

THE CAROTENE CONTENT OF THE GRAIN SORGHUMS¹

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The grain sorghums have been used by man for centuries. Their use in this country has been increasing for ninety years. Today they are one of the principal crops in the semiarid great plains of the midcontinent area. The grain serves for chicken and stock feed instead of the corn used in the northern states. For many years yellow corn has been more popular than white owing to its greater vitamin-A content. The interest in this factor in white- and colored-grain sorghums led to its being investigated by Heller and Green (1926). Basing their conclusion on rat-growth methods, they showed that yellow milo contains more vitamin A than the white-coated varieties. Smith (1930) reported that many of the grain sorghums are inferior to yellow corn as a source of vitamin A. Other articles indirectly point to that conclusion. In the 20 years intervening since the work of Heller and Green (1926), the development of the chemical method of determining carotene (the precursor of vitamin A) has made it possible to test large numbers of samples in much less time than by the biological method. During this period many new varieties have been introduced. Both of these facts suggested the desirability of determining the carotene content of all available samples.

Material available for analysis represented 28 varieties of grain sorghums grown at Perkins and at Woodward, Oklahoma, two places having different soils and climatic conditions. These samples had been produced, gathered, and classified by an agronomist of the U. S. Department of Agriculture. The samples were air-dried in the laboratory, threshed by hand, and ground. Five-gram samples were analyzed for their carotene content by the method of Wall and Kelley (1943).

The quantitative readings were made with a Coleman Universal Spectrophotometer and compared with a calibrated carotene-absorption curve.

Table I records the varieties, the place grown, and the carotene content determined. No great variation is shown among varieties; and the carotene content was relatively low in all. The average amount was less than one-half of the percentage found in yellow corn. For this reason mixed feeds having the sorghum as their base would require addition of a good, green-alfalfa meal or other vitamin-A supplements.

¹ Contribution from the Department of Agricultural Chemistry Research.

TABLE I

*Carotene content of grain sorghums
(micrograms per gram)*

Variety	Perkins	Woodward
Standard kafir	1.8	2.5
Sharon kafir	2.8	2.78
Sunrise kafir	1.4	1.43
Club kafir	1.2	2.05
Reed kafir		3.37
Hydro kafir	2.1	
Rice kafir	2.2	
Red kafir	1.45	
Bishop kafir		1.48
Peterita		1.39
Early hegari		2.25
Kaferita	2.88	
Darso	1.6	1.78
Yellow darso	2.96	3.8
White darso	2.61	2.71
Sagrain	5.16	
Migari		2.89
Dwarf yellow milo		2.73
Club x Day-16	1.23	1.41
Atlas	2.16	2.85
African millet	2.61	2.82
Leoti sorgo	1.94	
Sumac sorgo	2.16	1.65
Sugar Drip sorgo	1.61	1.2

LITERATURE CITED

- Heller, V. G., and R. Green. 1926. The chemical and nutritive properties of the grain sorghums. *J. Metabolic Res.* 8:205-216.
- Smith, M. C. 1930. The comparative nutritive value of yellow corn and the grain sorghum hegari and yellow milo. *J. Agric. Res.* 40:1129-45.
- Wall, M., and E. G. Kelley. 1943. Determination of pure carotene in plant material. *Ind. Eng. Chem. Anal. Ed.* 15:18-20.