

### Biological Hazards Control – Commercially Sterile (Canned) Products

Product	Hazard	Primary Control	Usual CCP
Low Acid	<i>C. botulinum</i> Spores	High heat (under pressure)	Retort Process
Acidified Low Acid	<i>C. botulinum</i> Spores Germination plus Vegetative Pathogens	Low pH ( $\leq 4.6$ ), plus mild heat	Formulation Step (pH of product, amount of acid) Heat Step (time/temp)
Cured	<i>C. botulinum</i> Spores Spore Germination, and Vegetative Pathogens	Salt and nitrite, plus mild heat	Formulation Step (amount of salt and nitrite) Heat Step (time/temp)

### Biological Hazards Control – Shelf-Stable Dried Products

Product	Hazard	Primary Control	Usual CCP
Fermented, Heat Treated	Vegetative Pathogens such as <i>E.coli</i> O157H:7, <i>Salmonella</i> and <i>S.aureus</i>	Low pH, Mild heat, and Low $a_w$	Fermentation Step (time to pH of 5.3) Heat Step (time/temp) Drying Step (room time/temp/humidity)
Non-Fermented, Non-Heated, Dry cured	Vegetative Pathogens such as <i>E.coli</i> O157H:7 <i>Salmonella</i> and <i>S.aureus</i>	Salt, nitrite, and Low $a_w$	Salting/Burning Step (amount of salt and time) Drying Step (room time, temp., humidity)
Full Cooked	Vegetative Pathogens such as <i>E.coli</i> O157H:7 <i>Salmonella</i> and <i>S.aureus</i>	Mild heat and Low $a_w$	Cooking Step (time/temp/humidity) Drying Step (time/temp)