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**RESERVE MILK SUPPLIES OF
MILK PROCESSORS
IN MAINE AND MASSACHUSETTS**

by

Homer B. Metzger

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RESERVE MILK SUPPLIES OF MILK PROCESSORS IN MAINE AND MASSACHUSETTS

Homer B. Metzger¹

INTRODUCTION

In making payments to producers, fluid milk dealers pay for milk on a utilization basis. That used as fluid whole milk, low fat, or skim milk is paid for at a Class I price and all other milk, regardless of how used, is paid for at a lower Class II price. The milk classified as Class II is often distinguished as that processed and that not processed at the fluid milk receiving plant. The latter is shipped to a surplus milk disposal facility and in Maine, the dealer pays producers a lower, Class Iib price for it. This milk ultimately is processed into cream for ice cream, cheeses, skim milk powder, butter and other storage products.

The milk shipped to surplus disposal outlets by fluid milk dealers is the concern of this study. Part of this milk provides operating reserves (needed to meet variations in daily receipts, processing schedules, and sales, and unanticipated spillage, etc.). Part of this milk is a seasonal reserve (needed because of variations in both production of raw milk and consumption of milk products, and impossible to avoid if adequate supplies in the low months of production are to be assured). Part of this milk is a surplus reserve (milk in excess of operating and seasonal reserves needed only to meet year-to-year variations in production or to assure adequate supplies in a year, rather than a few months, of low production. Annual milk reserves are a composite of these two "necessary" reserves and the more or less "unnecessary" reserve.

In some respects, any Class II milk could be considered a reserve supply of milk with respect to meeting fluctuating Class I milk demands. However, a dairy's commitment to supply fresh and sour cream, cottage cheese and ice cream mixes frequently requires treating demands for these items as equally important as demands for homogenized, low fat and skim milk products which comprise Class I uses. Therefore, Class II products frequently are not produced on the basis of availability of milk supplies. Thus reserve milk supplies are needed to assure consumers of a regular supply of products whether or not they are classified as Class I or Class II for pricing purposes.

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From a producer point of view a minimum use of milk for Class II purposes enhances the price received for milk. On the other hand, increasing Class II use provides a larger market, albeit at a lower price. Producer interests are best served by some middle point of utilization at which price covers costs and a reasonable return. It is to the advantage of both producer and dealer as well as consumers to keep the reserve supplies of milk at a minimum.

The objective of this study was to determine the minimum reserve requirements of fluid milk processing plants and to analyze some of the factors influencing the level of reserves.

METHOD AND SCOPE

Quantities of milk received and processed daily (during the weeks of June 15 and November 16), monthly (for June and November) and annually during 1975 were obtained from 42 fluid milk pasteurizing plants in Maine and Massachusetts. Twenty of the plants were located in Maine and 22 in Massachusetts.

Data were requested by mail from most fluid milk plants in each state with personal contacts used to solicit additional responses. The Maine plants included in the study represented 40 percent of all plants and over 50 percent of the milk received by all plants in the state. For Massachusetts, the study plants represented 20 percent of all plants and nearly 40 percent of the milk received by all plants in the state.

Analyses of data consisted primarily of simple tabulations to identify operating, seasonal and annual reserve milk supplies. Factors influencing reserves were analyzed using cross tabulation.

RESERVE MILK SUPPLY SITUATIONS

Reserve milk supplies varied depending upon whether measured by the week, by the month or by the year. Variations in reserve supplies were indicated between plants located in Maine and those located in Massachusetts. Variations were associated with differences in sources of supply and to some degree to differences in frequency of processing per week and to differences in plant storage capacity.

Operating Reserves

Milk supplies are lowest in November in most markets. Thus plants would tend to operate with the minimum amount of reserves during this month. A good indication of minimum reserves needed should be obtained by the proportional quantities of milk received and processed in November, particularly during a week of lowest production. The week of November 16-22 was considered the lowest production period of the year.

The quantity of milk received and processed during the selected week in November was compiled from dealers' reports of daily milk utilization. The results indicate one percent more milk was received than processed by all firms providing data, Table 1, and was the same in both Maine and Massachusetts.

Table 1

AVERAGE QUANTITY OF MILK RECEIVED AND PROCESSED PER PLANT AND MILK RECEIVED AS PERCENT OF MILK PROCESSED, BY VARIOUS PERIODS AND BY PLANT LOCATION, 32 FIRMS, 1975

Period	Number of Firms	Received	Processed	<u>Received</u> <u>Processed</u>
		-Hundredweight-		Percent
MAINE				
June week	15	2,201	1,778	124
Nov week	15	2,123	2,096	101
June month	11	12,109	10,036	121
Nov month	11	11,279	10,701	105
Annual Total	15	115,136	105,977	109
MASSACHUSETTS				
June week	14	2,001	1,963	102
Nov week	14	2,092	2,066	101
June month	15	7,188	7,000	103
Nov month	15	7,846	7,502	105
Annual total	17	98,367	96,164	102
MAINE AND MASSACHUSETTS				
June week	29	2,104	1,867	113
Nov week	29	2,108	2,082	101
June month	26	9,270	8,284	112
Nov month	26	9,298	8,855	105
Annual total	32	106,228	100,764	105

Variations in reserve supplies among individual firms was substantial, ranging from -20 to +32 percent of milk processed. Using the November week (Nov. 16-22) as a basis for comparison, 52 percent of the firms had either negative or no reserves. They processed either the same amount of milk, or more, than was received during the week. Inventories of milk from the previous week permitted negative reserve situations in the selected week. About one quarter of the firms had a reserve of from one to ten percent of processed milk. About 25 percent had reserves of 11 to 32 percent, Table 2. The typical situation both in Maine and in Massachusetts was no reserve or a negative reserve during the November week. Nearly twice as many Maine as Massachusetts firms had positive reserve supplies in this week.

Table 2

NUMBER OF FIRMS BY PERCENTAGE OF MILK RECEIVED TO MILK PROCESSED, SELECTED WEEK IN JUNE AND NOVEMBER, BY PLANT LOCATION, 29 FIRMS 1975

Percent Received of Processed Milk	Plant Location				All Firms	
	MAINE		MASS		No. Firms	Percent
	No. Firms	Percent	No. Firms	Percent	No. Firms	Percent
JUNE WEEK						
91-100	1	7	8	58	9	31
101-110	3	20	2	14	5	17
111-160	7	47	2	14	9	32
161-210	2	13	1	7	3	10
211-260	2	13	0	0	2	7
Over-260	0	0	1	7	1	3
All	15	100	14	100	29	100
NOVEMBER WEEK						
81-90	2	13	1	7	3	10
91-100	4	27	8	58	12	42
101-110	4	27	3	21	7	24
111-130	3	20	1	7	4	14
Over-130	2	13	1	7	3	10
All	15	100	14	100	29	100

This low reserve supply, averaging one percent for all plants, suggests that the reserve supply was strictly an operating reserve. The operating reserve would cover milk production and sales variations from day to day or from week to week. The low level of reserves suggests little or no existence of a surplus reserve which would assure needed milk from year to year. It was concluded that one percent of receipts constituted the minimum operating reserve for fluid milk plants.

Surplus Reserves

When reserves were examined on a monthly rather than a weekly basis, substantially larger reserves were indicated. For the month of November, the average amount of milk received exceeded the average amount of milk processed by five percent, both for 15 plants in Maine and 15 plants in Massachusetts, Table 1. This suggests that a surplus reserve existed and amounted to four percent of the milk processed after allowing for the one percent operating reserve. (Five percent total monthly reserve less one percent previously established as an operating reserve.)

Seasonal Reserves

Milk supplies are highest in June in most markets and total reserve supplies of milk usually are highest in June. The quantity of milk re-

ceived in one selected week in June (June 15-21) was 13 percent greater than that processed, based on reports by 29 firms, Table 1. Subtracting the five percent reserve in November (the operating and surplus reserves) gave a remainder of eight percent which was the seasonal reserve. This reserve is a reflection primarily of the uncontrolled seasonal variation in milk production on farms. Some is due to seasonal variation in sales due to closing of schools. This seasonal reserve differed widely between states. In Maine, the seasonal reserve was 19 percent, while in Massachusetts it was zero or negative. Milk received was only two percent more than milk processed by Massachusetts plants in June.

Reserve milk supplies in the June week (June 15-21) were quite variable from plant to plant. About one third reported no reserves or negative reserves in June, while 20 percent had reserves of from 60 to over 160 percent, Table 2. The typical positive reserve was from 11 to 60 percent in this June week.

Measuring seasonal reserve supplies on a monthly basis, rather than on a weekly basis in June, reduced the proportion of seasonal reserves an average of one percentage point based on 26 firms. For eleven Maine plants the reduction was three percentage points. Fifteen Massachusetts plants showed no seasonal reserves in June.

Annual Reserves

A plant's annual milk reserves consist of a combination of operating reserves, seasonal reserves and surplus reserves. The annual reserves were indicated by computations using data for the calendar year.

When reserve supplies were measured on an annual basis, using data for the year 1975, they averaged five percent of milk processed for 32 firms. The annual reserves averaged nine percent for 15 Maine plants and two percent for 17 Massachusetts plants, Table 1. The differences between Maine and Massachusetts in annual reserve supplies was a reflection of a high proportion of Massachusetts plants buying milk from another plant, under a full service contract, rather than directly from producers. The Massachusetts plants buying milk from producers had reserve supplies similar to Maine plants buying from producers.

MANAGING RESERVE MILK SUPPLIES

The relatively low percentage of milk which constitutes operating reserve supplies is made possible primarily by the use of storage facilities which enable inventory build up to meet wide variation in day to day processing volumes. These varying volumes result from (1) uneven packaged milk demands primarily from stores with high Friday and Saturday sales patterns and (2) the reduced number of processing

days which serve to improve plant operating efficiency. Seasonal and surplus reserve milk supplies are controlled by purchasing less milk than needed direct from producers and supplementing this with milk from other plant sources through open market or contractual purchases as needed.

Storage Capacity

The need for storage capacity is evident from the variable day to day quantities of milk received and processed during one week. Receipts of milk were sufficient to meet processing demand on Saturday, Sunday, Tuesday and Wednesday, but short of demand on Monday, Thursday and Friday, Figure 1 and Figure 2. Inventory build up enabled processors to meet demand on the peak packaging days. Such build up was necessary in June but was critical in November, Table 3.

Substantial plant storage capability existed for both raw and packaged milk. Information on the capacities of these two types of storage indicated that the average plant could store six days of milk, based on average daily milk receipts in June. The breakdown by type of storage and by plant location was as follows:

Type Storage	Maine	Massachusetts
	percent of daily receipts	
Raw Milk	231	214
Packaged Milk	372	412

Storage capacities of individual firms showed wide variations. Twenty five percent had less than two days' capacity for raw milk while about 20 percent had three or more days capacity, Table 4. Packaged milk storage capacity was particularly variable. Twenty five percent had less than three days, 25 percent had between five and eight days while 18 percent had capacity for nine for more days or receipts. Some of this variation could have been due to firms which currently had a low volume of receipts in a plant designed for a much larger volume. The firms were about equally divided in capacities for combined raw and packaged milk storage. About 20 percent were in each of these capacity groups: 3 to 5 days, 5 to 7 days, 7 to 9 days, and 9 days or more, Table 4.

Storage capacity was related to size, or quantity of receipts, and frequency of processing. The storage capacity was inversely related to annual receipts. As capacity increased, annual receipts generally declined. This was particularly evident for raw milk storage capacity, Table 5.

Firms which processed three or four times per week had greater storage capacity than those processing six or seven times. An exception to this was one Massachusetts firm with only three days of capacity and processing three days per week, Table 6.

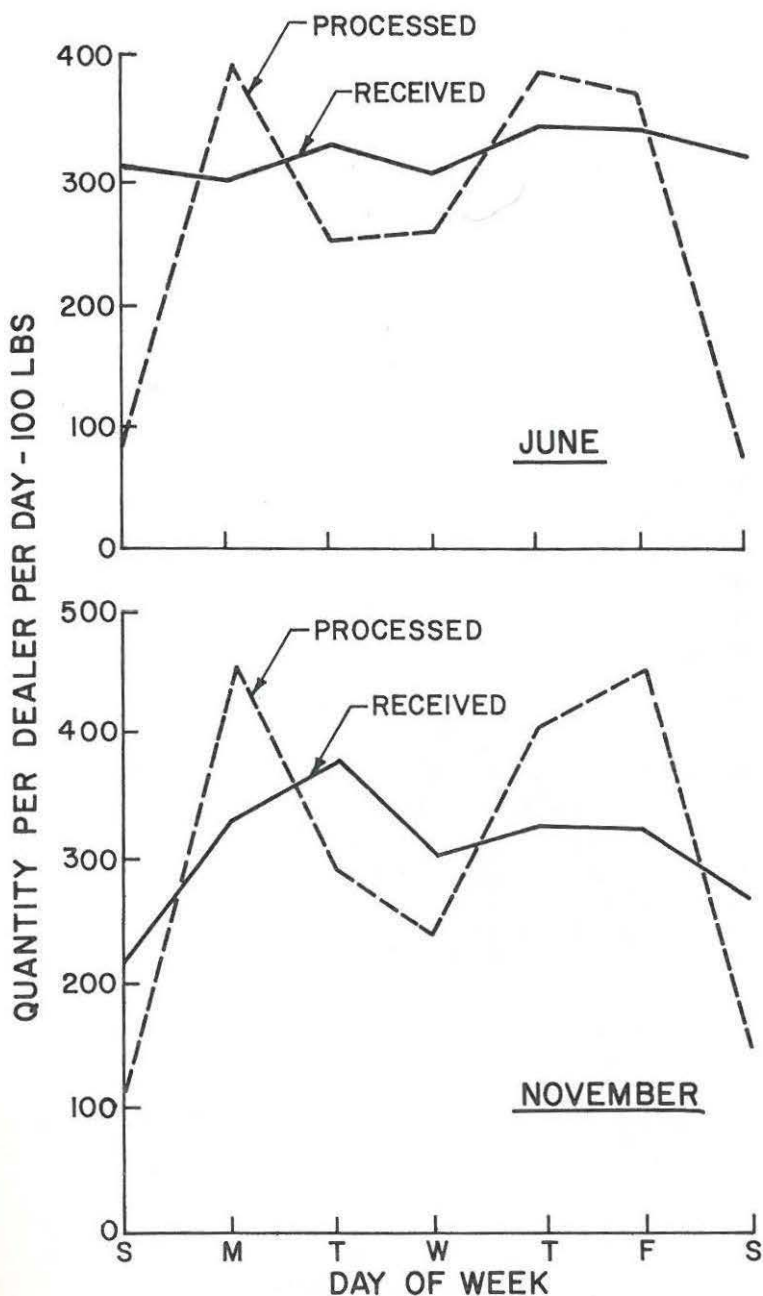


FIGURE 1— Milk received and processed per day, June week, and November week, Maine 1975.

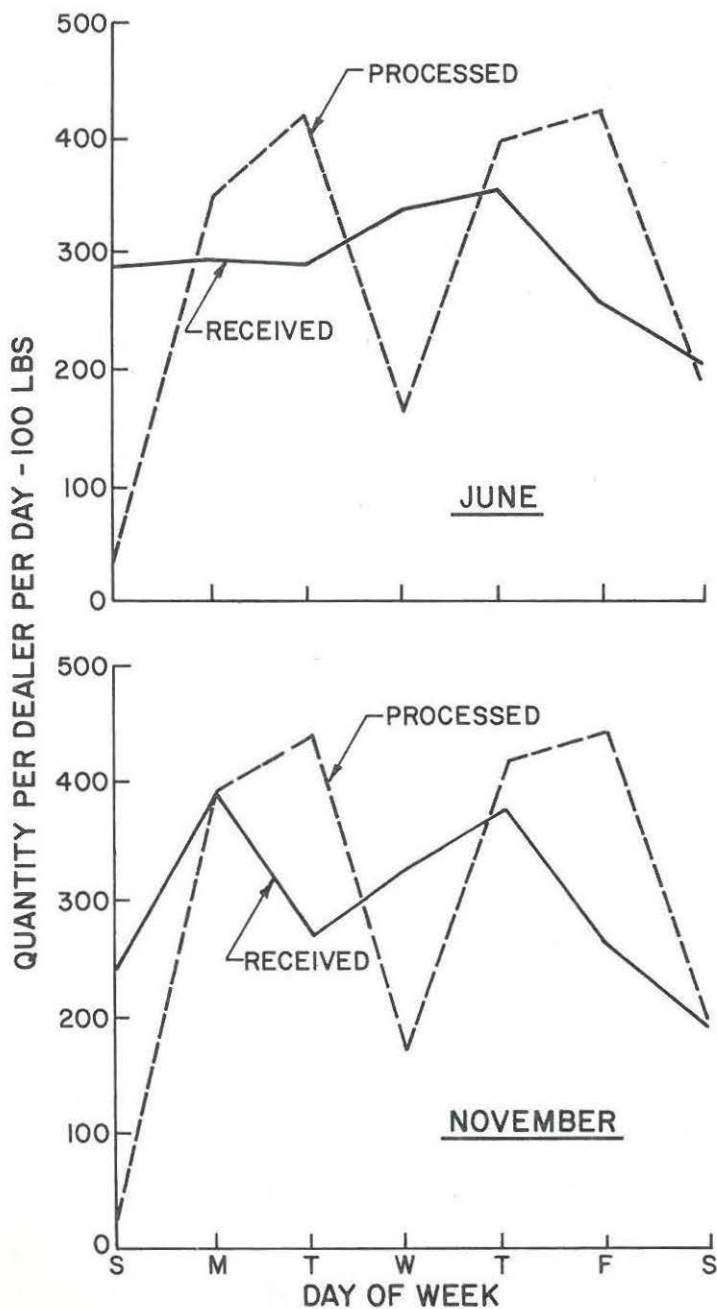


FIGURE 2— Milk received and processed per day, June week, and November week, Massachusetts 1975.

Table 3
 AVERAGE DAILY RECEIPTS AND DISPOSITION OF MILK PER FIRM, WEEKS
 OF JUNE 15-21 AND NOVEMBER 16-22, BY PLANT LOCATION, 29 FIRMS, 1975

Month/Day	Disposition				
	Inventory	Received	Processed	Shipped	Shrink/Dumped
Hundredweight					
MAINE					
JUNE					
Sun	271	305	83	30	0
Mon	464	297	392	61	20
Tues	288	322	245	75	9
Wed	281	301	249	70	2
Thurs	263	332	375	17	2
Fri	200	330	360	18	10
Sat	142	313	74	146	18
Total	—	2201	1778	416	61
MASS.					
JUNE					
Sun	32	286	28	2	1
Mon	289	290	345	0	2
Tues	233	286	418	9	2
Wed	90	333	165	0	2
Thurs	258	349	396	4	2
Fri	206	255	420	10	2
Sat	29	202	190	1	1
Total	—	2001	1963	26	13
MAINE					
NOVEMBER					
Sun	245	220	111	0	0
Mon	353	332	456	2	2
Tues	224	376	294	0	2
Wed	299	300	242	5	1
Thurs	352	318	400	3	2
Fri	265	315	448	0	2
Sat	131	263	146	54	2
Total	—	2123	2096	63	15
MASS.					
NOVEMBER					
Sun	35	268	24	0	1
Mon	286	389	388	0	3
Tues	279	270	436	3	3
Wed	111	324	171	9	2
Thurs	255	372	415	0	3
Fri	211	279	439	6	2
Sat	44	189	192	0	1
Total	—	2092	2066	18	15

Table 4

NUMBER OF PLANTS BY MILK STORAGE CAPACITY AND PLANT LOCATION,
28 FIRMS, 1975

Storage Capacity (% of Average June Receipts)	Location of Plant				All Plants	
	Maine		Mass.			
	No.	%	No.	%	No.	%
Raw and Packaged Milk						
300-499	3	21	3	23	6	22
500-699	3	21	4	31	7	26
700-899	3	21	4	31	7	26
900 & Over	5	37	2	15	7	26
	—	—	—	—	—	—
Total	14	100	13	100	27	100
Packaged Milk						
Under 300	3	21	4	29	7	25
300-499	5	36	4	29	9	32
500-699	2	14	3	21	5	18
700-899	0	0	2	14	2	7
900 & Over	4	29	1	7	5	18
	—	—	—	—	—	—
Total	14	100	14	100	28	100
Raw Milk						
Under 200	3	20	4	31	7	25
200-299	7	47	8	61	15	54
300-399	3	20	1	8	4	14
400 and Over	2	13	0	0	2	7
	—	—	—	—	—	—
Total	15	100	13	100	28	100

Storage Capacity and Level of Reserve Supplies

A large storage capacity relative to the quantity of milk received permits the build-up of milk supplies to meet peak processing needs. This reduces the amount of reserve milk supplies handled compared with contracting annually for sufficient milk to meet the peak need. The level of reserve supplies undoubtedly was lower than it otherwise might be because of substantial storage capacity of the firms studied. However, there was no convincing evidence that the level of reserve supplies was influenced by the different storage capacities of these firms. Reserve supplies tended to increase (rather than decrease) as storage capacity increased. The relationship was not consistent. On an annual basis, for all firms, reserve supplies increased from five percent of milk processed for those with 3 to 7 days of storage capacity to 19 percent for those with 7 to 9 days of capacity and was 12 percent for those with 9 or

Table 5

ANNUAL RECEIPTS OF MILK BY MILK STORAGE CAPACITY AND PLANT LOCATION, 25 FIRMS, 1975

Storage Capacity (% of Average June Receipts)	Location of Plant		Location of Plant		All Plants
	Maine	Mass.	Maine	Mass.	
	number		hundredweight		
Raw & Packaged Milk					
300-499	3	3	279,577	41,213	160,394
500-699	3	4	150,468	164,205	158,317
700-899	2	3	21,565	95,415	65,875
900 & Over	5	1	33,569	2,000	28,308
Total	13	11	115,470	97,155	107,075
Packaged Milk					
Under 300	3	4	279,577	33,324	138,861
300-499	4	4	118,466	171,476	144,971
500-699	2	2	17,134	151,433	84,283
700-899	0	1	0	149,182	149,182
900 & Over	4	1	38,562	2,000	31,250
Total	13	12	115,470	106,104	110,974
Raw Milk					
Under 200	3	4	206,090	101,160	146,130
200-299	7	6	130,559	109,067	120,640
300-399	2	1	22,948	9,655	18,516
400 & Over	2	0	18,028	0	18,028
Total	14	11	115,295	97,155	107,313

more days of capacity, Table 7. For individual state situations and for weekly or monthly reserve supply situations both similar and divergent patterns emerged. Factors such as source of supply, frequency of processing and volume of receipts, which were correlated to some degree with storage capacity, influenced the relationship.

Source of Milk Supplies

Milk processors have three sources of milk supplies (1) their own herds (2) herds of other producers and (3) other plants receiving milk from producers. The amount of reserve milk supplies is influenced substantially by the source used.

Firms in the study reported the percentage of their milk supplies obtained from various sources during June, November and for the year. Supplies obtained from other plants were identified as to purchase arrangement as follows: spot market, supplemental supply agreement, full service contract, own firm, and other.

Table 6

RAW MILK STORAGE AND PACKAGED MILK STORAGE CAPACITIES AS PERCENT OF AVERAGE DAILY RECEIPTS, WEEK OF JUNE 15-21, 1975 BY PROCESSING DAYS PER WEEK AND PLANT LOCATION, 26 FIRMS

Processing Days Per Week	Number Plants	Storage Capacity		Daily Receipts (100 lbs)	Capacity as Percent of Receipts	
		Raw (100 lbs)	Packaged (100 lbs)		Raw	Packaged
MAINE						
3	3	176	538	49	359	1098
4	4	641	888	206	311	431
5	5	1308	2069	646	202	320
6	2	267	416	100	267	416
All	14	726	1167	314	231	372
MASS						
3	1	129	157	89	145	176
4	4	462	1280	219	211	584
5	3	828	1695	393	211	431
6	1	2752	3864	1250	220	309
7	3	99	78	38	261	205
All	12	626	1205	292	214	413
ALL						
3	4	164	443	59	278	751
4	8	552	1084	213	259	509
5	8	1128	1928	551	205	350
6	3	1095	1565	483	227	324
7	3	99	78	38	261	205
All	26	680	1185	304	224	390

In Maine the major proportion of processor milk supplies — over 75 percent — came from regular producers. Herds owned by the processor provided about 20 percent and about 5 percent was obtained from other plants, primarily through supply agreements, Table 8. By contrast, in Massachusetts about half of the processors' milk supplies came from other plants through full service contracts (agreements whereby needed quantities of milk were delivered at specified times at negotiated prices). In addition, nearly one third of supplies was obtained from processors' own herds with only about 15 percent from regular producers. The balance of supplies was obtained from other plants, primarily from other plants of the processor.

Seasonal differences in sources of supplies were small. In Maine spot market purchases and purchases under supplemental agreements accounted for six percent of the milk in November, compared with two percent in June, Figure 3. In Massachusetts four percent of supplies came from other plants in November compared with one percent in June.

Table 7

MILK RECEIVED AS PERCENT OF MILK PROCESSED, WEEK, MONTH AND ANNUAL BASES, BY TOTAL RAW AND PACKAGED MILK STORAGE CAPACITY AND PLANT LOCALTION, 27 FIRMS, 1975

Raw & Packaged Milk Storage Capacity (Percent of Receipts)	Period					
	Year		Month		Week	
	No. Firms	Percent	No. Firms	Percent	No. Firms	Percent
			June	Nov	June	Nov
			MAINE			
300-499	3	106	3	116	3	119
500-699	3	114	2	126	3	129
700-899	2	112			3	154
900 and over	5	108	4	131	5	117
All	13	110	9	120	14	124
			MASS			
300-499	3	101	2	101	3	107
500-699	4	100	3	100	4	98
700-899	3	111	4	109	4	106
900 and over	1	100			2	223
All	11	103	9	105	13	102
			MAINE AND MASS			
300-499	6	105	5	115	6	118
500-699	7	105	5	116	7	109
700-899	5	119	4	109	7	112
900 and over	6	112	4	131	7	119
All	24	106	18	115	27	113

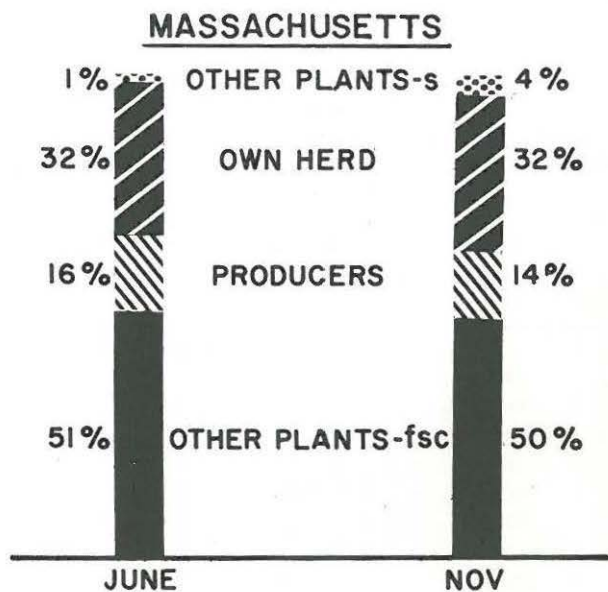
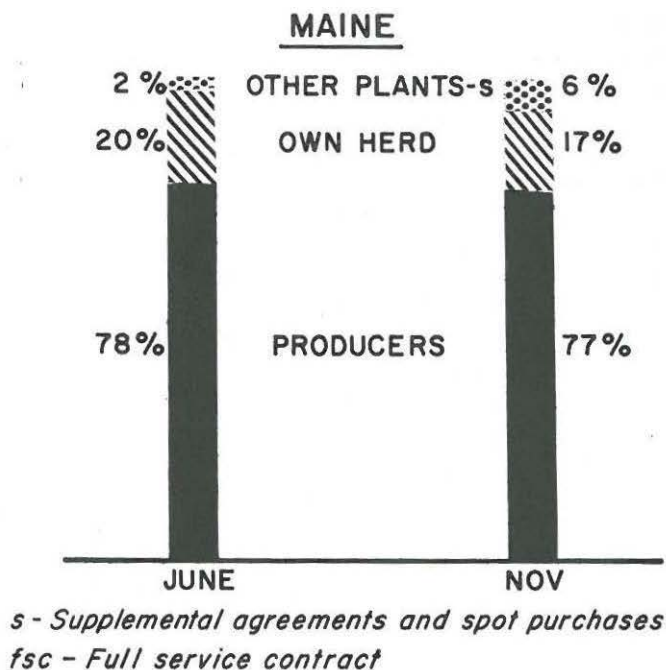


FIGURE 3 — Source of milk supplies by state, June and November.

The percentage of **firms** obtaining milk from various sources (for a **major** portion of their milk supplies) paralleled closely the percentage proportion of all milk supplies obtained from various sources. In Maine, 21 percent of the firms obtained half or more of their milk from their own herds while 79 percent obtained more than half from regular producers, Table 9. This compares with 20 percent of the **milk supply** coming from own herds and 77 percent from producers. In Massachusetts, 32 percent of the firms obtained 90 or more percent of their milk from their own herds. Nineteen percent of Massachusetts firms received most of their milk from producers, while 49 percent obtained most supplies under a full service contract. The proportion of the **milk supplies** from these sources was similar to these percentages of **firms**.

Supplemental purchases (less than 50 percent of supplies) were obtained from a wide variety of sources. Forty two percent of the firms in Maine used the spot market and 32 percent used supply agreements, Table 10. Milk from regular producers and from their own herd was used to supplement milk from major supply sources by 16 percent of the firms. Twenty six percent of the firms obtained no supplemental supplies. In Massachusetts 51 percent of the firms did not purchase supplemental supplies. The relative importance of the supplemental supply sources used were similar to those used by Maine firms, except for the use of other plants of the processor and the full service contract.

Table 9

NUMBER AND PERCENTAGE OF FIRMS USING VARIOUS SOURCES FOR MAJOR SUPPLIES OF RAW MILK BY PLANT LOCATION, 41 FIRMS, 1975

Source of Major Supplies	Percent of supplies	Number and Location of Plants		
		19 Maine	22 Mass	All 41
			percent of firms	
Own Herd	100 pct.	5	27	17
	90-99 pct.	5	5	5
	50-89 pct.	11	0	5
Producers	100 pct.	21	5	12
	90-99 pct.	47	0	22
	50-89 pct.	11	14	12
Full Service	100 pct.	0	40	22
	90-99 pct.	0	9	5
All Major Sources		100	100	100

Table 10

NUMBER AND PERCENTAGE OF FIRMS USING VARIOUS SOURCES FOR SUPPLEMENTAL SUPPLIES OF RAW MILK, ANNUAL BASIS, BY PLANT LOCATION, 41 FIRMS, 1975

Source of Supplemental Supplies ¹	Number and Location of Plants						All 41
	19 Maine		22 Mass		Number	Percent	
Own Herd	1	5	2				3
Producers	2	11	0		2		5
Other Plants							
Own Firm	0	0	1		1		2
Spot Market	8	42	0		8		20
Supplemental supply agree.	6	32	3		9		22
Full Service Contract	0	0	1		1		2
Other	1	5	0		1		2
None	5	26	16		21		51
Total	—	—	—		—		—
	*	*	*		*		*

¹Less than 50 percent of receipts

*Does not total to number of plants or 100 percent due to multiple sources of supplies

Source of Milk Supplies and Level of Reserve Supplies

The level of reserve supplies was influenced by the source of milk. Reserve supplies were highest when the major source of milk was producers and lowest when from other plants under a full service contract. Reserve supplies were moderately high for firms obtaining a major portion of their supply from their own herds.

In general, the higher the proportion of the supply obtained from producers the higher the reserve supplies. Under a full service contract, where no milk was received from producers, and reserve supply levels were those needed to maintain operating reserves, milk received was 100 to 104 percent of milk processed, depending upon period of measurements, Table 11. Where producers accounted for 50-89 percent of milk supplies, milk received was 105 to 111 percent of milk processed. This compared with 109 to 170 percent where producers provided 100 percent of the milk supplies.

For firms with their own herds, those which obtained 100 percent of their milk from this source had much lower levels of reserve supplies than those which obtained 50-89 percent of their milk from the own herd source. These latter firms apparently supplemented their own herd milk with other producer milk, which resulted in increased reserve milk supplies.

Reserve milk supplies held by Maine plants were higher than those held by Massachusetts plants largely because milk was purchased directly from producers in Maine and largely from other plants in Massachusetts. Plants receiving milk from producers in Maine had reserves of eight to 12 percent while plants receiving milk from other plants under full service contracts in Massachusetts had reserves of zero to two percent, Table 11. While the explanation of differences between the states in sources of supply is not within the scope of this study it warrants some comment.

The striking difference between the two states in sources of milk supply is not due to sampling error. The differences are real. Likely reasons for the differences include differences between the states in pooling arrangements, density of milk production and geographic dispersion of plants. The individual handler pool used in Maine makes contractual arrangements with other plants less attractive than the marketwide pool used in Massachusetts. The long distances between plants and the low density of milk production in Maine work against interplant movements. Despite these obstacles, the improved efficiency in disposing of excess milk supplies warrants some consideration of full service contracts in Maine. The excess milk supplies would be more centralized and either manufactured or transferred for manufacture at lower cost.

Table 11

MILK RECEIVED AS PERCENT OF MILK PROCESSED, WEEK, MONTH AND ANNUAL BASES, BY SOURCE OF SUPPLY AND PLANT LOCATION, 31 FIRMS, 1975

Source of Supply	Percent of Supply	Year		Month		Period	
		No. Firms	Percent	No. Firms	Percent	No. Firms	Percent
				June	Nov.	June	Nov.
MAINE							
Own Herd	90 - 99	1	115			1	128
	50 - 89	1	130	1	100	2	142
Producers	100	3	112	2	114	3	170
	90 - 99	7	108	5	111	7	123
	50 - 89	2	109	2	116	1	100
All		14	109	10	121	14	103
MASS.							
Herd	100	3	100	2	100	3	100
	90 - 99	1	102	-		1	86
Producers	100	1	102	1	101	-	-
	50 - 89	3	111	3	108	3	109
Full Service Contract	100	7	100	7	104	5	100
	90 - 99	2	102	2	104	2	104
All		17	102	15	103	14	101

Table 11

MILK RECEIVED AS PERCENT OF MILK PROCESSED, WEEK, MONTH AND ANNUAL BASES, BY SOURCE OF SUPPLY AND PLANT LOCATION, 31 FIRMS, 1975

Source of Supply	Percent of Supply	Period					
		Year		Month		Week	
		No. Firms	Percent	No. Firms	Percent	No. Firms	Percent
				June	Nov.	June	Nov.
MAINE & MASS.							
Own Herd	100	3	100	2	100	3	100
	90 - 99	2	107	-		2	115
	50 - 89	1	130	1	469	2	142
Producers	100	4	109	3	129	3	170
	90 - 99	7	108	5	119	7	153
	50 - 89	5	111	5	109	4	105
Full Service	100	7	100	7	102	5	100
Contract	90 - 99	2	102	2	101	2	104
All		31	105	25	112	28	113

- None reported

Frequency of Processing

Milk processors processed and packaged milk as frequently as 7 days per week and as infrequently as 3 days per week. About sixty percent of the firms processed either 4 days or 5 days per week, Table 12. The 4-day processing week was the most frequently reported processing schedule. The five day processing week was more prevalent in Maine than in Massachusetts, Table 12.

Table 12

FREQUENCY OF PROCESSING PER WEEK, JUNE WEEK, BY PLANT LOCATION, 28 FIRMS, 1975

Number of Days Processed Per Week	Number and Location of Plants					
	Maine		Mass		All	
	No. Firms	%	No. Firms	%	No. Firms	%
1	0	0	1	7	1	3
3	3	20	1	7	4	14
4	4	27	5	37	9	31
5	5	33	3	21	8	28
6	3	20	1	7	4	14
7	0	0	3	21	3	10
All	15	100	14	100	29	100

The frequency of processing appeared to be directly related to volume of milk processed. As volume increased, the frequency of processing increased, except that the 7-day week was used by firms with the smallest average volume, Table 13.

Days of the week on which processing was done within a frequency group varied substantially. Most dealers processed Monday, Tuesday, Thursday, and Friday when on a four day schedule, but four other combinations of days were used by four dealers. The five day week usually was Monday, Tuesday, Thursday, Friday and Saturday. About equally used was a M-T-W-Th-Fri pattern and two other patterns were used. The three day week usually consisted of Monday-Wednesday-Friday but two other patterns were also used.

Frequency of Processing and Level of Reserve Supplies

There was an inverse relationship between the frequency of processing and reserve supplies. Milk received exceeded milk processed by greater percentages as the number of processing days per week declined. However, the firms processing three days per week did not have the highest percentage of receipts in relation to sales. On an annual

Table 13

MILK RECEIVED AS PERCENT OF MILK PROCESSED, ANNUAL BASIS, BY PROCESSING DAYS PER WEEK AND PLANT LOCATION, 25 FIRMS, 1975

Days Process Per Week	Number Firms	Annual Quantity		Received Processed
		Received	Processed	
- hundredweight -				%
MAINE				
3 days	3	17,351	15,779	110
4	3	72,441	55,159	131
5	5	232,015	221,036	105
6	2	81,113	75,638	107
7	-			
All	13	122,437	113,021	108
MASS.				
3 days	1	33,056	32,250	102
4	5	111,673	105,261	106
5	2	89,206	88,934	100
6	1	455,500	455,500	100
7	3	15,969	15,814	101
All	12	106,104	103,280	103
MAINE & MASS.				
3 days	4	21,277	19,897	107
4	8	96,962	86,473	112
5	7	191,212	183,293	104
6	3	205,909	202,259	102
7	3	15,969	15,814	101
All	25	114,597	108,345	106

basis, seven percent more milk was received than processed by firms processing three days per week compared with four percent for firms processing five days and one percent for those processing seven days, Table 14. While the percentages differed, similar relationships were indicated by data for the months of June and November and a week in June and November. However, differences in the November week were minimal.

It would appear that frequency of processing per week influenced reserve supplies despite adequate storage facilities for holding milk from one processing day to the next. Milk was received and shipped rather than stored for several days, when processing was done only three or four days per week. An important reason may be the desire to process fresh milk rather than rely on inventories. Reducing average receipts and building inventories over longer periods to meet a three or four day processing schedule was apparently rejected as operating policy.

Table 14

MILK RECEIVED AS PERCENT OF MILK PROCESSED, WEEK, MONTH AND ANNUAL BASES, BY FREQUENCY OF PROCESSING AND PLANT LOCATION
28 FIRMS, 1975

Number of Days Processed Per Week	Year		Month		Week				
	No. Firms	Percent	No. Firms	Percent	No. Firms	Percent	Period		
							June	Nov.	
	MAINE								
Three	3	110	2	132	100	3	120	107	
Four	3	131	2	175	133	4	169	122	
Five	5	105	5	114	102	5	116	99	
Six	2	107	-	-	-	3	123	93	
Seven	-	-	-	-	-	-	-	-	
All	13	108	9	120	105	15	124	101	
	MASS.								
Three	1	102	-	-	-	1	100	100	
Four	5	106	5	104	106	5	106	104	
Five	2	100	3	106	106	3	100	101	
Six	1	100	-	-	-	1	100	100	
Seven	3	101	2	101	100	3	100	99	
All	12	103	10	105	106	13	102	101	
	MAINE & MASS.								
Three	4	107	2	132	100	4	112	97	
Four	8	112	7	119	112	9	123	109	
Five	7	104	8	112	103	8	111	99	
Six	3	102	-	-	-	4	106	98	
Seven	3	101	2	101	100	3	100	99	
All	25	106	19	114	106	28	113	101	

- None reported

SUMMARY

The quantity of milk received, processed and shipped during 1975 by 42 fluid milk pasteurizing plants in Maine and Massachusetts was used to determine reserve milk supplies. Daily receipts and disposition for one week in June and November plus monthly and annual receipts and disposition were analyzed. Levels of operating, seasonal and surplus reserves were estimated. Several factors affecting levels of reserves were examined. Reasons for differences between states were postulated.

An operating reserve averaging one percent of milk processed was indicated for all plants combined. Seasonal reserves amounted to eight percent when measured on a weekly basis and seven percent when measured on a monthly basis. A surplus reserve of four percent of milk processed existed, based upon monthly data. Variations in operating, surplus, and seasonal reserves among plants were substantial.

Annual reserve supplies averaged five percent of milk processed for all plants and varied from nine percent for Maine plants to two percent for Massachusetts plants.

Relatively low levels of operating reserves were achieved through having adequate storage facilities. For the average plant, storage facilities were sufficient to handle six days of average daily receipts in June. Wide day-to-day variation in processing volume compared with receipts was managed by inventory build up rather than increased receipts. Variations in reserve supplies among plants were not explained by storage capacity, however.

Sources of processor milk supplies — whether own herd, producer, or other plant — appeared to influence the level of reserve supplies. Reserve supplies were highest when the source of milk was from producers and lowest when from other plants under a full service contract. Massachusetts plants received half their milk supply under full service contracts compared with none in Maine.

Frequency of processing — whether three, four, or five or more days per week — appeared to be inversely related to the level of reserve supplies. On an annual basis seven percent more milk was received than processed by firms processing three days per week. This compared with four percent more milk for firms processing five days and one percent more milk for those processing seven days.

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