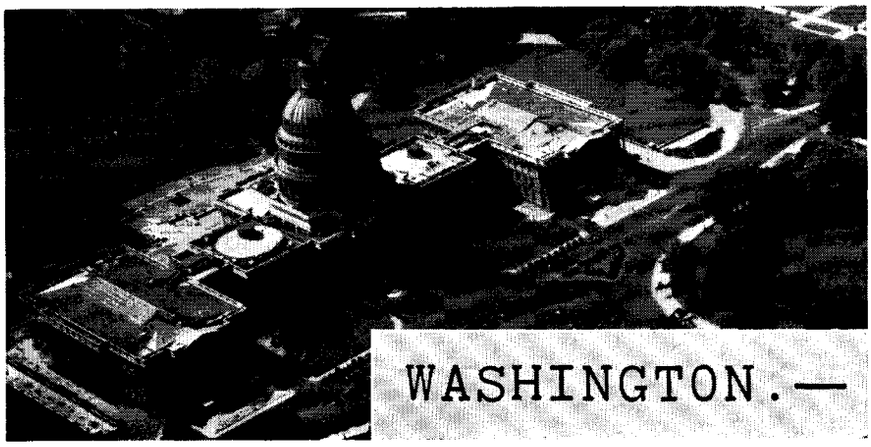

WASHINGTON.—

New cold sterilization research program to be conducted by QMC

A FIVE-YEAR RESEARCH PROGRAM on radiation sterilization of foods is being undertaken by the Army Quartermaster Corps. The program, conducted for the benefit of all the armed forces, promises to speed up work on all aspects of the cold sterilization process.

Determining the most effective ways of preserving specific foods by irradiation is one of the primary aims of the new study. Taking part in the program, in addition to the Quartermaster Corps (QMC), which will oversee the entire project, are the Atomic Energy Commission, other elements of the armed forces, government agencies, and educational and industrial institutions (see table).

The long range objective of the plan is to learn the precise value of radiation sterilization as a method of preserving foods on a large scale. Scientists will take a critical look to see whether cold sterilization can successfully compete with conventional preservation methods.

Extensive basic research already has been conducted. The QMC has been conducting exploratory research on radiation sterilization processes, under the direction of the Quartermaster Food and Container Institute for the Armed Forces in Chicago. The Navy, AEC, and the Department of Agriculture also have had projects under way.

Under the expanded program coordinated by the QMC, the individual research program of the AEC will be discontinued. Although the commission will no longer take part in the food technology aspects of the program, it will continue to work to develop practical radiation sources. Institutions holding contracts with AEC for food sterilization work probably will be given new contracts under the Quartermaster program.

Bacteria and Roentgen's Rays

While much of the practical work on cold sterilization has been carried out within the last decade, the idea behind the process is not new. Back in 1896, a year after Roentgen discovered x-rays, it was suggested that these mysterious radiations might kill microorganisms responsible for decay in foods. But the idea was termed impractical, laid aside, and nearly forgotten.

After a number of Van de Graff accelerators and other high-voltage generators had been built—and later after the atom had been split—interest in the project resumed. The accelerators produced streams of beta rays which inactivate bacteria quickly. From the nuclear reactors came "gross fission products," a source of gamma rays.

These two types of radiation—beta and gamma rays—are of primary interest in current cold sterilization studies. Beta rays do not have much penetrating power unless used at high voltage, so they are usually employed for surface sterilization. Gamma rays, on the other hand, penetrate deeply and can be used for interior sterilization.

Radiations destroy the microorganism's ability to reproduce, thereby eliminating one of the most important factors involved in food spoilage. In addition, it has been shown that the rays have the secondary effect of destroying food-infesting insects and trichina worms.

The effectiveness of radiation sterilization already has been demonstrated with several foods. Experiments with bread showed that radiation sterilization retarded mold growth for more than three weeks, while untreated slices developed extensive mold after only a few days.

Meats seem to offer some of the best possibilities for effective cold sterilization processes. In fact, irradiation ultimately may prove to be one of the best processing methods for meat, according to researchers at the American Meat Institute Foundation. When used together with mild heat which inactivates certain enzyme systems, irradiation seems to be very effective in cutting down food spoilage. The institute workers point out that irradiation alone does not eliminate all potential causes of spoilage. The enzyme systems can cause deterioration, as can the breakdown of fats, proteins, and other food constituents.

Many Problems Remain

Much more research must be done before cold sterilization can take its place alongside other food preservation methods. Much remains to be discovered about certain effects of the process—whether it causes unwanted changes in flavor, color, or texture—and to what extent. The intensity and duration of radiation exposure needed for effective preservation must be studied further. And probably one of the biggest factors—the cost of radiation treatment—must be computed.

The new QMC studies will begin with radiation studies on about 50 different foods. The opening project may help determine which is the better sterilization tool—radiations obtained from isotopes, or those from mechanical generators. Studies also will be made of the effects of combining radiation with other methods of processing, such as dehydration or freezing.

Toxicity and nutrition tests will be run by the Surgeon General's Office, to make sure all food treated is suitable for human consumption.

To aid in the program, the National Research Council has named a special advisory committee on radiation sterilization. Committee members are: Joseph Butts, AEC; L. E. Clifcorn, Continental Can Co.; Gail Dack, University of Chicago; C. Glen King, Nutrition Foundation; H. S. Mitchell, Swift & Co.; and Bernard Procter, MIT.

New Quartermaster Contracts for Cold Sterilization Work

INSTITUTION	SUBJECT
American Meat Institute Foundation, Chicago, Ill.	Radiation sensitivity of meat spoilage microorganisms; chemistry of color, flavor, and odor changes in irradiating meat
University of Chicago, Chicago, Ill.	Effects of irradiation of *Clostridium botulinum*, organisms which cause food poisoning
Hormel Institute, Austin, Minn.	Changes produced in lipid materials by high energy radiations
Iowa Agricultural Experiment Station, Ames, Iowa	Chemical changes in protein of sterilized meat
Massachusetts Institute of Technology, Cambridge, Mass.	Modifications of irradiation processing technology to prevent flavor changes; fundamental physical and biochemical studies of the changes in flavor, color, and texture which occur during the radiation sterilization of foods
Ohio State University Research Foundation, Columbus, Ohio	Chemical changes in carbohydrates and proteins produced by radiation sterilization
Oregon State College, Corvallis, Ore.	Flavors of foods sterilized by combining conventional processing with ionizing radiations; the extent and nature of the off-flavor development in foods sterilized by high intensity radiation