

## DEVELOPMENT OF FUNCTIONAL SHEEP AND GOAT MILK PRODUCTS AND THE INVESTIGATION OF FUNCTIONALITY IN VARIOUS PACKAGING MATERIALS

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### Abstract

Small mammalian's milk products can serve as the basics of development of functional foodstuffs whose bioactive compounds are well preserved and the biological uptake is promoted in these media.

Sheep and goat milk products (yogurt and smearcase) amended with omega-3 containing oil and inulin were developed in this study. Besides different packaging means we were investigating hygienic status and plausible changes in functionality throughout storage. Yogurt products were filled in polystyrene or polypropylene bottles with in-bottle or in-tank congealing. Smearcase products were packed in shrink foil or in modified atmosphere. Products were amended with 3% inulin and 0.9% omega-3 fatty acid containing oil. Prototypes were stored for 35 days at 5-8 °C and samples were taken weekly to follow the changes of 6 microbes (*Escherichia coli*, coliforms, *Enterococcus faecalis*, *Staphylococcus aureus*, moulds, lactic acid bacteria) by cultivation techniques. The amounts of 11 fatty acids were assessed at the start and the end of storage by using gas chromatography.

Significant differences were found in hygienic parameters of products made from the same milk-type, but the amount of functional compounds remained almost unchanged. The proliferation of budding yeasts was predominant in the microbiota of yogurt but the addition of omega-3 containing oil decreased it to tenfold lower value. Inulin amendment did not influence the composition of the microbiota. Fatty acid composition of products did not change markedly during the storage, just tridecane and docozane acids were not detectable after 35 days. Snap closed cup gave 6-times higher microbial count in yogurt than the welded one, but it caused no difference in the presence of risk indicator microbes. In case of smearcase application of modified atmosphere did not result in any benefit compared to the shrink foil packaging.

Major outcome of study was the development of two different functional milk based product with monitored preserved bioactive compound content. Amounts of beneficial compounds were not decreased significantly throughout 35 days of storage, thus potential physiological impact should be retained. Welded cup closure was more favourable for storage as it promotes the proliferation of bacteria to the least extent.

**Key words:** Sheep and goat milk products, Added omega 3 fatty acid, Increased functional values, Various packaging materials.