

Department of Agriculture, report the potential for use on larger animals, including cattle, is excellent.

Radionuclides have been instrumental in revealing various physiological conditions in livestock. An example is the study of milk fever. High-producing cattle stricken with this disease often become permanently paralyzed or die because of a decrease in the calcium level in the blood when they calve and milk production begins. The outpouring of calcium into the milk and the inability of the cow to replenish the blood level is now better understood through radioactive-calcium experiments carried out by the University of Pennsylvania and the University of Illinois. A rational basis for treatment and prevention of this condition is now possible.

The application of nuclear medicine to the diagnosis and treatment of animal diseases is now becoming feasible. For example, a nuclear *in vitro* test has been developed to study the thyroid function of farm animals. These tests require only a sample of blood serum from the animal. When a tiny amount of radioactivity is added to the serum, the researcher can determine if the animal is normal or hyperthyroid without injecting any radioactivity into the animal. Early tests were conducted at Cornell University with dogs. Success has now been achieved with cattle, and the tests will likely be applied to sheep, pigs, and horses.

Food preservation

International food experts estimate that one-fifth of the world's food crops are destroyed by insects, microorganisms, and other pests; losses are as high as 30 to 50% in some areas. This includes spoilage in transit and storage. Food preservation by irradiation is emerging—slowly but surely—as at least a partial answer to the problem.

This technology, the first basically new food-preservation process since the invention of canning, has important implications for the world in alleviating food shortages and losses and in meeting food needs of the population growth, particularly in developing countries.

Meats exposed to high, or sterilization, doses of gamma rays remain edible without refrigeration almost indefinitely—an important plus for the field soldier, who still travels on his stomach and is usually far from freezer facilities. The radiation-sterilization research program is being