COMPARISON OF THE AGE OF UNDATED AND DATED MILK ON HAND FOR SALE IN FOOD STORES IN NEW YORK CITY

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Three years ago a study was made of the influence of dating retail milk containers on certain practices in food stores located in New York City (1). It was found that the date on retail containers had several undesirable features in the merchandising of milk and that this requirement in the Sanitary Code was not necessary to assure the sale of milk within reasonable time limits. A number of companies sold milk marked by code to food stores with no time limit for sale in markets near New York City. This coded milk moved out of the food stores as fast as the dated milk in the metropolitan city and there were none of the problems of additional cost and loss inherent in the dated milk.

In the light of these results and the apparent need for some basis of determining the time from pasteurization to sale, "It was recommended that code marking of milk containers and a time limit from pasteurization to sale be established in the Sanitary Code to replace the present dating requirement." This change in the Sanitary Code was not made by the New York City Department of Health but in 1960 the New York State Legislature passed a law prohibiting any board of health or similar regulatory agency from requiring the dating of retail milk containers.[1]

Effective in May 1960 the milk dealers of New York City discontinued the use of dated milk containers but coding was not put into practice. It appears that the milk dealers were certain that the milk in food stores would be entirely satisfactory without date or code providing careful instructions were given to its wholesale route men about proper handling of milk in food stores.

The author proposed that a study should be made of the age of milk in undated containers in food stores in New York City to determine the current situation. The project was outlined at a private conference and three selected milk dealers agreed to code mark milk containers for two weeks. The plan was to ascertain the age of the milk offered for sale in the food stores the second week of coding. The experiment was held confidential so that only management in the companies was informed of the test to assure no checking on the rotation of milk in the sales refrigerators by means of the code.

All details were arranged to make this study comparable with the previous study of April and May 1957. The test was conducted in May 1961. An independent research organization[2] was hired to collect the data. Forms for recording data were drawn up and their suitability was determined by some advance test trials. Interviewers visited each food store to obtain answers to specific questions from the manager of the store or of the dairy section, and an actual count was made of the number of containers in the sales case with a notation of the code markings. Obviously, no count was made of milk containers with no code mark from other milk plants. The containers will be referred to as "undated" to mean neither dated nor coded even though they were coded because there was no chance to gain any merchandising effects from the temporary code marking.

RESULTS

Data were secured from 154 food stores (Table 1), which were classed in four groups or types, as in the previous study. These stores had 21,936 undated milk containers (temporarily coded) in the sales refrigerators, or an average of 142 containers per store. This number compares with 187 food stores and 56,342 containers in the previous study of dated milk.

The number of containers of milk on hand in the food stores the night before the day of the interview was now 27 per store, which was 10 more

TABLE 1. Type of Food Stores in the Study

Number of stores	154
Type of stores	
Supermarket, chain company	64
Supermarket, independently owned	29
Food stores open Sunday	25
Food stores closed Sunday	36
Number of undated milk containers[1]	
Total daily	21,936
Average per store	142

[1]This milk was temporarily coded and other milk in the refrigerators of food stores was not counted.

[1]This Law was repealed in March 1962.

than the number found in the study of dated milk (Table 2). The number of food stores that closed yesterday's business with no milk on hand decreased from 34% to 9%. Apparently, there is still some carry-over from the practices developed through the years of dating retail containers because in 1957 food stores handling coded milk outside New York City closed the day with 49 containers per store on hand and only 3% closed with no milk on hand the day prior to the survey.

The age of the 1-qt. undated containers in the food stores' sales refrigerators was very satisfactory as 98.8% of all milk was today's or yesterday's milk (Table 3). Only 2 containers of milk, 0.01%, were 3-day milk, the longest period that any milk remained in the food stores. These results were very

TABLE 2. INVENTORY OF UNDATED AND DATED MILK IN FOOD STORES

	Undated	Regularly Dated[1]
Number of stores	154	187
Containers of milk on hand when business ended yesterday		
Total	4,096	3,152
Average per store	27	17
Number of stores found with no milk at close of yesterday's business		
Total	14	63
Per cent of stores	9	34

[1]Influence of Dating Milk Containers on Retailing Milk in New York City Food Stores. A. C. Dahlberg, Cornell Research Bulletin 927, March, 1958.

TABLE 3. AGE OF UNDATED MILK IN 1-QT AND 2-QT CONTAINERS ON HAND FOR SALE IN FOOD STORES IN NEW YORK CITY AS SHOWN BY TEMPORARY CODE ON CONTAINER AT TIME WHEN COUNT WAS MADE

Category of milk	Number of containers - May 1961[1]			
	1-qt.	Per cent	2-qt.	Per cent
Total milk on hand for sale	18,068	100.00	3,074	100.00
Today's milk	16,234	89.85	2,619	85.20
Yesterday's milk	1,622	8.98	357	11.61
2-day milk	210	1.16	78	2.54
3-day milk	2	.01	0	0
4-day milk	0	0	15[2]	.49
5-day milk	0	0	0	0
6-day milk	0	0	5[2]	.16

[1]Counts were made about one year after the end of the dating of milk and the containers were coded for too brief a period to affect sales practices.

[2]These containers were all found in one food store.

TABLE 4. COMPARISON OF AGE OF UNDATED AND DATED MILK ON HAND FOR SALE IN FOOD STORES IN NEW YORK CITY AS SHOWN BY TEMPORARY CODE ON CONTAINER OR BY DATE ON CONTAINER AT TIME COUNT WAS MADE

Category of milk	May 1961, undated milk in 1-qt. and 2-qt. containers[1]		April-May 1957, dated milk in 1-qt. containers[2]	
	No. of containers	Per cent	No. of containers	Per cent
Total on hand for sale	21,142	100.00	38,237	100.00
Tomorrow's milk, predated	0	00	1,701	4.45
Today's milk	18,853	89.17	35,062	91.69
Yesterday's milk	1,979	9.36	1,365	3.57
2-day milk	288	1.36	107	.28
3-day milk	2	.01	2	.01
4-day milk	15[3]	.08	0	0
5-day milk	0	0	0	0
6-day milk	5[3]	.02	0	0

[1]Summary of data obtained in present study as given in Table 3.

[2]Influence of Dating Milk Containers on Retailing Milk in New York City Food Stores, A. C. Dahlberg, Cornell Research Bulletin 927, March 1958. Since 21 per cent of the dated milk was predated by one day it is obvious that some of this milk was one day older than shown in this table.

[3]These 2-qt. containers were all found in one food store.

comparable to those obtained for dated milk. The data are less satisfactory for 2-qt. containers. One of the 154 stores failed to properly handle its 2-qt. containers as it had for sale 15 containers of 4-day milk and 5 containers of 6-day milk.

DISCUSSION

Two principal points are at issue from the data in this study and in the former one on dating retail milk containers in New York City. The first involves the comparative time intervals from pasteurization of milk to its being offered for sale in the sales refrigerators of food stores in undated and in dated containers.

The combined figures for 1-qt. and 2-qt. containers for undated milk and the previous data on dated milk in New York City clearly demonstrate that undated and dated milk take the same approximate time from pasteurization to sale in food stores (Table 4). It is reasonably accurate to state that 90% of the milk in the sales refrigerator is today's milk, 9% is yesterday's milk, and 1% is 2-day old milk. Only .01% of the milk offered for sale in 1-qt. containers was 3-day milk or one container in each 10,000. This shows very comparable data for undated and dated containers.

The second point involves the significance of the 2-qt. containers found in one food store out of 154 which were over three days old. In the former study a total of 196 stores were involved in the over-all

study of dated milk and none of them had milk dated over three days old; however, one extra day must be added to the age of some of this milk as 21% of all milk was legally pasteurized and packaged one day early so there probably was some 4-day dated milk offered for sale. There were 38 stores in the previous study that sold coded milk and the period from pasteurization to sale in food stores was the same as for dated milk. In the present study there were 154 food stores selling undated milk and one store had milk that exceeded the previous time limits. Even though this one store in 154, as compared with no store in 234 in the previous study, may be statistically insignificant, the fact remains that five containers of milk were in the sales refrigerator that should not have been there, which is one container in each 4,000 offered for sale.

A regulation requiring the dating of containers may not control this age problem for Kirchoff (2) reported in 1952 that inspectors in Jefferson County, Alabama, picked up 2,445 over-age containers of dated milk in food stores of which 30.5% ranged in age from five to eight days.

The essence of these findings is that nearly all milk was offered for sale within the limit of "3½ days after the day of pasteurization," previously recommended by the author (1) as sound commercial and public health practice. Equally important, however, is that there was a small amount of undated milk found in food stores of sufficient age to have a possible effect on quality. Quality used in this respect refers to off-flavors, due to bacterial growth or spontaneous chemical reactions which are objectionable to consumers. It affects consumer acceptance of milk and goodwill toward the milk industry, as well as competition among milk companies. There is no easy way by which the Board of Health and the milk dealer, or anyone else could determine that an isolated food store was not properly moving milk from the dealer to the consumer except by coding. The age of this milk was actually determined by coding milk containers in New York City without introducing any of the problems and needless costs due to dating, and without any aroused feelings in public relations as the code was not known to consumers. Unfortunately, the milk dealers of New York City have not adopted coding on their own initiative. This study showing that one food store in 154 studied did have milk of sufficient age to raise the possibility of justified consumer complaints about milk flavor may prompt voluntary adoption of coding. Emphasis is given by this study to the soundness of the recommendations of 1958, namely, that code marking of milk containers and a time limit for sale of 3½ days after the day of pasteurization should be a requirement in the Sanitary Code unless these practices are adopted by the milk industry.

SUMMARY

Since undated milk has been sold in food stores in New York City there has been an increase in the number of containers held overnight in the sales refrigerators of food stores and a decrease in the percentage of stores that had no milk for sale at the end of the day.

Undated milk in 154 food stores surveyed had the same period of time from pasteurization to sale to consumers as previously found for dated milk, except in one food store. The milk in this one food store which was older than necessary under good milk distribution practices and which may cause consumer complaint due to developed off-flavor represented one container in each 4,000 sold. For the purpose of providing a method of detecting these isolated instances of not maintaining an entirely satisfactory rate of movement of milk to consumers at all times, it is recommended again that retail undated milk containers should be marked by codes known to those responsible for proper handling of the milk but not known to the public.

REFERENCES

1. Dahlberg, A. C. Influence of Dating Milk Containers on Retailing Milk in New York City Food Stores. Cornell University Agricultural Experiment Station Bul. 927. March, 1958.

2. Kirchoff, George F. Dating - An Essential and Necessary Public Health Control Measure. The Milk Dealer. March, 1952.