



Inactivation of *Campylobacter* and spoilage bacteria on poultry by high hydrostatic pressure (HHP)

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Summary

The study is focused on understanding the relationship between the application of high hydrostatic pressure (HHP) and the inactivation rate of a species of common food borne spoilage flora and pathogens such as *Campylobacter*.

Background and Objectives

HHP is an emerging technology for improving meat quality. It is a non-thermal processing technology which can preserve the bioactive compounds and micronutrients in food.

HHP can affect molecular interaction such as gelation; and is capable of inactivating pathogens. However, little research has been done on *Campylobacter* spp., the leading causes of bacterial food borne illness in developed nations.

The aim of the study is to identify HPP treatment parameters to inactivate *Campylobacter*s, pathogens and spoilage flora, without altering nutritional properties of the chicken meat. Experiments will use meat model system applicable in industrial settings.

Experimental Design

All experiments will be performed using chicken breast meat.

First stage:

- ❖ At least 16 strains of the *Campylobacter* spp. will be isolated
- ❖ Spoilage and pathogenic organisms from meat processing plants will be isolated
- ❖ A strain cocktail and the most resistant strain alone will be treated with HHP

Second stage:

- ❖ A challenge test upon ideal process parameters will be applied to spoilage flora and other pathogens. Surviving cells will be counted.

First Results

Strain acquisitions

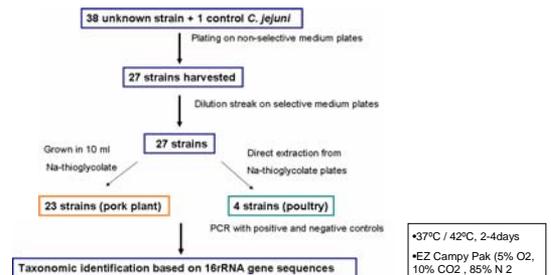


Figure 1. Identification of *Campylobacter* spp. and spoilage organisms obtained from pork and poultry production, research facilities .

HHP machine at Agri- Food Discovery Place (AFDP)



Flow chart of identification of bacterial strains



PCR results

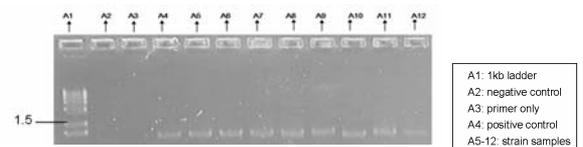


Figure 2. 16rRNA PCR product of unknown strains

Sequencing of the PCR products will reveal later.

Bacteria from meat processing plants and research facilities were isolated. The isolates were *Campylobacter*s, as well as many spoilage and pathogenic organisms.

Future Research

Campylobacter strains exhibiting the highest and lowest resistance to pressure after 300MPa and 30 °C, in 2-5min. treatment will be identified.

A strain cocktail and the most resistant strain alone will be treated in the pressure range of 200 - 500MPa and temperature range of 4 °C – 45 °C (3 combinations).

Significance of the Study

The work so far reveals that *Campylobacter* spp., other pathogenic and spoilage organisms can be isolated and identified. The second stage of the experiment is a must in order to determine the ideal parameters for industrial applications of HHP treatment. HHP technology is feasible and can be applied for improving broiler meat quality in both areas of nutritious properties and safety.

Acknowledgements

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