

Gamma Irradiation Advocated To Prevent Trichinosis

NEW YORK—Gamma irradiation of pork to prevent trichinosis, through x-ray, cobalt-60, or atomic waste fission material, would probably be more effective and desirable than methods used so far, which embrace cooking garbage fed to hogs, inspection of hog carcasses, low temperature treatment, and thorough cooking by the consumer. The irradiation process is analogous to that of pasteurization which revolutionized the milk industry.

This was the conclusion in a paper by S. E. Gould, H. J. Gomberg, and F. H. Bethell, University of Michigan scientists, before the 81 annual meeting, American Public Health Association, here Nov. 9 to 13. The proposed method is, they say, sanitary, simple, and rapid; apparatus is compact and long-lasting; the required time for irradiation is 1.75 minutes. It is effective and the wholesomeness of the meat is preserved. No radioactivity is induced in the meat, no flavor changes produced, and no harm to the pork eater results, they add.

The method requires but a single room, an irradiation source and technical staff of one or two persons for a large packing plant. The estimated cost for a plant with daily capacity of 2000 hogs would be 2.3 mills per pound of pork processed, if total investment is amortized over five years, or 1.5 mills, over 10 years. The cost in subsequent years is even less. For a plant with one sixth this capacity the cost would be 7.4 mills. Hence the larger and more centralized plant would be more desirable.

The method would eliminate need for special processing, such as heating, freezing, and curing of ready-to-eat pork products such as sausages and smoked ham, which comprise 30% of produced pork. Those producers who adopt the method early should have a tremendous economic advantage, the authors opine, citing the advertising value of pasteurized milk.

The great frequency of trichinosis in the United States has been a source of "astonishment and horror to many people in other countries," the authors stated. Microscopic inspection of pork has not been deemed suited to our high-speed processing methods, even though practiced in many other countries with success. The low temperature method (-36°F . for two minutes at the center of the meat) is too expensive.

As of Sept. 1, 41 states had adopted requirements that all garbage fed to hogs be cooked thoroughly to kill possible

infection, which implies boiling for 30 minutes. This also theoretically kills vesicular exanthema, hog cholera, foot-and-mouth disease, salmonellosis, and tuberculosis. Garbage cooking is not the sole solution, since even among farm-fed and grain-fed hogs, and in Canada where all garbage must be cooked, incidence of infection is 0.3 to 0.7%. It is estimated that 25% of all Americans, during their lifetime, will harbor trichina larvae in their muscles, with mortality rate of 5 to 6%.

For two years experiments have been conducted on effects of ionizing radiation on trichina larvae *in vitro* in rat muscle and in pork. A dose of 3500 R. x-rays will render most of the maturing parasites sexually sterile, while 5000 to 6000 R. will prevent most from developing to adult forms. With cobalt-60, 15,000 R. produced sterility in rat muscle, while 18,000 R. inhibited maturation of the larvae. Waste fission nuclear material produces the same results. Such treatment produced no changes in flavor of pork.

With a single radiation unit it would be possible to apply irradiation at any one of five points: live animal prior to slaughter; carcasses before, during, or after chilling; finished packaged products prior to shipment. About 20 hours would be needed for irradiating

one day's production, but since it is necessary to chill carcasses for 24 hours, the two could be done simultaneously.

Chemicals in Foods. When considering possible toxicity of chemical additives to foods, one must not be content with apparent harmlessness to the normal healthy individual, but one must take into consideration the fact that a segment of population is undergoing various physiologic changes or stresses, such as in pregnancy, said William J. Darby, professor of biochemistry and director of the division of nutrition, Vanderbilt University school of medicine. Such a segment might be peculiarly susceptible to the particular food additive.

Additives with definite toxicologic effects are numerous. Lithium chloride, used as a salt substitute, produced widely-known tragic effects. Cadmium, a contaminant from containers in preparation of certain frozen confections, resulted in acute toxicologic episodes. Dulcin, once permitted as an artificial sweetener, is found sufficiently toxic to animals to render it unsafe for foods. More recently coumarin, on the basis of studies in animals, has been found toxic, and is no longer used as flavoring for human food.

Most additives found harmful show immediate apparent injury. One must not neglect those additives which might have a cumulative effect and not immediately apparent as harmful. The effect may be chronic in character. Possibility of long-term chronic toxicity related to all ages must be kept in mind. Total population must be considered.

Growth Factor in Animal Proteins Stimulates Chick Growth

CHICAGO.—An unidentified growth factor in animal proteins increases the growth rate of a fast growing strain of chickens. The factor, present in meat scraps, fish meal, and fish solubles, was described by H. R. Bird, University of Wisconsin, at the 20th anniversary convention of the National Renderers' Association here Nov. 16 and 17. Ten-week-old chickens fed a diet including fish meal weighed an average of 0.38 pound more per bird for male birds and 0.21 pound more per bird for females than control lots fed a complete diet entirely from plant sources.

There is evidence that the new factor is supplied by some fermentation products, such as the antibiotic residues. It also appears to be synthesized by certain bacteria. Autoclaving at pH's ranging from 2 to 11 does not destroy the factor. The substance is water soluble. So far it

has not been isolated. The biggest difficulty here is the lack of a suitable assay. Response in chick growth is the only known means of detection. The substance has been shown not to be vitamin B₁₂ by including crystalline B₁₂ in excess of requirements in the diet.

Fats in Feeds. Besides being used to improve texture, dusting properties, and color, animal fats are now being used to increase the energy content of feeds. At present prices inedible tallow is more economical as an energy source than feed grains. White grease is not quite as economical as corn but it is still within the price range of other grains. Experiments show, said Dr. Bird, that animal fats are utilized both by growing chicks and by laying hens.

The first requirement for a fat to be used in feed is that it should be stabilized or preserved with some recognized anti-

oxidant. Adding a preservative is cheap and is good advertising, said W. M. Hendrixson, Kentucky Chemical Industries. Most feed men think, of fat and rancidity together; it is up to the fat suppliers to dispel this idea from their minds.

There is evidence that highly unsaturated fatty acids tend to destroy vitamin E unless stabilized. A possible explanation of the appearance of hock disease in turkeys fed feed containing fats is the destruction of vitamin E in the feed.

As far as it is known, poultry and swine can use any fat which will become liquid after it is taken into the body. There is not too much data available on chickens as to the titre of fats which can be utilized, but in the case of rats digestibility drops rapidly when the melting point reaches about 50° C. Accordingly, said Mr. Hendrixson, it does not seem that hydrogenated animal fats would be available to poultry and swine.

Industry

Monsanto Reorganizes; Phosphate Division Renamed Inorganic Chemicals

The phosphate division of Monsanto is being renamed the inorganic chemicals division under a number of changes in the company's organization announced by the president, Charles A. Thomas. The new inorganic chemicals division will operate the plants of the former phosphate division and the former Merrimac division plants at Everett, Mass., and Camden, N. J. J. L. Christian, vice president and general manager of the former phosphate division, will be head of the new inorganic division.

Dr. Thomas explained that the Merrimac, Texas, and Western divisions will be absorbed by other divisions having compatible product lines.

Under the new setup, there will be eight staff departments—accounting, advertising and public relations, general development and patent, personnel relations, law, medical, purchasing and traffic, and treasury. There will be five other divisions in addition to the phosphate division—organic chemicals, plastics, research and engineering, merchandising, and overseas.

The organic chemicals division will continue to operate plants at St. Louis, Monsanto, Ill., Nitro, W. Va., and Norfolk, Va., and will take over operation of the western division's new phenol plant at Avon, Calif. Charles H. Sommer, Jr., now general manager of the Merrimac division, will head the organic chemicals division.

The new research and engineering division will include functions of the central research department at Dayton,

Ohio, the general engineering department at St. Louis, and the engineering sales department of the organic division. J. R. Mares, vice president and general manager of the Texas division, will head the new research and engineering division.

Brea Chemicals to Give Technical Service on Aqua NH₃

Brea Chemicals has formed a technical service division to give its dealers and their farmer customers information on the most efficient use of aqua ammonia and other agricultural chemicals. R. L. Luckhardt will head the service group and is now working with specialists on perfecting new techniques for the application of aqua ammonia.

Brea Chemicals, a subsidiary of Union Oil Co., is now constructing a multi-million dollar aqua ammonia plant near Brea, Calif.

Research

WARF Building New Lab for Insecticide, Animal Testing

Construction of a building to house the insecticide and animal laboratories has started at the Wisconsin Alumni Research Foundation in Madison. The separate unit, to be built behind the present WARF building, is expected to cost about \$150,000.

The English-type basement of the structure, a 50 by 100 foot concrete block building, will house the insecticide testing division, giving it approximately three times more space than it presently has.

Animal work, including chick tests, warm blooded toxicity tests, and biological assays for vitamins, will be done on the first floor.

About 35 members of the WARF technical staff will work in the new building. Construction of the building is expected to be completed next March.

People

Ferguson Named President of Geigy Agricultural Chemicals

George R. Ferguson, formerly technical director in charge of research and production of Geigy Co., Inc., has been named president of the newly formed Geigy Agricultural Chemicals Division of Geigy Chemical Corp. John G. Plowden, who has been manager of the company's western territory in Fresno, Calif., becomes sales manager of the new division, replacing R. J. Zipse who recently resigned. Paul B. Allen succeeds Plowden as manager of the western territory. C. C. Alexander, formerly chief entomologist, becomes research manager in charge of the research and development work at the Bayonne, N. J., laboratory. Lewis P. Harris, former manager and plant superintendent for Cotton States Chemical Co., will join the division as production manager, with headquarters at the Bayonne lab.

Richard J. Both has been promoted to sales manager, agricultural chemicals, naval stores department, Hercules Powder. Formerly assistant sales manager, he succeeds the late Frank U. Rapp.

U. J. Lewis has joined the staff of the division of biochemistry and nutrition, American Meat Institute Foundation, and the department of biochemistry at the University of Chicago. He has been doing postdoctoral research in the laboratory of Hugo Theorell in Sweden.

Thomas H. Vaughn has resigned as vice president in charge of research and development for Wyandotte Chemicals to become vice president in charge of research and development for Colgate-Palmolive Co.

D. C. Shallcross has been named assistant sales manager for Davies Nitrate Co., Inc. He had been a technical representative for the company.

Edith C. Weir has been appointed chief of the division of home economics, American Meat Institute Foundation. For the last four years she has been doing research at the USDA's Agricultural Research Center, Beltsville, Md.

On The Cover

Antibiotics in Nonpharmaceutical Uses

Visual evidence of the increasingly widespread application of antibiotics is offered on the cover of the issue.

Animal feed supplements are represented by the pigs and chickens, which present the results of controlled experiments demonstrating the value of these materials in animal nutrition.

The bean seedlings are representative of new areas opening up for antibiotics in the treatment of plant diseases. Basic research studies concerning the effects of these fermentation products on growing plants and spoilage organisms may point the way to more distant and widespread utilization.

Photos Courtesy Lederle Laboratories and USDA