

PRELIMINARY DATA ON HYDROLYTIC ACTIVITY OF LACTIC ACID BACTERIA ON β -LACTOGLOBULIN IN MILK

Galluzzo P.*^[1], **Settanni L.^[2]**, **Gaglio R.^[2]**, **Cascone G.^[2]**, **Macaluso G.^[1]**, **Moschetti G.^[2]**, **Portolano B.^[2]**, **Caracappa S.^[1]**

^[1]*Istituto Zooprofilattico Sperimentale della Sicilia ~ Palermo*, ^[2]*Università degli Studi di Palermo ~ Palermo*

β -Lactoglobulin (β -lg) is the major whey milk protein and it represents the main allergen in cow and sheep milk (1). Microbial fermentation produces some proteolytic enzymes and leads to the degradation of milk protein allergens. In this study, the results of a screening on the ability of lactic acid bacteria (LAB) isolated from typical Sicilian cheeses to reduce the β -lg are shown. This screening was carried out through an indirect competitive ELISA. The lactic acid fermentation was found to be suitable for decreasing milk immunoreactivity.

Twenty three strains of cheese LAB, belonging to six genera (Enterococcus, Lactobacillus, Lactococcus, Leuconostoc, Pediococcus and Streptococcus), were cultured for 48h in their optimal growth medium and, after washing and re-suspension in Ringer's solution, inoculated (1% vol/vol) in UHT milk. After 24h incubation at the optimal growth temperature, all samples were diluted (1:10) in distilled water and analysed by Ridascreen β -Lactoglobulin kit (r-biopharm-Germany) according to the manufacture's instructions. Un-inoculated UHT milk was used as control.

After milk fermentation by LAB, the amount of β -lg decreased in twelve samples with an inhibition rate ranging between 21% and 96%, as compared with unfermented milk. Eleven samples did not show a significant β -lg decrease. The strains that showed a higher capacity to hydrolyze the β -lg were represented by Leuconostoc mesenteroides, followed by Lactococcus lactis subsp. lactis (Figure 1). It is important to observe that two different strains of Leuconostoc mesenteroides give different results.

Since β -lg is recognized as the major milk allergen and it is known that its hydrolysis may reduce milk allergenicity (2), this study can contribute to give some help in the development of hypoallergenic milk products. Future studies will be needed to evaluate the efficacy and suitability of the selected LAB useful in the processes of cheese-making.

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2. Pescumaa1 M., Héberta E. M., Brua E., Font de Valdeza G. and Mozzia F. "Diversity in growth and protein degradation by dairy relevant lactic acid bacteria species in reconstituted whey" J. of Dairy Research 79: 201-208 (2012)

Animal production

β -Lactoglobulin, LAB, allergenicity

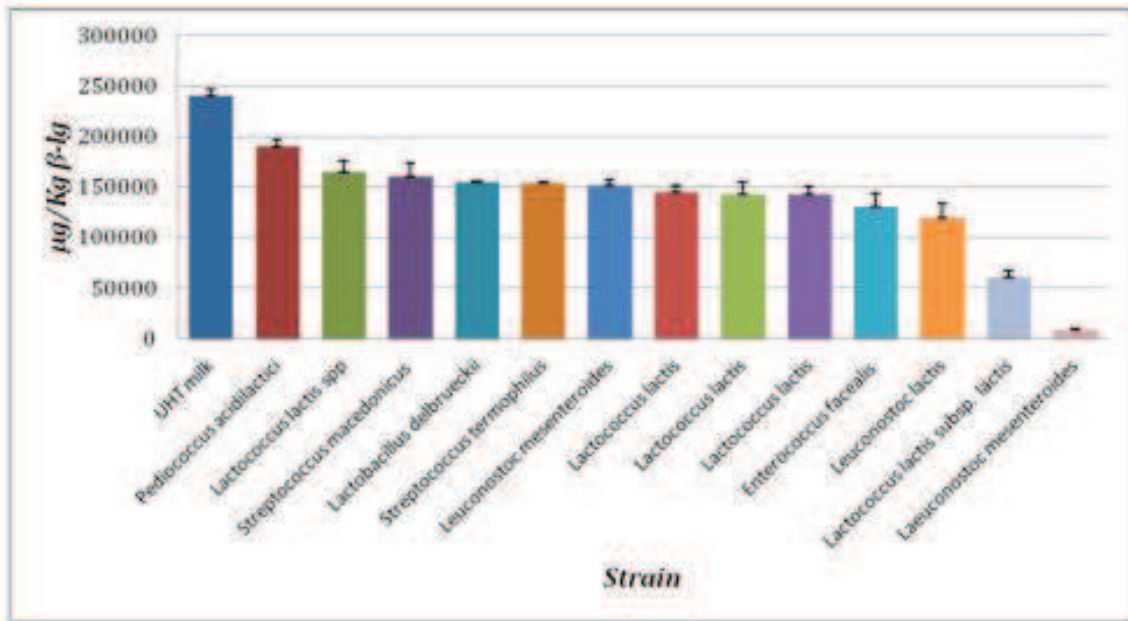


Figure 1: Changes in β -lg content during milk fermentation by LAB strains compared with unfermented milk.