An Improved Method for Preparing Cottonseed for Oil Content Determination

An examination of the methods of analysis for cottonseed indicates that a considerable variation in oil extraction may result from the manner of preparation of the sample for analysis of oil and ammonia. The official methods of the American Oil Chemists' Society for analysis of cottonseed for oil and ammonia content (Aa-4-38) direct that the fumed sample of cottonseed be ground in a "Bauer Bros. No. 148 laboratory mill, with 6912 plate, at 3,600 r.p.m., to a fine meal." If the plates are spaced too far apart, the sample will not be ground to a sufficient fineness, and some of the oil will not be extracted. If the plates are too close, the sample may be burned during the grinding, thereby changing the composition of some other constituents of the seed, making them soluble in petroleum ether. There is need therefore for a means of grinding which will result in uniformity of oil extraction from sample to sample so as to eliminate, as far as possible, variations resulting from the human element.

A survey of commercial laboratory mills for sample preparation was made. A small laboratory mill originally developed to pulverize soil samples and successfully used in grinding soybeans was found to grind fumed samples of cottonseed satisfactorily. The mill, called a "Mikrosamplmill," consists of a rotor operating at a high speed and throwing the seed against a screen. The size of the screen openings determines the resulting particle-size. The screen is quickly and easily removed for cleaning, a necessary part of the sample preparation.

In order to determine the optimum screen-size for cottonseed sample preparation, 1956–1957 A.O.C.S. Check Cottonseed Samples Number 2 and Number 6 were fumed and ground, using five different screen-sizes. Sample 2 was selected since it contained high moisture- and low oil-content, Sample 6 because of its low moisture- and high oil-content. Sample 7 was also checked with three different screens. Screens with round perforations of from 3/64 to 1/8 in. and one screen with herringbone perforations of 3/64 x 1/2 in. were used in the test. Preliminary grinds, using smaller perforations, were unsatisfactory since the resulting samples were discolored, indicating burning of the sample. Screens with the 3/64-in. round and the 3/64 x 1/2 in. herringbone perforations appeared to give the best results (Table I).

TABLE I

Comparison of Oil Content of Cottonseed, When Fumed Samples Were Ground in the Mikro-samplmill Using Specified Screens, with the Accepted Analysis, A.O.C.S. 1956–57 Check Cottonseed Series

Sample mark	Accepted analysis A.O.C.S.		Size of screen opening used in grinding fumed sample				
			3/64 in. rd.	3/64 in. HB	1/16 in. rd.	3/32 in. rd.	1/8 in. rd.
	Moisture %	Oil %	Oil %	Oil %	Oil %	Oil %	Oil %
1956–57 Check seed No. 2	15.4	17.1	16.9	16.9	16.8	16.8	16.7
1956–57 Check seed No. 6	7.8	21.9	21.9	22.1	22.0	21.7	21.5
1956–57 Check seed No. 7	9.0	19.0	18.7	18.9	18.7	.....	.....

The complete series of 10 A.O.C.S. Check Cottonseed for 1956–57 were then fumed and ground, using the 3/64-in. round and the 3/64 x 1/2 in. herringbone screens. Three oil determinations were made on each sample with results that checked favorably with the accepted averages (Table II). The herringbone screen appeared to be better for cottonseed since the seed could be fed faster during the grinding operation.

TABLE II

Comparison of Oil Content of Samples of the 1956–57 A.O.C.S. Check Cottonseed Series with Oil Content When Fumed Samples Were Ground, Using Specified Screens in the Mikro-samplmill

Sample identification	Oil Content of A.O.C.S. Check Cottonseed No.									
	1	2	3	4	5	6	7	8	9	10
	%									
A.O.C.S. accepted avg.	18.2	17.1	17.7	19.0	19.7	21.9	19.0	22.4	18.8	19.2
3/64 in. rd. perf. screen	18.4	16.9	17.5	19.0	19.7	21.9	18.7	22.3	19.2	19.3
3/64 in. HB screen	18.4	16.9	17.5	18.9	19.9	22.0	19.0	22.7	19.0	19.1

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Guenther Returns from Africa

Ernest Guenther, vice president and technical director of Fritzsche Brothers Inc., New York, N. Y., has returned from a six-month tour of Kenya Colony, South Africa, Madagascar, the Comoros, and Reunion Island. His investigations were conducted primarily in the interest of his firm, but the entire industry has been kept informed of his findings by the frequent publication of "Guenther Reports." It is Fritzsche's plan to continue distributing these reports until Dr. Guenther's full account of his experiences and findings has been completed.

A pictorial record of his trip was also made, and it is expected that it will provide the foundation for a short series of films. In addition to a study of the economic conditions of each area, Dr. Guenther's survey covered the production of oils of geranium, mahwah, vetiver, lemongrass, ylang ylang, eucalyptus, clove, cedar wood, and citrus oils, also the cultivation of vanilla beans.

Offers 42nd CEC Catalog

The 42nd annual edition of the Chemical Engineering Catalog, published by Reinhold Publishing Corporation, 430 Park avenue, New York 22, N. Y., contains 2,000 pages devoted to the products of 700 manufacturers. Material in this 1958 edition is indexed by company, trade name, and function.