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鮮乳中黃嘌呤氧化酶之活性 (1)
熱處理、均質化與乳脂肪含量對牛乳中黃嘌呤氧化酶活性之影響

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摘　要

黃嘌呤氧化酶（xanthine oxidase；XO）為一種含鉬酵素，在哺乳動物乳汁中，其主要係存於乳脂肪球膜（milk fat globule membrane；MFGM）上，並可能因乳品在加工時之許多程序而改變其活性。本研究旨在探討生牛乳經熱處理、均質化 (homogenization) 與乳脂肪含量對牛乳中黃嘌呤氧化酶活性之影響。藉硫酸銨 (ammonium sulfate) 分離法純化出牛乳之黃嘌呤氧化酶，再由光電比色儀偵測單位時間內催化黃嘌呤 (xanthine) 轉換為尿酸 (uric acid) 之氧化速率，以代表黃嘌呤氧化酶之活性。結果顯示，未均質而經高溫短時間 (high temperature short time, HTST) 和低溫長時間 (low temperature long time, LTLT) 熱處理後之牛乳與生乳中黃嘌呤氧化酶活性未有顯著差異；而經均質後之牛乳，不論何種熱處理，其黃嘌呤氧化酶活性均較未均質之牛乳高 ($P<0.05$)；此外，當乳脂含量愈高時，其黃嘌呤氧化酶活性亦愈高。總體而言，乳脂肪含量上升及經均質化後，均會影響其黃嘌呤氧化酶之活性。

關鍵詞：熱處理、均質化、黃嘌呤氧化酶

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Xanthine Oxidase Activity in Bovine Fresh Milk: I. Effects of Heat Treatment, Homogenization and Milk Fat Content on Xanthine Oxidase Activity in Bovine Milk

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Abstract

Xanthine oxidase (XO) is one member of the molybdenum family. In mammal milk, the XO mainly exists in a milk fat globule membrane (MFGM). During milk processing, many process steps will change the status of the MFGM and also affect the XO activity in bovine milk. This study aims to investigate the effects of heat treatment, homogenization and milk fat content of bovine milk on XO activity. The XO was purified from bovine milk by ammonium sulphate fractionation and the activity of XO was determined by measuring the rate of oxidation from xanthine to uric acid with UV-spectrophotometer. The results showed that the XO activities of HTST pasteurized fresh milk, LTLT pasteurized fresh milk and raw milk were not significantly changed. The XO activity in homogenized milk was higher than non-homogenized milk no matter what kinds of heat treatments. Furthermore, when the milk fat content has been increasing in the fresh milk, it would also increase the XO activity. In conclusion, the homogenization and different fat content of the bovine milk can affect the XO activity in fresh milk.

Key words: Heat treatment, Homogenization, Xanthine oxidase

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