

Irradiation destroys Johne's in milk

By Kimberlee Schoonmaker

New research shows gamma radiation kills the Johne's organism in milk.

Last year, the Food and Drug Administration approved the use of irradiation for red meat products, such as fresh and frozen ground beef. This process — sometimes referred to as "electronic pasteurization" — uses gamma rays or electron beams to kill any harmful bacteria that may be present in the meat.

Recently, researchers at the National Animal Disease Center in Ames, Iowa, and at Colorado State University investigated the ability of gamma radiation to destroy the Johne's organism in milk. Their results indicate irradiation successfully destroys *Mycobacterium paratuberculosis*, the organism responsible for causing Johne's disease, and could therefore be an alternative to — and maybe even eliminate — pasteurization.

To conduct the study, the researchers "spiked" milk samples with either 100,000 or 1 billion colony forming units (CFU) of *M. paratuberculosis* per 1 milliliter of milk.

Next, they exposed the milk samples to three different levels of gamma radiation — 5, 10 or 15 kGy, a unit that measures the energy given off by a

radiation source. Control samples were not exposed to any radiation or pasteurization.

Following irradiation, the researchers cultured the milk samples to determine if the Johne's organism was still present. Their results indicate both levels of radiation destroyed 100 percent of the Johne's organism in the milk samples.

And, the organism did not regenerate, even after being left on the culture plates for several months. "We were not able to culture the organism, even after six months of incubation," notes Judy Stabel, research microbiologist at the National Animal Disease Center. Stabel collaborated with Chuck Waldren, professor of radiologic health sciences at Colorado State University, and Frank Garry, veterinarian at Colorado State University.

The next step At this point, more research is needed to pinpoint the minimum level of gamma radiation needed to destroy the Johne's organism, Stabel says.

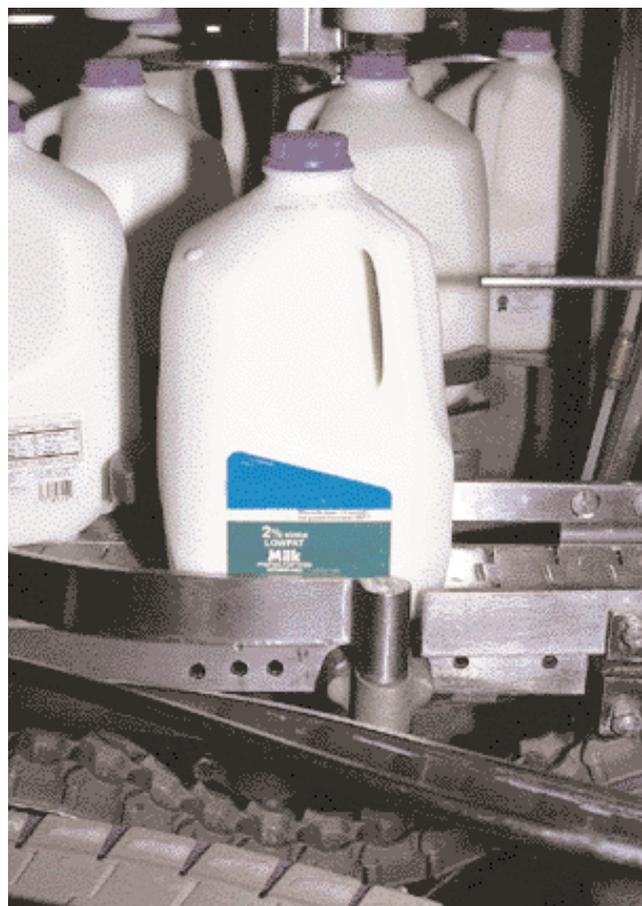
And, while this research certainly looks promising, it is still too

early to say if irradiation will be a feasible alternative to pasteurization. Pasteurization is very effective at destroying most human pathogens in milk.

However, as the debate over whether pasteurization kills the Johne's

organism remains unresolved, irradiation could alleviate some of the human-health concerns associated with Johne's — in particular, a possible, yet unproven, link between Johne's disease and Crohn's disease in humans.

Ultimately, the success of irradiation will hinge on consumer acceptance of the technology. *RM*



Milk processing plants may someday use irradiation to destroy pathogens in milk. Recent research indicates gamma radiation kills the Johne's organism in milk, and could therefore be a viable method.