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Utilization of salt whey from Ras cheese in microbial milk clotting enzymes production

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Microbial milk-clotting enzymes are valued as calf rennet substitutes in the cheese industry. The worldwide increase of cheese production coupled with a reduced supply of calf rennet has prompted a search for calf rennet substitutes, including microbial and plant rennets. However, most plant rennets have proved unsuitable because they impart a bitter taste to the cheese. Microbial rennet appears to be more promising because its production is cheaper, biochemical diversity is greater, and genetic modification is easier. Most cheese manufacturing facilities in Egypt perform land spreading of salt whey. However, this practice increases the chloride levels of soil, and elevates the risk of crop damage. One possible application for salt whey is to use it as a whole medium for growth and production milk clotting enzyme from fungi. Material and methods. *Mucor pusillus* QM 436 was identified to produce the highest milk-clotting activity during screening of 19 fungal strains. Salted whey resulting from Ras (Cephalotyre) cheese manufacture as a whole medium for growth for growth of *Mucor pusillus* QM 436 and production of the enzyme. The milk-clotting enzyme from *Mucor pusillus* QM 436 was purified to 7.14-fold with 54.4% recovery by precipitation in ammonium sulfate, ethanol and fractionated by gel filtration on Sephadex G-100. The enzyme was active in the pH range 5.5-7.5 and was inactivated completely by heating 5 min at 70°C and 30 min at 65°C. The highest level of enzyme activity was obtained at 60°C, pH 5.5. A positive and proportional relationship occurred in presence of CaCL2 in milk, with inhibition occurred in presence of NaCl. The high level of milk-clotting activity coupled with a low level of thermal stability suggested that the milk-clotting enzyme from *Mucor pusillus* QM 436 should be considered as a potential substitute for calf rennet.

Biography

El-Sayed El-Tanboly has completed his Ph.D. from The Institute of Dairy Technology at University of Agriculture and Technology (AR-T) Olsztyn, Poland, Since June 1991. He is the Professor and Consultant of Food & Dairy Enzymes at Dairy & Food Technology Department, National Research Centre (NRC), and Cairo, Egypt. He has published more than 40 papers in journals and scientific conferences, local and European countries.

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