



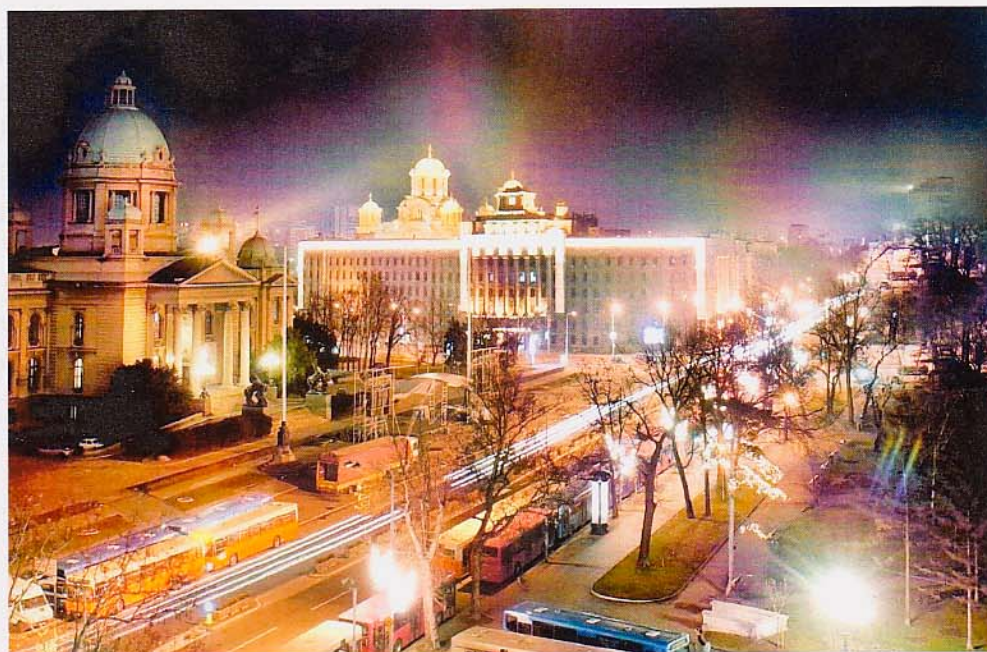
FCUB ERA



2nd FCUB ERA Workshop

Food Chemistry and Biotechnology

Belgrade, 18th and 19th October 2011.



2nd FCUB ERA Workshop

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- 1. Session 1: Plant food chemistry and biochemistry**
- 2. Session 2: Animal food chemistry and biochemistry**
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Session 5: Dairy industry

Invited lecture: **Micellar/Serum distribution of heat-induced whey protein/ κ -CN complexes in caprine milk**

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In most commercial dairy processes, thermal treatment of milk and dairy products is an essential operation aimed at both food safety and shelf life of the final product and improvement of functional properties of proteins. During thermal processing, the whey proteins, mainly β -lactoglobulin (β -LG) and α -lactalbumin (α -LA), denature and aggregate with each other and κ -casein to form protein complexes that are known to have a marked effect on the technological-functional properties of final product.

In bovine milk, the heat-induced serum protein/ κ -CN complexes are located partly at the surfaces of casein micelles as micellar-bound complexes and partly in serum phase of milk as soluble complexes. The amount of formed complexes, their composition and repartition between micellar and serum phase of milk depends of varies technological factors such as pH, temperature, milk protein concentration and salts.

In the present study, the distribution of denatured whey proteins in serum and micellar-bound complexes formed in thermally treated caprine milk at 90°C during 10 minutes was investigated. Protein were fractionated using fractionation technique based on renneting and three electrophoretic techniques, SDS-R-PAGE, SDS-NR-PAGE and native PAGE, were used to obtained information on the characteristics of the milk.

The obtained results indicated that intensive denaturation of caprine major whey proteins were occurred in heated caprine milk at natural pH (6,71). Upon heating, only 2,61% of the total β -LG and 3,83% of the total α -LA were in the native state. Fractionation analysis of major caprine whey proteins was revealed that all denatured β -LG and α -LA were located on the surface of micelles as micellar-bound complexes. These data could be very useful in understanding the formation of acid gels of caprine milk. Concerning that the soluble complexes can act as a bridging material in the acid gel network, the lack of soluble complexes in serum phase of heat-treated caprine milk could be one of the main reason of unsatisfactory structure and soft curd of yoghurt produced from pure goat milk.