INACTIVATION OF WILD-TYPE BACILLUS SPORES IN A SOY MEAT ANALOG MODEL BY EXTRUSION COOKING

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ABSTRACT

The heat resistance of spores continues to be a challenge in food processing applications. Suitable methods that effectively inactivate spores without producing adverse effects on quality and nutrition of food products are constantly being sought. In this study, the efficacy of extrusion cooking (180°C, 125 rpm, 1 MPa pressure) in inactivating wild-type spores in a soy meat analog was determined.

The wild-type spores were isolated from soy flour, soy protein concentrate and wheat gluten. Several sporulation media were tested to determine the media that would yield the most heat resistant spores. Sporulation Agar I was determined to result in the most heat resistant spores. Next, the D-values of *B. cereus*, 4II 1, *B. stearothermophilus* and 3III 1C spores suspended in peptone water were obtained. *B. cereus* and 4II 1 spores were less heat tolerant and had a comparable D-value$_{100°C}$. *B. stearothermophilus* and 3III 1C spores were more heat resistant and also had a comparable D-value$_{150°C}$. The recovery media used were Nutrient Agar (NA), Nutrient Agar with 1 ppm Calcium plus starch (NACaS) and fortified concentrated Tryptone glucose extract (TGE) agar with Calcium and dipicolinate (Ca-DPA TGE). Extrusion processing of the soy meat analog inoculated with *B. stearothermophilus,* 4II 1 and 3III 1C spores significantly reduced the numbers of *B. stearothermophilus,* 4II 1 and 3III 1C spores inoculated into the soy meat analog. However *B. stearothermophilus* spores were more heat resistant