

CHEMICAL AND NUTRITIVE PROPERTIES OF *CENTAUREA AMERICANA* NUTT. (STAR THISTLE)¹

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Centaurea americana Nutt., commonly referred to as star thistle, is widely distributed from Missouri to Louisiana and west to Arizona. It has been observed that it grows abundantly and the yield of seed is good on depleted soils of southern Oklahoma. The plant is easily harvested and threshed, though there is a tendency for uneven ripening and shattering of the small seeds. Cattle² eat the seed and the question of its nutritive chemical and nutritive properties of these seed have been investigated in this laboratory during the past two years.

The seed used in these experiments were harvested in southern Oklahoma in the summer of 1943. An analysis showed that the seed contained 5.78 percent moisture, 4.02 percent ash, 19.13 percent protein, 11.57 percent ether extract, 19.34 percent crude fiber, 51.73 percent N.F.E., 0.198 percent calcium, 0.556 percent phosphorus, and 2.97 mg HCN per 100 grams of seed. The moderate yield of yellow oil suggested a more detailed examination of the oil, which gave the following data: refractive index 1.472, saponifi-possibilities has been raised frequently. The literature gives no reference to the seed in regard to chemical composition and nutritive value. The cation number 195, iodine number 96, and carotene 1 microgram per gram. All analyses were made with the latest methods of the A.O.A.C. (Anon. 1940).

The nutritive value of the seed was studied using albino rats and chickens as experimental animals. Rats that were fed ground seed supplemented with minerals and vitamins died within two weeks. The feed evidently was decidedly distasteful, as little was consumed. When the seed was mixed with an equal weight of corn and properly supplemented with

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² Mr. Dan Diehl of the Oklahoma Agricultural Extension Service made the original observations on its consumption by cattle and collected the seed used in these experiments.

minerals, the rats ate only small amounts and attempted to separate the thistle seed from the corn. The rats appeared unkempt, their coats were rough, and they lost weight during the experimental period; therefore, the thistle seed was diluted further. Growth of the rats was normal when the star-thistle seed was used in a smaller proportion in the following ration: star-thistle seed 30 percent, casein 10 percent, granulated starch 51 percent, mineral mixture 21 percent, yeast 6 percent, and cod-liver oil 1 percent. It was found necessary to grind all components of the feed finely so that separation was impossible; still the rats wasted considerable amounts of the ration.

In the test with chickens it was necessary to further dilute the seed for satisfactory results. A ration which produced normal growth and plumage of normal color and appearance had the following composition: star-thistle seed 15 percent, corn 50 percent, wheat shorts 8 percent, butter-milk (dried) 15 percent, alfalfa meal 5 percent, salt 1 percent, calcium carbonate 1 percent, casein 5 percent, and 0.25 percent of cod-liver oil was added to the ration.

These experiments show that star-thistle seed can be used in rations for chickens and rats provided that (a) seed is diluted with other substances sufficiently to make it palatable to the animal; (b) the feed is ground finely enough to prevent separation of individual particles.

LITERATURE CITED

Anonymous. 1940. Official and tentative methods of analysis. Washington (D. C.): Association of Official Agricultural Chemists.
