Consumers as well as governmental agencies are becoming increasingly concerned about the safety of food and food store operators' need to establish procedures to assure clean and wholesome food.

The year of 1973 may well be remembered as the year of wholesome foods... the year that Clostridium botulinum, Staphylococcus, and Clostridium perfringens, Shigella, Vibrio para-haemolyticus, and especially Salmonella became household words.

This may be stretching the truth a bit...but certainly consumers have become increasingly knowledgeable and concerned about health, the environment, and the quality and safety of their food. This concern has been heightened in recent months by the recall of canned mushrooms which required a nationwide public warning and an all out campaign to remove the implicated products from the market.

Media Features Food Safety Problems

Food manufacturers are still reeling from the (GAO) General Accounting Office's Report to Congress on Insanitary Conditions in the Food Manufacturing Industry...This is the report that revealed inspections of 97 establishments selected from many different industries, discovered "significant insanitary" conditions in 23 plants; "insanitary conditions" in 28 plants. Only 30 out of 97 plants were in compliance. This presented an inevitable question: How many of the 60,000 food plants, food warehouses, and similar establishments the Food and Drug Administration inspects are out of compliance, and how is the welfare of the consumer affected? Needless to say, resources become available for an intensified program to eliminate these insanitary conditions in the Nation's 60,000 food plants.

The Department of Agriculture was also referred to in the Reader's Digest article entitled "How Safe Is Food?" This article reported on the 1971 (GAO) report on inspections of poultry plants and it revealed: "The USDA's inspection of poultry plants was woefully inadequate. After surveying 68 federally inspected plants, which account for nearly 1/5 of all the poultry slaughtered in the United States, the GAO found a dismaying list of insanitary and weak enforcement practices by the Department of Agriculture."

Distributors, including food retailers, also got into the act; fortunately or unfortunately, this has been somewhat overshadowed in recent months by rising food prices. Retailers in some states, especially the cities of Chicago and Dayton, Ohio, will long remember their place in the "insanitary sun".

A Chicago TV station, in its hamburger report, stated "filth or extraneous matter in samples collected from 18 of the 20 food stores...E-Coli (bacteria) in over half the samples". The report further stated that "E-Coli bacteria, could indicate animal or human fecal matter".
The Dayton Daily News, not to be outdone, headlined in their Sunday edition, "Hamburger: A Dirty Story" and followed it up with the following lead: "Hamburger bought at seven Dayton food stores was dirty...out of 14 samples tested...not a single one met the cleanliness guidelines used by the Ohio Department of Agriculture." The report further stated that "according to Consumer Report Magazine bacteria counts of 1,000,000 to 5,000,000 may cause mild intestinal stress." Also of interest, was the statement that "there is widespread acceptance that 10,000,000 bacteria per gram is the point at which hamburger begins to decompose." Four samples taken in the test exceeded that limit...one reached 380,000,000.

Moneysworth, The Consumer Letter gave the restaurant and food service industry some cause for concern by stating: "Have you ever dined out—and stayed out for days afterward with ptomaine, undulant fever, or a zapped stomach? It's no secret that eating in the U.S. is a health hazard. In New York City, literally hundreds of restaurants were closed for health violations, most of them nauseating. Major health code violations were found in 86 percent of the restaurants in one mid-Manhattan district."

More Resources Allocated to Food Safety

Although some of those presiding over the regulatory areas are convinced that "today's food supply is safer than it has ever been before," the American consumers are apparently unconvinced. Consumers have raised their expectations to peaks never before known in this country and they are much concerned with their health and demand that food products be safe. They have made significant demands on the Federal Government and the Congress has responded with new and stronger laws and the Government agencies as well as industry groups are responding with new programs initiated to help alleviate the consumer's concern about food safety.

Concern about food safety is not new...many agencies including FDA and the USDA have had ongoing programs of research, education, and inspection programs designed to achieve the objectives of providing wholesome foods to the consumers.

There is little question, however, that in recent years more attention and resources have been focused on the problems of food safety.

In 1964, the grocers in Massachusetts recognized the role of bacteriological control in supermarkets. The State Grocers' Association, at that time, put on a vivid demonstration of aseptic meat cutting. Much to the amazement of most of the members, wrapped cuts of meat had their shelf life extended from two to seven days. It was pointed out to achieve this longer shelf life it would require radical changes in equipment used in meat cutting operations, training of personnel to understand the reason for better sanitation practices, and the use of special detergents and sanitizers.

At about the same time, my research and Extension colleagues at the University of Missouri were preparing their "Guidelines for Handling Prepackaged Meats in Retail Food Stores" in which they pointed out that packaged meat display life could be doubled by improved handling methods. They also provided the sanitation, temperature, and product care guidelines to achieve longer shelf life. Other colleagues in New Mexico and New Jersey tested the meat sanitation program and found that savings in products and increased net value of products more than covered the additional costs of the sanitation program.
The Supermarket Institute and National Association of Retail Grocers, as well as Extension and other private and public educational groups, brought this information to the attention of retailers at workshops, seminars, and through various bulletins and visual publications.

**Project Consumer Concern**

In July 1972, Project Consumer Concern was introduced with its objective of effecting improvements in food handling, storage and distribution of food to insure wholesome food for consumers.

A well-known Extension technique was used in this project...the demonstration store. Demonstration supermarkets were established in Pennsylvania, North Carolina, and Ohio. This concept utilized the result demonstration principle in which improvements, based on research results, are established in one store of a firm, or a group of stores, and extended by various means to other stores within the firm.

**Problems of Sanitation in Supermarkets**

In the development of the Total Store Sanitation Program for the demonstration stores, problems were defined that were affecting food safety. These included:

1. A lack of commitment and follow through by top management.
2. No uniform guidelines for the sanitation program.
3. Disagreement among regulatory agencies as to the equipment, facilities, materials, and cleaning methods to be used.
4. Confusion as to temperatures and how to check them.
5. Ineffective use of code dates on perishables.
6. Unawareness of effect of lighting on product temperatures.
7. Careless handling of frozen foods.
8. Perishables not refrigerated during transportation.
9. Principles of safe food handling not understood by personnel handling prepared foods.
10. Inadequate cooking or reheating temperatures for prepared foods.
11. Potential for cross contamination and recontamination as same person handled uncooked and ready-to-eat products as well as money.
12. Many potential hazardous products were not being protected in the bakery...left uncovered and unrefrigerated. Smoking was also observed in this department.
13. Cooked and uncooked fish were being stored, processed, and displayed in common areas.
14. At the checkout, water and blood from meat and poultry were wiped from belts, but belts were not sanitized.

Utilizing available research and accepted industry practices, procedures and checklists were developed for store operators' use. These have been made available to the industry by the National Association of Retail Grocers.

**FDA Develops Model Sanitation Ordinances for Supermarkets**

Of great interest to the food distribution and food service industries were the announcements by the (FDA) Food and Drug Administration that "they will
give priority to regulatory initiatives which would substantially lessen the risks of food contamination in the distribution of human foods, especially the uniform food service sanitation ordinance and code, and a model ordinance for retail food stores and standards for controlling microbiological contamination in the transportation of foods."

In discussing the model ordinance for food stores, the FDA report states: "The model ordinance includes specific mention of cross contamination...it stipulates several practices which can reduce the spread of microbiological hazards, in the retail product. For example, the draft requires thorough cleaning of a meat grinder before switching from one meat to another."

The uniform food service sanitation ordinance will also include explicit mention of cross contamination and recontamination by potentially hazardous food.

FDA also plans similar model ordinances for those transporting human foods and animal feeds.

A recent contact with the FDA indicated that the food service and retail store ordinances would be published in the Federal Register prior to January 1, 1974.

The First of May in Oregon

May 1, 1973, may also be a significant date for the food distribution industry as it was on this day that the new Oregon consumer law establishing bacterial standards for all meat at retail went into effect. Oregon is the first state to adopt such standards. Basically, the law states "meat food products will be deemed adulterated if the microbacterial level exceeds 5 million organisms per gram in fresh or frozen meat products and one million for meat products cooked or smoked...of

if E-Coli organisms exceed 50 per gram in fresh and frozen meat products or 10 per gram in cooked or smoked."

Although a Supermarket News Report stated that some state officials here are hopeful that the Oregon meat bacterial standards law will serve as a model for the U.S. Department of Agriculture. The USDA is interested in bacterial standards and especially how they are established and how they are applied. In a paper on microbiological standards, a USDA scientist states "microbiological criteria can be applied in three ways: first, by taking a figure out of the air, this is, of course, the bad way; second, by determining the general microbiological levels in foods in commerce without regard to the effect of processing, this is a better way; and third, the best, by determining what is a good manufacturing practice and then determining the microbial levels associated therewith. When a microbiological criterion is established, methods for sampling and analysis should be specified. The data both for establishing a microbiological criteria and for establishment of acceptability of given lots should be statistically significant; therefore, it is necessary to know the natural variation of levels of microbial groups within various commodities. If microbiological criteria require drastic changes in an entire industry, they should be applied with great discretion to avoid seriously damaging the industry."

Another source indicates that there is absolutely no way to relate bacterial number to safety and that putrification depends on many things, including types of organisms and temperature of storage as well as numbers. This statement is supported by a study of the bacteria of ground beef that also includes this challenging statement..."as hamburger is usually handled in meat markets it is inevitable that the meat will become contaminated with organisms capable of growing rapidly at ordinary refrigerated temperatures. The extent of the growth
and the time required for spoilage in the consumer's possession will depend mostly on the degree of contamination, the time the meat is held in the store, and, of course, the temperature at which it is stored...thus, the purchaser receives a product already heavily inoculated and to prevent its rapid spoilage he must consume it promptly or freeze it.

Stop and Shop's Aseptic Meat Processing

In 1972, one firm finally challenged the "zero-home-life" of ground beef with a new concept of a central, refrigerated meat processing plant to prepare beef in an aseptic environment...a method that removes all surface bacteria from incoming shipments of beef. Following cleaning, the carcasses move through holding, cutting, and wrapping stages under constant low temperatures and in a close to sterile atmosphere. According to chairman Sidney R. Rabb of Stop and Shop Stores, Inc., "the greatest single investment ever made by the company will provide vacuum-wrapped cuts of beef and ground beef to all supermarkets that will end up in display cases as clean, fresh, aged, and uniformly trimmed cuts."

Impossible to Eliminate Salmonella

Assistant Secretary of Agriculture, Clayton Yeutter, has noted that it is impossible to totally eliminate salmonella. "Steps can, however, be taken and others developed, through more research, to greatly reduce bacterial loads on animal and poultry carcasses. This, with lowering salmonella organisms in animal feeds and improved feed handling practices, will reduce salmonella as a significant health hazard."

Several research studies of particular interest to this audience are the USDA's Agricultural Research Service-Oregon State University study to..."obtain information relative to the cost benefits implementing a total store sanitation program and improving the handling of returnable bottles and containers."

Also of interest is a Northeast Regional research project with New Jersey, Massachusetts, New York, Pennsylvania, and Rhode Island participating with the objective of "developing programs and procedures to protect foods during preparation, manufacturing, distribution, marketing, and serving from potential quality losses and health hazards."

American Consumers Are Concerned About Safety of Food

American consumers today are the best informed and most militant in history. Scientific achievements have raised consumer expectations to a peak never before known in this country. Greater influence and broader educational opportunities have made consumers more concerned about their environment and about their health, and they are demanding that products be safe, effective, and honestly labeled and promoted.

A recent FDA study of consumer's opinions about the safety of foods revealed: "More than one-third of those interviewed said that foods were getting less safe; 76 percent believed that a dinner prepared fresh by the consumer himself is safer than ready-to-eat foods, such as frozen dinners or canned stew. Foods which are cooked or heated before serving were judged by 48 percent of the consumers to be safer than foods which are put directly on the table; in comparing fresh foods with dry, frozen, or canned, 68 percent of the consumers think fresh foods are safer; 86 percent believe that food containers are important in making foods safe. As for processing, 77 percent believe that the manufacturing
process kills all or most of the germs which might contaminate the food; 72 percent of the consumers say that manufacturers do a good job of keeping impurities out of food. As to who does the most to make foods safe, the Government was given 45 percent of the credit by consumers; processors, 23 percent; consumer groups, 21 percent; and companies that sell food to the public, 5 percent." The concern of Government and the food industry is the belief by the public that food is getting less safe.

The Economic Research Service of the USDA is in the process of conducting a similar consumer study of homemakers' knowledge, opinions, and attitudes toward food safety on selected items. This study will concentrate on consumer food handling practices with special attention given to meat and poultry products.

USDA-FDA to Sponsor Joint Consumer Programs on Food Safety

At a recent USDA-FDA press conference on food safety, it was announced that the two Departments would expand and coordinate an intensive consumer educational campaign aimed at eliminating careless food handling practices in the home and in food service establishments. In addition to coordinating their respective consumer education activities, they will also be developing joint materials. The aim is to provide publications that can gain mass distribution through consumer groups, educational institutions, and the food industry. The overall objective is to carry food messages to every household in the United States.

Extension Increases Food Safety Activities

The Extension Service is gearing up its activities to carry the food safety message in greater volume to 10 million families and 3 million youths it reaches each year in rural and urban America.

Yes, the years of 1972-73 may well be remembered as the years for more wholesome food...as food safety problems became better defined and better communicated to food industry groups, Government agencies, and to consumers. Also, the coordinated activities of these groups will bring about further improvements in the safe handling of foods...that is in the transportation, storage, and preparation especially in the supermarket, in food service operations, and in the home.

Literature Cited

(2) Supermarket News, September 27, 1972.
(8) Kirsch, Berry, Baldwin, and Foster, 1952--Bacteriology of Refrigerated Ground Beef.
(9) Stop and Shop's Annual Report, 1972, "A Revolution in Meat Processing."
(10) Yeutter, Clayton, Assistant Secretary for Marketing and Consumer Services, August 14, 1973, Joint USDA-FDA Press Conference on Food Safety.