

## **Irradiation**

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The concept of integrating electron beam/x-ray technology into food and meat processing systems to reduce foodborne pathogens and spoilage microflora has moved forward in 2000. Researchers have demonstrated that the irradiation of food is safe, effective and results in a product which exhibits excellent sensory qualities. Government regulations have been established for the safe utilization of irradiation technologies. Irradiation technologies have proven their reliability in dozens of commercial applications. Electron-beam systems are versatile and can be integrated into the process at the producer's facility. Consumers are willing to purchase irradiated meat and have, in marketing studies, selected it over the non-irradiated product. The design and operation of the Cloverleaf, Hawaii Pride and Zero Mountain Surebeam® processing facilities will be presented.

The Cloverleaf facility in Sioux City, Iowa will incorporate two, 10 MeV electron beam sources and will process various meat products single-sided or double-sided on a single pass. It will be capable of processing greater than 100,000,000 pounds of meat per year at 1.5 kGy dose. This facility became operational December 1, 1999. The Hawaii Pride facility located in Hilo, Hawaii will utilize Titan's Surebeam® X-Ray system for the disinfestation of greater than 20,000 pounds of tropical fruit annually. The facility is scheduled to be operational June 2000. Zero Mountain Cold Storage in Russellville,

Arkansas has purchased an X-Ray system to pasteurize poultry products and other meats. This facility will begin operation the fourth quarter of 2000.

Electron-beam systems are highly efficient because the electrons are focused as a beam on the product as compared to Cobalt-60, which emits gamma rays in all directions. Hence, greater processing flowrates are compatible with production rates; and uniform high dose application rates can be achieved; and critical product temperature limitations can be maintained. Electron-beam systems can be optimized for treatment of a specific product in case-ready packages. Variations in electron energy, machine power, conveyor belt speed, one or two sided treatment allow designs to be integrated into a production line for a wide range of products.

Electron-beam technology has important advantages when considering its application for pasteurizing food products. Electron-beam technology provides irradiation without employing radioisotopes. When the switch is "off" electrons are no longer produced, eliminating the source of irradiation. Further, since electron-beam technology does not utilize radioisotopes, it is environmentally friendly and does not require Nuclear Regulatory Commission (NRC) licensing.

Moving forward with irradiation technology will result in the reduction of foodborne disease and waste. Both are admirable objectives and worthy of immediate action.

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