

WIDE RANGE OF TOPICS COVERED IN SCIENTIFIC PAPERS READ AT ANNUAL MEETING OF ASSOCIATION AT SEATTLE

Papers dealing with subjects ranging from radiation-resistant bacteria to procedures to follow in food-borne disease outbreaks were among the many heard at the 43rd Annual Meeting of INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC., September 5-7 in Seattle, Washington. Because of the wide general interest in the papers, summaries of some of the major papers are given below.

Sanitary Aspects of Radiation-Resistant Bacteria in Foods, by Dr. PAUL R. ELLIKER, Oregon State College — The presence of bacterial species of extremely high resistance to gamma radiation has been definitely established. The organisms are gram-positive, non-spore-forming micrococci which possess a brownish-red pigment. They have survived in meats which have been irradiated with gamma rays up to 5 million rep. Strains of the organisms, isolated from naturally contaminated unirradiated meat, demonstrated the same high order of radiation resistance as organisms taken from treated meat; this would indicate that the radiation-resistance is probably an inherent, stable characteristic not acquired as the result of one or a few exposures to gamma radiation. The mechanism or protective agency responsible for such remarkable radiation-resistance has not been established. Radiation-resistant bacteria may enter food products along with the raw meat or in the processing plant. Because of the limited degree of radiation which certain foods will tolerate from flavor and other standpoints, radiation-resistant bacteria must be prevented from entering the raw product or must be limited to low numbers before processing. If processing of food by gamma radiation is to become widespread in the future, this situation may require a highly specialized type of sanitary inspection of production facilities to assure successful processing.

Research Needs in the Field of Milk and Food Sanitation, by Dr. KEITH H. LEWIS, U.S. Public Health Service, Cincinnati, Ohio — A host of important new problems continues to arise in the prevention of foodborne diseases of microbial and chemical origin. They are associated not only with changes in food technology and consumer habits, but with unusual circumstances involving established processes and products. The opportunities for worthwhile experimentation in the field of milk and food sanitation are so diverse that research organizations must limit the number and character of problems which they undertake. The criteria applied in establishing priorities for support of projects play an important role in the success of long-range program planning as well as the conduct of current investigations. From the viewpoint of improving public health, increased emphasis on research in several aspects of milk and food sanitation is urgently needed. Among the areas considered most worthy of attention on a continuing basis are: (1) Detection and control of specific microbial or toxic contaminants in foods. (2) Development and evaluation of indicator methods for food sanitation. (3) Determination of critical time-temperature relationships for maintaining the sanitary quality of perishable foods during preparation and holding. (4) Study of the sanitary efficacy of high-temperature short-time and "no-hold" pasteurization processes. (5) Evaluation of the influence of aquatic environments and commercial practices on the sanitary quality of shellfish. (6) Estimation of the

significant microbiological and chemical changes associated with commercial processing and marketing of poultry, fish, and other food products of animal origin. (7) Development of standards for sanitary processing, storage and preparation for serving of precooked frozen foods and other non-sterile products that are essentially ready to eat as marketed. (8) Investigation of materials, procedures and conditions for cleansing and disinfection of milk and food equipment. (9) Exploration of food sanitation problems associated with industrial use of atomic energy. (10) Provision of improved sanitation procedures applicable to mass feeding and salvage of food supplies in natural disasters and civil defense emergencies.

The Bacteriology of Pre-Cooked Frozen Foods, by Prof. H. H. WEISER, Ohio State University, Columbus, Ohio — During production, processing, storage and distribution of pre-cooked frozen foods the microbial content must be kept low, if the quality of the product is to be maintained. The ingredients used in pre-cooked frozen foods are perishable and usually will support microbial growth, especially if the temperatures are above freezing. Growth can increase very rapidly if the temperature approaches 68-70°F. If the temperature is favorable for increased growth, the metabolic activity may produce off-flavors, off-odors, off-colors and may be the ultimate cause of certain types of infection. Obviously, a few careless producers or distributors can do much harm in creating an unfavorable impression on the part of the consuming public of the whole pre-cooked frozen food industry. Reasonably high standards should be constantly maintained. The dissemination of basic principles of microbiology should be encouraged thus instilling a sense of respect and devotion to the maintenance of high quality from the raw product to the finished product, and ultimately into the hands of the consumer. The consumer, after all, will be the final judge in accepting or rejecting pre-cooked frozen foods.

Quality Standards for Pre-Formed Milk Cartons, by HAROLD WAINES, Executive Secretary, Milk Carton Pre-Forming Council, Chicago, Ill. — In 1955, approximately 48 per cent of fibre containers used for milk were of the pre-formed type, and there are presently plants for manufacturing pre-formed milk cartons in every section of the United States. The manufacturers of these cartons have formed a council to establish sanitary standards to govern the fabrication of the cartons at the pre-forming plant and their handling in the filling plant up to the time of actual filling and sealing. Beyond this point, existing 3-A Sanitary Standards for filling and sealing may be considered as adequate.

Aspects of Chemical Food Additives, by Dr. K. G. WECKEL, University of Wisconsin, Madison, Wisc. — With fewer and fewer acres used in food production, and with the devastating toll of food taken by insects, rodents, mites, fungi, weeds and depleted soils, chemicals must be used on the land to enable full maturity development of foodstuffs. Transportation and storage of fresh foods, even in the raw state, necessitate certain chemical modifications, such as gassing, packaging, refrigerating, etc., to enable their subsequent use in even a simple form. Chemicals are also used in modification of food at the processing plant: cereals are refined and blended with other foodstuffs; vegetables and fruits are modified and pack-

aged for ready-serve uses; meats and fish are pre-packaged for ready distribution; and fats and oils are modified. Homogenization, comminuting, cutting, blending, cooking, grinding, pulping, blanching, sterilizing, melting, salting, brining or scraping, dehydrating, stabilizing and emulsifying, enzyme treating, spicing and preserving, and numerous other processing procedures are among the steps by which raw food materials are made ready for consumption. Production procedures as those just mentioned are not always possible without the use of chemicals. Through the provisions of the Food, Drug and Cosmetics Act, and its enforcement, the use of unsafe chemicals has been largely delimited. On the other hand, control officials generally recognize the usefulness of safe chemicals in the production and distribution of food.

The Etiology and Epidemiology of Paralytic Shellfish Poisoning, by H. I. EDWARDS, Department of National Health and Welfare, Vancouver, B. C., Canada — Outbreaks of food poisoning with paralytic symptoms, following the consumption of toxic shellfish, have resulted in more than 40 deaths in coastal areas of North America since 1927. Intensive studies have revealed that the toxic agent exists pre-formed in certain members of the dinoflagellate plankton species, *Gonvaulax*, which occur with seasonal frequency in the food supply of several commercially important shellfish varieties. The paralytic toxin has been extracted from both plankton and shellfish, and concentrated to a high degree of purity. In the absence of suitable chemical methods, its determination is conducted by biological assay. Frequent routine sampling of shellfish from potentially dangerous areas, and the establishment of quarantine measures when necessary, have greatly reduced this hazard to public health.

Food-borne Disease Outbreaks, a panel discussion presided over by Dr. R. J. HELVIC, U. S. Public Health Service, Washington, D. C.; and with a panel composed of Dr. W. R. GIEDT, Washington State Department of Health, Seattle; K. R. BERQUIST, Laboratory Department of Health, Seattle; Dr. SAMUEL HOPFER, Indiana University School of Medicine, Indianapolis; and HAROLD B. ROBINSON, U. S. Public Health Service, Washington, D. C. — After determining that only a very few states and municipalities have guidelines which can be followed by the average milk and food sanitarian in initiating an investigation of a suspected food-borne disease outbreak, and after determining from contacts with professional epidemiologists, health officers and sanitarians, that a definite need for a guideline exists, the Committee on Communicable Diseases Affecting Man initiated in 1952 the development of a suggested procedure for the investigation of food-borne disease outbreaks. Principal objectives were: (1) To provide public health workers with a suggested procedure for guidance when confronted with an outbreak of disease which may be attributed to milk, food, or water. (2) To prevent future outbreaks, through application of knowledge gained as a result of complete and thorough epidemiological investigations. (3) To stimulate an active interest on the part of public health workers in the epidemiological aspects of their programs. (4) To improve reporting of food-borne disease. The Committee has this year completed the preparation of "A Suggested Procedure for the Investigation of Food-Borne Disease Outbreaks." This will soon be published in booklet form as a separate association publication. Announcement will be made in an early issue of the *Journal of Milk and Food Technology* as to its availability.

Q-Fever Studies, by Dr. JOHN B. ENRIGHT, University of California, Davis, Calif. — Q-fever is a disease caused by a rickettsia, affecting both animals and man. Symptoms are often very difficult to observe in infected animals, and in man. The organism which causes Q-fever is discharged in large numbers with body secretions, including milk. Animals most frequently infected in the United States are sheep, dairy cows and goats. Because of the possibility that Q-fever might be transmitted to man through milk from an infected cow, special studies were undertaken at the University of California to determine the efficiency of pasteurization in destroying the Q-fever organism in cow's milk. These experiments were sponsored jointly by U. S. Public Health Service, Milk Industry Foundation and Dairy Industries Supply Association. Results of experiments have indicated that slightly higher temperatures than those currently specified for the low temperature holding method of pasteurization would be desirable to assure total destruction of the rickettsia in milk. No change was recommended for the time-temperature relationship specified for the high-temperature short-time method of pasteurization.

Some Field Trial Studies with a Detergent-Sanitizier in the Sanitation of Milking Utensils, by Dr. MARVIN L. SPECK, North Carolina State College, Raleigh, N. C. — In a field study covering 15-16 months and which involved 155 Grade A milk producers in three widely separated areas, a detergent-sanitizer was compared with customary methods of milk utensil sanitization. Producers were divided into two comparable groups, one using the detergent-sanitizer method continuously and the other using regular methods. No supervision was made of the producers other than that normally given by the sanitarian and fieldman. In one area, the thermoduric count of milk was significantly lower when the detergent-sanitizer was used. This was the case for another area, except that the lower thermoduric count was not statistically significant. Raw milk counts were also lower when the detergent-sanitizer was used, although the difference between the counts of milk produced under the different methods of utensil sanitization was not statistically significant. Milking utensils appeared cleaner and milk-stone deposits were absent from the utensils of those producers who used the detergent-sanitizer method. There was no evidence of residual sanitizer in the milk as determined from interference with starter culture activities. Since this study covered an extended period of time with only normal supervision of the producers, the detergent-sanitizer method appears to be one that can be used routinely over an indefinite period of time with entirely satisfactory results.

Flavor Defects in Milk and Their Relationship to Farm Holding Tanks, by Prof. C. C. PROUTY, Washington State College, Pullman, Wash. — The flavor of milk should be a major concern to both producers and processors of the product, as it is flavor which is the major criterion of quality applied by consumers to milk. Some observers have reported their belief that the flavor quality of milk has decreased in areas in which farm bulk holding tanks have replaced milk cans, although there is little evidence to support this view. Perhaps the most important factor which must be considered in assuring the absence of off-flavors in milk procured by the bulk tank system is proper training of the tank truck driver in flavor evaluation. Data gathered from Washington state farms showed that feed flavors were the most common off-flavors encountered.

Sanitation Problems in the Manufacture of Cottage Cheese, by Prof. J. C. BOYD, University of Idaho, Moscow, Idaho — Cottage cheese is an economical, easy digested, high-quality

protein food which builds, repairs and maintains the tissues of the body. As cottage cheese is the result of a controlled bacteriological fermentation, its successful manufacture and distribution is largely a matter of controlling certain bacteriological and sanitation problems. These may be broken into three categories: (1) Those that affect the manufacturing procedure. (2) Those that affect the shelf life or keeping quality of the finished product. (3) Those that affect the spread of disease. The program recently initiated by the Spokane Health Department of placing cottage cheese under the same sanitary in-

spection program as bottle milk is to be commended and will no doubt result in a better quality product which will continue to enjoy good consumer acceptance.

Complete texts of the papers summarized above will subsequently appear in future issues of the *Journal of Milk and Food Technology*, official publication of INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS.