

HEAT-INDUCED CONFORMATIONAL CHANGES OF BOVINE LACTOFERRIN: IMPLICATIONS OF MILK PASTEURIZATION PROCESS

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Lactoferrin (LF) is an iron-binding protein present in several secretions with antimicrobial and physiological properties. LF comprises a monomer with 76 kDa and it can be divided into two lobes with two domains each. Since high temperature may affect protein stability and its functional properties, we decided to investigate the effect of heat on bovine LF structure during milk pasteurization process. The changes were monitored by spectroscopic techniques (circular dichroism (CD) and fluorescence). CD data when temperature is gradually raised from 25 to 105°C until 105°C showed that LF structure is drastically and irreversibly affected. The CD data were confirmed by tryptophan fluorescence emission measurements. We simulated the pasteurization process effects on LF, where temperature was raised rapidly from 5 to 70°C (during 20s) and returned to 5°C. LF remained structured during the whole process. We concluded that LF is sensible to gradual increase of temperature. However, pasteurization process (fast increases temperature) keep LF folded probably leads LF to a molten globule conformation. A better understanding of heat stability is very important to use the LF as a bioactive component in foods.

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