

mate the number of surviving colony-forming units. Both incubation temperature and culture media frequently affect the ability of injured bacteria to recover. Because there are so many possible variables, it is often difficult to compare data on the radiation sensitivity of foodborne pathogens from different studies. The objectives of the studies reported here were to compare the radiation sensitivities of *Bacillus cereus* on beef, beef gravy, chicken, pork, and turkey; and of *Escherichia coli* O157:H7, *Listeria monocytogenes*, *Salmonella*, and *Staphylococcus aureus* on beef, pork, lamb, turkey breast, and turkey leg meats. Examples of the effects of serovar, irradiation temperature, growth phase, and atmosphere during irradiation were also examined.

The following diarrheal strains of *B. cereus* were used: ATCC 33018, B4AC(2), F4433/73, Watertown F45814/70, and the emetic strain F4552/75. Five isolates ATCC 35150, ATCC 43889, ATCC 43894, 93-937, and ENT C9490 of the enterohemorrhagic *E. coli* O157:H7 were studied. *L. monocytogenes* isolates ATCC 15313, 43256, 49594, and 7644 were evaluated. The salmonellae used were *S. dublin* ATCC 25480, *S. enteritidis* ATCC 13076, *S. newport* ATCC 6962, *S. senftenberg* ATCC 8400, and *S. typhimurium* ATCC 14028. *S. aureus* isolates ATCC 25923, ATCC 13565, and B124 were used.

Samples were irradiated in a self-contained  $^{137}\text{Cs}$  gamma radiation source at a dose rate of 0.108 kGy/min. Most samples were irradiated, except where noted, at a temperature of  $5 \pm 0.5^\circ\text{C}$ .

The radiation resistance of the spores of *B. cereus* were 2.78 kGy when they were present in ground beef, ground pork, and beef gravy, but the radiation resistance (1.91 kGy) was significantly lower when the spores were in chicken and turkey. The radiation resistances of *E. coli* O157:H7 and *L. monocytogenes* were not affected by the suspending meat. However, the radiation resistance of salmonellae was lower on pork than on the other meats studied, and the radiation resistance of *S. aureus* was lower on lamb and chicken meat than on the other meats. The results indicated that these pathogens, with the exception of *B. cereus*, can be controlled or eliminated using the current guidelines for the irradiation of poultry. However, the results also indicate that estimates of the radiation resistance of foodborne pathogens obtained with one species of meat should not be extrapolated to other species without actual experimental data.

#### **4. Gamma Radiation Sensitivity of Foodborne Pathogens on Meat and Poultry, Donald W. Thayer, Glenn Boyd (USDA, Philadelphia)**

Several factors have been identified that may affect the responses of foodborne pathogens to ionizing radiation. Among these are the temperature and atmosphere during the process of irradiation; the medium in which the pathogen is suspended; and the genus, species, serovar, and physiological state of the organism. In addition to these factors, variations in "apparent" radiation sensitivity of bacteria may occur because of the incubation conditions and media used to esti-