

Report of Frozen Desserts Committee for 1947

IT is clearly evident, in reading over the reports of the various Committee members, that the problems in frozen dessert sanitation are never solved, and presumably never will be. It is obviously a matter of vigilance and education by the inspectors. Each new manufacturer and practically every new employee that enters the industry—to say nothing about the old ones—must be checked and watched constantly for their sanitary habits. The same sanitary problems present themselves anew each inspection. Carelessness, indifference, and ignorance are the worst enemies of sanitation.

Proper handling of the ingredients, correct washing of the machinery, and wrapping or packaging the finished products must be checked constantly. Such a simple matter as the correct handling of flavors and colors to avoid contamination is easy and yet, in most plants, they are handled so carelessly that they are a constant source of contamination.

The greatest problem the counter freezer presents is one of sanitation. Frequent changes in the ownership of places operating them, the type of place in which they are operated, the fact that making frozen desserts is usually only one of the many duties required of the operator, and, finally, that the mix and the frozen desserts themselves are treated in the same manner as any of the other foods dispensed, all adds up to a real problem in sanitation and a headache for the inspector.

Postwar problems in the frozen dessert industry have been even greater than during the war. During the war,

scarcity of labor and materials were the chief consideration. Now another and more formidable foe, high cost of labor and materials, has entered the picture. Quality and sanitation are almost sure to suffer as a result of these factors.

One of the more hopeful signs from a sanitary standpoint is the manufacture and more common use of automatic filling, capping, and wrapping machines for novelties and package goods. Another cheering thought is the provision which is being incorporated into state and city laws that the plans and specifications for new buildings and extensive alterations of old ones must be approved by the Board of Health or other agency responsible for the sanitation of the plant. Manufacturers of machinery have long since seen the advisability of asking the advice and cooperation of sanitarians in building equipment which is easily cleaned and sanitized.

So it is that we are slowly but surely making progress. One in educational work such as a food or milk inspector should never become discouraged. They should look for the bright spots and remember the infinite capacity of the human mind to resist knowledge.

As usual, the meat of the Report of the Frozen Desserts Committee is found in the individual reports of each of its members. The information in their reports serves as an excellent cross sectional view of what is going on throughout the United States and Canada. It should serve as a source of information and guidance for other inspectors.

FROZEN DESSERT SANITATION IN CALIFORNIA

O. A. GHIGGOILE

Sacramento, California

A comparison of ice cream production figures for the year 1946 with those from 1947 shows a very noticeable decline in the production of ice cream. This decline has caused the manufacturers of ice cream to give more serious consideration to the quality of the product.

There has been a marked tendency to improve quality, and one of the greatest improvements has been accomplished by the elimination of sweetening substitutes which were necessary during the war. An increase in the use of fresh condensed skim milk and fresh cream is quite evident and is replacing powdered milk and frozen or plastic cream to a considerable extent.

It is recognized that an increase in the consumption of ice cream can be accomplished by producing a high quality product acceptable to the consumer.

Many manufacturers have inaugurated as a company policy, a very definite and comprehensive quality program. There has been established a program wherein all department supervisors are being held for the operational functions in his department. There is to be a closely controlled supervision over all operations from the careful selection of ingredients until the finished product reaches the consumer. Such a program can hardly fail to reflect itself in the quality of the finished product.

Specific consideration has been given to the improvement in the body and texture of ice cream. As a result of this, there is a very definite trend toward the use of products having distinctive emulsifying properties. It is felt that where these products are used, there is brought about a more definite control over the freezing operation, greater control of the crystallization and greater dispersion of the milk fat with improved whipping properties.

During the period when industrial sugar was under government restriction, the amount of sherbet manufactured showed a decided downward trend. This is due to a greater amount of sugar required in the manufacture of sherbet as compared with ice cream. We have felt that due to substitute sweetenings used in sherbet during the war period, the consumer would be an unwilling purchaser even when the quality of the sherbet is improved. However, it appears that many plants are again manufacturing a good fruit sherbet and are enjoying good sales.

Special attention is being given to improve the quality of sherbets to regain consumer confidence which apparently is being achieved. The manufacturers of sherbets feel that there is a definite place for this product, but that to be acceptable to the average consumer, it must be of high quality.

The manufacture of so-called novelties, which in the past has been confined to a few manufacturers is now being undertaken by many of the smaller plants. In this connection, close supervision must be given to the washing and sterilizing of the molds that are being used. In this connection, old bottle case washers were made suitable for the washing and sterilization of the molds at the end of operation each day. Means for the washing and sterilization of these molds upon emptying and before being returned for filling are now being devised. This means that the molds will be continuously washed and sterilized each time emptied and sent through the cycle of operation.

For a number of years, we have been confronted with complaints due to the presence of brine in certain novelty items. This condition was brought about by the use of leaky molds and brine splashes in the tank. This problem was partially overcome by the addi-

tion of colored dye to the brine, making it possible for the operator in the defrosting tank to detect the presence of brine in the frozen product should there be a leaky mold. Although this precaution has merits, it has not completely solved the problem.

Several installations are now in the process whereby the semi-frozen product passes directly from the freezer to the automatic filler. The filler fills the respective molds as they travel through their cycle on a conveyor passing directly into a low temperature blast tunnel. Upon leaving the tunnel, the novelty items are defrosted and passed on to an automatic bagger, the molds washed and sterilized before refilling. By this system, the use of brine is eliminated and the operation being automatic reflects a decided improvement in the sanitary features of novelty production.

Now that building materials, supplies, and equipment are generally available, a determined effort is being made for repairing, remodeling, and rebuilding of factories and the installation of modern and new equipment. Many factories which started to remodel and modernize in keeping with more efficient operation, better quality control, and sanitary features, are at last being completed. There has been a great tendency toward cooperation in regard to the sound planning of new construction before work actually begins. Cooperation on the part of the equipment salesmen, manufacturers of ice cream, and regulatory officials has been very helpful in directing prospective plant operators to members of the Department of Agriculture so that they may become familiar with legal requirements before proceeding with the construction work. In nearly all instances, sketches or plans have been submitted for review before construction is started.

Perhaps one of the largest turnovers in the manufacture of ice cream and similar products is with operators of so-called counter freezers. Several

makes of these machines are again available, and many people gathered the impression that the operation of a small malt shop with a counter freezer would be a lucrative business. Counter freezers were, therefore, installed in many malt shops, drug stores, cash and carry dairies, etc., without regard of the location. As a result, some of these places change hands several times during the year and constitute a problem for the control officials having to do with the enforcement of laws governing factory sanitation, licensing, and composition and sale of product. This requires a large portion of the inspector's time in making reinspections to determine if conditions are satisfactory for the issuance of a factory license and properly to instruct operators of the factories in washing and sterilizing methods, composition control, manufacturing operations, and many other factors entering into the production of quality products because this operation is entirely new to them.

A tremendous increase is noticed in the number of so-called ice cream peddlers on the streets. In some portions of certain cities, the streets are so crowded with putputs, carts, and trucks catering to the children and door to door delivery that it seems like a parade. It will not be surprising to see a majority of these operators who are doing business on a shoestring drop out of business by fall.

During the 1947 session of the California State Legislature, many important changes were made in the law pertaining to the construction of ice cream factories as well as other milk product plants. The new law which becomes effective September 19 requires that all plans and specifications for new milk product plants or extensive repairs to existing plants be submitted to the Director of Agriculture for review and approval.

Another section of the law which has been added strengthens the requirements pertaining to equipment

used in processing frozen milk products and calls for sanitary design and construction. The placing of equipment must be so that it can be readily cleansed and so located as to permit the cleaning of walls and floors. All freezing and processing rooms must have water-proof walls high enough to take care of any splash. The material used for the walls must be non-absorbent and acceptable to the Director.

The water supply used in milk product plants, including ice cream factories, must be properly located, easily accessible, adequately operated, and protected against contamination. The bacteria quality must conform to the standards of the State Board of Health for public supplies of drinking water.

Separate rooms will be required for each operation and includes separate rooms for receiving and weighing of milk or cream and washing or sterilizing containers in which milk or cream is received; for pasteurization, processing, cooling, and manufacturing, washing and sterilizing of bottles or cans used in delivering products to the wholesale or retail trade; for bacteriological and chemical analysis, for adequate and efficient cold storage rooms; for boilers, compressors, and other machinery; for storage of supplies and for toilets, lavatories and lockers.

The importance of adequate supervision over the manufacture of ice cream and similar frozen products and strict control over all phases of ice cream manufacturing can not be over emphasized.

CONTINUOUS FLOW EQUIPMENT FOR ICE CREAM MIX

RALPH E. IRWIN

Camp Hill, Pennsylvania

After several years of experience with continuous flow equipment for the pasteurization of milk, the milk plant operator and the health officials have given almost universal approval to this type of equipment. Likewise, the continuous flow ice cream freezer has been with us many years. Now equipment is in use for continuous flow during the preparation of ice cream mix.

The Hershey Creamery Company of Harrisburg, Pennsylvania, has continuous flow equipment in operation in their plant in Chambersburg, Pennsylvania. Mr. Harry E. Sauers, Director of Research, assisted me in collecting the following information for the use of our Committee on Frozen Desserts Sanitation.

Milk is purchased from 450 local farms. Some cream is obtained outside of Pennsylvania. The milk is cooled and stored in two 3,000-gallon tanks and three 2,500-gallon tanks. Milk from the storage tanks and cream from

cans in cold storage are weighed into a mixing vat and sugar added. From this vat, the mix is pumped through a continuous flow heater. A part of the heated mix is returned to the mixing vat to hasten the melting of the sugar. The mix is heated to 150° F. and pumped to either of two vacuum pans where the temperature is approximately 135° F. About one third of the water is removed in the vacuum pans.

From the vacuum pans, the mix flows to measuring tanks to permit a check on the butter fat, solids, etc. The mix then flows to a surge tank from which it is pumped through a filter to the second heater, where the temperature varies between 150 and 160° F., and thence to the homogenizers. The homogenizers pump the mix through the tubular pasteurizers equipped with a diversion valve set to divert at 175° F. The mix is held in a 4-inch holder pipe at 175° F. for 22½ seconds.

From the holder, the mix flows to

a cabinet cooler and thence to any one of five storage tanks. The stored mix is pumped to a battery of continuous freezers for the preparation of bulk ice cream or novelties, or to tank trucks for transportation to the Harrisburg plant where the mix is stored or pumped to continuous freezers for the preparation of pint packages of ice cream.

Heating before condensing and before pasteurizing takes place in what is called Ste-Vac equipment. This consists of cylinders approximately 10 feet long and 30 inches or 35 inches in diameter. In the first Ste-Vac, there are forty-eight $1\frac{1}{2}$ -inch tubes arranged so that the mix flows through two parallel tubes and thence to the vacuum pans.

The second Ste-Vac has sixteen $1\frac{1}{2}$ -inch tubes arranged in two sections. The first section of eight tubes maintains 150° F. for homogenization while the second section of eight tubes raised the temperature for holding at not less than 175° F.

Both Ste-Vac units operate on vacuum to prevent burning. Each unit

has a capacity of about 20,000 pounds per hour. The first operates at full capacity and the second unit at about 15,000 pounds per hour for six hours daily.

To clean the equipment, one of the prepared milk stone removers is circulated through the equipment for about one hour. This is followed by hand brushing and final sterilization with hot water or steam. Before starting operations in the morning, a chlorine solution of 200 p.p.m. is circulated through the equipment. The mix follows the chlorine solution.

Each ice cream plant is equipped with a laboratory. Bacteriological samples are collected daily from each step in the preparation of the mix. The finished product gives a standard plate count of 1,000 to 1,500 colonies. Seldom are colon organisms obtained from samples from the cooler, final storage tanks, or finished product by the use of desoxycholate agar.

During 1946, 70 percent of the mix was used in the preparation of over 32,000,000 pint packages of ice cream.

FROZEN DESSERTS SANITATION IN BROOKLINE, MASSACHUSETTS

J. J. DONOVAN

Brookline, Massachusetts

For the past year, I have personally made a concerted effort to cover the ice cream field as extensively as the fluid milk industry from the standpoint of inspection. Of the twenty-six ice cream plants inspected, all but two have given whole-hearted cooperation. Needless to say, these two dealers are on probation and will be eliminated from the eligible list of dealers in our town soon unless they comply with our regulations.

Our biggest problem seems to be the lack of experienced help. They do not understand the principles of sanitation. They are careless in handling the ingredients used in the mix. They cut corners in washing equipment and the

result is usually high counts. In packaging ice cream, the girls were careless, sometimes neglecting to wear hair nets, and will only wear rubber gloves when someone in charge stands over them and insists on it.

Most all of the plants inspected are up-to-date structurally with the exception of about four. Plant sanitation, as a whole, is satisfactory with the exception of two places.

Vermin control was one of the problems that was giving considerable trouble, but this is gradually being brought under control. I insisted, in order to rid the plants of insects, rodents, etc., that a qualified exterminator

nator would be the best approach on a contract basis. Once they are cleaned out, good housekeeping, watchfulness, and the selection of one of the employees to devote time to this project can keep pests under control.

Proper storage of ingredients was another item lacking. This is practically solved through the operators setting aside certain rooms devoted to the storage of the various ingredients not needing refrigeration. Shelves were built, skids were made, and doors and partitions erected to safeguard against spoilage and waste.

Quality control of the product was another project that was lacking. Here again, the dealers were sold the idea of controlling their product, starting with the raw ingredients and controlling the product all the way through chemical and bacteriological analysis.

Together, we have profited by our working agreement. The dealer is doing a better job and is proud of it. It reflects in the quality of the product and doubtless in the sales. The consuming public profits since it is getting a better, purer, lower count ice cream.

SOME PHASES OF THE ICE CREAM INDUSTRY IN CANADA, 1947

W. C. CAMERON

Ottawa, Canada

Wartime restrictions limiting the volume of ice cream mix and sherbet mix that could be manufactured in Canada were lifted by the Canadian Government on the 1st of April, 1947, after being in force for five years. At that time, there was considerable speculation as to what the increase in production would be as a result of removing these restrictions. Reports from the Dominion Bureau of Statistics show that during July, 1947, there was an increase of 41.9 percent in the production of ice cream in Canada as compared with that of the corresponding month of 1946, while during August the increase was 79.3 percent. For the period January to August inclusive, the increase in ice cream production was 41.1 percent as compared with the corresponding period during 1946.

Sugar is still rationed in Canada, and has been a limiting factor on production to some extent, but allotments to manufacturers were increased during the year, and were 90 percent of their 1941 usage from the 1st of June onwards. Glucose and Cuban hard candy have been available and freely used as

sweeteners to supplement any shortage of cane sugar. As a result of the shortage of sugar during and since the war, ice cream generally has had a lower sugar content than prior to the war. There are some manufacturers who maintain that this condition may continue even when sugar becomes plentiful, because they feel the lower sugar content is conducive to increased consumption of ice cream.

Prior to the war, the use of sweeteners other than sucrose and honey in the making of ice cream was prohibited by Regulations under the Food and Drugs Act. During the war, because of the scarcity of sucrose, these Regulations were amended to permit the use of dextrose, glucose, and corn syrup. At the present time, the definition for ice cream in the Regulations under the Food and Drugs Act is being revised, and the sweetening agents enumerated in the preliminary draft of this definition are sugar (sucrose), invert sugar, honey, or a mixture consisting of not less than 75 percent by weight of sugar (sucrose) and not more than 25 percent by weight of dextrose or glucose.

Due to the short supply position of milk fat, the composition of ice cream in Canada is still restricted to wartime levels, namely, a milk fat content of not less than 9.5 percent and not more than 10.5 percent; a total solids content of not less than 34 percent; a minimum weight of 5 pounds per gallon; and a minimum food solids content of not less than 1.7 pounds per gallon, of which 0.47 pound shall be milk fat.

During the war, it was found necessary to define "ice cream mix" and "imitation ice cream," and to prohibit the manufacture, importation, and sale of imitation ice cream. These wartime amendments to the Regulations under the Dairy Industry Act are being retained.

The ice cream industry in Canada has been confronted with many problems during the year, mainly lack of supplies and efficient labor. It is safe to say, however, that the industry has not lost sight of the importance of high quality goods dispensed under sanitary and attractive conditions, but this has been difficult because of the aforementioned conditions. Some manufacturers, in an attempt to increase the total solids in the face of limited milk fat and sugar supplies, have used milk-solids-not-fat to an extent beyond what is usually considered safe in this country. Some have experienced sandy ice cream if the product did not reach the consumer within a few days.

Cocoa for chocolate coatings on novelties, etc., has been in short supply, thus reducing the volume of this type of ice cream which otherwise would have been manufactured.

Paper containers have been difficult to secure, and in some cases this necessitated manufacturers adjusting their output of packaged goods accordingly. Although bulk ice cream has been plentiful the scarcity of packages has no doubt had an effect on total sales because the "take-home" sundae, particularly, has been popular where available.

The supply of tin also has been short,

with the result that replacements and repairs of metal containers have been difficult. The same holds true of equipment generally.

There has been an increase in the number of counter freezers in operation. These new operators are for the most part, veterans of the armed services who were anxious to own their own business. On the other hand, many of the established counter freezer operators are turning to the purchase of bulk ice cream, either to supplement their own make, or in some cases, to replace it entirely. The main reason for this trend in certain areas seems to be the lack of reliable labor, and a better quality of ice cream coupled with effective advertising by ice cream firms. There is, however, an increase in the total number of counter freezers in Canada this year as compared with 1946, particularly on the Pacific Coast.

There appears to be a decrease in the sale of dried household ice cream mix preparations now that ice cream is more plentiful.

There has been a new development in the distribution of ice cream in some sections of this country which is of interest. Some ice cream manufacturers have contracted with locker storages at country points to store and distribute ice cream. Retailers of ice cream have also been using locker storages to supplement their cabinet space. These ventures have not been entirely satisfactory because ice cream has been stored with other food products and, as a result, absorbed the food odors.

As mentioned in our report of a year ago, manufacturers of ice cream were quite concerned regarding the increase in cost of their basic mix, due largely to advances in the cost of milk fat and serum solids. On the 20th of January, 1947, slight advances in ceiling prices of ice cream and ice cream mix were authorized by the Government, equivalent at retail levels to 8 cents per gallon, 2 cents per quart, and 1 cent per pint of ice cream. The wholesale price of mix was also advanced

by 16 cents per gallon. These price increases were the first ones granted to the industry since the imposition of price ceilings in October, 1941. On the 9th of June, 1947, ceiling prices on all dairy products were removed by the Canadian Government. Since that time, there have been price increases in butter, cheese, and concentrated milk, but only isolated increases in prices charged for ice cream. In fact, present retail prices of bricks are only about 3 percent higher than in 1939, and the wholesale price of ice cream is only approximately 6 percent higher than in 1941. It is believed that the relatively

large increase in volume of sales during the summer is due, in part, to these steady and unchanged price levels.

In conclusion, it can be stated that the ice cream industry in Canada has enjoyed a good year from the standpoint of volume. The people of Canada are consuming greater quantities of ice cream than ever before. It is to be hoped that this demand will not only continue but increase in the future, particularly as ingredients, supplies, equipment, etc., become more plentiful, and thereby enable the industry to provide a high quality product at all seasons of the year.

FIFTEEN YEARS OF FROZEN DESSERTS SANITATION

ANDREW J. KROG

Plainfield, New Jersey

This will be my last report to this committee, as health officer of Plainfield, New Jersey. My resignation from that post, to enter another field, becomes effective on October 1.

I would like the privilege, therefore, to review frozen desserts control at this time, not merely from the standpoint of the past year's developments, but from the perspective of the fifteen years I spent as executive officer of the Plainfield, New Jersey, Health Department.

The mechanical technology of frozen desserts manufacture has taken great strides, during the past decade and a half. Sanitary head homogenizers; precision pasteurization controls; vacreactors; improved batch freezers; perfected continuous freezers and fruit hoppers; refrigerated storage tanks; all automatic cup filling and capping machines; fully mechanical mold filling and cutting machines; completely non-manual novelty filling, coating and packing machines; fast-freezing tunnels; pressurized hardening rooms with cyclic defrosting are but a few of the engineer's contributions to the frozen desserts field.

But the control of the finished frozen desserts has become more complicated, as time has gone on. Years ago, we did not know enough to insist on coliform-free products; we did not know how to determine the egg yolk contents of an ice cream sample; we did not check fruit and nut products, as routine, for yeast and mold counts. The number of operations to which an individual sample of frozen dessert must be submitted to determine its adequacy has increased many fold.

Years ago we had trouble with the transient "hokeypokey" sellers; these, you will recall, merchandized articles represented to be ices, sherbets and ice creams whose genesis was questionable, most of the time. We had trouble, too, with the "homemade" frozen desserts manufacturers—who generally utilized formulas which were more describable as puddings than ice creams. Too frequently, too, their concepts of sanitation were far from satisfactory, even though our own were then quite elementary.

When we found products whose origin and manner of preparation were

questionable, we arranged that the products of approved manufacturers be used. Our present calibrations have shown that the practices of many of the so-called "approved" manufacturers also require standardization.

While the mixes prepared in large plants will usually comply fully with the quite critical standards of today, mixes continue to be ruined at the freezers through the addition of unsatisfactory products, or at the packaging equipment through inadequate preparation and handling.

In our report last year we reviewed the difficulties attending the recently re-born desire for "freezer fresh" and "homemade" frozen desserts. While ice cream mixes prepared by large plants were frequently employed as the basic ingredient, normal storage times at small freezer installations at milk plants and roadside stands ranged from a day to a week, and sometimes longer if the weather was not conducive to sales. Storage facilities were generally inadequate. While fruits and nuts might be purchased in sterile No. 10 tins, the utilization of the entire contents of a tin might not occur on one day; the storage interval thus provided an incubation period for organisms introduced through faulty handling.

The storage of materials added to mixes at the freezers of large plants multiplied the control problem. Consider, then, how tremendously enlarged it becomes when it is found that a single freezer at a dairy bar may turn out, from a single mix, twenty batches of ice cream, each different, because of varying the flavor and color added at the hopper.

Control? The concept has grown (through adoption by individual municipalities of standards which do not coincide with those of adjacent areas) that the control is to be provided by the health departments, financed by the taxpayers; only the very largest plants attempt to calibrate their own finished products, and then, usually, only on a very limited scale; the effect of the dif-

ferent materials added to the basic mixes is rarely considered important enough to warrant testing other than the vanilla and chocolate.

It is time that the problem were faced, and steps taken to meet it. The situation is quite analogous to that which exists in the fluid milk shed; specifications are not constant throughout an entire area, and those of the most critical region will be broken down whenever any commodity goes into short supply. In the milk industry, nothing has as yet been done to establish a floor for the product from individual milk producers, and until this is done, it is to be expected that market and seasonal variations will negate all of the standardization sought for by individual control systems.

In his recent article "Trade Barriers in the Milk Industry" (*JOURNAL OF MILK AND FOOD TECHNOLOGY* 10, 195-205, 1947) A. W. Fuchs, Sanitary Engineer Director of the United States Public Health Service, describes the difficulties due to not fixing a "bottom" on the characteristics to be required of milk from the producer. Mr. Fuchs suggests a plan for certifying the acceptability of shippers whose products meet definite standards (which will demonstrate the effects of practices as well as facilities), to permit the use of the milk for interstate shipments. The plan is, in my opinion, a step in the right direction although I would not class the reduction type tests as equivalent to the agar plate technique, and I would also like to see the microscopic method used regularly as a complement to the agar plate count for "type analysis."

The consumer utilizes the milk as food, and not the facilities employed to prepare the products. Good facilities do not guarantee good products. Calibrating products by laboratory technique does not entail the tremendous manpower which would be involved in calibrating facilities. It seems to me that a practical system of establishing a floor for the basic raw milk to be utilized in the preparation of fluid milk

products, or of manufactured items, could well be established through employing laboratory procedures primarily. But there is no individual municipality or state (and it certainly is impossible for the Federal Government) which can afford to establish a control system even on a limited laboratory scope for all shippers, and to attempt to maintain it.

I have already remarked that the frozen desserts industry has adopted the reasoning that the control of their products is the responsibility of the official agencies, and not of the industry itself. The same, or similar reasoning has been followed by the fluid milk industry; as well. If uniform specifications are developed, it will help to make the dairy industries realize that the control of the products they seek to sell is strictly their responsibility; that the control services of the official agencies are to be expended in checking random samples to see if the conformity which may be reported by the industrial divisions is actually prevailing.

Professor B. L. Herrington of the Dairy Division of Cornell University detailed at the Ithaca Conference on September 4, how only a small fraction of the students trained in dairy technology remained in that field. Small wonder—the men trained for the industry's technology are sublimated through the present "fluctuating standards" system. The laboratory staff members are made the "hatchet-men" during the flush periods, and the "alibi-givers" during short seasons; they are often placed in such a subservient position to other members of the management staff that they must withhold information which would reflect unfavorably on superiors; they are given compensation which is frequently inferior to that received by even the least trained members of a cleanup crew (who are generally protected by union contracts). The dairy technology graduate rarely locates employment with official agencies; there are very few municipal or state divisions whose

control systems are elaborate enough to require full time, a possessor of such advanced training. A majority of dairy technology majors have been absorbed in other food industries where the kind of efficiency developed by research in dairying is appreciated from its profit-yielding demonstrations.

If we are to obtain fully satisfactory fluid milks or frozen desserts, then, it is essential that we plan for uniform standards throughout the milk shed; the individual states could, by accepting a system developed by a national committee (constituted of both industry and official agency representatives), arrange for uniformity among adjacent states. The official control agencies, by promulgating that the industry develop and maintain its own control, could then formulate their programs to check random items to see that the industrial control systems functioned properly. Until such a system is established, I prognosticate a continuance of the present definitely inadequate condition.

Of essential importance is the consideration of the fundamental purpose of control, with respect to those who consume the final foods. It has long been recognized that the greatest threat from pasteurized products is not the possible presence of pathogens but of staphylococcus enterotoxin. This may be formed in any raw milk which is not cooled rapidly, after its removal from any dairy animal's udder. (Enterotoxin-producing staphylococci may be recovered from any gland of ectodermal origin.) In spite of this—and in spite of regulations requiring rapid cooling of milk following its withdrawal, there is no control system, to my knowledge, which mandates that the inspectors check the producing farms on completion of night milking. It is gratifying to report that the control services of some of the advanced industrial organizations have adopted inspection after night milking to be able to check on this very point. With regard to the enterotoxin situation, it is disappointing to note that while "summer com-

plaint" was fully described before the turn of the century (review Swithinbank and Newman's *Milk Bacteriology*, Dutton, 1903), neither official agencies nor the industry has as yet adopted an effective program to combat it, beyond applying pasteurization. While the heat treatment inactivates the staphylococci, it does not destroy already formed toxin.

That staphylococcus enterotoxin may become a problem even in ice cream mixes processed at high temperatures, which are subjected to long storage periods following handling, is readily established, considering the principles for its development laid down in G. M. Dack's text *Food Poisoning* (University of Chicago Press, 1943) and in W. C. Haynes and G. J. Hucker's "Review of Enterotoxin Poisoning" (*Food Research* 11, 281-298, 1946). Ice cream mix contains the required carbohydrate and protein; handling will furnish the universally present staphylococci; and the long storage period will amply satisfy the incubation requirement.

From the foregoing, what will be necessary, then, for adequate control of frozen desserts is that their preparation will have to be restricted to those who will demonstrate not only their understanding of proper sanitation, but their practice of it. This will mean that some who have entered the business—in inadequate roadside stands, department stores, soda fountains, milk plants, and even some ice cream plants—will definitely not be permitted to continue until they really arrange to give consumers consistently safe, health-promoting products. It is again stressed that if specifications are not made uniform, the system will be torn down. It has been done before—someone will be sure to say that his products "have not caused death" in an adjacent area where no standards at all are maintained. As Dack has so frequently reminded us, the adult does not complain about the random stomach upset, which is the common index of enterotoxin poison-

ing; the child who demonstrates a violent gastric complaint has frequently ingested so many different things that the source of the upset is clouded; and the infant, during whose first six months dairy products are essentially the sole source of nutriment, is unable to report his symptoms verbally—though he may do so vocally—and pediatricians are so frequently prone to assume that the mere approval of a supply by a health department makes every package the equivalent of what the Certified Milk Association would like its products to be.

My message, as I leave the municipal control field, is, therefore, that it is high time that all cooperate really to solve the problem.

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To consider briefly, now, the developments in the frozen desserts field, during the past year, in this area: Frozen cream put up during the flush period continued to be the major source of butterfat for the frozen desserts industry; butter oil has definitely become more accepted; plastic milk was not used to as great a degree, probably because of its higher price; sweetened condensed whole milk, which returned to the market primarily because of sugar restrictions during the war, has practically disappeared by now; sweetened condensed skim milk has receded, too; skim condensed (not superheated) is the most popular serum solids source in this area at this time, although spray and roller powders are coming back.

Rennet curd, prepared during the flush season, pressed and frozen, has been put up by one plan in the area for experimental purpose, and I anticipate that, if its use is successful, it will provide a means of preserving much of the serum solids lost to this market annually, during flush seasons.

The greater availability of cane sugar has curtailed utilizing the sweetened condensed products, as reported above, and has also decreased the tonnage of high-conversion corn syrups entering plants in this market. Sugar percent-

ages are being elevated back to pre-war levels as supplies increase; sugar is still the lowest-cost ingredient of the ice cream mix.

The elevated egg yolk solids content required by some of the state laws for French ice creams has (a) curtailed the acceptability of some of the ice creams made with a full yolk solids complement—some of the yolk powders on the market exhibit strong flavors; (b) caused the birth of some products called "egg yolk blends" which are employed as if the entire contents were yolk solids, but whose composition rarely recites the actual percentage of yolk.

The flavorings added to the freezer, or following freezing, continue to be a source of high coliform and yeast and mold concentrations. Since the fruit supply was short this year, because of both the weather and high labor costs, it was impossible to get packers to agree to furnish fruits on specifications requiring coliform absence. Until plants are reminded that bulk-packed products which contain coliform and yeasts and molds must be given a heat treatment to inactivate these, before adding to the frozen dessert mix, the flavors utilizing these products will not adhere to standards. Ice cream merchandizers have been troubled by only a few health departments on this score, since the lack of personnel at health department laboratories generally keeps the testing of ice creams (where it is practiced at all) confined to vanilla and chocolate. (Since the number of ice cream outlets, and of individual products has more than trebled, during the past year, it has been quite impossible for municipal control agencies to attempt to test all varieties distributed by all manufacturers even once a month.)

Color solutions, prepared from pow-

ders in such a manner that they become contaminated, are still used at many plants. To prevent these solutions from becoming nutrient media for organisms introduced through carelessness, the color solutions should be boiled, packaged in small bottles, and measured out, employing single-service paper graduates, before they are used.

Heavy manufacturing equipment continues to be slow in delivery, in this area, probably because of the great backlog of orders. A few packaging devices exhibited for the first time at last year's Dairy Industry Exposition have already made their appearance at some plants in the area with the resulting automatic filling and capping of cups, and filling, coating and packaging of novelties. These pieces of equipment are hailed for their proper maintenance of satisfactory products.

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It has been a pleasure to me to serve on the Frozen Desserts Committee during the past number of years. I have been grateful to the Committee for the information it has supplied to me. I have attempted to use many of the lessons taught; in my work at Plainfield. If my own reports have been helpful to others, I am particularly gratified. In the new field which I will enter soon, I will continue to strive toward the goal of public health work—to make good health more obtainable by all.

Committee on Frozen Desserts
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