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Milk distribution Costs

ECONOMIC FACTORS AFFECTING MILK SUPPLIES OF LARGE CITIES

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THE FOLLOWING discussion is based largely on the results of a study of the New York City milk shed made by the New York State College of Agriculture in cooperation with the New York Central Railroad. The data for the study were made available through the courtesy of New York milk distributors and manufacturers, the Dairymen's League Cooperative Association, Inc., and the New York State Department of Agriculture and Markets.

The New York metropolitan area constitutes one big fluid milk market. Within its limits are approximately ten million persons, nearly two-thirds of whom are in New York City proper. The rest are in suburban sections and near-by municipalities in New York and New Jersey. Milk routes of the larger distributors cover practically the entire area, while numerous small distributors, particularly wholesalers, cover sections throughout the territory.

Three factors characterize the New York milk market and affect its supply of milk to a great degree. They are: (1) strict sanitary control of all sources of supply; (2) sale of milk through producers' cooperative organizations at prices varying with the utilization of the milk; (3) absence of any form of seasonal production control other than that of appeal to dairymen.

The New York City Department of Health permits milk and cream to be shipped to the city only from farms and plants that have been inspected and approved. This regulation definitely determines the limits of the milk shed for New York City, and to some extent, for the metropolitan area, because the larger dealers who sell in surrounding districts as well as in the city, have their entire supply approved. Some of the suburban municipalities have their own inspection service; others accept New York City inspection; while some receive supplies, particularly cream, from uninspected sources.

At present, the New York City approved milk shed is limited to New York State, parts of New Jersey, Pennsylvania, Maryland, Connecticut, Massachusetts, Vermont and adjoining regions in Ontario and Quebec, Canada. The recent increase in the tariff has almost eliminated the latter territory as a source of supply.

The outer limits of the milk shed are slightly over 500 miles from New York by rail, and the center of production, 267 miles.

The rapid increase in population in the New York metropolitan area and the greatly increased per-capita consumption of the last ten years, have required increasing quantities of approved milk to meet the demand. The average annual increase has amounted to approximately 5.5 per cent, or 60,000 gallons per day. Demand has pressed so closely on supply that in November, 1927, and again in November, 1928, slight shortages occurred, and for a few days

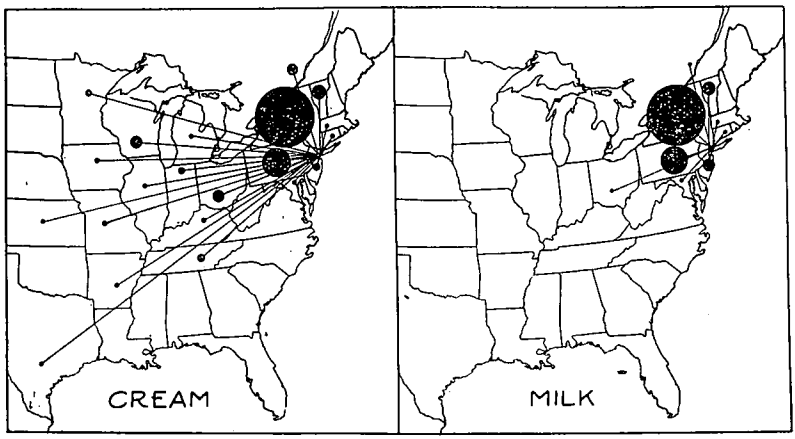

FIGURE 1. STATES SHIPPING MILK AND CREAM TO THE NEW YORK METROPOLITAN AREA IN 1929

New York City's milk and cream supply came only from sources inspected and approved by the Department of Health. Cream shipments shown from states west of Pennsylvania, went to suburban points outside New York City.

dealers were forced to limit sales. In 1929, the supply was more than adequate in November, but in the early part of September, an acute situation existed because of low production and high demand.

Despite these shortages, the market is subject to surplus conditions during the rest of the year because of the wide range in seasonal production. If the demand for milk continues to grow, additional supplies can be obtained during the shortage period in three ways: (1) extension of the milk shed into more remote dairy regions; (2) increased production in the present milk shed; (3) adjustment of seasonal production to more nearly conform to seasonal consumption. Only the last two methods will be considered here.

Aside from the question of quality control and inspection, there are certain economic advantages in handling the entire supply through the plants and equipment of the present milk shed, pro-

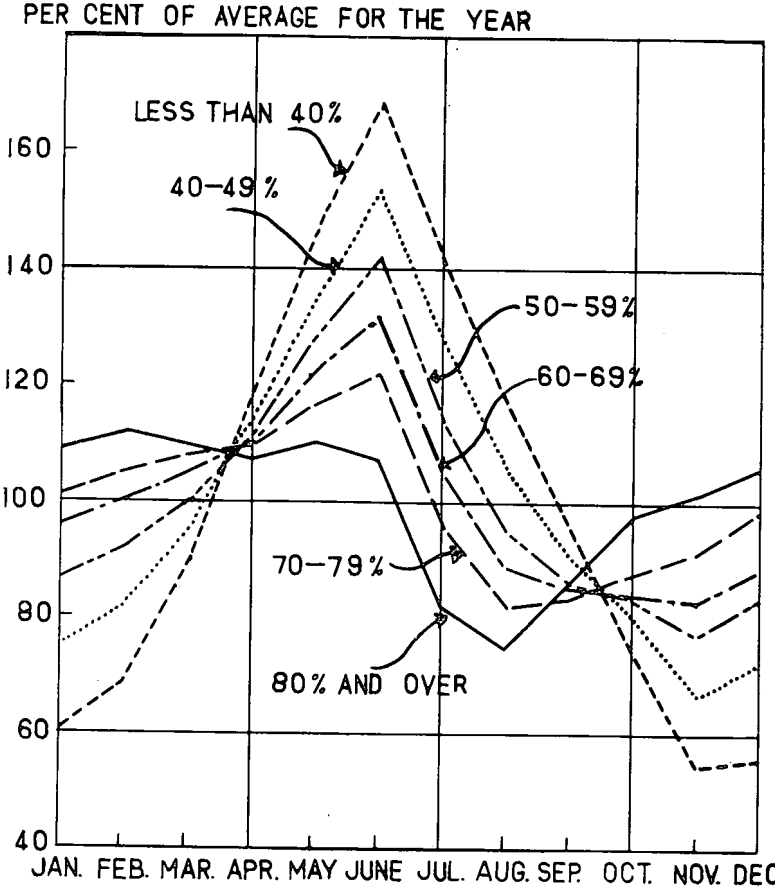

FIGURE 2. SEASONAL VARIATION IN MILK PRODUCTION AND IN THE RECEIPTS OF MILK, CREAM AND CONDENSED MILK (IN TERMS OF MILK EQUIVALENT) AT THE NEW YORK MARKET

Consumption, as measured by receipts, increases during the summer months, but production increases at a still more rapid rate and, ordinarily, there is a surplus eleven months of the year.

vided an adequate supply can be obtained in this way. Unfortunately, the New York milk shed is over-supplied with milk plants. This tends to shorten the haul from the farm, but the

dairy industry is saddled with a heavy plant operating expense due to the low volume per plant.

The average New York approved Grade A plant handles 230 cans of milk a day in June and 160 cans in November, while the average approved Grade B plant handles 287 cans in the former month and only 133 in the latter. There are 240 approved plants in the milk shed, which handle less than 78 cans per day in November. The volume at unapproved manufacturing plants located off railroads is, of course, much smaller, averaging 96 cans per day in June and 33 cans in November. Many plants of this

Table 1. Average Quantity of Milk per plant Received Daily at Various Types of Plants in the New York Milk Shed

Grade	*Cans per day*		
	June	*November*	*Annually*
New York approved Grade A milk..	230	160	180
New York approved Grade B milk...	287	133	185
New York unapproved milk.....	227	114	154
Milk manufactured on railroads.....	304	136	193
Milk manufactured off railroads.....	96	33	58
All milk.....	232	114	156

type do not even operate during the winter because of the small quantity of milk available.

Increased production within the present milk shed would naturally lower the unit cost of country plant operation. In many territories, dairy farms are not producing the maximum amount of which they are economically capable. The average annual production of 44,400 Grade B farms is only about 78,000 pounds, while that of 5,853 Grade A farms is nearly 117,000 pounds. Not all of this difference in production, however, can be attributed to the higher price received for Grade A milk. In locating Grade A plants, dealers have tended to put them in the more intensive parts of the milk shed so as to obtain a sufficient volume of milk close to the milk plants. The establishment of new Grade B plants in recent years, on the other hand, has largely been in the outlying regions of lower production.

A general increase in production, however, gives additional supplies of milk during the greater part of the year when there is already a large amount of surplus that must be manufactured and

Table 2. Average Annual Deliveries of Milk Per Farm at Various Types of Plants in the New York Milk Shed

Grade	*Number of plants*	*Number of farms*	*Farms per plant*	*Pounds of milk per farm*
New York approved Grade A milk	122	5,853	48	116,639
New York approved Grade B milk	603	44,400	74	77,984
New York unapproved milk	45	3,796	83	57,521
Milk manufactured on railroads	55	5,526	100	58,540
Milk manufactured off railroads	229	7,295	32	53,045
All Milk	1,054	66,870	63	75,992

sold in direct competition with similar products from the West. Seasonal adjustment of production would supply the market for many years to come and would also reduce the quantity of surplus milk.

For the milk shed as a whole, twice as much approved milk is produced in June as in November. Twenty-five per cent of the approved farms have a November production only one-third that of June, while over one-half of the unapproved farms fall in the same category.

It has frequently been said that summer dairies produce a surplus only in the spring when condenseries and cheese factories are operating, but that winter dairies produce a surplus from December to March when its disposal is most difficult. This is a mistaken idea. Since the New York milk supply is usually shortest in No-

Table 3. New York Approved Farms Grouped According to the Degree of Summer or Winter Dairying

November milk production in per cent of June production		*Number*		
Group	*Average*	*Plants*	*Farms*	*Millions of pounds of milk*
Less than 40	32.6	158	12,450	1,040
40 to 49	43.9	184	14,199	1,138
50 to 59	54.1	137	9,887	774
60 to 69	62.4	93	5,745	450
70 to 79	74.2	83	4,924	406
80 and over	94.2	70	3,048	340
All	49.4	725	50,253	4,148

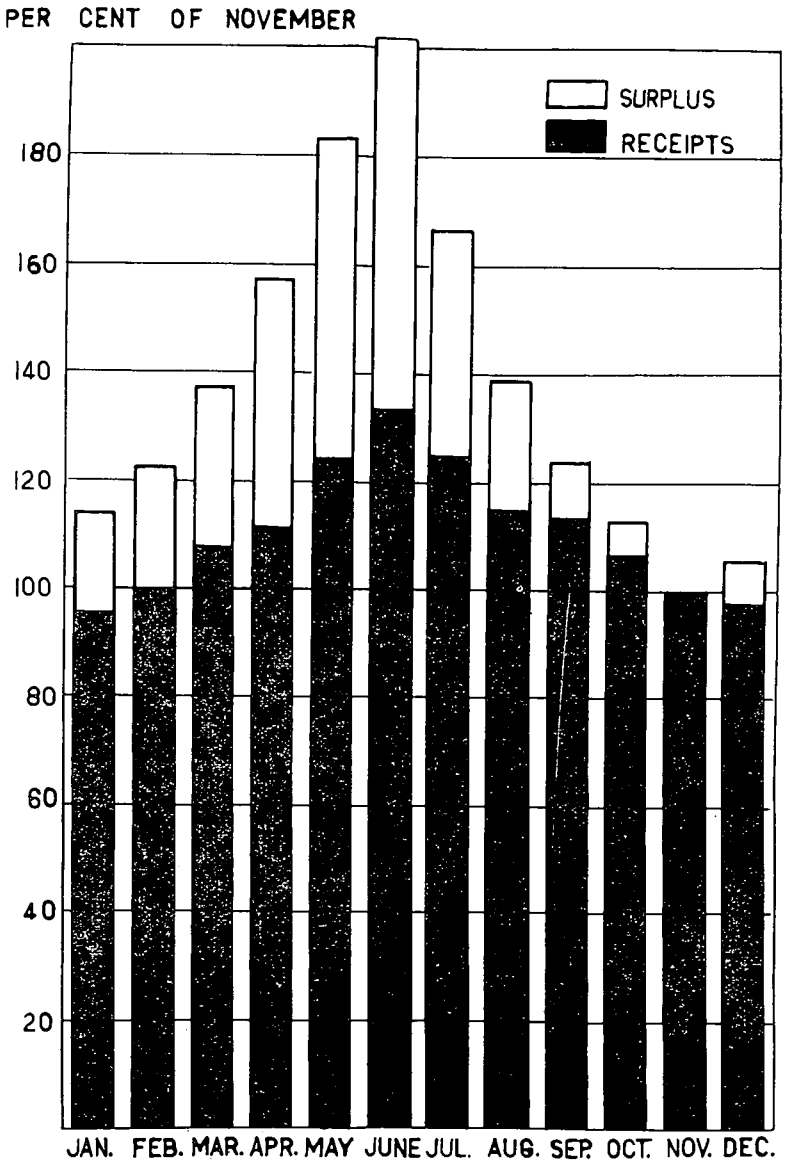

FIGURE 3. SEASONAL VARIATION IN THE PRODUCTION OF MILK BY 50,253 NEW YORK CITY APPROVED FARMS GROUPED ON THE BASIS OF NOVEMBER PRODUCTION IN PERCENTAGES OF JUNE PRODUCTION

(Average for the year = 100 per cent)

As winter dairying increases, production from April to September decreases, while production from October to March increases.

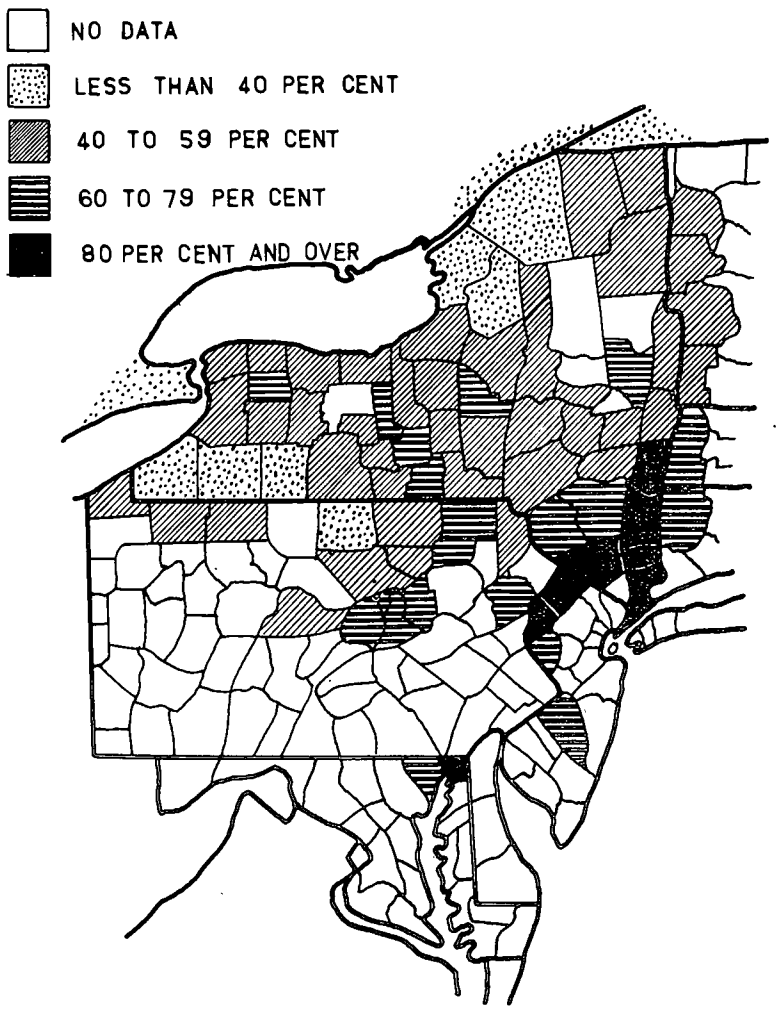

FIGURE 4. PERCENTAGE OF SURPLUS ABOVE NOVEMBER PRODUCTION FOR SIX GROUPS OF NEW YORK CITY APPROVED FARMS FOLLOWING VARYING DEGREES OF SUMMER OR WINTER DAIRYING

(50,253 farms delivering milk to 725 plants)

The more uniform seasonal production of winter dairies results in a very small seasonal surplus.

vember, the only true measure of contribution to winter or summer surplus by any given group of dairymen, is the quantity of milk produced above their November production. Surplus computed on this basis is not only greatest for summer dairymen during the spring and summer, but is also greater than that of winter dairymen from December to March.

The seasonal range in production varies greatly in different regions. For instance, Dutchess County, New York, produces more

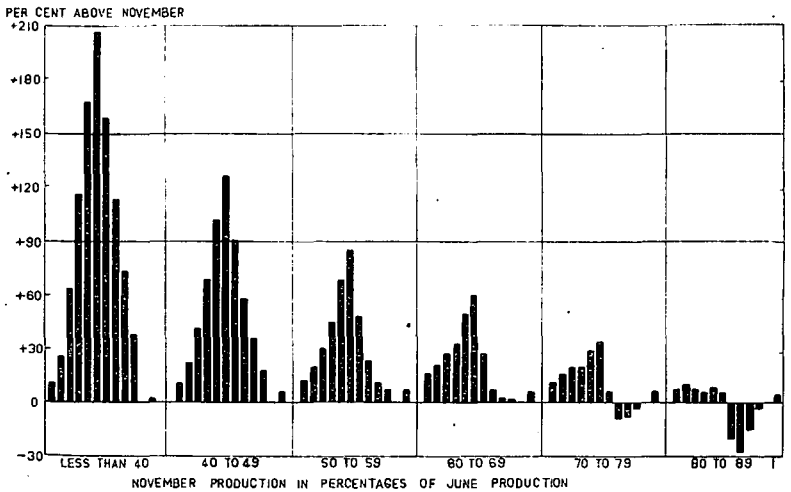

FIGURE 5. NOVEMBER PRODUCTION OF NEW YORK APPROVED MILK IN PERCENTAGES OF JUNE PRODUCTION IN VARIOUS COUNTIES OF THE NEW YORK MILK SHED

The districts which have been producing longest for the New York City market have the most uniform seasonal production.

milk in November than in June, while St. Lawrence County, New York, produces only one-third as much. Part of this difference is due to climatic, topographic, and soil factors, but of equal importance is the factor of previous markets.

As the New York City milk shed developed, plants were first located in near-by dairy regions. When these supplies proved inadequate, new plants were built in up-state New York in those regions which were probably best adapted to the production of winter milk. Further development saw new receiving stations established in summer dairy regions. St. Lawrence County is typical

of this last development, while Dutchess County has long been under the influence of the city market.

In earlier years, milk prices in the two regions were entirely different. From 1897 to 1913, the New York City market paid 74 per cent more for a pound of butterfat in November than it did in June, while a St. Lawrence County creamery paid only 27 per cent more. Obviously, dairymen in the latter region could not afford to produce as much winter milk as could those in Dutchess County.

The importance of this factor of markets is shown by the seasonal range in the production of various grades of milk. The

Table 4. Changes in the Number of Dairy Cattle Per Farm on 5,068 New York Approved Farms

Year (Nov.-Dec.)	*Cows*	*Heifer calves*	*Heifers, 1 year and over*	*Total heifers*	*Ratio, cows to heifers*
1926	15.8	2.6	2.3	4.9	3.2
1927	15.9	2.7	2.5	5.3	3.0
1928	15.8	3.3	2.8	6.1	2.6
1929	16.3	3.3	3.8	7.1	2.3
Percentage change, 1926 to 1929	+3	+27	+65	+45	
1930 (Mar.-Apr.)	16.3	3.4	3.9	7.3	2.2

November production in percentage of the June production for Grade A, Grade B and unapproved milk manufactured off railroads is 68, 46, and 34 per cent respectively. Even the factor of distance of the farms from the milk plants shows up in the seasonal production. The more distant farms having a greater hauling cost, particularly in winter, tend to produce less winter milk and to grow more young stock.

Physical factors of climate and topography undoubtedly influence seasonal production, but the wide range found in some of the summer-dairying regions today will diminish as those districts continue under the influence of city fluid milk prices. When farms from the milk shed as a whole were grouped on the basis of the percentage of land in pasture, it was found that farms with the greatest amount of tillable land had the largest percentage of

fall-freshening cows. This is partly due to the fact that grouping farms on this basis also tends to group them according to the length of time they have been supplying the city market, because receiving stations were first established in regions with a relatively low percentage of pasture. Within a given region, however, the percentage of land in pasture appears to have very little effect on the seasonal production of milk. When the seasonal production of milk on farms producing for the New York market over a period of twenty years was compared, it was found that winter dairying increased at practically the same rate regardless of the percentage of land in pasture.

Table 5. Percentages of Cows and Heifers Bred to Freshen in Different Months on 5,068 New York Approved Farms

Season	*1928*	*1929*	*1930*
	(per cent)	(per cent)	(per cent)
Spring			
Mar. Apr. May	31	30	28
Summer			
June July Aug.	10	10	11
Fall			
Sept. Oct. Nov.	32	35	39
Winter			
Dec. Jan. Feb.	27	25	22
Total	100	100	100

Under ordinary conditions, changing the seasonal production of milk in a large milk shed by advancing the breeding dates of mature cows is a difficult procedure requiring many years. It is relatively simple, however, to delay the breeding of heifers so that they will freshen in the fall. This, apparently, is what is now being done, and, with the very great increase in the number of young stock on New York dairy farms, a shift toward more fall freshening is occurring at a surprisingly rapid rate.

If this trend continues, the November shortage problem will be solved, but a new difficulty may develop in future years due to low production during the latter part of August and the first part of September. At that time, many fall-freshening cows are dry and spring-freshening cows are dropping in production. At the same time, relatively warm weather and the return of vacationists to the

city, combine to give a fairly high demand. This problem can also be solved by a slight change in the season of freshening, and more easily than in the case of the November shortage since it involves delayed breeding of spring-freshening cows. Whether or not this will be done is problematical. It is evident, however, that proper seasonal adjustment of production would assure the New York market an adequate supply from the present milk shed for many years, and would, at the same time, reduce a burdensome surplus.