Targets for Public Health and Commercial Sterility

For low-acid canned foods (those with a pH greater than 4.6), the thermal process focuses on the destruction of the spores of certain sporeforming bacteria. (These have been discussed in the previous section). The target pathogen for low-acid canned foods is *Clostridium botulinum* (specifically the spores of the organism.) Failure to destroy these spores, followed by germination and growth, can lead to the production of the deadly botulinum toxin, an extremely potent neurotoxin. Low-acid canned food processes that assure the destruction of *C. botulinum* spores are adequate to protect human health; however, as noted previously, a more substantial process, or a commercial sterility process, is required to destroy spores of other microorganisms that could germinate and grow under normal storage and handling conditions and cause economic spoilage. The target for commercial sterility is typically *C. sporogenes*, an organism very similar to *C. botulinum* but with a higher heat resistance.

Thermal processes for acidified foods are targeted toward vegetative cells of microorganisms and are generally significantly milder than those applied to low-acid foods. This is primarily because spores of microorganisms such as *C. botulinum* will not germinate due to the acid nature in the product. Keeping the spores from germinating will prevent the growth of the vegetative cells of *C. botulinum* and subsequent toxin production. In distinguishing between acidified and low-acid foods, the standard used is a pH of 4.6 (greater than 4.6 is low-acid and less than or equal to 4.6 is acid or acidified). Typical thermal processes for acidified foods will maintain the commercial sterility of a product as long as good sanitation and GMPs are followed. Lack of pH control for an acidified food can lead to problems if the pH is high enough to allow surviving spores of *C. botulinum* to germinate and produce toxin.