The Question of Sanitary Standards for Ice Cream Mix Ingredients*

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When your secretary-treasurer inquired concerning my willingness to present a paper on this subject, he suggested that I think out loud. I assume that he meant I was to express myself quite frankly and without inhibitions. In preparing this paper I have tried to do just that. I trust that these remarks will be received with the same openness of mind as was required in preparing them.

In contrast to sanitary standards for market milk, the question of sanitary standards for ice cream mix ingredients is extremely complex. It is complex for several reasons: (1) because of the multiplicity of ingredients that legitimately come into consideration for use in ice cream mixes; (2) because the demand for ice cream is subject to sudden fluctuations, and the peak seasonal demand does not coincide with the peak in milk production; and (3) it is further complicated by the inclination of sanitarians to apply to ice cream the sanitary standards which have been elaborated over a period of years for the market milk industry.

Let us examine the first of these two premises in detail in order to develop a background against which the feasibility of the last premise may be appraised.

Ice Cream Ingredients

The number of potential ingredients for ice cream is large—dairy products, stabilizers and emulsifiers, and sugars. In general three types of dairy products are required in an ice cream mix: (1) a fat-rich product, (2) a serum-solids-rich product, and (3) a product of relatively low fat and serum solids content. The various dairy products under these three classes should be further classified according to whether they are perishable, or whether they are suitable for storage as a reserve against a fluctuating demand.

Fresh cream is, of course, the chief fat-rich product, but where long shipments are involved and storage is necessary, frozen cream, plastic cream, unsalted butter, and butter oil are legitimate supplements. Of these, plastic cream is the newest product, and the extensive use of butteroil is probably just around the corner. When the continuous butter-making processes, which have been developed, come into use, either butteroil or butter can issue from such processes within an hour from the time the milk is received. Butteroil will then not be a product of a salvaging operation, but a high quality product, which when dried and deaerated is ideal for economical storage. In my opinion prohibiting the use of any of these ingredients cannot be justified on the basis of public health, nor on the basis of quality, and certainly not from the standpoint of the consumers' pocketbook.

Under the class of serum-solids-rich dairy products, we have a very extensive list of ingredients. We have condensed skim milk and condensed whole milk, and each of these may be in the form of the perishable plain condensed product and the superheated condensed product, or in the sweetened condensed
form, suitable for storage. In addition to these six condensed milks, there are skim milk powder, condensed buttermilk, and dried buttermilk. Use of these products is generally accepted, with the exception that objections may be raised against the use of the buttermilk products. In defense of the use of buttermilk products let me point out that buttermilk is rich in phospholipids, containing about one-fourth of the amount that was present in the much larger volume of milk from which the buttermilk stemmed. It is because of this rich phospholipid content that buttermilk has a characteristic richness of flavor. It is also because of this richer phospholipid content that the buttermilk solids contribute qualities ordinarily sought from the use of eggs. When the buttermilk stems from unripened cream of a quality that is acceptable for use in ice cream, there can be no legitimate objection to the use of the buttermilk solids in ice cream.

Before leaving the serum-solids-rich products, mention should be made of "Low-Lac", and caseinates. The use of "Low-Lac" and soluble caseinates represent an effort to use the milk proteins more generously than would otherwise be possible from the standpoint of sandiness, which is due to excessive lactose content. "Low-Lac" is condensed skim milk made with some sugar added, and concentrated to such a point that an appreciable portion of the lactose crystalizes out for removal by filtration or centrifuging. The function of the added sugar is to cause a lower viscosity so as to permit successful filtration or centrifuging. The sugar content is not high enough to have preservative effects, and the product is to be considered perishable. Soluble caseinates are made by precipitating and washing the casein, and redissolving it by the use of alkali to a controlled pH. It is difficult to see how categorical prohibition of the products in ice cream can be justified on the basis of public health. The more generous use of milk proteins is nutritionally sound, and there is no question of inferior food value involved to justify prohibition.

As dairy products that are neither rich in fat nor in serum solids, we have skim milk and whole milk, and also sweet buttermilk. The comments that have already been made in connection with condensed and dried buttermilk also apply here.

With respect to sanitary standards, our chief interest is in the dairy ingredients of ice cream, and it is here also that there is the greatest likelihood of controversy. Therefore, we shall pass over the subject of stabilizers, emulsifiers, and sugars very briefly. The history of stabilizers and emulsifiers in ice cream is one of change and innovation. Early in the industry gelatin was the chief stabilizer. Also permitted and used to a limited extent were the "harmless vegetable gums", natural gums, i.e. gummy exudates from certain semi-tropical or tropical trees or shrubs. Starch was also used to a limited extent, but has long since become taboo. Then came various ice cream improvers—mixtures, usually with a generous proportion of sugar, offered with fanciful claims to exploit the industry. More recently the development has been in offering extracted and refined gums, partly synthetic hydrophobic organic compounds, and emulsifiers. The latter are considered by some as stabilizers in the sense that they stabilize the fat emulsion. The newer products undoubtedly involve less question of sanitation than the gelatin of old, and than the natural gums which are exposed to dust accumulation and contact with insects.

With respect to gelatin, the edible gelatin manufacturers have done an outstanding job of improving sanitation and lowering bacterial counts, so that there is now little need for a standard. There is little or no question of sanitation with respect to the use of the newer types of stabilizers and emulsifiers. What questions may be raised
are more likely to be on the basis of food value and harmlessness. In passing, let me note that their harmlessness should, of course, be proven, but in my judgment they need not contribute to food value to be acceptable. These products are, in any case, not added for their food value, but for their functional use in the product.

The use of eggs and egg products is related to the field of stabilizers and emulsifiers. Here we have a product which is subject to fermentation and deterioration both before and during processing, and sanitary standards are in order. It is also desirable to have composition standards to exclude or control the admixture of cheaper ingredients.

Great changes have occurred in the use of sugars by the ice cream industry. From exclusive use of sucrose, and controversy between cane and beet sugar, the industry has gone to extensive replacement of sucrose by dextrose and corn syrup. This replacement had its inception with the development and improvement of the latter products shortly after World War I. It had proceeded to a considerable extent before World War II, which, of course, greatly expanded the replacement. This replacement does not involve questions of sanitation, nor of food value, and its ultimate determination may well be left to the decision by consumer preference. With respect to sugars the chief point of sanitation is the protection of dry products against dirt and vermin, especially when ordinary sacks are used.

**Problem of Sanitary Requirements**

Returning now to the problem of dairy supplies in relation to a fluctuating demand for ice cream, sudden changes in weather may drop the sales of ice cream to a fraction of preceding days, or may suddenly stimulate demand. Holidays affect ice cream sales more than is true for market milk. In any case there is the decided seasonal peak in sales during July and August, coming later by several months, than the peak in milk production. As a result there is the need for mix ingredients that can be stored as supplements when fresh supplies are inadequate. In the case of dense population areas the normal milk shed does not provide enough milk for both the market milk needs and the needs of ice cream. Therefore, both perishable and storage products must be drawn from more distant points from a supply that is responsive to this need. This distant supply can be responsive to this seasonal and fluctuating need only if its market outlet during a large part of the year is in the form of products that yield a lower return to the producers. In other words, this supplemental supply must come from typical dairy manufacturing areas.

If we accept these facts, as we of necessity must, then we must resist any attempt to impose the same sanitary standards on this supplemental supply as are generally accepted for market milk. Let us ask ourselves the question: Why are the sanitary standards for market milk generally accepted by producers and distributors, and with acquiescence by consumers? The consumer generally does not realize what these standards are doing to his pocketbook. The distributors in many cases were largely instrumental in this build-up of standards because it made their efforts at quality improvement easier by shifting the burden to municipal inspectors. The producers, once they were in compliance with a highly artificial set of rules and requirements, were anxious to maintain the standards as an effective trade barrier. Because of the trade barrier, the bargaining position of producers is greatly strengthened, and the consumer pays the bill without realizing what factors are contributing to the leak in his pocketbook.

Even with respect to market milk it is high time that we re-examine the...
elaborate structure that has been evolved. As milk sanitarians we should re-examine our duties and lay our course in terms of basic principles. It is our duty to safeguard the public health, but this duty should not be pursued with reckless disregard of the consumer pocketbook. In terms of basic principles it is our duty and right to insist that the milk be produced from healthy cows, that the milk be clean (not cleaned by straining), that the milk meets suitable standard of cleanliness as measured by such objective tests as the methylene blue test or bacterial counts, that the use of preservative be excluded, and that the water supply be clean and safe. In my judgment and in terms of basic principles it is neither our duty nor our right to specify detail for detail how the producer must meet these specifications. In this connection, let us recall the demonstrations that it is possible to produce clean, low-count milk under conditions which would be rated as sordid in terms of presently accepted standards for market milk.

With respect to market milk the pattern of the standards has been thoroughly established and is difficult to change, as committees charged with this duty have found. It must also be admitted that, even though many of the detailed requirements are highly arbitrary, some semblance of consistency in enforcement can be maintained because the demand for market milk is fairly steady and there is less need for supplemental supplies than in the case of ice cream. It would, however, be a serious mistake to assume that similar standards for ice cream mix ingredients would be equally acceptable and workable. The extent to which non-observance of requirements in supplemental supplies would have to be condoned would be demoralizing; yet the requirements would exist and serve as the basis for higher costs to consumers. You cannot expect a producer to rebuild his barn in order to become eligible to a higher priced market with only an occasional shipment to such market. Before detailed requirements are imposed on the producing farms of ice cream mix ingredients, let it be demonstrated that the need for such action exists in terms of the public health record of this industry.

These remarks should not be construed as arguing against quality improvement. Instead, they are an argument for quality specifications in terms of herd health records and quality standards as measured by objective tests.

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still in a sellers’ market and pretty nearly anyone who has anything to sell need not worry about getting buyers. But this condition will not last forever. When business returns to a competitive basis, the advantage as far as restaurants are concerned will definitely be with those who have acquired a reputation for sanitary operation.

This article has been limited to a discussion of the restaurants but the same problems exist in bakeries, delicatessens, butcher shops, produce markets, and all other food establishments. They are not being neglected. This program is not a “drive.” It is simply the routine work of the Department intensified and brought up to a level where it is effective. There will be no letdown. On the contrary, the work will be intensified. The people of New York City realize that the Health Department will not relax its efforts until every food establishment in the city is operating in accordance with the highest standards of sanitary control.