

Proceedings of the Iowa Academy of Science

Volume 8 | Annual Issue

Article 13

1900

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Recommended Citation

Weems, J. B. and Grettenberg, H. N. (1900) "A Study of Some Cotton Seed Oils," *Proceedings of the Iowa Academy of Science*, 8(1), 89-90.

Available at: <https://scholarworks.uni.edu/pias/vol8/iss1/13>

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A STUDY OF SOME COTTON SEED OILS.

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In connection with an investigation which was recently made at the Experiment Station it became necessary to investigate a number of cotton seed oils, which were prepared for general use. When it is realized that cotton seed oil, which is one of the cheaper oils, is used in many cases for adulterating oils of a better class it is seen that any data regarding this substance is of value to those who are engaged in the analytical branch of chemistry.

The samples which were investigated were of different grades, as may be seen by the following outline:

SAMPLE No. I—“*Butter Oil.*” Probably could be used as an addition to lard to lower the melting point of this substance and used in the manufacture of oleomargarine.

SAMPLE No. II—“*Cooking Oil.*” Intended for use when oil is desired for cooking purposes.

SAMPLE No. III—“*Snow Flake.*” A good grade of cotton seed oil intended for general use.

SAMPLE No. IV—“*Salad Oil.*” Prepared for use as a salad oil and could be readily used for adulteration of olive oil.

SAMPLE No. V—“*Common Oil,* known as “Summer White.”

SAMPLE No. VI—Labeled “Summer Yellow.”

SAMPLE No. VII—Labeled “Winter Yellow.”

SAMPLE No. VIII—“*Crude Oil.*”

SAMPLE No. IX—Purchased in New York market as common “Cotton Seed Oil.”

Allen* gives the standards for cotton seed oil as follows:

Specific Gravity 93°-100°C.....	.867—.873
Saponification Equivalent.....	190.8—209.7mg
Iodin Number.....	102—111

*Commercial Organic Analysis, Vol. 2, pt. 1, p. 93.

Benedict* and Lewkowitsche give the following constants for cotton seed oil:

Specific Gravity 99°.....	.8725
Saponification Equivalent.....	191—196.5
Iodin Number	100 9—116.9

The specific gravity is that found by Allen while the saponification equivalent is also the result of the investigations of that author. The Iodin number is that found by Wiley.

COTTON SEED OILS.

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.
SPECIFIC GRAVITY.....	.90035	.9005	.9003	.9005	.9005	.9005	.9003	.9006	.9005
VOLATILE ACIDS.....	.315	.22	.217	.562	.872	.78	.609	.557	.54
SAPONIFICATION (equivalent in mg. KOH for 1 gram.).....	195.6	198.6	194.4	194.2	195.1	194.9	192.1	192.1	194.8
SOLUBLE ACIDS52	.88	.53	.51	1.85	2.05	1.47	1.85	.85
INSOLUBLE ACIDS	95.48	94.81	95.61	95.48	94.08	94.58	94.73	93.97	94.66
IODINE ABSORPTION.....	84.83	88.12	82.68	86.50	96.5	97.4	106.2	106.7	101.8

It will be noticed that the specific gravity of the samples investigated varies from .9003 to .9006 and with an average of .90045. This is considerably higher than that given by either Allen or Benedict and Lewkowitsche.

The limits of the value of the Saponification equivalent as given by Allen are very wide while the other authors give a more restricted limit for the constants of these oils.

The results from the samples vary from 192.1 to 198.6 and with an average of 194.6, the better oils having the higher and the common oils the lower values.

In the Iodin number there is a great variation which depends largely on the nature of the oil, whether of the better grade or not.

The common and crude oils gave results which came within the limits for the constants as stated by Allen and also Benedict and Lewkowitsche.

The better grades of oils, however, give results for the Iodin absorption which are much lower than the limits given for the constants by the authors as quoted.

The methods used in the investigation are those of the Association of Official Agricultural Chemists and published in bulletin No. 46 of the Division of Chemistry (revised edition). The results given are the average of three determinations for each sample.

*Oil Fats and Waxes, p 306.