

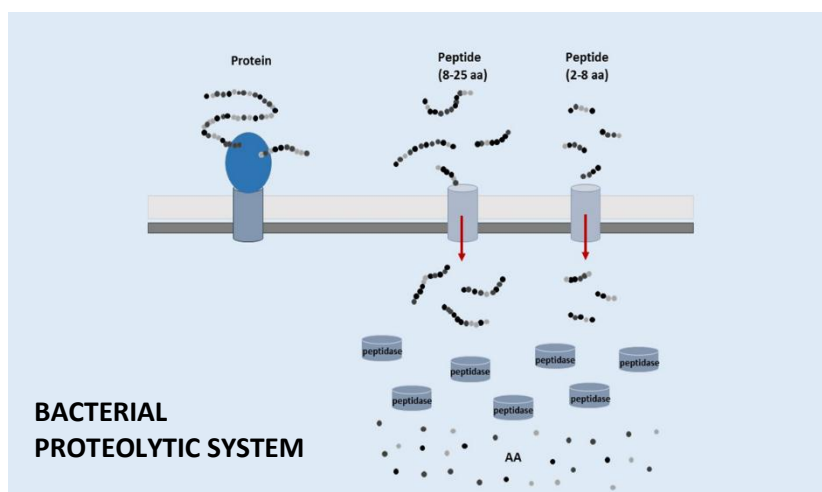
# INVESTIGATION ON METABOLITES PRODUCED BY LACTIC ACID BACTERIA OF FOOD INTEREST

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Recently, donkey milk has attracted increasing research interest due to its nutritional and functional properties (1). In fact, thanks to its peculiar composition, it can be considered a pharma-food/nutraceuticals product devoted to particularly sensitive categories of consumers (infants, seniors, allergic). Moreover, in Piedmont donkey breeding allows the preservation of environmental areas. The aim of this research project was to evaluate the ability of lactic acid bacteria (LAB) to improve the qualities of donkey milk in terms of bioactive peptide release. Milk proteins (especially caseins) represent the primary source of bioactive peptides, which can be encrypted within the amino acid sequence by bacterial proteolysis (2). The bioactive peptides exert several biological activities: immunomodulatory, antibacterial, antihypertensive, antioxidant, metal chelating and opioid-like. For these reason, the degradation of milk proteins by LAB proteolytic system is an attractive approach to generate functional foods enriched in bioactive peptides given the low cost and the positive nutritional image associated with fermented milk drinks and yogurt.

For this study, a pool of milk coming from donkeys with different ages and different stages of lactation has been used. In order to improve the freshness, the just milked milk has been lyophilized and reconstituted when required. A new method of pasteurization, consisting in a double pasteurization at different conditions, has been developed to guarantee sterility without compromising the matrix.

Five different LAB strains have been tested for their ability to grow in donkey milk. Among all, *L. rhamnosus* 17D10 and *L. lactis* subsp *cremoris* 40FEL3 have been selected for the best peptide production and fermentative power. The peptide mixture has been collected after 24 hours of fermentation, carried out by the two strains separately, and tested for the antimicrobial, antioxidant, ACE-inhibitor and metal-chelating activity. Furthermore, to characterize the peptides, present in the mixture, a MALDI-TOF MS analysis has been performed. The results obtained indicate that the employment of both *L. lactis* subsp *cremoris* and *L. rhamnosus* represents a good strategy to obtain a functionalized product, based on donkey milk, improved on its beneficial effects on human health.



LAB strain	Peptide (mg/ml)	pH
<i>L. reuteri</i>	0,082	5,73
<i>L. helveticus</i>	0,107	4,85
<i>L. rhamnosus</i>	0,283	3,56
<i>L. cremoris</i>	0,221	4.57
<i>L. lactis</i>	0,170	6,75

Resume table of the LAB strains tested for donkey milk fermentation and peptides production.

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## References

1. Carminati *et al.*, 2014
2. Hayes *et al.*, 2007