

Antifreeze proteins in food preservation

Researchers at Rutgers University in the United States and McMaster University, Canada, are investigating into the efficacy of using antifreeze proteins in actomyosin gel-forming preservation. Gel-forming functionality of meat correlates to the quality of actomyosin. But during frozen storage, the gel-forming quality of actomyosin is degraded. The mechanisms are believed to involve freeze-induced denaturation of actomyosin and ice recrystallization.

Researchers think that by utilizing antifreeze proteins, these deteriorative mechanisms could be significantly inhibited than feasible with typical cryoprotectants because of the former's higher efficiency in depressing freezing temperature and suppressing ice recrystallization. Moreover, they also have the additional ability to enhance cellular integrity. Ca^{2+} ATPase activity is to be used as a marker for gel-forming quality of actomyosin. The main focus of this project includes:

- Study the feasibility of two types of antifreeze proteins in actomyosin gel-forming preservation; and
- Compare the efficiency between: two types of antifreeze proteins; and the antifreeze proteins and typical cryoprotectants (sodium monoglutamate and sucrose-sorbitol mixture), based on ATPase activity of a fish actomyosin suspension.

Actomyosin deterioration process was induced by a slow freezing process and three cycles of freeze-thaw processes. The Ca^{2+} ATPase activity and protein content of tilapia actomyosin suspension samples were measured before and after the deterioration process. Results have shown that both antifreeze proteins exhibited maximum protection (37 per cent higher than the control Ca^{2+} ATPase activity) at 200 $\mu\text{g}/\text{ml}$. *Contact: Mr. W. Boonsupthip/T.C. Lee, Dept. of Food Science and Centre for Advanced Food Technology, Rutgers University, 65 Dudley Road, New Brunswick, NJ 08901, the United States. Or Mr. D.S.C. Yang, Department of Biochemistry, Faculty of Health Science, McMaster University, Hamilton L8N 3Z5, Canada. (Website: http://www.ift.confex.com/ift/2000/techprogram/paper_4614.htm)*