

Effect of High Pressure Treatment on the Microbial Contamination and on Some Chemical and Physical Properties of Minced Chicken

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Abstract : Composite samples of minced chicken were vacuum-packaged and pressure treated at 300, 400, 450 and 500 MPa in a Stansted 'FOOD-LAB' model S-FL-850-9-W high hydrostatic pressure research apparatus (Stansted Fluid Power Ltd., Stansted, UK). Treated and untreated samples were then stored at 3°C, and microbial content as well as some chemical and physical properties monitored. The microbial load of the untreated samples reached the spoilage level of 10⁷ cfu/g in about one week, resulting in bad smell and dark brown color. The pressure treatments reduced total bacterial counts by about 1.8 to 3.2 log₁₀ cycles and reduced counts of Enterobacteriaceae and Salmonella to non-detectable levels. The color of meat was slightly affected, but pH, moisture content and the oxidation products of lipids were not substantially changed. The treatment killed mainly gram negative bacteria but also caused sub-lethal injury to part of the population resulting in prolonged lag phase. The population not killed by the 350 to 450 MPa treatments grew relatively slowly during storage, and its loads reached spoilage level in 4 to 6 weeks, while the load of the population treated at 500 MPa did not reach this level till the end of a storage period of 9 weeks.

Keywords : chicken, cold storage, microbial spoilage, high hydrostatic pressure

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