CLOSTRIDIUM BOTULINUM

SURVIVAL, GROWTH, AND TOXIGENESIS OF *CLOSTRIDIUM BOTULINUM* IN FRESH CARROT JUICE

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During September and October of 2006, 5 cases of botulism associated with commercial fresh carrot juice were reported. These cases have raised questions regarding the safety of fresh carrot juice. The objectives of this project were to evaluate the survival, growth, and toxigenesis of *Clostridium botulinum* in fresh carrot juice as affected by a *C. botulinum* inoculum of 1 to 1000 spores/ml, storage temperature of 4, 10, 15, 25, and 31°C, storage time of up to 8 days at 25 and 31°C and 6 weeks at lower temperatures, type of carrot juice (baby vs. mature carrots), food preservatives (potassium sorbate and nisin) and biological control agents (lactic acid bacteria) by using factorial design experiments. To date, lactic acid bacteria have been isolated from naturally fermented vegetables and six were selected for further study based on antagonistic activity against *C. botulinum* in vitro. Studies conducted at 15 and 25°C indicated that *C. botulinum* grew well in fresh carrot juice when stored at either temperature. Even an inoculum of 1 spore/ml of fresh carrot juice became toxic at day 5 or 6 when stored at 25°C and week 4 or 5 at 15°C. In general, fresh carrot juice made from baby carrots was less prone to the growth and toxigenesis of *C. botulinum* than carrot juice made from mature carrots. The addition of nisin had no effect on the growth and toxigenesis of *C. botulinum*, whereas potassium sorbate delayed the time to toxin production. Lactic acid bacteria with an inoculum of 1 CFU/ml prevented the germination, growth and toxigenesis of *C. botulinum* at both temperatures. The project is in progress.