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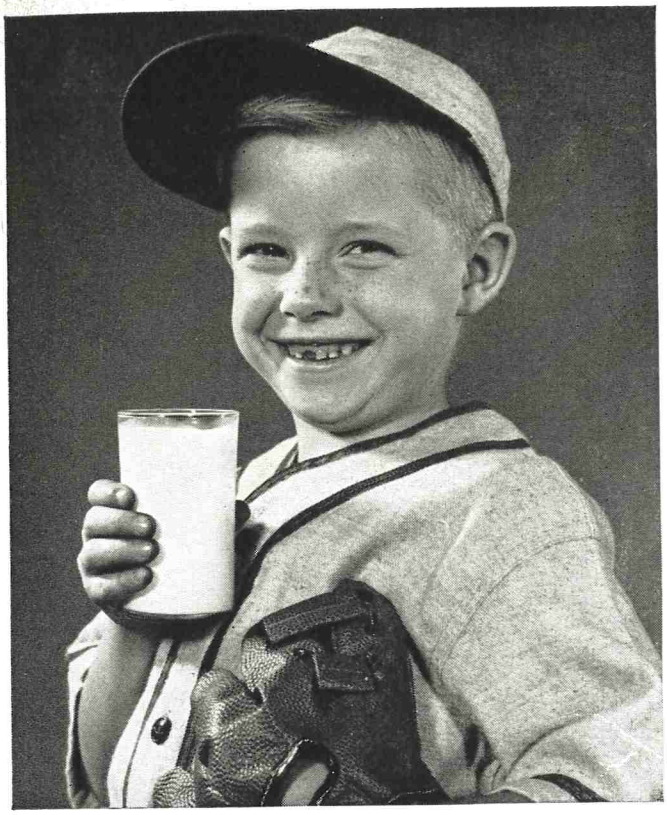

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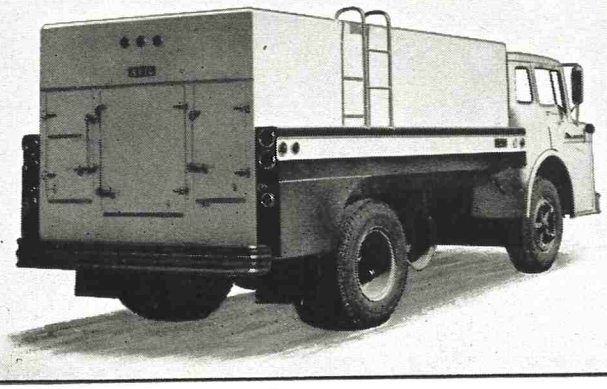

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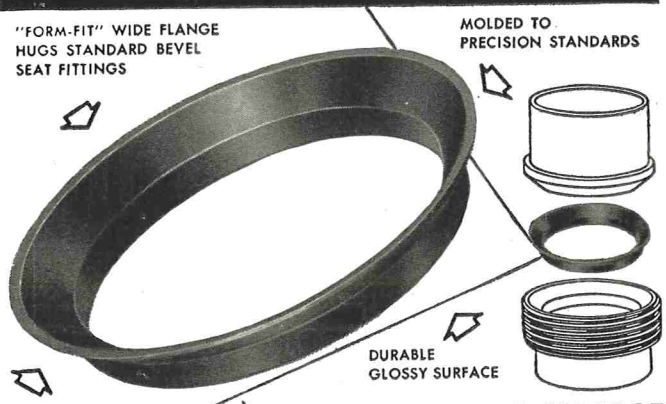

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Recommended by

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EDITORIAL OFFICES: J. C. Olson, Jr., Associate Editor, Dept. Dairy Industry, University of Minn., St. Paul, Minn.; H. L. Thomasson, Managing Editor, P. O. Box 437 Shelbyville, Ind.

Manuscripts: Correspondence regarding manuscripts and other reading material should be addressed to J. C. Olson, Jr., Associate Editor, Dept. Dairy Industry, University of Minn., St. Paul, Minn.

"Instruction to Contributors" can be obtained from the Editor for the use of contributors of papers.

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EDITORIAL

Welcome To Our New Affiliate

Elsewhere in this issue is the announcement that a new group has joined our ranks. This is the new *Mississippi Affiliate* bringing our affiliate total to thirty and again adding strength to our Association. We welcome our new Mississippi members and are proud that they have taken this forward step to become a part of *International.*

Both International and Mississippi assume some new responsibilities through this relationship. International's relationship has a variety of facets. While the list is long it is significant to mention some, at the outset, which are specifically the responsibility of International.

Among the first is the *Journal.* This is the official publication of the Association which comes to all members once each month. The Journal is a *technical* publication. Its articles and offering are not the run of the mill variety. The Journal is subject to careful technical editing. We believe the large majority of members look to the *Journal* as an authoritative publication in the field of environmental sanitation. It has been published continuously since 1937, and before that, Proceedings were published as early as 1912. Its articles are quoted often and are commonly referenced in other publication. The Publications Committee, the Journal Management Committee and the several Associate Editors strive continuously to make it a better Journal. The Journal is the laison between the parent Association and the more than five thousand members, subscribers and libraries who receive it. It is mailed to more than fifty foreign countries.

To further improve the stature and vitality of the Journal, The Executive Board, through a special committee, is currently taking applications for the selection of an Assistant Executive Secretary whose immediate and consumming duties will involve the *Journal.* The officers and members want an even better *Journal* and it appears that the skill and talents of a full time person trained in journalism is one logical step toward this objective. All affiliates, including Mississippi our newest, will benefit from this as we move into publication improvement.

International too has the responsibility of sponsoring and encouraging affiliate strength. It is a clearing house for information. With thirty affiliates a great deal of information is at hand and can be made available through the headquarters office. There is thus engendered a sense of belonging; of being one of a number of states who have their own local association yet enjoy membership in the larger group. The Executive Secretary, or as the situation may dictate, some elected Association officer, will attend affiliate annual meetings. This helps to cement good relationships and promotes better understanding of program, progress, problems and objectives.

But, of course, affiliates too have responsibilities. There are two sides to the coin. The parent association cannot be expected to give all and the affiliates nothing. To have a vital Association, strong active affiliates are needed. Affiliates must seek and gain new members; every member must believe in his Association and work as a one man membership committee.

An affiliate should be a constructive critic of the parent. Within limitations of finances and personnel, International will change and improve as good suggestions are made by the member groups.

A mechanism is provided for this through the Affiliate Council. Each affiliate is entitled to one delegate on the Council. At the annual meeting the Council convenes. Each affiliate has the responsibility of sending its Secretary or some other designate to the annual meeting. But suggestions need not wait for the annual meeting for each affiliate or each individual member may send in suggestions at any time.

In a certain sense, affiliates are autonomous groups. Each has its own officers, objectives and programs. As a unit then it should have one or more meetings a year, or, as in the case of some of the larger affiliates, regional meetings. They should be well planned and well programmed. Subject matter should be timely, interesting and of sufficient scope so that the several phases of environmental control can be discussed. Affiliate members should be alert for papers which can be published in the Journal. If a paper is significant and interesting to an affiliate, its contents should be made available to all Association members through the medium of the Journal.

We are confident, as time goes on, that the *Mississippi* affiliate will grow in strength and influence. As a professional group we know mature thought and careful deliberations went into their decision. In this day of competition for memership in Associations and Societies we are particularly pleased to add this fine group of Mississippi men to the Association's membership rolls.

H. S. Adams
Associate Editor
Indianapolis, Ind.

Opinions expressed in this Editorial are those of the author and are not necessarily those of this Association.

CHLORINATED HYDROCARBONS DEPOSITED IN BIOLOGICAL MATERIAL [1] [2]

I. PLANTS AND PLANT PRODUCTS

E. H. MARTH

Fundamental Research Laboratory,
Research and Development Division,
National Dairy Products Corporation, Glenview, Illinois

Editorial Note: Chlorinated hydrocarbon insecticides have been used to control pests on many plants of economic importance, on livestock and in soil. These uses have led to deposition of this group of insecticides in a host of biological material ranging from tobacco to eggs. This is the first of three review papers which will provide background information on different materials which have become contaminated and the levels of insecticide residues present. The first paper will discuss contamination of plants and their products; the second, animals and their products; and the third, soil and bodies of water.

Plants or their products may become contaminated with chlorinated hydrocarbons either through direct application of the insecticide to the plant in an attempt to control pests or through growth in soil which contains residues from previous years.

VEGETABLES

Guyer *et al. (36)* treated spinach with 0.25 lb lindane or one lb DDT per acre in attempts to control maggots. Fresh spinach harvested one day later contained 5.4 ppm lindane or 71 ppm DDT while the same spinach after canning had only 0.3 ppm lindane or 18 ppm DDT. After one week, levels were reduced to less than 0.05 ppm lindane or 3.8 and 1.4 ppm DDT in fresh and canned spinach respectively.

Snap beans, tomatoes and collards were treated with insecticides which contained 5% DDT, 10% methoxychlor, 20% toxaphene, 2% endrin or 1% lindane in studies by Brett and Bowery *(10)*. After treatment, endrin disappeared from tomatoes in one day, from snap beans in 3 days and from collards in 4 days. The highest initial level was found in collards (17.3 ppm) and lowest in tomatoes (0.31 ppm). Lindane disappeared from tomatoes after one, snap beans after 4 and collards after 12 days. The highest initial level again was found in collards (7.77 ppm) while the lowest was in tomatoes (0.28 ppm). The highest initial toxaphene level also appeared in collards (168 ppm) and the lowest in tomatoes (four ppm). At the end of the study (12 and 13 days after treatment), collards had the highest toxaphene residue (4.9 ppm) while tomatoes had the lowest (0.15 ppm). Results obtained with DDT or methoxychlor were similar except methoxychlor disappeared from tomatoes 7 days after treatment. Data from this study clearly indicated that highest residues of chlorinated hydrocarbons were present initially and persisted for longer periods in leafy vegetables than in those which produced a fruiting body. Other studies by Waites and Van Middlene *(91)* on DDT residues in snap beans, collards and leaf lettuce gave similar results.

Wallis and Carter *(92)* tested a variety of vegetables for methoxychlor residues after the crop had been sprayed with 1.75 or 3.0-3.5 lb per acre of insecticide. Green onions contained 13.8 to 23.0 ppm methoxychlor immediately after spraying and, after 8 days, contained 1.1 to 1.5 ppm. Initially, green beans had residues of 20.9 to 50.4 ppm and after 10 days, 1.0 to 10.8 ppm remained. Summer squash had initial residues of 2.9 to 8.4 ppm which were reduced to zero after 7 days. Immediately after treatment, okra contained up to 3 ppm which was completely eliminated 14 days later. Egg plant, initially, had residues of 1.7 to 8.2 ppm. This was completely eliminated one day later. Residues of 0.4 to 2.4 ppm were found in pumpkins immediately after treatment. Three days later 0.9 to 2.3 ppm were noted. Methoxychlor was completely eliminated from bell peppers 7 days after treatment, although initially residues of 0.9 to 5.4 ppm were present. Tomatoes contained 0.5 to 2.3 ppm initially and up to 0.6 ppm 7 days later. Initial residues of 1.1 to 1.7 ppm were detected in cucumbers and 3 days later 0.8 to 1.1 ppm remained. Immediately after application to kohlrabies, residues of 0.2 to 3.7 ppm were found. The contamination level after 7 days was 2.5 to 5.1 ppm. Turnip roots, initially, contained up to 1.0 ppm methoxychlor and after 7 days, up to 0.6 ppm.

Peppers were sprayed with different formulations of DDT at rates of one and 2 lb per acre in tests reported by Menzer, *et al. (69)*. Average residues detected immediately after spraying ranged from 6.7 to 10.5 ppm. During the ensuing 24 hr, 0.55 in of rain fell and peppers were again examined. Average residues were not appreciably different from

[1] Portions of this paper were presented at the Residues in Foods Conference conducted by the Food Science Department, Michigan State University, East Lansing on March 27-28, 1961.

[2] First in a series of three review papers on this subject which will appear in this Journal.

those noted initially. Seven days later 1.2 to 8.1 ppm of insecticide were noted as average values. Highest residue levels were noted when treatment consisted of 2 lb of insecticide plus 4 oz of a sticker-spreader per acre.

Menzer, *et al. (69)* extended these studies by determination of DDT residues in peppers at different stages during commercial processing. Residues in unwashed peppers ranged from 2.8 to 8.4 ppm. After the first wash, 2.1 to 5.3 ppm remained and after the second wash, 0.8 to 3.7 ppm were observed. Canned peppers contained from 0.5 to 4.4 ppm DDT.

Vegetables may become contaminated with insecticides through growth in treated soils. San Antonio *(79)* tested different crops grown in lindane treated soils for residues of the insecticide. He reported levels up to 25 ppm in carrots, sweet potatoes and in plants of snap bean, tomato, wheat, and potato which had grown on soils with either 5 or 10 ppm lindane present initially.

Soils were treated with aldrin, chlordane, DDT, dieldrin and toxaphene *(73)*. Various vegetables were then planted and, after harvesting, were analyzed for insecticide residues. When aldrin was added at the rate of 4 lb per acre, no residue was detected in shelled lima beans. Sweet potatoes contained 0.03 ppm each of aldrin and dieldrin while radishes were free from aldrin but had 0.24 ppm dieldrin. Chlordane was added to soil at the rate of 10 lb per acre. No residue was detected in broccoli, eggplant, bell pepper, cauliflower, cabbage, or collard. Residues of 0.01 ppm were found in tomatoes, 0.04 ppm in sugar beet roots and lettuce, 0.08 ppm in cantaloupes and cucumbers, 0.16 ppm in turnip roots and tops, 0.43 ppm in sweet potatoes, 0.50 ppm in rutabagas, and 1.51 ppm in carrots. No DDT was observed in sweet potatoes and 0.2 ppm was noted in shelled lima beans when 10 lb insecticide was added to the acre. Residues of DDT were not observed in any of the following crops when they were grown in soil previously treated with 20 lb insecticide per acre: cauliflowers, collards, broccoli, turnips, eggplants, kale or brussel sprouts. Potatoes and red beets contained 0.5 ppm each and bell peppers had 0.2 ppm insecticide. Dieldrin was added to soil at the rate of 4 lb per acre. No residue was found in radishes but sugar beet roots contained 0.11 ppm. Three pounds of toxophene were added per acre. No residues were found in sugar beet or red beet roots. Potatoes contained 0.3 ppm and radishes 0.4 ppm.

Heptachlor was applied at the rate of 0.5–2 lb per acre to the seed furrow together with ammonium phosphate in attempts to control the sugar-beet root maggot *(2)*. Sugar beets contained 0.01 ppm heptachlor and 0.02 ppm heptachlor epoxide at all rates of insecticide application.

Roberts, *et al. (78)* added insecticides to soil in the drill with fertilizer. Heptachlor, aldrin, dieldrin, toxaphene and DDT were added at the rates of 2, 2, 2, 10, and 5 lb per acre, respectively. Sweet potatoes grown in soils receiving the different treatments contained 0.11 ppm heptachlor, 0.06 ppm aldrin, 0.06 ppm dieldrin, 0.11 ppm toxaphene or 0.01 ppm DDT.

Several investigators have reported that flavors of vegetables may be affected by insecticides. Hening, *et al. (41)* noted an off-flavor in pureed squash prepared from squash grown in aldrin-treated soil. When soil was treated with chlordane, no off-flavors were noted in squash, carrots, peas, beans, spinach, red beets or tomatoes. Carrots and squash grown on soils treated with chlordane, aldrin or dieldrin appeared deeper in color than those from untreated soils. This effect was not observed when soil was treated with DDT.

Gyrisco, *et al. (39)* studied the effect of lindane-treated soil on flavor of potatoes and red kidney beans. The soil was treated for 2 consecutive years prior to growth of these crops. An application of one lb insecticide per acre was used. Potatoes grown on treated soil and tested for flavor were judged "probably-off" to "strongly-off". No flavor differences were detected in red kidney beans.

No adverse effect was noted on the flavor of turnips, parsnips or carrots when these crops were grown in soils treated with 3 or 6 lb per acre of heptachlor or 5 or 10 pounds per acre of chlordane *(51)*. During one growth season an additional 20 lb per acre of chlordane were applied to soil in which carrots were grown. Flavor was not affected by this treatment.

Murphy, *et al. (74)* evaluated a variety of vegetables for off-flavors caused by growth in soils previously treated with insecticides. Benzene hexachloride, lindane or toxaphene treatments resulted in off-flavors in about 50% of vegetable samples. When mixtures of insecticides were used, those containing toxaphene produced off-flavors in 14% of the samples. Off-flavors from toxaphene were most pronounced in potatoes. The same crop also suffered in flavor when grown on endrin-treated soil. Chlordane, DDT and heptachlor, when used individually, generally did not induce off-flavors. Ten to 13% of samples from soils treated with chlordane, heptachlor, lindane or endrin showed improvements over controls in flavor quality.

Lindane was used to control mushroom flies in studies reported by Weigel and Gilpin *(94)*. When 0.5 lb insecticide per acre was applied to mushroom beds, yield was not affected. An application of one lb or more per acre depressed yields. No appreciable residues were detected in mushrooms harvested 5 days after application. Slight occasional off-flavors

were found in canned mushroom pieces and cream of mushroom soups made from mushrooms grown in beds treated with 0.25, 0.5 or 1.0 lb of lindane per acre at least 7 days before harvest. Mushrooms harvested 3 days after treatment had musty off-flavors which made both pieces and soup inferior in flavor quality.

FRUIT

Hoskins *(42)*, as early as 1949, was concerned with residues of DDT, DDE or methoxychlor on different sprayed fruits. He reported DDT was present in the range up to 30.5 ppm on apples, apricots, grapes, peaches, pears, prunes, and raisins.. A higher level (20.5 to 35.6 ppm) was found in olives. The DDE content in apples, apricots and prunes varied from 0.14 to 38.5 ppm with the higher level present in apricots. Methoxychlor residues ranged from 0.18 to 32.4 ppm in apples and apricots. Again, the highest level appeared in apricots.

The deposition on peaches of five different chlorinated hydrocarbons applied 40, 30, 20 or 10 days before harvesting fruit was studied by Fahey, *et al. (20)*. When DDT was applied 10 days before harvesting, peaches contained 24.6 ppm of insecticide. The level dropped to 5.3 ppm when the insecticide was applied 40 days before harvesting. Results with chlordane, heptachlor, dieldrin and endrin were similar although quantities of residues were different. Peach trees were sprayed with a solution of 2 lb of 50% wettable DDT powder per 100 gal on May 27, June 5, June 17, July 4 and July 15, 1957. On August 22 a solution containing one-half the above-mentioned concentration of insecticide was used. At harvest time, on September 16, peaches from trees which received all 6 sprays contained an average of 9.7 ppm DDT. Peaches from trees which received the first 5 sprays contained an average of 5.3 ppm while those from trees which received the last 3 sprays only contained 5.0 ppm. A residue of 1.6 ppm DDT was detected in peaches from trees which received the last spray only.

Lemons and oranges were treated with neotran (bis (p-chlorophenoxy) methane) to control the red mite of citrus fruits *(47)*. The pulps of both citrus fruits were virtually free of the insecticide while peels contained 11.4 to 15.2 ppm one day after treatment and 6.8 to 9.5 ppm 32 to 36 days later.

Blinn, *et al. (6)* studied the deposition of various insecticides on lemons and oranges. Chlordane (4 lb of 50% powder per 100 gallons of water) was used for a full coverage spray. Seven days later residues in and on the peel averaged 15.0 ppm. After 21 days this was reduced to 9.0 ppm and after 34 days, 5.6 ppm remained. Similar tests were conducted with dieldrin (2 lb of 50% powder per 100 gal of water). Seven days after spraying, an average of 31.4 ppm dieldrin appeared in and on the peel. This was reduced to 7.3 ppm after 21 days and further reduced to 6.2 ppm after 34 days. Heptachlor residues were studied after trees were sprayed with a solution of 4 lb of 25-% insecticide per 100 gal of water. After 7 days the average residue detected was 8.4 ppm. This dropped to 3.6 ppm after 21 days and to 1.7 ppm after 34 days. Lower heptachlor residues were noted when either 2 lb of heptachlor powder or one qt. of emulsifiable heptachlor concentrate was mixed with 100 gal of water instead of 4 lb of powder. Blinn, *et al. (6)*, reasoned that initial dissipation of the chemical occurred while it remained primarily on the surface of fruit and was subjected to physical and chemical action of weathering. Later, less rapid decreases occured after the chemical had penetrated into waxes and oils of the fruit where it undergoes change.

DDT and TDE were used in sprays at the rate of 2.5, 5.0 or 10.0 lb per acre in attempts to control a variety of orangeworms *(4)*. Residues of DDT in mature oranges, when 2.5 lb of insecticide per acre were used, ranged from 1.0 ppm 7 days after treatment to 0.3 ppm after 42 days. When 5 lbs of insecticide per acre were used, residues of 2.0 ppm after 7 days and 0.9 ppm after 42 days were noted. A treatment with 10 lb of DDT resulted in a residue of 3.1 ppm 7 days later and 2.4 ppm after 42 days. Residues of TDE followed the pattern noted with DDT.

Wolfe, *et al. (95)* investigated DDT residues on apples grown in central Washington after trees were sprayed with the insecticide during the growing season. Residues ranged from 0.3 to 12.4 ppm with an average of 3.0 ppm for all samples, both washed and unwashed apples. In general, higher DDT residues were found in unwashed apples and in those from trees which had received a greater number of cover sprays.

The use of DDT with a sticker-spreader to control the grape berry moth resulted in deposits of 17 to 23 ppm insecticide on grapes immediately after the final application *(85)*. At harvest time the residue was generally in excess of 7 ppm. Most of this deposit was contributed by the final spray applied for control of the second brood of grape berry moths. When only the original applications were used, 2.5 to 4.0 ppm insecticide were found in grapes. Elimination of the sticker-spreader reduced the residue to below 7 ppm at harvest. Combined effects of weathering and growth caused a reduction of DDT deposits at harvest which ranged from 37 to 64% and averaged 51%.

The flavor of some fruits has been affected by the presence of insecticides in soil *(37, 38, 52)*. Gyrisco

and Burrage *(37)* found "obvious off-flavors" in strawberries grown on dieldrin-treated soil. Off-flavors were noted in jams produced from berries grown on soils treated with aldrin, benzene hexachloride or dieldrin. These unsatisfactory flavors were also observed in canned berries and fresh-frozen fruit. Benzene hexachloride also imparted an off-odor to strawberries while chlordane did not affect their odor or flavor. Other experiments by Gyrisco, *et al., (38)* showed that flavor and odor of strawberries were unaffected when plants which produced the berries 12 to 24 months later were planted in soils treated with one, 2 or 4 lb per acre of aldrin, lindane, dieldrin or heptachlor.

Lindane, when applied to vines or melons produced musty flavors in a large portion of cantaloupes *(52)*. The frequency with which musty flavors appeared was related to the insecticide formulation used. Fifty-eight per cent of samples had the off-flavor when an emulsion concentrate was used. This was reduced to 44% with a wettable powder and further reduced to 10% with dust.

NUTS

Reynolds, *et al. (76)* determined levels of benzene hexachloride in peanut butter made from peanuts grown on land a year following cotton which had been sprayed with the insecticide. Peanut butter contained from 0.20 to 0.50 ppm BHC when cotton was treated with 3.8 lb of the gamma isomer per acre. When the rate was increased to 5.14 lb per acre, peanut butter contained 0.45 to 0.90 ppm benzene hexachloride.

WHEAT

Lindane and methoxychlor have been suggested for use on stored wheat *(35, 80)*. There was very little loss in lindane activity during 15 months of storage when wheat was treated with 4, 8 or 12 ppm of insecticide. Initial levels were 2.8, 5.1 and 7.7 ppm respectively and after 15 months they were 2.3, 4.0 and 7.4 ppm respectively.

Samples of wheat were treated with either methoxychlor or lindane in studies by Schesser, *et al. (80)*. The wheats were milled 9 to 10 days after treatment or after 18-24 months of ageing. Ageing by itself failed to eliminate these insecticides from grain. Cleaning of grain before milling somewhat reduced methoxychlor levels but had little effect on lindane. Highest levels of insecticide were found in the bran portion of milled wheat, followed in order by shorts, germ and flour. The flour portion contained from 0.3 to 1.8 ppm methoxychlor when the initial treatments ranged from 5 to 50 ppm. Lindane was present in flour at the rate of 1.3 to 2.6 ppm when the initial treatments were 2.5 to 7.5 ppm. Since the greatest portion of insecticide was present in shorts and bran, it appeared to be retained by the pericarp.

Laboratory studies were conducted by Strong, *et al. (84)* in which methoxychlor was added to wheat (15 ppm) to control the rice weevil and confused flour beetle. An emulsion, wettable powder and tetrachlorethylene solution of the insecticide were used. Samples of treated wheat having 10 or 13% moisture were held at 60° or 90°F. Whole grain, before cleaning, contained 4.2 to 12.1 ppm insecticide. Samples of wheat with different moisture levels held at 60°F were similar in residue content. Higher residue levels were noted in high moisture wheat when held at 90°F. Ranges of methoxychlor content found in different fractions of milled wheat were: *(a)* clean-out (prior to milling) - 19.76 to 101.6 ppm; *(b)* flour - 1.65 to 6.6 ppm; *(c)* bran - 13.18 to 28.4 ppm; *(d)* shorts - less than 2.0 to 13.38 ppm and *(e)* middlings - less than 2.0 to 5.65 ppm. These data verify those previously discussed *(80)* in regard to location of insecticide residues on kernels of wheat.

Highest levels of insecticide in flour and bran were noted when wheat was treated with the emulsion or wettable powder. Shorts and middlings from wheat treated with the tetrachlorethylene solution were higher in residue level than those from the other treated grain.

TOBACCO

TDE and endrin are the major chlorinated hydrocarbons used on flue-cured tobacco for control of the tobacco hornworm. Both are usually applied more frequently and closer, in time, to harvesting or priming than other compounds. Bowery, *et al. (8)* conducted extensive studies on TDE and endrin residues in green and processed tobacco and in cigarettes. Tobacco was sprayed with one lb TDE per acre before the second, fourth and sixth priming. Levels of TDE in green tobaccos one day after treatment were 460, 196 and 68 ppm respectively. After 5 to 7 days they had decreased to 69, 89 and 52 ppm. Use of 3 lb TDE per acre, applied as a dust, resulted in residues of 2,667, 167 and 582 ppm one day after treatment and 86, 82 and 149 ppm respectively 5 to 7 days after dusting. Dusting tobacco with endrin (0.4 lb per acre) before the second, fourth and sixth priming resulted in the presence of 316, 31 and 114 ppm respectively after one day and 33, 10 and 6 ppm respectively after 5 to 7 days. Flue curing of tobacco reduced the TDE content by 41% and endrin content by 42%. Stemming, shredding, redrying, ageing for 2 years and cigarette manufacturing failed to appreciably reduce further the contents of either insecticide in tobacco.

Tests on tobacco samples from commercial auction markets showed an average of 39.0 ppm TDE present in 1956, 28.6 ppm in 1957 and 43.7 ppm in 1958. Analyses for endrin indicated an average of 1.5 ppm present in 1957 and 2.2 ppm in 1958. TDE residues in different American cigarettes averaged 11.7 to 13.4 ppm. The average for endrin was 0.16 ppm. Smoke from cigarettes with an average of 10.3 to 14.7 ppm of TDE contained an average of 1.6 to 1.7 ppm TDE and 0.6 to 1.4 ppm dehydrochlorinated TDE.

PASTURES AND HAY

Pasture and hay crops have been treated with a variety of chlorinated hydrocarbons to control insects. Residues on these crops are of concern since after ingestion by cattle, they may appear in meat or milk. Alfalfa was treated with heptachlor in two different studies *(16, 57)*. In one, an application of about 0.25 lb per acre resulted in an initial contamination of 13.3 ppm. The insecticide had disappeared completely 14 days later. The use of about one-eighth lb gave similar results although the initial level was only 3.76 ppm. In the other study the highest initial level, 4.81 ppm, was encountered when 5 lb of heptachlor granules were applied per acre. Heptachlor persisted for more than 30 days regardless of application used (spray 0.25 lb per acre; dust 0.42 lb per acre; granules 3 and 5 lbs per acre). Aldrin was applied to alfalfa at a rate of 5 oz per acre. Initially 6.02 ppm were found in forage but none remained 14 days after treatment. An application of 0.25 lb dieldrin per acre resulted in an initial contamination of 3.65 ppm. Insecticide residues persisted on plants for over 30 days.

Fahey, *et al. (21)* noted that appreciable (in excess of 0.5 ppm, residues of lindane remained on alfalfa for 24 to 31 days if it was 15 inches or more in height at the time of spraying. No measureable residues were found at harvest time (20 days after treatment) if alfalfa was not over 12 in in height when it was sprayed.

Aldrin was applied to Ladino clover as a dust or in granulated attapolgite or vermiculite formulations *(15)*. Higher residues were encountered when dust was used. Residues had decreased to less than 0.1 ppm 14 days after 1.0 lb per acre was applied regardless of formulation used. Dosages of 2.1 to 2.4 lb per acre required more than 14 days to reduce levels below 0.1 ppm.

Peanut hay was treated with 28.5 to 36.0 lb per acre of a 2% DDT dust from 9 to 35 days before harvesting *(90)*. At 9 days a residue of 8.0 ppm was noted and after 35 days this had dropped to 0.8 ppm.

Corn was treated on July 11, 1957 with 20 lb per acre of a granulated formulation containing 5% heptachlor in an attempt to control the European corn borer *(49)*. Residues of heptachlor on corn ranged from 1.44 ppm one day after treatment to 0.55 ppm after 4 days. Less than 0.01 ppm was found after 8, 18, 32 and 102 days. Heptachlor epoxide present after one day was 0.04 ppm; after 4 days, 0.15 ppm; after 8 days, 0.07 ppm; after 18 days, 0.06 ppm; and after 32 days, 0.03 ppm. No heptachlor was found in corn stover samples collected 120 days after insecticide application. Experiments were conducted on residues of toxaphene in pangolagrass *(89)*. This grass, widely used in Florida for pasture purposes, is frequently treated with toxaphene to control caterpillars. Initial residues of 102 ppm were observed when 2 lbs of a 10% dust was applied per acre. Residues after 14 days ranged from 2.1 to 6.0 ppm for all treatments (one or 2 lb per acre of 10% dust; one or 2 pounds per acre of 40% wettable powder; one or 2 pounds per acre of a 60% emulsifiable concentrate).

Huddleston, *et al (43)* sprayed parts of five townships in an area near Norwich, N. Y. (Chenango Valley) with DDT in an attempt to control the gypsy moth. One lb of insecticide in one gal of mixed oil solvents was applied per acre by means of an airplane flown at a height of 20 feet. Pastures and hay from the sprayed area were tested periodically for DDT residues. Insecticide residues on pastures from five farms ranged from 21.6 to 348 ppm initially, 12.6 to 100.8 ppm after 7 days, 4.1 to 60 ppm after 30 days and 2.2 to 17.6 ppm after 60 days. Hay, harvested 120 days after treatment contained from 1.8 to 43.2 ppm insecticide.

Recent studies *(26,34)* have shown that aldrin is converted to the more residual and equally toxic dieldrin in alfalfa, soybeans, corn and carrots. This reaction may also occur in other plants. Other work *(27)* has shown that heptachlor is converted to its epoxide by alfalfa, soybeans and corn. These reactions also occurred when insecticides were absorbed by plants from contaminated soils *(62)*. This change is of importance since the new compounds are more persistant in plant tissue and also more toxic to insects and mammals.

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The complete list of references cited will be included with the third paper of this series.

THE NATIONAL MILK SANITATION BILL AND ITS PROBABLE EFFECT ON NORTHEASTERN MILK MARKETS[1]

A. C. Dahlberg
Department of Dairy and Food Science,
Cornell University, Ithaca, New York

For several years bills known as the National Milk Sanitation Act have been presented to congressional committees in the Federal Congress. The older obsolete bills were opposed by most state and local sanitary milk regulatory agencies and by the U. S. Public Health Service. There was need for thorough revision of the principles underlying the bills or for discarding them completely.

The bills introduced to committees in February 1959 incorporate new methods of procedure and objectives and the Johnson Bill H.R. 50, January 3, 1961 is one of several similar bills on which hearings were held this past summer. The bills have changed but the same objections continue to be used against them. One should consider the basis of this bill, the bill itself, and the probable disadvantages and advantages of the passage of this legislation.

Underlying Principles

It is difficult to correctly convey meanings by quotations but in this instance it is well to quote directly from the report of the Association of State and Territorial Health Officers *(1)* which has been used as the basis to formulate the present bill known as the National Milk Sanitation Act.

". . . the Association believes there is a need to strongly reaffirm that the sanitary control of fluid milk and fluid milk products is a public health matter which is primarily the responsibility of State and local governments except where interstate commerce is involved . . . ."

"The Association recognizes that States and their political subdivisions have the right to exclude milk of questionable quality, but unanimously agrees that health regulations should not be used to restrict either the intrastate or interstate movement of milk of high sanitary quality."

"It was the consensus . . . that the problems of the milk industry can no longer be considered solely on a local milk shed basis, that the increased interstate movement of milk has complicated its control by State and local agencies, and that uniform sanitary standards and practices are necessary to insure the quality of milk shipped interstate, and to eliminate the unjustified use of health regulations as trade barriers."

The Association considered former bills and " . . . is opposed to those sections of the bills that would provide for centralized Federal control, supervision, and the extension of such control to all milk supplies affecting interstate commerce." " . . . the Association believes that the essential elements of this program (voluntary State-PHS milk certification) should be incorporated into any Federal legislation enacted by the Congress to control interstate milk supplies. It was the consensus that if these elements were coupled with a provision prohibiting a State or municipality from excluding milk from out of State sources which complied with basic public health criteria for certification, that such an approach would provide an effective and practical means of assuring high quality products for consumers in milk-importing areas and for eliminating the use of health regulations as trade barriers without abridging the rights of State and local agencies to control the sanitary quality of their intrastate supplies. In fact, the Association believes that this approach would strengthen the programs of State milk sanitation agencies."

Then the Association outlined recommendations to be incorporated in the bill. These points will be discussed under the bill but the issues are clearly outlined in these quoted principles. One would expect that the State health officers concerned with milk sanitation did not make recommendations to delegate their professional responsibilities to a Federal agency.

The Provisions of the Bill *(4)*

The bill starts with the premise that the sanitary control of milk is necessary to protect the public health, that ". . . such sanitary control is primarily the responsibility of State and local governments, but that no State or local government has the right to obstruct the free movement of interstate commerce of milk and milk products of high sanitary quality by use of unnecessary sanitary requirements or other health regulations." It includes not only milk for fluid consumption but also milk products as defined in the last edition of the PHS recommended Grade A milk ordinance when such milk or milk products are ". . . shipped in interstate commerce in sufficient quantities to be of public health importance and to warrant its control under this title; . . .".

The Surgeon General (chief officer in charge of USPHS) shall by regulation promulgate a Federal

[1]Presented at the Annual Meeting of the New York State Association of Milk and Food Sanitarians and the Cornell Dairy Conference in Albany, N. Y. on September 26, 1961.

Milk Sanitation Code (PHS Grade A milk ordinance) which shall provide for quality at least equivalent to the present Grade A. Also, he shall by regulation promulgate standard rating and compliance methods. Any State milk sanitation rating agency that wishes to have milk in this program must submit a State plan to the Surgeon General for approval. Also, the State shall submit the list of plants wishing to ship interstate under this Act and the data showing that the farms and plants rate at least 90%. If the information submitted by the State meets the requirements, ". . . including a requirement that such ratings will be made only by State rating officials who are full-time employees of the State milk sanitation rating agency . . ." then the State program shall be approved as long as compliance continues. There shall be a published list of approved supplies, but consent of the company must be secured to publish its rating. It should be noted that this procedure is similar to the voluntary program of the National Conference on Interstate Milk Shipment. Ratings must not be more than one year old.

Decisions of the Surgeon General may be reviewed at a public hearing and from the evidence the decisions may be confirmed or changed. The complaining party has the right to transfer the record of the hearing to the United States court of appeals for the circuit in which the interstate milk plant involved is located and the court, before rendering a decision, may require the Surgeon General to secure additional information through hearings.

Now the real substance of this bill is that ". . . no milk or milk product which emanates from an interstate milk plant in another State, while such plant is listed by the Surgeon General . . . with respect to the milk or milk product, as the case may be, shall be subject to seizure or condemnation in, or to exclusion from, a receiving State or locality, or from transportation, distribution, storage, processing, sale, or serving in such State or locality, . . .". The right of the receiving State or locality to subject any milk or milk product to laboratory or screening tests to determine compliance with the Federal Milk Sanitation Code and to reject shipments not in compliance is specified. In case of litigation a United States district court shall have jurisdiction.

INTERPRETATIONS AND PROBABLE EFFECTS

Thus far this presentation has introduced neither interpretations of the bill nor its probable effects upon milk sanitation, regulation, and the dairy industry. There are many reasons for the controversial nature of this bill among which are milk prices and competition, and the future of sanitary milk regulations in selected areas. In discussing this phase of the problem it should be emphasized that the views expressed here were not determined by any action of the Department of Dairy and Food Science at Cornell University or by the Board of Directors of the Dairy Products Improvement Institute with which the speaker is associated; instead they are independent personal opinions.

The probable effects of this proposed national legislation will be best analyzed by confining the situation in part to New York and adjacent states. The adoption of the national ordinance is voluntary with each state, hence New York State could continue in the future as at present. It need not change its regulations for sanitary milk production and it can ignore the Federal law so far as acceptance of out-of-state supplies is concerned, with one very important exception. Should the dairy farmers of New York State be required to comply with the sanitary code recommended by the U. S. Public Health Service under the National Milk Sanitation Act, it would be done only through requirement by the New York State Department of Health, by the Board of Health of the City of New York, or by laws passed by the New York State Legislature. Furthermore, any national grade A milk program must be initiated by the State, must be enforced by the State, but is subject to the approval of and spot checking by the U. S. Surgeon General to assure compliance with the Federal law. The U. S. Public Health Service does not assume the responsibility for getting the milk supply of New York State to comply with the Federal legislation but does have the duty of making certain that New York State's milk supply shipped in interstate commerce is in compliance with the proposed law only after New York State has adopted the national law, just as it now checks the state ratings on milk supplies listed for the National Conference on Interstate Milk Shipments. There are now no milk supplies in New York State in this list published by the PHS so there is an absence of experience in this activity in this region.

Now the point of real controversy is that any state irrespective of whether or not it has adopted the proposed Federal milk legislation for use in its own state must accept milk for fluid consumption from another state that has adopted the program; providing that state's milk sanitation rating agency, as established by that state, has reported to the USPHS that the dairy farms and plants concerned with the milk to be shipped interstate rate 90% or better, that the milk is in compliance with the sanitary requirements, and the Surgeon General has substantiated these facts by spot checking of the supplies.

Suppose the National Milk Sanitation Act becomes a law. New York is the second or third largest milk producing state - it sometimes changes positions with Minnesota - and it exports large quantities of New York State Grade A milk. About 99.5% of all New

York State milk is Grade A but nearly half of this milk must be used for purposes other than fluid consumption. In some counties most of the milk is exported to Grade A markets in neighboring states. Under these conditions it seems imperative to place production and processing under the proposed national law. If this is not done, New York State Grade A milk may be discriminated against in some competitive markets in favor of PHS Grade A milk which can be secured irrespective of any local regulation that might exclude New York Grade A milk from the market. It probably is not a question of the quality of the milk. Compliance with the national code would assure interstate marketing.

What will such PHS approval mean on New York dairy farms? The health department of New York State, or designated local health departments, will inspect the farms more critically than previously because its reports as well as some farms, and plants, and milk will be spot-checked by the USPHS. Hard though this may be on some producers whose dairies and barns need improvement, it will be an advance in sanitation and milk quality through more thorough inspection. This statement is no reflection on the excellent sanitary conditions on most New York dairy farms and on the high quality of New York State Grade A milk. There will be items of expense on some farms in meeting the PHS sanitary code. Flowing hot and cold water under pressure must be available in the milkhouse. The double wash vat is almost universal now and the same is true for electric refrigeration required to cool milk below 50°F. Special facilities for washing hands are required. There will be some problem farms in respect to cleanliness and sterilization of equipment. Proper water supplies, toilets, and sewage disposal may be problems in some areas of the state. The New York State Department of Health may need more state sanitarians and more approved laboratories for testing milk to enable it to certify to the U. S. Public Health Service that the milk complies with the Federal standard.

Although the milk industry of New York State need not comply with the national code if the law is passed, nevertheless, the state must accept milk from other states that do comply, providing the milk quality is satisfactory upon arrival. Is this much of a change for New York State dairy farmers? Years ago a law was passed in New York State requiring that all out-of-state Grade A milk producers whose milk enters New York State must be inspected by a sanitarian in the employ of the New York State Department of Health. This law was passed to prevent the shipping of milk of inferior quality into the state and a budget was provided to do the inspections. As time passed conditions changed and it is often said today that the out-of-state milk producer generally receives more assistance from the New York State sanitarians to meet New York State sanitation requirements than does the New York State farmer. As it is necessary to inspect out-of-state supplies upon request, there is a rather free flow of Grade A milk into this state. Surely, the Health Department of the City of New York also has policies which assure that health regulations are not used as trade barriers. The National Milk Sanitation Act would not alter these conditions but might encourage the thought of shipments from greater distances. Incidentally, the State health department endorsed a bill last year eliminating the requirement that out-of-state inspections could be made only by New York State milk sanitarians, and this bill is desirable for all concerned.

The acceptance of PHS Grade A milk in interstate commerce solves the problem of restrictive public health trade barriers. What about the contention that it will lower the quality of some milk entering the market in areas having unusually high-level local sanitation standards? In a nation-wide study of milk regulations and quality conducted through the National Research Council *(2)* it was found that irrespective of variations in sanitation regulations "Each of the eight cities had a healthful milk supply of good sanitary quality." "The sanitary conditions of milk production on the farm were related to the bacterial counts of the raw and of the fresh pasteurized milk, but they were not related to the initial flavor and the keeping quality of the pasteurized milk." It was found, also, that the rigid enforcement of a limited number of essentials of sanitary milk production was the effective means of producing high quality milk. Thus, it is not correct to assume that some extra regulations will produce higher quality milk or that excellent sanitation guarantees good flavor and keeping quality.

Surely, one cannot seriously consider any possibility of increased danger of milk-borne disease epidemics from USPHS Grade A milk. Such epidemics occur rarely and do not repeat in specific areas. Also, about two-thirds of all cities and states in this country now have PHS Grade A milk regulations. The possibility of lowered quality of milk is not a question of ordinance but of enforcement at the state and municipal level.

Actually, the concern of the Northeast dairymen over the passage of the National Milk Sanitation Act is based upon possible economic competition with Midwest milk at lower Class I prices. The use of public health regulations to control market areas and prices is a gross misuse of the valuable work done in public health, and it is not approved by the public health services. Public health regulations ought to be concerned with the health of the people and it is improper for any industry or any health department to endeavor to control markets, prices, and jobs

through such regulations. Fortunately, there are state milk control agencies and Federal market administrators created by laws for the specific purpose of governing milk prices in various markets in the interests of consumers and producers. If such laws cannot handle the problems there is need to modify them so they can do the job.

New York State sanitation laws and the sanitary code of the City of New York have been designed to serve the public in respect to health rather than to restrict the free exchange of milk in commerce. The New York milk industry imports and exports milk with neighboring states in normal trade. There is little, if any, Grade A milk received from the Midwest and its importation is not restricted by public health regulations. The shipment of Grade A milk from Wisconsin to New York City may be a liability to the shipper for, the U. S. Department of Agriculture *(6)* found in 1954, such milk would have been shipped from Eau Claire, Wisconsin to New York City at a loss of sixteen cents per hundred.

Obviously, surplus Grade A milk bought at manufacturing prices might be shipped profitably to New York if sold at Class I prices, and the same might be true for milk shipped from New York to Wisconsin. This problem of pricing is one for the milk market administrators, the dairy farm cooperatives, and the milk dealers of the various milk marketing regions. It should not be entangled with public health sanitation regulations. It is true that the market administrator might be able to use public health regulations as effective trade barriers to support higher Grade A prices to producers, but it is to correct this type of misuse of health regulations that the National Milk Sanitation Act has been presented to the Congress.

The principal valid objection to the National Milk Sanitation Bill is that it creates another power in the Federal Government which must continue indefinitely. Final authority for the national milk sanitation ordinance and its enforcement would be Federal. The great advances in milk sanitation occurred under state and local control without interference by the Federal Government. The troubles with state autonomy are the obvious reasons for agitation for Federal legislation. Do we need, and are we ready for a national sanitation code for milk for fluid consumption? In editorials invited by the International Association of Milk and Food Sanitarians the two differing public health viewpoints are presented objectively by Olson *(5)* and by Corash *(3)*. Whether one sanitation code can be used equitably under all conditions in this country probably is less important than whether sanitary milk control officials are ready to accept one code. Actually the proposed bill prescribes one code only for Grade A milk shipped in interstate commerce, hence present codes at a local and state level will remain in effect until changed by the states.

The career men in milk sanitation in the Public Health Service of the Department of Health, Education, and Welfare generally have been objective and public spirited in capably performing their duties in the interest of the people. A similar tribute is proper for sanitarians and regulatory officials at state and local levels. In former years USPHS officials testified before congressional committees against passage of a national law forcing universal adoption of the PHS Grade A ordinance, and they have favored the present national legislation only when the adoption of the Grade A ordinance in respect to milk production and processing was left optional with the states. Advancements in the details of milk ordinances have been made through the PHS and there is reason to expect a careful study of the present ordinance with subsequent improvements.

Considering all aspects of this bill it may be that the milk industry will be given its best opportunity for development and that the interests of consumers will be best served by its passage. The principal value of the Act will be a reduction in discriminatory public health regulations affecting free trade and the possibility of providing approved Grade A milk ready for interstate commerce, especially among neighboring states and cities in natural milk producing and market areas. These occasional trade barriers are uneconomic and they are not imaginary. The fundamentals of sanitary milk production, processing, and distribution are known so future progress in milk sanitation will depend much more upon a program of research provided for in this bill than upon the individual trial and error methods of the past.

The principal objection to the Bill is the centralization of authority in Washington. Such authority is absolute, except for hearings and court review, but it is definitely specified within certain limits and can be applied only on milk produced and processed for interstate shipment as requested by the states. High quality of the career staff in the USPHS can do much to control this objection. Some individuals and organizations contend that the enforced acceptance by every state and municipality of high-quality Grade A milk shipped interstate and produced under state and local supervision, but with Federal assurance of quality, is a very objectionable feature; but I think it is one of the principal values of the Act. Temporarily, in a few markets the price structure enforced by state and Federal milk market administrators may become more difficult to maintain. Even though about two-thirds of the cities and states in this country now have the PHS Grade A ordinance there will be some areas where compliance with this regulation will require some effort and expense. The

passage of this bill cannot set aside the high cost of shipment of a bulky refrigerated food that must reach the market promptly, hence distant markets for milk may be an economic illusion.

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MICROBIAL ANALYSIS OF COMMERCIAL[1] FROZEN FISH STICKS

J. T. R. NICKERSON, G. J. SILVERMAN, M. SOLBERG[2], D. W. DUNCAN
and
M. M. JOSELOW[3]

Department of Nutrition, Food Science, and Technology,
Massachusetts Institute of Technology, Cambridge

A total of 78 samples of frozen fish sticks were analyzed for total plate count, coliform count, coagulase-positive staphylococci and members of the Salmonella-Shigella group. Fifteen samples (19%) contained 50,000 organisms or more per g. and 4 had 100,000 or more per g. Coliform counts were generally low, ranging from zero to 35 per g., with 6 samples showing counts of 10 or more per g. Two samples contained coagulase-positive staphylococci and an isolate from one of these samples was positive to salmonella polyvalent sera.

The consumption of prepared pre-cooked or partially cooked frozen foods has increased greatly in recent years. Though regulatory groups and public health officials have expressed concern over the sanitary quality of pre-cooked or prepared frozen foods, there has so far been very little promulgated as official standards for such control *(7, 8)*. The U. S. Army Quartermaster Corps stipulates standards of a total plate count not to exceed 100,000 organisms per g, not more than 10 coliform organisms per g and the absence of pathogens *(4)*.

The standards of the Commonwealth of Massachusetts for these products are somewhat more stringent *(9)*. The total plate count is limited to 50,000 organisms per g, and not more than 10 coliform organisms per g and no coagulase-positive staphylococci or members of the *Salmonella-Shigella* groups should be present. The National Association of Frozen Food Packers has tentatively suggested a standard consisting of 100,000 organisms per g, omitting any maximum allowance for coliforms or staphylococci *(2)*.

Although pre-cooked frozen fish sticks have been marketed commercially since 1953, published bacterial analyses of this product have not been numerous. Larkin ,Litsky and Fuller in 1956 *(5)* examined pre-cooked frozen fish sticks and reported that for most samples coliform counts were less than 20 per g, enterococci were less than 500 per g and total plate counts never exceeded 3,000 per g. They suggested that the breading on the fish sticks might be a major source of contamination. Benarde *(1)* in a later study stated that although breading was found to possess appreciable numbers of organisms, most contaminants were destroyed during processing.

Since the introduction of pre-cooked, frozen fish sticks, the market has expanded greatly and the number of producers has increased. It was thought that re-examination of this commercial product would be of interest.

PROCEDURE

Fish stick samples were purchased in retail outlets in 24 cities across the country, packed and shipped with dry ice, and maintained at temperatures of 0°F or below until examined. Three samples from each of 26 different processors were included.

[1]Contriution No. 435 from the Department of Nutrition, Food Science and Technology, Massachusetts Institute of Technology, Cambridge, Massachusetts.
[2]Present address: Colonial Provision Co., Boston, Mass.
[3]Consumer Union, Mount Vernon, N. Y.

Each sample was segmented while still frozen, and portions totaling 50 g blended for 2 min in 450 ml of water *(6)*. Total plate counts were made in plate count agar incubated at 35°C for 24 hr. The tetrazolium flooding technique of Solberg and Proctor *(11)* was employed to distinguish colonies in low dilutions.

Coliform organisms were enumerated by plating in desoxycholate lactose agar. After incubation at 37°C for 24 hr typical colonies were selected and inoculated into brilliant green bile lactose broth. The presence of gas and gram-negative organisms was considered confirmatory. In certain instances a larger aliquot, 10 ml, of the 1-10 slurry was plated in large 150-mm Petri dishes.

Coagulase-positive staphylococci were isolated by surface streaking on mannitol-salt agar. Characteristic yellow colonies were transferred to brain heart infusion broth for the determination of soluble coagulase by the tube method *(6)*.

For the detection of members of the *Salmonella-Shigella* group, 10 ml of the homogenate were mixed with 10 ml of double strength selenite-cystine broth. After 24 hr incubation at 37°C, a loopful from the broth was streaked on both bismuth sulfite and SS agars, and the plates incubated for 48 and 24 hr, respectively, at 37°C. Representative colonies were inoculated on tryptone agar slants which were incubated for 18 hr at 37°C. The isolates were characterized by their reactions in triple sugar iron agar and SIM medium. The presence of salmonella was then tested by agglutination with polyvalent sera (Lederle Labs).

The designation "*Salmonella-Shigella* group" is a term employed by Massachusetts *(9)* and does not imply that these organisms are identical. The isolation procedure will not distinguish *Salmonella* from certain other *Enterobacteriaceae*, notably the Arizona group. Although distinct from *Salmonella*, members of the Arizona group are, due to their infectious capabilities, of public health significance. Since identification of the isolates suspected of being either *Salmonella* or *Shigella* were not verified by official public health laboratories, their identity in this study is considered tentative.

RESULTS AND DISCUSSION

Total plate counts varied from a low of 300 to a high of 1,400,000 organisms per g. (Table 1). Of 78 samples, representing 26 processors, 15 samples (19%) contained 50,000 or more organisms per g. Four of the 15 samples had 100,000 or more organisms per g. These 15 samples were distributed among 8 processors, 6 of which accounted for 13 of the 15 samples. It appears that since the study of frozen fish sticks by Larkin, Litsky and Fuller *(5)* sanitary quality has deteriorated and that this problem is confined to individual manufacturers since a small number of the producers are distributing a bacteriologically inferior product. This is also supported by the fact that 2 of the 6 producers having high total count samples also accounted for 3 out of 5 samples that contained more than 10 coliform organisms per g. (Table 1). The majority of the samples examined did not contain any coliform organisms. The highest coliform count noted was 35 per g.

TABLE 1—MICROBIAL ANALYSIS OF FROZEN FISH STICKS FOR TOTAL PLATE COUNT AND COLIFORM ORGANISMS

Producer	Total Plate Count, No./g		Coliforms/g (range)
	Ave. Count	Range	
A	6,800	5,600-8,000	0
B	8,100	1,100-17,000	0-25
C	4,900	1,800-7,500	0
D	38,000	320-62,000	0
E	26,000	6,800-49,000	0
F[b]	800,000	11,000-1,400,000	0-14
G	23,000	7,300-44,000	0
H	20,000	1,800-38,000	0
I[a]	18,000	4,200-36,000	0-2
J	75,000	51,000-100,000	0-5
K	17,000	1,900-39,000	0
L	3,100	1,800-4,000	0
M	28,000	1,300-75,000	0
N	38,000	13,000-50,000	0-10
O	78,000	1,500-180,000	0-7
P	7,200	1,600-15,000	0
Q[b]	27,000	16,000-44,000	0
R	11,000	2,700-26,000	0
S	11,000	7,000-13,000	0-5
T	3,800	900-8,000	0
U[a]	56,000	16,000-76,000	0-39
V[abc]	17,000	4,200-40,000	0-24
W	29,000	12,000-59,000	0-5
X	12,000	3,800-17,000	0-5
Y	7,200	2,700-11,000	0
Z	13,000	2,200-24,000	0-5

[a]Coagulase-positive staphylococci were present.
[a]Isolates possessed reactions typical of *Salmonella-Shigella* group.
[c]Positive reaction with *Salmonella* polyvalent sera.

Quantitating the number of coliform organisms present in a sample by using one ml of a 1-10 homogenate presents certain difficulties. At this dilution, an average of slightly more than one organism per plate, which is equivalent to more than 10 per g in the original sample, will cause the sample to be considered illegal by certain authorities. Hartman *(3)* had previously noted this difficulty.

The use of a large 150-mm Petri dish should resolve this difficulty by allowing the use of a sample size of 10 ml, thus increasing the reliability of the test. Table 2 presents a comparison of results obtained from 1-ml and 10-ml aliquots. Two samples found to contain more than 10 coliforms per g by the standard technique possessed even higher coliform counts when examined with the large Petri

dish. One sample was found to possess 17 coliforms per g with the large Petri dish although averaging 10 per g when the 100-mm Petri dish was employed.

TABLE 2—COMPARISON OF COLIFORM COUNTS OBTAINED WITH 100 MM. AND 150 MM. PETRI DISHES

No. of Samples	1 ml of Original Homogenate (coliforms/g)	10 ml of Original Homogenate (coliforms/g)
4	0	0
1	0	2
1	5	1
1	10	4
1	10	17
1	15	32
1	25	53

Coagulase-positive staphylococci were isolated from one sample, of producers I and V. In a subsequent study by the authors of frozen raw and precooked shrimp *(10)*, an enrichment technique involving cooked meat media containing 10-% NaCl followed by selection on egg yolk agar was found to be greatly superior to mannitol-salt agar for isolation of coagulase-positive staphylococci. Mannitol-salt agar is not efficient for detection when these organisms are present as a minor portion of the bacterial population. The question of whether or not the possession of coagulase activity is a sufficient criterion for characterizing an enterotoxin-producing strain of staphylococci is discussed by the authors elsewhere *(10)*.

Isolates from 5 samples gave reactions typical of members of *Salmonella-Shigella* groups and, of these, one isolate from producer V reacted with *Salmonella* polyvalent sera. This sample, although having a moderate total plate count, had, in addition to a positive *Salmonella* isolate, a high coliform count, and contained coagulase-positive staphylococci.

The majority of the samples of frozen fish sticks analyzed in this study were of acceptable bacteriological quality, but a number of exceptions did occur. A total of 20 samples distributed among 12 processors did not meet the sanitary standards required by Massachusetts. Twelve samples obtained from 8 producers would have been in violation if the allowable total plate count requirement were to increase to 100,000 organisms per g.

The procedures used in this study have been recommended by various investigators and are intended to be indicative of sanitary conditions during processing and storage. Attempts to find a correlation between various tests normally employed, such as total plate count, coliform and pathogens have not been overly successful. This is not surprising when one reflects on all the numerous vectors for contamination indigenous to a food plant.

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SEDIMENT TESTING OF BULK TANK MILK ON THE FARM [1] [2]

B. J. Liska

Dairy Department, Purdue University, Lafayette, Indiana

The introduction of the bulk tank system of handling milk on the farm has brought about several major changes in milk quality control work. Many receiving room operations have been transferred from the dairy plant to the milk house on the farm. This change has caused some problems since milk now is accepted and samples for quality tests are taken before the milk is pumped into the bulk tank truck.

Considerable attention has been given to modification of methods and equipment for standard off-the-bottom sediment tests in order to accurately determine the sediment in bulk tank milk *(4, 6, 7, 8)*. The method using a pint of mixed milk in which the sediment is collected on an area 0.4 inches in diameter has been developed *(4, 6)*. This method is now included in *Standard Methods for the Examination of Dairy Products (5)*.

The mixed milk method has not been accepted for use in many areas. However, the survey by Kihlstrum and Delhey *(3)* indicates that routine sediment testing of bulk milk is needed. They found that milk in 10.8% of 1193 tanks yielded a sediment test of No.4 and 17.1% of the tanks contained milk with sufficient sediment to rate No. 3. Kihlstrum and Delhey used sediment testing equipment of various types and performed the testing on the farm. They suggested that sediment tests be performed on one pint mixed milk samples delivered to the laboratory.

The mixed sample method of testing milk for sediment can be performed at the time the milk is picked up or on a sample which is returned to the dairy plant laboratory. The test looses its value as a means of excluding unfit milk when it is performed in the laboratory after the producers milk is mixed with milk from other producers. A sediment test performed at the time of the milk pick up at the farm, with the producer present, is a good tool in quality control programs. The test is simple to explain and demonstrate to the producers. When the sediment test is performed in the dairy plant laboratory it looses some of its effectiveness in quality control work.

The mixed sample sediment test was accepted although simple, practical equipment with which it could be performed on the farm was not available. At the time bulk tank milk is received the temperature is 36-40°F. Kihlstrum and Delhey *(3)* found no difference in the amount of sediment in milk tested at 65°F. and 80-90°F. Prewarming the milk to 80-90°F. melts the butterfat so the filter pad is not clogged with solidified butterfat *(2, 8)*. With present methods for performing the sediment test on bulk tank milk, the milk is warmed in a separate container with hot water or electric heat and poured into the sediment tester, or milk is drawn into the sediment tester and the tester is held under hot running water until the milk is warmed sufficiently. The first method requires extra equipment while the other involves use of extra time to properly warm the sample.

This study was undertaken to develop a more practical method of performing the mixed milk sediment test on the farm.

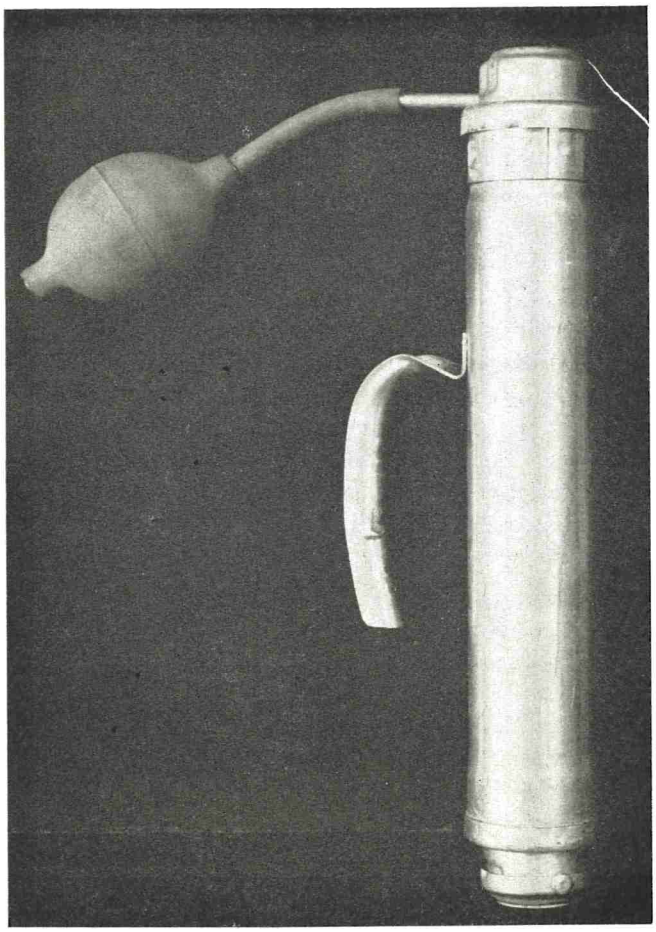

Figure 1. Superior type pressure tester.

[1]Journal Paper Number 1786 of the Purdue Agricultural Experiment Station.

[2]Presented at the 48th Annual Meeting of the International Association of Milk and Food Sanitarians, Inc., at Des Moines, Iowa, August 14-17, 1961.

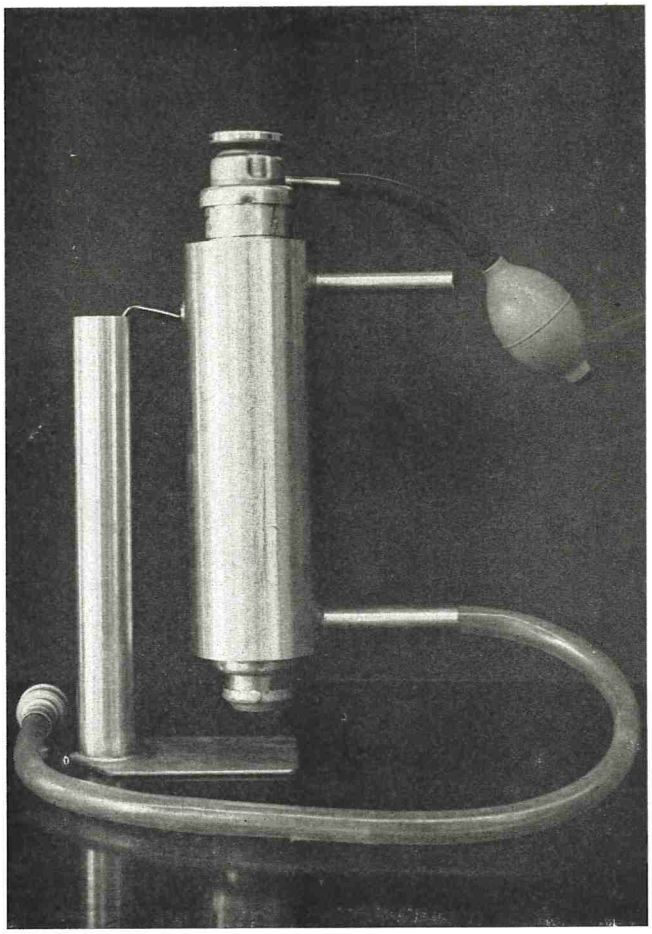

Figure 2. Modified tester showing water jacket, inlet for water, thermometer and stand.

METHODS AND RESULTS

There are a number of sediment testers now commercially available. It was decided early in the study to try modifying a tester now available so that milk could be preheated in it and tested on the farm. The tester selected is shown in Figure 1. The simplest means of preheating the milk appeared to be by circulation of hot water through a water jacket around the tester. It was assumed that hot water would be available where bulk milk tanks are in use. Several models were made which were rather crude but functional before the model shown in Figure 2 was developed. The new sediment tester is essentially a standard Superior type cream sediment tester with a water jacket made from three inch diameter stainless steel pipe. The jacket is held in place with neoprene gaskets which are removable. There is an inlet and overflow for hot water. Preliminary work on the temperature and rate of water circulation was undertaken. The results are presented in Tables 1 and 2. Water at a temperature of 130°F circulating through the water jacket at the rate of one gallon per minute will warm one pint of milk in the tester from 38°F to 90°F in 1.5 min.

TABLE 1--EFFECT OF WATER TEMPERATURE ON LENGTH OF TIME REQUIRED TO WARM MILK IN THE TESTER[a]

	(Time (sec)		
Temp. of water[b]	To 70°F	To 80°F	To 90°F
100	62	90	148
115	40	51	77
130	34	57	63
145	31	44	60

[a]Milk Started at 38-40°F.
[b]Flow rate: 1 gal per min.

Preliminary trials indicated the tester was practical for use in determining sediment in bulk tank milk. After a number of tanks were checked the following procedure for securing samples and performing the test was adopted:

1. Start the agitator on the bulk milk tank.
2. Attach the tester to the source of hot water and regulate the rate of water flow through the jacket.
3. Place a lintine cotton disk in the tester head and tighten it in place.
4. After 3-5 min of agitation, use a dipper and measure one pint of milk and pour it into the tester.
5. Replace the top of the tester and allow the milk to be warmed to 80-90°F by the circulating water.
6. When the milk reaches 80-90°F as indicated on the thermometer, shut off the water and force the milk through the filter pad.

TABLE 2— EFFECT OF THE AMOUNT OF WATER CIRCULATED ON TIME REQUIRED TO WARM MILK IN THE TESTER[a]

	(Time (sec)		
Gal/min[b]	To 70°F	To 80°F	To 90°F
0[c]	30	75	180
½	21	62	91
1	18	55	83
1½	15	50	68
2	10	40	48

[a]Milk Started at 38-40°F.
[b]Temp. of water 130°F.
[c]Jacket filled not circulated.

7. Remove the filter pad, label and grade it.

During use the sediment tester may be kept in the stand as shown in Figure 2 or hung on the wash sink as shown in Figure 3. Figure 3 also shows the position of the dial thermometer. The dial thermometer can be easily added to the tester and it saves time in determining whether or not the milk is sufficiently warmed to pass through the filter pad satisfactorily. In this way a temperature of 80-90°F can be repeated to make conditions of the test more uniform.

Sediment disks representing sediment tests made during this study are shown in Figure 4. The wet disks were graded using a photograph of reference standards for bulk tank milk. This set of standards has been prepared and recommended for use by the American Dry Milk Institute, the Cheese Institute, the Evaporated Milk Association and the American Butter Institute *(1)*.

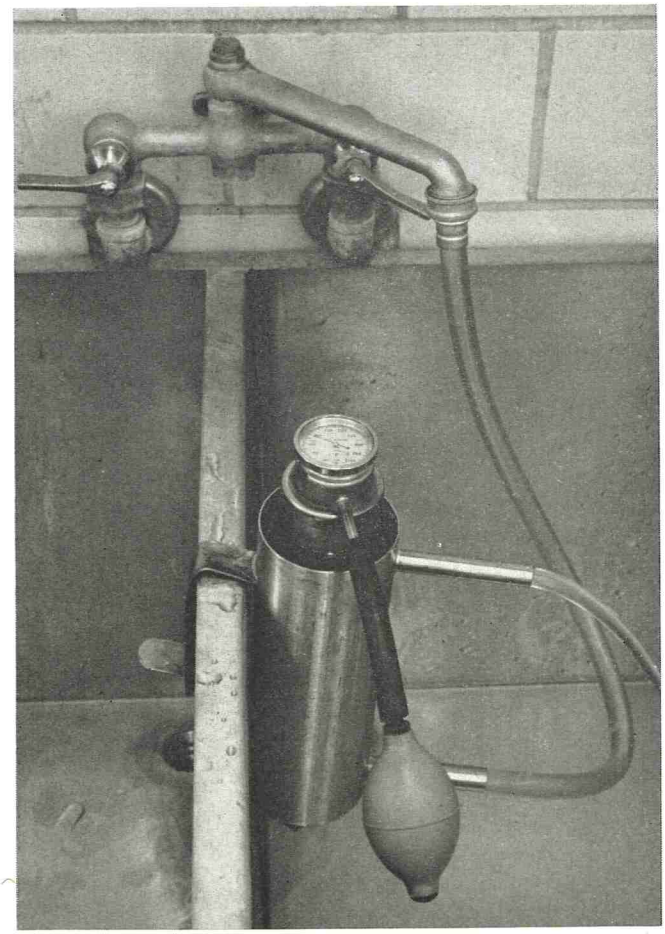

Figure 3. Modified sediment tester shown in operation.

DISCUSSION AND CONCLUSIONS

The sediment tester developed and used in this study is practical for sediment testing of bulk tank milk on the farm. Unfit milk can be detected before it is mixed with other milk. After the tank truck

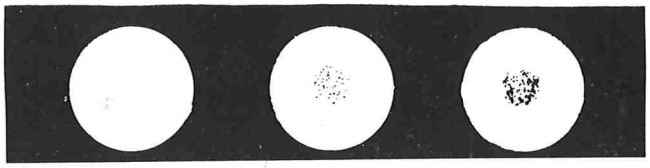

Figure 4. Sediment pads corresponding from left to right to grades 1, 2, 3 prepared using the modified tester and graded by comparison with recommended standards for bulk tank milk.

driver becomes accustomed to using the tester, he can perform the sediment tests as a normal part of his routine without the use of much additional time.

The sediment tester can be made from tinned steel or stainless steel. Cost and durability will vary with the type of material used. Since the milk is not returned to the bulk milk tank, there should be no objection to the use of tinned steel.

Choice of the type of sediment disk is quite important. The disk must be the thin, wafer type lintine cotton disk. If thicker, soft cotton disks are used, there is considerable difficulty forcing high fat milk through the filter disks. Using the thin, wafer type disk, properly warmed cream with 36% fat can be tested for sediment with no problems.

The work of Kihlstrum and Delhey *(3)* indicates a need for more emphasis on sediment testing of bulk tank milk. This should be in the form of a good, practical, routine sediment testing program used on the farm before the milk is pumped into the tank truck in order to maintain a high quality milk supply.

ACKNOWLEDGEMENT

The author wishes to express his appreciation to Morris Clark, Clark Dairy Supply Company, Greenwood, Indiana, for cooperation in the engineering and final design of the sediment tester.

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COMMITTEE REPORTS

REPORT OF THE COMMITTEE ON BAKING INDUSTRY EQUIPMENT—1961

The Baking Industry Sanitation Standards Committee (BISSC) met in Chicago, Illinois, March 3, 4, 1961. Representing the International Association of Milk and Food Sanitarians at this meeting were Mr. Abrahamson, Mr. Foley and Mr. Roth, all members of the Baking Industry Equipment Committee. The Committee approved the standard which includes Dough Chutes, Dough Hoppers, Dough Trough Hoists, and Automatic Dough Trough Dumps. It is the recommendation of this Committee that this Standard be approved by the Association. This brings the number of standards approved and published to twenty-one.

The Baking Industry with the co-operation and labor of a great many individuals, including members of this committee, have worked hard in the formulation of workable standards for bakery equipment. This Committee reported last year; *(a)* that there was a need for more aggressive action by BISSC in publicizing and using the approved standards; and *(b)* that a control should be initiated by BISSC over the equipment that is being manufactured and installed in bakeries that allegedly meets BISSC standards.

The Committee can report on Recommendation No. 1 that there has been some increased activity in publicizing BISSC standards. While admittedly, there is a long way to go before this activity is adequate, still, it is encouraging to know some headway is being achieved.

On Recommendation No. 2, no action has been taken by BISSC toward controling or inspecting equipment to determine if it meets a specific standard.

The Committee believes the need for certification of equipment is most urgent. The equipment being installed today will, in many cases, be in use twenty years from now.

Recently, in a Mid-western state, bakery equipment was installed in a State institution, allegedly to BISSC Standards. The Chairman of this committee received a telephone call from a Health Department official of that State. The State official described the equipment and was advised that it did not meet BISSC specifications. The official notified the manufacturer of the necessary changes to be made. Subsequently, the manufacturer made the necessary changes. Only through the action of an alert health official was this violation corrected.

Last year's report recommended that BISSC establish a Certification Board to approve or disapprove equipment. A statement could be placed on the equipment stating that it conforms to BISSC Standards. This is being done routinely in the restaurant field. Such a procedure would be very valuable to sanitarians and regulatory officials.

It is of little value to continue to write BISSC Standards without some control being exercised over equipment being manufactured relative to compliance or non-compliance with existing standards. Without such control it is extremely doubtful if confidence can be maintained in BISSC Standards. This is a BISSC responsibility. The corrective action must also come from BISSC but this committee feels that IAMFS should take the initiative to press this issue.

Vincent T. Foley, *Chairman,*
(Missouri Association)
Health Department,
Kansas City 6, Missouri

A. E. Abrahamson,
(N. Y. Association)
City of New York,
Dept. of Health,
New York 13, New York

James H. Burrows,
City Health Department,
Niles, Michigan

R. S. Doughty,
(N. Y. Association),
52A Troy Drive,
Springfield, N. J.

Lou King,
(Illinois Association)
400 E. Ontario,
Amer. Inst. of Baking,
Chicago 11, Ill.

W. R. McLean,
Dept. of Health,
Education & Welfare,
Atlanta 23, Georgia

Louis W. Pickles,
(Assoc. Ill. Milk San.),
City Health Department,
Peoria, Illinois

Armin Roth,
(Michigan Association),
Wyandotte Chemicals
Corp.,
Wyandotte, Michigan

REPORT OF THE COMMITTEE ON DAIRY FARM METHODS—1961

During the past year the Farm Methods Committee represented the IAMFS in the development of and participation in the activities of the National Mastitis Council. This organization was formed as the result of the conference called by the IAMFS last October and was developed in accordance with the recommendations adopted at that conference.

The standing subcommittees of the Farm Methods Committee have continued to study and evaluate the following major problems with which this committee is concerned:

I. *Cleaning of milk transfer systems.* The subcommittee on pipeline milkers and the subcommittee on milk transfer systems collaborated on a study of portable pipelines. Particular attention is being given to the proper cleaning and maintenance of plastic tubing with special reference to the types of films and discolorations which have been encountered with this equipment. A pink film has, no doubt, been present on dairy farm equipment in the past, but has not been noticeable until clear plastic was put into use. It is thought to be a form of microbiological growth and has appeared upon occasion on tubing that is used to connect the vacuum line to the vacuum bulk tank. It can be eliminated in this line by washing and sanitizing daily along with the rest of the milk house equipment. There are several types and causes of white and brown films or discoloration. A comprehensive study is now under way in industry to obtain factual data as to the effectiveness of in-place cleaning of plastic hoses, and its ability to maintain product quality. This program not only is being conducted under laboratory controlled conditions, utilizing official standard quality methods for raw and pasteurized milks, but also is paralleled in scope under

farm conditions. Cleaning and sanitizing methods and materials, temperatures, concentrations, recommended techniques for handling, prevention of opacity, minimum drainage problems, and longevity of use, are being objectively evaluated. Data are being obtained under comparative conditions to recommended practices in the selection, installation and maintenance of stainless and glass transfer systems.

II. *Bulk tank handling of milk.* The subcommittee for standardization of procedures, tests, etc., for farm bulk tank handling of milk has reviewed the existing situation concerning the responsibility of tank truck drivers and what is being done in some areas concerning the training and licensing of these drivers. As a result of this study it was concluded that attention should be given to:

(a) The need for education and licensing to insure proper qualifications of drivers and supervision of procedures.

(b) Renewal of licenses and provision for revocation if necessary.

(c) The problem of multiple licensing where there is overlapping of regulatory authority or where more than one market jurisdiction is involved.

(d) The need for uniform regulation and examinations pertaining to the licensing of farm pick-up tank drivers. (The subcommittee has been charged with the work of developing recommendations on this phase of the project during the coming year).

III. *Pesticides and antibiotics.* The committee on pesticides and antibiotics is continuing to survey this situation as it pertains to the dairy industry. The antibiotic program and its results has continued in a similar manner as reported last year. The 1960 report on pesticides was primarily concerned with pesticide control activities on the State and local level including some primary consideration in the development and conduct of a satisfactory and practical control program. Many state and local agencies have stepped up educational activities and testing programs although the complexity of analytical methods has tempered the degree and volume of testing. Actual testing for pesticide residues is usually confined to milk although much work is being done with dairy cattle feeds which experience has shown may be the principal offenders. Hay, silage, fodder, the so-called trash feeds, and in some cases commercial preparations appear to fall in this category. Laws and regulations concerning agricultural chemicals are in effect in the majority of states and either duplicate federal requirements or establish similar requirements. Much information is available concerning the use of pesticides and other agricultural chemicals. A partial listing includes:

"Insecticide Recommendation of the Entomology Research Division for the Control of Insects Attacking Crops and Livestock", Agricultural Research Service and Federal Extension Service, U. S. Department of Agriculture. (USDA Handbook #120 - 1961 edition)

"Open Door to Plenty", National Agricultural Chemicals Association, 1145 19th Street, N. W., Washington 6, D. C.

"The Good in Your Food", Super Market Institute, Inc., 500 N. Dearborn Street, Chicago 10, Illinois.

"Report on Agricultural Chemicals and Recommendations for Public Policy, by State of California, Governor E. C. Brown's special committee on Public Policy Regarding Agricultural Chemicals, Sacramento, California. Dec. 30, 1960.

"Report of the Panel on Food Additives to the President's Science Advisory Committee".

The latter report has been printed by The Nutrition Foundation, Inc., 99 Park Avenue, New York 16, New York. In brief, it recommends that the Secretary of Health, Education, and Welfare appoint an advisory board of experts to assist in the evaluation of scientific evidence on the basis of which decisions have to be made prohibiting or permitting the use of certain possibly harmful compounds. If existing legislation does not permit the Secretary to exercise discretion consistent with the evidence obtained, it is recommended that appropriate modification in the law be sought. It also recommends that research be expanded by the U. S. Department of Agriculture, by the State Agricultural Experiment Station, and by industry to discover additional safe and effective material used in the production and processing of foods.

IV. *In-place cleaning of farm bulk tanks, farm pick-up tank trucks and over-the-road tankers.* The subcommittee on in-place washing of farm bulk tanks and tank trucks has continued its survey and received a wealth of information from most areas of the United States. Observations from experience in the field reveal that many different types of equipment and methods are being used with varying results.

Notable in these observations is the lack of agreement on types of equipment, materials and procedures necessary to accomplish effective spray cleaning of farm bulk tanks, farm pick-up and transportation tanks. A great deal more attention apparently must be given to this labor saving system of tank sanitation.

It must be understood that all of these studies of the subcommittees deal with areas of milk production which necessarily will require continued attention. It is hoped that the efforts of the Farm Methods Committee will aid in bringing them to a successful conclusion in the future.

As a new project a subcommittee has been appointed to develop uniform sediment testing standards which will be acceptable to all agencies for farm bulk stirred samples.

Dr. R. W. Metzger, *Chairman*
Dairymen's League
Syracuse, New York

Chester F. Bletch,
Maryland & Virginia
Milk Prod. Association,
Arlington 9, Virginia

Dr. George D. Coffee
Dist. of Columbia
Dept. of Public Health,
Washington 1, D. C.

Dr. J. C. Flake,
Evaporated Milk
Association,
Chicago 1, Illinois

Milton E. Held,
Dept. Health, Education
& Welfare,
San Francisco 2, Calif.

M. W. Jefferson,
Dairy Products,
Sanitation Section,
Richmond 19, Virginia

Robert M. Keown,
Inter-City Milk Control
Council, Inc.,
Elkhorn, Wisconsin

Elmer Kihlstrum,
Johnson & Johnson,
Chicago 38, Illinois

William Knutzen,
Dept. of Agriculture,
Seattle, Washington

Richard M. Martin,
Ohio Dept. of Health,
Columbus 15, Ohio

Mike O'Conner,
Seattle-King County
Milk Division,
Bellingham, Washington

Alexander A. Paris,
State of Maryland
Dept. of Health,
Baltimore 18, Maryland

I. E. Parkin,
Pennsylvania State College
of Agriculture
University Park, Pa.

Dr. R. M. Parry,
Connecticut Department
of Agriculture,
Hartford 15, Connecticut

A. K. Saunders,
The Diversey Corporation,
Chicago 6, Illinois

Alex G. Shaw,
Florida Department
of Agriculture,
Tallahassee, Florida

Harry F. Stone,
Dept. of Public Welfare
St. Louis 3, Missouri

Richard P. March,
New York State College
of Agriculture,
Ithaca, New York

William Trobaugh,
City & County Dept of
Health & Hospitals,
Denver 4, Colorado

REPORT OF THE COMMITTEE ON EDUCATIONAL AND PROFESSIONAL DEVELOPMENT—1961

The work of the committee during the past year was accomplished through subcommittees. They were *(a)* Subcommittee on Scholarship, *(b)* Subcommittee on Sanitarian's Career Brochure and Recruitment Program, and *(c)* Subcommittee on Professional Standards and Registration.

REPORT OF THE SUBCOMMITTEE ON SCHOLARSHIP

William B. Palmer Scholarship Award

Both the scholarship announcement and application forms were sent to the eighteen universities and colleges offering undergraduate courses leading to a degree in Sanitary Science or Public Health. Two applications were received prior to the closing date of June 1, 1961. The applications were circulated among the subcommittee members for selecting the applicant to receive the award. The committee's recommendation was forwarded to the Executive Board of the Association for making the $300.00 William B. Palmer Scholarship Award.

Scholarship Fund

The members at the 1960 meeting of the Affiliate Council voted to eliminate contributions to the scholarship fund by the affiliate associations.

There remains $134.50 in the funds contributed by the affiliate associations. It is recommended that this money be used as part payment for the 1961-1962 scholarship award.

SUBCOMMITTEE ON SANITARIAN'S CAREER BROCHURE AND RECRUITMENT PROGRAM

During the course of the year, the committee chairman asked the Executive Board for direction with reference to the preparation of a sanitarian's career brochure. The need for such a brochure seems apparent. It can be used as a means of informing the public of the sanitarians part in public health and sanitation programs. It is needed in a recruiting program to encourage students to pursue the field of public health and sanitary science in their course of study. It can possibly be used in conjunction with membership recruiting programs as well as other phases of our work.

The Executive Board advised the committee to make contact with Health Careers of the National Health Council, 1790 Broadway, New York 19, New York, as a possible means of assisting each other and exchanging ideas. Preliminary contacts have been made; however, continued study must be made in order to determine whether or not their material covers our needs.

SUBCOMMITTEE ON PROFESSIONAL STANDARDS AND REGISTRATION

A questionnaire was sent to a representative in each of the 50 states and 3 U. S. possessions. It was devised to secure certain basic information with regard to the registration acts which have been enacted as law, and to determine the progress that has been made in those areas where registration acts have been presented to their respective legislatures in the near future.

The total number of states which have a registration law remains at eighteen. In eight states at least one attempt has been made to secure the enactment of a registration act. In four of these states more than one attempt has been made. The main reasons given for failure are listed as follows:

1. Administrative personnel opposed the legislation.
2. Held up in legislative committee.
3. Poorly prepared bill.
4. Opposition to educational requirement.
5. Opposition to further licensing of professions.
6. Lack of understanding by public and industry.

The committee was called upon to furnish information for aiding one affiliate association in their efforts for preparing and presenting a registration law.

Sanitarian's Joint Council Representatives were appointed ex-officio members of our committee. This was done to insure a close liaison between the accomplishments of the two groups. Since the Sanitarian's Joint Council has not had a full council meeting since the last annual meeting of the association, there is nothing to report through our committee.

W. Howard Brown, *Chairman*
Russell B. Cunningham
Karl K. Jones
Gilbert L. Kelso
Thomas D. Laughlin
Dr. Samuel O. Lear
Richard Mansfield
Dr. Sumner Morrison
Guy P. Stephens
Raymond Summerlin
Haynes Wright
Harold S. Adams, *ex-officio*
John D. Faulkner, *ex-officio*

REPORT OF THE COMMITTEE ON FOOD EQUIPMENT SANITARY STANDARDS—1961

The objectives of the International Association of Milk and Food Sanitarians Committee on Food Equipment Sanitary Standards are to participate with health organizations and industries in the formulation of sanitary standards for food equipment and to present to the membership those standards which the Committee recommends be endorsed by the Association.

The following report will outline the Committee's activities this year in working with two Health and Industry organizations (the National Sanitation Foundation's Joint Committee on Food Equipment Standards, and the Automatic Merchandising Health-Industry Council) and progress in meeting its objectives. It is expected these organizations will be the two groups that the Committee will work with during the coming year.

NATIONAL SANITATION FOUNDATION (*NSF*)

At the 1961 meeting of the National Sanitation Foundation's Joint Committee on Food Equipment Standards, consideration was given to proposed revisions of the Basic Criteria C-1, Standards 2, 3, 4, and 7 and to the proposed Standard No. 8 for Commercial Powered Food Preparation Equipment.

Basic Criteria C-1

Basic Criteria C-1 was amended to clarify the definition of a vending machine to include a machine vending ice. Another amendment stating that the vending mechanism shall be automatically locked when waste containers inside the machine become filled was also adopted.

Standard No. 2

Time did not permit a thorough study of all proposed revisions to Standard No. 2, as this was the last topic on the agenda. However, it was the consensus of the Joint Committee that the reference to wooden-top worktables should be deleted because of the difficulty in maintaining the surface of presently manufactured tables in a smooth, easily cleanable condition. It was felt that wood cutting boards would be acceptable, provided they were constructed of easily cleanable material and were easily removable for cleaning. Further review is planned for the coming year via mail with final review and adoption of several significant revisions to the Standard anticipated at the 1962 meeting of the Joint Committee.

Standard No. 3

Standard No. 3 was amended at the suggestion of the dishwashing machine industry to eliminate the use of wood in dish racks. There was also considerable discussion of problems in maintaining the specified temperature of 170°F in the recirculated rinse tank of multiple tank dishwashing machines. The NSF staff is to review and re-evaluate the requirements for these machines and to continue the study initiated in 1959 on similar problems of maintaining specified temperature of 160°F in the recirculated wash tank of single tank conveyor-type machines.

Standard No. 4

The importance of mechanical equipment performing satisfactorily in the field as a means of preventing food-borne illness was thoroughly discussed. Consequently, in the future, units for storing warm foods must be so designed and constructed as to make it possible to keep all foods stored therein at a temperature of 150°F or higher. Furthermore, if automatic controls are provided with the units, they must be accurate to ± 10°F.

Suggested revisions to Items 5.00 Alernate Installation, and 5.01 Space Behind Unit were approved. It is believed that these revisions should clarify the recommendations for installation of heating and warming equipment and should, where followed, assure safe installations of such equipment and permit sufficient space for sanitary maintenance of the equipment and related areas.

Considerable discussion developed relative to the need for drains in warming equipment (steam tables) designed for wet or dry usage. Contrary to laws in many states, drains, at the present time, are not required for this type of equipment. At the request of this Committee, the NSF staff plans to explore the feasibility of requiring drains in all such equipment and report their findings to the Joint Committee at the 1962 meeting.

Standard No. 7

Clarification was requested by the NSF staff on certain items of this Standard. This involved only minor changes in the Standard, such as adding the word storage before freezers and permitting drains from refrigeration units designed for holding products in cracked ice.

A brief discussion followed relative to the problem of approving pre-fabricated walk-in refrigerators and freezers when assurance could not be given that the proper refrigeration components would be installed. Consequently, in the future, the NSF listing of such equipment will reflect and enumerate for each model the specific BTU ratings of the recommended compressor and cooling units. In addition, the NSF staff plans to explore the feasibility of including such information on the manufacturer's name plate.

Standard No. 8

Standard No. 8 relating to Powered Food Preparation Equipment has been under development since 1954. However, very little was done on this Standard until 1959 at which time this Committee had an opportunity to review one of the early drafts developed by the Industry and Public Health Advisory Committees. A member of this Committee served on the Public Health Advisory Committee. A final draft of this proposed standard was reviewed and comments were submitted during the year by this Committee. At the Joint Committee Meeting, a general review of the proposed standard for powered equipment was conducted and tentative approval was given to the proposal with the understanding that it would be reviewed at the 1962 meeting in hopes of effecting more specificity for the evaluation of the various types of equipment to be considered under this Standard.

The present recommendation for alternate installation of equipment regarding the space behind, between and beside units have been subjected to much criticism by industry as being more stringent than necessary to assure ease of maintenance. Therefore, after a careful review, the Joint Committee adopted the following guide which will be reflected in all other NSF Standards.

1. When the distance to be cleaned is less than 2 ft in length, the width of the clear unobstructed space should not be less than 6 in.
2. When the distance to be cleaned is greater than 2 ft, but less than 4 ft in length, the width of the clear unobstructed space should not be less than 8 in.
3. When the distance to be cleaned is greater than 4 ft, but less than 6 ft in length, the width of the clear unobstructed space should not be less than 12 in.
4. When the distance to be cleaned is greater than 6 ft, the width of clear unobstructed space should be at least 18 in.

During the coming year, the NSF staff is to continue work on codification of all present standards to eliminate conflicts and secure uniformity of wording and requirements between them.

AUTOMATIC MERCHANDISING HEALTH-INDUSTRY COUNCIL

The sixth annual meeting and the mid-year meeting of the Automatic Merchandising Health Industry Council (AMHIC) of the National Automatic Merchandising Association were held during the last of 1960 and the middle of 1961, respectively, and were attended by representatives of public health organizations and the affected industries. The first few hours of each meeting were given to the public health representatives for a discussion of public health objectives and policies to be followed in their work with the entire membership of AMHIC. This proved to be an extremely enlightening experience for the Association's representative and aided the group in expediting the work of the Council which, primarily consisted of reviewing the proposed Evaluation Manual.

Evaluation Manual

The principal item on the 1960 agenda was a review of the fourth draft of the Vending Machine Evaluation Manual, which the Committee had reviewed and submitted its comments. The Committee's suggestions, as well as those of other members of AMHIC, were thoroughly discussed and considered for enclosure in the next draft.

It was decided during the 1960 annual meeting to hold a mid-year meeting of AMHIC during 1961 for the purpose of expediting the development of the Manual in order to have it ready for final approval by the 1961 annual meeting. Therefore, a small subcommittee of public health and industry representatives was reappointed for the purpose of preparing another draft incorporating suggestions of the Council and distributing this draft to members of AMHIC early in 1961.

Since the annual meeting, the Chairman has reviewed the fifth and much improved draft of the proposed Manual and submitted his comments for consideration at the mid-year meeting of the AMHIC.

The mid-year meeting proved to be very productive. The fifth draft was reviewed in its entirety, and many points where there formerly had been some lack of understanding between industry and public health representatives were cleared. Commonly used and understood definitions were incorporated into the Manual. The AMHIC staff then was instructed to revise the proposed Manual incorporating suggestions presented at the mid-year meeting and distribute a final working draft to the respective committees represented on AMHIC for their consideration and comment prior to the 1961 annual meeting of AMHIC.

Organization Plans and Procedures

The next topic on the agenda at the 1960 annual meeting concerned the clarification of the composition, organization and procedures of AMHIC. At the recommendation of the Council members, the Secretary of AMHIC amended the plan and procedures in keeping with the suggestions of the Council and submitted the amended AMHIC Organization Plan and Procedures to the members during 1961. Most of these revisions were suggested by the public health representatives on the Council and many of them resulted in significant improvements and clarifications of the plans and procedures which guide the Council.

Code Changes

The last item at the 1960 annual meeting was a discussion of recommendations for changes to the Public Health Service Ordinance and Code. Several comments for modifying or further interpreting the document have been offered by this Committee. It was decided that industry and public health representatives would review the Code in light of present needs and be prepared to submit comments on clarification or modification of the Ordinance and Code early enough for discussion at the 1961 Annual Meeting. The Committee's comments will be compiled with those from the other members of the Council and eventually submitted to the Public Health Service for consideration and possible incorporation in the next printing of the Ordinance and Code.

It is anticipated, with the work on the Evaluation Manual drawing to a close, that this Committee will be needed during the coming year to fulfill some of the other important public health objectives of AMHIC.

SUMMARY

The two national organizations which this Committee has worked with during the past several years have placed more emphasis on removing equipment that has been found to be below specifications of applicable standards, criteria, or evaluation manual from their respective listings of acceptable equipment, and it is hoped that, through more stringent requirements and stricter enforcement of these, listing of unacceptable equipment will be prevented in the future. They also have encouraged sanitarians to report any equipment which has been through one of their evaluation programs and which in the sanitarian's opinion has failed to conform to appropriate requirements.

The past year has shown considerable activity and the next year promises also to be a very busy one for this Committee. The Committee recommends that the Association continue its work with NSF and AMHIC in developing workable and acceptable standards for the food industry, and it urges all sanitarians and health departments to support the work of the Association's Committee and subscribe, by law or administrative policy, to programs of these two national organizations by demanding that all food equipment installed in their areas show evidence of compliance with the Food Equipment Sanitary Standards Program.

Karl K. Jones, *Chairman*,
(Indiana Association)
State Board of Health,
Indianapolis, Indiana

James W. Bell,
(International Association)
National Canners Ass'n.
Washington, D. C.

Col. F. H. Downs, Jr.
(International Association)
U. S. Army Retired,
Montgomery, Alabama

D. R. Gooden,
(International Association)
Health Department,
Los Angeles, Calif.

Gene McElyea,
(Missouri Association)
State Health Department,
Jefferson City, Missouri

J. Schoenberger,
(New York Association)
Health Department,
New York, New York

Eaton E. Smith,
(Connecticut Association)
State Department of
Consumer Protection,
Hartford, Connecticut

James W. Smith,
(Virginia Association)
State Health Department,
Richmond, Virginia

Jerome Trichter,
(New York Association)
Health Department,
New York, New York

James A. Westbrook,
(International Association)
Public Health Service,
Charlottesville, Virginia

REPORT OF THE COMMITTEE ON FROZEN FOOD SANITATION—1961

Since much work is being done by various agencies on many of the aspects of frozen food sanitation, your committee felt that it would be advisable to gather information concerning these projects and report to the association so that the membership would be informed of the developments in this field.

Several years ago, the Association of Food and Drug Officials of the United States (AFDOUS), through its Committee on Canned, Processed and Frozen Foods, became interested in the entire frozen food field. Many of the steps which followed have been outlined in the excellent paper presented by Dr. Slocum immediately prior to this report (Annual Meeting, 1961). As was pointed out, the industry, through their trade organization, the National Association of Frozen Food Packers (NAFFP) approached AFDOUS and proposed that a code embracing not only the maintenance of temperatures but also standards of sanitation, performance, and maintenance of quality be drafted for the frozen food industry. This code was to be advisory to the members of the frozen food industry and would be used by regulatory people as the basis for state laws and regulations to provide uniform laws nationwide.

At the 1958 annual meeting of AFDOUS, it was decided that immediate steps should be taken to establish a code of sanitation, procedures and performance for the frozen food industry. Accordingly, several committees and subcommittees were appointed to develop various sections of the code.

In 1960, at the annual meeting of AFDOUS, it was reported that all sections of the proposed code were complete except the bacterial standards for frozen foods. The proposed AFDOUS code requires that all frozen foods be held at 0°F, or lower, but allows temporary deviations up to 10°F for such operations as defrost cycles, loading and unloading, and other temporary conditions. However, frozen foods whose internal temperature has risen above 0°F must prompt-

ly be returned to an internal temperature of 0°F, or lower.

Just prior to the 1960 meeting, an industry committee known as the Frozen Foods All Industry Coordinating Committee (FFAICC) was formed by various industry groups. This committee proposed to develop a program of education and an industry self-policing program for the frozen food industry and suggested that the AFDOUS code be used only as a guide for reference and not as a law, regulation, or ordinance by any regulatory agency.

AFDOUS commended the frozen food industry for its program to develop its own standards of quality control practice and an industry self-policing program but rejected the industry's suggestion that the code be used only as a guide of reference and not as a law, regulation, or ordinance. At the 1960 meeting, AFDOUS accepted the report of the Frozen Food Standards Committee *(1)* and recommended that the completed sections of the proposed code be forwarded to the Committee on Editing and Format in order that the code could be put in final form before the next meeting of the association.

This committee, during the past year, has completed its task and presented the final draft of the proposed frozen food code at the annual meeting of AFDOUS in Washington, D. C., in June of this year. This proposed code contains eight sections dealing with definitions; frozen foods; construction and layout of frozen food plants; design and construction of ready-to-eat frozen food processing equipment; operating practices for the commercial manufacture of frozen foods; transportation; warehousing; and retail storage and display of frozen foods. The report of this committee was accepted by the Association. To the best of my knowledge, copies of this proposed code are not available for distribution at this time. However, it will be printed in the October, 1961, issue of the Quarterly Bulletin of the Association of Food and Drug Officials of the United States. At that time, copies may be obtained from Joe F. Lakey, Texas State Department of Health, Austin 1, Texas.

Although NAFFP provided part of the impetus for the development of the AFDOUS frozen food code, and many members of that Association served on the committees and subcommittees involved in the development of the code, they have now withdrawn their support in favor of an industrial self-policing program. While the value of a self-inspection program is recognized, such programs cannot be accepted as substitutes for regulatory measures at local, state, or federal levels.

Another project which received some publicity was the Conference on Frozen Food Quality which was held at Albany, California, November 4 and 5, 1960. The purpose of the conference was to enable groups concerned with industrial problems in the handling of frozen foods to hear and discuss research results in a comprehensive manner. Those attending were chiefly representatives of AFDOUS and FFAICC. The discussions centered on problems in packing, transporting, warehousing, distributing, and retailing of frozen foods and were arranged by the Western Regional Research Laboratory in cooperation with the Refrigeration Research Foundation.

For several years, the Western Utilization Research and Development Division of the USDA has been conducting a study of the time-temperature tolerance of frozen foods. The results of this research were presented at the Albany conference. The major purpose of the time-temperature tolerance project was to gain facts on changes in quality during transport, storage, and wholesale and retail selling of frozen foods which could be translated into improved techniques for better protection. Most of these studies were summarized and reported to this Association in the 1960 report of the Committee on Frozen Food Sanitation. *(2)*

At the Albany conference, papers were also presented outlining the problems of the trucking industry in frozen food handling and marine transportation of frozen foods. In addition, a paper on the microbiological limits for frozen precooked foods was presented by Dr. Slocum and the paper on microbiological standards for frozen foods by Dr. Gunderson. The report of this meeting entitled, "Conference on Frozen Food Quality" *(3)*, may be obtained from the Agricultural Research Service, U. S. Department of Agriculture, Albany, California.

In a statement summarizing the conference, Mr. Harold Clark, a past president of AFDOUS and a member of its Committee on Canned, Prepared, and Frozen Foods, included the following comment:

"This two-day seminar has been one in which many important phases of the frozen food industry have been thoroughly explained from a highly technical viewpoint. The research information presented clearly indicates that zero degree temperatures or lower are what is needed for frozen foods; and secondly, the temperatures above zero degrees, even though held for a short time, do have a deleterious effect on the quality of frozen foods. It has been made crystal clear here that exposures to unfavorable temperatures above zero for short periods do create quality-factor losses which may not be readily detected by the consuming public but which can be detected by a panel of experts. It has also been made clear that these foods should not deteriorate in quality to the extent that the consumer would ever make such a detection. Thus, it can be seen that in order to accomplish these objectives, it is a must that frozen foods be kept at zero degrees or lower."

For a number of years, regulatory personnel have been advocating the use of an indicating device that could be packed with frozen foods which would provide a means of indicating an exposure to time and temperatures which would result in damage to the frozen food. Of course, it would be a relatively simple matter to produce a device which would indicate temperatures alone. However, since it is generally recognized that temporary exposure for a small amount of time to high temperature does not necessarily cause any damage to frozen foods, an indicator showing temperature alone would be of little value. In the last few months, a time-temperature indicator has been introduced which appears to have some merit. The indicator responds to time and temperature in the same manner that the food does and records the integrated time-temperature reading on a calibrated scale. The entire device is approximately the size and shape of a cigarette, weighs just a fraction of an ounce, has no moving parts, no external wires or power supply, and requires no special calculations to interpret. It is completely sealed in plastic, durable enough so that it can be packed right in with most frozen foods without additional protection.

This time-temperature indicator operates like a tiny electrolytic battery. It is made by filling a thin glass tube with chemical salts and sealing off the ends. This small tube is then wrapped with a treated yellow colored paper. A band of copper is attached to one end of the vial and a band of cadmium to the other, with a thin copper strip connecting the two bands. The entire assembly is then sealed in a plastic tube.

The indicator is activated by the use of special pliers that release the salts from the glass tube. The treated yellow paper is saturated and the "battery" begins to react to the temperature. A red coloration begins to move along the

yellow paper from one end of the tube to the other. The speed of this movement is proportional to temperature.

In use, the indicator would be packed directly into the food cartons, properly protected to prevent damage to the plastic case. At any time that it is wished to determine the time-temperature experience with food, the scale is read. The scale reading is then referred to the graph accompanying the indicator to determine the total time-temperature conditions the food has experienced. This graph indicates the scale reading versus time at representative temperatures.

This time-temperature indicator is still experimental, and the USDA Laboratory at Albany, California, previously referred to is conducting both laboratory and field tests of this device. The Department of Interior, Bureau of Fisheries, Technological Laboratories, Gloucester, Massachusetts, is also conducting a research project using these devices along with temperature recorders in laboratory and in field shipping tests.

In the past, the frozen food industry has been reluctant to incorporate any type of indicating device in frozen food packages. However, the NAFFP is cooperating in the laboratory and field tests of these devices. If this or other similar devices are demonstrated to be practical, reliable, and useful in determining the time-temperature experience of frozen foods, the problem of screening frozen foods would be greatly reduced for the regulatory agency.

Frank E. Fisher, *Chairman*
(Indiana Association)
State Board of Health
Indianapolis, Indiana

Eaton C. Smith,
(Connecticut Association)
Dept. of Consumer Protection
Hartford, Connecticut

O. A. Ghiggoile,
(California Association)
State Dept. of Agriculture
Sacramento, California

Raymond Summerlin,
(Georgia Association)
State Dept. of Agriculture
Atlanta 3, Georgia

G. L. Hayes,
(Illinois Association)
American Can Company
Maywood, Illinois

Dr. K. G. Weckel,
(Wisconsin Association)
University of Wisconsin
Madison 6, Wisconsin

William C. Miller, Jr.
U. S. Public Health Service
Washington, D. C.

REFERENCES

1. Quarterly Bulletin, Association of Food and Drug Officials of the United States. **24** (4): October, 1960.
2. J. Milk and Food Technol., **24**:218-220. 1961.
3. Conference on Frozen Food Quality, Agricultural Research Service, U. S. Dept. of Agr.

REPORT OF THE COMMITTEE ON ORDIANCES AND REGULATIONS—1961

UNIFORM LABELING

During the past four years the Committee on Ordinances and Regulations has directed much of its effort toward the development of a program which would lead to more uniformity in the labeling of milk and other dairy products. The result of this effort has been moderately gratifying in that immediately following the 1960 meeting of the International Association of Milk and Food Sanitarians a special meeting was held, under the leadership and guidance of IAMFS, to plan and organize a national uniform labeling committee. The meeting was well attended by regulatory officials, trade association representatives, and others. At that time a temporary chairman, Dr. A. C. Dahlberg, Dairy Products Improvement Institute, Ithaca, New York, was appointed. Ernest Kellog, Milk Industry Foundation, Washington, D. C. was appointed temporary secretary.

During the ensuing months the founding group held several organizational meetings. At each meeting the IAMFS was represented by a member of the Executive Board and, in addition, the Committee on Ordinances and Regulations usually had one or more members in attendance.

The progress, organizational structure, etc., of the new organization will be described in the panel presentation entitled "The Organization and Functioning of the Committee on Coordination of Labeling Definitions, and Standards for Milk and Its Products", thus there is no need to elaborate further in this report. The Committee on Ordinances and Regulations, however, strongly recommends that the IAMFS, through its Executive Board, continue to actively participate in the new uniform labeling committee, guiding and assisting to the end that an effective permanent organization, established upon sound principles, will be developed and which will lead to uniformly accepted labeling of milk and other dairy products. It is the opinion of the Committee that relaxation of the effort at this time can only lead to the defeat of an absolutely essential program.

OTHER ACTIVITIES

The nature of the activities in which the Committee on Ordinances and Regulations might participate especially requires that they be carefully considered by the Executive Board before they are transmitted to the Committee. This year no new projects have been suggested, however, if any member has in mind a project which might fall within the scope of this Committee it is suggested that it be forwarded directly to the Executive Board for preliminary review.

Donald H. Race, *Chairman*
H. J. Barnum
C. V. Christiansen
A. B. Freeman
O. H. Ghiggoile
K. A. Harvey
C. H. Holcombe
Livingston Jennings
Dr. Howard K. Johnston
Dr. R. M. Parry
E. Small
John F. Speer
Dr. Kenneth Weckel
Stephen J. Wolff

REPORT OF THE COMMITTEE ON RESEARCH NEEDS AND APPLICATIONS—1961

The Committee continued its activity in contributing a question and answer column in the Journal. In addition, the Committee carried on such correspondence and inquiries as were spontaneously generated.

In an effort to bring the Committee's activities to the attention of the membership of the affiliates, a letter was sent to the secretaries and officers of the various affiliates. A response was not generated. Only the New York affiliate answered and posed two questions. These will be discussed at the Committee meeting in Des Moines.

The Committee, since its inception, has undergone a continuous program of self-evaluation in a desire to discharge its duties more completely. This year a series of suggestions was made by one of the members, and these will lead to the formation of a new program of activity at our Des Moines meeting.

In an effort to carry out one of these suggestions, namely,

the sponsoring of panel discussions, the Chairman arranged for a paper and a panel discussion on "The Training in Basic Food Technology for Sanitarians" to be included in the program of the 1961 Annual Meeting.

Fred C. Baselt, *Chairman,*
American Can Company,
New York
Samuel H. Hopper,
Dept. of Public Health,
Indianapolis, Indiana
H. J. Barnum,
Dept. of Health &
Hospitals,
Denver, Colorado
Howard Froiland,
City Health Department,
Aberdeen, South Dakota
Glen L. Hays,
American Can Company,
Maywood, Illinois
C. K. Johns,
Dept. of Agriculture,
Ottawa, Canada
W. C. Lawton,
Twin City Milk
Producers Association,
St. Paul, Minnesota
Keith H. Lewis,
Public Health Service,
Cincinnati, Ohio
Warren Litsky,
Univ. of Massachusetts,
Amherst, Massachusetts
W. K. Moseley,
3862 E. Washington, St.,
Indianapolis, Indiana
Ivan E. Parkin,
Penn. State University,
University Park,
Pennsylvania

REPORT OF THE COMMITTEE ON SANITARY PROCEDURE—1961

The Dairy Industry Exposition, customarily held in the Fall of even-numbered years, so occupies many members of the 3-A Sanitary Standards Committees, and especially of DISA Task Committees, for several months, that it was deemed advisable to hold no Fall, 1960, meeting of the Committees. Consequently, only one full-fledged meeting of the Committee on Sanitary Standards Procedure has been held since the close of the 1960 Annual Meeting of the Association, in Chicago.

However, a meeting of an ad hoc committee, consisting of such members of the Committee and the staff of the USPHS Milk and Food Program as were not committed to attend the simultaneously-held Mastitis Action Conference, also held on October 29, met with the DISA Task Committee to review the Tentative Sanitary Standards for Batch and Continuous Freezers of Ice Cream, Ices, and Similarly-Frozen Foods, on October 29, 1960. Agreements were reached on a number of features and provisions of those tentative sanitary standards which were accepted by the full caucus of sanitarians during the March, 1961, meeting of the 3-A Sanitary Standards Committees.

The Spring, 1961, meeting of the 3-A Sanitary Standards Committees, held at the Pick-Georgian Hotel in Evanston, Illinois on March 14-16, was attended by ten of the fifteen members of the Committee. Tentative sanitary standards pertaining to Plastic Materials Used As Product-Contact Surfaces, to Multi-Service Rubber and Rubber-Like Materials Used As Product-Contact Surfaces, and to Batch and Continuous Freezers of Ice Cream, Ices, and Similarly-Frozen Foods were reviewed by the Committee, in collaboration with members of the staff of the USPHS Milk and Food Program, at the meeting.

None of the drafts reviewed were approved for transmittal to the 3-A Sanitary Standards Committees for joint adoption. But the proposals for modification were accepted in principle by the chairmen of the respective DISA Task Committees, and, excepting those pertaining to plastic materials, should be adopted as 3-A Sanitary Standards at the next meeting of the Committees, to be held in Washington, D. C. on October 3-5, 1961, provided agreement can be reached on the efficiency of filters. The Tentative Sanitary Standards for the Use of Air Under Pressure should also be adopted as 3-A Sanitary Standards at that meeting.

The 3-A Sanitary Standards for Plastic Materials will include, for the guidance of makers of plastics, a comprehensive schedule of the multiple exposure of specimens to alkaline or acid detergent and to the several commonly used bactericidal solutions, in the order conventionally employed, and subsequent determination of gain or loss of weight and change in surface finish (with fixed maxima), as a screening procedure for determining the suitability of plastic materials potentially usable in dairy equipment. Classifications of rubber and rubber-like materials, by such characteristics as degree of hardness and extent of absorption of water and butter-oil, by proportion of exposure to product, and by function, will be established in those 3-A sanitary Standards.

At this point it appears to be desirable that the nature and intended application of the contemplated sanitary standards for plastic and rubber and rubber-like materials be clarified. In both instances, these sanitary standards will pertain to certain physical and chemical characteristics of the materials of which such parts are composed, with sanitarians will not normally be in position to determine by observation nor to corroborate (or question) by field test. In these respects the situation will parallel that currently pertaining to the mandatory use of "18-8 stainless steel, with a carbon content not exceeding 0.12 percent, nickel alloy, or equally corrosion resistant metal", the use of which in specific equipment is rarely questioned, and (so far as is known) has never been established or disproved by test of a sample field-collected by a sanitarian. These two sanitary standards are designed to provide manufacturers of equipment in which such materials are employed as parts, appurtenances, or castings, with criteria for their purchase and use.

Coincidentally with the adoption of sanitary standards for these two types of material, all 3-A Sanitary Standards in which reference to plastics or rubber is made will necessarily have to be amended so as *(a)* to specify that any such material employed shall conform to the pertinent 3-A Sanitary Standards, and *(b)* to prescribe the class of rubber or rubber-like material of which gaskets, O-rings, valve-plugs or valve compression members, etc., which may be employed in specicompression members, etc., are made, and which may be employed in specific areas of equipment. It will then (when such amendments take effect) become the function of the 3-A Symbol Council to ascertain that plastic and rubber parts DO conform to respective 3-A Sanitary Standards before authorizations to use the 3-A symbol are issued or renewed.

C. A. Abele, *Chairman,*
The Diversey Corp.
D. C. Cleveland,
Okla. City-County Health
Dept.
Paul Corash,
New York City Health
Dept.
M. R. Fisher, DVM,
St. Louis Health Dept.
Mark D. Howlett, Jr.,
Consultant
Prof. W. K. Jordan
Cornell University
C. K. Luchterhand,
Wisconsin Health Dept.
James A. Meany,
Chicago Bd. of Health
Sam O. Noles,
Florida Health Dept.
Ivan E. Parkin,
Penn. State University
Wilbur C. Parkinson,
Salt Lake City Health
Dept.
Richard M. Parry, DVM,
Connecticut Dept. of Agri.
George H. Steele,
Minnesota Dept. of Agri.
D. B. Whitehead,
Mississippi-Klenzade Co.
H. L. Thomasson,
Ex. Officio

NEWS AND EVENTS

DAIRY INDUSTRY BRIEFED ON RADIOACTIVITY REMOVAL[1]

The dairy industry was given quite a thorough briefing on the 3-agency project to develop a process for the *removal of strontium-90 from milk.* On December 19th nearly 150 persons, including Government and industry, heard several recognized experts talk about the foreseeable prospects of radiation hazards in milk and our food supply and give a progress report and demonstration of the strontium-90 removal process which has been developed through the research efforts of the Atomic Energy Commission, the U. S. Public Health Service, and the U. S. Department of Agriculture.

To this observer three conclusions emerged quite clearly. (1) On the basis of present and predictable strontium-90 levels in milk there is *no need for this or any other strontium-90* removal process to be utilized; (2) The process developed by the 3-agency team is very effective, but there remains *a great deal of work to be done before the process can be deemed feasible and practical for commercial use;* (3) It would be *premature and unwise for dairy processors to install equipment* and materials necessary for this process in their plants at this time for four cogent reasons: (a) present and foreseeable strontium-90 levels do not justify it; (b) the process at its present stage of development is very costly, both as to the necessary equipment and the chemicals necessary; (c) there are still many problems to be worked out and there is every indication that there will be many major improvements in equipment and methodology with respect to this process; and (d) investigations of other methods of removing strontium-90 from milk are being made and there is a distinct possibility that some other means to be developed in the future may be more practical.

Description of the Process

The strontium-90 removal process which has been developed is quite simple. It is based on the principle of ion exchange and milk, slightly acidified, is filtered down through a bed of resinous material charged with a concentration of metallic salts similar to that found in milk. The metallic ions in the milk reach equilibrium with the ions on the resins, and the minute amounts of strontium ions in the milk change places with calcium ions on the resins. The milk, minus its radioactivity, is then restored to its original acidity and pasteurized and homogenized as usual. Periodically, the resin columns must be washed and regenerated with fresh salt solutions.

It is possible to remove 98% of the strontium-90 from milk by this process. On the pilot plant scale as it is being worked on in Beltsville, about 90% of the radioactive strontium can be removed.

It is stated that the process has been developed to secure maximum removal of strontium-90 without inducing significant adverse change in the milk's chemical composition, physical stability, or flavor. Samples of milk which had been subjected to this process were available for tasting and there was no flavor difference noticeable to other than expert tasters.

On the matter of physical stability, the project people were asked whether the process in any way affected the use of milk for manufacturing purposes and the answer was that very preliminary investigations show that the milk will be all right for manufactured products.

Present pilot plant equipment includes 2 glass ion-exchange columns, five feet long and six inches in diameter. These columns are fitted with sufficient valves for directing the milk and the necessary solutions through the resin bed in controlled sequence for a continuous operation.

While milk is flowing through one column, the other is being cleaned and regenerated for re-use. More than two columns would have to be used if the clean-up and regeneration time exceed the milk flow time for a single column. The pilot plant facilities were designed for a capacity of about 100 gallons per hour.

Cost of Process

Because this research project is by no means complete, there is no final information as to the costs involved. However it has been estimated that for large scale plants, the equipment would cost from $50,000 to $100,000. The greater part of the cost is in the regeneration of the resin colums. The reagents, when added to the cost of equipment, would mean that it probably would cost about 10c per quart to remove strontium-90 from milk in a plant with a daily output of about 100,000 pounds. This

[1]Quoted from Dairy Industry Newsletter, Vol. VI:26.

cost would go down in larger scale operation. However, it was emphasized that these are really only guesses as to costs and cannot be accepted as final information.

No Present Hazard

Virtually all of the scientists who participated in the briefing were very emphatic in their declarations that the safety of our milk supply is not in jeopardy and that strontium-90 levels are still well below the point of any serious concern and are expected to remain so for the foreseeable future.

Dr. Gordon Dunning of the Atomic Energy Commission, one of the most respected authorities on this question, presented some very straightforward calculation which showed quite conclusively that the present and indicated amounts of strontium-90 in milk are such as to constitute no hazard at all. Dr. Dunning presented figures which showed that the amount of radioactivity which would be taken in a lifetime from all sources, under foreseeable conditions at this time, would be about 1/50th of what the Federal Radiation Council has designated as a safe level for "normal peacetime operations."

More Work Needed

Some of the scientists told the group that there are many desirable changes in equipment and methodology which are presently being worked on with respect to this strontium-90 removal process. It was pointed out that much more is still to be done to improve the method, to assure a nutritionally satisfactory product, to evaluate possible sanitation problems and to reduce the cost of this process.

It was emphasized that the experts were making a research report and were not presenting a completed project by any means. It was also pointed out that this strontium-90 removal project was just one phase of many information-getting activities in which the experts in Government are engaged. The briefing which industry was being given, it was stated, was merely for the purpose of "spreading the facts."

The group was also told that there was a possibility of other processes being found more practical and that work was going on in developing these other processes. One of them would involve the use of calcium phosphate in much the same way that the existing strontium-90 removal project is operated.

Installation at This Time Premature

A good deal of time was spent during the briefing in bringing out that it would be unwise to consider installing equipment for this process at this time. Some concern was voiced that this, or other strontium-90 removal equipment, might be installed as a means of capitalizing on a panic which seems to have been created by press stories. As to ways of controlling this, Mr. Wesley E. Gilbertson, Chief of the Division of Environmental Engineering and Food Protection of PHS said that he knew of no straightout regulatory approach which could be taken. However, he said: *"What we would like to present here today is a call to the industry to understand what is involved and to use its own restraint in this area"*. He said further that if it gets out of hand *"I suppose that other means might be devised."*

NOTICE TO MEMBERS INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC.[1]

The Georgia Society of Sanitarians under the name of their Secretary-Treasurer, John J. Sheuring, has proposed the following ammendments to the Constitution and By-Laws of International Association of Milk and Food Sanitarians, Inc. to be voted upon at the Annual Business Meeting in Philadelphia, Pa., October 24, 25, 26, 27, 1962:

Article I. I propose this Article be amended to read as follows: There is hereby created the International Association of Milk, Food and Environmental Sanitarians, Inc., not for pecuniary purposes, which shall hereinafter be referred to as the Association.

Article II. Amended to include the following objective: 9. Cooperate with sanitarians and professional groups in development of the fields of general and environmental sanitation.

Article IV. Sections 1, 2, 3 to be amended as follows:

Section 1. The officers of the Association shall be a President, President-Elect, First Vice-President, and a Secretary-Treasurer who shall hold these offices for one year or until their successors are elected or appointed, as provided in the By-Laws. At the termination of each Annual Meeting the President-Elect and First Vice-President shall automatically succeed into the offices of President and President-Elect, respectively. A First Vice-President and Secretary-Treasurer shall be elected by a majority of mail ballots cast at least thirty days prior to the Annual Meeting of the Association.

Section 2. The Executive Board shall consist of the President of the Association, the President-Elect, the Vice-President, the Secretary-Treasurer, and the immediate Past-President. The Executive Board shall direct the affairs of the Association. A majority of the Executive Board shall be composed at all times of members who are officially connected with Federal, State, County, or Municipal Government or with an educational institution. If the status of any member of the Executive Board changes after election, or during his term of office, or after

protem appointment as provided in Article II, Section 5, paragraph F of the By-Laws, so that a majority of members officially connected as stated herein, is not maintained in the Executive Board, then such member shall be deemed ineligible without prejudice for his office and such office shall be declared vacant.

Section 3. There shall be created a Council which shall consist of the Secretary or other authorized delegate from each Affiliate Association, and the immediate Past President of the Association. Each Affiliate Association shall have one vote at Council meetings. The Council shall select its Chairman and Secretary, shall keep a record of its proceedings, and shall, at each Annual Meeting of the Association, submit its recommendations to the Executive Board.

Article II, Section 3 of the By-Laws to be amended as follows:

Section 3. The Vice President shall perform the duties of the President and President-Elect in their respective absence, and shall serve on the Program Committee.

In accordance with the Constitution and By-Laws of International Association of Milk and Food Sanitarians the publication of the above proposed amendments is official notification of the membership at least 60 days, in the case of the Constitution, and at least 45 days, in the case of the By-Laws, prior to the stated annual meeting.

Karl K. Jones
Secretary-Treasurer

[1]These proposals may be amended at the annual meeting and, also may be voted upon section by section.

MISSISSIPPI ASSOCIATION OF SANITARIANS AFFILIATES WITH IAMFS

The International Association of Milk and Food Sanitarians is pleased to announce the affiliation of the Mississippi Association of Sanitarians which has been organized recently. The officers selected to head their organization the first year are as follows: President, Jean E. Morris, Sunflower County Health Dept., Indianola; Vice-President, Albert K. Monroe, Oktibbeha County Health Dept., Starkville; Secretary-Treasurer, A. R. Russell, P. O. Box 199, Tupelo.

All affiliates and members of IAMFS are hereby requested to send their newsletters and correspondence of interest to Mr. A. R. Russell, Secretary-Treasurer; also, to welcome and lend any assistance possible to our newest affiliate.

Charles E. Walton
President

LIQUID NITROGEN USED FOR FOOD FREEZING

The first food processing plant in the world using liquid nitrogen for freezing on a commercial basis went into production today in Toronto as part of a new plant making frozen prepared meals for Mealmaster System Ltd. The plant was originally scheduled to start up earlier this year but was delayed by a series of building and construction strikes. Mealmaster meals are now being shipped to key accounts both in the United States and Canada.

Shipments of frozen foods in LiqueFreeze containers are continuing. Regular shipments have been made for the United States Navy to bases overseas and several shippers have used the LiqueFreeze system between the West Coast and Hawaii. Through LiqueFreeze research a technique has been developed which greatly decreases the refrigration loss of known insulating materials thus reducing the quantity of nitrogen needed compared with previous methods. All future LiqueFreeze trailers and containers will be constructed using this new technique and several companies in the United States and Canada have already been granted licenses to manufacture LiqueFreeze transportation equipment.

CONSUMER EDUCATION BOOKLET ISSUED

Food shoppers who are interested in laws that protect their health and pocketbooks can get useful information from a new pamphlet, "What Consumers Should Know about Food Standards," issued by the Food and Drug Administration.

The FDA standards and regulations stand back of the quality and integrity of hundreds of major food items in the American diet. They specify what ingredients and processes may be used and the information which must be given on the label. Development of the standards is a cooperative activity on the part of Government, industry and consumers. Factual information from these sources is the basis of the standards.

Whenever "such action will promote honesty and fair dealing in the interest of consumers," says the Federal Food, Drug and Cosmetic Act, FDA is authorized to set standards of quality, identity and fill of container for any food, except most fresh and dried fruits and vegetables which are exempted.

"For example," the pamphlet states, "the standard of identity for fruit preserves and jellies requires not less than 45 parts by weight of fruit or fruit

juice to each 55 parts of total sweetening ingredients . . . At the public hearings, which preceded the writing of this standard, cookbooks 200 years old, as well as current ones, were introduced in evidence to show that pure jam is a product made from approximately equal parts by weight of fruit and sugar."

The twelve-page pamphlet is illustrated with photographs showing some of the scientific tests FDA makes to check samples of food products against the standards. The last page lists the food for which standards have been established. It is for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 20 cents a copy.

MICHIGAN LAUNCHES SEAL OF QUALITY PROGRAM

The first two commodities, poultry products and all Jersey milk through their organizations, have applied to the Michigan Department of Agriculture for consideration for the Seal of Quality. Legislation was approved by the last legislature.

The Michigan Allied Poultry Industries, Inc., has applied for consideration on all poultry products with standards to be set up by each segment of the poultry industry.

The Michigan Jersey Cattle club has asked for permission to use the Seal on dairy products.

The Seal of Quality, which is entirely voluntary with the commodity group, may be used on agricultural products grown, packed, and processed in Michigan if the commodity group elects to use the seal and follows requirements outlined in the legislation. A seal is being developed by the Michigan Department of Agriculture, according to Director G. S. McIntyre.

The Seal of Quality proposal for the past several years had the endorsement of leading farm organizations before it was passed. Proponents say that for the consumer the seal would assure high quality products that are easily identified in retail outlets. For the producer or packer, use of the seal is expected to stimulate sales on preferred mechandise through ease of identify.

After a commodity group makes application, a hearing must be held and other requirements fulfilled. Under the new law products bearing the seal must be graded in accordance with standards promulgated. Cost of inspection and the seals or tags would be borne by the commodity group electing to use the seal on its products, making the program self-supporting as far as public funds are concerned.

PENNSALT TO COMPLETE $8-MILLION RESEARCH CENTER BY MID-1963

Construction of five new technical and engineering buildings, including a 114,000 square foot research and development laboratory, will begin next month at Pennsalt Chemicals Corporation's 50-acre Technological Center at King of Prussia, Pa.

When completed, the over $8-million complex will be one of the most modern chemical research centers in the country. The first unit, a 30,000 square foot Technical Service Laboratory, was completed in March of this year. Completion of a new engineering laboratory, high pressure laboratory, central utilities building and a fireproof chemical storage building is expected by the end of 1962, with the main research and development laboratory scheduled for occupancy by mid-1963.

Incorporated within the R & D laboratory building will be a one-quarter million dollar fallout shelter equipped to house and feed all of the Center's employees for a two-week period. Among other facilities, the shelter will contain sleeping accommodations for 300 persons. "Although I am sure we all hope and pray this shelter will prove to be a needless expense," President Drake said, "I am equally certain that we should take every feasible precaution."

CONFERENCES SCHEDULED AT PURDUE

F. N. Andrews, Head of the Animal Sciences Department at Purdue University, and F. J. Babel, professor in charge of the Dairy Manufacturing Section, have announced two, one-day meetings to be held in March 1962. The Market Milk Conference will be held on March 14 and the Ice Cream Conference on March 15, in the Memorial Center at Purdue University. The conferences are an annual affair sponsored in cooperation with the Indiana Dairy Products Association.

The Market Milk Conference will include discussions on the Darisonometer; Studies of Plastic Coated Milk Packages; Plant Problems with Cultured Products; The Radio Activity Situation; and The Training of Management Personnel for the Future. The luncheon will be highlighted by a discussion of Dairy Processing in the Far East. The program will be concluded with a milk and cottage cheese clinic.

The Ice Cream Conference is to feature discussions on Cleanability of Stainless Steel Surfaces; Use of Modern Stabilizers; Methods, Equipment and Layout for Efficient Ice Cream Manufacture; and Food

Plant Insect Control. The luncheon will feature a look into the future of the "Fight Against Starvation."

Leading dairy technologists from Purdue and other Midwest Universities will participate in the program, as well as many dairy industry authorities.

Further information on the programs may be obtained from Mr. H. F. Ford, Smith Hall, Purdue University, Lafayette, Indiana.

PAPERS PRESENTED AT AFFILIATE ASSOCIATION MEETINGS

Editorial Note: The following is a listing of subjects presented at recent meetings of Affiliate Associations. Copies of papers presented may be available through the Secretary of the respective Affiliate Association.

CONFERENCE OF FIELDMEN AND SANITARIANS

Sponsored by

Department of Dairy Science, University of Kentucky, Kentucky Association of Milk and Food Sanitarians,

and

Kentucky Manufacturing Milk Improvement Associations

University of Kentucky, Lexington, Ky.

February 20 and 21, 1962

(*Secretary*: Wm. S. LaGrange, Dairy Dept., Univ. of Kentucky, Lexington 29, Ky.)

Effective Sanitation in Good Milking - D. R. Jacobson, Dept. of Dairy Science, Univ. of Kentucky.

Cleaning and Sanitizing Milk Equipment - L. C. Knierem, L. K. Quality Services, Inc., Louisville, Ky.

Quality of Bulk Milk for Interstate Shipments as Affected by Farm Practices - D. Richard Brazis, Bacteriologist, Milk & Food Research, Taft Sanitary Engineering Center, Cincinnati, Ohio.

Significance of the Grade A Label - Shelby Johnson, Director, Div. of Food & Drugs, State Dept. of Health, Frankfort, Ky.

Mastitis Was Controlled in a State Institutional Herd - L. S. Shirrell, D.V.M., Frankfort, Ky. and J. W. Skaggs, Div. of Veterinary Public Health, State Dept. of Health, Frankfort, Ky.

The Home Stretch Drive on Brucellosis Control - R. W. Hammermeister, State Veterinarian, Dept. of Agriculture, Frankfort, Ky.

The Positive Approach in Field Work - I. E. Parkin, Dept. of Dairy Science, Penn State Univ., University Park, Pa.

Central Ontario Milk Sanitarians Association

Fourth Annual Meeting
Mimico, Ontario
January 24, 1962

(*Secretary*: William D. McCorquodale, 409 Huron St., Toronto, Ont., Canada)

Bacteria, Quality and Flavours in the Farm Supply - Dr. H. V. Atherton, Dept. of Dairy Bacteriology, University of Vermont, Burlington, Vermont.

Spray Cleaning of Milk Transport Tankers - J. R. Greenfield, Tech. Development Engineer, Diversey Corp., Chicago, Ill.

Some Field Experience on Preliminary Incubation - James R. Neal, Field Supervisor, H. P. Hood & Co., Boston, Mass.

Quality Tests on Raw Milk - A Panel - Robert Sinclair, Dominion Dairies, Montreal, *Moderator*.
Dr. C. K. Johns, Dir., Research Branch, Central Experimental Farm, Ottawa.
Dr. J. Sterns, Dept. of Health, Ottawa.
Tom Dickison, Head, Field Service, Borden Co., Ontario.
Earl Powell, Production & Quality Control, Silverwoods Dairy, Toronto.

Connecticut Association of Dairy & Food Sanitarians, Inc.

Thirty-Seventh Annual Meeting
Northford, Conn.
January 17, 1962

(*Secretary*: Richard M. Parry, D.V.M., Tunnel Road, R. R. 1, Vernon, Conn.)

Cause of Added Water in H.T.S.T. Pasteurization - Arnold C. Smith, Assoc. Prof., Dairy Mfg., College of Agriculture, Univ. of Conn., Storrs, Conn.

Effect of Dry Storage Measuring Sticks in Farm Bulk Tanks - Albert R. Pernice, Dir. of Field Services, Borden's - Mitchell Dairy Div., Bridgeport, Conn.

Farm Water Supplies as They Relate to Public Health - Frederick E. O. Almquist, Dir., Sanitary Engineering Div., Conn. State Dept. of Health, Hartford, Conn.

New Connecticut Frozen Dessert Standards of Identity and Regulations - Harold Clark, Conn. Dept. of Agriculture, Hartford, Conn.

Food Quackery - Miss Elna Daniels, Ass't. Professor, Institutional Management & Foods, Univ. of Conn., Storrs, Conn.

Sanitation in Small Food Establishments - Robert Perriello, Assoc. Prof., Public Health Center, Univ. of Mass., Amherst, Mass.

PENN STATE OFFERS SHORT COURSE

The Pennsylvania State University offers a short course in Market Milk and Milk Supervision, March 19 to 31, 1962.

Persons interested in enrolling should write to: Director of Short Courses, College of Agriculture, The Pennsylvania State University, University Park, Pennsylvania.

MASTITIS TEST PROGRAM OPERATING IN OREGON

Shipper's milk coming to the Portland, Oregon milk shed is being checked out for *Mastitis* through the use of the California Mastitis Test. Three tests had been completed on each shipper.

Sixteen (16) per cent of the herds reacted on the first test, eight (8) per cent on the second and six (6) per cent on the third. It would appear that testing alone has shown some beneficial results.

All herd owner's whose milk showed a positive test received a letter advising of an indication that mastitis was present. The same letter with second notice in red was sent on the second infraction.

After a third positive, each cow in the offending herd was individually tested, and the dairyman advised to consult his veterinarian and have a bacteriological sensitivity test performed on each quarter showing a positive reading. Other control measures of a sanitary nature were also advised.

In addition dairymen were advised to consult a competent milking machine technician for advice on possible malfunction or faulty operation as a caustive factor.

One thing found shows that it is imperative that fresh samples be used. If samples are more than 12 hours old most will be negative.

All third repeats will be checked individually according to present plans and a letter will be sent for first and second positives.

On herds showing a score 3 on the first two tests the dairyman will be visited to talk over the situation in order to prevent serious trouble by waiting until three tests have been run on a herd, which would take approximately eighteen weeks.

Taken from the "Sediment Catcher", a publication of the Oregon Milk Sanitarian's Association, as reported by Lloyd N. Jones, D.V.M.

FEDERAL INSPECTION OF LABORATORIES PROPOSED

As a consequence of the Congressional investigation of the drug industry, the door has been opened to a broad expansion of the power of the Food and Drug Administration to regulate the manufacture and distribution of drugs. The so-colled Kefauver-Celler Bill (S. 1552 or H.R. 6245) and, according to reports, the "Omnibus Bill" being drafted by FDA for early introduction in the present session of the 87th Congress, are designed in large measure to tighten up present controls over the drug and allied industries. A special feature of both bills, of direct concern to independent laboratories serving these industries, is the proposed grant of authority to inspect not only the facilities of such laboratories but analytical reports, records, files, and the qualifications of technical personnel.

In an address before the meeting last November sponsored jointly by FDA and the Food Law Institute, Dr. Bernard L. Oser questioned whether any independent laboratories had denied permission to FDA to inspect facilities under the present law. Although there has been no evidence to this effect, it was nevertheless indicated that the American Council of Independent Laboratories would support such legislation "provided proper limits and controls are written into the law."

Of vital concern to independent laboratories is the necessity to preserve the confidential relationship between scientific consultants and their clients. It was pointed out that individuals and companies have an inalienable right to consult privately with scientific advisors as well as with legal counsel.

Dr. Oser stated that "No competent and responsible laboratory will object to showing its facilities and discussing its qualifications for providing the services it purports to offer. In fact the opportunity to do so is usually welcomed regardless of whether the visitors are clients, prospective clients, domestic or foreign government agents, teachers, students, or the general public. Reputable laboratories, such as those represented by the membership of the American Council of Independent Laboratories, are not only proud to display their wares but are ready and willing to participate in any effort to curtail the activities of the small fringe of incompetent or dishonest operators." He also pointed out that "aside from the manufacturers' own laboratories and commercial testing laboratories many other institutions and individuals play a role in evaluating the efficacy, safety, quality, and potency of drugs. Among them are medical schools, universities, research institutes, hospitals, clinics and even private practitioners of medicine, dentistry, and allied professions. To single out commercial laboratories for the purpose of this legislation is discriminatory."

In drawing the distinction between inspection as related to a specific regulatory action and inspection for the general purpose of validating facilities and personnel of a laboratory, Dr. Oser asked whether FDA intended to set up criteria for "certifying" laboratories. There are at present requirements for academic degrees, and for membership in professional and scientific societies. In certain areas of professional activity, certifying or licensing boards have been established, but no nationally recognized system exists for the certification of independent laboratories serving the food or drug industries. It is felt in laboratory circles that if the FDA is to be given such authority, the participation of all professionally interested groups should be enlisted.

DR. R. G. ROSS, PAST PRESIDENT OF INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC.

Dr. R. G. Ross, age 71, of 134 E. Jasper St., Tulsa, Oklahoma, President of International Association of Milk and Food Sanitarians, Inc., in 1947, passed away Sunday, January 28, 1962, after a long illness.

Dr. Ross was one of the IAMFS' most faithful and loyal members. He served the association in many capacities over the years and his many friends who had the honor and pleasure of associating with him will mourn his passing.

Dr. Ross retired in 1958 as the head of the Tulsa City-County Health Department's milk control division.

He was born near Winterset, Iowa, and was graduated in 1913 from the Iowa State College's School of Veterinary Medicine at Ames.

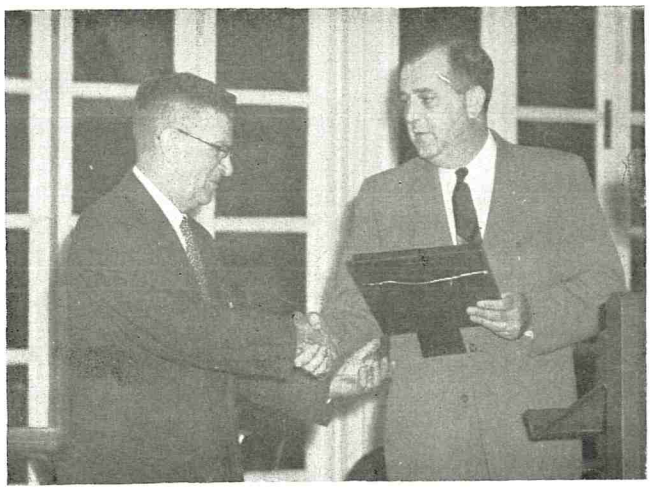
He came to Tulsa in 1929, joining the health department as field inspector in milk control. Four years later he was named head of the milk control division, a position he held until 1947, when he joined the Oklahoma State Department of Health's milk control unit.

He was instrumental in promoting adoption of the standard U. S. Public Health Service milk code in many Oklahoma cities, including Tulsa.

He rejoined the Tulsa office in 1953 and before his retirement in 1958, promoted passage of a modern milk ordinance and code recognizing the need for control of brucellosis in dairy herds.

He was a member of the First Methodist Church.

Surviving are the widow, Helen; a daughter, Mrs. Ford Bell, 1785 E. 31st St.; and three grandchilden.



Dr. R. G. Ross, left, receiving IAMFS "Citation Award" for outstanding service to the association from John D. Faulkner chairman of the committee on recognition and awards at the 42nd Annual Meeting, October 5, 1955, Augusta, Georgia.

CONGRESS CONSIDERS ENVIRONMENTAL HEALTH[1]

There's a lot Congress can do about environmental health, but will it? Politics being the art of the possible, some action will be taken, some compromises will be made and some programs will be shelved.

Creation of a Bureau of Environmental Health within the U. S. Public Health Service tops the legislative list. How the Bureau will be created, however, poses an interesting parliamentary problem.

A Presidential Reorganization Plan involving the entire USPHS is now being advocated, instead of the original proposal to send up a separate bill to create the Bureau of Environmental Health. The Presidential Reorganization Plan, would give the Surgeon General authority to create any bureaus he considered necessary, with approval of the Secretary of Health, Education and Welfare. He doesn't have that authority now. He can create and disband sections, branches and divisions—in short, any organization up to the level of bureau. That is why separate legislation to create the Bureau was originally considered necessary.

The Presidential Reorganization Plan, if adopted (and the chances are good that it will be), would give him that administrative authority, making separate legislation unnecessary. Another angle: a Presidential Reorganization Plan is considered automatically approved by Congress if no resolution of disapproval is adopted within 60 legislative days. Thus, it's faster and usually requires no hearings.

Establishment of a National Environmental Health Research Center is a horse of a different color. There is plenty of authority already existing for the Center—but the big problem here is getting the money.

The Senate Appropriations Committee, which has been force-feeding money down the throats of the National Institutes of Health for several years for medical research, unexpectedly developed an attack of economy last year and deleted $3,515,000 in planning and site-acquisition funds for an Environmental Health Research Center because it objected to the location in suburban Maryland.

The fight against the original site was led by Senators Robert Byrd (D- W. Va.) and Alan Bible (D-Nev.)—and, as far as we've been able to determine, they haven't changed their minds. In fact, the general opposition to location of more Federal agencies in the Washington area has probably increased in Congress. All in all, we would not bet on the chances of getting the Center through Congress this year.

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[1]Reprinted from Environmental Health Letter, Jan. 15, 1962.

CALENDAR OF MEETINGS

1962

March 1-2—Minnesota Dairy Products Association, Annual Meeting & Convention, Radisson Hotel, Minneapolis, Minnesota. Administrative Officer, Floyd Thompson, 416 New York Building, St. Paul 1, Minnesota.

March 11-13—Dairy Products Association of Kentucky, Inc., Annual Meeting and Industrial Conference, Sheraton Hotel, Louisville, Kentucky. Administrative Officer, D. F. Conley, 2927 West Kentucky Street, Louisville 11, Kentucky.

March 12-14—ICMI Merchandising Council Spring Meeting, Boca Raton Hotel, Boca Raton, Florida. Administrative Officer, Robert H. North, 1105 Barr Building, Washington 6, D. C.

March 15-17—Pacific Dairy & Poultry Association, 38th Annual Convention, Biltmore Hotel, Los Angeles, California. Administrative Officer, Carl E. Nall, 1304 E. 7th Street, Los Angeles, California.

March 18-20—Tennessee Dairy Products Association, Annual Convention, Andrew Jackson Hotel, Nashville, Tennessee. Administrative Officer, B. V. Lawson, 1719 West End Building, Nashville 3, Tennessee.

March 19-20—Florida Association of Milk & Food Sanitarians, Annual Meeting. Secretary, Dr. Kenneth L. Smith, Dairy Lab., Fla. Agr. Expt. Sta., Gainsville, Florida.

March 20-22—American Dairy Association, Annual Meeting, Pick Congress Hotel (tentative hotel) Chicago, Illinois. Administrative Officer, M. J. Framberger, 20 N. Wacker Drive, Chicago, Illinois.

March 21—Iowa Association of Milk Sanitarians, 21st Annual Meeting, Iowa State Univ., Ames, Iowa. Secretary, Richard E. Stedman, State Office Building, Des Moines 19, Iowa.

March 22-23—Dairy Industry Supply Association, Annual Meeting, Edgewater Beach Hotel, Chicago, Ill. Administrative Officer, J. S. Cunningham, Dairy Industry Supply Ass'n., 1145 19th Street, N. W., Washington, D. C.

April 2-13—Urban Planning for Environmental Health, Robert A. Taft Engineering Center, Cincinnati, Ohio. Contact: Chief, Training Program, Robert A. Taft Engineering Center, 4676 Columbia Pkwy., Cincinnati 26, Ohio.

April 3-4—University of Nebraska, Annual Dairy Industry Conference, Nebraska Center for Continuing Education College of Agriculture Campus, Lincoln, Nebraska. Administrative Officer, T. A. Evans, 101 Dairy Building, Lincoln 3, Nebraska.

April-9-12—United States-Mexico Border Public Health Association, Twentieth Annual Meeting, Nuevo Lardo, Tamaulipas, Mexico. Secretary, Ulpiano Blanco, M. D., 501 U. S. Court House, El Paso, Texas.

April 11-13—Institute of Environmental Sciences, Annual Technical Meeting and Equipment Exposition, Sheraton-Chicago Hotel, Chicago, Ill. Contact: J. P. Monroe, Lear, Inc., Grand Rapids, Mich.

April 8-10—Indiana Dairy Products Association, Inc., Business and Social Meeting, French Lick-Sheraton Hotel, French Lick, Indiana. Administrative Officer, Ward K. Holm, 603 Union Title Building, Indianapolis 4, Indiana.

April 9-10—American Butter Institute, Inc., National Cheese Institute, Inc., Annual Meeting, LaSalle Hotel, Chicago, Illinois. Administrative Officer, E. W. Gaumnitz, 110 N. Franklin Street, Chicago 6, Illinois.

April 10-11—Iowa Milk and Ice Cream Mfgs. Assns., Annual Convention, Hotel Savery, Des Moines, Iowa. Administrative Officer, John H. Brockway, 710 Fifth Avenue, Des Moines, Iowa.

April 11-13—Institute of Environmental Sciences, annual technical meeting and equipment exposition, Sheraton-Chicago Hotel, Chicago, Ill. Administrative Officer, J. P. Monroe, Lear, Inc., Grand Rapids, Michigan.

April 12-13—American Dry Milk Institute, Inc., National Meeting, Edgewater Beach Hotel, Chicago, Illinois. Administrative Officer, John Walsh, 221 North LaSalle Street, Chicago 1, Illinois.

April 26—Evaporated Milk Association, bi-monthly meeting of the Industry, Builders Club, Chicago, Illinois. Administrative Officer, E. H. Parfitt, 228 N. LaSalle Street, Chicago 1, Illinois.

Apr. 28-May 3—IAICM-ICMI Board of Directors Spring Meeting, Mountain Shadows, Scottsdale, Arizona. Administrative Officer, R. H. North, 1105 Barr Building, Washington 6, D. C.

Apr. 30-May 1-2—National Assn. of Dairy Equipment Mfgrs. Annual Spring Meeting, The Diplomat, Hollywood, Florida. Administrative Officer, John Marshall, 1012 Fourteenth St., N. W., Washington, D. C.

May 1-2—Pennsylvania Association of Milk Dealers, Annual Convention, Penn Harris Hotel, Harrisburg, Pennsylvania. Administrative Officer, Henry R. Geisinger, 303 Telegraph Building, Harrisburg, Pennsylvania.

May 9-10—National Dairy Council, Board of Directors Meeting, Sheraton-Chicago Hotel, Chicago, Illinois. Administrative Officer, Milton Hult, 111 North Canal Street, Chicago 6, Illinois.

May 9-10—New England Association of Ice Cream Manufacturers, Annual Convention, Sheraton Plaza, Boston, Mass. Administrative Officer, Malcolm D. MacLeod, 70 Franklin Street, Worchester, Massachusetts.

May 21-23—Assn. of Ice Cream Mfgrs. of Pa., New Jersey & Delaware, Inc., Annual Meeting, Pocono Manor Inn, Pocono Manor, Pennsylvania. Administrative Officer, Peter F. Rossi, 405 Lexington Avenue, New York 17, N. Y.

June 6—The Holstein-Friesian Association of America, Annual Convention, Hotel Roanoke, Roanoke, Virginia. Administrative Officer, Robert H. Rumler, Brattleboro, Vermont.

June 10-15—VIII Congress of the Inter-American Assn. of Sanitary Engineering, Washington, D. C. Administrative Officer, Edmund G. Wagner, c/o Officer of Public Health, I.C.A., Washington 25, D. C.

June 17-21—The American Dairy Science Association, Annual Meeting, University of Maryland, College Park, Maryland. Administrative Officer, H. F. Judkins, 32 Ridgeway Circle, White Plains, New York.

June 17-21—National Association of Retail Grocers, Annual Convention, Auditorium, San Francisco, California. Administrative Officer, Marie Kiefer, 360 North Michigan Ave., Chicago 1, Illinois.

June 18-20—Grocery Manufacturers of America, Inc., Mid-Year Meeting, Greenbrier, White Sulphur Springs, West Virginia. Administrative Officer, Paul S. Willis, 205 E. 42nd Street, New York 17, N. Y.

June 18-21—National Dairy Council, Summer Conference, Sheraton-Chicago Hotel, Chicago, Illinois. Administrative Officer, Milton Hult, 111 North Canal Street, Chicago 6, Illinois.

June 28—Evaporated Milk Association, bi-monthly meeting of the Industry, Builders Club, Chicago, Illinois. Administrative Officer, E. H. Parfitt, 228 N. LaSalle Street, Chicago, Illinois.

August 5-8—West Virginia Dairy Products Association, Annual Meeting, Greenbrier Hotel, White Sulphur Springs, West Virginia. Administrative Officer, S. J. Weese, West Va. University Dairy, Morgantown, W. Va.

Sept. 12-13—National Dairy Council Board of Directors Meeting, Sheraton-Chicago Hotel, Chicago, Illinois. Administrative Officer, Milton Hult, 111 North Canal Street, Chicago 6, Illinois.

Sept. 17—Wisconsin Creameries Association, Annual Convention, Whiting Hotel, Stevens Point, Wisconsin. Administrative Officer, Oscar Christianson, 1 West Main Street, Madison, Wisconsin.

Sept. 18-20—American Dairy Association Board of Directors & State Managers Meeting, Olympic Hotel, Seattle, Washington. Administrative Officer. M. J. Framberger, 20 N. Wacker Drive, Chicago, Illinois.

Sept. 27—Evaporated Milk Association, bi-monthly meeting of the Industry, Builders Club, Chicago, Illinois. Administrative Officer, E. H. Parfitt, 228 N. LaSalle Street, Chicago 1, Illinois.

Oct. 2-3—Minnesota Creamery Operators' and Managers' Association, Annual Convention and Business Sessions, Hotel Lowry, St. Paul, Minnesota. Administrative Officer, Floyd Thompson, 416 New York Building, St. Paul 1, Minnesota.

Oct. 24-27—International Association of Milk and Food Sanitarians, Inc. Annual Meeting, Ben Franklin Hotel, Philadelphia, Pennsylvania. Administrative Officer, H. L. Thomasson, P. O. Box 437, Shelbyville, Indiana.

Oct. 28-Nov. 2—Dairy Exposition, Atlantic City, New Jersey. Administrative Officer, Joseph Cunningham, Dairy Industry Supply Association, 1145 - 19th St. N. W., Washington, D. C.

Nov. 12-14—Grocery Manufacturers of America, Inc., Annual Meeting, Waldorf Hotel, New York, New York. Administrative Officer, Paul S. Willis, 205 E. 42nd Street, New York 17, N. Y.

Dec. 6—Evaporated Milk Association, bi-monthly meeting of the Industry, Builders Club, Chicago, Illinois. Administrative Officer, E. H. Parfitt, 228 N. LaSalle Street, Chicago, Illinois.

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May 7-9—Pennsylvania Association of Milk Dealers, Annual Convention, Bedford Springs Hotel, Bedford, Pennsylvania. Administrative Officer, Harry R. Geisinger, 303 Telegraph Building, Harrisburg, Pennsylvania.

June 17-19—Grocery Manufacturers of America, Inc., Mid-Year Meeting, Greenbrier, White Sulphur Springs, W. Va. Administrative Officer, Paul S. Willis, 205 E. 42nd Street, New York 17, N. Y.

QUESTIONS AND ANSWERS

Note: Questions of technical nature may be submitted to the Editorial Office of the Journal. A Question in your mind may be in the minds of many others. Send in your questions and we will attempt to answer them.

QUESTION:

What is the significance of finding coagulase positive staphylococci in milk to be consumed raw? Could this be classed as adulterated milk?

ANSWER:

The question of coagulase positive staphylococci is of much interest at the present time, but no definite position has been taken relative to their presence in milk. It is very likely that nearly all samples of raw milk would show the presence of coagulase positive organisms and, also, they could, no doubt, be cultured from almost any portion of our environment. Your question does not specify numbers, but, if the concentration was extremely high, the milk could be considered of poor quality and dangerous since pre-formed toxin might be present. Very likely it would be graded down on the basis of other quality tests. This is merely another risk associated with consumption of raw milk.

The answer to the second part of your question probably is no. The mere presence of coagulase positive staphylococci does not indicate adulteration, but only indicates that some of the organisms present, either as a part of the natural flora or through contamination, were of this type.

The Food and Drug Administration is presently making an extensive survey on the presence of coagulase positive staphylococci in raw milk, but, to my knowledge, have not released any results of their findings or commented on the significance of the organisms. It is reasonable to assume that this information will be reported sometime in the future.

UNIVERSITY OF KENTUCKY ISSUES INFORMATIVE CAREER BULLETIN

An attractive and informative brochure, entitled, *Careers in Dairy Production and Manufacturing*, has just been issued by the Dairy Department, University of Kentucky.

The many opportunities offered by the dairy industry through production, extension, sales, research, marketing, quality control and management are described. The brochure is attractively illustrated and the different facets of the industry are stated in a concise yet informative manner.

The brochure is aimed at young men and women of high school and entering college age. It is a type of publication that should also be of real value to guidance counselors working with students who are exploring various career fields.

Sample copies are available and requests should be addressed to Professor Theodore R. Freeman, Dairy Department, University of Kentucky at Lexington.

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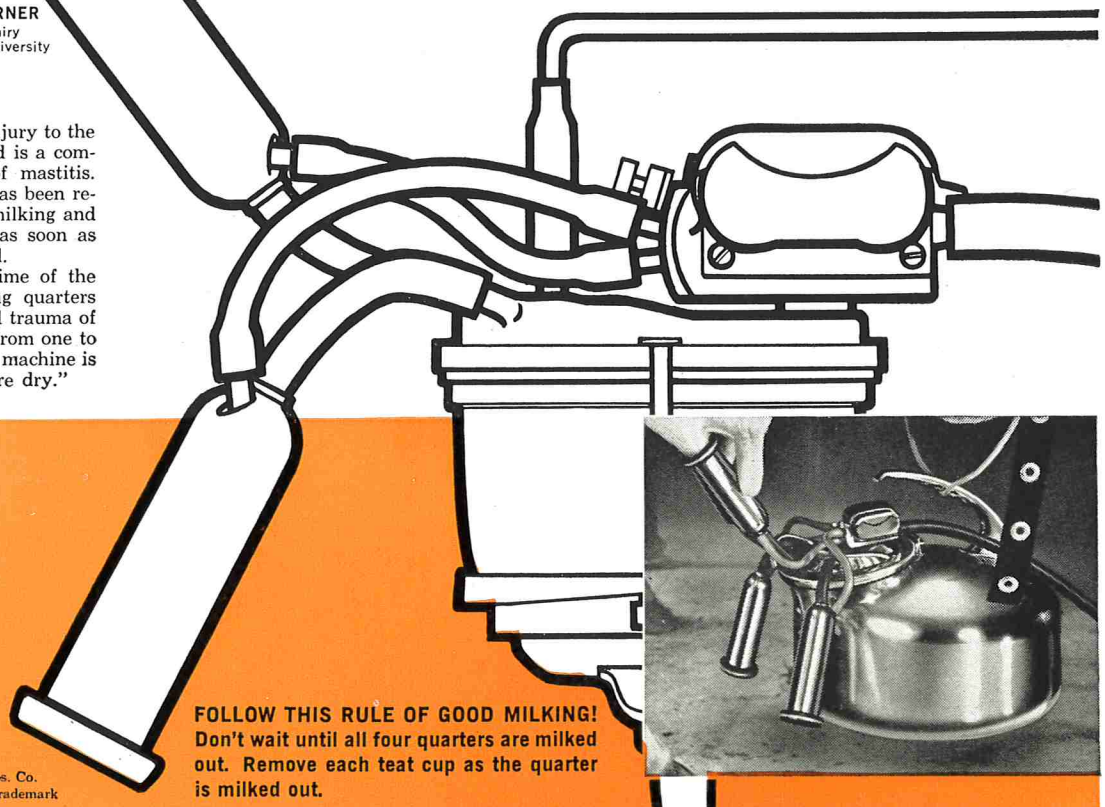

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