SIGNIFICANCE & HISTORY OF THE CANNERY INSPECTION PROGRAM

The Cannery Inspection Program has achieved almost 100 years of worldwide recognition for its excellent service to consumers and the food industry by preventing botulism associated with commercially processed low-acid canned foods and acidified foods manufactured in California. This document describes the public health significance of foodborne botulism, and provides an historical overview and information about today's Cannery Inspection Program.

Significance of Foodborne Botulism

Foodborne botulism is a true food poisoning, caused by the ingestion of food containing the neurotoxin produced by the bacterium, *Clostridium botulinum*. *C. botulinum* is commonly found in nature (soil, the environment, and certain foods we eat) and is harmless under most conditions. However, under certain anaerobic (absence of oxygen) conditions and optimal pH, moisture, and temperature, *C. botulinum* spores will germinate into vegetative cells and toxin is produced when the bacteria multiply. The botulism toxin is one of the most deadly toxins known and is responsible for causing botulism. Botulism is a serious and potentially deadly disease. It is characterized by symmetric, descending, flaccid paralysis of motor and autonomic nerves, usually beginning with the cranial nerves. Blurred vision, dysphagia (difficulty swallowing), and dysarthria (weakness or difficulty controlling the muscles used to speak) are common initial symptoms. If not treated immediately, death may result. Hermetically sealed (air-tight) containers of low-acid foods and/or acidified foods that are devoid of oxygen and stored without refrigeration are particularly susceptible to the growth of *C. botulinum* and the hazard of toxin formation if they are not properly processed.

History of the California Cannery Inspection Program

California is a major producer of low-acid canned foods and acidified foods, including vegetables, meat, fish products and specialty foods and beverages. Millions of cases of these foods are produced in the state annually, each of which can be a potential health hazard if each container is not properly processed. A single botulism occurrence can destroy the involved processor and cause financial ruin for other canneries. California has recognized the foodborne botulism problem since the 1920's and has laws, regulations, and a batch–release program for low-acid canned foods and acidified foods to control this hazard. The program regulating low-acid canned foods and acidified foods has been known as the California Cannery Inspection Program, administered by the State of California Department of Public Health (CDPH), Food and Drug Branch (FDB).

From 1899 to 1949, there were 483 outbreaks of botulism reported in North America (the United States and Canada) involving 1,319 case patients and 851 deaths. Of these outbreaks, cases and deaths, 184 outbreaks, 416 cases, and 252 deaths were in California. Additionally, 40 deaths occurred in other states from products prepared in California. In 1919 alone, olives commercially canned in California caused 17 deaths (7 in Ohio, 5 in Montana and 7 in Michigan). Such occurrences disturbed public health officials in California and the rest of the nation. In addition to the public health menace involved, the huge California canning industry was jeopardized.

All of this was aggravated by sensational newspaper publicity. As a result, botulism became a reportable disease in November 1920. Also, on August 7, 1920, the State of California Board of Health (Board) adopted the first regulation of olive production requiring sanitation throughout the canning facility and a mandated thermal process (specified time and temperature in heating canned foods to render then commercially sterile). In 1920-21 some 20 deaths occurred from botulism linked to canned spinach produced in California. As a result, in April 1921, the Board adopted a resolution covering canning and sterilization of spinach specifying definite fill-in weights, cut-out weights, initial temperatures, and sterilization processes.

In the 1920's, little was known about the nature and prevention of foodborne botulism. A Board of Investigation consisting of Dr. K.F. Meyer (University of California), Dr. E.C. Dickson (Stanford University), and Major J.C. Geiger (U.S. Public Health Service) investigated the subject of botulism and its causes. Several researchers and laboratories carried on studies regarding the effects of various methods of sterilization from a commercial standpoint. However, until the National Canners Association (later known as the National Food Processor's Association) published Bulletin No. 89-A "What Every Canner Should Know", almost no information was available to average individuals or food processors.

In addition to all the other existing duties under rules and regulations of the California Pure Foods Act, emergency olive and spinach regulations were to be enforced by a small staff of State Food and Drug Inspectors. That proved to be insufficient since the regulations did not prevent further cases of foodborne botulism. During this critical period and pending passage of the Cannery Inspection Act, another bolt of lightning struck the California canning industry. There were 4 deaths in Wyoming and 4 deaths in California due to botulism from canned olives produced in California. An emergency meeting was convened in 1924 and recommendations were proposed, with the advice and approval of state officials. These were extremely important because they constitute the original rules and procedures of the Cannery Inspection Program, and were an enlargement on earlier regulations adopted in 1920.

The trials and tribulations from 1919 through 1924 brought about passage of the Cannery Inspection Act in 1925, which was a joint effort by the State Board of Health and the California canning industry to prevent further outbreaks of foodborne botulism from commercially canned foods. The Cannery Inspection Act became a model for canning regulations worldwide (Rosaler, 2004).

Today's Cannery Inspection Program

Presently, FDB personnel inspect some 200 licensed canners where regulated products are packed. In addition, scientific and technical support is provided pursuant to a contract with the University of California Laboratory for Research in Food Preservation (UCLRFP). The UCLRFP is physically located in Dublin, California, and is presently under the administration of the University of California at Davis.

The primary goal in the Cannery Inspection Program is prevention of foodborne botulism. Under today's program, FDB personnel inspect and evaluate critical process steps involved in the manufacture of shelf-stable low-acid canned foods and acidified foods packed in hermetically sealed containers. This inspection includes oversight of the processor's employee practices, facility sanitation, equipment, formulation, processing steps, direct or indirectly added ingredients, and container and closure examinations. FDB personnel are also responsible for identification and

quarantine of canned foods when deviations from critical processing factors have been identified. This level of food protection oversight is over and above the minimum requirements for sanitary food production.

One important duty of the Cannery Inspection Program is the administration of written examinations and performance evaluations of retort operators, to determine their qualification to operate sterilization equipment at licensed canneries that produce low-acid canned foods. For acidified foods, FDB personnel regularly verify the pH of each lot of product made and select samples to be submitted to the UCLRFP for analysis to assure that the products, containers and closures are safe and in compliance with the law.

The UCLRFP provides a critical service in the prevention of foodborne botulism associated with canned foods produced in California. UCLRFP scientists are responsible for determining critical factors that must be controlled and monitored during processing to prevent growth of *C. botulinum*. These scientists review thousands of requests each year for official processes that use retort sterilization, acidification (pH control) and other preservation methods to prevent and control growth of *C. botulinum* in commercially produced canned foods from California.

FDB is proud of the public health protection provided to consumers and canners by our Cannery Inspection Program. We continue to improve the Cannery Inspection Program to ensure that it remains a world-class food safety program.

If you have questions about the Cannery Inspection Program, please contact us:

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