prevent any vitamin A deficiency.

The analyses showed that the one-year old prairie hays contained approximately 50 per cent less carotene than when first harvested. This is to be expected. Hay stored in mows or stacks loses a considerable amount of its carotene, especially during the summer months when the temperature is high. Consequently hay that has been stored for two or three years may contain little or no carotene.

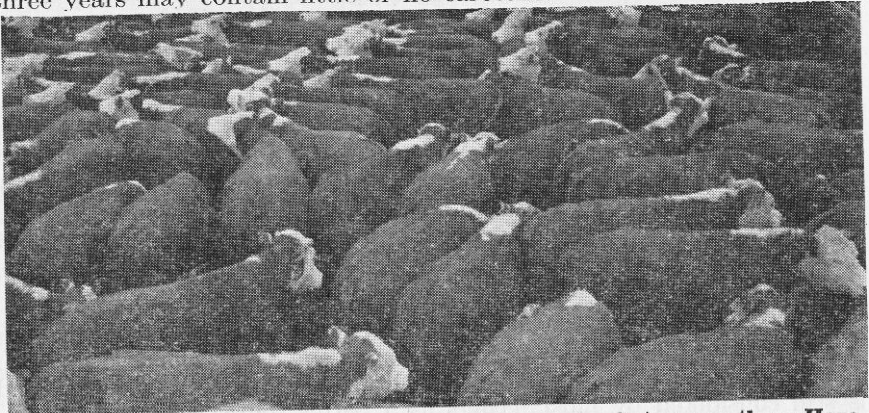


Fig. 2. Native grasses alone produce such plump beef steers as these Herefords, owned by the Davidson Cattle company of Williston and sent to the Sanish, N. D. yards for shipment. These three-year-olds weigh around 1300 pounds, all of it from native range pasture.

To produce a good quality prairie hay with a relatively high carotene content one should cut the hay before it reaches maturity and never allow it to lie in the field longer than necessary to dry. It should be strongly emphasized that the chances are very good for animals to become vitamin A deficient if fed prairie hay that has been cut after maturity, allowed to bleach in the field, or hay that has been stored for several years.

Summary

It has been pointed out that prairie hay can be a good source of vitamin A, if good haying practices are followed; and also a poor source of vitamin A if poor haying practices are used. Prairie hay that has been in storage for several years may lose all of its vitamin A activity through the loss of its carotene content. It should be mentioned here that prairie hay is very low in protein, phosphorus, and calcium in comparison to alfalfa. If prairie hay is fed it should be supplemented with a protein and a mineral concentrate.