

Effect of pressure on the denaturation of whey antibacterial proteins

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ABSTRACT:

Lactoferrin, IgG and lactoperoxidase provide health benefits. The antimicrobial properties of these proteins permit the use of them as supplements for nutraceutical products. These properties are vulnerable during processing. High-Pressure (HP) treatment is an appealing option in contrast to the customary heat processing of food. In this research, the impact of HP treatment on the denaturation of proteins present in skim milk and whey, and in buffer, were analyzed over a pressure range of 450 to 700 MPa at 20°C. The process of denaturation was analyzed by kinetic analysis. Denaturation of lactoferrin and IgG were estimated utilizing a sandwich ELISA and radial immunodiffusion, individually. Denaturation of lactoperoxidase was recorded by estimating the loss of enzymatic activity. Results obtained indicated that the effect of HP depend widely on the protein. At the point when milk was treated at 500 MPa, higher values of D-value, of 74×10^2 , and 123×10^2 sec, were recorded for lactoferrin and IgG, respectively. For lactoperoxidase, no loss of activity was seen after 30 min. Lactoferrin and IgG are denatured more slowly in buffer and in milk than in whey. The stability of lactoferrin, IgG and lactoperoxidase is to be considered to use them as bioactive components in food.

Keywords:

High-pressure treatment, Denaturation, Bovine whey proteins, Antibacterial activity, Food, Kinetic analysis.