Growth of Cottonseed-Products Industry

By EDW. G. MONTGOMERY
and
FELIX T. POPE
Foodstuffs Division, Dept. of Agriculture

THE United States produces more than one-half of all the cottonseed produced in the world, and more than four times as much as any other country, British India being the nearest competitor.

Very few industries in the United States have shown a more remarkable development than that of cottonseed products during the past fifty years. Fifty years ago, in fact, cottonseed was practically worthless.

Most large planters in the South had what was known as community gins on their plantations—that is, in addition to ginning their own cotton they also ginned that for their neighbors, the smaller planters. The usual charge for ginning was $2 per bale, or the ginner would take the seed. (Fifteen hundred pounds of seed cotton when ginned produces 500 pounds of lint and 1,000 pounds of seed.) In practically every case the ginner got the seed in payment for ginning. It was rare indeed to be paid in cash. This was equivalent to buying cottonseed at $4 a short ton.

The seed so acquired was used as far as possible for feeding cattle and sheep, being boiled in great iron pots and fed whole. What could not be used in this way was allowed to rot and then used as fertilizer, while great quantities were occasionally dumped in the Mississippi River to get rid of it. At that time the cottonseed-oil industry was in its infancy, and only a very small proportion of the seed produced in the South was crushed, as there were few uses for the oil and none for the cake, except as fertilizer.

Value Increased from $5,000,000 to $265,000,000

How a commodity formerly regarded as of little value has within 50 years grown from a value of less than $5,000,000 to $265,000,000, in 1929, contributing products which are being exported in various forms to all parts of the world, is shown in the following table:

Increase in Value of American Cottonseed Products

Year ended July 31	Seed crushed		Cake and meal produced	
	Quantity	Value	Quantity	Value
		Thousands		*Thousands*
	Tons	*of dollars*	*Tons*	*of dollars*
1881....	182	4,610	64	1,840
1891....	1,023	19,790	358	8,330
1901....	2,415	48,230	845	16,270
1911....	4,106	142,710	1,792	44,660
1921....	4,069	156,513	1,786	58,298
1926....	5,558	256,027	2,597	81,508
1929....	5,061	265,247	2,282	90,706
1930....	5,016	229,440	2,232	82,296
1931....	4,715	169,704	2,165	58,623

Cottonseed oil was first recognized as having commercial possibilities in the 1880's. In a small way, at first, the public became acquainted with the product in the form of liquid cooking oil, but the soap kettle offered the principal outlet. Subsequently, when lard compounds, manufactured from refined cottonseed oil and edible beef tallow or oleo stearin, were introduced, the field of edible consumption was broadened materially. The next step in the concentration of cottonseed oil into food channels took place about 1910, when cooking fats, consisting either wholly of hydrogenated cottonseed oil, or with the hardened oil supplanting edible animal fat in compounds appeared on the market. Winterized cottonseed oil as a salad oil also became established in popular flavor. Consequently, in the past fifteen years, virtually all our entire production of cottonseed oil, save the "foots" from refining, has been marketed as an edible product—to the resultant gain alike of cotton planters, ginners, crushers, refiners and processors.

The average prices per ton of cottonseed received by producers in the United States follow:

1880	$ 4.00	1920	$22.95
1890	8.54	1925	30.82
1900	11.55	1930	28.75
1910	25.82	1931	21.50

During the war and immediately thereafter, however, cottonseed sold as high as $75 a ton, the average for 1919 being $67.27.

Oil the Most Valuable Product

The most valuable product of cottonseed is the oil, cake and meal ranking second, linters third, and hulls fourth.

For the year ended July 31, 1931, according to the Bureau of the Census cottonseed crushed totaled 4,715,148 tons; oil produced, 720,941 short tons valued at $91,638,000; cake and meal, 2,164,820 tons, $58,623,000; hulls, 1,303,504 tons, $10,474,000; linters, 823,944 bales, $8,969,000. In this particular year the value of hulls was greater than that of linters, but ordinarily that of linters is larger. Figures for 1931 do not present a fair picture of the industry, as prices were far below the level of other years.

Further emphasis is lent to this statement by citing the consumption data for cottonseed oil, as determined by the Bureau of the Census, in its statement of "Factory consumption of animal and vegetable fats and oils for 1929." Consumption totaled 1,372,295,000 pounds, of which 1,192,021,000 pounds, or nearly 87 per cent, were diverted to edible consumption (including 30,173,000 pounds as an ingredient in the manufacture of oleomargarine). The soap kettle received but 12 per cent of the total oil consumed, which may be considered to have been almost entirely "foots."

The production of cottonseed oil in the United States for the year ended July 31, 1931, was 720,902 short tons valued at $91,638,000, as compared with 786,161 tons in 1930, valued at $114,892,000, and 802,065 tons in 1929 valued at $133,906,000. Exports for these three years were 13,177 tons, 15,999 tons and 14,766 tons, respectively. This, of course, however, only accounts for actual oil exported as such, and does not take into account various manufactured products made wholly or in part from cottonseed oil, the total of which would be far greater than that of actual oil exports.

United States Exports of Cottonseed Cake and Cottonseed Meal

[Short tons]

Country of destination	1929		1930		1931	
	Cake	Meal	Cake	Meal	Cake	Meal
Belgium	.....	1,824	.....	269	5,731	1,468
Denmark	134,398	1,571	30,085	.....	120,682	.....
France	.....	1,184	.....	476	.....	700
Germany	22,646	17,060	2,708	1,400	12,225	5,723
Irish Free State	896	6,107	.....	3,484	.....	1,120
Italy	.....	.....	.....	.....	.....	560
Netherlands	2,004	4,168	.....	392	.....	1,418
Norway	.....	734	.....	56	.....	5,768
Sweden	224	.....	.....	.....	1,019	.....
United Kingdom	2,117	27,950	181	4,135	66	12,296
Canada	.....	11,845	.....	7,268	25	3,853
Mexico	9	66	9	12	1,410	57
Guatemala	.....	25	.....	21	.....	9
Honduras	.....	6	.....	3	.....	.....
Panama	.....	50	.....	97	.....	54
El Salvador	.....	28	.....	9	.....	.....
Cuba	27	1,833	66	850	24	504
Jamaica	.....	80	.....	52	.....	.....
Barbados	.....	104	.....	.....	.....	.....
Other countries	.....	41	25	69	.....	382
Total	162,320	74,676	33,074	18,593	141,181	34,912

Exports of Cottonseed Cake and Meal

The exports of cottonseed cake and meal by countries of destination for the years 1929, 1930, and 1931 are shown above.

America was much higher than in other coun-

tries. There was a remarkable recovery, however, in 1931.

Denmark is the largest exporter of butter in the world, and it is little realized that a considerable proportion of the production of Danish butter is produced by the feeding of American cottonseed cake and meal, about 80 per cent of our exports going to that country.

Cottonseed Hulls as a Cattle Feed

The hulls of cottonseed, which for a great many years were a waste product having no use except for fuel, have also become recognized as a valuable cattle feed and are worth considerably more per ton than could be obtained for the seed 25 or 30 years ago. After the seed has been reginned it is run through hulling machines and the hulls removed. Very nearly one-half of the entire weight of the seed is thereby converted into the product known as cottonseed hulls. These—especially when mixed with cottonseed meal—make a cattle feed of superior value, for which there is a steady demand at around $10 per ton—practically the entire supply being consumed in the Southern states. For the year ended July 31, 1931, 1,303,504 tons were produced, valued at $10,474,000.

Committee Report On Olive Oil

M. F. LAURO, *Chairman*
(Reported to New Orleans Meeting)

In scanning the values for the possible adulterants of olive oil, rape and coconut oils appear to be the only ones with figures sufficiently far removed from those of olive to indicate detection in mixtures.

IN 1927-28, the modified Valenta or Crismer test was primarily responsible for a number of prosecutions in New York City in cases of suspected olive oil adulteration. Interest was thus focused on a test which up to this time had been rarely, if ever, included in the routine analysis of olive oil for purity. A dozen or so court cases, in which the chairman participated, devolved on this and iodine absorption as leading issues of fact, and thus considerable discussion as to the reliability of Crismer values came about.

At about the same time, Dr. Jamieson undertook a study of this method, the results of which are summarized in his recent book on "Vegetable Fats & Oils," 1932.

The test is a simple one and not without its value. Since it had been strongly sponsored by the Olive Oil Association, its official chemists and the local Department of Health, I felt it would be to our interest to have the committee study and perhaps settle the question of its value one way or another.

Accordingly, through relations in Italy, I was able to secure five samples of olive oil of the first pressing from different local presses in the province of Foggia. This oil runs somewhat high in acidity and of pronounced odor and flavor which mellows out on standing and is usually blended for the general market, but in Foggia finds direct consumption at home.

These samples were sent to the members of the special committee investigating the ultra-violet ray examination of olive oils, to conduct that as well as the Crismer, with instructions to follow the improved procedure outlined in the practical part of Fryer and Weston, "Oils, Fats & Waxes," and in Elsdon, "Edible Oils & Fats."

The ultra-violet ray report was as follows:

Sample No.	*Chemist* 8	*Chemist* 2	*Chemist* 6
1	Virgin	Virgin	Virgin
2	"	"	Virgin
3	"	"	Orange with purple cast
4	"	"	Orange with purple cast
5	"	"	Orange with purple cast

The report of Chemist No. 6 would imply doubt as to samples 3, 4 and 5. Since the oils are undoubtedly pure, this would leave the method open to question; which is about the conclusion reached by other experimenters. See Jamieson "Vegetable Fats & Oils" on the detection of refined olive and other oils.

In the matter of the Crismer test, our second task, while some of the members have not been