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Prepared by the Divisions of Agricultural Economics and Agricultural Extension
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Competition in Fats and Oils

W. H. DANKERS

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important soap fats and oils are tallow, coconut oil, palm and palm kernel oil, and whale and fish oils. In the drying industry linseed oil is most important but is supplemented by other important oils such as tung and perilla. Butter and lard are generally known as food fats and have been largely used in that manner. Inedible tallow and greases are used almost entirely in

soap. There is considerable confusion of thought regarding fats and oils that are or can be used in various ways. To provide a clearer picture of the extent to which such fats and oils were used in 1940, percentages are given in table 2.

The total as well as the per capita consumption of all fats and oils in the United States has increased materially during the last 25 years. The total apparent disappearance¹ was 6,141 million pounds in 1916, 7,972 million pounds in 1926, 9,075 million pounds in 1936, and 9,767 million pounds in 1940. Per capita disappearance in 1939 and again in 1940 was 74 pounds. The amount of each fat and oil used and the percentage of the total is given in table 1.

Table 1. Disappearance of Fats and Oils in the United States, 1940 (Crude oil basis)

	Pounds (1,000,000)	Per cent of total		Pounds (1,000,000)	Per cent of total
Butter	2,299.7	23.6	Olive oil edible	52.7	.5
Lard	1,925.9	19.7	Sesame oil	4.9	.....
Edible tallow	79.8	.8	Coconut oil	597.9	6.1
Inedible tallow and wool grease	1,244.5	12.8	Palm and palm- kernel oil	189.2	2.0
Oleo oil and edible stearine	107.0	1.1	Olive oil inedible and foots	23.1	.2
Neat's-foot oil	3.7	.....	Linseed oil	590.0	6.1
Total animal fats	5,660.6	58.0	Tung oil	67.5	.7
Fish and fish-liver oils	225.1	2.3	Perilla oil	19.5	.2
Whale oil	33.3	.3	Oiticica oil	15.5	.2
Total marine oils	258.4	2.6	Castor oil	90.2	.9
Cottonseed oil	1,378.3	14.1	Teaseed oil	4.3	.....
Soybean oil	502.9	5.2	Rape oil	12.9	.1
Peanut oil	61.9	.7	Other*	5.1	.....
Corn oil	172.2	1.8	Total vegetable oils	3,848.3	39.4
Babassu oil	60.2	.6	Total—All fats and oils	9,767.3	100.0

* Includes vegetable tallow, cashew nut-shell, sunflower, hempseed, and kapok oil.

In studying the competition of fats and oils it is desirable to classify them according to their use. Broadly, they can be divided into two groups, edible and technical fats. The technical fats can again be divided according to those primarily used in the drying industry and those used largely in soap. The major food fats and oils include butter, lard, and cottonseed and soybean oil. The more

¹ Production from domestic and imported materials, net imports or exports, and changes in primary stocks.

Table 2. Percentage of the Total Amount of Each Oil Used in Various Products, 1940

	Food oils			Soap oils			Drying oils	
	Cottonseed oil	Soybean oil	Corn oil	Coconut oil	Palm oils	Fish oils	Linseed oil	Tung oil
Vegetable compounds	60	42	49*	3	18	5	.....	.....
Margarine	9	18	.....	4	.....	.....	.....	.....
Other edible products	19	8	41	9	4	.....	.....	.....
Soap	.....	4	2	66	45	39	.....	.....
Drying industry	.....	7	.....	.....	.....	20	63	86
Miscellaneous	5	7	8	6	19	15	3	1
Unaccounted for	7	14	.....	12	14	21	34	13
Total of all uses	100	100	100	100	100	100	100	100

* Largely used as salad dressing, table and cooking oil, and not in compounds.

Those primarily interested in butter and lard have been concerned about the competition from fats and oils compounds and of the foreign oils in such compounds. The limited use of foreign oils in the food industry can be observed from figures on the composition of margarine and vegetable compounds given in table 3.

It will be observed from table 3 that considerable change has taken place in the composition of these compounds. In the earlier years margarine contained a larger proportion of animal fats than the margarine manufactured at the present time. It also contained a much larger proportion of animal fats than the vegetable compounds. At present domestic vegetable oils are the major source of

Table 3. Percentage Contributed by Various Fats and Oils to the Manufacture of Margarine and Vegetable Compounds

	Margarine				Vegetable Compounds			
	1922	1933	1937	1940	1922	1933	1937	1939
Oleo oil and stearine.....	30.0	9.1	4.8	6.9	6.1	1.8	1.9	1.8
Lard neutral	17.5	4.5	.5	2.0	1.5	.3	.....	.5
Tallow .....	.....	.....	.....	.....	1.4	4.8	4.2	4.0
Other	2.1	.4	.4	.5	.....	.9	1.3	1.5
Total animal fats.....	49.6	14.0	5.7	9.4	9.0	7.8	7.4	7.8
Cottonseed oil	9.7	9.0	53.2	45.0	84.7	87.7	72.5	64.4
Soybean oil .....	.....	.....	9.8	33.8	.....	.1	5.7	14.3
Peanut and corn oil	5.8	1.5	1.5	.9	3.1	.4	3.8	3.8
Total domestic oils.....	15.5	10.5	64.5	79.7	87.8	88.2	82.0	82.5
Coconut oil	34.9	75.2	22.6	8.5	2.1	.7	.8	1.5
Palm and palm kernel oil .....	.....	.3	2.7	.....	.....	2.2	7.7	8.0
Other .....	.....	.....	4.5	2.4	1.1	1.1	2.1	.2
Total foreign oils.....	34.9	75.5	29.8	10.9	3.2	4.0	10.6	9.7
Total fats and oils.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

supply for both margarine and vegetable compounds. With expanding production, soybean oil has rapidly become a strong competitor in the manufacture of both products. The present great similarity in composition of margarine and vegetable compounds should make them more easily interchangeable than in earlier years.

The figures in table 3 clearly indicate that the major competition for the edible fats and oils market is not between foreign and domestic products but largely between American produced butter, lard, and cottonseed and soybean oil. In some areas three of these four commodities, namely butter, lard, and soybean oil, come from products on a single farm. This situation must be kept clearly in mind in any attempt to promote one or the other of these commodities for consumption.

The relative amounts of butter, lard, margarine and vegetable compounds consumed per capita are given in table 4. The total per capita consumption of these four major edible fats and fat compounds reached an all time high in 1939. Margarine competes largely with butter, and vegetable compounds compete largely with lard. There has been no consistent increase or decrease in the per capita consumption of butter, of margarine, or of the two combined. The price difference is the all important determinant of the relative consumption of the two products. The per capita consumption of margarine was low and of butter high during the years when the price margin was relatively small. The per capita consumption of margarine was high and of butter low during the years when the price margin was relatively large. The price difference also is important in the relative consumption of lard and vegetable compounds. Vegetable compounds sold at a retail price ranging from 6.7 to 10.5 cents per pound higher than lard during 1930-1934. Because of the drouth and lower hog production during 1934 lard prices moved up rapidly in 1935. An abundance of the oils used in vegetable compounds kept prices for those products near previous levels. The price difference dropped to less than 2 cents. The per capita consumption of lard dropped to an all time low while the consumption of vegetable compounds was relatively high. The price margin since that time has ranged from 4.5 to 9.6 cents with a decided in-

crease in per capita consumption of lard and a gradual decline in per capita consumption of vegetable compounds. A loss of major export markets for lard since the beginning of the war and extra supplies on the domestic market resulted in retail prices for lard in 1940 that were the lowest since 1933, which in turn resulted in per capita consumption equal to the record high.

Table 4. Per Capita Consumption of the Principal Edible Fats and Retail Price Differences

Year	Price Difference Butter Over Margarine	Butter*	Margarine	Total Butter and Margarine	Price Difference Veg. Comp. Over Lard	Lard	Vegetable Compound	Total Lard and Vegetable Compound	Grand Total
	Cents				Cents					Lbs. per capita	Lbs. per capita
1912-14.....	.....	16.8	1.5	18.3	.....	11.1	9.7	20.8	39.1
1924-29.....	.....	17.6	2.3	19.9	.....	13.1	9.3	22.4	42.3
1930.....	21.4	17.3	2.6	19.9	6.7	12.7	9.8	22.5	42.4
1931.....	15.9	18.1	1.9	20.0	9.2	13.5	9.4	22.9	42.9
1932.....	12.4	18.3	1.6	19.9	10.5	14.3	7.5	21.8	41.7
1933.....	14.6	17.9	1.9	19.8	9.0	13.9	7.6	21.5	41.3
1934.....	18.0	18.3	2.1	20.4	6.8	12.8	9.5	22.3	42.7
1935.....	17.3	17.3	3.0	20.3	1.9	9.5	12.1	21.6	41.9
1936.....	21.3	16.6	3.0	19.6	5.6	11.2	12.4	23.6	42.2
1937.....	21.9	16.7	3.1	19.8	4.5	10.6	12.3	22.9	42.7
1938.....	17.6	16.8	3.0	19.8	6.8	11.2	11.6	22.8	42.6
1939.....	16.2	17.6	2.3	19.9	9.3	12.7	10.7	23.4	43.3
1940†.....	20.1	17.4	2.4	19.8	9.6	14.5	.....‡	.....	.....

* Includes farm and factory.

† Preliminary

‡ Not yet available but estimated to be lower than in 1939.

Feed Costs and Returns in Dairy Production

GEORGE A. POND

How much feed is required for a good dairy cow for a year under farm conditions? What production may be expected from the feed? At the average prices prevailing in recent years how much of a return per cow over feed costs has the farmer received? The answers to these and similar questions are to be found in the records of the Southeastern Minnesota Farm Management Service. The members of this service are dairymen of somewhat more than average ability and are located in one of the best dairy sections of the state. The average number of cows per farm was 17 and the average size of farm, 203 acres. The records cover an average of 145 farms per year for a 12-year period.

The amount of feed consumed by a cow in one year on these farms is shown in table 1. In addition to this feed the cows had access to pasture during the usual pasture season. The annual production of butterfat per cow was 241 pounds. This includes butterfat in cream and milk used in the house and fed to calves and the butterfat actually paid for in cream and milk sold. Roughly the average feed per cow was 1800 pounds of concentrate, mostly farm grains, 2 tons of dry roughage, and 3½ tons of silage. In recent years more alfalfa and less corn fodder, wild hay, and silage have been used. This has served to increase the proportion of protein in the ration. The

Table 1. Production and Feed per Dairy Cow
(Southeastern Minnesota Farm Management Service, 1928-1940)

	1928-30	1931-33	1934-37	1938-40	13-year Average
Butterfat	243	241	235	245	241
Corn, lbs.	252	484	407	682	453
Small grain, lbs.	1395	1227	745	1117	1093
Commercial feed, lbs.	251	326	233	185	248
Total concentrates	1898	2037	1385	1984	1794
Alfalfa, lbs.	1692	1881	2208	2718	2139
Other tame hay, lbs.	1106	812	806	908	900
Wild hay and corn fodder, lbs.	1116	817	777	621	806
Total dry roughage	3914	3510	3791	4247	3845
Silage, lbs.	7214	6884	7184	6411	6943
Total Digestible Nutrients, lbs.	4448	4358	3938	4686	4325
Lbs. T. D. N. per lb. B. F.	18.3	18.1	16.8	19.1	18.6
Per cent protein in ration	12.5	12.7	13.1	13.7	13.0

heavier feeding in 1938-40 was largely due to the fact that pastures were poor and more barn feeding was required.

The cost of feed per cow and the value of the product are shown in table 2. The product is valued on the basis of the average price secured in the area for butterfat in cream to be used in butter manufacture with an additional allowance for the skim milk retained on the farm. The return over feed represents the amount available to pay for hired labor, shelter, interest, taxes, depreciation, and similar costs and to pay the farmer for his labor and management. By using the quantities of feed and production shown in table 1 and applying to them various sets of feed and butterfat prices it is possible to determine, at least roughly, the probable return that might be expected from a dairy cow giving this production under different price situations.

Table 2. Feed Costs and Returns in Dairy Production
(Southeastern Minnesota Farm Management Service, 1928-1940)

	1928-30	1931-33	1934-37	1938-40	13-year Average
Value of Dairy Production					
per cow	\$129.64	\$64.24	\$90.25	\$84.75	\$92.07
Feed cost per cow	66.66	43.30	47.66	40.52	49.39
Return over feed per cow	62.98	20.94	42.59	44.23	42.68
Average price concentrates per 100 lbs.	1.32	.71	1.12	.78	.97
Average price dry roughage per ton	11.36	8.52	8.89	6.17	8.73
Average price B. F. per lb. ....	.48	.24	.34	.31	.34

Creamery Operating Problems in West Central Minnesota

W. H. DANKERS

A detailed analysis of 29 cooperative creameries in 10 counties of West Central Minnesota was made in 1940.¹ It appears that cooperative creamery problems are numerous in this area. Considerable difference was found between sections of the area and individual plants.

The variation in efficiency among these plants suggests that much can be gained through improved plant

operations. The principal obstacle to lower per unit costs is that the volume of output of many plants is insufficient for the most effective use of buttermaking facilities. The only permanent solution of this problem is consolidation of the smaller plants. With fewer plants serving parts of this area, plant costs could be considerably reduced. No plants should be replaced or large expenditures made for equipment without first giving careful consideration to the advisability of consolidating some of the existing units. With more efficient plant operations the remaining cooperative creameries in the area would find less competition from other types of buyers.

Some of the creameries are netting considerably less on their butter than the average plant in the area, especially on the portion shipped. Each step in the marketing process should receive careful analysis with the aim of correcting defects. Quality of product in this area is below that of most other areas in the state and can be improved. There is considerable seasonality in butter manufactured which reflects seasonality of production in the area. By influencing producers to level out production a larger proportion of the butter could be sold at a higher price. Also, operations within the creamery could be more efficiently organized. Sales outlets should be carefully analyzed in an effort to determine the best outlet for the butter produced.

Some of the creameries in this area confront difficult membership problems. With improvement in highways and transportation facilities, butterfat producers have had opened to them several alternative outlets for their products. Through failure to operate efficiently, and to inform members and patrons, and sometimes through indifference, many cooperative creameries have lost patrons to other plants (cooperative and private) from their area.

West Central Minnesota creameries in general have too large a proportion of their ownership in the hands of nonproducers, and do too large a share of their business with nonmembers. Cooperative associations should make and follow definite plans to keep the ownership of stock or membership as nearly as possible in the hands of patrons. Membership should be made reasonably easy to acquire.

It is of increasing importance that officers and members alike are kept informed concerning the economic problems facing the industry and the specific business operations of their association. Rapidly changing technological developments in the industry and increasingly complex business problems demand that cooperative boards employ only men of superior ability and training to manage their plants. Operators and other employees should periodically be required to supplement their training in order that the organization may keep abreast with the latest developments in the industry. A sound educational program including more effective annual meetings, informational literature, periodic accounting reports, and statistical comparisons are a vital necessity to successful cooperative marketing in this area and in the state as a whole.

¹ See Agricultural Extension Service Pamphlet No. 70, A Survey of Cooperative Creameries in West Central Minnesota, for details of this study.

Minnesota Farm Prices for April, 1941

Prepared by W. C. WAITE and W. B. GARVER

The index number of Minnesota farm prices for the month of April, 1941, was 85. When the average of farm prices for the three Aprils, 1924-25-26, is represented by 100, the indexes for April of each year from 1924 to date are as follows:

1924—82	1929—112	1934—53	1939—67*
1925—106	1930—101	1935—92	1940—69*
1926—112	1931—71	1936—84	1941—85*
1927—110	1932—46	1937—99	
1928—106	1933—40	1938—77	

* Preliminary.

The price index of 85 for the past month is the net result of increases and decreases in the prices of farm products in April, 1941, over the average of April, 1924-25-26, weighted according to their relative importance.

Average Farm Prices Used in Computing the Minnesota Farm Price Index, April 15, 1941, with Comparisons*

	Apr. 15, 1941	Mar. 15, 1941	Apr. 15, 1940		Apr. 15, 1941	Mar. 15, 1941	Apr. 15, 1940
Wheat	\$0.79	\$0.73	\$0.91	Cattle	\$7.90	\$7.70	\$6.90
Corn	.50	.45	.47	Calves	9.70	9.70	8.50
Oats	.30	.28	.34	Lambs-Sheep	8.94	8.84	8.16
Barley	.41	.38	.43	Chickens	.13	.11	.10
Rye	.44	.39	.55	Eggs	.19	.14	.14
Flax	1.73	1.54	1.93	Butterfat	.34	.32	.29
Potatoes	.41	.41	.55	Hay	6.22	6.16	4.61
Hogs	8.10	7.10	4.75	Milk	1.55	1.55	1.45
				Wool†	.33	.31	.25

* These are the average prices for Minnesota as reported by the United States Department of Agriculture.

† Not included in the price index number.

Indexes and Ratios of Minnesota Agriculture*

	Apr. 15 1941	Mar. 15 1941	Apr. 15 1940	Average April 1924-26
U. S. farm price index	79.1	73.0	70.5	100
Minnesota farm price index	84.6	74.0	69.2	100
U. S. purchasing power of farm products	100.2	92.6	90.0	100
Minn. purchasing power of farm products	107.2	93.9	88.4	100
Minn. farmers share of consumers food dollar	47.1	44.1	43.6	52.8
U. S. hog-corn ratio	12.9	12.4	8.4	12.4
Minnesota hog-corn ratio	16.2	15.8	10.1	15.5
Minnesota beef-corn ratio	15.8	17.1	14.7	9.7
Minnesota egg-grain ratio	17.5	14.4	11.8	12.7
Minnesota butterfat-farm-grain ratio	37.5	38.3	30.1	36.8

* Explanation of the computation of these data may be had upon request.

With the exception of milk and potatoes all commodities in the index rose from March to April. These rises brought the index up to its highest level since 1937. The rise of nearly 15 points indicates about a 20 per cent improvement over the price level as of March, 1941. Nearly all products shared the rise. All the crops except potatoes rose more than the usual seasonal amount. The same was true for hogs. Cattle and sheep advanced at about the usual seasonal rate. Calves, and eggs and butterfat rose strongly instead of their normal seasonal tendency to decline from March to April.

Food and Farm Prices Rising

The rise in farm prices discussed elsewhere on this page has been accompanied by a rise in retail prices of food products. Figured on the basis of average monthly consumption, the Minnesota farm price of wheat, potatoes, hogs, beef, chickens, eggs, milk, and butterfat, taken all together, has risen by better than 15 per cent since last August. None of this rise can be explained as due to seasonal price changes, for taken together the net normal tendency of this group is to decline about 2 per cent seasonally from August to April.

Pricing the flour, bread, potatoes, pork and beef cuts, chickens, eggs, fluid milk, cheese, and butter resulting from these farm products, and weighting them according to estimated consumption, the retail value of the products at Minneapolis has risen by 7.5 per cent since August. The largest rise was for eggs, which rose by 27 per cent. Pork products advanced nearly 15 per cent. Beef products have shown less than a 1 per cent rise. Milk products were up 18 per cent, milk having risen from 10 cents to 12 cents per quart and butter from 31.9 cents to 37.0 cents per pound. Cheese advanced from 24.9 cents to 26.8 cents per pound. The price of chickens rose 12 per cent, about matching the rise in farm price. Potatoes were 11 per cent above August price, although farm price for April was more than 25 per cent below August.

The only retail group showing a decline was for wheat products, which taken together were 12 per cent below August prices. Wheat flour declined from 5.2 cents to 4.9 cents per pound, while bread declined from 8.9 cents to 7.6 cents per loaf. Most of the bread price decline occurred from March to April, when it dropped from 8.8 cents to 7.6 cents per loaf. Had it not been for this drop in bread prices, the level for the products listed here would have been 10 per cent above the August level, instead of 7.5 per cent.

The spread between the farm and retail value of these products increased by only a little more than 1 per cent.

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