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Improving the Domestic Market for Lard

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AMES, IOWA

Lard vs. Lard Substitutes Highlights

About two-thirds of a pound of lard substitutes are consumed for each pound of lard Page 70

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Standardization of lard is difficult to achieve largely because of: (1) Technical difficulties in manufacture; (2) the large numbers of establishments producing lard; (3) many packers have extensive interests in lard substitutes manufacture Pages 75-77

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The domestic market situation of lard—and consequently, income for the hog producer—may be improved by the standardization of lard, improved merchandizing and educational work among consumers Pages 80-82

IOWA'S INTEREST IN LARD

1. More than one-fifth of the lard produced in the United States is rendered from hogs originating in Iowa.

2. Iowa sends to market 25 hogs for every 1 slaughtered on the farm. The average of the United States is 4 to 1. In no other state is the hog enterprise so highly commercialized as in Iowa. That is to say, in no other state are farmers so vitally affected by the market situation of hog products as in Iowa. (See fig. 1.)

3. Hogs produced in Iowa yield a higher percentage of lard than those marketed in most other parts of the United States, because the great majority of Iowa hogs are slaughtered in large packing houses with modern lard rendering equipment, making for higher lard output per hog, and also because of the heavier weight of Iowa hogs.

4. On the average, hogs provide about two-fifths of the Iowa farmer's income. Since lard represents about one-fifth of the hog value, lard prices have a considerable effect upon the financial well-being of the Iowa farmer.

5. Hoyt and Morgan of Iowa State College in a survey found that the average farm family in 1927-29 did not render enough lard for its own use, but purchased about one-third to one-half of its supply from the retail market.

Improving the Domestic Market for Lard¹

BY RAINER SCHICKELE AND THEODORE W. SCHULTZ²

"As go the prices of pork and lard—so goes the price of hogs."

Because this is true, it is important to know the factors that make the price of lard. Iowa naturally is much interested in this problem since its hogs furnish over one-fifth of the domestic supply of lard.

The following facts are of outstanding significance to anyone concerned with the market situation of lard:

1. Lard, as it is sold today—with the exception of a few grades and brands—is an unstandardized product. This is one of the reasons why it suffers greatly from the competition of lard substitutes, which are for the most part highly standardized.

2. To improve the competitive position of lard against lard substitutes, lard should be:

- a. Thoroughly improved and standardized.
- b. Advertised and promoted so that the consumer understands the advantages of lard of a dependable standard over lard substitutes.

In this publication various factors will be explained which contribute to the domestic consumption of lard and how lard prices may be improved by careful attention to its production and promotion.

CONSUMPTION OF LARD AND ITS SUBSTITUTES³

Lard ranks second among the domestically consumed fats and oils, exceeded only by butter (see table 1). It constitutes about one-fifth of the value of hogs (see table 2). Hence, the

¹ This study and Bulletin No. 320, "The Lard Market—at Home and Abroad," are both based upon the technical and economic analyses set forth in Research Bulletin No. 171, "Competitive Position of Lard in the Market of Animal and Vegetable Fats and Oils," Iowa Agr. Exp. Sta. March, 1934.

² This abridgement of certain phases of Research Bulletin No. 171 was prepared by Joseph G. Duncan of the Bulletin Office Staff.

³ The term "lard substitutes" comprises vegetable shortenings made solely from vegetable oils, and lard compounds, which are blends of vegetable and animal fats and oils, and which usually contain also some lard. The word "substitutes" as used herein does not have any derogatory implications. Hydrogenated lard is not considered a lard substitute, since it consists wholly, or at least 95 percent, of pure hog lard.

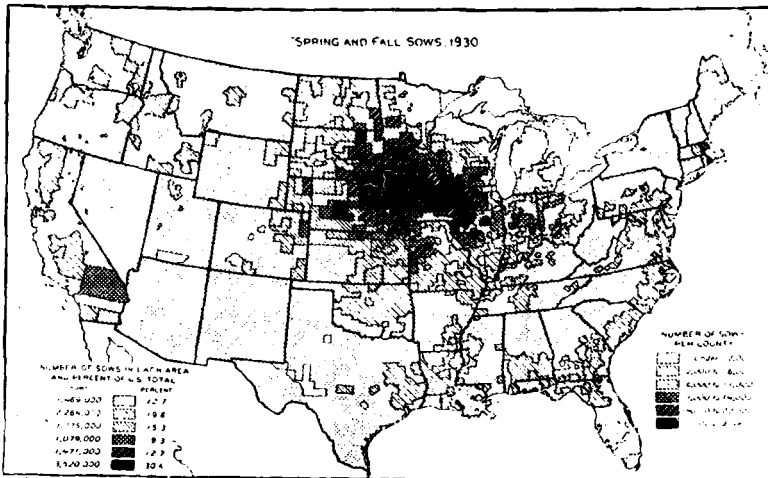


Fig. 1. The location of the hog enterprise in the United States. Observe the striking concentration of hogs in Iowa. Practically all Iowa counties have more than 20,000 sows farrowing in spring and fall, and many of them greatly exceed this figure. Source: U. S. Dept. of Agr., Bur. of Agr. Ec.

income from hog products is greatly influenced by lard prices. In 1929, almost half of the lard produced in federally inspected packing plants was exported, while in 1932 only slightly more than one-third was sold abroad. (See fig. 7.) An increasing share of the lard production had to be absorbed by the American consumer as a consequence of the loss of export markets. This, along with other forces, has pushed lard prices down to unprecedented levels.

Lard substitutes include all cooking fats commonly known as lard compounds and vegetable shortenings. They consist of mixtures of animal and vegetable fats and oils, or of pure vegetable oils. (See fig. 2). About 85 percent of the raw material used in their manufacture is cottonseed oil. They appear under such trade names as Crisco and Snowdrift.

The consumption of lard substitutes has increased greatly since 1921. Less than $\frac{1}{2}$ a pound of lard substitutes was consumed for each pound of lard until about 1925 when the amount rapidly increased to $\frac{2}{3}$ of a pound. (See fig. 3 and table 3.)

In the western and south central states consumption of lard substitutes is greatest in comparison with lard, while it is

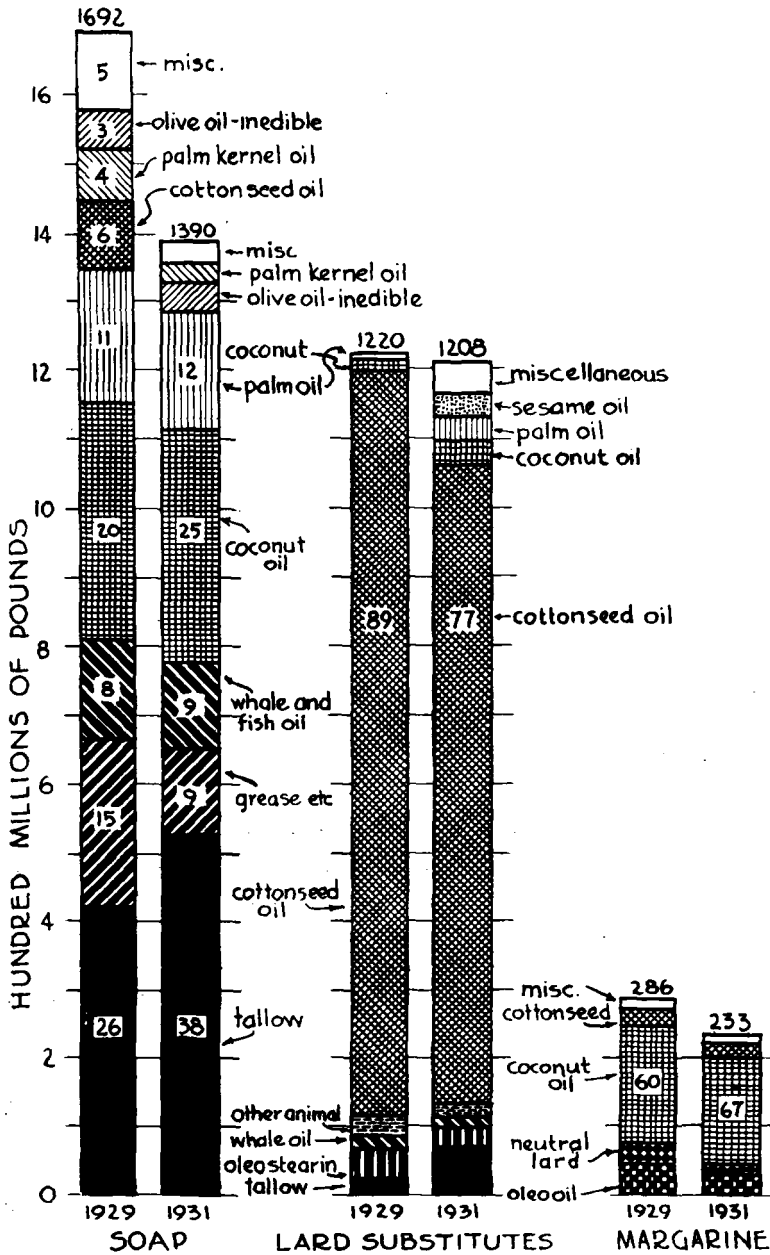


Fig. 2. Oils used in making soap, lard substitutes and margarine. Note the predominance of cottonseed oil as a raw material used in making lard substitutes. Cottonseed oil supplied, in 1929, 89 percent of the total oils used in lard substitutes.

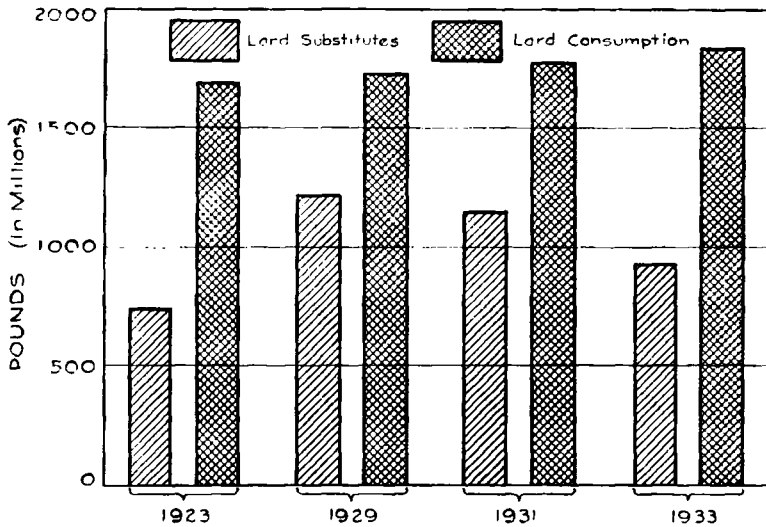


Fig. 3. Comparison of the total domestic consumption of lard and lard substitutes.

smallest in the north central states. Climatic conditions in the South tend to favor the use of substitutes because of their greater firmness and longer keeping quality. In addition, since most lard substitutes are made chiefly from cottonseed oil, they are produced in the South, near the raw material from which they are made.

The intense competition of lard substitutes with lard has been influenced greatly by the general vegetarian tendencies of the consuming public. Many persons have the sentimental belief that vegetable oils are purer than animal oils. Private interests in the field of vegetable oils, to increase the sale of their product, have not been slow to capitalize upon the consumer's lack of accurate information. By means of aggressive salesmanship and intensive advertising campaigns, the consumer has been made **vegetable oil** conscious.

Certain lard substitute manufacturers in advertising claims imply that their cooking fats are much more digestible than lard. On the contrary, lard is one of the most easily digested and readily absorbed of all the fats used in cooking. In general animal fats, including lard, average about 95 percent in digestibility, vegetable fats about 90 percent. This is partly because of the lower melting point of lard.

LARD LACKS STANDARDIZATION

Lard substitute manufacturers have been aided materially because of the centralization of their industry (see fig. 5) which facilitates standardization and also nation-wide advertising of their product. In striking contrast to the 40 establishments which produce more than 70 percent of all lard substitutes, out of a total number of around 150 establishments reporting lard substitutes production, there are more than 1,200 establishments manufacturing lard in the various parts of the United States. (See fig. 4.) About one-third of the lard substitutes is made by meat packers, who also manufacture lard.

Lard has never been widely advertised chiefly because its manufacture, as mentioned before, is highly decentralized. Consequently, poor lard as well as good lard is sold to the housewife simply as a lard. Much of the lard that is sold in retail shops is sold in the bulk and not under brand names.

One of the greatest handicaps that lard faces is that relatively few grades or brands are thoroughly standardized. Thus the consumer has little assurance of constant quality. This is all the more a handicap to the marketing of lard because practically all lard substitutes are highly standardized. Even the quality of the same brand of lard often varies considerably.

FACTORS AFFECTING LARD'S QUALITY

Lard is difficult to standardize primarily as a result of the following factors:

1. Difference in the flavor, keeping quality and other properties of the various fat cuts from the carcass that are used in making lard.
2. The influence of the combination of fat cuts put into the rendering kettle.
3. The rendering methods used.

Lard is obtained from pork fat by rendering the fat at high temperature in either closed or open kettles. Pork fat, however, varies greatly in its properties, depending upon the place in the carcass from which it is obtained. For instance, the usual melting point of the back fat (65°F.) is considerably

lower than that of leaf fat derived from around the kidneys (74°F.). Besides the difference in the quality there is the effect of variation of the proportion or combination of the fats when they are put into the rendering kettle.

About 80 percent of the manufactured lard in the United States is "steam lard" rendered in closed kettles under 30 to 50 pounds of steam pressure and at a temperature of 285°F. This lard is obtained from the fatty tissues trimmed from the hams, bacon, shoulders (cutting fats), and from fat backs and parts of the visceral fats (killing fats). Keeping quality of "steam lard" is usually satisfactory but varies considerably.

Most of the remaining 20 percent is rendered in open steam-jacketed kettles at a temperature of 230° to 260°F. from leaf fat and fat backs. This open kettle rendered lard represents the highest grades of lard. Keeping quality ranges from good to excellent.

A new process known as "dry rendering" has been introduced in recent years and produces lard of a different flavor, somewhat darker in color and lower in moisture content than that of the steam process. The materials are put into steam-jacketed tanks and heated to about 215°F., the moisture being drawn off by a vacuum pump.

"Neutral lard," which is rendered in open kettles at a low temperature of 126°F., is used almost exclusively as a raw material in the margarine industry.

A type with which some of the larger packers have experimented in recent years is "hydrogenated lard." In producing this lard hydrogen gas is combined with the lard to improve certain qualities. By hydrogenation the firmness and texture can be improved considerably and the melting point raised. These properties give lard particular advantages when sold in the South, in fact, wherever the climate is hot. The keeping quality is greatly improved since hydrogenation reduces the rate of deterioration. Furthermore, hydrogenated lard is odorless and has a neutral flavor. This gives it an advantage in some consuming centers, while it tends to be disadvantageous in others, namely, where people like the natural lard flavor.

WHY LARD IS NOT STANDARDIZED

Let us examine further some of the more important causes for the lack of uniform and dependable lard. Why is one purchase of lard that the housewife makes good, while the next—labeled quite the same—is inferior?

In the lard substitute industry, the nature of both the raw material and the production process facilitates the getting of a uniform product. Cottonseed oil and other vegetable oils are available in large quantities of uniform quality, and it is necessary in the production process, involving hydrogenation as it does, to use large processing plants. This results in a high degree of centralization of production, especially since the cottonseed oil industry, which provides the chief raw material for lard substitutes, is concentrated in the Cotton Belt. (See fig. 5.)

There are three main reasons why it is difficult to bring about standardization of lard and thus better its competitive position. These are:

1. The decentralization of lard production. (See fig. 4.)
2. Technical difficulties for packers in standardizing lard.
3. The fact that many packers are involved in both the lard and lard substitute business.

It can be said literally that lard is produced wherever a hog is slaughtered—whether it be at the farm, in a small butcher shop, or in the large packing house. About one-fourth of all the lard used in the United States is rendered and used on farms. In the South Atlantic and South Central states the hog industry—and thus, lard production—is strictly non-commercial. Here approximately two hogs are slaughtered on the farm for each hog sent to market. (See table 4.) Thus, the production is intended primarily to supply the farmer's family with lard and pork for its own use.

Iowa, on the other hand, presents a striking contrast (see table 4). In this state about 25 hogs are sent to market for every hog slaughtered on the farm, indicating the extraordinary degree to which the hog farmer of Iowa is dependent upon lard and pork markets for his financial well-being.

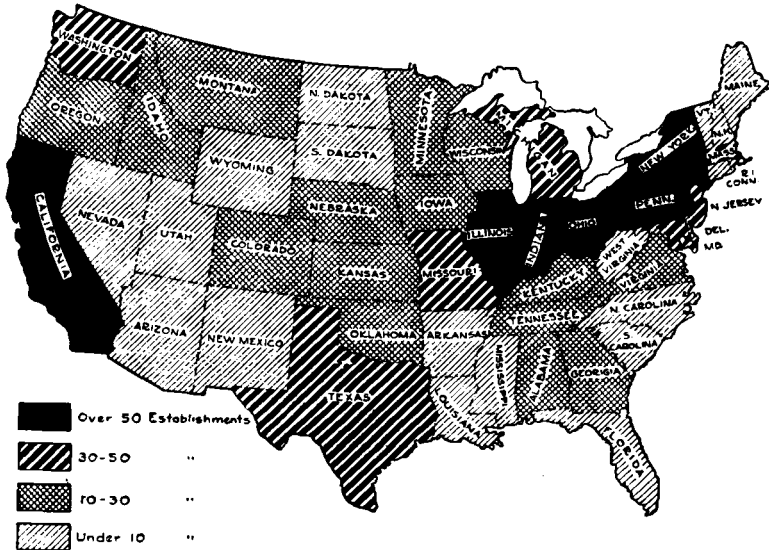


Fig. 4. Location of lard rendering establishments as shown in the 1929 census of manufacturers. Lard establishments, as the map indicates, are widely scattered over the United States.

A number of technical difficulties would need to be overcome if standardization of lard were to be attained. Much more care than is now used would have to be exercised in the rendering process. In contrast with vegetable oils, the hog fats, the raw material for lard, vary greatly in quality according to the place in the carcass from which they originate, and according to regions and feeding methods. As mentioned before, it would be necessary to insure using the proper proportion of the various pork fats and to know the effect of variations in quality of the fats. Modification may be necessary of the Chicago Board of Trade's regulation, which, in short, requires packers to render their lard shortly after the hog is killed. This regulation is intended to reduce the fatty acid content of prime steam lard, which is related closely to the rate of deterioration after rendering. Packers now are sufficiently equipped with chilling or refrigerating facilities to permit them with safety to accumulate enough pork fat of the same kind to make the rendering of distinct lard grades possible, provided the Board of Trade's regulation were modified.

Another factor that has made the standardization of lard difficult is that many packers, besides manufacturing lard, are

ing, lard gives the product specific flavors, which no substitute can produce.

A recent shift has been noted in consumers' tastes away from the highly flavored lard to one of a more neutral flavor. This shift tends to benefit lard substitutes because of their neutral flavor.

Besides better standardization, lard substitutes have a longer keeping quality than lard. For practical purposes, however, lard's keeping qualities are absolutely satisfactory in the first grades but not so in most other grades. An advantage of lard over many substitutes is that it may be worked over a wide range of temperatures. It may be used immediately upon removal from the refrigerator without becoming brittle as many other fats do. This brittleness makes it difficult to blend the fat with flour or other mixtures.

Through hydrogenation the required degree of firmness and the melting point can be governed for both lard substitutes and lard. It is chiefly used at present, however, in the manufacture of lard substitutes. This enables the manufacturer to vary his product to suit a particular climate (such as for the South) or for a particular temperature (for summer or winter). Manufacturers also can vary their product to suit the standardized requirements of particular consumers such as bakery and pastry shops.

Lard substitutes have a much higher smoking point (435° F.) than lard (380°F.), which is of particular value in frying foods.

PRICE RELATIONSHIP

The price relationship of lard substitutes and lard is very striking. The substitutes sell from 5 to 10 cents higher than lard on the retail market, although lard substitutes generally are quoted about the same or slightly lower than lard in the wholesale trade. This and also the fact that during the depression the prices of lard substitutes have resisted the general price decline far better than have those of lard, indicate the strong competitive position of lard substitutes as against lard. The retail price of lard dropped from 18 cents per pound in 1929 to 9 cents in 1932, while that of lard substitutes dropped

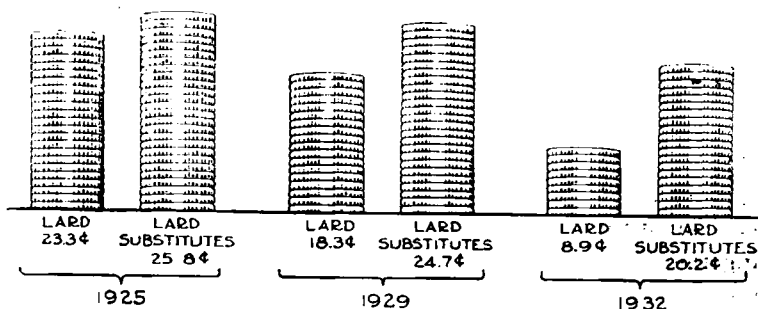


Fig. 6. Retail prices of lard and lard substitutes. Observe how much more the price of lard has fallen compared with lard substitutes. Since 1932, lard sold at less than half the price of lard substitutes.

only from 24 to 20 cents during the same period (see fig. 6 and table 5).

In the decade from 1921-30, the difference between the wholesale and retail prices of lard ranged from 4 to 6 cents, while for lard substitutes it varied from 10 to 13 cents. (See table 5.) Thus, the retailer's margin for lard substitutes was considerably more than twice as large as that for lard. This discrepancy in the wholesale and retail prices of lard substitutes is rather difficult to explain. The decentralized character of lard production, resulting in strong competition in local markets, may account for much of the difference in trade margins. Differences in transportation costs are probably also a factor, together with advertising and promotion expenses. Pricing policies of packing houses, lard substitute manufacturers and grocery stores undoubtedly play a part in the situation. In addition, lard frequently is used as a "leader" in chain food stores. This, in view of the large number of chain stores, may have a depressing effect upon the average retail price.

If by some change in the marketing mechanism, the substitutes trade margin were to decrease and the retail price were to approach that of lard, lard prices would in all probability suffer a serious decline.

Changes in prices of lard substitutes appear to affect their consumption comparatively little, while prices of lard in relation to the amount that is consumed are very sensitive. An increase in the consumption of lard usually seems to be obtainable only by a drop in lard prices while a large supply of sub-

stitutes has, at least prior to the depression, been readily absorbed with little or no depressing effect upon lard substitute prices. During 1932 and 1933, however, lard substitute production was markedly reduced, in face of accumulating cottonseed oil stocks. This at least suggests definite pricing policies agreed upon by the manufacturers involved. And it is true, lard substitute retail prices have kept up exceedingly well during the depression. The fact that housewives have been willing, even in the depression, to pay 10 cents more (over twice as much) for lard substitutes than for lard, suggests that if lard prices should approach those of lard substitutes, consumption would tend to shift from lard to its substitutes, unless lard is offered in a more standardized and dependable form.

LARD HAS IMPORTANT EXPORT POSITION

A great factor in the price of lard is the export trade. Before and shortly after the World War, both in quantity and value, lard constituted about one-half of the exports of hog products. Since the war, lard has become an ever-increasing proportion of the total American hog products entering international markets. In 1932 and 1933 lard represented in volume more than 80 percent, in value more than 75 percent of the hog products exported. (See fig. 8.) In no other agricultural export commodity, possibly with the exception of cotton, does the United States hold as strong a competitive position in the world market as it does in lard. The United States furnished 85 to 90 percent of the total lard entering world trade which amounts to a monopoly position. Another bulletin deals in more detail with the export phase of the lard problem.

IMPROVING LARD'S MARKET POSITION

The success of steps to improve lard's competitive position appears to hinge largely upon the manufacture of a product superior to that now on sale. Lard on the market today—with the exception of a few brands—is unstandardized and, as a result suffers greatly from the intense competition of lard substitutes. These substitutes, in striking contrast with lard, are highly standardized.

Factors which impede standardization of lard are the decentralization of lard production, technical difficulties that

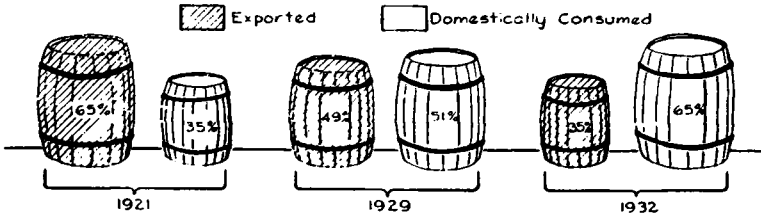


Fig. 7. Decrease in the proportion of federally inspected lard entering export channels. In 1921, nearly twice as much lard was exported as was used by American housewives, while by 1932, the proportion was reversed.

packers face in the standardization process, and the fact that many packers are involved both in the lard and lard substitute business. These packers, through the manufacture of lard substitutes, have been able to dispose profitably of certain packing house by-products. An important share of the income of these packers is derived through the sale of lard substitutes.

In connection with the standardization of lard, hydrogenation—although definitely in the experimental stage—offers possibilities to the lard manufacturer to produce a superior product.

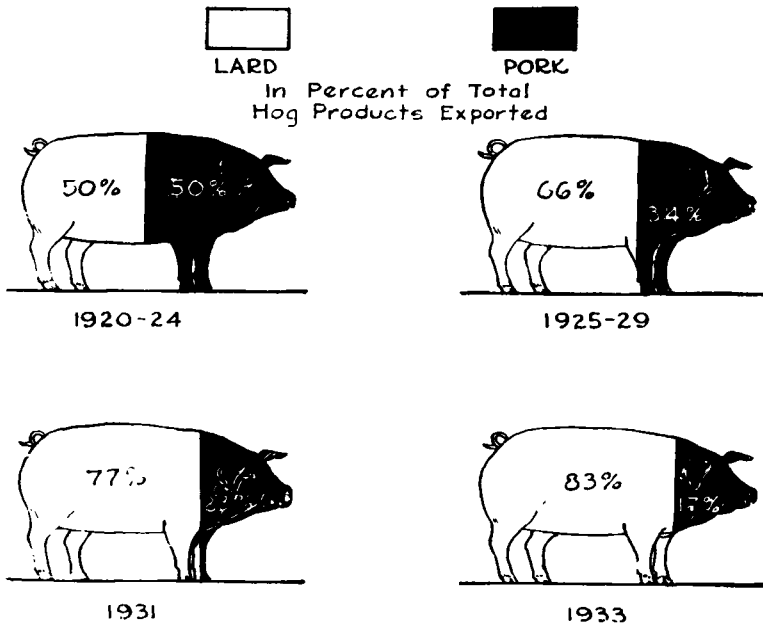


Fig. 8. Increase in the share lard has come to hold in our hog product exports. During 1920-1924, lard represented 50 percent of the total hog products exported. By 1933, it constituted 83 percent of the total.

Educational and promotional campaigns could play a large part in aiding lard in its struggle against lard substitutes. The present strong position of lard substitutes has been strengthened materially by extensive advertising.

But the first step in improving the competitive position of lard will be that of **standardization**—the manufacture of a lard that the consumer can rely upon for its dependable qualities and good performance in cooking.

To be sure, there are many difficulties in standardizing lard. Packers would have to reorganize their methods of lard production, their marketing practices, their advertising policies. Well-defined grades of lard would have to be established on a nation-wide scale. Housewives must be convinced of the superiority and dependability of standard lard brands. But, certainly as far as the Iowa farmer is concerned, it should undoubtedly be greatly worthwhile, a substantial benefit to the hog farmer, to overcome these difficulties. Lard is not in itself inferior to its substitutes. Quite to the contrary, if properly rendered and marketed, it has qualities which make it superior to substitutes in several respects. But its production and marketing is disorganized, chaotic, not well taken care of. Unless lard is thoroughly improved and standardized, it will continue to be in a relatively weaker competitive position than its substitutes, to be on the defense, to suffer from the attacks of the well-organized forces of the highly standardized substitutes.

TABLE 1. DOMESTIC CONSUMPTION OF FATTY FOODS, 1931*

	Million pounds	Percentage of total
Butter (including farm consumption) ---	2,223	41
Lard (including farm consumption) ----	1,784	33
Lard substitutes -----	1,153	21
Margarine -----	222	4
Olive Oil** -----	66	1
Total -----	5,448	100

* Basic data from table 11. Consumption of cooking and salad oils are not included, since no data for 1931 could be obtained. For 1927 and 1929, around 500 million pounds of vegetable cooking and salad oils were produced. See page 162.

** "The Cotton and Cotton Oil News," Dallas, Texas, Vol. 33, No. 37. September, 1932.

TABLE 2. A COMPARISON OF COMMERCIAL PRODUCTION
VALUES OF LARD, PORK AND HOG PRODUCTS FOR
THE CENSUS YEARS, 1921 TO 1931.

Census year	Value of pork and lard combined*	Value of pork products (excl. lard)*	Value of lard*	Value of lard to hog products	Value of lard to pork	Value of lard to live hogs**
	Millions of dollars	Millions of dollars	Millions of dollars	Percent	Percent	Percent
1921	1,108	918	190	17.1	20.7	30.2
1923	1,302	1,038	264	20.3	25.4	30.2
1925	1,548	1,268	280	18.1	22.1	22.7
1927	1,356	1,121	235	17.3	21.0	21.0
1929	1,521	1,273	248	16.3	19.5	20.1
1931	1,001	852	149	14.9	17.5	21.6

* U. S. Dept. of Com., Bur. of the Census, Biennial Census of Manufactures, Slaughtering and Meat Packing and Related Industries.

** Based on reports from federally inspected slaughter, U. S. Dept. of Agr., Crops and Markets and weighted average hog prices at Chicago taken from U. S. Dept. of Com., Statistical Abstracts, and refined lard price at Chicago, The National Provisioner, Chicago, Ill.

TABLE 3. TOTAL AND PER CAPITA CONSUMPTION OF
LARD AND LARD SUBSTITUTES

Year	Lard*		Lard substitutes consumption	
	Total consumption	Per capita consumption	Total**	Per capita***
	Million pounds	Pounds	Million pounds	Pounds
1921-25	1,552	13.9	843	7.4
1926-30	1,683	14.0	1,170	9.7
1921	1,223	11.3	763	7.0
1922	1,558	14.2	752	6.5
1923	1,707	15.3	748	6.5
1924	1,749	15.4	814	7.0
1925	1,522	13.2	1,135	9.8
1926	1,584	13.5	1,130	9.6
1927	1,634	13.8	1,166	9.9
1928	1,763	14.7	1,136	9.5
1929	1,735	14.3	1,215	9.9
1930	1,701	13.8	1,205	9.8
1931	1,784	14.4	1,149	9.4

* Statistics of Meat Production, Consumption and Foreign Trade, U. S. Dept. of Agr., Bur. of Agr. Ec., p. 9.

** U. S. Tariff Commission, Report 41, p.159, and, for 1930 and 1931 (production minus exports) Foreign Crops and Markets, July 23, 1932.

*** U. S. Tariff Commission, Report 41, p. 208

TABLE 4. DEGREE OF COMMERCIALIZATION OF THE HOG ENTERPRISE FOR THE UNITED STATES BY REGIONS AND FOR IOWA.*

Region	Pounds of hogs marketed for each pound of hog slaughtered on farms			
	1924-1928	1929	1930	1931
United States	3.48	3.75	3.64	4.17
North Atlantic States	0.62	0.82	0.76	0.63
North Central States	8.34	8.72	8.49	9.47
Northeast Central	5.14	5.11	4.86	5.30
Northwest Central	11.49	12.30	11.96	13.16
Iowa	22.21	24.62	24.81	25.34
South Atlantic States	0.31	0.32	0.30	0.27
South Central States	0.53	0.62	0.52	0.42
Western States	2.88	3.08	2.66	3.28

* Based on the figures for "Shipments and Local Slaughter" and "Farm Slaughter" reported in the "Preliminary Report on Farm Value, Gross Income and Cash Income from Farm Production," Part I, U. S. Dept. of Agr., Bur. of Agr. Ec. (Summarized annually in Yearbook of Agriculture).

TABLE 5. WHOLESALE AND RETAIL PRICES OF LARD AND LARD SUBSTITUTES. (Cents per pound).

Year	Wholesale prices		Retail prices		Retail price differentials of lard substitutes over lard	Wholesale price differentials of lard substitutes over lard	Trade margin (differential between wholesale and retail prices)	
	Lard*	Lard substitutes***	Lard††	Lard substitutes††			Lard	Lard substitutes
1913	10.8	----	15.8	----	----	----	5.0	----
1919	28.4	26.2	36.9	36.3	-0.6	-2.2	8.5	10.1
1920	22.2	18.6	29.5	35.1	5.6	-3.6	7.3	16.5
1921	13.2	10.2	18.0	22.6	4.6	-3.0	4.8	12.4
1922	13.1	11.9	17.0	22.5	5.5	-1.2	3.9	10.6
1923	13.9	12.8	17.7	22.9	5.2	-1.1	3.8	10.1
1924	14.7	13.8	19.0	24.9	5.9	-0.9	4.3	11.1
1925	17.9	13.2	23.3	25.8	2.5	-4.7	5.4	12.6
1926	16.9	13.6	21.9	25.7	3.8	-3.3	5.0	12.1
1927	13.7	11.8	19.3	25.1	5.8	-1.9	5.6	13.3
1928	13.3	12.0	18.6	24.9	6.3	-1.3	5.3	12.9
1929	13.0	11.6	18.3	24.7	6.4	-1.4	5.3	13.1
1930	12.0	10.9†	17.0	24.2	7.2	-1.1	5.0	13.3
1931	9.0	8.8†	13.3	23.1	9.8	-0.2	4.3	14.3
1932	5.8**	6.4†	8.9	20.2	11.3	0.6	3.1	13.8

* U. S. Dept. of Agr., Yearbook of Agriculture, Refined Lard, Chicago.
 ** The National Provisioner, Refined Lard, Prices, Chicago.
 *** U. S. Tariff Commission, Report 41, p. 208.
 † The National Provisioner, Vegetable Lard Compounds, Prices, Chicago.
 †† U. S. Dept. of Labor, Bur. of Labor Stat., Monthly Labor Review, Average retail prices in 51 cities.