

3. Radiation decontamination of frozen chicks

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Meat offers an excellent medium for the growth and multiplication of bacteria. The pathogenic bacteria mostly present in poultry and poultry meats are Salmonella, Campylobacter, Staphylococcus, Clostridium, Listeria E. coli etc. Most of these cause food-transmitted infectious diseases. The spoilage microorganisms in poultry meat quickly render the meat unacceptable due to decomposition of the products resulting in off-odour and development of slime. The elimination of these micro-organisms by the irradiation process can slow down the spoilage. Radiation sensitivity of the microorganisms differs with genera and even with species. However irradiation (2-5 kGy) and freezing has been found effective in eliminating various pathogens. These combination treatments were tested in our local environment.

Slaughtered and cleaned chicks were packed in polyethylene bags. These were irradiated (5.0 kGy) and stored alongwith unirradiated controls for 6 months at the temperature of $-22 \pm 2^{\circ}\text{C}$. Different parameters were studied at 15 days interval during storage. The initial total bacterial count was 2.8×10^5 . The freezing process reduced bacterial count in poultry meat. The results showed (Table 33) that total viable bacterial count/cm² reduced significantly by the irradiation treatment of 5.0 kGy, the total count being 1.7×10^5 was reduced to 9.7×10^3 /cm² immediately after irradiation. Gradual decrease was also recorded in total bacterial count during the entire storage period irrespective of control and irradiated samples. The samples were also judged for colour and flavour. No prominent differences in colour and flavour between irradiated and control samples were noted. These results indicated that radiation followed by freezing greatly protected quality of poultry meat during storage for 6 months.

Table 33: Effect of irradiation and storage on total viable bacterial counts in frozen poultry meat.

| Storage time (days) | Total viable counts/cm ² | | | C.V |
|------------------------|-------------------------------------|-------------------|-------------------|-----|
| | Control | Irradiated | Mean | |
| 0 | 1.7×10^5 | 9.7×10^3 | 8.9×10^4 | 126 |
| 15 | 1.2×10^5 | 6.5×10^3 | 6.3×10^4 | 127 |
| 30 | 1.5×10^5 | 5.2×10^3 | 7.7×10^4 | 132 |
| 45 | 9.6×10^4 | 4.5×10^3 | 5.0×10^4 | 129 |
| 60 | 8.5×10^4 | 3.5×10^3 | 4.4×10^4 | 130 |
| 75 | 9.2×10^4 | 3.8×10^3 | 4.7×10^4 | 130 |
| 90 | 7.8×10^4 | 2.7×10^3 | 4.0×10^4 | 132 |
| 105 | 6.6×10^4 | 1.9×10^3 | 3.3×10^4 | 134 |
| 120 | 5.2×10^4 | 1.5×10^3 | 2.6×10^4 | 133 |
| 135 | 4.5×10^4 | 2.1×10^3 | 2.3×10^4 | 129 |
| 150 | 4.7×10^4 | 1.5×10^3 | 2.4×10^4 | 133 |
| 165 | 4.5×10^4 | 1.0×10^3 | 2.3×10^4 | 135 |
| Mean | 8.7×10^4 | 8.3×10^3 | | |
| C.V | 48.0 | 69.0 | | |

Initial value = 2.8×10^5
 Radiation dose = 5.0 kGy.