

## THE CONTROL OF THE SANITARY QUALITY OF A MUNICIPAL MILK SUPPLY.

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The control of the sanitary quality of a municipal milk supply, to be continuously effective and successful, must be based upon the intelligent utilization of three compelling factors, namely, education, competition and legal force. While a milk sanitation ordinance must, of course, be technically sound, it is equally important that its provisions be such that full utilization is made of these three compelling human factors, so that it can be successfully administered with a practical expenditure of time and money, and in a manner which will sustain public interest in its continued enforcement.

The mortality rate among municipal milk ordinances has been exceedingly high in the past. It is safe to say that where one city milk ordinance has been successful in its operation, two have been repealed, forgotten or indifferently enforced. The reason for this is not so much that the technical provisions were not sound, although there is a confusing lack of uniformity in them in various ordinances, but rather for the reason that they were drawn up on the assumption that a milk supply could be successfully safeguarded by legislation alone. Legal force is an essential, but should follow education and competition, rather than precede them, in the work of effectively controlling a milk supply.

In many instances, the dairy industry has looked upon a milk ordinance as the basis for a campaign of prosecution against it, due to the fact that the effort has been to force it into complying with the provisions of the ordinance by threats of prosecution. This makes the dairy farmer antagonistic at the start, so that he will not carry out, whole-heartedly, the sanitary routine prescribed, by the ordinance, but will "spruce up" only when his neighbor 'phones him the inspector is in the vicinity. To secure real and lasting cooperation from the dairyman, an educational program must be undertaken to convince him that the sanitary precautions he is asked to take, in producing milk for a municipal supply, benefit

him by improving the flavor, cleanliness and keeping qualities of the milk; that this will increase its market value over what he can secure for milk sold for butter or cheese making or condensing; and that the successful operation of the milk ordinance will increase milk consumption with direct benefit to the dairyman who complies with its provisions.

Authoritative data are available, showing that the adoption and enforcement of a milk ordinance in a thoroughly constructive manner has resulted in an increased milk consumption of from 15 to 35 per cent in two years' time, due to the increased confidence of the public in the cleanliness and safety of the supply. The recent action of the Chicago Department of Health, in requiring all milk to come from tuberculin tested herds, was followed immediately by an appreciable increase in milk consumption in Chicago, estimated at 10 per cent.

Bacterial counts may be somewhat difficult for the dairyman to appreciate at first, but he can readily realize their importance when he understands that the souring is produced by bacteria breaking down the lactose sugar in the milk, thus increasing the acidity, and that sanitary methods of producing and handling greatly reduce the number of these bacteria in the milk and as a result its keeping qualities are much improved. This was conclusively demonstrated by a series of tests conducted by the Board of Health of Ontario, in which milk was produced in the same dairy under different conditions and tested to determine the time which it took to sour at room temperatures. The point of souring was taken as an acidity of 0.35 per cent, at which point milk possesses an odor and is no longer salable.

In one experiment samples of milk were collected, directly after milking, from two pails, one of which had been thoroughly sterilized by steam and the other washed, rinsed in hot water, inverted and allowed to dry. The results of thirteen tests showed that the milk in the steam-sterilized pails remained sweet 60 per cent longer than that from those only washed and rinsed. Two cows were tested under similar conditions except that the flanks and udder of one were thoroughly brushed and

wiped with a damp cloth some time prior to milking. No special attention was given to the cleaning of the other. The milking was done in sterile pails. Nine tests showed that the milk from the cleaned cow remained sweet 46 per cent longer than that from the uncleaned cow.

Similar comparisons showed the benefit of other sanitation requirements, such as dry hand milking, and the thorough steam sterilization of milk cans and bottles. Educational data of this nature will help to convince the dairyman of the practical value of sanitary methods of producing and handling milk.

The dairy farm inspectors of the Chicago Department of Health are instructed to take time to explain to the farmer the necessity of the different requirements in producing clean wholesome milk. Thirty minutes of friendly, helpful suggestions will often accomplish more than several hours consumed in formal score card inspections and notices of violations.

The Chicago Department of Health recently undertook a program of improved pasteurization plant supervision, in which the first step was to demonstrate to the plant owners and equipment manufacturers that certain sanitary defects had been overlooked in the past which had prevented complete pasteurization of all the milk. By this means alone the majority of the owners are willing to make the necessary improvements as they see that they will benefit them in securing more positive pasteurization of the milk.

A few of the results being accomplished under this program include:

1. The elimination of pockets of unpasteurized milk in the outlet pipe of pasteurizer holders by the installation of flush type valves.
2. The installation of leak protector valves to waste unpasteurized leakage which inevitably occurs sooner or later from milk valves.
3. The elimination of foam in the pasteurizer holder which is not heated as rapidly or as high as the milk itself, with the result that it is not properly pasteurized.
4. The installation of covers or shields on open coolers and the tops of automatic fillers to protect the milk

from flies at all exposed points between the pasteurizer holder and milk bottle.

Failure to eliminate these defects has resulted in incomplete pasteurization of portions of the milk, in which any pathogenic bacteria, if present, remained undestroyed and seeded the pasteurized milk when it was withdrawn from the holder.

The U. S. Public Health Service has considered further research on pasteurization equipment important and, fortunately for Illinois, has located its testing station in Chicago, where the findings can be given immediate application in further improving the effectiveness of pasteurization.

The educational work should extend also to the public, for no milk sanitation program can be successfully and permanently enforced without the intelligent and sympathetic support of the milk-consuming public. The increased use of milk should be encouraged, emphasizing its value as the most nearly perfect of all foods. The use of the highest grade of pasteurized milk available should be recommended as offering the cleanest, most wholesome milk, having the maximum degree of safety. The ordinance should require the grade of milk sold by each dairyman to be published at least quarterly, and to be printed on the bottle caps to serve as a constant reminder to the housewife of the quality of the milk she purchases, and the service rendered by the city in inspecting, sampling and grading the milk supply.

The second compelling factor which must be used in controlling the quality of a milk supply is competition. People buy milk on the basis of cream line, taste, cleanliness and published grades. The cream line is a mistaken, but practically universal yard stick to the majority of consumers in selecting their milk supply. However, it is not destroyed by pasteurization when carefully conducted. The taste and cleanliness or freedom from sediment, are better criterions of the sanitary quality. It is here that the dairymen producing and handling their milk in a sanitary manner from cow to bottle get their reward in part, in that their milk will be in demand because of its better taste and cleanliness. Their

final reward comes, however, in the endorsement of the Health Department of official grades or ratings which give the public confidence in the high quality and safety of the supply.

An ordinance establishing several grades of milk does not attempt to legislate any milk off the market, but gives each dairy a grade based upon both bacterial counts of the milk and the sanitary conditions and methods at the dairy. The majority of the people will buy the highest grade of milk and the dairyman with a low grade loses business, which acts as a powerful incentive to improve and get a better grade. In one city where the grading ordinance, suggested as a standard ordinance by the U. S. Public Health Service, was adopted, this factor of competition, together with a thorough educational campaign, increased the volume of Grade A milk from 10 per cent to 80 per cent in six months' time. The use of a standard milk ordinance by municipalities has the advantage in that the state can rate the towns by brief surveys, and a spirit of competition among the health officers or city milk inspectors is aroused, preventing the enforcement of the milk ordinance from being dropped after the first flush of enthusiasm has waned. States using the U. S. Public Health Service standard ordinance are even now being rated by them as to the results in their municipalities, with resultant benefit in improving the state's milk sanitation program.

The suggested standard ordinance provides for four grades of raw milk and three of pasteurized. When full advantage has been taken of the factors of competition and education, so that a large percentage of the supply is either pasteurized or grade A raw, steps can be taken to limit the scale of milk to these grades, and later to pasteurized milk only. A milk sanitation program is only fifty per cent effective if it merely improves the quality of the raw milk, for there is danger of sickness and epidemics from a raw milk supply, regardless of an ordinance, as experience with typhoid epidemics has shown. The program is 100 per cent effective only when it encourages the consumption of pasteurized milk; provides adequate supervision to secure proper pasteur-

ization, and finally establishes a completely pasteurized supply.

In Chicago, many years of work on the improvement of the milk supply have caused the gradual elimination of all but a single high grade of pasteurized milk, all of which comes from tuberculin tested cattle.

The third requisite of the successful control of a milk supply is legal force, used in an honest, unprejudiced and aggressive manner in those remaining instances where education and competition have failed to accomplish improvement. A program can be seriously hampered by political interference, for this destroys morale all along the line. Here again the adoption of a standard ordinance, in which the state and government can cooperate in the ratings, stabilizes and gains prestige for the whole milk sanitation program, so that political interference is negligible. Happily, the work of the Chicago Health Department has gained such prestige and popularity with the citizens that it is not hampered in this manner.

In conclusion, to be continuously effective, control must be based upon the intelligent utilization of three factors, education, competition and legal force. Many milk ordinances have been unsuccessful, due to the fact that they relied on legislation alone. The dairyman must be educated to appreciate that the sanitary precautions, required by an ordinance, improve the flavor, cleanliness and keeping qualities of the milk, increasing its market value, and that a properly enforced milk ordinance increases milk consumption.

An ordinance should take full advantage of the force of competition in bringing about improved production and handling of market milk by incorporating grading features which stimulate the dairymen to improve so as to secure the highest possible grade.

Legal force is an essential requisite for control and should be used in a strictly unprejudiced, intelligent and aggressive manner in cases where education and competition fail to accomplish satisfactory results.

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