

HIGH PRESSURE TREATMENT ON SELECTED SOYMILK COMPONENTS

ABSTRACT

By Yokiushirdhilmara Estrada-Girón, Ph. D.
Washington State University
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Chair: Gustavo V. Barbosa-Cánovas

With the present trend toward the application of emerging technologies for processing of foods, the use of high hydrostatic pressure (HHP) has become a realistic technology. The effectiveness of HHP, alone or combined with moderate thermal treatment, has been demonstrated to inactivate enzymes and microorganisms and extend shelf life of an extensive variety of fluid food products including fruit juice, eggs, soups, and particularly milk.

This dissertation examines the effectiveness of HHP on the inactivation of undesirable compounds in soymilk and functional components as well. Chapter one contains a review of the latest research in the field of cereal grains and their subproducts, regarding the use of HHP as an alternative technology to either preserve nutritional components or create new texturized products.

Chapter two reports the inactivation of lipoxygenase activity in HHP treated soymilk and soymilk made from HHP treated soybeans. Lipoxygenase, the enzyme conferring the characteristic beany flavor to soy products, may be inactivated at specific conditions of pressure, temperature and holding time.

Chapter three summarizes the degradation of standard isoflavones of daidzein and genistein after HHP treatment and the percentage of these isoflavones in raw soymilk, HHP treated soymilk, soymilk from HHP treated soybeans, and sterilized soymilk. Isoflavones are of special interest to the food industry, particularly because of their properties as health-enhancing dietary compounds. Under HHP, genistein standard was more stable compared with daidzein; however, in soymilk, the percentage of these isoflavones varied according to the type of treatment used.

Chapter four reports the inactivation of protease inhibitors in soymilk subjected to HHP by measuring the inhibition of trypsin activity. Trypsin inhibitors are compounds whose antinutritional properties include in particular pancreatic hypertrophy. HHP exhibited potential to destroy trypsin inhibitors because of the increase in the percentage of residual trypsin with increased HHP treatment.

Chapter five summarizes the kinetic effects of HHP in the inactivation of *Bacillus stearothermophilus* spores suspended in soymilk as an aspect related to quality and safety. Important reduction of these pressure-thermal resistant spores was achieved at selected treatment levels, indicating that HHP may be advantageous in controlling undesirable microorganisms in soymilk.