

Agriculture by Marcia Merry

Irradiation kills *E. coli*

Lives and money will be saved if the Agriculture Department and FDA approve irradiating beef.

The facts are now in on the recent outbreak of disease in the Pacific Northwest caused by *E. coli* bacteria (specifically, the strain *E. coli* 0157:H7), passing along the food chain from cattle, to frozen ground meat, to fast-food restaurant hamburgers. An estimated 40,000 potentially contaminated hamburgers were served before the problem was tackled. In Washington state, 400 people were hospitalized in serious condition, and two children died.

The best outcome of this disaster will be for the federal government to finally approve irradiating beef, and take similar measures long withheld because of public ignorance and because of the control of meat processing by a small cartel of food companies—Cargill, ConAgra, IBP, and others.

As it now appears, the situation arose last fall when tainted beef carcasses were processed and shipped out as bulk frozen meat products by the California-based Vons Companies, to, among others, the Jack-in-the-Box restaurant chain in Washington state, where hamburgers were prepared at temperatures below the point necessary to kill the bacteria.

The cases of illness grew daily over the first three weeks of January, until epidemiologists tracked down the cause and sources, and action was taken to withdraw all potentially tainted meat, and to prepare hamburgers safely.

Charges and lawsuits are flying between stricken customers and the companies involved. However, the question posed is: Why let this happen? Why not employ technologies

known for years?

No food supply can be sterile from beginning to end—with the exception of special situations such as space flights and antiseptic units in cancer-treatment centers. However, there are certain points in the food supply chain, where the application of science and technology will greatly diminish risks to health.

First look at the nature of the beast, and then at what should be done.

All healthy mammals carry strains of *E. coli* bacteria in the gut. However, one special strain of bacteria, *E. coli* 0157:H7, is not tolerated by humans without problems—sometimes fatal—though the strain is easily carried in the intestines of other mammals, especially cattle. This *E. coli* 0157:H7 strain was first identified 11 years ago, and causes bloody diarrhea, and sometimes permanent damage or death in the very young or old.

If, during the slaughtering or processing, the *E. coli* is transferred from the intestine to the meat cuts (an uncommon occurrence in standard processing), and the final product is not cooked adequately, the consumer stands to be infected. The *E. coli* 0157:H7 is not killed by freezing, and it can be carried in juice and milk products. Infection can also be spread from person to person, mostly by transfer of fecal matter because of lack of routine handwashing.

Only 11 states so far require reporting of cases of *E. coli* infection, but certain patterns of the incidence stand out.

Outbreaks of the illness are more prevalent in the summer, when more

people are outside cooking hamburgers. Outbreaks spread more easily in institutional situations such as children's and elderly centers, where personal hygiene may be haphazard.

Origin of the contamination may be more common where dairy herds are slaughtered. Dairy cows usually go into ground meat because they are too old and tough for steaks and choice cuts. Then, because ground meat is stirred up, the prevalence of the bacteria is enhanced throughout the meat; therefore, it must be cooked thoroughly to avoid possible infection. In contrast, when steaks are contaminated, it is from "the outside in," and high-temperature cooking that leaves the meat rare in the middle, may still pose small risk. Scientists cannot say how much or how little bacteria is dangerous, because it varies from person to person. But *E. coli* 0157:H7 is very virulent.

Food microbiologists advise that cooking meat to an internal temperature of 155°F is the safest practice. Federal law is 140°F. The Jack-in-the-Box restaurants in Washington were apparently following the lower guideline.

The principal precaution that should be taken nationwide is to irradiate ground beef. A very low dose of gamma rays from radioactive cobalt, or highly charged particle beams, will kill bacteria, and also any fungus and insects present. A model for such a process is the Vindicator plant in Florida.

Extensive research on food irradiation has been done since 1940. In 1963, irradiation was approved for wheat and flour, and since then on certain fruits and vegetables, and on chicken and pork.

The major food cartel companies monopolizing meat packing, Cargill, IBP, ConAgra and others, have refused to implement irradiation.