USE OF PRESSURIZED CARBON DIOXIDE TO INACTIVATE ALKALINE PHOSPHATASE IN MILK

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The idea of using high pressure processing of foods is old. The use of CO_2 as a sterilizing agent has submitted several benefits. CO_2 is not flammable and not toxic at low concentrations, requires no special handling or ventilation, and leaves no toxic waste, besides being inert. Moreover, CO_2 is inexpensive and readily available, which can facilitate its use in sterilization, as many studies. The experimental system used in this work consists in a microwave reactor tube with feeding of the mixture of milk and CO_2 under conditions of high pressures and temperatures. After the experiments, in addition to the determination of alkaline phosphatase, tests were performed for characterization of milk, in order to monitor changes in physical-chemical relation to pH, acidity, protein, lactose, calcium, iron, potassium and magnesium when using CO_2 and high pressure treatment of milk. The experimental condition of 80 bar pressure, 70 °C temperature, CO_2/milk ratio of 5% and residence time of 30 min was observed where the best results. The use of carbon dioxide was effective for the inactivation of alkaline phosphatase in milk. Although we can observe that the use of high pressure associated with CO_2 resulted in a 65% decrease of the counting of Escherichia coli previously inoculated in milk, causing no loss of protein, calcium, iron, potassium and magnesium in milk.

Keywords: CO_2, milk, alkaline phosphatase.

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