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Dairy and Food Sanitation

A Publication of the International Association of Milk, Food and Environmental Sanitarians, Inc.

The Role of the
U.S. in the
IDF

Goat Milk
Regulation

National Dairy
Council Promotes
Latest Computer
Program



Food Color
Through the Ages

Cholesterol
in Food and
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71st Annual IAMFES Meeting
August 5-9, 1984, in Edmonton
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REGULATION OF GOAT MILK PRODUCTION AND PROCESSING

H. V. ATHERTON

University of Vermont

70th Annual Meeting, IAFMES, August 7-11, 1983

Milk Sanitation Section, August 10, 1983

The American goat milk industry has been wrapped up in a certain mystique that approaches religious fervor for some people. To them, goat milk has unsurpassed therapeutic and nutritive values, truly the elixir of the Gods. On the other hand, there are those who have looked on goats as the brunt of their jokes, eating weeds and tin cans and smelling awful.

To most of us, goats have been ignored. We knew there were such things, probably recognized there were goat dairies on the outskirts of some big cities, but most of us never set foot on a commercial goat dairy.

Regulatory agencies as a whole took one of two attitudes - goat milk was milk and treated in same manner as cow milk while goat dairies were inspected and scored just as if it were a bovine operation. Others have attempted to ignore them, sort of a nightmare they wish would go away.

We have discovered in recent years that all these attitudes are incorrect. The goat milk industry is alive and well gaining strength all the time. Goat milk is available for most everyone who really want to find it. A few statistics may be interesting:

Haenlien (1981) notes there are at least 143 dairy goat associations and clubs in 31 states. There were 1450 dairy goat herds on DHI official test in the U.S. in 1980. Further, he reported the number of youngsters in 4-H dairy goat activities in the U.S. increased

from 3530 in 1972 to 16,618 in 1980. Holsinger (1982) observed there were 32,459 registered goats in the U.S. in 1976, up nearly 900% from 1955. The DHIA Policy Board reestablished its Dairy Goat Committee in 1981 with 13,400 does in 1400 dairy goat herds in the DHIA system. Such widespread interest in the goat industry in the U.S. would seem to mandate serious consideration be given to establishing suitable and separate sanitation and composition standards which recognize the natural differences between cows' milk and goats' milk.

Regulatory agencies, too, have become aware of the increased number of goat dairies -- many small operations with only a few does but others with dozens of caprine critters. The big question for many supervisors in these agencies is "We know they are there, what do we do with them?"

Thoughtful consideration tells us that the production and distribution of goat milk is vastly different from the commercial dairy industry we know so well. On the other hand, the final product is consumed by humans. Our regulatory agencies have the responsibility of assuring the safety and purity of the milk supply, whether it comes from cows or goats.

The goat industry is not well organized to pursue common goals. Most dairies are small. Most do not have marketable quantities of milk on a year-around basis. As a rule, operators of goat dairies are not familiar with the legal requirements for producing a salable product, rules long accepted by the dairy cow industry.

Marketing goat milk normally does not follow well established procedures for processing and handling cows' milk. Most goat dairies market fluid milk only and in relatively small quantities. Fat percentages do not seem to be a major consideration of goat milk purchasers. Goat milk dairies have no reason to adjust the normal milk fat concentration of their milk and few have equipment to do so.

The 1981 National Conference on Interstate Milk Shipments recognized that recent evidence indicates there may be basic differences between cow and goat milk. A Goat Milk Task Force was appointed to review information available as it pertained to compositional standards for goat milk under the Pasteurized Milk Ordinance, commonly known as the PMO. The Task Force was asked to present their report and make recommendations for the 1983 NCIMS meetings held here in St. Louis in May.

The Grade A Pasteurized Milk Ordinance, or PMO, is the basic document defining compositional standards and production practices required to produce a sanitary milk supply. It is acceptable by FDA and NCIMS, the state agencies regulating interstate shipments of milk.

The PMO defines "Goat Milk" as the lacteal secretion, practically free from colostrum, obtained by the complete milking of healthy goats. The work "milk" shall be interpreted to include goat milk.

"Milk" is the product defined in the Code of Federal Regulations, Title 21, Section 131.110., which, in turn, described milk as the lacteal secretion, practically free from colostrum, obtained by the complete milking of one

or more healthy cows. Milk that is in final package form for beverage use shall have been pasteurized or ultrapasteurized, and shall contain not less than 8¼ percent milk solids not fat and not less than 3¼ percent milkfat. Milk may have been adjusted by separating part of the milkfat therefrom, or by adding thereto cream, concentrated milk, dry whole milk, skim milk, concentrated skim milk, or nonfat dry milk. Milk may be homogenized.

The Goat milk Task Force was appointed because voting members of NCIMS became aware of at least two major areas of continuing concern among goat milk producers and some regulatory agencies working with the retail goat milk industry. These were:

- 1) Are DMSCC levels established by NCIMS and presently in the PMO valid for milk produced by the caprine species? and:
- 2) Are minimum fat percentages established within the PMO and most state regulatory codes suitable when applied to goat milk?

The Task Force members reviewed pertinent literature describing the composition and properties of goat milk. They surveyed state agencies responsible for regulatory control in the production and marketing of retail goat milk. This paper is based on the Task Force Report to the 1983 delegate body.

Forty-seven of the 50 states responded to our survey. We found State Laboratories use a variety of procedures approved for cow's milk samples for determining DMSCC levels in goat milk. We did not ask for methodology for other components and properties of goat milk but we now believe such information should be obtained.

The Task Force did not address minimum production practices necessary to assure the purity of a retail goat milk supply. One of the challenges for the Goat Milk Task Force should be to review the PMO with FDA personnel to establish such requirements for the vastly different conditions in a goat milk dairy.

Information made available to the Task Force indicates there are basic differences in milk produced by bovine and caprine species that should not be ignored. Task Force members believe

these differences in composition and properties of goat milk preclude the continued reference of a single set of legal standards regulating the sale of cow milk and goat milk to the consuming public.

There appear to be major predictable differences in at least three normal constituents and properties of goats' milk and cows' milk. The NCIMS Goat Milk Task Force recommended separate compositional and/or analytical procedures be established for regulation of goat milk in relation to:

1. Regulations concerning milk acceptability based on total somatic cell count. Some methods used to determine this count lack the specificity to differentiate somatic cells from the cytoplasmic particles which have been shown to be a normal component of goat milk. This discrepancy may result in the erroneous classification of normal goat milk as unacceptable milk. Therefore, regulations dealing with somatic cell count in goat milk must clearly state that only nucleated cells, as opposed to cytoplasmic particles, should be counted and that only methods which distinguish these cells may be used in determining the somatic cells count. It was the consensus of the Task Force members that if such clarification of DMSCC methodology is accepted by voting members of the NCIMS, then a uniform somatic cell count standard for cows' milk and goat's milk would be justified.

Such procedure would include the Pyronin-Y methyl green stain, a modified Wright's stain, the membrane filter-DNA technique, Fossomatic cell counts, and the California Mastitis Test or Wisconsin Mastitis Test. The DMSCC using the Levowitz-Weber modification of the Newman-Lampert stain and the Coulter Counter procedures would not be acceptable for goat milk.

2. Evidence suggests a lower milkfat percentage should be established for goat milk. Normal amounts of milk fat produced within a goat's lactation cycle vary widely and consistently. Goat herd and indi-

vidual doe (DHIA) average milk fat percentages frequently drop to less than 3.0% for one or two months of each lactation cycle. Few goat dairies are equipped to determine milk fat percentages and standardization is not common in the industry. Goat milk which is mechanically standardized should conform to acceptable milk fat standards for cows' milk.

3. Limited data indicate normal freezing points of goat milk samples may be much lower than is the case with cows' milk. Further study should be made to determine appropriate freezing point standards to detect water adulteration of goats' milk.

There are reports that several other characteristics used to regulate the market milk supply seem to differ between goat milk and cow milk. We had inadequate data to confirm these apparent differences and suggested further study be made to verify them or lay them aside.

Specifically, questions were raised about:

1. The use of the phosphatase test to assure proper pasteurization. It has been reported that the amount of alkaline phosphatase enzyme is too small to provide a reliable distinction between raw and pasteurized goat milk.
2. The acceptability of the *Bacillus stearothermophilus* test for detecting antibiotic residues in milk. "Natural" inhibitors have been reported in goat milk so that an unacceptable number of "false positive" reactions were found when goat milk was tested by this official method.
3. The use of the "ring" test to detect brucellosis in goat herds. Information available suggests ring test has suitable reliability in checking individual goat's sample but causative agent dilutes very rapidly in mixed milk sample. U.S. Animal Health Assn. questions need for brucellosis testing in dairy goats because *B. melitensis*, the causative agent in goats, is not present in the U.S.

4. The solids-not-fat or total solids content of goat milk. There seems to be little data available concerning the amount of non-fat-solids in goat milk. Also, we found little information to determine if goat milk has the same fat to solids-not-fat ratios as cow milk. If the fat test requirements for goat milk were lowered (as recommended by the Task Force), should not SNF requirements be lowered also.

Reports from Australia indicate it is possible to detect as little as 1% addition of cow milk to goat milk using a rapid cellulose acetate electrophoresis system. Confirmation of such data would be very helpful to assure goat milk customers they get only goat milk.

Development of manufactured dairy products utilizing surplus goat milk has been hampered by Federal labelling restrictions. A long-standing interpreta-

tion by the Division of Regulatory Guidance in the Bureau of Foods considers the "standard of identity" provides only for cow milk in such products. "Goat milk ice cream" was defined recently but other products made from goat milk in semblance of conventional manufactured dairy products must be labelled by some fanciful name.

The Goat Milk Task Force made only one specific recommendation to the 1983 NCIMS delegate body. That was the leucocyte (DMSCC) standard for cow milk and goat milk should be the same provided that "Pyronin Y-methyl green stain shall be used as the confirmatory test for DMSCC in goat milk." This was accepted by the delegates and should become effective in the near future. It is understood that the procedure will be described in the next edition of "Standard Methods for the Examination of Dairy Products."

The NCIMS Executive Board made the Goat Milk Task Force a standing committee of the Board, to continue to receive and evaluate pertinent information relating to the composition and properties of goat milk. A further report was requested for the 1985 Conference.

Clearly, regulation of goat milk supplies has advanced to a new level. No longer can we consider the composition and properties of cow milk and goat milk to be identical nor can they be regulated by the same set of standards. Equitable regulatory standards for goat milk must be established. Production practices necessary to produce a safe, wholesome supply of goat milk must be defined and enforced. New information is being sought and received regularly. We look forward to further progress in goat milk regulation by the NCIMS delegate body in 1985.

REGULATION OF GOAT MILK PRODUCTION AND PROCESSING

H. V. ATHERTON - *University of Vermont*
70th Annual Meeting, IAMFES, August 7-11, 1983
Milk Sanitation Section, August 10, 1983

TABLE 1. *Definition and Standards for Goat Milk sold to consumers.*

PMO - 1978 Recommendations

Section 1. A. *Milk*. Milk is the product defined in the code of Federal Regulations, Title 21, Section 131.110.

Section 1. A1. *Goat Milk*-Goat milk is the lacteal secretion practically free from colostrum, obtained from the complete milking of healthy goats. The word "milk" shall be interpreted to include goat milk.

CFR. Section 131.110. *Milk* (a) Description. Milk is the lacteal secretion, practically free from colostrum, obtained by the complete milking of one or more healthy cows. Milk that is in final package form for beverage use shall have been pasteurized or ultrapasteurized, and shall contain not less than 8¼ percent milk solids not fat and not less than 3¼ percent milkfat. Milk may have been adjusted by separating part of the milkfat therefrom, or by adding thereto cream, concentrated milk, dry whole milk, skim milk, concentrate skim milk, or nonfat dry milk. Milk may be homogenized.

Basic Recognition of Separate Goat Milk Standards in six states.

California 3.0% fat, 8.15% MSNF, 11.15% TMS - Illegal to sell cow's milk for goat milk or goat milk for cow's milk.

Florida 2.5% fat, 8.25% MSNF, 10.75% TMS. DMSCC 2,000,000/ml

Ohio 3.0% "goat milk fat"; 8½ goat milk SNF". 3.25% goat milk fat, 8.25% goat MSNF in final package for beverage use.

Vermont 2.5% fat, 7.5% MSNF, (in retail package) at least 10% TMS in goat milk.

Wisconsin 3.0% fat; 8.25 MSNF (Raw). 3.25% fat, "Same as cows" (Past.) Notes that somatic cell counts are handled on individual basis for goat dairies.

Connecticut not more than 88.6% water, not less than 2.75% milk fat, 30,000/ml SPC or 50 coliforms/ml in retail goat milk. 1,000,000/ml SCC; no water; TB and Bangs Free in annual test.

Raw milk sales permitted in 13 states, not permitted in 13 states, 2 states-local option, 2 states-Certified only. (30 responses)

NCIMS Goat Milk Task Force Survey (1982)

Action Taken at 1983 NCIMS Meeting in St. Louis, now awaiting implementation:

In the paragraph at the middle of column 1 on page 43 section 6 of the PMO, starting "one of the following confirmatory tests, etc.," add a sentence at the end of paragraph stating (Pyronin Y-methyl green stain shall be used in the confirmatory test for DMSCC in goat milk.

FOOD COLORS THROUGH THE AGES

Certified Color Manufac. Assn.
900 17th St., NW
Washington, DC 20006

It's not just taste that tells whether a food is appetizing or not; sight is another sense that is tightly bound to the way people perceive food. Most of us are extremely sensitive to food color. Appetite is quickened or dulled by reaction to colors, with red the most appealing and blue the least. The natural red color of an apple, cherry or rare cut of beef can make one's mouth water, and the green or purple of a grape indicates freshness. A rich brown hue is associated with well-cooked meats, breads and wholesome cereals. Pure blues and violet-colored foods are usually unacceptable.

Color has always been associated with the quality of the food—bright yellow bananas, red cherries, green peas. Even dairy products like cheese, butter and milk are expected to be a certain color. Studies have shown that if a food isn't the proper color, it doesn't taste right, either. Attractively colored foods are, of course, more readily eaten. Therefore, added food colors, by increasing consumer acceptance, often support good nutrition.

Food Color Additives Three Millennia Ago

History is not lacking in accounts of color added to make food taste better in the mind's eye. Generally, the first color additives were dyes and pigments obtained from plants or animals. Paintings in the Egyptian tombs dating as far back as 1500 B.C. depict the making of colored candy. During Cleopatra's day, spices were colored with Carmine, a natural colorant still in use today.

Pliny the Elder tells of wine that had color added to it four centuries before the birth of Christ.

Usage of modern food colors stems from a discovery made by Sir William Henry Perkins in England in 1856. He synthesized mauve, the first synthetic dye which led to a host of new colors. They were popular because, unlike many vegetable and mineral dyes, they were much more stable and uniform.

Early Congressional Regulation of Color Additives

Until 1886, there were no laws in the United States regulating the use of colors in foods. In that year Congress authorized the addition of a color to butter. Ten years later Congress allowed cheese to be artificially colored. By 1900, Americans were eating a wide variety of artificially - colored foods such as noodles, wine, candy, sausage, butter, cheese and jellies.

Also at that time, Congress authorized funds for the Bureau of Chemistry of the U.S. Department of Agriculture to investigate the nature of color additives and their relationship to health. They hired a German dye expert, Dr. Bernhard C. Hesse, to determine what food colors were safe to use. He studied the chemistry and physiological effect of nearly 700 dyes that were being synthesized following Perkins' initial discovery.

Early on, Hesse decided that only those synthetic dyes found to be harmless to health and necessary in a specific food should be permitted. Additionally, only those dyes which could be

analyzed and certified as pure should be allowed in foods. These principles were incorporated into the Pure Food and Drugs Act of 1906, and the first "Food Inspection Decision" on dyes was issued the following year. Seven synthetic dyes were recognized as harmless for human consumption and a *voluntary* certification program for food color was established. Experts tested each batch of synthetic dye, and if it was found to meet chemical specifications, it was certified by the Federal government as harmless and suitable for use in foods. Ten other colors were later added to Hesse's original list.

Certification became *mandatory* in 1938 with the passage of the Federal Food, Drug and Cosmetic Act which allowed only certified colors to be added to foods. That law, which although amended remains in effect today, was quite specific about the certification process. It requires that each batch of synthetic color permitted for use in foods be tested by the Food and Drug Administration (FDA) to ascertain its purity. Each batch which passes approval receives the government's stamp of approval and is "certified." The term "U.S. certified color" is still used today.

The authors of the 1938 law also devised a new system for naming the color additives. Thus, the food color commonly known prior to 1938 as "tartrazine" became FD&C Yellow No. 5, for example. The FD&C letters meant that the color could be used in foods, drugs and cosmetics. Finally, the 1938 law required that all synthetic food colors be retested on animals to determine their safety.

By the 1950s, with advances in science, new animal testing methods had been developed. Retesting of all synthetic color additives was begun.

In 1960 Congress passed the Color Additive Amendments after concluding that consumers wanted the continued use of color additives. The Amendments broadened the law to include all colors, not just synthetic colors. And the burden of proving that a color is safe shifted from the government to industry.

The Provisional List

The 1960 Amendments also established what is known as the "provisional list." That is, colors then in use were given provisional approval until studies could be completed which would re-confirm their safety and permit permanent approval of their use. The safety studies started by the FDA and completed in 1964 became the basis for industry petitions for permanent listing.

Action on permanent listing of the food colors lagged, however, because of a court action regarding interpretation of the Color Additives Amendments. Then in 1970, questions about the reproductive effects of food colors were raised, so the food color industry conducted teratology and multigeneration reproduction studies not previously within the scope of food additive testing. These studies revealed no harmful effects on embryos. Finally, it was determined by FDA that the 1957 studies no longer represented the most advanced state-of-the-art studies needed to establish safety. As a result, lifetime feeding studies in rats and mice were begun in 1977. These have been completed, and the results have been received or are under review by the FDA.

Recent Regulation

FDA recently approved the permanent listing of FD&C Blue No. 1 and

FD&C Green No. 3. Decisions on the remaining colors--FD&C Blue No. 2, FD&C Yellow No. 6, FD&C Yellow No. 5 and FD&C Red No. 3 -- will be made later this year or in early 1984. FD&C Red No. 40 was not part of the testing program begun in 1977 because it was permanently listed in 1971 based on state-of-the-art tests. Two other colors are permitted for specific and limited uses: Citrus Red No. 2 is used to color the skins of oranges not intended for further processing and Orange B is allowed for coloring the casing of sausages.

Food Colors Today

The certified food colors in use today have, as we can see, been subjected to rigorous scrutiny by the government over many years and supported by data from the food color industry's own extensive testing. Not only that, *each batch* of food color used is also tested individually and certified by the government to assure it conforms to purity standards.

Color is added to some food today because it has no natural color of its own, because its natural color is lost or altered as a result of processing or storage, or because the color of the food varies according to the season or geographical origin. The major use of color additives, however, is in products that contain little or no color of their own. These include many liquid and powdered drinks, dairy products, snack foods, candies, ice creams and sherbets. The object is like that of the Egyptian confectioner or the Roman vintner, to assure that foods are recognizable, appetizing and appealing to the consumer.

The Role of the United States in the International Dairy Federation

HAROLD WAINESS, Secretary

*The U.S.A. National Committee of the International Dairy Federation (USNAC)**

The International Dairy Federation (IDF) was founded in 1903 to establish an international forum for the exchange of technical and scientific dairying subjects. IDF has published over 300 Technical Manuals, Guides, Monographs, Standards and Seminar Proceedings. Recently this has included such topical subjects as "A Technical Guide to Packaging" and "A Monograph on UHT Processing" that have become current texts. The U.S.A. National Committee of the IDF (USNAC) was formed in 1980 to encourage U.S. participation in IDF and a sharing of scientific information, and in 1981 USNAC became a member of IDF. The IAMFES was a founding member of this highly successful venture and many of its members are currently sharing in this two-way exchange of knowledge. The active participation of IAMFES members in over 98 Groups of Experts in five different categories is reviewed. These include: Production, Sanitation & Quality of Raw Milk; Technology & Engineering of Plant Processes, Controls & Packaging; Composition, Nutrition & Chemical Contaminants; Analytical Standards & Laboratory Techniques (Microbiological & Chemical); and The Application of Science & Education to the Dairy Industry. Seminars & Symposia to be held in the U.S. and other countries will be discussed, including the role to be played by IAMFES.

THE INTERNATIONAL MARKET FOR DAIRY PRODUCTS AND INFORMATION

During the early settlement period of colonial America, each family had a cow or two to produce enough milk for its daily needs. In the Revolutionary War era, families began producing enough milk for themselves and others in the community. The early 1900's saw milk marketing adopt a regional scope as transportation and processing methods improved. Then in the mid-1900's processors and producers began shipping milk and dairy products across the country to take advantage of new marketing opportunities.

Times have changed in the dairy industry as in most businesses today; the world has become a smaller place because of improved transportation and technology. Many of

the country's industries are now involved in marketing on an international basis and the U.S. dairy industry has turned its attention to this worldwide market as well.

In 1980 the United States of America National Committee of the International Dairy Federation (USNAC) was formed to represent U.S. dairy interest in the international dairy community and to serve as a liaison between IDF and the U.S. (1).

INTERNATIONAL DAIRY FEDERATION MEETING THE NEEDS OF A WORLDWIDE INDUSTRY

IDF is an independent, non-political, international association. The IDF is a non-profit organization and does not interfere in the purely domestic matters of any country. It was founded in 1903 and has become a unique organization that provides continuing opportunities for its members to bring their combined expertise to bear on matters of interest and concern to the dairy industry. Its purpose is to promote the solution of scientific, technical and economic problems in the international dairy field through cooperation and consultation with its thirty-four member countries.

The IDF has grown to include all the world's major dairying nations on six continents. These members include all European countries (both East and West), a number of African, South American and Near Eastern countries, Australia, New Zealand, Japan, Canada and the U.S. Its role in the dairy industry has grown in importance as well. IDF provides a forum for specialists in various phases of dairying to exchange views and bring their combined expertise to bear on common problems. With this aim the Federation has been able over the years to maintain a flexible approach to its mandate. In so doing, it has broadened its definition of "problems" to include their perception in advance and thus act in areas where inaction or omission from consideration could lead to the actuality of problem development. In this respect, the Federation's role has been primarily of action rather than reaction. "It is the nature of IDF's work to set down in print the best of current experience and thought but the approach

*464 Central Avenue, Northfield, IL 90063; (312) 446-2402. Presented at the Seventieth Annual Meeting, International Association of Milk, Food and Environmental Sanitarians, August 7-11, 1983.

is always to seek to foresee developments, according to the following objectives:"

1. To promote the study of scientific, technical and economic aspects of the dairy industry on an international basis.
2. To cooperate with national and international organizations in matters relating to or affected by the dairy industry.
3. To act in a consultative and advisory capacity to the dairy industry and to other organizations as appropriate (e.g. FAO, WHO).
4. To publish information resulting from the work and activities to the Federation.
5. To organize cooperatively with national committees - seminars, symposia, congresses, and other meetings on subjects of topical importance to the dairy industry.

ADVANTAGES OF ASSOCIATION WITH IDF

Better Understanding of the International Dairy Field

A fundamental aim of IDF is to bring together milk producers, equipment and supply manufacturers, plant managers, dairy scientists, dairy sanitarians and officials, representatives of the dairy trade, and individuals and companies from the dairy industry in an atmosphere of cooperations. With no commercial or political interests, IDF offers an excellent opportunity for a better understanding and interchange among people from a variety of languages, cultures and economic structures.

Source of Information

USNAC and IDF meetings offer interchange of information. The international Dairy Congress held every four years, the IDF Annual Sessions, regular seminars, symposia, and "Groups of Experts" provide valuable discussions of current interest to the international dairy community.

The principal tangible product of IDF's work is its publications. There are 2 types: (a) a technical journal known as the IDF Bulletin that consists of a number of major documents each year, each issue dealing with a single subject; (b) standards which include standard methods of chemical analysis, sampling and microbiological examination (the great bulk of the standards), engineering standards and standards of composition for dairy products. The publications are listed in the IDF Catalogue of publications which is available free of charge from USNAC (2).

In addition IDF publishes newsletters, of specialized interest, e.g. Mastitis News and Packaging News, and proceedings of IDF meetings. All publications are distributed by USNAC to its members and constitute a comprehensive reservoir of dairy knowledge. USNAC also provides access to knowledge of scientific and technical research activities and developments in the international dairy field which are not available from other sources.

Table 1 is a list of some of the most recent publications (1982-83). These 19 Bulletins are clearly a comprehensive group of subjects and an indication of the many activities of IDF.

Another function of extreme interest, particularly to the U.S. is the publication of IDF Standards. To date, there are

125 such standards and USNAC has been actively involved in their development and revision. Table 2 is a portion of Standards (of interest to the U.S.) published to August 1983.

IDF COMMISSIONS

IDF works through six specialized Commissions and each of these Commissions has Groups of Experts which, to an extent, are similar to the Task Forces utilized by the 3-A Sanitary Standards Committee. The IDF publishes a list of all Groups of Experts each year (3).

Commission A entitled Production, Hygiene, and Quality of Milk is basically one involving raw milk, methods of obtaining raw milk of good quality and maintaining the quality until it is delivered to a processing plant. It contains such Groups of Experts as:

- Production and Utilization of Ewe's and Goat's Milk
- Quality of Milk as a Basis for Payment
- Bacteriological Quality of Raw Milk
- Standards for the Genetic Merit of Cattle and Progeny Testing
- Measurement of Mechanical Milking Practices in Relation to Environmental Factors Affecting the Efficiency of Milk Production

Recycling of Water and Waste Disposal on the Dairy Farm

The IAMFES has 7 representatives on these Groups of Experts.

Commission B, Technology and Engineering, is of greater interest to milk and food technologists than any other group. Its aim is to propound and develop the best technical procedures by which milk is collected, treated, or processed into a variety of dairy products.

Of particular interest are the following Groups of Experts which are a part of this Commission and there are 14 IAMFES representatives active with these groups:

- Technical Aspects of Packaging Milk and Milk Products
- Control of Water and Waste Water in the Dairy Industry
- Influence of Technology in the Quality of Heat Treated Milk and Fluid Milk Products
- Air Pollution in the Dairy Industry
- Membrane Processes and Resulting Products
- Energy Use and Conservation in the Dairy Industry
- Corrosion in Dairying
- Flow Meters and Sampling Equipment
- Whey and Permeates Processing
- Control Systems for Automated Processes
- Technological Problems in the Manufacture and Storage of Dairy Products Caused by Lipolysis
- Hygienic Design of Dairy Equipment
- New Systems for Materials Handling
- Fermented Milks and Fermented Milk Products: Technological Developments

Commission C, Economics, Marketing and Management, deals with matters of economic and management techniques which are of interest to the international dairy industry and to further the knowledge of the economic factors of the pro-

duction, processing and marketing of milk and milk products for the benefit of producers, processors and consumers.

Commission D - Legislation, Compositional Standards, Classification and Terminology

It is the purpose of this Commission to develop a philosophy or doctrine to guide in the development of international legislation for milk products, to elaborate standards for identity of milk products and to develop classification criteria on the basis of analytical determination and to help define certain dairy terminology. Typical among its Groups of Experts (with the involvement of six IAMFES representatives) are some of the following:

- Standards of Identity for Milk Protein
- Hygienic Requirements in Standards of Identity
- Standards for Food Grade Whey Powder
- Low Fat Spreads
- Prevention of the Contamination of Milk

Commission E - Analytical Standards and Laboratory Techniques

By far this is the largest of the Commissions and contains thirty-eight separate Groups of Experts whose purpose is to establish internationally acceptable and reliable reference and routine methodology for the precise determination of the composition, nutritional value, microbiological quality and chemical and physical analysis of all types of milk and milk products.

No attempt will be made to list the voluminous number of Groups of Experts but to point out those on which eleven IAMFES members have been active in this very important phase of the work of IDF and USNAC. The tangible accomplishments of this Commission is evident in the many published Standards (see Table 2).

- Heavy Metals and Other Elements in Dairy Products
- Psychrotrophs in Milk and Milk Products
- Coagulase Positive Staphylococci in Dairy Products
- Automated Methods for Routine Analysis of Raw Milk
- Coliforms in Milk and Milk Products
- Mycotoxins
- Yeasts and Molds in Dairy Products
- Freezing Point of Milk
- Sampling Techniques
- Antibiotics
- Simplified Methods for Viable Counts in Milk
- Preparation of Microbiological Samples and Dilutions

Commission F - Science and Education. The Commission deals with scientific problems with may arise with respect to all of the facets of the dairy industry including nutritional aspects, dairy education and the adequacy of dissemination of dairy industry research findings. The Groups of Experts include some of the following:

- Heat resistant proteinases in milk
- Accelerated cheese ripening
- Heat treatment and physico-chemical properties of milk
- Indigenous antibiotic and bacteriostatic systems in milk
- Role of cultured and culture containing dairy foods in health

Significance of milk in the diet from the angle of calcium metabolism

Genetic manipulation of dairy cultures
Nutritional Properties of milk protein and non-milk proteins

Bacteriophage problem in the manufacture of cheese and fermented dairy products

All of the specialized Commissions A through F meet once a year during the IDF Annual Sessions. These are attended by delegations appointed by the National Committees. Although USNAC has a relatively small delegation at this time it manages to cover each of the Commissions thoroughly. At the end of the Annual Sessions, USNAC prepares a report (4) of those subjects, that will be of interest to the U.S. and a copy of this report is available from the office of the USNAC Secretary.

The Groups of Experts have meetings throughout the year and although most of the meetings are held in Europe, the greater amount of work is performed by correspondence. Last year (1983) there was a meeting of Group B4 "Technical Aspects of Packaging Milk and Milk Products" held in conjunction with the DFISA Exposition in Chicago, Illinois.

Within USNAC there are counterparts of specific Groups of Experts, limited to five individuals with the Chairperson acting as the official delegate to the IDF group. Although there are IAMFES members working with forty-four Groups of Experts, this represents only a small portion of the expertise available within the organization.

This is not a one-way street and for those involved, the Groups of Experts offer a tremendous amount of technical information based on research and new developments in countries throughout the world. In many fields, other countries are far in advance of the U.S. and this is an excellent opportunity to keep abreast in all of the various aspects of dairy technology. A complete list of all Groups is available from USNAC (5).

SCOPE OF ACTIVITIES

Both IDF and USNAC do not limit their work or study programs to their own organizations and work together with many national and international groups such as ADSA, IAMFES, ISO, AOAC, FAO, NMC, etc.

Another interesting aspect is the holding of "weeks". This is done to increase intergroup liaison and to reduce travel and other expenses. Those groups with related subjects usually convene for about three or four days. The two groups in this field are Microbiological Week and Chemical Week and the last Microbiological Week was held in Washington, D.C. earlier this year and many of those present attended these Sessions. Next Microbiological Week will be held in the spring of 1984 in Europe and the Chemical Week in Washington, D.C. during October of 1984.

Seminars, Symposia and Workshops are held during the year on various topical subjects. Table 3 lists these activities for 1983-1987. Note particularly that for the

first time a seminar entitled "New Dairy Products via New Technologies" will be held under the auspices of USNAC in 1985 in Atlanta, Georgia during the DFSIA Exposition. Additional information of this seminar will be circulated to IAMFES and all of the dairy and food journals.

IDF AND USNAC

IDF is an unusual international organization specializing in dairy interests. There is no other similar forum for dairy technologists to exchange ideas, achievements, problems, concerns and future plans with their peers throughout the world. This opportunity benefits each National Committee's dairy industry and its members. Before a country can become a member of IDF it must establish a National Committee to represent the entire range of dairy interests in that country. USNAC not only assures valuable input in all aspects of the dairy field but, in many cases, provides the only interaction between different facets of the dairy industry in the U.S. and internationally. Each Group of experts serves as a liaison between USNAC, IDF, and the dairy industry internationally. All programs and services of IDF are channeled to member countries through their National Committees. Only USNAC members receive the current worldwide information and are included in meetings and discussions covering international dairy issues.

Membership in USNAC is open to, but not limited to, milk producers, processors and distributors of dairy products, suppliers of ingredients, chemicals and packaging materials, manufacturers of processing, packaging and test equipment, scientists and technologists in industry, academia, and government at all levels.

TABLE 1
RECENT BULLETINS PUBLISHED BY
INTERNATIONAL DAIRY FEDERATION
DURING 1982-1983

Factors Affecting the Quality of Heat Treated Milk
New Monograph on UHT Milk
Membrane Processes - Guidelines for Testing Equipment
International Lexicon of Selected Terms and Acronyms
Dairy Effluents
Corrosion in the Dairy Industry
IDF Catalog of Cheeses
Technical Guide for the Packaging of Milk and Milk Products
Taxonomic Features and Identification of *Lactobacillus bulgaricus*
and *Streptococcus thermophilus*
The World Market for Cheese
Dairy Ingredients in Food Products
Iodide in Milk and Milk Products
Measurement of Extraneous Water by Determination of Freezing Point of Milk
International Study of Dairy Cooperatives
IDF Dictionary of Dairy Terminology
Sludge from Dairy Effluent Treatment Plants
Utilization of Goat's and Ewe's Milk
Cultured Dairy Products and Human Nutrition
Survey on the Use of Antibiotics and Their Residual Levels in Milk

To offset costs of membership in IDF and recover costs of operating USNAC, a structured dues program has been developed. This provides for representation and participation by all segments of the industry while providing each person or organization the opportunity of a level of financial support for the National Committee. The dues are based on various categories within the industry and with classifications within each category.

TABLE 2
SELECTED INTERNATIONAL DAIRY
FEDERATION STANDARDS

Count of contaminating organisms in butter
Standard routine method for the count of coliform bacteria in raw milk
Standard routine method for the count of coliform bacteria in pasteurized milk
Standard method for the count of lipolytic organisms
*Control methods for sterilized milk
**Milk and milk products - Guide to sampling techniques
Machine milking: definitions and terminology
Ice cream and milk ices: colony count (reference method)
Ice cream and milk ices: count of coliform bacteria (reference and routine methods)
Milk and milk powder, buttermilk and buttermilk powder, whey and whey powder: determination of phosphatase activity (reference method)
Fermented milks: count of coliforms (reference method)
Fermented milks: count of microbial contaminants (reference method)
Milk and milk products: count of coliform bacteria (reference and routine method)
**Determination of the organochloride pesticide residues content of milk and milk products
Milk and milk products - Determination of the copper content
Standard procedure for testing the corrosiveness of detergents and/or sterilants on metal and alloys intended for use in contact with milk and milk products
Standard procedure involving alternate immersion and emersion for testing the corrosiveness of detergents and/or sterilants on metals and alloys intended for use in contact with milk and milk products
**Milk and milk products - Detection of Salmonella
**Milk and milk products - Yeasts and moulds
Sensory evaluation of dairy products, (recommended general code - grading of butter - grading of milk powder)
**Liquid milk - Microorganisms
*Liquid milk - Psychrotrophic microorganisms
**Milk - Determination of freezing point - Thermistor cryoscope method
Milk and cheese - Determination of aflatoxin M1 content by thin layer chromatography
Milk, cream and evaporated milk - Determination of total solids by oven drying
**Sampling for determination of hygienic condition of dairy plant
**Preparation of samples and dilutions for microbiological examination
**Overall accuracy of indirect methods of milk analysis
*Under revision
**Provisional Standard

THE FINAL WORD

IDF and USNAC have developed and will continue to develop in a dynamic fashion. The future will require new initiatives to take care of the changing needs of its members and to discharge its responsibility as the world's paramount dairy industry organization. There is a vast reservoir of expertise in the IDF and for the U.S. this is an unique opportunity to become fully involved with a practical exchange of this knowledge and experience with other dairy technologists, research scientists and educators. The long term goal of these efforts will be

a cooperative venture that will be of incalculable advantage to all parties participating in this undertaking.

REFERENCES

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 2. IDF 1983. Catalogue IDF*.
 3. IDF 1983. Programme of Work IDF*.
 4. USNAC 1983. Report to USNAC Members on the 67th Annual Sessions of the IDF, Oslo, Norway*.
 5. USNAC 1983. List of USNAC Groups of Experts*.
- *Available from USNAC: 464 Central Ave., Northfield, IL 60093.

TABLE 3
INTERNATIONAL DAIRY FEDERATION
TIMETABLE FOR SESSIONS, SEMINARS, SYMPOSIA, WORKSHOPS
(excluding group meetings)

	1983
March 7-11	Microbiological Week - Washington, D.C.
March 22-25	Symposium: "Role of milk proteins in human nutrition" - Kiel, Germany
April 19-22	Seminar: "Dairy Effluents (II)" - Killarney, Ireland
May 2-6	Chemical Week - Brussels, Belgium
May 17-19	Symposium: "Physico-chemical aspects of dried protein-rich milk products" - Helsingor, Denmark
July 3-8	Annual Sessions: Oslo, Norway
September 19-21	Workshop: "Computerized bulk milk collection systems" - Toronto, Canada
November 15-18	Seminar: "Quality assurance - means of promoting efficiency in dairying" - Valdivia, Chile
	1984
March 27-30	Seminar: "Challenge to contemporary dairy analytical techniques" (in cooperation with the FECS and AOAC) Reading, UK
May 7-11	EEC Seminar: "Milk proteins as food ingredient" - Luxemburg
May 14-16	Seminar: "Fermented Milks" - Avignon, France
Spring (*)	Microbiological Week
September 14-15 (*)	Symposium: "Progeny testing methods for dairy cattle" - Prague, Czechoslovakia
September 17-21	Annual Sessions - Prague, Czechoslovakia
September (*)	Workshop: "Econometric demand analysis" - Ottawa, Canada
October (*)	Chemical Week: Washington, D.C., USA
	1985
April or May	Seminar: "Mastitis" - Kiel, Germany
September (*)	Seminar: "Milks other than cow's milk" - Thessaloniki, Greece
October 5-9	Seminar: "New dairy products via new technologies" Atlanta, Georgia, USA
October 14-16	Seminar: "Milk production with emphasis on feed energy" - Melbourne, Australia
October 20-25	Annual Sessions: Auckland, New Zealand
	1986
September 24-October 3	Annual Sessions and XXII International Dairy Congress - The Hague, Netherlands
August 31-September 4	Annual Sessions: Helsinki, Finland
(*) date or place tentative or not definite	

Cholesterol Study Discussed

Recent publicity about the role of cholesterol in heart disease has concerned nutritional scientists with the University of Wisconsin-Madison.

They say there's a great deal of difference between the cholesterol in food and the cholesterol in blood even though misleading publicity about a recent drug study fails to distinguish between the two.

UW-Madison nutritional scientists say some publicity about a recent drug study sponsored by the National Institutes of Health make it appear as though most people would benefit by reducing their intake of cholesterol.

"The NIH study was not a nutrition study, it was a drug study," says Howard Ganther, chairman of the UW-Madison Department of Nutritional Sciences.

While the NIH study implicated high levels of blood cholesterol as a cause of heart disease, it did not show high cholesterol intake was a cause of high blood cholesterol levels. Diet was not even a variable in the study.

The UW scientists interviewed agreed with an editorial in *Nature* magazine which stated that the study "set off another wave of bad advice from the dietary pundits who have never been able to distinguish between cholesterol in food and cholesterol in blood."

The UW scientists strongly object to the tactic of "Extrapolating" research findings, in this case, using a drug's effects on a selected group of high-risk men with very high blood cholesterol levels to formulate dietary advice for the general public.

Alfred Harper, a UW-Madison biochemist and nutritional scientist, speculates that some of the publicity may be an attempt to increase public support for certain types of research.

The UW scientists praise the NIH research concerning the beneficial effects of cholestyramine, a cholesterol-reducing drug, but criticize the publicity which fails to distinguish between cholesterol in food and cholesterol in the bloodstream.

The NIH researchers noted in their report that a large-scale study concerning the effects of diet on heart disease was rejected years ago due in part to its "prohibitive cost," estimated at \$500 million to \$1 billion.

Ganther notes that, while the NIH report admits that diet's effect on heart disease has not yet been conclusively determined, much of the publicity about the NIH report has stressed the links between diet and heart disease.

"I don't think it's wise that the whole nation be put on a diet in order to benefit only a few. The study simply did not show that the diet used was

effective in reducing blood cholesterol levels," Harper says.

"I worry that those who need comprehensive intervention might instead think that a modified diet will solve their problems," he adds.

Those on a limited cholesterol diet during the NIH study reduced blood cholesterol levels by only 3.5 percent.

Approximately 480,000 men between 35-59 years of age were screened before 3,810 were selected for the NIH study. All those participating in the study had very high blood cholesterol levels averaging 291 milligrams per 100 milliliters.

"Even ardent advocates of dietary change freely admit that dietary cholesterol is a very secondary factor in controlling serum cholesterol levels compared to genetic factors.

"The evidence concerning dietary cholesterol is still inadequate. We face a choice; we can target treatment of those with a unique problem or treat the entire population in the hope that this will benefit those who need help," Harper says.

Results of the \$150 million study were announced Jan. 12. The 7-year study is said to provide the first conclusive evidence that lowering cholesterol levels in the bloodstream with the drug reduces the risk of heart attacks.

"I have no objection to the study, but I do object to how it is being interpreted," says Charles Elson, A UW-Madison nutritional scientist who has been studying the cholesterol-reducing effects of plant substances.

He is particularly concerned by the assumption that dietary cholesterol has a "linear" effect on blood cholesterol levels; in other words, that increasing cholesterol intake also proportionately increased blood cholesterol levels.

Elson says the body manufactures most of its cholesterol in an extremely complex, regulated process. Factors such as dietary fiber which appears to remove cholesterol from the body, the regulated metabolic pathways which synthesize cholesterol and genetic factors are still being studied.

Elson notes that those studies which have shown that dietary cholesterol increases blood cholesterol have usually fed massive amounts of cholesterol. "Within normal dietary intakes, diet has little effect on the blood cholesterol levels of normal individuals whose cholesterol-control mechanisms are intact," Elson adds.

Decreasing caloric intake while maintaining protein and carbohydrate intake is "as effective as anything in decreasing blood cholesterol levels," Elson adds.

"Nobody talks about the vested interests on the 'other side' although there's plenty of discussion of the meat, milk and egg interests," Harper adds, responding to criticism that he might be influenced by agricultural interest in America's Dairyland. If anything, he says the charges make him weigh the evidence more carefully before reaching a conclusion.

New Computer Program Evaluates Kids' Food Choices

Teachers can determine if youngsters' food choices for meals and snacks add up to a balanced diet with help from National Dairy Council's latest computer program titled, WHAT I USUALLY EAT.

The program is designed as an evaluation tool to gain valuable dietary data from children in grades 3-6, said NDC President M.F. Brink, Ph.D.

"Information on children's eating habits has been difficult to get," Brink noted, "But WHAT I USUALLY EAT makes the job easier for the educator. In addition, students using WHAT I USUALLY EAT learn about nutrition in an enjoyable way."

The computer program asks kids what they usually eat for breakfast, lunch, supper, and snacks.

Youngsters make their selections from 40 popular foods, a number that pilot tests have shown to be appropriate for the students' age group. Their responses are compared to the recommended number of servings from each of the basic food groups.

"The program was developed for Dairy Council by Iowa State University," explained Judy Brun, Ph.D. evaluation research associate with National Dairy Council. "Educators can use the program to evaluate dietary habits with large numbers of students, classrooms or even school districts."

Teachers, Brun explained, can also use WHAT I USUALLY EAT to evaluate how kids' food choices have improved following an instructional unit on nutrition. Some teachers may even prefer to teach four food group nutrition with the computer program rather than take advantage of its evaluation capacity.

By making the computer program available to educators, NDC strengthens its position as a leader in the field of nutrition education, noted Brink. "At the same time, a balanced diet based on the four food groups is stressed, including the need to select the recommended number of servings from the milk group."

The program has been pilot-tested nationally with elementary school teachers and their students.

WHAT I USUALLY EAT uses colorful graphics with sound and simple language that appeals to youngsters. The program will run on Apple II plus (48K) or Apple IIe (64K) computers.

Each WHAT I USUALLY EAT software package comes with two floppy disks, master copies of two student handouts and a user's manual. The package costs \$30 if purchased from the National Dairy Council. For more information, contact your local Dairy Council office or National Dairy Council, 6300 N. River Rd., Rosemont, IL 60018.

Low Dairy Sign-Up May Hurt Dairy Farmers

Lower than expected farmer participation in the government dairy diversion program means good news for beef, hog and crop farmers.

"But it's bad news for dairy farmers," said Paul Hasbargen, farm management economist with the University of Minnesota's Agricultural Extension Service.

Nationally, 12 percent of the U.S. dairy farmers signed contracts under the U.S. Department of Agriculture (USDA) dairy paid-diversion program. That's expected to reduce U.S. milk output 5.5 percent during the 15 months of the program.

About 337,000 dairy cows will be removed from milking herds under the program. But Hasbargen and coworkers had earlier projected about 500,000, while the USDA had estimated up to one million.

"Of the 337,000 dairy cows, 23 percent of them have presumably already left the milking herds. They've already hit the market, and the rest will be spread out to about 20,000 head per month for the next 14 months," Hasbargen said.

That means there should not be a glut of cull dairy cows hitting markets and driving prices of beef and hogs down. "We expect hog prices may average 25 to 30 cents a hundred lower due to the dairy diversion program. Fed cattle prices will probably be about 35 to 40 cents a hundred lower, and cow prices may average about 65 cents a hundred lower," Hasbargen said.

"This means good news for beef and hog farmers since there will not be a significant impact on prices.

In fact, it's less than one-half the price drops earlier expected by meat industry groups. It's also good news for corn and soybean growers. Any price reductions in corn and soybean markets will be very limited," Hasbargen said.

"The bad news is that dairy farmers will be facing even lower milk prices 18 months from now, when the secretary of agriculture can reduce milk prices another 50 cents per hundred. And we won't get the necessary adjustment of supply and demand in the dairy industry that was possible under this law.

"I'm afraid the dairy industry used lots of political capital to get the dairy bill passed, but most dairy farmers ignored it. And I don't think the next program will provide such an economically attractive offer to them," he said.

"In Pursuit of Excellence" is National Frozen Food Convention Theme

The National Frozen Food Convention and Exposition, always the central meeting ground for the frozen food industry, will take on even greater importance in 1984 with the special invitation of 1000 retail and foodservice merchandisers and buyers to the event.

The Convention, sponsored by the American Frozen Food Institute (AFFI) and the National Frozen Food Association (NFFA) will take place November 11-14 at the Hilton Hotel in San Francisco, California. Personal invitations to the Convention, including complimentary registration, are being issued to two executives from each of the top 300 retail food chains and 200 foodservice organizations.

Chief executives from major retail and foodservice chains, nationally-known political commentators, productivity experts and other important speakers will participate in a wide variety of exciting programs at the Convention, which will have "In Pursuit of Excellence" as its theme.

The Convention will be kicked off Sunday, November 11 at 3 p.m. with the opening of the Exposition, which will feature exhibits of the latest in products, supplies, services and equipment. Reintroduced in 1982, the Exposition has experienced healthy growth in the past two years, and this year's event promises to be bigger and better than ever. A

grand opening reception will be held from 6 to 7:30 p.m. following the opening of the Exposition.

Programs on Monday, November 12 will begin at 7:30 a.m. with an opening breakfast session that will feature a leading political journalist/commentator who will provide an analysis of the 1984 election and its potential impact on the frozen food industry.

Following breakfast, a general session from 9 to 11 a.m. will feature a keynote address by the chief executive officer of a major supermarket chain. This address will be followed by a panel discussion that will include the keynote speaker, the chief executive officer of a major foodservice company and two top political commentators. The general session will also feature presentation of the "Golden Penguin" awards, which will recognize excellence in participation in the March 1984 National Frozen Food Month program, and exciting audiovisual presentations.

Delegates will have the afternoon of November 12 free to conduct business and attend the Exposition.

Programs on Tuesday, November 13 will be headed by a breakfast session from 7:30 to 8:45 a.m. with a nationally known speaker, followed by a series of workshops on state-of-the-art information and techniques that can be used by the frozen food industry "In Pursuit of Excellence."

The first set of workshops, which will take place from 9 to 10:15 a.m., will include a session on long-term trends in the foodservice industry and how technology is impacting them and a session on frozen food profitability. The second set of workshops, which will take place from 10:30 to 11:45 a.m., will feature a presentation on retail trends, similar to the foodservice session, and a presentation on the use of objectives matrices to boost productivity. The last organized events of the Convention will be a reception at 6 p.m. and the grand awards banquet at 7 p.m. November 13. The banquet will feature presentation of the Foodservice Innovator and Retail Master Merchandiser Awards and entertainment by nationally-recognized performers.

Wednesday, November 14 is being held free of programs and organized activities so that delegates can conduct business meetings and conferences.

Registration materials are now available. For more information, contact the National Frozen Food Convention and Exposition, 1700 Old Meadow Road, Suite 100, McLean, VA 22102. 703-821-0770.

The Surge InFARmation Farm Manager

A farmer used to have a few cows around to produce dairy products for his family. The feeding of such small groups was not much of a problem for the dairyman -- he could give the cows a couple scoops of this or that, turn them out to pasture and he was done.

With increasing cattle numbers and commercialization of dairy herds came feeding problems, as well as increased production from each cow. Larger numbers of cows in one herd created much more work with no better feeding methods than the use of a scoop shovel. This was not an accurate way of feeding and much time and labor was involved.

A dairyman's time became a valuable resource -- especially during the planting and harvest seasons. Often, cattle would not be cared for quite as well during these times. This could result in wide variances in diet and nutrition -- milk production and herd health often suffered because of it.

The actual feeding process progressed due to automated augering, but feeding was still done in mass and there was no accurate method to measure the amount individual cows were fed -- much less consumed. Little has been done, until recently, and now Babson Bros. Co., builders of Surge dairy farm equipment is introducing a revolutionary -- farm tested -- computer operated herd management system -- a system that does so much more than just feed cows.

The new Surge InFARmation Feed Manager will allow up to eight feeding periods per day and can help boost milk production, lower feed usage and has tremendous labor-saving capabilities. The key to the system is "Auto Continuous Update." A lactation curve for each individual cow is projected and feeding allotments are adjusted daily, up or down, according to her production. The best part about this is that it is all done automatically. All of this data is then available to the dairyman through the system's Feed Management Report.

Daily production reports are also available and deviations from the herd average are reported. The Individual Production Report generates the expected 305-day production of each cow. The Production Alert shows when a cow's milk output is down. Production Rankings numerically list cows -- from top to bottom producer. Exception and Hold reports show which cows aren't milked and cows whose milk is not saleable because of antibiotic residue or, for example, because a cow is recently fresh.

The Feed Manager is designed to help the dairyman make more money with fewer cows by eliminating over or under feeding -- by reminding him about treated cows, and through direct savings of time.

The dairyman, with guidance from his nutritionist, decides what to feed, when to feed, and the amount to be fed. The Feed Manager takes these parameters and computes a lactation curve based on the cow's daily production. Each installation is set up according to the dairy's needs. Even the amount offered during each feeding period is decided by the dairyman. With the Feed Manager, a dairyman can choose nutritionally correct diets for individual cows even though they are grouped with dissimilar cattle. This allows the dairyman to challenge-feed high-producing cows and have separate diets for cows that are in late lactation, over-conditioned or even dry. Lead-feeding is also possible and there is a separate beef cow feeding program as well. In fact, each feed station can be adapted for dual feeding, thus doubling each unit's feeding capabilities and giving the dairyman more dietary options.

The electronic transponder-cow tag is manufactured for Babson Bros. by Identification Devices, Inc. (IDI), of Westminster, Colorado. According to IDI, "It contains a silicon chip uniquely coded to identify individual cows and is activated to transmit that code by a low power electromagnetic signal. This tag has greater flexibility, reliability and a wider range of sensitivity than any other currently on the market." This readily adapts it to parlor usage, and allows for future expansion.

The system is also designed for the future. A daily milk production monitoring system is under field test and a health monitor which will enable the dairyman to detect mastitis at the subclinical stage will also be available. The system automatically resets itself after a power outage. Thus no records, (which are stored on floppy discs) will be lost and no battery back-up is needed.

The Feed Manager will handle up to 48 feeding stations and the basic system includes the 64K terminal, a printer that uses eight-and-one-half in. by eleven-in. continuous-feed paper, a wall mounted feeder control unit, heavy-duty galvanized feed station assemblies, InFARmation neck tags, individualized software programs and start-up supplies.

An InFARMer club has been created specifically for InFARmation users. The dairyman receives free system software updates for six months, a toll-free Help-Line and certified Surge InFARmation service. Also, the Feed Manager users will receive the

InFARMer newsletter quarterly, which will include articles by nutritionists about feeding programs—tips on system maintenance—early announcements of new software and equipment options—and will provide a forum for InFARMer users to communicate with each other.

For more information, please contact your local authorized Surge dealer or write to Babson Bros. Co., 2100 S. York Road, Oak Brook, IL 60521.

AACC Workshop on Integrated Pest Management for the Food Industry

Over 100 registrants attended an American Association of Cereal Chemists (AACC) sponsored workshop titled "Integrated Pest Management for the Food Industry," February 14-15, 1984 in Atlanta, GA. Experts presented information about the variety of tools available for controlling pests in the food industry, and how different approaches to control may be integrated into an overall pest management program. They also worked on ways to further develop and publicize these methods.

The American Association of Cereal Chemists (AACC) is a scientific society of more than 3,000 members internationally. It was founded in 1915 to establish standardized methods of analysis in cereal laboratories and to encourage research within the cereal processing industries.

For more information contact: Raymond J. Tarleton, American Association of Cereal Chemists, 3340 Pilot Knob Road, St. Paul, MN 55121. 612-454-7250.

Sandra Haagen Appointed as Marketing Coordinator at Bell-Mark

Bell-Mark Corporation, designers and manufacturers of automatic Coding and Printing Equipment, has announced the appointment of Sandra Haagen to the position of Marketing Coordinator. She has 15 years experience in the areas of marketing/sales analysis and research. Her last position was marketing analysis department manager for North American Philips.

Sandra will be taking over all the existing programs, projects and responsibilities of the Marketing Department. The Bell-Mark Corporation is located in E. Orange, New Jersey.

Evaporated Milk Association Elects New Officers

John P. Speiser, Diehl, Inc., Defiance, Ohio, was elected President of Evaporated Milk Association at its annual meeting in Washington, DC.

W. D. Vanderhoof, Pet Incorporated, St. Louis, was elected Vice President.

R. J. Przybylski, O-AT-KA Milk Products Cooperative, Batavia, New York, was elected Treasurer.

Elected to serve on the Board of directors with the three officers were: William Adams, Milnot Company, Litchfield, Illinois, and Clarke A. Nelson, Carnation Company, Los Angeles.

J. C. Flake continues as Executive Vice President.

Evaporated Milk Association, based in Rockville, Maryland, represents all U.S. manufacturers of evaporated milk.

Fraser Pemberton Appointed Director of Product Planning at Babson Bros Co.

Babson Bros. Co. has announced that Mr. Fraser Pemberton has been appointed Director of Product Planning and Development of the Oak Brook-based company.

Throughout his career at Babson Bros. Co., Mr. Pemberton has been involved in sales and marketing for the complete-line dairy equipment firm. Beginning in 1957 as a Canadian District Sales Manager, he was later named Divisional Sales Manager and subsequently Regional Sales Manager. Appointed Assistant General Sales Manager in 1976, Mr. Pemberton has been responsible for all aspects of sales and marketing for the entire eastern United States Region since that time.

Since its inception in 1906, Babson Bros. Co. has been an industry leader in both innovative research and development of dairy equipment and related products. Major innovations continue to take place within both the dairy and the dairy equipment industries. In order to meet these changes, Mr. Pemberton will report directly to the company president and provide direction for all personnel involved with new product planning and development.

"By continuing to develop state-of-the-art equipment, Babson Bros. Co. will maintain their reputation of offering the highest quality products and further strengthen the company's leadership position in the marketplace," said Mr. Pemberton.

Preventive Sanitation Workshop

The Huge' Company, Inc., and its division, the American Sanitation Institute, will conduct a "Preventive Sanitation and Food & Drug Compliance Workshop" including EPA/FIFRA and Pesticide Updates on May 22-23, 1984.

The seminar will be held in St. Louis, MO at the Holiday Inn-Riverfront. It is open to all food industry Plant Management, QA and QC Managers, Directors of Sanitation, Sanitarians and PCO's.

Prominent speakers from the Federal Food and Drug Administration, Federal EPA, State Agencies, State colleges and universities, members of the American Sanitation Institute staff and Quality Assurance Directors of well known food processors will be in attendance.

Topics discussed will include the FDA Act, Pesticide labels, Corporate Responsibility, Employee Practices, the new Retail Store standards, Development of a preventive sanitation program, Sanitation hazards, Fumigation, and insect, rodent and bird control.

Information regarding the seminar program and registration may be obtained by contacting the Huge' Company/American Sanitation Institute at 800-325-3371. In Missouri call 314-725-2555 or 800-392-0855.

NASFT's 30th Annual Fancy Food & Confection Show

A broader vision of the industry, reflecting its growth, diversity and ambitions, characterizes the goals of the 30th Annual International Fancy Food & Confection Show.

Seminars will focus on HOW to succeed in the latter part of the 80's: merchandising speciality cheeses and takeout cuisine with an eye on the lifestyles of consumers; managing with an ear to what motivates customers and employees, the two keys to greater profits; relations with suppliers voiced by industry leaders not known to be bashful; and what may be one of the industry's secret weapon...the growing presence of women in the specialty food business.

Chairman of the seminar committee is Russell B. Vernon of West Point Market in Akron, OH. He is also chairman pro tem of the NASFT Retailers Division.

The world renowned exhibition, sponsored by the National Association for the Specialty Food Trade,

will be held at the Washington Convention Center, Washington, D.C. June 24-27.

"America's Specialty Foods--An International Heritage" is the theme, inspiration and promise of the exhibition, said Edith Friedland of EFCO, an NASFT director and show chairperson.

"With 90% of last years exhibitors signed on again for the same place as last year, we expect to break another record and go some 20% ahead of 1983, Friedland said. "This is a fitting tribute to the show's 30th anniversary," she said.

The show is now among the top one percent of such events in the U.S.A.

For more information contact: Dennis Raveneau, show manager, International Fancy Food & Confection Show, PO Box 3833, Stamford, CT 06905. 203-964-0000.

Louis Arrigoni Appointed to UDIA Board of Directors

The appointment of Louis Arrigoni, Seattle, WA, to the board of directors of United Dairy Industry Association (UDIA), was announced recently by the organization's chairman, James P. Camerlo.

"We are pleased that Mr. Arrigoni, a nationally-known dairy leader can fill a vacancy on our board. The next election for board members will be held on March 31, 1984, at UDIA's 14th annual meeting in San Antonio, Texas," Camerlo said.

Arrigoni is president and chief executive officer of Darigold, Inc., Seattle. He is also general manager of United Dairymen's Association and a director of National Milk Producers Federation. He served on the board of directors of National Dairy Council, the nutrition research and education division of UDIA, from 1973 to 1982.

Arrigoni received his Ph.D. in chemistry from the University of Washington in 1944. He was a professor of chemistry at the university until he joined Consolidated Dairy Products in 1949.

United Dairy Industry Association's total promotion program includes nutrition research and education, advertising and marketing, product and process research. The national dairy-promotion organization, based in Rosemont, Illinois, represents more than 93% of the nation's dairy farmers, 85% of the milk marketed, and has promotional programs in 45 states.

SmithKline Animal

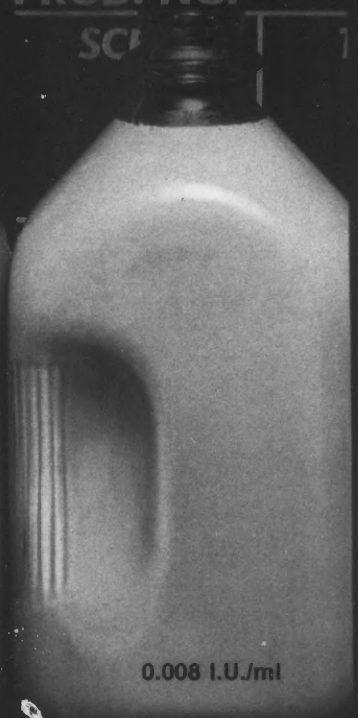
PROCEDURE • Reconstitute vial 1 & 2. (Add 1 ml of distilled water) • Add 10 ul of vial 1 to 50 ul of milk. (Incubate for 5 minutes at 47° -C.) • Add

PROD. NO.

SC



0.000 I.U./ml



0.008 I.U./ml



These colors are representative
Pen

Give milk a go

SmithKline Animal Health Products • F

Sold under License from UCB-BI

Health Products

1 ml of vial 2 & 3 (Incubate 15 minutes at 47° C.)

● Add 100 ul of 50% sulfuric acid. (Observe for color indication of beta-lactam antibiotic level in milk.)



0.010 I.U./ml

0.017 I.U./ml

3 Penzyme colorimetric assay. The actual colors of the test may slightly vary with each test.

zyyme

vel screen test.

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CTS s.a. Made in Belgium

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New Product News

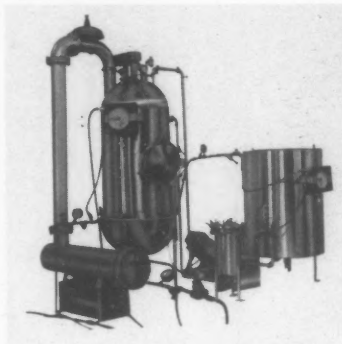
The products included herein are not necessarily endorsed by Dairy and Food Sanitation

Lee Industries Offers Vacuum Processing Equipment

Process Systems and Equipment, a division of Lee Industries, Inc., Port Matilda, PA, offers a complete line of vacuum processing equipment. The equipment is designed for applications where evaporation, low temperatures, or low pressures are required. By operating under vacuum conditions, evaporation and concentration can be accomplished at an efficient high rate, without subjecting the product to the high temperatures of atmospheric boiling.

Lee Industries designs and manufactures an extensive line of industrial processing equipment and systems for the food and chemical industries.

For more information contact: Lee Industries, Inc., PO Box 520, Port Matilda, PA 16870. 814-692-5562.



Lee Industries Vacuum Equipment

LKB Instruments Offers Faster Amino Acid Analysis

LKB Instruments, Inc. introduces its new Alpha Plus, designed to provide even faster high performance amino acid analysis. The instrument features a powerful microprocessor and stainless steel analytical columns for improved sensitivity and resolution. The earlier introduced Alpha model is still available as a low cost alternative.

The Alpha Plus will appeal to laboratories where identification and quantitation of amino acids present in physiological fluids, protein hydrolysates, and foodstuffs is required. Applications include confirmation of inborn errors of metabolism, protein composition, and nutritional analysis. Also, polyamine concentrations, an important factor in cancer research, can be determined.

Instrument functions and operating parameters are simply set on a keyboard, while LED displays and indicators confirm status of instrument and operation. Power failures will initiate flushing of coils to prevent blockages while retaining stored operation programs in memory.

For more information: LKB Instruments, Inc., 9319 Gaither Road, Gaithersburg, MA 20877. 301-963-3200.

Centaur Sciences Expands to Accommodate Dairy Industry

Centaur Sciences manufactures disposable products used in laboratory testing. Recently, facilities were expanded to accommodate the dairy industry. Centaur Sciences now offers three products especially designed for use in dairy testing procedures: PENTRAY-1 -- disposable penicillin test trays or plachets for use in the Charm-Test, DUAL RANGE PIPETTOR -- designed for use in the Standard Plate Count, this pipettor draws 1.1ml and aspirates 1ml, then the remaining .1ml, and GLASS CULTURE TUBES -- 13x100 capless tubes manufactured from either sodalime or borosilicate.

In addition to these items, they carry fixed volume pipettors ranging from 1 to 5000 ul. These pipettors and tips are designed for use in a variety of testing procedures, including penicillin assay of milk, milk phosphatase testing, and various milk dilutions. They are all guaranteed for life and are quite economical, especially when you consider the available discounts.

Other products offered are the Centaur 12x75 culture tube in polystyrene and polypropylene, and the disposable pasteurimeter.

Centaur Sciences is offering a 25% discount off the list price for pipettors, and a 20% discount on all other products. Larger discounts are available depending on the product, the quantity ordered, and the frequency of purchase.

For more information contact: Donna Harwood, Centaur Sciences, Inc., 180 Harvard Avenue, Stamford, CT 06902. 203-324-5741, or Sylvia Crawford, Centaur West, Inc., 587 Dunn Circle, Sparks, NV 89431. 702-331-1890.

Faster Dairy Quality Control Results from Bactomatic

Bactomatic's model 123 BACTOMETER Microbial Monitoring System combines modern computer technology with accepted microbiological procedures to allow the dairy quality control laboratory to arrive at results generally within 1/6 the time and at a significantly lower cost than currently used procedures.

The model M123 is a microprocessor controlled instrument which provides rapid automated detections of microbial levels in up to 512 samples simultaneously. Testing capabilities of the system currently include total, psychrotrophic, coliform, and mesophilic determination in raw milk, as well as coliform and highly accurate and rapid shelf-life determinations in pasteurized milk. In addition, a test for the determination of yeast contamination in yogurt is also available.

The BACTOMETER is now an American Public Health Association (APHA) approved method and will be included in the 15th edition of "Standard Methods for the Examination of Dairy Products". Benefits which can be

expected from the use of the instrument by the dairy processor include rapid classification of incoming raw product, rapid determination of in-process product status, and earlier determination of post process contamination. This will allow line sanitation to be conducted on a need only basis and permit the packaging of a superior quality product leading to an extension of shelf-life and increased profit margins.

For more information contact: Bactomatic, PO Box 3103, 719 Alexander Rd., Princeton, NJ. 08540. 609-452-8515.

Hayward Announces an Industry First

Hayward Industrial Products announces a first. An all plastic (PVC) Duplex Strainer containing no metal, which handles corrosives, and will not contaminate the product. The major design advantage is uninterrupted flow for any piping application. As sludge or particles build up, the flow is easily switched from one strainer to the other. PVC construction eliminates the need for more expensive stainless steel, bronze or alloy strainers.

Hayward PVC Duplex Strainers are ideally suited to protect pumps, filters, flowmeters, instrumentation, and other equipment in corrosive fluid service. They can be used in food processing, plating, sewage treatment, semiconductor plants, chemical processing and many other industries. PVC material is approved for potable water and edible oil applications. If the application requires, Hayward Duplex Strainers are available in CPVC on request.

Hayward PVC Duplex Strainers are shipped ready-to-use, no assembly required. Two, 3-way ball valves control fluid flow. Basket covers can be easily removed by hand when strainers require cleaning. No tools are needed.

Strainer sizes offered are 1/2" through 2" with basket mesh perforation available from 1/32" through 3/16". End connections include threaded, socket and flanged. Working pressure is 150 psi at 72°F.

For more information contact: Bob Fischer, Marketing Manager, Hayward Industrial Products, Inc., Plastic Products Division, 900 Fairmount Avenue, Elizabeth, NJ 07207. 201-351-5400.



Hayward PVC Duplex Strainers

Superior Tube Adds High-Strength Stainless Alloy

Superior Tube Company has announced the addition of seamless Alloy 16-6 PH tubing to its standard-order inventory. According to metallurgist Tom Rees, the martensitic precipitation hardening stainless steel is ideal in applications requiring the corrosion resistance of a high chromium alloy combined with exceptional strength and hardness obtained through a simple heat treatment. Some usages include instrumentation, meat injection needles and gundrill shanks.

Its high yield and tensile strengths can be significantly increased by cold working the annealed metal before aging. At room temperature, a wide variety of mechanical properties is available, ranging from solution annealed to over 200,000 psi yield and tensile strengths realized through various aging treatments. Long exposures at temperatures above 1,000°F will cause overaging and softening.

Alloy 16-6 PH is usually fabricated in the solution annealed condition. Machinability is better than that of the austenitic steels. Final machining may be performed after precipitation heat treatment, but roughing cuts are best executed in the solution annealed state.

For more information contact: Superior Tube Company, PO Box 191, Norristown, PA 19404. 215-489-5200.

Low-Cost Temperature Controller Offered by Athena Controls

The Athena 3000, a compact, full feature, analog set point temperature controller has been introduced by Athena Controls.

The Athena 3000 was designed for use where proportional or three-mode (Proportional, Integral and Derivative) control is necessary, but low cost is a critical consideration.

Typical applications include packaging machinery. Because of its flexibility, the 3000 is a great asset to end-users of machinery, but its low cost makes it of especial interest to equipment manufacturers as well.

For more information contact: Athena Controls, 5145 Campus Drive, Plymouth Meeting, PA, 19462. 215-828-2490.



Temperature Controller
by Athena Controls

Anderson Series J Sanitary Electronic Indicators

Anderson Series J Sanitary Electronic Indicators are solid-state instruments which use transducers and appropriate circuitry to convert sensed process pressures into bright, easy-to-read digital displays. Single and dual-channel models are available, each having two set-points which can be user-adjusted at will. When the set point is reached, it actuates a long-life relay which can be used to sound an alarm or to turn process controls or plant equipment on or off.

The second control function of the Series J features a 0-1 Vdc proportional take-off signal which can be interfaced with instrumentation such as recorders, controllers, and microprocessors used for process pressure indication and control.

The pressure sensor and transducer are provided as a one-piece assembly in standard configuration. However, the transducer can be mounted well away from the sensor to protect it against potentially hazardous process conditions such as excessively high temperature. The pressure sensor is made of a stainless steel diaphragm welded to any one of the wide range of 2" and 1-1/2" sanitary fittings used in dairy, food, and beverage applications. Thus, the Series J can be made compatible with existing process lines as well as with new systems.

For more information contact: Anderson Instrument Company, Inc., R.D. #1, Fultonville, NY 12072. 518-922-5315.

Improved Milk Sterilization System from Tri-Canada

A recently published, full-color brochure introduces Tri-Canada's packaged UHT milk sterilization system, using DASI FreeFallingFilm TM technology. Tri-Canada and DASI claim that this revolutionary new system produces shelf-stable milk which is indistinguishable in taste tests from regular pasteurized milk.

The brochure describes the development of the DASI FreeFallingFilm concept, and its first fully commercial application in the Tri-Canada packaged system. Unlike other ultra-high temperature sterilization techniques, the DASI system does not allow milk to come into contact with hot metal surfaces, or subject it to high pressure stream jets. The product...which can be milk, cream, ice-cream mix or other liquid food products...is effectively sterilized without degradation of protein, change of color, or "burnt" flavors.

Tri-Canada and DASI believe that by eliminating these off-flavors, which so many consumers find objectionable, their new system will allow long-life dairy products to seriously challenge refrigerated products in the market

place or provide customers with fresh tasting products for extended refrigerated shelf life.

For a copy of the brochure "UHT Milk with the Flavor of Fresh", contact Tri-Canada Inc., PO Box 4589, Buffalo, NY 14240. 716-856-2648.

New Compressor Oil Purifying System by Velcon

A new compressor oil purifying system specifically designed for large ammonia refrigeration installations has been introduced by Velcon Filters Inc. The VP-1ST series portable oil reclaimers let you reuse contaminated compressor oil that previously had to be thrown away. In addition, routine purifying of the oil reduces compressor wear and downtime.

Made with components specially selected for highly corrosive ammonia service, the VP-1ST design applies the field proven technology of the Petroclar family of oil reclaimers manufactured by Velcon. Oil is heated to 180°F and pumped into a vacuum chamber where water, solvents, and gaseous contaminants are flashed off. A unique disperser/filter cartridge removes sediment and other particulate contaminants and also aids the flashing process.

Mounted on a portable cart, the VP-1ST only requires an electrical connection. Two versions are available, one for 230V, 1 phase and the other for 460V, 3 phase service.

For more information contact: Velcon Filters Inc., 1750 Rogers Ave., San Jose, CA 95112. 408-298-6525.



Velcon Oil
Purifying System

MEMBERSHIP DIRECTORY

IAMFES will be publishing a 1984 Membership Directory. Please fill out this form and mail TODAY, if you haven't already done so.

We need the following information in order to make the directory complete. Thank you for your cooperation.

NAME _____

Company Name _____

City _____ State/Province _____

Country _____ Zip _____

1. Job Title _____

2. Office Phone Number with area code _____

3. How long have you been a member of IAMFES _____

MAIL TODAY. . . This form must be received no later than May 1, 1984.

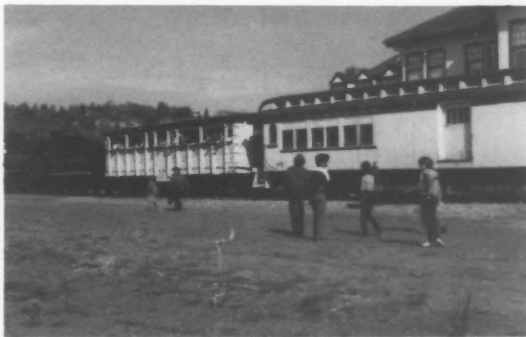
Mail to:

K. R. Hathaway
IAMFES, Inc.
PO Box 701
Ames, IA 50010
515-232-6699

If you haven't already done so, please complete this form today for inclusion in the IAMFES Membership Directory.

ENJOY A VOYAGE TO YESTERDAY!

During the 71st Annual Meeting of the IAMFES to be held in Edmonton, Alberta, August 5-9, 1984, you'll have the opportunity to step back in time more than one hundred years, to experience what life used to be like in frontier and pioneer days - and learn about those who made Edmonton the vibrant, vital city that it is today. The sights and sounds of the past are part of the atmosphere at Fort Edmonton Park where you will stroll down the boardwalk of 1885 Street, tour a real frontier fort, ride on an authentic steam driven train, and top off the evening with a barbequed dinner of world-famous Alberta beef. Then wake up the next morning to a Klondike Breakfast held in retrospect of the Gold Rush of yet another era in Edmonton's history. You - and your family - are sure to have a wonderful time. Join us in Edmonton in '84!



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Food Science Facts

For The Sanitarian



Robert B. Gravani
Cornell University
Ithaca, NY

FOODBORNE DISEASE

Foodborne disease, foodborne illness and food poisoning are terms used to describe the illnesses associated with eating food that contains harmful microorganisms, chemicals or toxins (poisons).

There are four major types of foodborne disease that should be familiar to all food industry personnel. They are caused by the following agents: 1) bacteria, 2) chemicals, 3) parasites and 4) viruses. A brief description of each type is given below.

BACTERIAL FOODBORNE DISEASE

It is estimated that about 1% of all known bacteria are harmful to humans. This group of bacteria are called pathogens. Some of these organisms can cause infectious diseases such as Strep throat and pneumonia while others can grow in foods and cause food poisoning.

The most harmful bacteria that cause food poisoning are listed below.

BACTERIA	FOODBORNE DISEASE
<i>Staphylococcus</i>	"Staph" food poisoning
<i>Salmonella</i>	<i>Salmonella</i> food poisoning or Salmonellosis
<i>Clostridium perfringens</i>	Perfringens foodborne disease
<i>Clostridium botulinum</i>	Botulism

Although these names are difficult to pronounce, the outcome is simple--these bacteria can cause illness and even death when allowed to grow and multiply in foods. There are other bacteria capable of causing foodborne disease, but these four organisms are responsible for a majority of foodborne disease outbreaks that occur each year.

CHEMICAL POISONING

There are two major types of chemical poisoning. One is associated with metals and the other with chemical products. Chemical poisoning due to metals occurs when foods are stored in unapproved containers made of materials like zinc, cadmium, tin, copper, antimony, and lead. These metals can dissolve in acid foods, such as fruit juices, and produce fast acting poisons. The other type

of chemical foodborne illness is associated with chemical products such as detergents, sanitizers, pesticides, or other chemicals that find their way into food intentionally or by accident.

PARASITIC FOODBORNE DISEASE

This type of foodborne disease is caused by parasites. The most widely known parasite is the microscopic worm, *Trichinella spiralis*, that causes trichinosis. This organism infects pigs, bear and some other wild animals. It is most commonly transmitted to humans who consume undercooked pork products. Although trichinosis occurs less frequently than in the past, all pork should be thoroughly cooked before eating.

VIRAL FOODBORNE DISEASE

Hepatitis A virus is the most common viral foodborne disease. The virus is usually transmitted by an infected food worker to raw or lightly processed foods. The food is then consumed and symptoms of the disease are noticed.

Each year the Center for Disease Control in Atlanta, Georgia summerizes all the reported outbreaks of foodborne disease in the United States. These figures are reported from local, state and federal agencies responsible for food protection and public health. For the last several years, when the cause of the outbreak was determined by laboratory analysis, bacteria were the most common cause of foodborne disease followed by chemicals, parasites and viruses.

Although the number of foodborne disease outbreaks varies from year to year, there are several key factors responsible for these food poisonings. They are: 1) holding foods at improper temperatures, 2) improper cooking/processing, 3) poor personal hygiene of people working with food, and 4) contaminated equipment.

These factors should be recognized by all people who work with food; food safety is a concern to everyone and it is up to each food industry worker to prevent foodborne disease.

Remember, the safeness of food depends on all people, but especially: 1) those who produce and process it, 2) those who transport and distribute it and 3) those who prepare it.



Dairy Quality

by Darrell Bigalke, *Food & Dairy Quality Mgmt., Inc., St. Paul, MN*

SOURCES OF PSYCHROTROPHIC ORGANISMS FOUND IN RAW MILK

Last month's Dairy Quality Newsletter pointed out that when psychrotrophic organisms are found in raw milk at large populations they can adversely affect the quality and yield of cultured dairy products. Other past issues have shown that large populations of psychrotrophs in raw milk can cause quality defects in finished fluid products. These occur when 1) off-flavors are produced by psychrotrophs in raw milk and are not removed by pasteurization, 2) when heat stable enzymes produced by psychrotrophs survive pasteurization and produce quality defects at some subsequent time, and 3) through the problem of psychrotrophic spore-forming organisms surviving pasteurization and subsequently growing in pasteurized fluid milk. For these reasons, the microbial quality of raw milk must be based on low numbers of psychrotrophic organisms.

This month's newsletter is intended to point out the sources of psychrotrophic contamination in raw milk. With the increasing requirement for extended storage time before processing, controlling contamination and growth of psychrotrophs is extremely important. An understanding of the sources of psychrotrophic organisms will be of benefit to those responsible for controlling and monitoring the quality of raw milk supplies.

There are primarily two broad types of psychrotrophic organisms of concern found in raw milk -- gram negative rods and gram positive spore-forming rods. The primary source of gram negative rods has been demonstrated to be water and soil (3,7). Every conceivable type of water supply (plant well water, farm well water, municipal water supplies, drainage ditches, water from condensation in compressed air, and other water sources) have demonstrated the presence of gram negative rods. Secondary sources, and of greater significance, are improperly cleaned and sanitized milk handling equipment. Research has shown that milk aseptically drawn from healthy cows is relatively free of psychrotrophs (5), therefore, milk handling equipment may be responsible for contaminating milk supplies with these organisms. For example, in Mikolajcik's (3) review of psychrotrophic bacteria in dairy products, it is pointed out that poorly cleaned bulk

tank surfaces, pipelines, and milking machines are sources of gram negative rods. Druce and Thomas (1) found that when rinse samples were taken from farm bulk tanks, those with counts higher than 2.5 million per square foot included 76.7% as gram negative psychrotrophic rods. Also, work done by Jackson and Clegg (2) indicated that an average of 22% microflora found in milking equipment on the farm was gram negative rods.

The second group of bacteria demonstrated to cause quality defects in milk are spore-forming gram positive rods. These organisms can survive pasteurization and grow at refrigerator temperatures. Mikolajcik and Simons (4) found that when 109 raw milk samples were heated at 80C for 12 minutes and subsequently stored at 7C for 7, 14, and 28 days 50 and 88% of the samples had psychrotrophic counts greater than 100,000/ml after 14 and 28 days of storage respectively. The primary sources of gram positive spore-forming bacteria in raw milk were shown to be soil, water, feed, feces, bedding, and personnel (4,6,7). Secondary sources of gram positive spore-formers have been demonstrated to be improperly cleaned and sanitized equipment with rubber parts including pipeline gaskets as the major sources.

In general, the dairy industry can be accused of placing the responsibility of raw milk bacteriology on the producer, fieldmen, and milk suppliers. However, care in raw milk handling at the processing plant is equally important. There are several potential sources of psychrotrophic contamination, both gram negative rods and gram positive spore-formers, at the plant. Of greatest concern are improperly cleaned and sanitized silos, transfer pumps, and pipelines. In addition, sources such as plant or municipal water supply contamination for air (especially compressed air used for air agitation) and contamination that might occur through pits and cracks in raw milk storage tanks must be monitored and controlled.

While control of contamination of raw milk with psychrotrophic organisms is necessary, temperature control of raw milk is equally important. Since complete elimination of psychrotrophic organisms in raw milk supplies is virtually impossible, control of the subsequent growth of these bacteria must hold a high priority in any dairy's quality control program. In this regard, receiving temperatures,

storage temperatures, and length of time until processing must be controlled and monitored very carefully. Previous Dairy Quality articles have provided schemes that might be used for monitoring temperatures of the raw milk supply.

In summary, there is no doubt that the psychrotrophic content of raw milk has the greatest effect on raw milk microbiological quality. Understanding the sources of psychrotrophic organisms in raw milk is necessary in controlling contamination from these bacteria. With water and soil being the primary reservoir of psychrotrophic organisms, steps should be taken to assure that even small amounts of water and soil are not allowed to enter raw milk supplies. Additionally, contaminants originating from improperly cleaned and sanitized equipment on the farm must be controlled. It is equally important that the milk handling equipment at the dairy processing plant be effectively cleaned and sanitized. Sources such as condensation from compressed air, plant water supplies, and contaminants originating from cracks in storage tanks also need to be eliminated.

- (1) Druce, R.G., and S.B. Thomas. 1972. Bacteriological studies on bulk milk collection: Pipeline milking plants and bulk milk tanks as sources of bacterial contamination of milk - A review. *J. Appl. Bact.* 35:252-270.
- (2) Jackson, H. and L.F.L. Clegg. 1965. Effect of preliminary incubation (55F/18 hr.) on microflora of raw bulk tank milk with some observations on microflora of milking equipment. *J. Dairy Sci.* 48:407.
- (3) Mikolajcik, E.M. 1979. Psychrotrophic bacteria and dairy products quality I. Major organisms involved and defects produced. *Cultured Dairy Products Journal* 14(4):6-10.
- (4) Mikolajcik, E.M., and N.T. Simon. 1978. Heat resistant psychrotrophic bacteria in raw milk and their growth at 7C. *J. Food Protect.* 41:93-95.
- (5) Morse, Pamela M. et. al. 1968. Investigation of factors contributing to the bacterial count of bulk tank milk. II. Bacteria in milk from individual cows. *J. Dairy Sci.* 51:1188-1191.
- (6) Morse, Pamela M. et. al. 1968. Investigation of factors contributing to the bacterial count of bulk tank milk. III. Increase in count, from cow to bulk tank and effect of refrigerated storage and preliminary incubation. *J. Dairy Sci.* 51:1192-1206.
- (7) Witter, L.D. 1961. Psychrophilic Bacteria - A Review. *J. Dairy Sci.* 44:983-1015.



N.M.C.

NATIONAL MASTITIS COUNCIL

The National Mastitis Council has numerous materials which are especially appropriate for educational purposes. The materials cover the organisms that cause mastitis, how to control mastitis and locate infected cows, and how to use proper milking procedures to assure udder health and maximum milk yields.

A 48-page book, entitled "Current Concepts of Bovine Mastitis", is also available. It contains the latest information on mastitis and is written in easy-to-understand language.

For microbiologists, veterinarians, lab technicians and students, there is a very useful manual which identifies mastitis-causing organisms. It is called "Microbiological Procedures for Use in the Diagnosis of Bovine Mastitis".

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All NMC educational materials can be obtained through Nasco, 901 Janesville Ave., Fort Atkinson, Wis. 53538. Write for Flyer No. 642 or call 1-800-558-9595.

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Ontario Food Protection Association Seminar

Under joint sponsorship of the Ontario Food Protection Association, the Canadian College of Microbiologists, and the Canadian Institute of Food Science & Technology, a seminar was held November 22, 1983 in Toronto, Ontario. The seminar was attended by approximately 350 people.

Based on the combined membership of the three organizations, this event was a major gathering of Microbiologists, Food Science Technologists, Management and Quality Assurance personnel of the Food Industry.

Topics covered were Rapid Methods In Food Microbiology, including developments in Hydrophobic grid membrane filtration. Foodborne disease outbreaks, laboratory diagnosis of *Campylobacter jejuni*, and the use of indicator organisms in microbial analyses were also discussed.

The success of this seminar was the combined effort of all participating organizations and the contribution of the following speakers.

Mrs. Donna Hodge, Mr. Bruce Cieben, Mr. Michael Brodsky, all of Ontario Ministry of Health, Mrs. Phyllis Entis, Q.A. Laboratories, Ltd., Toronto, Ontario, Dr. Anthony N. Sharp, Dr. Ewen C.D. Todd, both of the Bureau of Microbiological Hazards, Health Protection Branch, Ottawa, Ontario, and Dr. E. Idziak, McGill University, Montreal, Quebec.

Dr. Idziak talked about the role of the microbiologist in the food industry and stressed the need for microbiologists to be more than an indicator tool with his results, but to be able to identify the cause of the problems encountered.

The 1984 Annual Meeting of the Ontario Food Protection Association will take place on March 28, 1984 in

Toronto. This years theme of the association will be, "Food Quality and Food Preservation." All the activities of the organization will center around this topic, beginning with the annual meeting, which will also include an Antibiotic Workshop.

Pennsylvania Dairy Sanitarians Laboratory Director's Conference

The annual conference of dairy sanitarians and laboratory directors will be held at the Keller Conference Center on the University Park campus of The Pennsylvania State University in State College, PA, May 14-16, 1984. Joint sessions of sanitarians and laboratory directors will start at 1:15 p.m. on Monday, May 14 and continue until Wednesday noon. Separate programs for the two groups will be held Tuesday afternoon and Wednesday morning. There will be evening presentations and discussions on Monday and a banquet Tuesday evening.

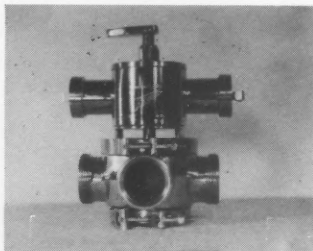
More than 40 persons will participate in the panels and presentations. Topics include making a rating, DHIA program and testing results, regulations, computerized milking and feeding, automated composition testing, quality tests, communications, quality tests, farm quality panel, sampler surveillance, computerization in the laboratory, bacterial types and sources, bottom filling of tanks, equipment installation applications, FDA approval of drugs, testing dairy products, calf and heifer housing, dairy situation, freezing mix, milkfat test variations, PI counts, plant testing programs, using water from streams, stray voltage, cattle nutrition and mastitis, somatic cell count update, and a bonus for milk quality.

For a copy of the program, contact the Agricultural Conference Coordinator, 409 J.O. Keller Building, The Pennsylvania State University, University Park, PA 16802. 814-865-9547, or contact Sid Barnard, chairman, 814-863-3915.

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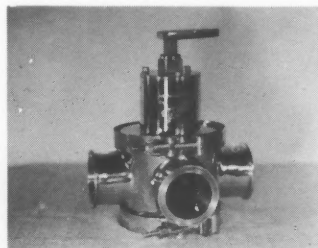


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Abstracts of papers in the April Journal of Food Protection

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Survival and Growth of *Staphylococcus aureus* on Temperature-Abused Beef Livers, B. W. Berry, K. F. Leddy and C. A. Rothenberg, Meat Science Research Laboratory, Agricultural Research Service, U.S. Department of Agriculture, Beltsville, Maryland 20705

J. Food Prot. 47:260-262

Beef livers from freshly slaughtered cattle were inoculated with coagulase-positive *Staphylococcus aureus* and then placed in frozen storage. After 14 d of frozen storage, one-half of the livers were subjected to 21°C for 24 h followed by a 15-d period of storage at -1°C. The other livers were kept in frozen storage (-29°C) during this 15-d period after which all livers were subjected to either 10 or 21°C temperatures. *S. aureus* counts did not change during the 15-d storage period at -1°C, whereas aerobic plate counts (APC) increased by over 3 log₁₀ cycles. The low storage temperature plus the growth of competitor bacteria most likely prevented *S. aureus* from proliferating. When all livers were subjected to 24 to 144 h of storage at either 10 or 21°C, those that had been subjected to 15 d of slow surface thawing displayed a lower *S. aureus* count and higher APC than livers subjected to rapid thawing followed by holding at the high temperatures. This may mean that if livers become contaminated with substantial numbers of *S. aureus* before freezing, then rapid thawing coupled with high storage temperatures (more typical of meat merchandising in less developed countries) could allow for rapid *S. aureus* growth before competitor organisms increase in numbers.

Indirect Enzyme-Linked Immunosorbent Assay for Detection of Aflatoxin B₁ in Corn and Peanut Butter, Titan S. L. Fan and Fun S. Chu, Food Research Institute and Department of Food Science, University of Wisconsin, Madison, Wisconsin 53706

J. Food Prot. 47:263-266

An indirect enzyme-linked immunosorbent assay (ELISA) for aflatoxin B₁ (AFB₁) was developed. The method involves coating AFB₁-polylysine conjugate on microtiter plates as immobilized antigen, followed by incubation with free toxin standard or sample extract and anti-aflatoxin antibody from rabbits. The amount of antibody bound to the solid phase was determined by subsequent incubation with a secondary antibody conjugated with an enzyme, i.e., goat anti-rabbit IgG-horseradish peroxidase conjugate, and reaction with the chromogenic substrate. Aflatoxins were extracted from peanut butter and corn meal samples according to the BF and CB method of the Association of Official Analytical Chemists, respectively. Extracts without column cleanup treatment were dissolved in assay buffer for subsequent ELISA. Using this technique, 79.5 to 98.6% and 68 to 97% of AFB₁ added in the range of 5 to 40 µg/kg to the corn meal and peanut butter samples were recovered, respectively. The indirect ELISA achieved the same sensitivity and specificity for AFB₁ as that obtained from the direct ELISA, with an additional advantage that much less antibody (100 times less) was required for the assay.

Evaluation of Direct Enrichment at Elevated Temperature for Recovery of Salmonellae from Oysters, Mary L. Miller and John A. Koburger, Food Science and Human Nutrition Department, University of Florida, Gainesville, Florida 32611

J. Food Prot. 47:267-269

A comparison of the recovery of salmonellae from naturally contaminated oysters was made by using either Lactose broth preenrichment at 35°C followed by selective enrichment in Tetrathionate and Selenite Cystine broths at 35, 41 and 43°C, or direct enrichment in Tetrathionate and Selenite Cystine broths with incubation at 35, 41 and 43°C. Direct enrichment in Selenite Cystine broth at both elevated temperatures produced the greatest number of positive samples. Similar results were obtained with artificially contaminated oyster samples (1 *Salmonella*/5 g of meat). Statistical analysis of the data showed that significantly higher recovery of salmonellae was obtained by using direct enrichment of samples in Selenite Cystine broth at the elevated temperature.

Squash Containing Toxic Cucurbitacin Compounds Occurring in California and Alabama, K. S. Rymal, O. L. Chambliss, M. D. Bond and D. A. Smith, Department of Horticulture, Alabama Agricultural Experiment Station, Auburn University, Alabama 36849

J. Food Prot. 47:270-271

A highly toxic, extremely bitter compound was found in canned zucchini squash from a large California cannery. The same toxin occurred in yellow straightneck squash grown in two different home gardens in Alabama. The compound was determined as cucurbitacin E and the quantities found in both squash types were potentially hazardous to humans.

Microwave Drying to Determine the Solids Content of Milk and Cottage and Cheddar Cheese, David M. Barbano and Mary E. Della Valle, Department of Food Science, Cornell University, Ithaca, New York 14853

J. Food Prot. 47:272-278

Microwave ovens have been used in quality control laboratories for rapid determination of moisture content of dairy products. Factors that influence sample drying rate and final test result for microwave drying are quite different than factors that influence conventional drying methods. Differences in dielectric properties of samples will have a significant influence on microwave drying, but may not influence conventional drying. Sample handling methods that reduce variability in test results for milk, cottage cheese, and Cheddar cheese are discussed. Preliminary investigations indicated that there are differences in results from one microwave oven to the next, even when the same sample material was dried under the same analysis conditions. This variations may be due to a combination of differences in sample positioning, differences in wave patterns in individual oven cavities, and differences in magnetron power output with age and heavy usage. Good correlations of microwave test results with those from the standard method were obtained for

milk and cottage and Cheddar cheese. Statistically significant differences between microwave results and standard method results indicated that for best agreement between laboratories it would be necessary to calibrate individual microwave ovens against a standard reference method for each type of product.

Effect of Electrical Stimulation on Meat Microflora: Observations on Agar Media, in Suspensions and on Beef Carcasses, C. K. Lin, W. H. Kennick, W. E. Sandine and M. Koothmarai, Clark Meat Science Laboratory, Department of Animal Science, Oregon State University, Corvallis, Oregon 97331

J. Food Prot. 47:279-283

Electrical stimulation of beef carcasses did not cause a significant reduction in surface microbial population at three different sampling positions immediately following slaughter. However, significant microbial reduction ($P < 0.05$) was found at position 2 (muscle above aitch bone) but not at position 1 (inside of neck) or position 3 (fat on outside of round) after 72 h of chilling storage. Nine bacterial species from eight different genera commonly associated with meat were inoculated on three different agar media which varied in electrical conductivity. Electrical stimulation of these media caused a reduction in numbers of microorganisms under various voltage and time treatments. Spore-forming bacteria were the most resistant to the electrical treatments. Among the non-spore formers, gram-negative bacteria were more resistant to electrical treatment than gram-positive bacteria. Also, microorganisms inoculated on the lowest resistance medium A revealed greater reduction in numbers than that of the other media with higher resistance. A five log cycle reduction in *Escherichia coli*, *Pseudomonas putrefaciens* and *Pseudomonas fragi* was found in 0.85% saline solution and phosphate buffered saline solution after a 30-V, 5-min treatment, but little change in count was detected in 0.1% aqueous peptone or 2.5 M sucrose solution.

Automated Counting of Bacterial Colonies on Spread Agar Plates and Non-Gridded Membrane Filters, J. A. Devenish, B. W. Ciebin and M. H. Brodsky, Ontario Ministry of Health, Laboratory Services Branch, Box 9000, Terminal A, Toronto, Ontario, Canada M5W 1R5

J. Food Prot. 47:284-287

The Biotran II automated colony counter was compared with a manual procedure for accuracy in counting bacterial colonies using both spread agar plate and membrane filter techniques. Comparative total bacterial counts of 250 samples (14 food, 124 water and 112 raw milk) were analyzed using the spread agar plate technique. Compared to manual enumeration, the Biotran II was found to be inaccurate for counting bacterial colonies on spread agar plates. Only 60 (24%) and 79 (31.6%) Biotran II counts fell within 10 and 20%, respectively, of the corresponding manual counts. Two samples from each of three river and four effluent sources were analyzed for total aerobic, total coliform, fecal coliform, fecal streptococci and total staphylococci bacterial counts using non-gridded membrane filters. A yellow acetate filter was used to mask the background growth and enhance the target colonies on the membrane filter. However, the method had limited success. Only 12 (20.7%) and 20 (34.5%) Biotran II counts fell within 10 and 20%, respectively, of the corresponding manual counts. Until the effect of background growth can be eliminated, the Biotran II cannot be relied upon to accurately count bacterial colonies on membrane filters.

Changes in Some Functional Properties of Freeze-Dried Milk Made from Skim Milk that Supported Growth of Psychrotrophic Bacteria, Jonathan P. Burlingame-Frey and Elmer H. Marth, Department of Food Science and The Food Research Institute, University of Wisconsin-Madison, Wisconsin 53706

J. Food Prot. 47:288-292

Effects of growth of psychrotrophic bacteria in skim milk on functional properties of nonfat freeze-dried milk made from the skim milk were assessed. Average dispersibility of freeze-dried milks produced from skim milk which had supported growth of *Pseudomonas fluorescens* #3 and *Lactobacillus* sp. together with the indigenous microflora increased as the incubation time of the skim milk at 7°C was extended, whereas samples treated similarly with *Pseudomonas fluorescens* #7 decreased in average dispersibility as the incubation time at 7°C increased. Percent foam volume of reconstituted freeze-dried nonfat milk increased as the holding time of skim milk at 7°C was extended when *Pseudomonas fluorescens* #3 or #7 were used to treat skim milk. Reconstituted freeze-dried nonfat milk made from milk precultured with *Lactobacillus* sp. decreased in foam volume as the initial incubation of the skim milk was extended. Percent insolubility of nonfat freeze-dried milk tended to increase as incubation at 7°C was extended when skim milk was inoculated with *Pseudomonas fluorescens* #3, #7 or *Lactobacillus* sp.

Preliminary Observations on the Occurrence of *Campylobacter jejuni* at Four California Chicken Ranches, R. E. Smitherman, C. A. Genigeorgis and T. B. Farver, Department of Epidemiology and Preventive Medicine, School of Veterinary Medicine, University of California, Davis, California 95616

J. Food Prot. 47:293-298

During a 3-month period from April to July, 1983, three *Campylobacter jejuni* survey studies were done at four chicken ranches in Northern California. In Survey 1, 29 of 200 (14.5%) total cloacal swab and dropping samples collected from the 20 occupied houses on the four ranches were positive for *C. jejuni*. Positive samples were from two of the four ranches. On one of these ranches, both occupied houses were positive. However, on the other ranch, only one of six houses was positive. Follow-up feed, water, litter and dropping samples were collected from three houses on this latter ranch during Survey 2. Again, positive samples were from only one house with 26 of 30 (86.7%) droppings positive for *C. jejuni* and 3 of 20 (15%) water samples positive. No feed or litter samples were positive. During Survey 3, cloacal swabs or bird dropping samples were collected from two houses on each of three ranches at approximately weekly intervals from the time of arrival of new flocks of chickens. All six houses ultimately became positive. The first positive samples were collected from one house when chickens in that house were 12 d old. This house had contained *C. jejuni*-positive chickens during Survey 1, had old litter, and had not been very thoroughly cleaned and disinfected. First positive samples in each of the other five houses were collected when chickens were between 40 and 46 d old. Two of these houses had previously been positive for *C. jejuni* but had old litter replaced with new and had been thoroughly cleaned and disinfected. The three other houses had been negative for *C. jejuni* during Survey 1. Two of these houses had new litter and had been well cleaned. The other house contained old litter and had not been well cleaned. When each house became positive, virtually all samples from that house were positive within a week indicating that *C. jejuni* likely spreads rapidly among birds in the house.

Recovery of *Salmonella* from Artificially Contaminated Poultry Feeds in Non-Selective and Selective Broth Media, B. J. Juven, N. A. Cox, J. S. Bailey, J. E. Thomson, O. W. Charles and J. V. Shutze, University of Georgia, Cooperative Extension Poultry Science Department, Athens, Georgia 30602 and United States Department of Agriculture, Agricultural Research Service, Richard B. Russell Agricultural Research Center, Athens, Georgia 30613

J. Food Prot. 47:299-302

The efficacy of four preenrichment media (lactose broth, lactose broth with Tergitol, buffered peptone and M-9) and of direct enrichment in selenite cystine and modified tetrathionate broths for recovering two *Salmonella* serotypes from dry poultry feed was determined. The salmonellae, artificially inoculated and stored for 7 wk in the dry feed (1.5 to 2.2 cells of salmonellae/g of feed analyzed), were recovered from significantly more samples after preenrichment with M-9 or buffered peptone than with any of the other procedures tested.

Inhibition of *Clostridium botulinum* Okra B by N-Acyl Amino Acid Ester (N^α-Cocoyl Arginine Ethylester-DL-Pyrrolidone Carbonate), Misao Miwa, Takeshi Mori and Shinji Matsuura, National Food Research Institute, Ministry of Agriculture, Forestry and Fisheries, Tsukuba, Ibaraki 305, Japan

J. Food Prot. 47:303-304

An amino acid ester, N^α-cocoyl-L-arginine ethylester-DL-pyrrolidone carbonate (CAE), was inhibitory to growth and toxin production of *Clostridium botulinum* okra in peptone-yeast extract-glucose (PYG) medium, pH 7.0, at 30°C. Addition of 10 mg of CAE/L to PYG medium delayed toxin production and 25 mg of CAE/L inhibited growth and toxin production, whereas 5 mg of CAE/L had no effect on both growth and toxin production.

Enzyme-Linked Immunosorbent Assay of Mycotoxins Using Nylon Bead and Terasaki Plate Solid Phases, J. J. Pestka and F. S. Chu, Department of Food Microbiology and Toxicology, University of Wisconsin, Madison, Wisconsin 53706

J. Food Prot. 47:305-308

Nylon beads and Terasaki plates were tested as solid phases for the enzyme-linked immunosorbent assay (ELISA) of the mycotoxins aflatoxin B₁ (AFB₁), aflatoxin M₁ (AFM₁) and T-2 toxin. Both methods had detection limits comparable to that of mycotoxin microtiter plate ELISAs. Using the nylon bead ELISA, ELISA competition curves for AFB₁, AFM₁ and T-2 toxin exhibited linear response between 1.0 to 100, 0.1 to 100, and 0.1 to 10.0 ng/ml, respectively. Response ranges for Terasaki plate ELISAs of AFB₁, AFM₁ and T-2 toxin were 1.0 to 50, 0.05 to 0.50, and 0.5 to 1.0 ng/ml, respectively. The new procedures did not require specialized instrumentation and may be used as an economical screening method for mycotoxins in the field and to diagnose certain mycotoxicoses.

Development of a Yeast Microflora on Frozen Lamb Stored at -5°C, P. D. Lowry and C. O. Gill, Meat Industry Research Institute of New Zealand (Inc.), P.O. Box 617, Hamilton, New Zealand

J. Food Prot. 47:309-311

Lamb loins wrapped in gas-permeable plastic film and stored at -5°C developed a yeast microflora with maximum numbers (approximately 10⁶/cm²) being reached after 20 weeks of storage. Yeast isolates were identified as *Cryptococcus laurentii* var. *laurentii*, *Cryptococcus infirmo-miniatus*, *Trichosporon pullulans* and *Candida zeylanoides*. The first of these species formed over 90% of the yeast flora at all times. Black spot and white spot mold colonies were barely visible after 40 weeks of storage at -5°C. No microbial growth was detected on loins stored at -10°C for 40 weeks.

Effects of Potassium Sorbate on Growth and Patulin Production by *Penicillium patulum* and *Penicillium roqueforti*, Lloyd B. Bullerman, Department of Food Science and Technology, University of Nebraska, Lincoln, Nebraska 68583

J. Food Prot. 47:312-316

The effects of potassium sorbate on growth and patulin production by strains of *Penicillium patulum* and *Penicillium roqueforti* isolated from cheese were studied. Potassium sorbate at 0.05, 0.10 and 0.15% delayed or prevented spore germination and initiation of growth, and decreased the rate of growth of *P. patulum* in potato dextrose broth at 12°C. Increasing concentrations of sorbate caused more variation in the amount of total mycelial growth of *P. patulum* than in the control, and generally resulted in a decrease in total mycelial mass. Potassium sorbate also greatly reduced or prevented the production of patulin by *P. patulum* for up to 70 d at 12°C. At 0.10% potassium sorbate, patulin production was essentially eliminated, but at 0.15% low and variable amounts of patulin were produced late in the incubation period. At 0.05% potassium sorbate, patulin production was greatly decreased over the control. Overall, patulin production by *P. patulum* in the presence of potassium sorbate was very low and variable. Conversely, *P. roqueforti* responded differently to potassium sorbate, being less affected. At all three levels of potassium sorbate, growth of *P. roqueforti* was reduced and more variable than the control. Patulin production, however, was greater in the presence of potassium sorbate, especially at the 0.05% level.

Effects of Rigor, Salt, Freezing, Lyophilization and Storage Time on pH, Water-Holding Capacity and Soluble Protein Nitrogen in Beef Muscle, J. C. Kuo and H. W. Ockerman, Department of Animal Science, The Ohio State University, Columbus, Ohio 43210 and The Ohio Agricultural Research and Development Center, Wooster, Ohio 44691

J. Food Prot. 47:317-321

The water-holding capacity (WHC) of frozen and reconstituted lyophilized (freeze-dried) beef (both pre- and post-rigor) increased ($P < 0.05$) with the increase in salt levels (0, 2 and 4%). Freeze-dried and reconstituted beef had lower ($P < 0.05$) WHC than the frozen control at all salt levels tested. The freeze-drying process may damage some of the beef muscle proteins. The WHC of the freeze-dried beef (both pre- and post-rigor) decreased ($P < 0.05$) with the increase of storage time (10 weeks). Salt (2 and 4%) retarded the glycolysis process in the pre-rigor frozen and freeze-dried beef as indicated by higher ($P < 0.05$) pH values than the post-rigor frozen and freeze-dried beef. The addition of salt (0, 2 and 4%) increased ($P < 0.05$) the extractable soluble protein nitrogen content in the pre-rigor frozen beef and decreased ($P < 0.05$) the soluble protein nitrogen content in the post-rigor frozen beef. The pre-rigor freeze-dried beef with 2% salt contained ($P < 0.05$) more extractable soluble protein nitrogen than the other two pre-rigor freeze-dried groups (0 and 4% salt). The pre-rigor beef contained more ($P < 0.05$) extractable soluble protein nitrogen than the post-rigor beef at the three different salt levels (0, 2 and 4%) during the 15 weeks of storage.

Diarrheal Episodes and Diarrheal Disease: Acute Disease with Chronic Implications, Douglas L. Archer, Division of Microbiology, Food and Drug Administration, Washington, DC 20204

J. Food Prot. 47:322-328

Diarrheal episodes and diarrheal disease are often considered to be acute events of limited duration; a review of current literature indicates that this is not true. Diarrheal episodes caused by many bacteria, viruses, protozoans and other parasites cause alteration of intestinal structure and function. Consequences of such diarrhea-associated gut alterations include loss of normal defense mechanisms against secondary opportunistic pathogens and the ability to exclude macromolecules from systemic circulation. Additionally, loss of endogenous nutrients and malabsorption of essential nutrients result from diarrheal episodes; the consequences of such losses, even of a single essential nutrient, is compromised immune function, which predisposes to further infection. The net result of such events in some persons is long-term debilitating disease(s) such as allergy, autoimmune disorders and neoplasia.

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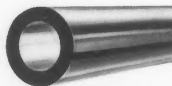
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April 24-25, **FAMFES ANNUAL EDUCATIONAL CONFERENCE**, Cypress Gardens Quality Inn, Cypress Gardens, FL. For more information contact: Franklin W. Barber, 1584 Cumberland Ct., Ft. Meyers, FL 33907.

April 25, **SOUTHERN CALIFORNIA FOOD PROCESORS SANITATION WORKSHOP FOR THE FOOD PROCESSING AND FOOD SERVICE INDUSTRIES**. Presented by the University of California Cooperative Extension with assistance from industry trade associations and food industry personnel. Inn at the Park, Anaheim, Ca. For more information contact: Paulette De Jong, Food Science and Technology, University of California, Davis, CA 95616. 916-752-1478.

April 25-27, **WORKSHOP II IN FOOD FLAVOR; A HANDS ON COURSE IN FLAVOR APPLICATIONS**. For more information contact: G. Reineccius, Dept. of Food Science and Nutrition, University of MN, 1334 Eckles Avenue, St. Paul, MN 55108.

April 30-May 3, **ASEPTIC PROCESSING AND PACKAGING WORKSHOP**. For more information contact: Dr. James V. Chambers, Purdue University, Dept. of Food Science, West Lafayette, IN 47907. 317-494-8279.

May 2-4, **SOUTH DAKOTA ENVIRONMENTAL HEALTH ASSOCIATION ANNUAL MEETING**. Staurolite Inn, South Dakota State University, Brookings, SD. For more information contact: Morris V. Forsting, Secretary-Treasurer, 1320 S. Minnesota Ave., Room 101, Sioux Falls, SD 57105.

May 2-4, **AMERICAN ASSOCIATION OF CEREAL CHEMISTS (AACC) 14TH ANNUAL SPRING TECHNICAL CONFERENCE** of its Milling and Baking Division. To be held at the Marriott Hotel in Omaha, Nebraska. For more information contact: Joseph V. Nigro, Conagra, Inc., 1521 North 16th Street, Omaha, Nebraska 68110. 402-399-9000.

May 6-11, **FOOD SANITATION INSTITUTE EXECUTIVE LEADERSHIP INSTITUTE IN ENVIRONMENTAL SERVICES MANAGEMENT**, University of Illinois, Champagne, IL. For more information contact: Jean M. Day, Executive Director, Food Sanitation Institute, 1019 Highland Ave., Largo, FL 33540. 813-586-5710.

May 7-11, **AN INTRODUCTION TO THE SENSORY EVALUATION OF FOOD: EXPERIMENTAL METHODS AND STATISTICAL ANALYSIS** is a 5-day course for beginning sensory scientists. To be held at the University of California - Davis. For more information contact: Michael O'Mahony, Department of Food Science & Technology, UC Davis, Davis, CA 95616. 916-752-0980.

May 7-11, **INTERNATIONAL MILK PROTEIN CONGRESS**. For more information contact: International Milk Protein Congress, Congress Secretariat, PO Box 399, 5201 AJ's-Hertogenbosch, The Netherlands.

May 9-11, **NATIONAL CONFERENCE FOR FOOD PROTECTION**, Hyatt Regency Crystal City, Arlington, VA. For more information contact: Charles W. Felix, 1025 Connecticut Ave., NW, Suite 1015, Washington, DC 20036. 202-347-0020.

May 14-16, **SEMINAR ON FERMENTED MILK**, International Dairy Federation, Avignon, France. For more information contact: Harold Wainess, Secretary U. S. National Committee of the IDF (USNAC), 464 Central Avenue, Northfield, IL 60093. 312-446-2402.

May 14-16, **PENNSYLVANIA DAIRY SANITARIANS' LABORATORY DIRECTORS' CONFERENCE**, J.O. Keller Conference Center, PA State University in State College, PA. For more information contact: Agricultural Conference Coordinator, 409 J.O. Keller Building, University Park, PA 16802. 814-865-9547.

May 14-17, **INTRODUCTION TO CEREAL CHEMISTRY AND TECHNOLOGY**, a 12th annual AACC short course. To be held at the Marriott Hotel in Bloomington, Minnesota. For more information contact: Raymond J. Tarleton, AACC Headquarters, 3340 Pilot Knob Road, St. Paul, MN 55121. 612-454-7250.

May 15-17, **SANITATION - BACK TO BASICS II**, Food Sanitation Institute Western Regional Educational Conference, Oakland Airport Hilton, Oakland, CA. For more information contact: Jean M. Day, Executive Director, Food Sanitation Institute, 1019 Highland Ave., Largo, FL 33540. 813-586-5710.

May 19-23, **65TH NRA RESTAURANT, HOTEL-MOTEL SHOW**, Chicago's McCormick Place. For more information contact: Jeffrey R. Prince, Senior Director, 800-424-5156 or 202-638-6100.

May 21-23, **PREVENTIVE SANITATION AND FOOD & DRUG COMPLIANCE WORKSHOP** including EPA/FIFRA and Pesticide Updates seminar to be held in St. Louis, MO, Holiday Inn - Riverfront by the Huge' Company, Inc. and its division, the American Sanitation Institute. For more information call 800-325-3371. In Missouri call 800-392-0855 or 314-725-2555.

May 27-30, **THE CANADIAN INSTITUTE OF FOOD SCIENCE AND TECHNOLOGY'S 27TH ANNUAL CONFERENCE**. Hyatt Regency Vancouver Hotel, 655 Burrard St., Vancouver, B.C. 604-687-6543. For more information contact: Jerry Hedding, Publicity Chairman, Qwest Food Ltd., 260 E. 5th Ave., Vancouver, B.C. V5T 1H3. 604-873-2647.

June 3-6, **BBEX** (British Baker International Baking Exhibition). At the Conference and Exhibition Centre, Harrogate, England. For

more information contact: Tom Webb, British Trade Development Office, 212-593-2258.

June 10-14, **50th ANNUAL EDUCATIONAL CONFERENCE** of the Canadian Institute of Public Health Inspectors. For more information contact: J. Dunlop, CPHI (C), 1984 National Educational Conference Committee, Canadian Institute of Public Health Inspectors, 444 Sixth St., N.E., Medicine Hat, Alberta, Canada T1A 5P1.

June 11-12, **TEXAS ASSOCIATION OF MILK, FOOD AND ENVIRONMENTAL SANITARIANS ANNUAL MEETING**. For more information contact: Clair Gothard, 1115 North MacGregor, Houston, TX 77030.

June 11-13, **TECHNICAL SESSIONS AND EXHIBITS**, Association of Official Analytical Chemists, Leamington Hotel, Minneapolis, MN. For more information contact: Raymond H. Bowers, General Mills, Inc., 9000 Plymouth Ave. N., Minneapolis, MN 55427.

June 24-27, **30th ANNUAL FANCY FOOD & CONFECTION SHOW**, Washington, D.C. For more information contact: Dennis Raveneau, Show Manager, International Fancy Food & Confection Show, PO Box 3833, Stamford, CT 06905. 203-964-0000.

June 24-27, **NATIONAL ENVIRONMENTAL HEALTH ASSOCIATION'S ANNUAL EDUCATIONAL CONFERENCE** to be held in Grand Rapids, MI. For more information contact: NEHA, 1200 Lincoln, 704 Denver, CO 80203. 303-861-9090.

July 14-21, **WORKSHOP ON RAPID METHODS AND AUTOMATION IN MICROBIOLOGY**, at Kansas State University, Manhattan, KS. Dr. Daniel Fung, Dr. Nelson A. Cox and Dr. Millicent C. Goldschmidt will present lectures. The course will carry 7.2 Continuing Education Credits for the American Society for Microbiology. For more information contact: Dr. Daniel Fung, Call Hall, Kansas State University, Manhattan, KS 66506. 913-532-5654.

July 29-August 2, **24TH ANNUAL MEETING OF THE HOSPITAL, INSTITUTION AND EDUCATIONAL FOOD SERVICE SOCIETY (HIEFSS)**, at the Riviera Hotel and Convention Center in Las Vegas, Nevada. The HIEFSS Expo '84 will be open on July 31 and August 1. For more information contact: Carolyn Isch, Asst. Exec. Dir., HIEFSS 4410 W. Roosevelt Rd., Hillside, IL 60162. 800-323-1908 or 312-440-2770.

Aug. 5-9, IAMFES ANNUAL MEETING, Edmonton Inn, Edmonton, Alberta, Canada. For more information contact: Peggy Marce, Alberta Association of Milk, Food & Environmental Sanitarians, PO Box 8446, Station F, Edmonton, Alberta, Canada T6H 5H3 or call IAMFES at 515-232-6699.

August 6-10, BIOTECHNOLOGY: MICROBIAL PRINCIPLES AND PROCESSES FOR FUELS, CHEMICALS AND INGREDIENTS, a Massachusetts Institute of Technology one week course. For more information contact: Director of Summer Session, MIT, Room E19-356, Cambridge, MA 02139.

September 12-13, The FIFTH ANNUAL JOINT EDUCATIONAL CONFERENCE of the Wisconsin Association of Milk and Food Sanitarians, the Wisconsin Environmental Health Association, The Wisconsin Dairy Technology Society and the Wisconsin Association of Dairy Plant Field Representatives will be held at the Stevens Point Holiday Inn and Holidome Indoor Recreation Center. For more information contact: Ron Buege, West Allis Health Department, 7120 West National Ave., West Allis, WI 53214. 414-476-3770.

September 15-21, 68th ANNUAL SESSIONS OF THE INTERNATIONAL DAIRY FEDERATION, Prague, Czechoslovakia. For more information contact: Harold Wainess, Secretary U. S. National Committee of the IDF (USNAC), 464 Central Avenue, Northfield, IL 60093. 312-446-2402.

September 20-21, MINNESOTA SANITARIANS ASSOCIATION, INC. ANNUAL MEETING to be held at the Earl Brown Center for Continuing Education on the St. Paul Campus of the University of Minnesota. For more information contact: C. B. Schneider, President, Minnesota Sanitarians Association, Inc. 612-623-5335.

September 30-October 4, 69TH ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF CEREAL CHEMISTS to be held at the Hyatt Regency and Amfac Hotels in Minneapolis, MN. For more information contact: Raymond J. Tarleton, AACC Headquarters, 3340 Pilot Knob Road, St. Paul, MN 55121. 612-454-7250.

October 9-10, DAIRY INDUSTRY CONFERENCE, Hyatt/Long Beach, Long Beach, CA. For more information contact: John C. Bruhn or Shirley Rexroat, Dept. of Food Science & Technology, University of California, Davis, CA 95616. 916-752-2191.

October 15-17, ISSUES IN SENSORY EVALUATION - STABILITY AND QUALITY CONTROL - Palo Alto, California. Attendance is limited and there is a fee. For more information and registration contact: Tragon Corporation, 750 Welch Road, Suite 210, Palo Alto, CA 94304.

October 19-25, FOOD SANITATION INSTITUTE 27TH ANNUAL NATIONAL EDUCATIONAL CONFERENCE & EXPOSITION, Holiday Inn Surfside, Clearwater Beach, FL. For more information contact: Jean M. Day, Executive Director, Food Sanitation Institute, 1019 Highland Ave., Largo, FL 33540. 813-586-5710.

November 22-24, 14TH ANNUAL SYMPOSIUM ON THE ANALYTICAL CHEMISTRY OF POLLUTANTS, 3rd International Congress on Analytical Techniques on Environmental Chemistry-Expoquimia, Bar-

celona, Spain. For more information contact: Av. Reina Ma. Christina Palacio No. 1, Barcelona-4 Spain.

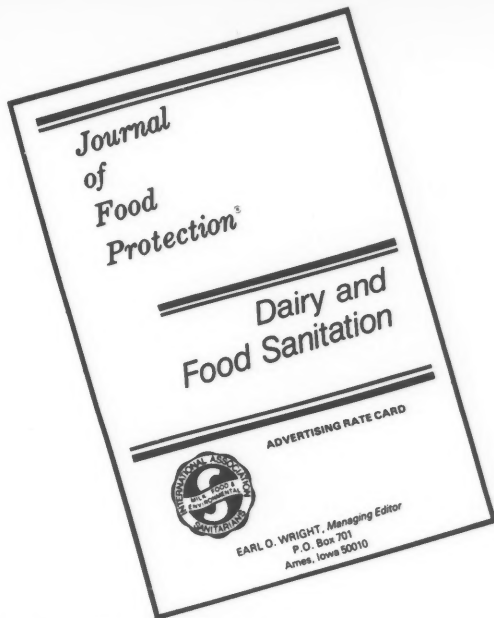
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May 20-23, FOODANZA '85, joint convention of the Australian and New Zealand Institutes of Food Science and Technology. To be held at the University of Canterbury, Christchurch, New Zealand. For more information contact: D. R. Hayes, Convention Secretary, 394-410 Blenheim Road, PO Box 6010, Christchurch, New Zealand.

August 25-30, 9TH SYMPOSIUM OF WAVFH. The World Association of Veterinary Food Hygienists (WAVFH) will hold their 9th Symposium in Budapest, Hungary. For more information contact: 9th WAVFH Symposium, Organizing Committee, Mester u. 81, H-1453 Budapest Pf 13, Hungary.

1986

May 26-31, 2ND WORLD CONGRESS FOODBORNE INFECTIONS AND INTOXICATIONS will take place in Berlin (West) at the International Congress Centre (ICC). For more information contact: FAO/WHO Collaborating Centre for Research and Training in Food Hygiene and Zoonoses, Institute of Veterinary Medicine (Robert von Ostertag-Institute), Thielallee 88-92, D-1000 Berlin 33.



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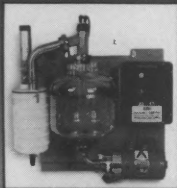
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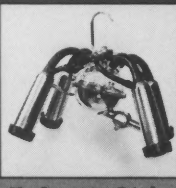


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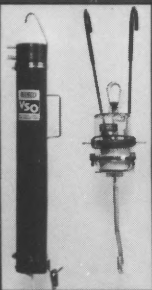
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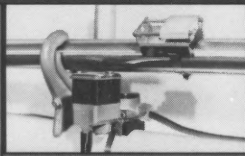
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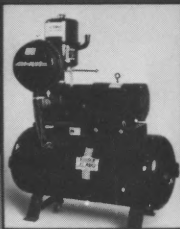
The Surge Mini-Orbit®. Lightweight. Easy to carry. Yet, its 39-cubic inches give it more capacity than any other claw-type milker.



The Surge Stanchion VSO™ is a simple, easy-to-operate automatic take-off device that is easily moved from stanchion to stanchion.



Rugged, welded stainless steel construction makes Surge pipelines vacuum-tight, easy to clean, more economical to install and maintain.



With the dependable Alamo® Vacuum System, you can be assured of vacuum stability and high efficiency milking for years to come.

We can make your cows worth more.

SURGE

