



IMMUNOLOGICAL PROPERTIES OF DONKEY MILK: AN ANALYSIS OF ITS POTENTIAL USE IN PROMOTING HEALTH

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Abstract: Donkey milk has attracted attention in recent years due to its specific chemical composition, which emphasizes its potential use as a functional food with immunomodulatory properties. The bioactive components present in donkey milk, including lysozyme, lactoferrin, and immunoglobulins, play an important role in modulating the immune system. The aim of this study was to analyze publications in the specialized literature, to corroborate existing scientific information and featuring the nutritional and immunological qualities of this functional food.

• Introduction

Donkey milk has a long history of medicinal uses, being recognized as "therapeutic food" across various cultures. Multiple studies have confirmed the positive effects of donkey's milk in human nutrition such as high digestibility, antimicrobial, and anti-inflammatory properties. This review will delve into the biochemical properties of donkey milk, examining current research on its immunological benefits and potential applications in health promotion.

1. Particularities of donkey milk

Donkey milk production differs significantly from that of other species especially in terms of quantity. The storage capacity of the mammary gland in equine species is low, averaging 2.5 l. The composition is significantly different from that of other species (cattle, sheep, goats, camelids). It is characterized by a low content of fat, cholesterol, total protein and casein and by a high content of lactose, whey protein, calcium, selenium and vitamin D3. The high lactose content gives the milk a pleasant taste and facilitates the intestinal absorption of calcium, which is essential for bone mineralization.

2. Chemical composition of donkey milk



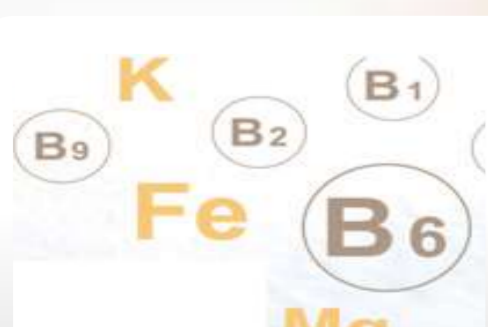
The lactose varies from 5.8% to 7.4%. These values have a positive effect on the intestinal microbiota. Donkey milk has a low microbial level due to the presence of antimicrobial factors: immunoglobulins, lactoferrin and lysozyme.



The high content of omega 3 fatty acids, supports the use of donkey milk as an effective functional food in the prevention of cardiovascular diseases, autoimmune and chronic inflammatory processes.



Casein fraction in the total protein content of donkey milk is considerably lower as compared to bovine milk, which contributes to low allergenicity of donkey's milk.



Donkey milk is rich in vit. C, but contains lower amounts of vitamins A and E as compared with cow milk. Calcium / phosphorus ratio is more suitable for human nutrition than that in cow milk.

Table 1. Chemical composition of donkey milk compared to cattle milk

Nr.	Composition (%)	Mean value	Bovine milk
1.	Water	90.63	87,7
2.	Total solids	8.61	13,2
3.	Fat	0.76	3,4
4.	Protein	1.91	3,3
5.	Lactose	6.30	4,9
6.	Ash	0.40	0,7
7.	pH	7.19	6,6
8.	Lysozyme (g/L)	1,4	Trace

3. Immunological properties of donkey milk

Donkey milk has been shown to increase the number of cytokines involved in the regulation of innate immunity and the onset of the acute local inflammatory response.

Alpha-lactalbumin stimulates the production of specific cytokines, such as interleukin-10 (IL-10), which is known for its anti-inflammatory effects. IL-10 helps regulate the immune response by suppressing excessive inflammation, thereby reducing tissue damage and promoting overall immune system balance.

4. The effects of donkey milk on human health

Donkey's milk hypoallergenic nature makes it suitable for those with cow's milk allergies, while its support for digestive health and immune system enhancement further underscores its value. With recognized skincare benefits and contributions to bone health, donkey milk emerges as a versatile and holistic dietary option for promoting overall well-being.

• Conclusions

According to all the aforementioned physico-chemical properties and unique nutritional characteristics, donkey milk can be considered to have optimal potential for use as a new dietetic food.

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