

CLOSTRIDIUM BOTULINUM

**STUDIES ON THE PREVENTION OF BOTULINUM TOXIN PRODUCTION IN HOME-CANNED VEGETABLES TO PROVIDE A PRACTICAL TREATMENT TO REDUCE BOTULISM IN THE REPUBLIC OF GEORGIA (ROG)
(C.-M. Lin, L. Thurber, and M. P. Doyle)**

Due to lack of equipment and facilities, people in the Republic of Georgia (ROG) use boiling water instead of a pressure cooker to prepare home-canned vegetables. These boiling conditions for a short period of time will not inactivate spores of *Clostridium botulinum*, hence botulinum toxin frequently forms in canned foods resulting in the ROG having the highest incidence of botulism in the world. Based on epidemiologic data, the occurrence of botulism in the ROG is lower in areas where acetyl salicylic acid (ASA, aspirin) is added to home-canned vegetables. In addition, acidified calcium sulfate (ACS, Safe₂O) produced by Mionix Corp. has been shown to inhibit the growth of pathogenic bacteria in foods. The objective of this study was to evaluate the efficacy of ASA and ACS in preventing botulinum toxin production in home-canned vegetables prepared with utensils and according to methods used in the ROG. Because of difficulties in importing vegetables from the ROG, domestic cucumbers and tomatoes were used and canned based on methods demonstrated by two ROG scientists. Due to differences in the composition of domestic and ROG vegetables, home-canned cucumbers and tomatoes prepared in the laboratory did not support the growth of *C. botulinum* independent of the addition of ASA or ACS. However, sensory characteristics of the vegetables were better when ACS or ASA, especially ACS, was added. Based on a small number of cucumbers and tomatoes imported from the ROG, it was determined that domestic cucumbers and tomatoes have higher acidity (lower pH) than those from the ROG. In addition, ROG water contained high concentration of CaCO₃ compared to Griffin tap water. Hence, the home-canned vegetables prepared in the laboratory using produce from the U.S. did not adequately simulate canned vegetables as they are prepared in the ROG. Recently, CDC epidemiologists have collected more information regarding vegetables canned in the ROG, including acidity of fresh and canned vegetables, pickling recipes, and water quality. The project will be resumed during the next vegetable-growing season in the ROG when produce from the ROG can be used.