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*Journal of*

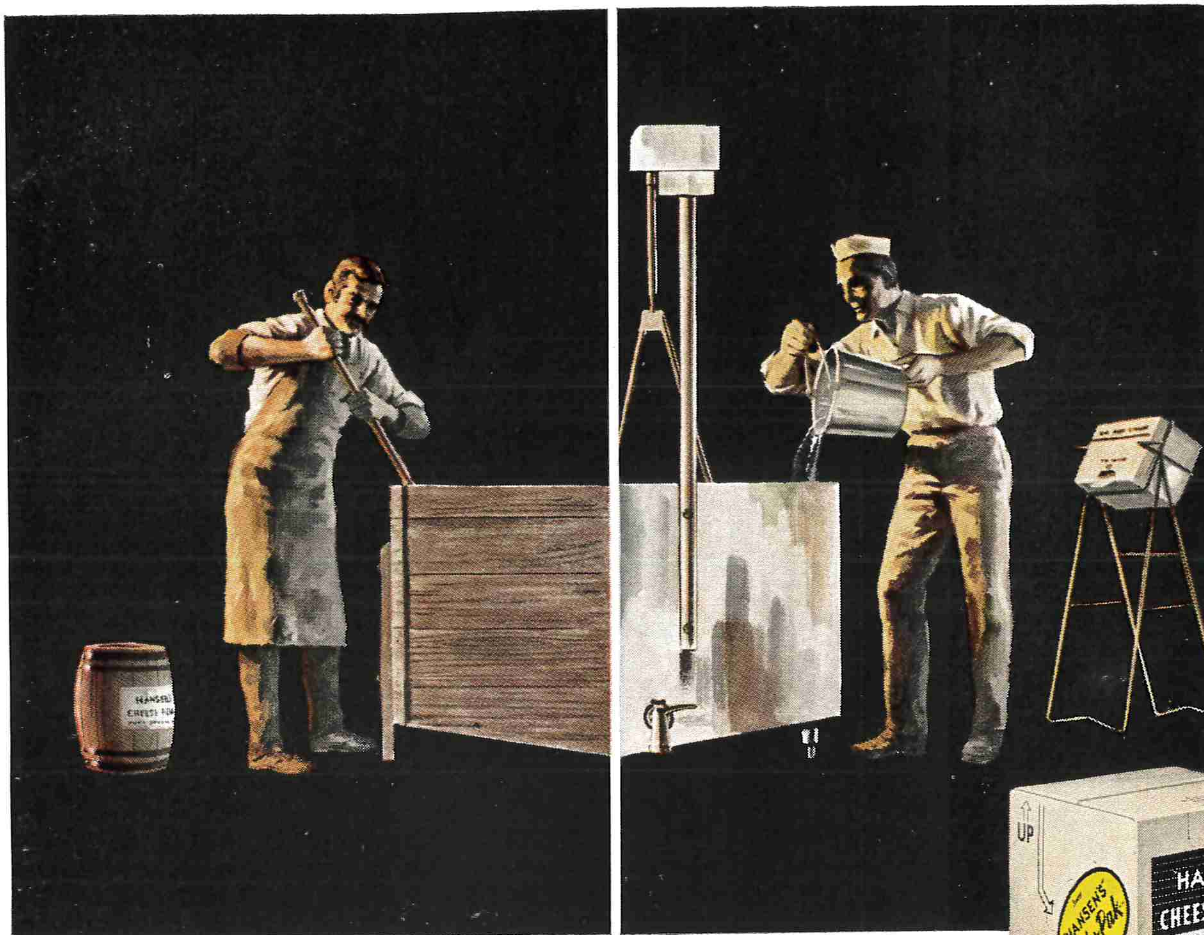
# MILK and FOOD TECHNOLOGY

**51st ANNUAL MEETING**
**AUGUST 18, 19, 20, 21, 1964**
**Portland Hilton Hotel — Portland, Oregon**

**DEADLINE**
**Sanitarians Award Nominations**
**June 1, 1964**

*Official Publication*

International Association of Milk, Food and Environmental Sanitarians, Inc.

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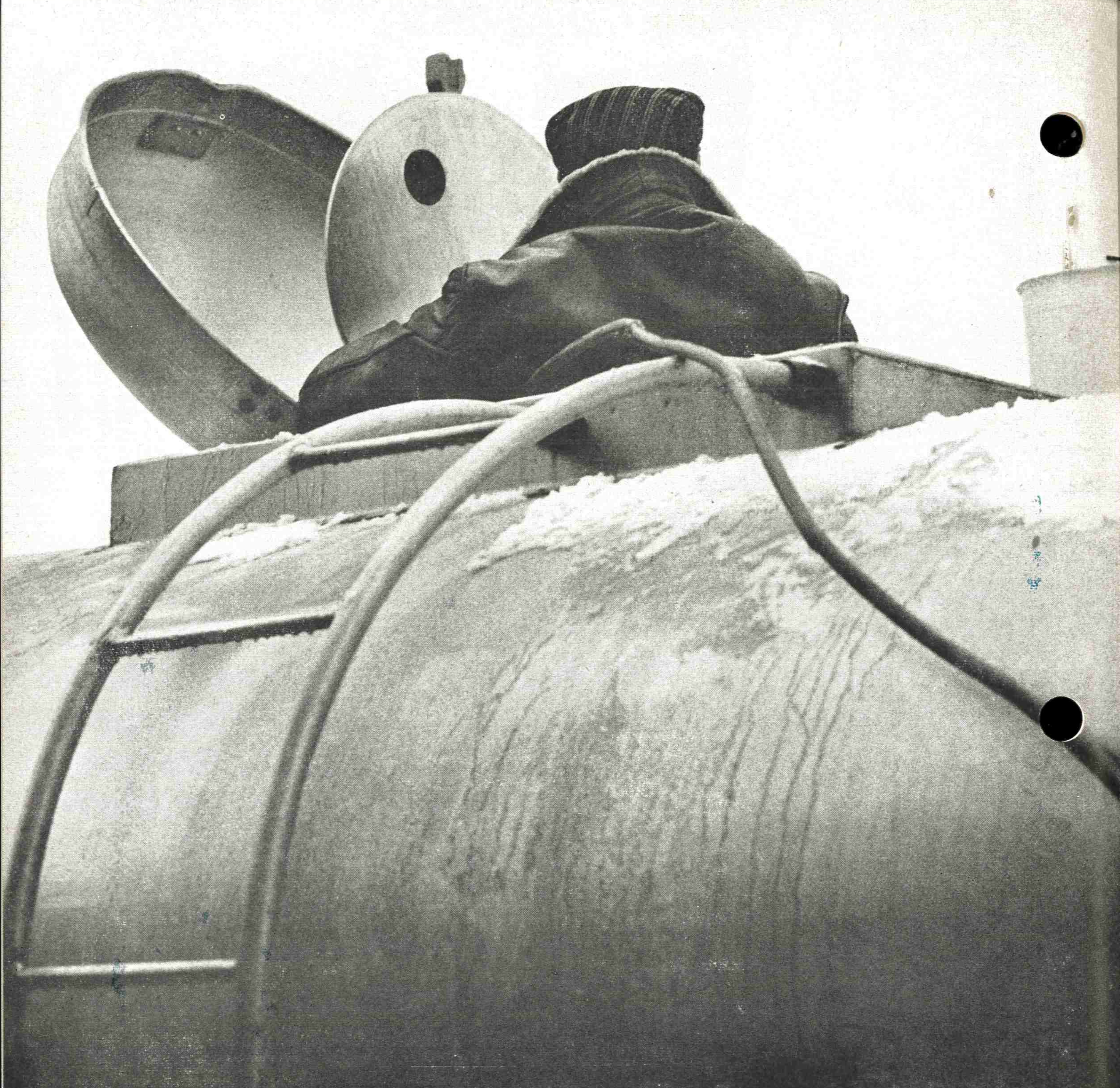

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*Journal of*

# MILK and FOOD TECHNOLOGY

INCLUDING MILK AND FOOD SANITATION

*Official Publication*

International Association of Milk, Food and Environmental Sanitarians, Inc.

Reg. U. S. Pat. Off.

Volume 27 April, 1964 Number 4


*Contents*




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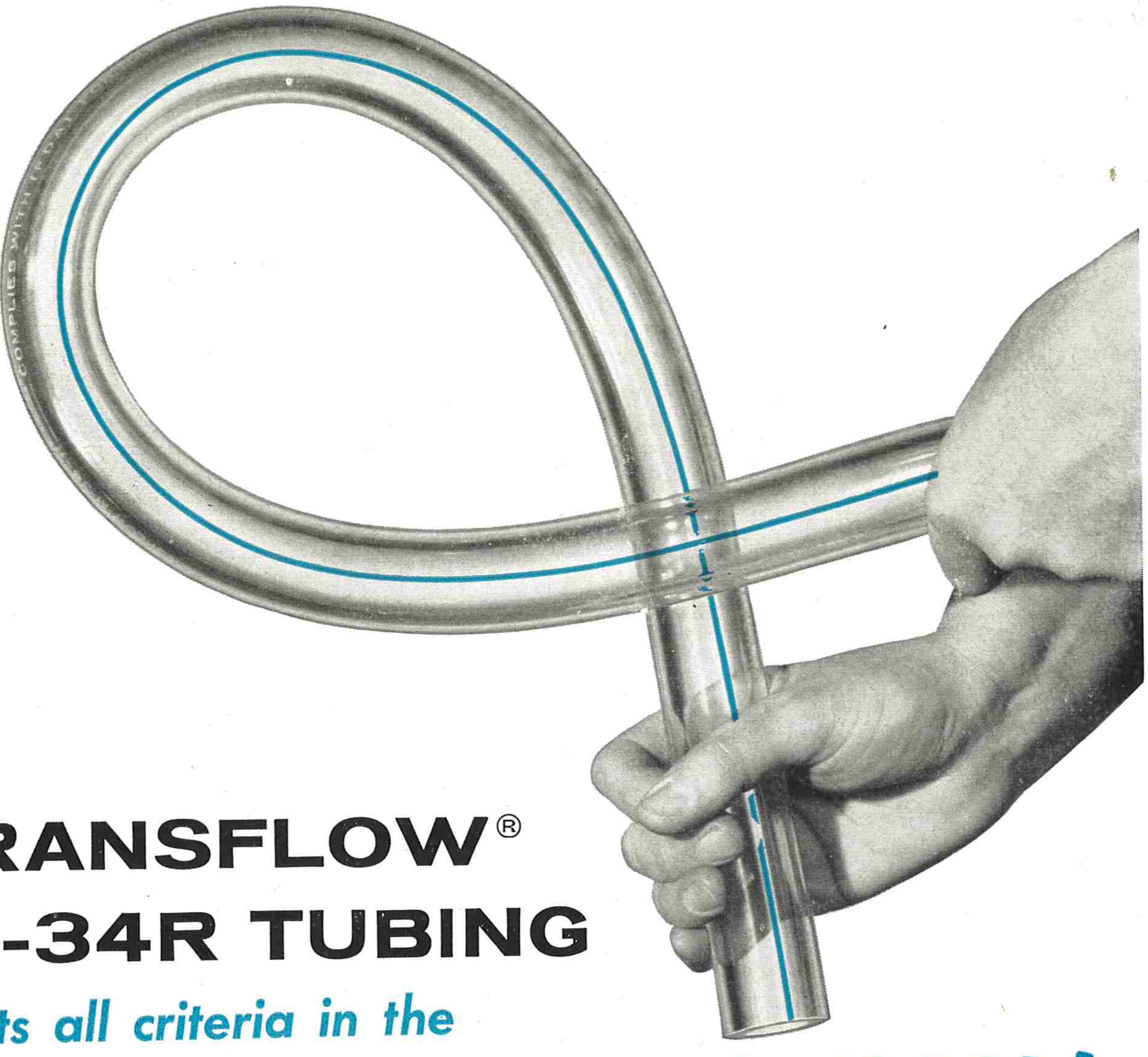


CUT OUT FOR FILE REFERENCE

# SANITATION NEWSLETTER

## AN EFFECTIVE ROUTINE FOR MASTITIS CONTROL

First, a veterinarian should be called to make a thorough herd check-up, and to outline an eradication and control program. Essential to any control plan is a thorough sanitation plan. The following is a milk house procedure that has been proved effective and may be recommended:

**1.** Milking machine operators can carry mastitis infection from one cow to another. It is imperative that their hands be sanitized.

**2.** Milk first-calf heifers and healthy cows first, suspected cows next and mastitic cows last.

**3.** Just before milking, sanitize all utensils and machines with a fresh 200 ppm solution of B-K* Powder or Pennsan* (Fig. A).

**4.** Wipe the cow's udder and teats with the sanitizing solution, using a separate towel for each cow. Put used towels in a separate bucket (Fig. B).

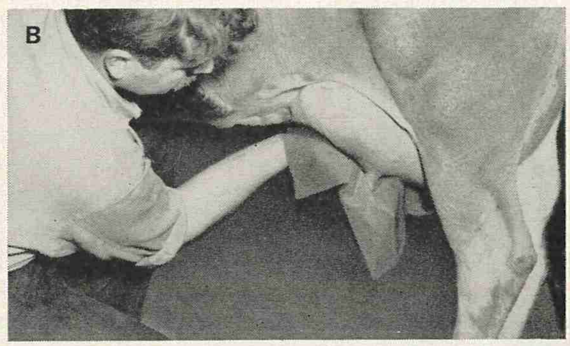
**5.** Milk a few streams from each quarter into a strip cup or black strip plate and check for mastitis. If the milk is clotted, flaky or shows signs of being abnormal, milk that cow last, separate her from the others and notify the veterinarian (Fig. C).

**6.** Between milkings, dip the milking machine teat cups first in a pail of clean water, then in a pail of sanitizing solution.

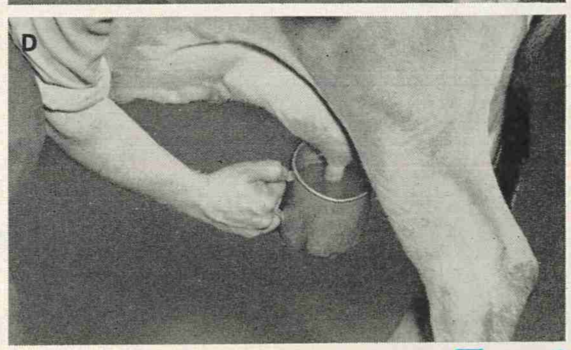
**7.** Dip all teats in fresh sanitizing solution as shown in Fig. D. Fill the cup or dipper from a separate pail (not one used for milking machine teat cups) and pour out the used solution.

**Note:** To avoid injury to cows' teats, maintain the vacuum and pulsation speed recommended by milking machine manufacturers. Remove machines from cows as soon as milking is completed. Use inflations that are in sound and sanitary condition and of proper size.

*B-K and Pennsan are registered trademarks of Pennsalt Chemicals Corp.






B-K Department, Pennsalt Chemicals Corporation
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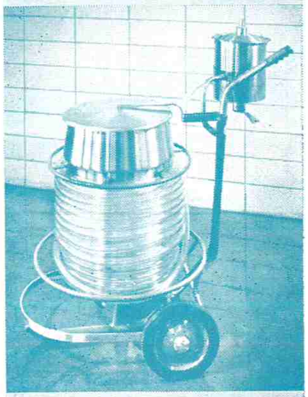

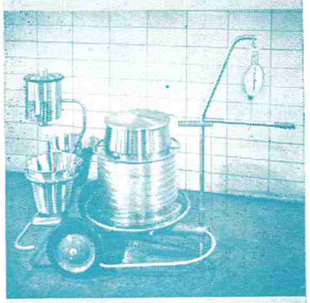

*Editorial*

# Membership

Do we want new members? Oh, yes! New and added interest by old members? Yes, indeed! Are we getting more and more members? Well, not exactly. Additions are barely keeping pace with drop-outs.

Associations and societies cannot judge their success or failure by gross numbers of members. This may be one of the indications of success or failure. But it is only one and *not* the most important of many ways to measure the effectiveness of an association.

To make International Association of Milk, Food and Environmental Sanitarians the dynamic moving influence for the improvement of public health it can and should be, a small amount of money and a large amount of manpower is needed. Each individual member should help first, of course, by prompt payment of dues, but, in addition, by direct participation and involvement in its program and objectives.

Through the unity of purpose provided by a society or organization, the individual multiplies his effectiveness by hundreds or thousands. Remember the old story of the single straw and how easily it was broken? That single straw with 100 others became well nigh unbreakable.

Not only International, but your local or regional association needs you. They need your participation and voice in the many projects to improve environmental health and the professional status of sanitarians. These projects often are the bases on which parts of International's program are built.

Furthermore, not only sanitarians have a stake in the success of the professional associations of sanitarians. The public health worker whose activities have a relationship with environmental health, or who has a keen interest in that area of public health, can help to shape its future by taking part in the democratic process of voicing opinion through these associations.

The will of the majority prevails in all sanitarians' associations. The more people there are who express their will, the more certain it is that the decisions adopted by the associations are truly representative of our profession as a whole and not possibly of some small group or clique with some special purpose in making these decisions.

In proportion as the number rendering their judgment increases, their voice is more likely to be heard and heeded by official authorities and other professional groups. The individual needs the associations as much as they need him.

While you may feel that you need the money you would have to pay for annual dues of local and national associations to meet other current expenses, consider these facts:

1. Dues to sanitarians' associations are probably less than one-tenth of one percent of your annual salary.
2. This money supports activities intended to improve public health practice, professional standards of sanitarians, professional recognition of sanitarians and many other activities. If you don't give your support you are asking your co-workers to carry the burden for you.
3. The publications, newsletters, reprints and other educational information issued by the associations keeps you abreast of new developments in your field of work.
4. As in all professions, you frequently need some reassurance that your work is of value, fills an important need in the community, and fulfills a desire of all people —a sense of being needed and wanted.

You will be surprised how much satisfaction you will find in spending some time with fellow workers, and contemporaries in "of-the-job" situations.

To enjoy all of the benefits of association with thousands of sanitarians and other people in related public health activities, join the International Association of Milk, Food and Environmental Sanitarians — it has much to offer, and it needs your participation in association activities.

If at all possible, join your local or regionel sanitarian association. In all likelihood it is affiliated with one or more of the national organizations.

No sanitarian can find complete satisfaction in his job. Lend a hand in improving professional development, sanitation standards and practices, work conditions, compensation and recognition. Don't remain an isolated individual — don't be a single straw in the wind.

William V. Hickey, *Chairman*
Membership Committee

**Opinions expressed in this editorial are those of the author and do not necessarily represent those of the Association.**

# 3-A ACCEPTED PRACTICES FOR SUPPLYING AIR UNDER PRESSURE IN CONTACT WITH MILK, MILK PRODUCTS AND PRODUCT CONTACT SURFACES

*Formulated by*

*International Association of Milk, Food and Environmental Sanitarians*
*United States Public Health Service*
*The Dairy Industry Committee*

It is the purpose of the IAMFES, USPHS and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius or new developments. Practices for supplying air under pressure heretofore or hereafter developed which so differ in material, fabrication and installation or otherwise as not to conform with the following practices, but which, in the opinion of the operator, manufacturer or fabricator are equivalent or better, may be submitted for the joint consideration of IAMFES, USPHS, and DIC, at any time.

## A. *SCOPE*

These 3-A Accepted Practices shall pertain to the equipment used in the supplying of air under pressure which comes in contact with milk or milk products and/or any product contact surface.

All equipment for supplying air as defined herein shall be considered meeting these 3-A Accepted Practices when they comply with C. Material, D. Fabrication and Installation, and the applicable Special Requirements E., F., or G., as specified hereafter.

## B. *DEFINITIONS*

(1) *AIR UNDER PRESSURE*: Shall mean air, the pressure of which has been increased by mechanical means to exceed atmospheric pressure, and which is used for agitation of milk and milk products, the movement of milk and milk products, incorporation of air into ice cream and frozen dessert mixes, and whipped butter, the automatic opening of containers, the drying of product contact surfaces, and for other purposes where specifically directed at a product contact surface.

(2) *AIR SYSTEMS*: Air systems are of two general categories:

(a) *CENTRAL SYSTEM*: Shall mean those which furnish air to more than one piece of equipment. (See Figure No. 1). Such systems usually require the use of an air storage tank.

(b) *INDIVIDUAL SYSTEM*: Shall mean those which furnish air to one piece of equipment, and which may be an integral part of a given piece of equipment. (See Figures No. 2, No. 3, and No. 4).

(3) *PRODUCT*: Shall mean milk, milk products, ice cream and frozen dessert mixes, and whipped butter.

(4) *PRODUCT CONTACT SURFACE*: Shall mean all surfaces that are exposed to the product, or from which liquid may drain, drop, or be drawn into the product.

(5) *NON PRODUCT CONTACT SURFACE*: Shall mean all other exposed surfaces.

## C. *MATERIAL*

(1) *FILTER MEDIA*

(a) *FOR INTAKE AND AIR PIPELINE FILTERS*: Intake and air pipelines filters shall consist of fiberglass, cotton flannel, wool flannel, spun metal, electrostatic, or other equally acceptable filtering media, which are non-shedding and which do not release to the air toxic volatiles, or volatiles which may impart any flavor or odor to to the product.

(b) *FOR DISPOSABLE MEDIA FILTERS*: Disposable media shall consist of cotton flannel, wool flannel, spun metal, non-woven fabric, U. S. P. absorbent cotton fibre, or suitable inorganic materials which under conditions of use are non-toxic and non-shedding. Chemical bonding materials contained in the media shall be non-toxic, non-volatile and insoluble under all conditions of use. Disposable media are not intended to be cleaned and re-used.

(2) *FILTER PERFORMANCE*

(a) *INTAKE FILTERS*: The efficiency of intake filters shall be at least 50% as measured by the National Bureau Standards "Dust Spot Method",* using atmospheric

*For a description of this method see:
Dill, R. S. – A test method for air filters. Amer. Soc. Heating and Vent Eng. Trans., Vol. 44, P. 379, 1938.

dust as the test aerosol. In an aggravated atmospheric environment, e.g. industrial districts, prefilters are recommended to prolong the useful life of intake filters.

(b) *AIR PIPELINE AND DISPOSABLE FILTERS*: The efficiency of either air pipeline filters or disposable filters shall be at least 50% as measured by the DOP** test.

(3) *PIPING*: Air distribution piping, fittings, and gaskets between the downstream terminal filter and the processing equipment except where the compressing equipment is of the fan or blower type shall conform to 3-A "Sanitary Standards For Fittings Used on Milk and Milk Products Equipment And Used On Sanitary Lines Conducting Milk And Milk Products", and Supplements thereto except that where air distribution piping, or fittings and gaskets do not actually contact the product or form a part of the product contact surfaces, transparent plastic tubing may be used.

D. *FABRICATION AND INSTALLATION*

(1) *AIR SUPPLY EQUIPMENT*: The compressing equipment shall be of such design so as to preclude contamination of the air with lubricant vapors and fumes. Oil-free air may be produced by one of the following known methods or its equivalent:

(a) Use of carbon ring piston compressor.

(b) Use of oil-lubricated compressor with effective provision for removal of any oil vapor by cooling the compressed air.

(c) High pressure water-lubricated or non-lubricated blowers.

The air supply shall be taken from a clean space or from relatively clean outer air and shall pass through a filter upstream from the compressing equipment. This filter shall be so located and constructed that it is easily accessible for examination, and the filter media are easily removable for cleaning or replacement. This filter shall be protected from weather, drainage, water, product spillage, and physical damage.

Where it is necessary to store air, an air tank(s), if used, should meet the requirements of ASME and/or National Board of Underwriters Code for unfired pressure vessels.

(2) *MOISTURE REMOVAL EQUIPMENT*: If necessary to cool the compressed air, a liquid-cooled aftercooler shall be installed between the compressor and the air storage tank for the purpose of removing moisture from the compressed air, except that a compressor the design of which incorporates the aftercooling function does not require a separate aftercooler. (See Figure No. 1). Other moisture removal equipment may be used downstream from the compressing equipment prior to the final point of application. The resultant condensate from the aftercooler shall flow to a properly trapped outlet and shall be discharged to the atmosphere.

(3) *FILTERS AND MOISTURE TRAPS*:

(a) Filters shall be constructed so as to assure effective passage of air through the filter media only.

(b) The air under pressure shall pass through an oil-free filter and moisture trap for removal of solids and liquids. The filter and trap shall be located in the air pipeline downstream from the compressing equipment, and from the air tank, if one is used (See Figures No. 1 and No. 2). The filter shall be readily accessible for examination, cleaning, and for replacing the filter media. The moisture trap shall be equipped with a petcock or other means for draining accumulated water. Air pipeline filters and moisture traps downstream from compressing equipment shall not be required where the compressing equipment is of the fan or blower type (See Figures No. 3 and No. 4).

(c) A disposable media filter shall be located in the sanitary air pipeline upstream from from and as close as possible to each point of application or ultimate use of the air (See Figures No. 1 and No. 2) except that a disposable media filter shall not be required where the compressing equipment is of the fan or blower type (See Figures No. 3 and No. 4).

(4) *AIR PIPING*: The requirements of D. (4) (a) which follow do not apply where the compressing equipment is of the fan or blower type.

(a) The air piping from the compressing equipment to the filter and moisture trap described under D. (3) (b) shall be readily drainable.

**Dioctyphthalate fog method ("DOP"). For a description of this test see:

Military Standard No. 282 (MIL-STD-282, 28 May 1956) Method 102.9.1 Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pa.

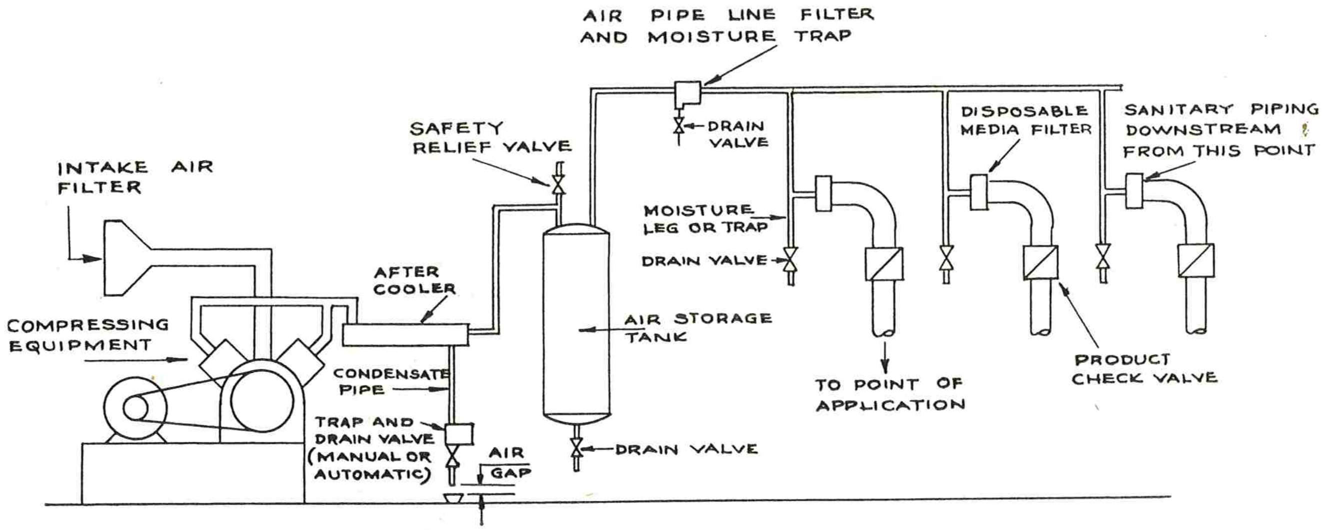


FIG. 1 CENTRAL SYSTEM

(b) A product check valve of sanitary design which complies with the criteria set forth in Supplement No. 3 to the 3-A "Sanitary Standards For Fittings Used On Milk And Milk Products Equipment And Used On Sanitary Lines Conducting Milk And Milk Products" shall be installed in the air piping downstream from the disposable media filter described in D. (3) (c) to prevent backflow of product into the air pipeline; except that a check valve shall not be required if the air piping enters the product zone from a point higher than the product overflow level which is open to atmosphere.

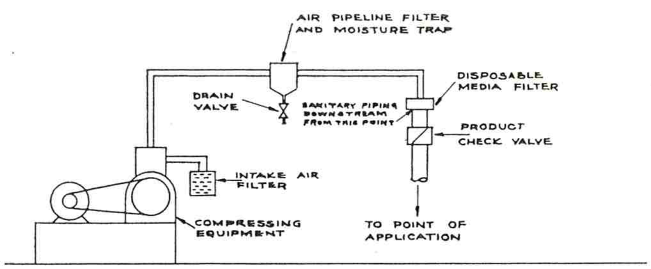


FIG. 2 INDIVIDUAL SYSTEM

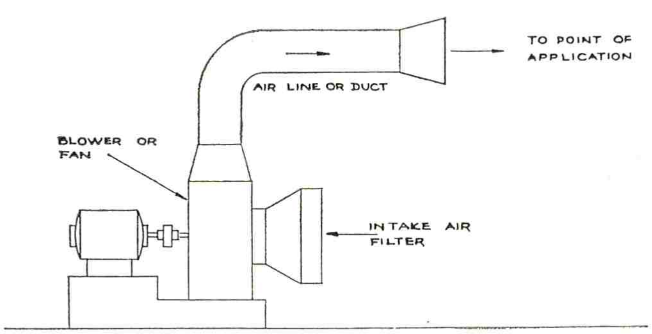


FIG. 3 INDIVIDUAL SYSTEM

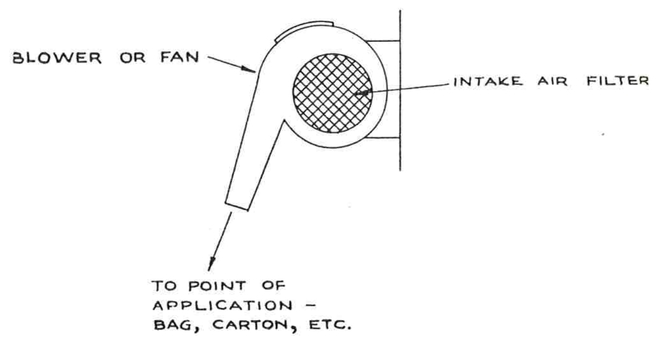


FIG. 4 INDIVIDUAL SYSTEM

E. *SPECIAL REQUIREMENTS FOR AGITATION BY AIR*

(1) Tubing used to introduce air into the product and/or product zone shall be of stainless steel and shall conform to 3-A "Sanitary Standards For Fittings Used On Milk And Milk Products Equipment And Used On Sanitary Lines Conducting Milk And Milk Products."

(2) No threaded fitting shall be used in the product zone.

(3) Where drilled or perforated pipe is used, internal drilling burrs shall be removed and the orifices shall be chamfered on the outer surface of the pipe.

(4) If the volume of the air from the compressing equipment is in excess of that required for satisfactory agitation, suitable means should be employed to eliminate the excess volume.

(5) If the product to be agitated is in an enclosed tank, means to allow the air used for agitation to escape should be provided on the tank by a vent or a safety valve as described in F. (2).

F. *SPECIAL REQUIREMENTS FOR THE MOVEMENT OF PRODUCTS BY THE AIR DISPLACEMENT METHOD*

(1) The requirements of E. (1), E. (2) and E. (3) shall also apply to this section.

(2) A safety (pressure relief) valve should be installed in the air line. This valve should be set to open upon reaching a pressure not greater than the maximum allowable internal working pressure specified by the manufacturer of tank from which the product is to be moved. This safety valve should have ample capacity to pass freely the entire output of the compressor.

(3) The safe internal working pressure of the tank should be stated on a plate attached to the tank.

(4) The check valve specified in D. (4) (b) shall be installed in the air piping wherever air is used for displacement purposes.

G. *SPECIAL REQUIREMENTS FOR AIR WHICH IS TO BE INCORPORATED IN PRODUCTS*

An air system in which the air is compressed by a sanitary rotary pump shall require only an intake air filter which shall be of the disposable media type. Non-sanitary air line should be pitched away from sanitary air inlet pipeline, or a transparent sump shall be provided to collect any moisture or scale that may originate from the non-sanitary air line.

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These accepted practices shall become effective July 26, 1964.

Selected Reference

Friedlander, Silverman, et al — Handbook on air cleaning. Atomic Energy Commission, 1952. U. S. Gov't Printing Office, Washington 25, D. C. 45c.

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# AMENDMENT TO SANITARY STANDARDS FOR STAINLESS STEEL AUTOMOTIVE MILK TRANSPORATION TANKS FOR BULK DELIVERY AND/OR FARM PICK-UP SERVICE

Serial #0504

*Formulated by*
*International Association of Milk, Food and Environmental Sanitarians*
*United States Public Health Service*
*The Dairy Industry Committee*

The 3-A "Sanitary Standards For Stainless Steel Automotive Milk Transportation Tanks For Bulk Delivery And/Or Farm Pick-Up Service" amended April 28, 1954, Serial #0501, are hereby further amended in the sections indicated below.

The following new paragraph A-9 is added:

9. *Rubber and Rubber-Like Materials*: All rubber and rubber-like materials when used for specified applications shall conform to the applicable provisions of "3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Serial #1800".

The following sentence is added to paragraph H-5.:

When rubber-like material is used it shall conform to the applicable provisions of "3-A Sanitary Standards for Multiple- Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Serial #1800".

This amendment shall become effective July 26, 1964.

# AMENDMENT TO 3-A SANITARY STANDARDS FOR MILK AND MILK PRODUCTS FILTERS USING DISPOSABLE FILTER MEDIA

Serial #1001

*Formulated by*
*International Association of Milk, Food and Environmental Sanitarians*
*United States Public Health Service*
*The Dairy Industry Committee*

The "3-A Sanitary Standards For Milk And Milk Products Filters Using Disposable Filter Media" dated June 5, 1950, Serial #1000, are hereby amended by substituting the following for section D.

D. Gaskets

1. Single service gaskets of the sanitary type are preferred, or removable rubber or rubber-like gaskets may be used. If made of rubber or rubber-like materials, they shall conform to the applicable provisions of the "3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Serial #1800".

This amendment shall become effective July 26, 1964.

# AMENDMENT TO SANITARY STANDARDS COVERING HOMOGENIZERS AND HIGH PRESSURE PUMPS OF THE PLUNGER TYPE

Serial #0401

*Formulated by*
*International Association of Milk, Food and Environmental Sanitarians*
*United States Public Health Service*
*The Dairy Industry Committee*

The 3-A "Sanitary Standards Covering Homogenizers And High Pressure Pumps Of The Plunger Type" dated June 23, 1947, Serial #0400, are hereby amended in the section indicated below.

The following sentence is added to paragraph D. 1.:

If of rubber or rubber-like materials they shall conform to the applicable provisions of "3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Serial #1800".

This amendment shall become effective July 26, 1964.

# AMENDMENT TO 3-A SANITARY STANDARDS FOR FARM MILK COOLING AND HOLDING TANKS – REVISED

Serial #1302

*Formulated by*
*International Association of Milk, Food and Environmental Sanitarians*
*United States Public Health Service*
*The Dairy Industry Committee*

The "3-A Sanitary Standards For Farm Milk Cooling and Holding Tanks–Revised, Serial #1301", are hereby amended in the section indicated below.

The following paragraph is added to Section A-7 following sub-paragraph (h):

These parts if made of rubber or rubber-like materials shall conform to the applicable provisions of the "3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Serial #1800".

This amendment shall become effective July 26, 1964.

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# AMENDMENT TO SANITARY STANDARDS FOR THERMOMETER FITTINGS AND CONNECTIONS ON MILK AND MILK PRODUCTS EQUIPMENT

Serial #0902

*Formulated by*
*International Association of Milk, Food and Environmental Sanitarians*
*United States Public Health Service*
*The Dairy Industry Committee*

The 3-A "Sanitary Standards For Thermometer Fittings And Connections Used On Milk and Milk Products Equipment" dated March 29, 1950, Serial #0900, are hereby amended by substituting the following for section C.

C. Gaskets:

Single service gaskets having product contact surfaces, if used, shall be of the sanitary type. The material used for multiple service gaskets of the rubber or rubber-like type shall conform to the applicable provisions of the "3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Serial #1800".

This amendment shall become effective July 26, 1964.

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# AMENDMENT TO 3-A SANITARY STANDARDS OF PLATE TYPE HEAT EXCHANGERS FOR MILK AND MILK PRODUCTS

Serial #1101

*Formulated by*
*International Association of Milk, Food and Environmental Sanitarians*
*United States Public Health Service*
*The Dairy Industry Committee*

The "3-A Sanitary Standards Of Plate Type Heat Exchangers For Milk And Milk Products" dated September 1951, Serial #1100, are hereby amended by adding he following sentence to subsection D. 2.

Rubber and rubber-like gasket material shall conform to the applicable provisions of the "3-A Sanitary Standards For Multiple-Use Rubber And Rubber-Like Materials Used As Product Contact Surfaces In Dairy Equipment, Serial #1800".

This amendment shall become effective July 26, 1964.

# AMENDMENT TO SANITARY STANDARDS FOR FITTINGS USED ON MILK AND MILK PRODUCTS EQUIPMENT AND USED ON SANITARY LINES CONDUCTING MILK AND MILK PRODUCTS

Serial #0807

*Formulated by*
*International Association of Milk, Food and Environmental Sanitarians*
*United States Public Health Service*
*The Dairy Industry Committee*

The 3-A "Sanitary Standards for Fittings Used on Milk and Milk Products Equipment and Used on Sanitary Lines Conducting Milk and Milk Products" dated March 29, 1950, Serial #0800, are amended by substituting the following Section A. Material for the Section A. Material in the original Standards dated March 29, 1950:

A. *MATERIAL*

All 3-A standard sanitary fittings shall be constructed throughout of stainless steel, or equally corrosion resistant metal, or nickel alloy, that is nontoxic and nonabsorbent except as provided in (c) below:

(a) All metal product contact surfaces shall be finished to an equivalent of not less than 120 grit finish properly applied.

(b) All outside surfaces shall be smooth.

(c) Plug type sanitary valves, other than leak protector valves, may have plugs covered with rubber or rubber-like materials. Rubber and rubber-like materials used shall be of such composition as to retain their surface and conformation characteristics encountered in the environment of intended use and in cleaning and bactericidal treatment. The rubber or rubber-like coating of sanitary valve plugs shall be bonded in such manner that the bond is continuous and mechanically sound, and so that in the environment of its intended use the rubber or rubber-like material does not separate from the base material. Valve plug cores, if completely covered with rubber or rubber-like materials, may be made of metal, plastic, rubber or rubber-like materials.

(d) All rubber and rubber-like materials when used for specified applications shall conform to the applicable provisions of the "3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used As Product Contact Surfaces in Dairy Equipment, Serial #1800".

This amendment shall become effective July 26, 1964.

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# AMENDMENT TO SUPPLEMENT NO. 5 TO THE 3-A SANITARY STANDARDS FOR FITTINGS USED ON MILK AND MILK PRODUCTS EQUIPMENT AND USED ON SANITARY LINES CONDUCTING MILK AND MILK PRODUCTS

Serial #0805A

*Formulated by*
*International Association of Milk, Food and Environmental Sanitarians*
*United States Public Health Service*
*The Dairy Industry Committee*

"Supplement No. 5 to the 3-A Sanitary Standards for Fittings Used on Milk and Milk Products Equipment and Used on Sanitary Lines Conducting Milk and Milk Products" dated April 26, 1955, Serial #0805, is amended by substituting the following for the third paragraph of section I. Fitting Name, and the second paragraph of section II. Fitting Name:

The valve may be metal to metal or rubber or rubber-like material to metal seat. Grooves for removable rubber or rubber-like parts shall be readily cleanable. Rubber or rubber-like material either removable or bonded shall conform to the applicable provisions of A. Material of the 3-A "Sanitary Standards for Fittings Used on Milk and Milk Products Equipment and Used on Sanitary Lines Conducting Milk and Milk Products" dated March 29, 1950, Serial #0800, as amended by Amendment Serial #0807 dated July 26, 1964.

This amendment shall become effective July 26, 1964.

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## AMENDMENT TO 3-A SANITARY STANDARDS FOR FILLERS AND SEALERS OF SINGLE SERVICE CONTAINERS FOR MILK AND FLUID MILK PRODUCTS

Serial #1701

*Formulated by*
*International Association of Milk, Food and Environmental Sanitarians*
*United States Public Health Service*
*The Dairy Industry Committee*

The "3-A Sanitary Standards For Fillers And Sealers of Single Service Containers For Milk And Fluid Milk Products, Serial #1700," are hereby amended by substituting the following for subsection (c) in section C. (1).

Rubber and rubber-like materials may be used for filling nozzles, plungers, gaskets, diaphragms, sealing rings, drip shields, container opening and closing parts, filling valve members, seals and parts used in similar applications. These materials shall conform to the applicable provisions of the "3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces In Dairy Equipment, Serial #1800".

This amendment shall become effective July 26, 1964.

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## AMENDMENT TO 3-A STANDARDS FOR INTERNAL RETURN TUBULAR HEAT EXCHANGERS FOR USE WITH MILK AND MILK PRODUCTS

Serial #1201

*Formulated by*
*International Association of Milk, Food and Environmental Sanitarians*
*United States Public Health Service*
*The Dairy Industry Committee*

The "3-A Sanitary Standards For Internal Return Tubular Heat Exchangers For Use With Milk And Milk Products,, approved April 29, 1952, Serial #1200, are hereby amended by substituting the following for subsection D. 3.

D. Header Gaskets

3. Single-service gasket material shall be of a type that is smooth, non-toxic, relatively fat resistant, and non-absorbent. Rubber and rubber-like gasket material shall conform to the applicable provisions of the "3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Serial #1800".

This amendment shall become effective July 26, 1964.

# AMENDMENT TO 3-A SANITARY STANDARDS FOR MILK AND MILK PRODUCTS EVAPORATORS AND VACUM PANS

Serial #1601

*Formulated by*
*International Association of Milk, Food and Environmental Sanitarians*
*United States Public Health Service*
*The Dairy Industry Committee*

The "3-A Sanitary Standards for Milk and Milk Products Evaporators" dated March 1, 1957, Serial #1600, are hereby amended in the section indicated below and a subsection is added.

The following is substituted for subsection C-(1) (b).

C-(1) (b)—Multi-use gaskets shall be made of a rubber or rubber-like material. Single service gaskets may be used.

A subsection C-(1) (d) is added.

C-(1) (d)—The rubber or rubber-like materials used to make gaskets or non-metallic parts shall conform to the applicable provisions of the "3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Serial #1800".

This amendment shall become effective July 26, 1964.

## NOTICE TO MEMBERSHIP

Amendment to the Constitution, Article IV, Section I as published in Vol. 26, No. 12, December 1963 issue is hereby declared as officially passed by more than a two-thirds majority in accordance with the voting procedure on a mail ballot.

KARL K. JONES
Secretary-Treasurer
International Association of Milk, Food and Environmental Sanitarians, Inc.

# 3-A SANITARY STANDARDS FOR MULTIPLE-USE PLASTIC MATERIALS USED AS PRODUCT CONTACT SURFACES FOR DAIRY EQUIPMENT

Serial #2000[1]

*Formulated by*

*International Association of Milk, Food and Environmental Sanitarians*
*U. S. Public Health Service*
*The Dairy Industry Committee*

It is the purpose of the IAMFES, USPHS and DIC in connection with the development of the 3-A Sanitary Standards Program to allow and encourage full freedom for inventive genius or new developments. Multiple-Use Plastic Materials Used As Product Contact Surfaces For Dairy Equipment heretofore or hereafter developed which so differ in specifications or otherwise as not to conform with the following standards, but which, in the fabricator's opinion are equivalent or better, may be submitted for the joint consideration of the IAMFES, USPHS and DIC at any time.

A. *SCOPE*

These sanitary standards cover the requirements of plastic materials for multiple-use as product contact surfaces in equipment for production, processing and handling of milk and milk products. Test criteria are provided for plastic materials as a means of determining their acceptance as to their ability to be cleaned and to receive effective bactericidal treatment and to maintain their essential properties under repeated use conditions. These standards do not apply to plastics for single service application nor plastics which are of rubber or rubber-like origin resulting from chemical or thermal vulcanization or curing. In order to conform with these 3-A Sanitary Standards, multiple-use plastic materials shall comply with the following material, fabrication, and standards for acceptability criteria.

B. *DEFINITIONS*

(1) *PRODUCT*: Shall mean the milk or milk product which is processed in contact with plastic surfaces.

(2) *PRODUCT CONTACT SURFACES*: Shall mean all surfaces which are exposed to the product, surfaces from which liquids may drain, drop, or be drawn into the product or into the container and surfaces that touch product contact surfaces of the container.

(3) *PLASTIC*: Shall mean materials as defined in ASTM D 883-59T under "plastic," "thermoplastic," "thermosetting," "elastomer," except those materials included under the "3-A Sanitary Standards for Multiple-Use Rubber and Rubber-like Materials Used as Product Contact Surfaces in Dairy Equipment, Serial #1800." From ASTM D 883-59T:

Plastic, n.—A material that contains as an essential ingredient an organic substance of large molecular weight, is solid in its finished state, and, at some stage in its manufacture or in its processing into finished articles, can be shaped by flow.

Plastic, adj.—The adjective "plastic" indicates that the noun modified is made of, consists of, or pertains to plastic.

Thermoplastic, n.—A plastic which is thermoplastic in behavior.

Thermoplastic, adj.—Capable of being repeatedly softened by increase of temperature and hardened by decrease of temperature.

Note: Thermoplastic applies to those materials whose change upon heating is substantially physical.

Thermoset, n.—A plastic which, when cured by application of heat or chemical means, changes into a substantially infusible and insoluble product.

Thermoset, adj.—Capable of being changed into substantially infusible and insoluble product when cured under application of heat or chemical means.

Elastomer, n.—A material which at room temperature can be stretched repeatedly to at least twice its original length and upon immediate release of the stress, will return with force to its approximate original length.

(4) *FABRICATION*: Shall mean the standard techniques of the plastic industry for forming and shaping parts.

(5) *REFERENCES*: See Appendix D.

C. *MATERIALS*

Plastic materials used as product contact surfaces shall be non-toxic, shall comply with Section I. Stand-

[1]Pre-printed separates of these Standards were distributed to the 3A Sanitary Standards Committees on October 1, 1963, as a result of the subsequent FDA clearance and cleanability evaluation of new materials, an addition has been made to the list of generic classes shown in Section I.(2) herein.

ards for Acceptability, shall be relatively resistant to abrasion, and shall maintain their original characteristics such as form, shape, flexibility and dimensions when subjected to normal cleaning and bactericidal treatment.[1] Plastic materials complying with Section I. shall be considered to be relatively non-absorbent, relatively resistant to fat, and relatively insoluble when subjected to normal cleaning and bactericidal treatment.[1]

Functional properties of plastic materials such as color, transparency, or translucency shall be relatively retained in the environment of its intended use, and in cleaning and bactericidal treatment.[1] Only virgin, unadulterated, first run plastic materials shall be used in the fabrication of plastic equipment and/or parts.

D. *FABRICATION*

The surface finish of plastic materials shall comply with subsection (3) of Section I. Standards for Acceptability.

E. *PREPARATION FOR CLEANABILITY RESPONSE, PRODUCT TREATMENT AND CLEANABILITY COMPARISONS PROCEDURES*

(1) *APPARATUS*

Appropriate glassware, oven, hot plate, analytical balance, wide field microscope or magnifying lens, sample of 18-8 stainless steel sheet, having a 120 grit finish properly applied.

(2) *TEST SOLUTIONS (SIMULATED REAGENTS)*

(a) Test Solution A (Acid Cleaner)
Acid Solution: 2% Orthophosphoric Acid

(b) Test Solution B (Alkaline Cleaner)
Sodium tripolyphosphate, 15%
Sodium hydroxide, 80%
Trisodium phosphate, 3%
Synthetic detergent, anionic type, 2%

Above to be equivalent to 63% $Na_2O$. Dissolve in water to produce a 2.5% solution by weight.

(c) Test Solution C (Alkaline Chlorine Sanitizer)
Hypochlorite solution: sodium hypochlorite, 400 ppm in water, adjusted to pH 8.0 $\pm$ 0.5 with sodium bicarbonate

(d) Test Solution D (Acid Chlorine Sanitizer)

| | |
|---|---|
| Dichloroisocyanurate, potassium salt (ACL 59 Monsanto) | 15.0% |
| Monosodium phosphate, anhydrous | 60.0% |
| Sodium sulfate, anhydrous | 25.0% |

Dilute above with distilled water to give a test solution containing 400 ppm of available chlorine.

(e) Test Solution E (Quaternary Ammonium Sanitizer)
Alkyl di methyl benzyl ammonium chloride, 400 ppm in water.

(f) Test Solution F (Iodophor Sanitizer)

| | |
|---|---|
| Nonylphenol ethylene oxide condensate, 9-1/2 to 10 moles ethylene oxide | 15.0% |
| Iodine to provide 1.75% available iodine | 2.45% |
| Orthophosphoric acid-100% basis | 15.0% |
| Water | 67.55% |

Dilute above with distilled water to give a test solution containing 50 ppm of available iodine.

(g) Test Solution G (Acid Anionic Sanitizer)

| | |
|---|---|
| Orthophosphoric acid–100% basis | 21.0% |
| Dodecyl benzene sulfonic acid, sodium salt | 2.75% |
| Nonionic wetting agent | 1.00% |
| Water | 75.25% |

Dilute above with distilled water to give a test solution of 400 ppm of active anionic.

(h) Test Solution H (Simulated Dairy-Soil Solution)

| | |
|---|---|
| Cream (27% butter fat) | 55.6% |
| Nonfat dry milk | 8.7% |
| Sucrose | 15.0% |
| Water | 20.7% |

To give a composition of:
15.0% Fat
12.0% Milk-solids-not-fat
15.0% Sugar
58.0% Water

(i) Test Solution I (Dairy Product, High Fat Medium)
Pasteurized cream, minimum 36% butterfat

(j) Test Solution J (Dairy Product, Acid Medium)
Lactic acid, 3.0% in aqueous solution

(3) *TEST SPECIMENS*

(a) Test Specimens, when prepared for testing shall have a surface at least as smooth as stainless steel having a 120 grit finish properly applied and shall have a total exposed surface area of 7.0 $\pm$ 0.1 square inches.

(aa) Molded test specimen shall be in the form of a disk 2 inches in diameter and 1/8 inch in thickness. Permissible variations in thickness are plus or minus 0.007 inch for hot molded and plus or minus 0.012 inch for cold molded or cast materials. The disk mold prescribed in Section

[1]Procedures in sections F and G are not normal cleaning and bactericidal treatment tests, but are accelerated use-simulating tests.

3 of ASTM D 647 is suitable for molding disk specimens of thermosetting materials, and Section 5 of ASTM D 647 is suitable for injection molding of thermoplastic materials.

(bb) Sheet test specimen shall be in the form of a bar 3 inches in length and 1 inch in width, which for comparison, shall be 1/8 ± 0.008 inch thick (Surface area, 7.0 ± 0.1 sq. in.)

(cc) Rod test specimen shall be of normal diameter as received, and cut to proper length to produce the required surface area of 7.0 ± 0.1 square inches. The diameter of the specimen shall be the diameter of of the rod.

(dd) Tube test specimen of less than 3 inches in diameter shall be the full section of the tube cut to proper length to produce the required surface area of 7.0 ± 0.1 square inches including as the exposed surface area the outside, inside, and ends of the tube. For a tube having an inside diameter of 3 inches or more, a rectangular specimen shall be cut 3 inches in length laterally to the tube or cut to proper length and width to produce the required surface area of 7.0 ± 0.1 square inches including as the exposed area the outside, inside, and ends of the cut section.

(b) Test specimens from sheets, rods, and tubes shall be machined, punched, sawed or sheared from the sample and so treated on such surfaces as to have edges free from cracks, rough surfaces and loose material.

(4) *CONDITIONING OF TEST SPECIMEN*
All test specimens pre-conditioned to equilibrium in a Standard Laboratory Atmosphere (see E. (5) below) for water content at Room Temperature shall be cleaned using Test Solution B (Alkali Solution) at 165-170°F., with 6 repeated one minute immersions, followed by thorough cold water rinsing and drying at room temperature for 24 hours.

(5) *DEFINITIONS OF TERMS RELATING TO TESTING*
Room Temperature—defined in ASTM E-41-57T.
Standard Laboratory Atmosphere—a relative humidity of 50 ± 2% at a temperature of 23 ± 1°C. or 73.4 ± 1.8°F.
Hot Water—from 95 to 115°F.
Cold Water—from 45 to 65°F.

(6) *NUMBER OF TEST SPECIMENS*
Two sets (Set M and Set M¹) of eight specimens each and two sets (Set L and Set L¹) of eight specimens each shall be identified and treated as:

| Set M and M¹ | Set L and L¹ | For Tests in: |
|---|---|---|
| M-0: M¹-0 | L-0: L¹-0 | Controlled, Distilled water |
| M-1: M¹-1 | L-1: L¹-1 | Solutions A-B |
| M-2: M¹-2 | L-2: L¹-2 | Solutions A-B-H-A-B |
| M-3: M¹-3 | L-3: L¹-3 | Solutions A-B-C-H-A-B-C |
| M-4: M¹-4 | L-4: L¹-4 | Solutions A-B-D-H-A-B-D |
| M-5: M¹-5 | L-5: L¹-5 | Solutions A-B-E-H-A-B-E |
| M-6: M¹-6 | L-6: L¹-6 | Solutions A-B-F-H-A-B-F |
| M-7: M¹-7 | L-7: L¹-7 | Solutions A-B-G-H-A-B-G |

An extra molded test specimen or a piece of the sheet, rod or tube shall be available for the comparisons required in F.(10)(b)(1) and G.(3)(b)(1).

F. *PROCEDURE—CLEANABILITY RESPONSE*[1]

(1) After conditioning the test specimens according to section E.(4) above, all samples to be weighed ($W_1$). After ($W_1$) has been determined:

(2) Specimen M-0, M¹-0 and L-0, L¹-0 are:
(a) Immersed in distilled water, 165-170°F., 60 minutes.
(b) Rinsed, hot water.
(c) Dried, room temperature, 20 hours.
(d) Re-weighed ($W_2$).

(3) Specimen M-1, M¹-1 and L-1, L¹-1 are:
(a) Immersed in Solution A, 165-170°F., 30 minutes.
(b) Rinsed, hot water.
(c) Immersed in Solution B, 165-170°F., 30 minutes.
(d) Rinsed, hot water.
(e) Dried, room temperature, 20 hours.
(f) Re-weighed ($W_2$).

(4) Specimen M-2, M¹-2 and L-2, L¹-2 are:
(a) Immersed in Solution A, 165-170°F., 15 minutes.
(b) Rinsed, hot water.
(c) Immersed in Solution B, 165-170°F., 15 minutes.
(d) Rinsed, hot water.
(e) Immersed in Solution H, room tempera-

[1]Procedures in sections F and G are not normal cleaning and bactericidal treatment tests but are accelerated use-simulating tests.

ture, 20 hours.
(f) Rinsed, hot water.
(g) Immersed in Solution A, 165-170°F., 15 minutes.
(h) Rinsed, hot water.
(i) Immersed in Solution B, 165-170°F., 15 minutes.
(j) Rinsed, hot water.
(k) Dried, room temperature, 20 hours.
(l) Re-weighed ($W_2$).

(5) Specimen M-3, $M^1$-3 and L-3, $L^1$-3 are:
(a) Immersed in Solution A, 165-170°F., 15 minutes.
(b) Rinsed, hot water.
(c) Immersed in Solution B, 165-170°F., 15 minutes.
(d) Rinsed, cold water.
(e) Immersed in Solution C, room temperature, 60 minutes.
(f) Rinsed, hot water.
(g) Immersed in Solution H, room temperature, 20 hours.
(h) Rinsed, cold water.
(i) Immersed in Solution A, 165-170°F., 15 minutes.
(j) Rinsed, hot water.
(k) Immersed in Solution B, 165-170°F., 15 minutes.
(l) Rinsed, cold water.
(m) Immersed in Solution C, room temperature, 60 minutes.
(n) Rinsed, hot water.
(o) Dried room temperature, 20 hours.
(p) Re-weighed ($W_2$).

(6) Specimen M-4, $M^1$-4 and L-4, $L^1$-4 are: Identical to regimen stated in paragraph (5) for M-3, $M^1$-3 and L-3, $L^1$-3 except: Use Solution D in place of Solution C.

(7) Specimen M-5, $M^1$-5 and L-5, $L^1$-5 are: Identical to regimen stated in paragraph (5) for M-3, $M^1$-3 and L-3, $L^1$-3 except: Use Solution E in place of Solution C.

(8) Specimen M-6, $M^1$-6 and L-6, $L^1$-6 are: Identical to regimen stated in paragraph (5) for M-3, $M^1$-3 and L-3, $L^1$-3 except: Use Solution F in place of Solution C.

(9) Specimen M-7, $M^1$-7 and L-7, $L^1$-7 are: Identical to regimen stated in paragraph (5) for M-3, $M^1$-3 and L-3, $L^1$-3 except: Use Solution G in place of Solution C.

(10) Report the following: (For Report Form, see Appendix A)
(a) Calculated per cent weight loss or gain—

$$\%\ \text{Loss} = \frac{W_1 - W_2}{W_1} \times 100$$

$$\%\ \text{Gain} = \frac{W_2 - W_1}{W_1} \times 100$$

(b) Comparison made visually with the aid of magnification
(1) The test specimen is compared with the original as to change in surface smoothness as: NO CHANGE, SLIGHT CHANGE, or MARKED CHANGE.
(2) The rating as to the smoothness of the test specimen compared to the sample of 18-8 stainless steel sheet having a 120 grit finish properly applied: SMOOTHER, EQUAL, or ROUGHER.
(3) Report under "Remarks" other apparent changes, such as: surface tack, exudation, cracks and other surface discontinuities, color changes, changes in transparency, permanent or temporary visual changes, distortions in shape, dimension, delaminations, and changes in surface tension.

G. *PROCEDURE—PRODUCT TREATMENT*[1]

The test specimens which were treated in section F—"Cleanability Response", are to be *further* tested as follows:

(1) Immerse Set M and $M^1$ (Specimens M-0 to M-7 and $M^1$-0 to $M^1$-7 inclusive), weighed ($W_2$) in: Test Solution I, at room temperature for a total time of 168 hours, renewing the test Solution I every 24 hours. Test specimens shall be rinsed with cold water to remove old solution prior to re-immersing in renewed solution. At the conclusion of the 168 hours immersion, the specimens shall be removed and cleaned, using Test Solution B at 165-170°F., with 6 repeated one minute immersions, followed by a thorough hot water rinse, dried at room temperature for 20 hours. Re-weighed ($W_3$).

(2) Immerse Set L (Specimens L-0 to L-7 and $L^1$-0 to $L^1$-7 inclusive) weighed ($W_2$) in: Test Solution J, at 155-160°F., for a total time of 168 hours, renewing the test Solution J every 24 hours. Test specimens shall be rinsed with cold water to remove old solution prior to re-immersing in renewed solution. At the con-

[1]Procedures in sections F and G are not normal cleaning and bactericidal treatment tests but are accelerated use-simulating tests.

clusion of the 168 hours immersion, the specimens shall be removed and cleaned, using Test Solution B at 165-170°F., with 6 repeated one minute immersions, followed by a thorough hot water rinse, dried at room temperature for 20 hours. Re-weighed ($W_3$).

(3) Report the following: (For Report Form see Appendix B)

(a) Calculated per cent weight loss or gain—

$$\% \text{ Loss} = \frac{W_2 - W_3}{W_2} \times 100$$

$$\% \text{ Gain} = \frac{W_3 - W_2}{W_2} \times 100$$

(b) Comparison made visually with the aid of magnification

(1) The test specimen is compared with the original as to change in surface smoothness as: NO CHANGE, SLIGHT CHANGE, or MARKED CHANGE.

(2) The rating as to the smoothness of the test specimen compared to the sample of 18-8 stainless steel sheet having a 120 grit finish properly applied: SMOOTHER, EQUAL, or ROUGHER.

(3) Report under "Remarks" other apparent changes, such as: surface tack, exudation, cracks and other surface discontinuities, color changes, changes in transparency, permanent or temporary visual changes, distortions in shape, dimensions, delaminations, and changes in surface tension.

H. *PROCEDURE—CLEANABILITY COMPARISON*

(1) All of the test specimens after exposure to the regimen set forth in sections F and G are to be immersed in Test Solution H, at room temperature for 20 hours, cleaned using Test Solution B at 165-170°F., with 6 repeated one minute immersions, followed by a thorough hot water rinsing and drying at room temperature for 20 hours.

(2) The sample of 18-8 stainless steel sheet having a 120 grit finish properly applied or a piece of it (approximately 3 inches in length and 1 inch in width) is to be cleaned as set forth in E.(4). This sheet or piece of stainless steel is then to be exposed to the regimen set forth in H.(1).

(3) With the aid of magnification, visually judge the cleanability of the test specimens by comparing them with the sample of 18-8 stainless steel sheet after exposure to the regimen set forth in H.(2). Rate the cleanability of the test specimens as: BETTER, EQUAL, or POORER. (For Report Form see Appendix C.)

I. *STANDARDS FOR ACCEPTABILITY*

Acceptable plastic materials shall comply with the following:

(1) None of the test specimens, after exposure to the regimen set forth in sections F and G, shall have a loss in weight greater than 0.05 percent.

(2) None of the test specimens, after exposure to the regimen set forth in sections F and G, shall have a gain in weight greater than that given for the generic class in the following table.

| Generic Classes of Plastics | Maximum Percent Weight Gain | | |
|---|---|---|---|
| | Cleanability Response (Section F. Regimen) | Product Treatment (Section G. Regimen) Solution I | Product Treatment (Section G. Regimen) Solution J |
| Polyethylene — | | | |
| ASTM Type I | 0.20 | 0.50 | 0.20 |
| ASTM Type II | 0.20 | 0.20 | 0.20 |
| ASTM Type III | 0.20 | 0.20 | 0.20 |
| Polypropylene — (unmodified and modified for impact resistance) | 0.10 | 0.20 | 0.20 |
| Polystyrene — | | | |
| Normal (unmodified), Type 3 of ASTM D 703-56T | 0.10 | 0.10 | 0.10 |
| Modified (impact), Type III, Grade 6 of ASTM D1892-61T | 0.10 | 0.10 | 0.10 |
| Styrene-acrylonitrile | 0.20 | 0.50 | 0.50 |
| Plasticized polyvinyl chloride— | | | |
| (a) For contact with high-water, low-fat products | 0.25 | 0.55 | 0.90 |
| (b) For contact with high-fat products | 0.10 | 0.20 | 0.55 |
| Acrylics | 0.20 | 0.50 | 1.50 |
| Fluorocarbons | 0.05 | 0.05 | 0.05 |
| Polycarbonates | 0.10 | 0.15 | 0.25 |
| Nylon — | | | |
| Nylon Type 66 | 2.00 | 3.00 | 8.00 |
| Nylon Type 610 | 1.00 | 2.00 | 4.00 |
| Chlorinated polyether | 0.05 | 0.05 | 0.05 |

(3) All of the test specimens, after exposure to the regimen set forth in sections F and G, shall be at least as smooth and cleanable as 18-8 stainless steel sheet having a 120 grit finish properly applied. To conform with this, all of the test specimens shall be judged to be SMOOTHER or EQUAL in the comparisons made in accordance to F.(10) (b) (2) and G.(3) (b) (2), and BETTER or EQUAL, in the comparisons made in accordance to H. (3).

These standards shall become effective July 26, 1964.

## APPENDIX A
### Cleanability Response

| SAMPLE NO. | WEIGHT | | SURFACE COMPARISON | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | | | TO ORIGINAL SAMPLE SEE F. (10) (b) (1) | | | TO STAINLESS WITH 120 GRIT FINISH SEE F. (10) (b) (2) | | | |
| | % LOSS | % GAIN | NO CHANGE | SLIGHT CHANGE | MARKED CHANGE | SMOOTHER | EQUAL | ROUGHER | |
| M-0 | | | | | | | | | |
| $M^1$-0 | | | | | | | | | |
| M-1 | | | | | | | | | |
| $M^1$-1 | | | | | | | | | |
| M-2 | | | | | | | | | |
| $M^1$-2 | | | | | | | | | |
| M-3 | | | | | | | | | |
| $M^1$-3 | | | | | | | | | |
| M-4 | | | | | | | | | |
| $M^1$-4 | | | | | | | | | |
| M-5 | | | | | | | | | |
| $M^1$-5 | | | | | | | | | |
| M-6 | | | | | | | | | |
| $M^1$-6 | | | | | | | | | |
| M-7 | | | | | | | | | |
| $M^1$-7 | | | | | | | | | |
| L-0 | | | | | | | | | |
| $L^1$-0 | | | | | | | | | |
| L-1 | | | | | | | | | |
| $L^1$-1 | | | | | | | | | |
| L-2 | | | | | | | | | |
| $L^1$-2 | | | | | | | | | |
| L-3 | | | | | | | | | |
| $L^1$-3 | | | | | | | | | |
| L-4 | | | | | | | | | |
| $L^1$-4 | | | | | | | | | |
| L-5 | | | | | | | | | |
| $L^1$-5 | | | | | | | | | |
| L-6 | | | | | | | | | |
| $L^1$-6 | | | | | | | | | |
| L-7 | | | | | | | | | |
| $L^1$-7 | | | | | | | | | |

## APPENDIX B

### Product Treatment

| SAMPLE NO. | WEIGHT | | SURFACE COMPARISON | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | % LOSS | % GAIN | TO ORIGINAL SAMPLE SEE G. (3) (b) (1) | | | TO STAINLESS WITH 120 GRIT FINISH SEE G. (3) (b) (2) | | | |
| | | | NO CHANGE | SLIGHT CHANGE | MARKED CHANGE | SMOOTHER | EQUAL | ROUGHER | |
| M-0 | | | | | | | | | |
| M¹-0 | | | | | | | | | |
| M-1 | | | | | | | | | |
| M¹-1 | | | | | | | | | |
| M-2 | | | | | | | | | |
| M¹-2 | | | | | | | | | |
| M-3 | | | | | | | | | |
| M¹-3 | | | | | | | | | |
| M-4 | | | | | | | | | |
| M¹-4 | | | | | | | | | |
| M-5 | | | | | | | | | |
| M¹-5 | | | | | | | | | |
| M-6 | | | | | | | | | |
| M¹-6 | | | | | | | | | |
| M-7 | | | | | | | | | |
| M¹-7 | | | | | | | | | |
| L-0 | | | | | | | | | |
| L¹-0 | | | | | | | | | |
| L-1 | | | | | | | | | |
| L¹-1 | | | | | | | | | |
| L-2 | | | | | | | | | |
| L¹-2 | | | | | | | | | |
| L-3 | | | | | | | | | |
| L¹-3 | | | | | | | | | |
| L-4 | | | | | | | | | |
| L¹-4 | | | | | | | | | |
| L-5 | | | | | | | | | |
| L¹-5 | | | | | | | | | |
| L-6 | | | | | | | | | |
| L¹-6 | | | | | | | | | |
| L-7 | | | | | | | | | |
| L¹-7 | | | | | | | | | |

## APPENDIX C
## Cleanability Comparison

| SAMPLE NO. | CLEANABILITY COMPARISON SEE H. (3) | | | REMARKS |
|---|---|---|---|---|
| | BETTER | EQUAL | POORER | |
| M-0 | | | | |
| M[1]-0 | | | | |
| M-1 | | | | |
| M[1]-1 | | | | |
| M-2 | | | | |
| M[1]-2 | | | | |
| M-3 | | | | |
| M[1]-3 | | | | |
| M-4 | | | | |
| M[1]-4 | | | | |
| M-5 | | | | |
| M[1]-5 | | | | |
| M-6 | | | | |
| M[1]-6 | | | | |
| M-7 | | | | |
| M[1]-7 | | | | |
| L-0 | | | | |
| L[1]-0 | | | | |
| L-1 | | | | |
| L[1]-1 | | | | |
| L-2 | | | | |
| L[1]-2 | | | | |
| L-3 | | | | |
| L[1]-3 | | | | |
| L-4 | | | | |
| L[1]-4 | | | | |
| L-5 | | | | |
| L[1]-5 | | | | |
| L-6 | | | | |
| L[1]-6 | | | | |
| L-7 | | | | |
| L[1]-7 | | | | |

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# ENVIRONMENTAL HEALTH–TODAY AND TOMORROW[1]


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It is particularly fitting that in its 50th anniversary meeting, the International Association of Milk and Food Sanitarians would take stock of the present status of environmental health. But it is even more gratifying to observe that rather than to review past decades of notable effort, you are eager to look ahead and to plan for the needs of tomorrow. Admittedly this is a difficult assignment because environmental health is related to social development as well as to physical conditions, and to some extent both of these factors are unpredictable. Of one thing we can be certain — environmental health problems will become more varied and more complex and the public, more demanding.

Environmental health programs of the past five decades have largely reflected the application of knowledge that became available through the golden era of bacteriology. The identification of the typhoid bacillus in 1880 was soon followed by the general development of water treatment plants in the early 1900's. Concern over poor home sewage disposal practices led to the development of the sanitary privy and this is said to have been one of the factors that led to the organization of the county health department movement beginning at about 1910. It was in the fruitful first decade of this century that a few visionary pioneers in food and milk sanitation met together and later formed the organization that is meeting here today. The efforts of these early sanitarians have been basic to the remarkable conservation of life that has occurred since 1900. However, health workers are now aware that environmental health programs must embrace significantly broadened responsibilities because of the changing dimensions of our national life.

> Often do the spirits of great events stride on before the events, and in today already walks tomorrow.
> —*Schiller*

There are many changes that exert pressure on environmental health programs today. Consider, for example, the following influences.

1. Population expansion and movement is by far the most significant development of this century. In 1900 the United States population was 76 million; in September 1963, it reached 190 million. In 1900, 40% of the population was urban; in 1963 70% lived in urban areas. The movement of population from rural to urban areas continues. Within metropolitan areas a reverse phenomena is seen and as a result the suburban fringe may extend outward from central core cities as far as 30 to 50 miles. In the United States there are today 210 standard metropolitan areas of which 27 embrace parts of two or more states.

2. Changing technology has greatly broadened the exposure to processes and substances either known to be injurious to health, or in many cases to involve completely unknown risks. The past 25 years have seen tremendous growth in the chemical industry which has given birth in this short time to such commonplace items as synthetic rubbers, detergents, synthetic fibers such as nylon and orlon, herbicides and

[1]Presented at the 50th Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., October 22-25, 1963, at Toronto, Canada.

pesticides, plus a wide variety of plastic compounds. Modern technology has made wide use of radioactive chemicals and energy from radioactive sources is commercially feasible. Recent interest in lasers and masers illustrate the rapidity with which entirely new energy forms emerge from the research laboratory and soon become industrial processes.

3. Increased social consciousness has become evident as a part of public policy in the United States. Public housing programs to provide acceptable low cost housing began modestly in 1935. In 1959 expenditures from tax sources for this purpose reached 156 million dollars, at which time there were 594,000 dwelling units of public housing available or under construction. But in the census the following year, 18.8% of all housing units in the United States were adjudged dilapidated or lacking one or more plumbing facilities.

4. Increased concern with the conservation of natural resources has focussed attention upon the problems of air and water pollution. The dramatic consequences of polluted air are widely known — the Donora disaster, the London fogs associated with smoke, Los Angeles and its smog alerts. But there is also increasing concern with sub-clinical effects and their possible long term relationship to emphysema and pulmonary cancers.

The nature of the problem of water resources conservation is also becoming better known. Essentially it involves the quantity and quality of water available for industrial and community use. Whereas originally water pollution was chiefly related to domestic sewage and the solution was obtained by relatively simple treatment processes, today's pollution problems frequently involve complex chemicals, some of which are radioactive. Often the treatment plant processes do not alter the chemicals present in the sewage. Then, too, the sheer volume of sewage presented by a large metropolitan treatment plant results in heavy loading of the receiving stream even when the most efficient methods of treatment are employed.

5. New dimensions of old public health programs require further study. Even our traditional environmental health activities are undergoing change. Typically the processing and distribution of milk has changed from a family operation to a major industry with the product moving out of the plant and into a distribution area that may embrace several counties or even two or more states. Nearly all the market milk is now pasteurized. Public health concern, in turn, has broadened to include distribution practices, shelf life, nutritional quality, and possible chemical additives. Similarly in the traditional food sanitation program, concern resided with the enforcement of restaurant sanitation standards. Today's program embraces the sanitation of food processing plants, vending equipment, and frozen foods. The sanitarian is also alert to the possibility of foreign chemicals in the food supply, and he must safeguard foods from viral and bacterial agents.

Even the traditional concern of the sanitarian with sewage disposal has been modernized. The pit privy has long since been replaced by the ubiquitous septic tank. In the 15 years, from 1945 to 1960, the population in metropolitan areas served by septic tanks has quadrupled to a figure of 23 million and the end is not yet in sight. Although no figures are available, many metropolitan area health officials would agree that more citizen complaints originate from poor sewage disposal practices than any other single source.

6. Environmental planning is the final area of the changing order about which comment should be made at this time. The interest of the community planner in environmental factors is readily understandable. The interest of public health and planning merge as each profession seeks to insure an environment conducive to comfortable living. Wise decisions made today by the public health oriented planning official will help to avoid problems that may otherwise plague the community for a lifetime, as for example, through the proper planning for community facilities, the location of industrial parks to minimize air pollution and noise problems, the provision of waste disposal sites, the preservation of open spaces for recreational purposes, and the design of modern road systems to minimize driving hazards.

This review of trends and community expectations in the area of environmental health is neither original or new. But it is essential that these components be recognized because they will shape the face of environmental health in the future. Since they represent potential problems, and express community needs, sooner or later citizens will seek answers to these problems. If our present local health organizations and our present staffs cannot cope with these problems, it is safe to predict they will not long be retained.

In this series of papers the speakers have emphasized various aspects of the communication process. Today it is essential that public health engage in two types of communication — first, searching intraprofessional study; second, candid discussion with the various publics with which we are concerned.

Within our professional framework, both in voluntary associations and within organized health departments, the following activities are in order:

1. The environmental health problems that are of significance in terms of present day thinking must be identified. Traditional program practice can no

longer be a guide to the progressive administrator. A questioning attitude toward traditional procedures may well lead to changes that will provide personnel for activities of greater importance. But of even more significance, failure to act will only result in the creation of new agencies prepared to provide services that are needed in the community today.

2. The environmental health services available at the level of local government must be strengthened. It is an unpleasant fact that local health departments have not proliferated rapidly in the past two decades, despite the fact that many of the problems previously mentioned are post-war phenomena. In this circumstance, it should be incumbent upon public health officials to improvise and demonstrate new patterns of organization in order to attack those community health needs that are present. Environmental health problems are tangible, readily recognized as community obligations, and programs to cope with these problems can be "sold" to the public.

3. Responsibility for environmental health services should be delegated to the level of governmental authority closest to the population to be served, providing that proper legal authorization and competent supervision of personnel can be assured. On the one hand, the present pattern of organization for local health services has tended in many instances to proliferate small jurisdictions in which it is difficult to recruit competent and trained personnel. At the same time there is often reluctance on the part of state authorities to delegate responsibility to local jurisdictions. Combination of jurisdictions into larger units is one method by which sufficient resources could be obtained to enable the employment of trained and specialized personnel with necessary supporting services. In turn, increased competence and availability of prepared staff members would enable local health units to attack modern environmental health problems more vigorously.

4. Training opportunities for the environmental health sciences should be promoted. The modern environmental health program can and must utilize various levels of trained personnel, with a variety of technical backgrounds. Supervising personnel undoubtedly will require post graduate training in engineering, sanitary science, or related disciplines. Staff level assignments are performed by personnel from many disciplines, some with and some without baccalaureate preparation. A continued staff education program is essential for all employees. Good administrative practice requires that job assignments be made with full recognition of the level of training required to perform the work assignment. Only the exceptional department will be able to employ every type of specialized personnel required. However, more use should be made of consultants; part time employees and jointly employed personnel should also be considered when feasible.

5. Research opportunities should be encouraged at the level of local operations. The recognition that significant types of original investigation can be performed in operating agencies would have several beneficial efforts. The practical application of new methods of operation could be determined more quickly. It would also provide greater stimulation for trained personnel to remain in the field level departments. Certainly the knowledge that research activity was carried out would enhance the esteem of the department in the community.

6. Environmental health workers must continue to cultivate a broad professional outlook. The study and control of environmental hazards involves many disciplines working together and the staff worker must have knowledge as to the basic principles and techniques used by the various related disciplines. Often problems requiring the cooperation of other members of the public health team, not associated with the environmental health unit, will be encountered and appropriate referrals must be initiated. Finally, as a professional worker in an increasingly complex society, the environmental health consultant must be sufficiently versed in the social sciences in order to apply his specialized knowledge effectively.

This series of recommendations regarding the strengthening of local environmental health services is inter-related. Program, organization, personnel, training, and motivation are facets of a single structure. Although a beginning can be made at any point, the other aspects must soon be examined.

The modern environmental health program is carried out in a highly organized social structure. Although "health" and "safety" are regarded by public health workers as prime values, to the citizen, the business man, or the political scientist, they may have only a relative value, equated with taxes, profits, community fund drives, and the need for schools.

In the face of these many demands for attention, the citizen is not likely to be concerned with his environmental health services unless problems occur. Good service by staff when requested by private citizens is an excellent way of creating a favorable image for the department. Often these contacts present an opportunity for voicing the department's program interests. But conscientious service by itself is not enough.

To be effective and successful, the administrator of environmental health programs must cultivate community understanding and support. Increasingly, advisory committees are being used to provide a means of liaison with business and professional interests in the community. Such contact provides a means of sharing the department's goals with the group that will be involved, and, in turn, provides an opportunity for comment on problems of interpretation, compliance, and enforcement.

The use of citizen committees, and regular meetings with civic bodies such as city councils, chambers of commerce, and trade associations can also be the means for projecting public health concerns and goals.

In all of our public health activities today, it is in our professional interest to share responsibility with the community. As public health workers, we can not guarantee a healthy community unless the community is interested in accepting, demanding, and when necessary, enforcing the standards that insure good practice. In all areas of environmental health practice, we are seeking a transfer of learning, and subsequently an acceptance of responsibility for good health practice by the citizens, by industry, and by business. Our interests have broadened to include all aspects of man's environment. More than ever before our position requires leadership and planning. Our techniques must emphasize consultation and education as well as enforcement. Thus as this association enters its second half century, it does so with the knowledge that the horizon for professional performance has never been broader, nor have the opportunities for the environmental health scientist ever been greater.

# THE MICROBIOLOGICAL SIGNIFICANCE OF FOOD PACKAGING MATERIALS[1]

RICHARD D. O'NEILL

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Principal among the trademarks of an advanced society is the continuous availability to its members of a nutritionally adequate and otherwise wholesome food supply. Only in a milieu which supplies this essential to a majority of the population can we secure the not unmixed blessings of technological and cultural progress. We have achieved our high level in the maintenance and protection of public health through the devices of law and education primary to the accomplishment of the objectives of a democratic society. Attainment of the goal of adequate and safe nutrition demands a careful and continuous surveillance of our food supply from its source in the agricultural industry through each step in its inexorable march into the gullet of the ultimate consumer.

Investigations of communicable disease transmission, control of spoilage, transportation and protection of perishables, pesticide management and dozens of other facets of this engaging field provide an impressive body of literature upon which we draw to make prudent judgments and exercise adequate control. The more specialized problems which arise as new food processing and distribution techniques develop, have likewise received their share of attention. Frozen foods, vending, radiation sterilization and other mileposts in the evolution of the food industry, have generated appropriate investigations. In this body of information one is impressed not by the scarcity of publications on food packaging which are legion, but rather by the relatively few publications of relevance to its microbiology.

## THE MICROBIOLOGY OF PACKAGING

The microbiological significance of packaging resides in a very simple relationship; it is in direct contact with its food contents. Thus, if food packaging does have a microbiology, it is *a priori* significant, assuming our aim is to preclude exogenous organisms from food. If this is our goal it makes very little sense to exercise sanitary control over the endless details of production, processing, dispensing and handling of food while remaining indifferent to the condition of the container in which it is finally packed and presented to the consumer.

The first essential then is to establish whether packaging can make a significant microbial contribution to food i.e., does it have a meaningful microbiology? Let us look at the bacteriologically important events in the production of some common packaging materials. Perhaps the most universally employed packaging are variants of paper and paperboard. Many aspects of the complex process which converts cellulose fibers into a finished food package bear on the microbiological picture.

Beginning with the fiber slurry from which it is made, the microbial population of paper is highly variable. It may range from a few or a few hundred per gram up to hundreds of thousands, sometimes millions depending upon the type of pulp, its

[1]Presented at the 50th Annual Meeting of the INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC. October 22-25, 1963 at Toronto, Canada.

source, temperature and time of wet storage, recycling of water, etc. In the manufacturing process a water suspension of pulp flows onto a moving felt or wire and thence to a battery of drying rolls in a continuous web. The sheet may be of a single type of pulp and uniform throughout or it may be a laminant of several layers, often differing one from another in composition. In addition to fiber, various additives are often incorporated into the pulp. Rosin size, starch, alum and wet strength agents may be added to the wet pulp to control the characteristics of the finished sheet. Additional inocula may accompany these additives. For example starch and casein are excellent microbial media and may contain enormous numbers of microorganisms.

The next stage of manufacturing is that of drying in which the wet web begins its passage over a number of drying rolls. There may be as few as twenty, or over a hundred depending upon the size of the machine. Roll temperatures are varible; about 275 F. would be an average temperature. Probably the maximum temperature which a paperboard of appreciable caliper would reach during the drying process is about 200 F. As one would expect, a substantial microbial kill is effected, particularly on the surface; the insulating properties of the board protects somewhat the more interior organisms. The surviving microbial population is not uniformly distributed throughout the sheet.

In many instances subsequent additions to the sheet are made at the size press or at the calender stack. These operations are near the so called dry end of the paperboard machine. Starches, clays, moisture and other surface treatments occur at these points. Usually additional drying is accomplished after the size press; additions at the calender may or may not be subject to subsequent drying. The microbes which paperboard will contain then are those which may have been able to survive the high temperature stages in the process, and those which are subsequently brought to the sheet by surface treatments later in the process of paperboard manufacture.

At various stages of manufacture antimicrobial factors other than heat are often brought to bear. Principal among these are preventive sanitation and chemical slimicides. Since papermaking is a continuous process, it is not feasible to shut down an operation for frequent cleanups. These must await shut down for maintenance reasons. While this is not necessarily true of all systems feeding into the machine, pulp beaters, chests, etc., cannot be casually emptied and cleaned. Here microbial control is more often accomplished by slimicide addition. The manufacturer of food packaging grade paper must limit his slimicide addition to those which comply with the Food Additives Amendment. This precludes the use of certain excellent control agents not consistent with food associated use.

Auxiliary systems are somewhat more amenable to control by preventive sanitation as they are often designed in duplicate and parallel facilities. While one starch system is on stream for example, the other may be sanitized and microbial control effected without recourse to sanitizing agents.

Rarely is paper converted into a formed food package in the same plant as that in which it is made. Though sometimes coating with plastic may be accomplished at the paper mill. Paper is shipped by rail or truck in large rolls to a converting plant for the final steps in the manufacture of food containers. A converting plant will usually carry out the printing, blanking, forming and coating, though not necessarily in that order. Of these operations only coating or impregnation can have an appreciable sanitizing effect.

For purposes of convenience we may consider the final package to be of three different types; uncoated, waxed or plastic coated. In the uncoated type, the converting process merely creates a geometric shape and usually provides no effective surface treatment. In this instance the microbiological quality of the end product will be largely dependent on that of the paper as it entered into the conversion process and the extent to which it has been protected from contamination during conversion. Where wax coating or wax impregnation is accomplished in the converting plant it can be considered a sanitizing step by virtue of the heat of the wax treatment. Secondly, wax impregnates paperboard, immobilizing organisms *in situ* as well as acting as a surface barrier. In general a waxed container provides a food contact surface of very low bacterial count. Of course, contamination may occur subsequent to waxing where a quench of water or refrigerated air is used to harden the wax quickly or where there is excessive exposure to the environment and manual contact incidental to assembling and packaging the units for shipment.

Plastic coatings may be applied either to the paper web or to the formed package. Regardless of where it may be accomplished, coating is usually simultaneously sanitizing in its effect since a heat treatment is involved.

### SUBSURFACE MICROORGANISMS

As indicated earlier, the process of papermaking while inherently antimicrobial, nevertheless does permit organisms to survive both internally and on the surface of paperboard. What kind of a microbial population do we have and are organisms transferred from the interior of the board from which a container is made to the food contents? The internal microbial population of board is almost invariably found to be comprised of spore formers. Perhaps a few other thermodurics survive; we have never investigated this point. However we have been able to demonstrate, using commercially available board that internal organisms can and do under some circumstances contaminate food contents. One procedure has been as follows: Samples of commercially available paperboard are milled to the desired depth using a high speed end mill and a drill press with an adjustable stop. It is possible to remove a portion of the paperboard leaving the remainder of the fibers virtually undisturbed. Following X-Ray sterilization inocula can be introduced into any plane. We employ bacterial spores suspended in a volatile solvent since we wish to avoid the effects of added moisture. Inoculated samples are placed in the top of a screw top test tube containing a liquid medium. Upon inversion of the tube, medium is in contact with the undisturbed surface opposite the inoculated milled depression. Migration through the intact surface of the paperboard can be detected by the usual methods. Tagged microorganisms have also been used. We use a variety of *Bacillus subtilis* which produces a brown pigment when grown on a tyrosine containing medium. This distinguishes this organism from other paperboard spore formers. Secondly, we have employed *Bacillus cereus* tagged with $Fe^{55-19}$. Iron appears to be the isotope of choice since bacilli retain most of the iron assimilated and it can be detected in subsequent progeny through several generations.

Our experience thus far indicates the sub-surface paperboard microbe to be immobilized until a liquid phase within the board is established. At that time depending upon temperature, nutrient, agitation, etc., organisms will demonstrate their viability and grow in all directions from the point of origin. When uncoated paperboard is in contact with the liquid nutrient, migration occurs rather quickly, often in less than two days. The position of the organism with respect to the surface may affect the threshold of contamination though it does not appear to be of great significance. Coatings which remain intact appear to retard migration to the surface. Plastics, such as polyethylene and vinyl, appear to act as semi-permeable membranes, allowing liquid to move to the interior strata. So long as these coatings remain intact, they are impervious to penetration by growing microorganisms. Probably the weakest point bacteriologically in these packages would be a cut edge i.e. raw paper exposed to liquid food. Though such papers are treated to resist the moisture, the cut edge is a breach in the plastic barrier and microbes migrate readily through it.

Wax appears to act somewhat differently in that it impregnates the board and immobilizes the organisms. The rate of migration of sub surface organisms may be increased by such factors as agitation, bending and abrasion. In general abuses which are inimical to the integrity of the board and/or coating will hasten the movement of organisms from board into the contents of the containers.

We have also carried out some experiments in which we have inoculated paperboard as it is produced on the machine at several cross section levels. Results from these experiences follow the same pattern as previously observed in the laboratory.

We conclude that microbial migration does take place from any of several levels of uncoated paperboard at room temperature and incubator temperature. The rate at which this takes place is, of course, temperature dependent. The establishment of a liquid phase within the board is essential to bacterial migration. Some coatings so long as they remain intact retard the movement of mircoorganisms from board to the food. Board which is variously abused will permit a more efficient movement of organisms either because of increase in liquid permeability or disruption of surface coatings.

As was noted above the surface of a food package may be able to contribute appreciable bacterial counts depending upon the extent to which it is exposed to the atmosphere or comes in contact with microbe bearing materials. One aspect of this problem which we have presently under investigation is that of establishing the significance, if any, of static charge to the incidence of contamination from airborne sources. In the past decade we have witnessed a vast increase in the use of plastic materials in food storage, handling, dispensing and packaging. A characteristic shared by many of the plastic materials is their tendency to accept and hold a substantial static charge. Our investigations are aimed toward the quantitative determination of the relationship of this charge to airborne contamination and to evaluate the significance of static charge during manufacture, storage and use. While the study is by no means complete, certain of the preliminary findings appear interesting. It is apparent in certain cases that while the predominating charge on a surface will be either negative or positive, the distribution of the charge on the surface will assume a pattern. Sometimes these patterns are strikingly similar to lightning streaks and where a charge may be let us say, predominately negative, we will find islands of positively charged areas. To the degree to which surface distribution of airborne contaminants can be imputed to static charge, they will not be uniform over the entire surface. Secondly, the intensity of charge will depend on frictional characteristics of the machinery which handles packaging and on such variables such as temperature and humidity. Time is also an important factor. Generally speaking static charge levels tail off with time. Under uncontrolled conditions, the charged surface will very quickly develop a substantially higher contamination level than the normal control. We are presently conducting some controlled experiments within a closed cabinet in which we can add various bacterial and other particulate contaminants to surfaces upon which we have developed charges by an electrostatic generator. While these data are only preliminary, we are quite convinced that the degree of contamination of a plastic surface with airborne particulate matter is in direct relationship to the surface charge.

### PERSPECTIVE

Quite apart from health considerations, competition, sharpened by a need to present to the purchaser an attractive display, has played its role. Pre-packaging is so universal today, even unprocessed commodities are often presented as a purchase unit. We have long since passed the era of cracker barrel distribution of bulk commodities at the retail level. Packaging then serves functions additional to that of protection.

We can expect future demands for extended shelf life of perishable foodstuffs will require parallel developments in sanitary packaging. Already feasibility studies in which paper packaging is sterilized and aseptically filled have reached the marketing phase. Packaging has not yet reached the limit of its ability to contribute to the needs of a hungry world.

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# COMMITTEES
# INTERNATIONAL ASSOCIATION OF MILK, FOOD AND ENVIRONMENTAL SANITARIANS

## COMMITTEE ON RECOGNITION AND AWARDS

(1 year appointment)

### OBJECTIVES

This committee is charged with the responsibility of implementing those objectives of the Association concerned with (1) recognition of individual milk, food and environmental sanitarians whose achievements have contributed greatly to the public health and welfare of their communities, and (2) recognition of those members of the Association who have, through distinguished service, contributed greatly to the professional advancement and growth and reputation of the International Association of Milk and Food Sanitarians, Inc.

The Committee receives and reviews nominations for the annual Sanitarian's Award, and has full responsibility for the selection of the recipient. The Committee also receives and reviews recommendation on candidates for the annual Citation Awards, and counsels with the Executive Board relative to the selection of the recipients. It is also responsible for handling all matters pertaining to the presentation of awards, publicity and other related items.

### MEMBERS

Charles E. Walton, Chairman, City Health Department, City Hall, Laramie, Wyoming.

Harold L. Austin, The Coca Cola Company, P. O. Box 1734, Atlanta 1, Georgia.

Frank L. Kelley, 1216 Ohio Street, Lawrence, Kansas.

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M. W. Jefferson, Dairy Products Inspection Section, Dept. of Agriculture, 203 North Governor Street, Richmond 19, Virginia.

Donald K. Summers, 1542 Buchanan Street, Novato, California.

## COMMITTEE ON MEMBERSHIP

(1 year appointment)

### OBJECTIVES

To make every effort to increase the membership of the organization by bringing to the attention of all qualified persons the advantages of belonging to the International Association of Milk and Food Sanitarians, Inc., and to interest state milk and food sanitarians' organizations in the advantages of affiliation with the Association.

### MEMBERS

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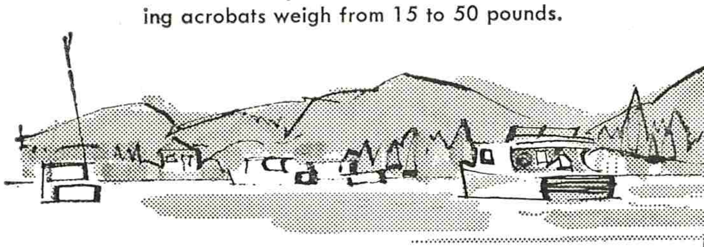
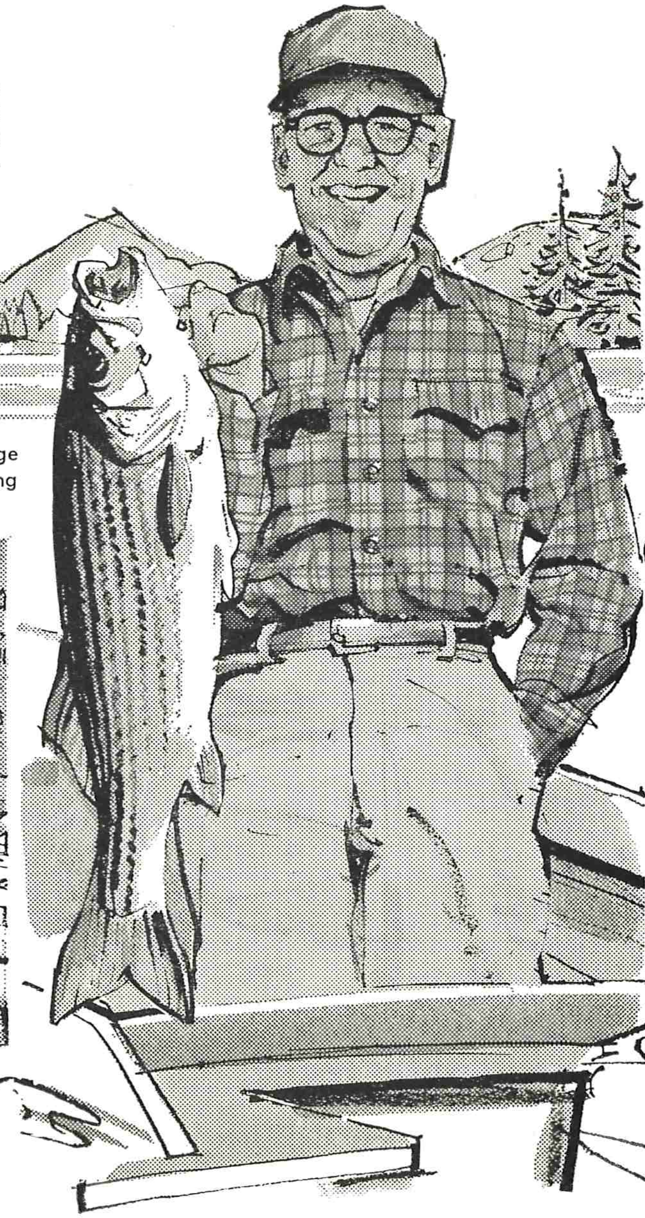
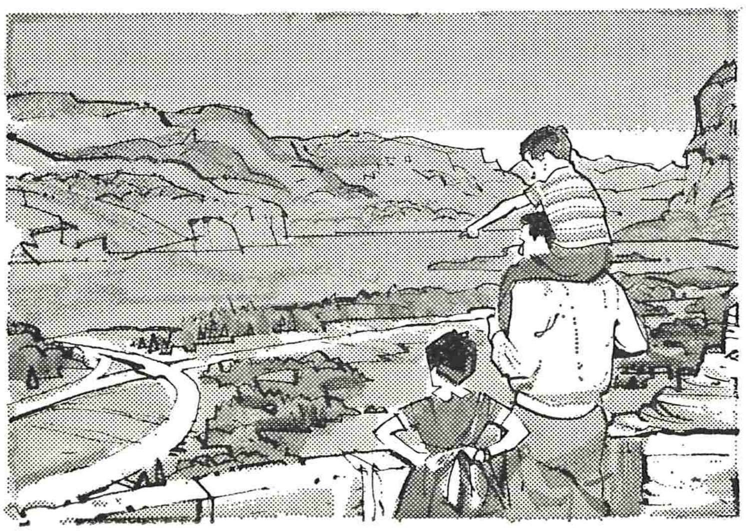




A BREATHTAKING PANORAMA of the magnificent Columbia River Gorge is seen from the Vista House lookout. The Columbia River scenic route along Oregon's northern boundary is a spectacular sightseeing drive.



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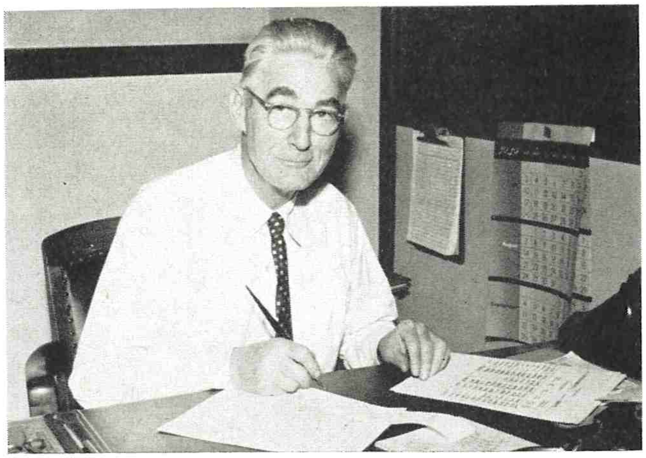
***ATTEND THE 51st ANNUAL MEETING***

# I. A. M. F. E. S. for 1964

## HILTON HOTEL Portland, Oregon—Aug. 18-21

# NEWS AND EVENTS

## "DEAN OF MILKER BUSINESS" PASSES AWAY IN TEXAS



George Courtland Mather, sometimes referred to as "The Dean of the Milking Machine Business," passed away March 8 at McAllen, Texas, at the age of 76.

For over 40 years he was the Director of Sales for Babson Bros. Co., builder of Surge dairy farm equipment. He was a born leader of men, a keen judge of human nature, a colorful speaker, a prolific writer and an inspiration to all who came in contact with him.

T. W. Merritt, Sr., President of Babson Bros. Co., has said, "In a very large measure, the success which this company enjoys today can be credited to George."

Surviving are his wife, Christine, and a son, George.

## EXECUTIVE BOARD OF THE NATIONAL CONFERENCE ON INTERSTATE MILK SHIPMENTS HOLD FLORIDA CONFERENCE

Park Livingston (right) of NCIMS confers with Donald H. Race, chairman of the Program Committee.

The Executive Board of the National Conference on Interstate Milk Shipments met March 16th, 17th, 1964 at Daytona Beach, Florida. Presiding at the two day session was Conference Chairman Park Livingston of the Dean Milk Co., Chicago, Illinois.

One of the several important actions taken at the meeting was the appointment of a committee to plan the program for the 1965 Conference which will be held in Louisville, Ky. Members of the committee are Shelby Johnson, Kentucky State Department of Health, Louisville, Ky.; W. D. Hanns, Arkansas State Department of Health, Little Rock, Ark.; M. S. Campbell, Indiana State Board of Health, Indianapolis, Ind.; Myron P. Dean, University of Wisconsin, Madison, Wisc.; Harold J. Barnum, Denver Department of Health and Hospitals, Denver, Col.; Dr. P. R. Carpenter, Akron Department of Health, Akron, Ohio; Clarence Luchterhand, Wisconsin State Department of Health, Madison, Wisc.; Donald H. Race, Dairymen's League Co-operative Association, Syracuse, N. Y. was appointed Chairman of the committee.

Mr. Shelby Johnson is Chairman of the Local Arrangements Committee.

## ROBERT H. NORTH AND E. L. PETERSON TO SERVE BOTH MILK INDUSTRY FOUNDATION AND INTERNATIONAL ASSOCIATION OF ICE CREAM MANUFACTURERS

In order to further the close working relationship that has prevailed between the two organizations, an arrangement has been worked out by the Boards of Directors of the Milk Industry Foundation and the International Association of Ice Cream Manufacturers whereby Robert H. North is to become Executive Director of both associations with E. L. Peterson as his special assistant, effective April 1, 1964.

The two associations will continue to operate as separate and completely autonomous organizations with no change whatever as regards officers, Executive Committees, Boards of Directors and members. Financial resources will be maintained separately.

Under the new arrangement, one paid staff will serve both the milk foundation and the ice cream association.

This is a logical furtherance of the present way the two organizations have been cooperating with joint activities. Several efforts along this line have met with outstanding success, such as the annual convention joint Wednesday session, the joint accounting committee, the joint advanced management school, the joint committee on the Fair Labor Standards Act and others.

## SURGEON GENERAL COMMENDATION MEDAL AWARDED TO DR. A. RICHARD BRAZIS

**Dr. A. Richard Brazis (right) of the U. S. Public Health Service's Robert A. Taft Sanitary Engineering Center, Cincinnati, receives the Surgeon General's Commendation Medal from Harry P. Kramer, Taft Center Director.**

A Commendation Medal was presented on behalf of the Surgeon General of the U. S. Public Health Service to Dr. A. Richard Brazis at the annual award ceremonies at the Robert A. Taft Sanitary Engineering Center, 4676 Columbia Parkway, Friday afternoon. The award to Dr. Brazis was made by Harry P. Kramer, Director of the Center.

Dr. Brazis, a microbiologist in Milk Sanitation Research, a unit of the Milk and Food Program, was commended for his field studies conducted from 1960 through 1962 on the effects of farm and dairy plant practices on the bacterial quality of milk and more recently for his investigation of the sanitation aspects of a Center-developed method for the removal of strontium from milk.

Commendation medals are presented only to members of the Commissioned Corps, the Public Health Service's uniformed scientific service. Dr. Brazis holds the rank of Senior Scientist, equivalent to the naval rank of commander.

Dr. Brazis's commendation was stated as follows: "In recognition of his sustained superior performance in milk research activities, his persistent dedication to duty and his deep concern with the quality of his contribution to the Service."

A native of Bridgeport, Conn., Dr. Brazis received his bachelor's degree from Norwich University, Northfield, Vt., in 1949 and his master's and doctor's degrees from the University of Missouri, Columbia, in 1951 and 1954, respectively. He was commissioned in the Public Health Service in 1951 and has been assigned to the Center since 1954. He is a member of Sigma Xi fraternity, Gamma Alpha, and Gamma Sigma Delta honor societies.

## C. D. LEE RECIPIENT OF IOWA ASSOCIATION MERLE P. BAKER AWARD

The award was given at the annual banquet held at the Sanitarians annual meeting March 24. This award is given the outstanding person in the state each year who has contributed most to milk and food sanitation work in Iowa. Mr. C. D. Lee was given a certificate of merit and a $50.00 defense bond.

Mr. C. D. Lee was born in Shelby County, Iowa in 1899 and went to Colorado at the age of 12. He also lived in Kansas and Nebraska. He came to Waterloo at the age of 19 and purchased a farm and married that year.

He farmed until 1922 and then went to work at the Sanitary Dairy in Waterloo where he worked in the plant and on routes until 1928. In 1928, Mr. Chris Olsen and Mr. Lee formed a partnership and operated the Daylight Dairy until 1945 when this company was sold to Walnut Dairy Farms. He

C. D. Lee

served as Ice Cream mix salesman with this company until he was injured in 1948. When he recovered, he served as fieldman until 1962.

When Walnut Dairy Farms Dairy was purchased by Anderson Erickson Dairy in 1962, he continued to serve as fieldman for Anderson-Erickson Dairy.

The farms under his supervision have consistently maintained very commendable farm ratings. His work in milk sanitation has been commendable. His leadership is examplified by his persistence in the production of pressurized ventilation in milkrooms and plants, deep gutters for barn cleaners and the proper distribution and placement of artificial light in the milkrooms and barns. He joined the Iowa Association of Milk Sanitarians in 1948 and has served on various committees through the years. In 1960 and 1961 he served as president of the Iowa Association of Milk Sanitarians.

The Sanitarians also awarded 20 year members a certificate of achievement. The certificates were awarded to: Mr. Harry Jasper, Omaha, Nebraska; Mr. James H. Burkett, Merrill, Iowa.

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## ANNUAL MEETING OF CENTRAL ONTARIO MILK SANITARIANS ASSOCIATION

The annual meeting was held on January 29 at the Pickfair Restaurant in Mimico. President Bill McCorquodale was chairman and there were about 125 members in attendance.

The business meeting in the morning elected as your executives: Past President, Wm. D. McCorquodale, Toronto; President, Dr. J. E. Watt, Oshawa; Vice President, Herman Cawthers, Barrie; Secretary, Tom Dickison, Willowdale; Treasurer, Jack Raithby, Toronto; Directors, Glen White, Acton, F. S. Whitlock, Burlington, Dr. A. N. Myhr, Guelph; Ray Bowles, Toronto, R. B. Brown, Gormley; Auditor, Howard Hooper, Toronto.

These resolutions were presented and passed:

To thank Mrs. Vic Jensen for capably organizing and conducting the ladies program at the International.

To increase from three to five the number of directors.

To include the immediate past president as an ex-officio member of the executive.

To study and present at the next annual meeting a revision of the constitution.

To activate the membership committee and Don Woods named as the chairman.

Professor Fred Hamilton presented the Secretary's report.

This report briefly outlined a very successful year. We had accepted as an affiliate, the Perth Dairy Club with 45 members drawn from Perth and Huron Counties. The secretary is D. R. Stacey of Mitchell, who attended our annual meeting.

Accolades should also go to the Chairmen of the various committees formed to host the International. I hope I do not omit anyone, but here they are. Don Woods, George Hazelwood, Mrs. Vic Jensen, Jack Palmer, Dr. Don Irvine, Ed Pinder, Prof. Fred Hamilton and his right hand man Mrs. Irene Owen, to whom congratulations are also due as she is now Mrs. Wibley and soon to retire from Government service. Bill Lawrence did a fine job of his committee, in fact, he even managed to salvage a fine door prize which we awarded at our annual meeting to H. Blackstock of Barrie.

Cecil Craig and Clare Merkley were up to the annual from the Eastern Ontario Association and we can hope they enjoyed themselves.

A highlight of our annual meeting was the presentation of our Sanitarian of the Year Award.

Ontario Dairy Commissioner Jim Baker made the event very impressive with some carefully chosen remarks that surprised Prof. Hamilton. Yes, it was Prof. Fred Hamilton, recently retired from the Dairy Science Dept. at O.A.C. and now retired as our secretary, who received this well earned reward. Fred will of course remain active in our organization, unless of course he continues to place milking stools on top of boxes to get at those hard to get spots.

Our treasurer really had his trials and tribulations this year, however he won, and we wound up the year with a gain of $101.17 over the year previous. Jack Raithby congratulations from us all.

Our banquet featured an address and slide presentation by Dr. Claud Vipond of Oshawa. His experiences in Malasia as a member of a Canadian medical team and his remarkable camera which saw so much that was interesting gave us all an unusual experience that we thoroughly enjoyed.

The afternoon program packed the hall.

Dr. Al Myhr started it rolling with a very interesting picture of the quality problem facing the butter people and the cream producers in their efforts to improve quality. Al is the spark plug behind this big effort and he sure has a very challenging job ahead of him.

The theory and practice of C.I.P. cleaning was presented by S. J. Bell of the Diversey Corp. Excellent slides complimented a fine address. We have copies of this.

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Dr. Ted Watt was chairman of a panel that discussed mastitis. Dr. Barnum and Dr. McEwan of Guelph discussed the professional viewpoint and Daniel Noorlander of the Dairy Equipment Co. in Madison, Wis. presented a controversial and stimulating viewpoint that certainly drove home the importance of the milking machine and its operation to the control of this problem.

Tom Dickison, Secretary

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INDEX TO ADVERTISERS

## 3-A STANDARDS FOR BATCH PASTEURIZERS, PROCESSORS OKAYED, EFFECTIVE 3/65

Two new 3-A Sanitary Standards for Dairy Equipment received their final validating signatures from participants in the 3-A program on March 23, thus setting in motion procedures which will make them effective a year hence.

These two new 3-A Standards are:

"3-A Sanitary Standards for Non-Coil Type Batch Pasteurizers, Serial #2400".

"3-A Sanitary Standards for Non-Coil Type Batch Processors for Milk and Milk Products, Serial #2500".

The effective date of the new standards will be March 23, 1965. Official publication will take place in the December 1964 number of the Journal of Milk and Food Technology. On and after the effective date application may be made to the 3-A Symbol Council for authorization to use the 3-A Symbol on batch pasteurizers and batch processors which comply with those respective 3-A Standards.

The two standards are similar in many respects, the essential difference being the inclusion in the Batch Pasteurizer Standard of requirements for appurtenances necessary for legal pasteurization, such as leak protector valves, air space heaters, thermometers, etc.

The wide and growing use of closed-top processors for pressure or vacuum applications in heating dairy products created the need for sanitary guidelines for this equipment. The new Batch Processor Standards may be welcomed by industry and sanitarians alike for providing needed sanitary criteria.

THE ONLY *Approved* SANITARY METHOD OF APPLYING A U. S. P. LUBRICANT TO DAIRY & FOOD PROCESSING EQUIPMENT


# *Haynes-Spray*

## U. S. P. LIQUID PETROLATUM SPRAY

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CONTAINS NO ANIMAL OR VEGETABLE FATS. ABSOLUTELY NEUTRAL. WILL NOT TURN RANCID — CONTAMINATE OR TAINT WHEN IN CONTACT WITH FOOD PRODUCTS.

**SANITARY — PURE**

**ODORLESS — TASTELESS**

**NON-TOXIC**

*This Fine Mist-like* **HAYNES-SPRAY** *should be used to lubricate:*

SANITARY VALVES
HOMOGENIZER PISTONS — RINGS
SANITARY SEALS & PARTS
CAPPER SLIDES & PARTS
POSITIVE PUMP PARTS
GLASS & PAPER FILLING MACHINE PARTS
and for ALL OTHER SANITARY MACHINE PARTS which are cleaned daily.

**The Modern HAYNES-SPRAY Method of Lubrication Conforms with the Milk Ordinance and Code Recommended by the U. S. Public Health Service**

The Haynes-Spray eliminates the danger of contamination which is possible by old fashioned lubricating methods. Spreading lubricants by the use of the finger method may entirely destroy previous bactericidal treatment of equipment.

PACKED 6-12 oz. CANS PER CARTON
SHIPPING WEIGHT — 7 LBS.

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HAYNES-SPRAY INGREDIENTS CONFORM WITH FDA REGULATIONS AND CAN BE SAFELY USED AS A SANITARY LUBRICANT FOR FOOD PROCESSING EQUIPMENT WHEN USED IN COMPLIANCE WITH A EXISTING FOOD ADDITIVES REGULATION.

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Lazarus offers you a full range of money-saving programs that cope with every dairy-sanitation problem. Lazarus markets Dyne, Iobac, Pipeline Powdr Plus, Super Powdr Plus, Kleen-Ezey D-1, Foamchek and Foamchek-100 — all in addition to famous Iosan, the 4-way farm detergent/germicide. And — this complete line is proven and accepted in the field. So if you're a plant operator, a bulk tank, can or pipeline shipper — and profit-minded, too—

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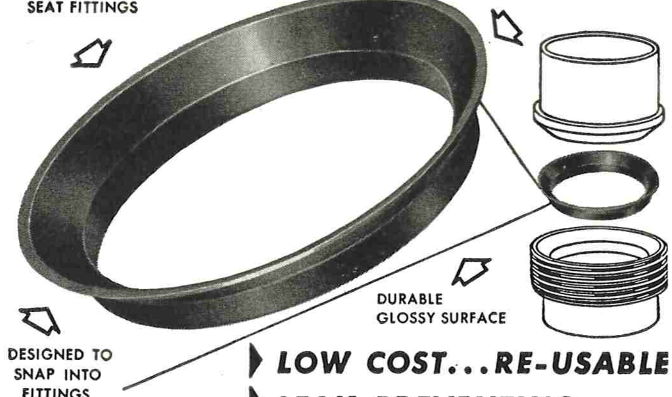


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**LEAK-PREVENTING**

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Sanitary, unaffected by heat or fats
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**SPRAY AND TUBE**

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ESPECIALLY DEVELOPED FOR LUBRICATION OF FOOD PROCESSING AND PACKAGING EQUIPMENT

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SPRAY — PACKED 6 — 16 OZ. CANS PER CARTON
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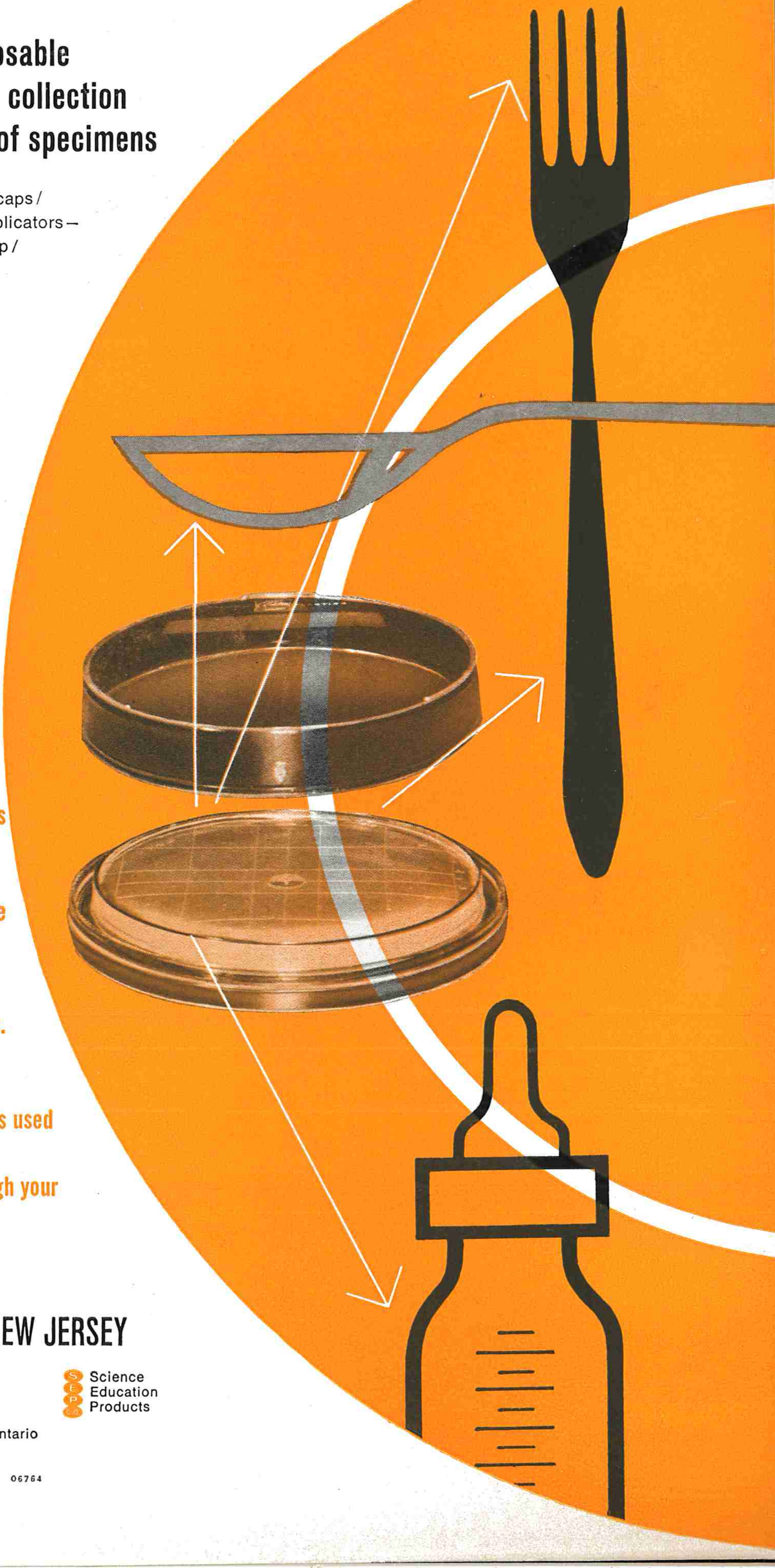
Tubes – various sizes, plain and screw cap / Cups, with caps / LIQUID-TITE flexible container / SWUBE disposable applicators – single, double, sheath, paddle, and applicator screw cap / RODAC Plate for detection of surface contamination



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**But we think we would be wrong if we did not make available to you some of the things that Dr. Gibson told a group of Surge Dealers when he talked to them.**

"In the advertising field . . . it is essential that we appeal to the teenagers—especially the girls who are the mothers of tomorrow. Surveys show that "Poor" to "Very Poor" diet classification is present in 70% of teenage girls and women under 30".

"They are just not interested in strong bones and teeth. *They are more interested in their figures, when . . . what we have been trying to sell them is health.* Let's WAKE UP and tell them

(1) that as far back as Cleopatra, the Egyptians knew that protein tightened up sagging facial tissues. So . . . they bathed in milk. They worried more about wrinkles than about health.

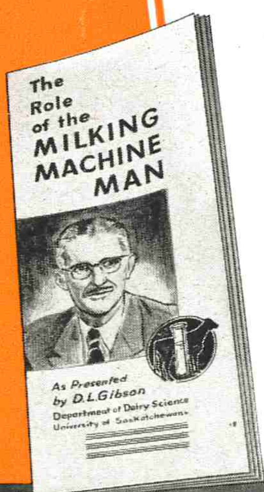
(2) today the expensive face creams contain pure milk protein.

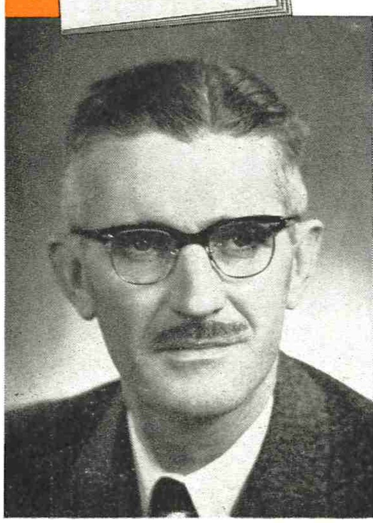
(3) that the job of producing beautifully textured skin . . . and . . . lovelier, prettier, naturally shining hair . . . can be aided by milk *inside* the body as well as outside.

(4) that the dairy industry has tailor-made products for low calorie diets.

"It is high time we in the dairy industry embarked on an aggressive mission to acquaint producer, processor, salesman and consumer alike that . . . pound for pound *. . . the protein in dairy products is one of the cheapest and highest qualities that can be obtained in any food.*

For many years we have pleaded poverty. Let's become aggressive".





The above is part of a talk given by Dr. D. L. Gibson, Head of the Department of Dairy Science, University of Saskatchewan, on January 21, 1964, before Surge Milking Systems Equipment Dealers and Canadian dairy industry officials at Toronto. It is presented here as a public service to the entire dairy industry. Copies of Dr. Gibson's speech are available in booklet form and may be obtained by writing to:

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