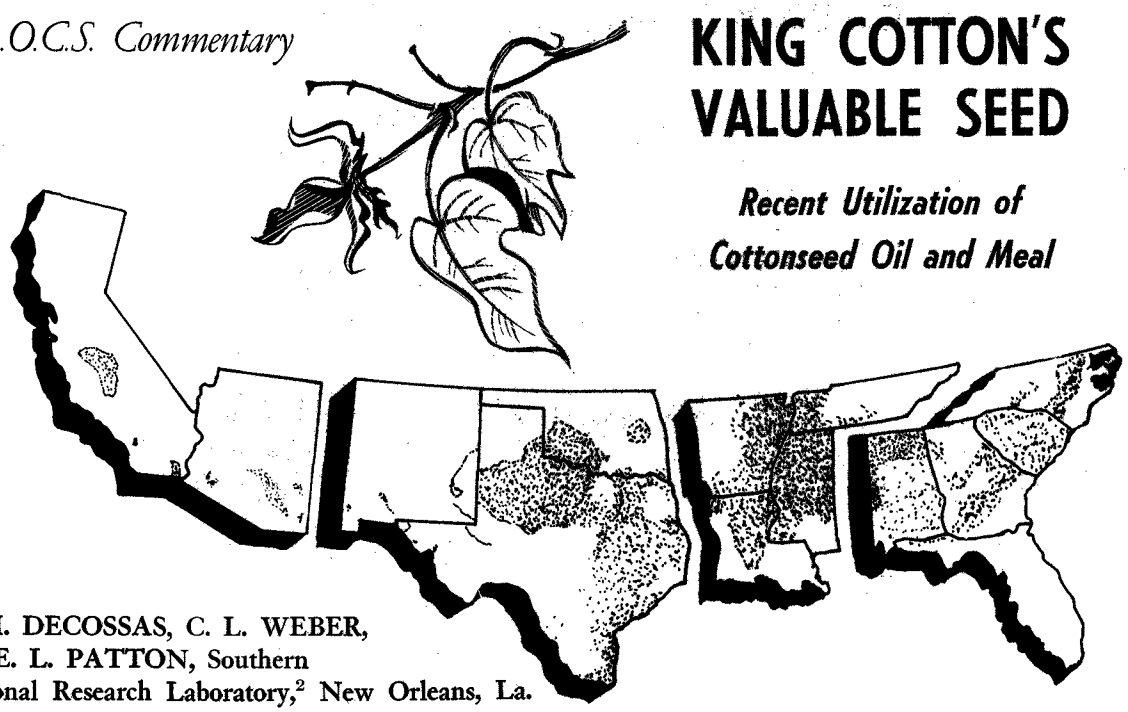
• *A.O.C.S. Commentary*

KING COTTON'S VALUABLE SEED

Recent Utilization of Cottonseed Oil and Meal



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COTTON AND MAN have been wedded amicably and profitably since ancient times. Grown at first for its fiber or "tree wool," Gossypium has also become an important source of cottonseed which is the raw material of an important industry in the southern and western United States, India, China, Russia, Egypt, Brazil and other countries. The production of cottonseed's most important product—cottonseed oil—has for many years far outranked that of all other vegetable oils in the U. S. Cottonseed oil products have been important in the food industries and cottonseed oil has been, and still is, the premium salad oil in large domestic production. However, its favored position is being challenged by the soaring increase in domestic soybean oil production and advances in chemical and technological research on edible fats and oils in general.

Cottonseed, the valuable co-product of King Cotton, is worth approximately $250 million annually to U. S. farmers, and is the raw material for a wide variety of consumer products valued at approximately $1.5 billion. More than 200 oil mills employing 8,500 people in 16 states, process 5.2 million tons of cottonseed into its primary products—oil, meal, linters, and hulls—having a total value of over $400,000,000 (3,4,9,11). The industry is primarily a rural one with almost 65% of its employees and more than 75% of its mills in rural areas.

Recent changes in methods and location of processing, resulting from changing social and economic conditions and from the perennial need to meet renewed competition from a variety of products, have brought about more efficient utilization of cottonseed, by improving the quality of its products and by increasing oil yield. In a little over one decade annual average yield of oil per ton of cottonseed has increased from 320 to 340 lb.

In the early 1950's the trend from hydraulic pressing to solvent extraction developed. Figure 1 shows miscella evaporation and meal desolventization equipment in the pilot plant of the Southern Utilization Research and Development Division, typical of new plant investment at that time resulting from the shift to solvent extraction. Later, the trend from hydraulic pressing to screw pressing occurred as a consequence of decreasing supplies of cottonseed and high capital investment of solvent plants. Now, some screw press mills are converting to prepress solvent extraction. In the meantime, filtration-extraction, developed in the pilot plant of the Southern Division, Figure 2, was commercialized, there now being two installations in the U. S. processing cottonseed by this method.

The shift of the industry to the Mississippi Valley and the Southwest is evidenced by the fact that during the past 3 years 31.3% of cottonseed crushings has occurred in the Valley, 56.3% in the SW and far W, while only 12.4% has occurred in the SE (6).

In a paper given approximately 3 years ago (5), it was reported that increasing amounts of cottonseed oil were being consumed in the production of cooking oils, salad oils, mayonnaise, and related products, but that total consumption of cottonseed oil was decreasing, because smaller quantities were being used in shortening and margarine. Increasing amounts of cottonseed foots were being used as a feed additive. At that time, cottonseed meal utilization in poultry and swine feeds was increasing in the SW and W, and decreasing in the E with the exception of the extreme SE.

This paper is a review of recent information obtained on oil and meal utilization from the National Cotton Council, the National Cottonseed Products Association, the Agricultural Experiment Stations of the Cotton Belt States, oilseed processors, and feed manufacturers.

Oil Utilization

Between 1956 and 1960, cottonseed oil accounted for a decreasing percentage of total U. S. factory consumption of selected fats and oils in major edible and inedible products (2). Cottonseed oil's percentage dropped from 15.3% of a total consumption of 8.7 billion lb of fats and oils in 1956 to only 11.4% of 9.6 billion lb in 1959. Utilization of 1.2 billion lb of cottonseed oil in 1960, the highest since 1956, accounted for 12% of total U. S. factory consumption of almost 10 billion lb of fats and oils. On a per capita basis, 6.8 lb of cottonseed oil and 54.7 lb of fats were consumed in the U. S. in 1960. While cottonseed oil consumption decreased from 1.3 billion lb in 1956 to 1.2 billion lb in 1960, consumption of fats and oils in edible products increased from 5.0 billion lb in 1956 to 5.8 billion lb in 1960, reflecting increases in consumption of soybean and corn oils.

Salad or Cooking Oils. (Fig. 1.) 57% of cottonseed oil consumed in 1960 was used in salad or cooking oil (2). Cottonseed oil usage in these end products increased from 625 million lb in 1956 to 701 million lb in 1960, or from 35 to 39% of total utilization. Soybean oil consumption

[1] Presented at the 11th Cottonseed Processing Clinic, So. Utiliz. Res. & Dev. Div., U.S.D.A., New Orleans, La., 1962.

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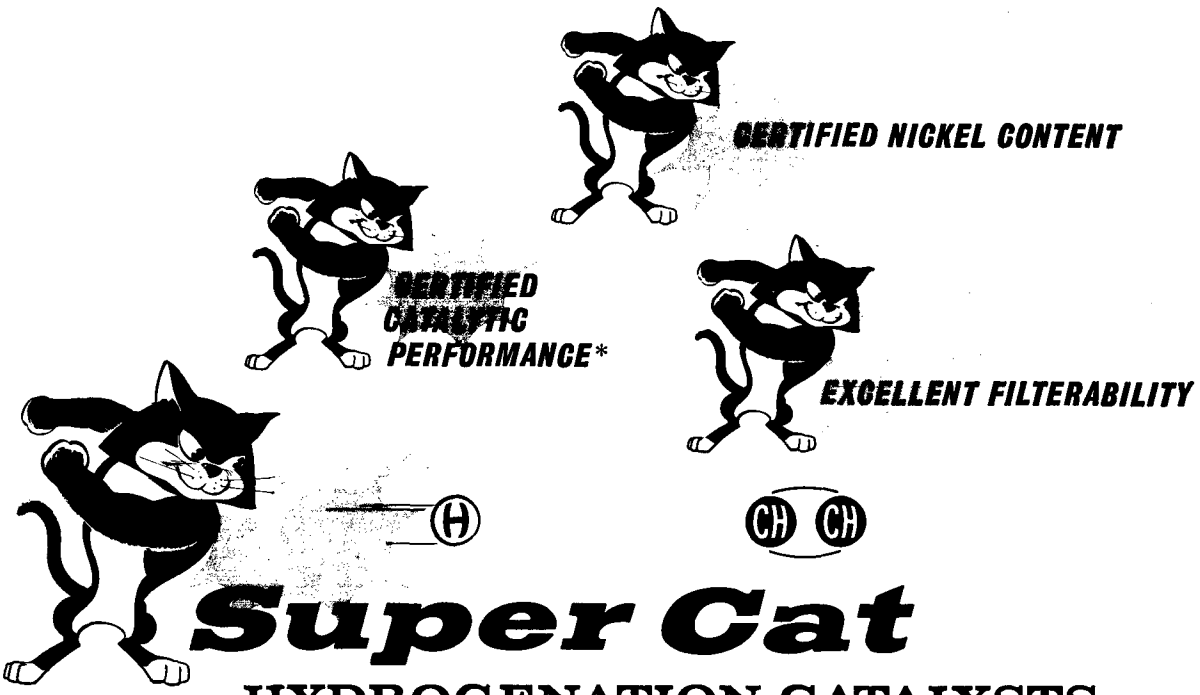

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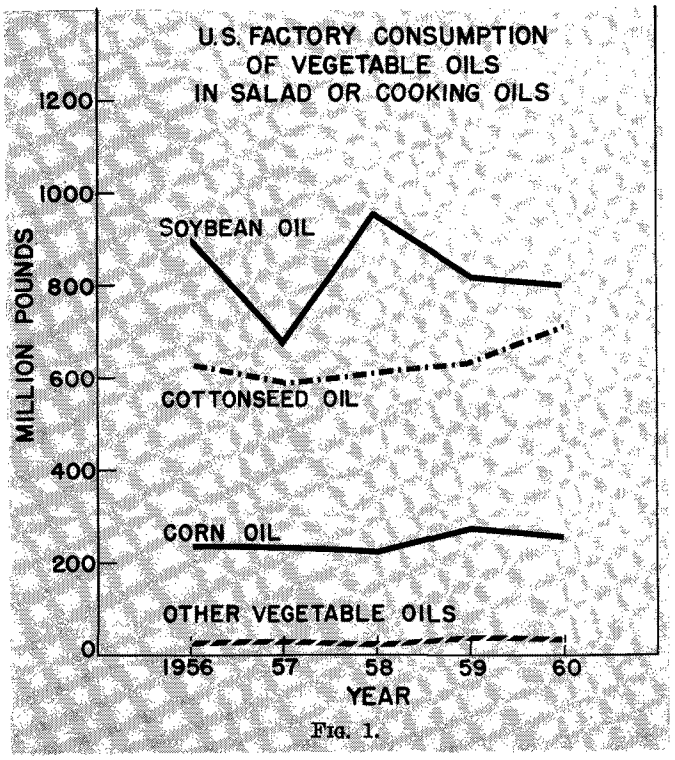

FIG. 1.

declined from 895 million lb in 1956 to 796 million lb in 1960, while corn oil usage rose from 234 to 247 million lb during the same period.

Cottonseed oil use in salad dressing, mayonnaise, and related products increased from 157 million lb in 1956 to 185 million lb in 1960. During the same period soybean oil use increased from 330 million lb to 453 million lb.

Baking or Frying Fats (Fig. 2.) 30% of cottonseed oil consumed in 1960 was used in baking or frying fats, the largest single outlet for fats and oils (2). Cottonseed oil utilization declined from 394 to 365 million lb between 1956 and 1960, while soybean oil usage rose 49% from 782 million lb to 1.2 billion lb. Lard consumption declined while edible tallow consumption rose sharply, resulting in a net increase in consumption of animal fats during the period.

Margarine. (Fig. 3.) 11% of cottonseed oil consumed in

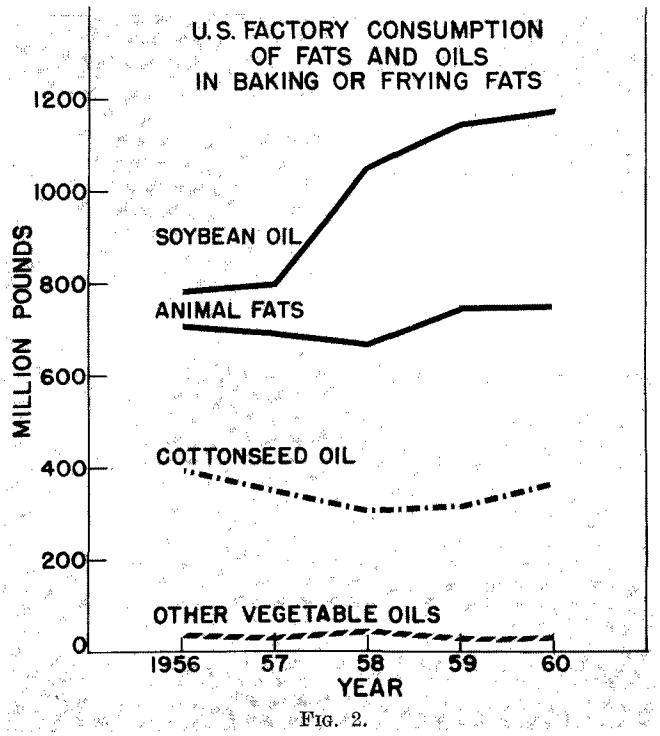

FIG. 2.

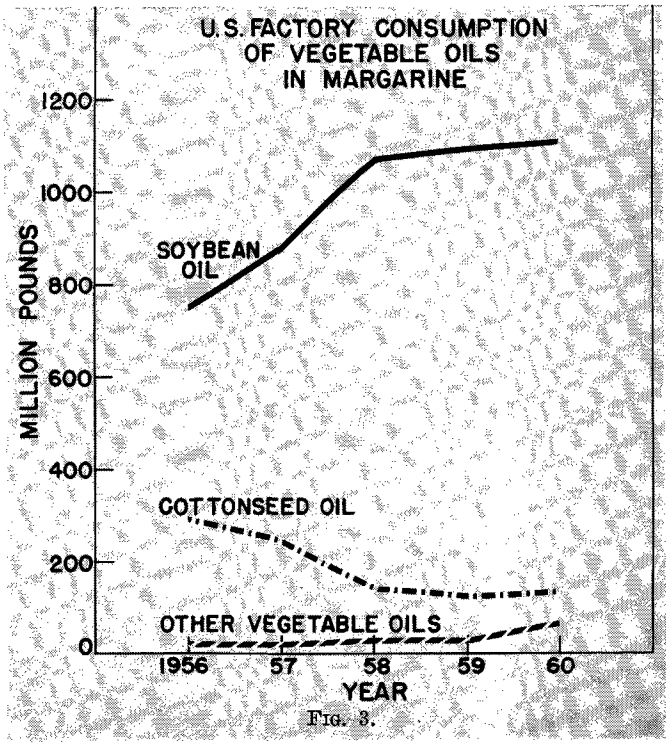

FIG. 3.

1960 was used in margarine, in which an all-time high of nearly 1.4 billion lb of fats and oils was used (2). Cottonseed oil consumption in margarine declined from 293 million lb in 1956 to 136 million lb in 1960. During that period, soybean oil utilization increased from 751 million lb to 1.1 billion lb, accounting for more than 80% of total consumption in this product in 1960. Usage of other vegetable oils, including corn and peanut oils, increased. Margarine per capita consumption increased from 8.2 to 9.6 lb while butter per capita consumption decreased from 8.8 to 7.6 lb.

Other. The use of cottonseed oil in mellorine declined between 1956 and 1960, when 4.2 million lb were consumed

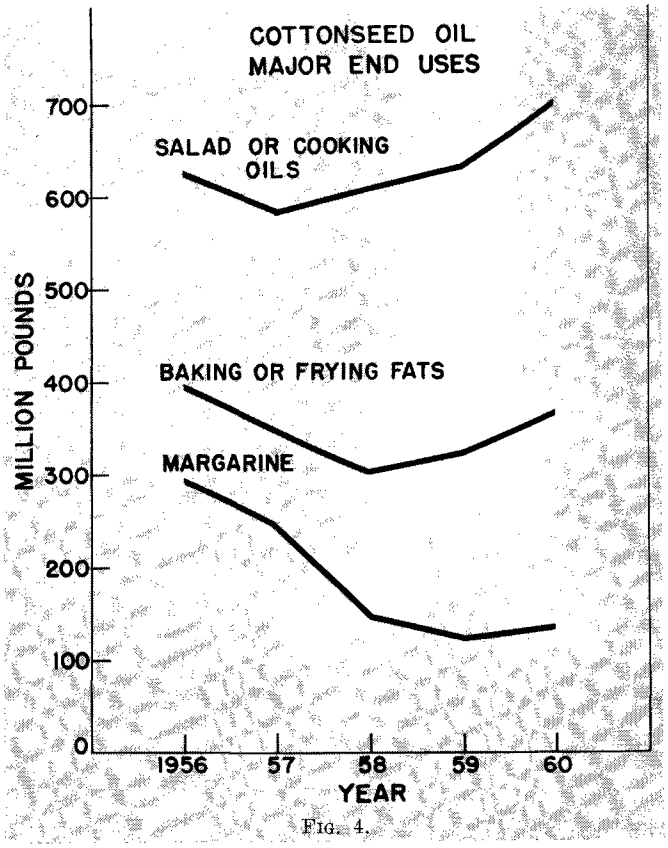

FIG. 4.