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Immune Modulation and Reduction of Inflammatory Biomarkers by Bioactive Peptides from Whey Fermented with *Saccharomyces boulardii* in an Animal Model

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INTRODUCTION

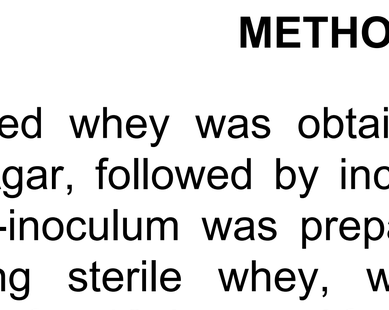
Saccharomyces boulardii is rich in proteins, carbohydrates, minerals and vitamins, making it a potential substrate for the low-cost production of various nutraceuticals and value-added products, enhancing the by-product of the food industry.

The study investigated the nutraceutical potential of whey fermented with *S. boulardii*, evaluating the effects of its administration on the modulation of inflammatory and immunological responses in an animal model, with the aim of identifying its possible health benefits.

METHODOLOGY

Fermented whey was obtained from yeast activation on YEPD Agar, followed by incubation at 30ºC for 24 hours. The pre-inoculum was prepared and transferred to a vial containing sterile whey, where the main fermentation occurred for 12 hours. After fermentation, the whey was centrifuged, resulting in fermented whey.

The in vivo experiment was performed using 15 animals (cats), divided into two groups with similar average body weights. The Control group, with 8 animals, did not receive the fermented product, while the Treatment group, with 7 animals, received the fermented whey product.



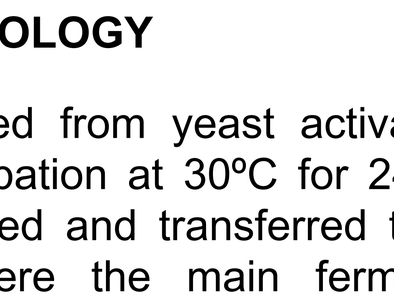


Figure 01 and 02: Cats used in the experiment, belonging to the UDESC Experimental Farm Cattery

The fermented milk with *S. boulardii* was freeze-dried and mixed with dehydrated feed at a concentration of 0.59% (65g of additive for 11kg of feed), being supplied to the animals for 20 days.

Blood samples were collected on days 0 and 20 by puncture of the jugular vein, using vacuum tubes with clot activator to obtain serum. The samples were centrifuged at 7,000 rpm for 10 minutes to separate the serum, which was stored at -20°C.

RESULTS

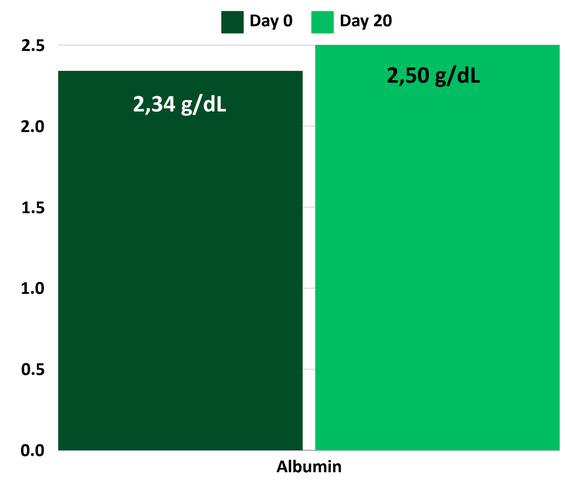
The results indicated that the Treatment group presented a modulated immune response, with a reduction in leukocyte levels from 11.7 × 10³/µL to 6.31 × 10³/µL suggesting a possible anti-inflammatory activity associated with fermented whey.

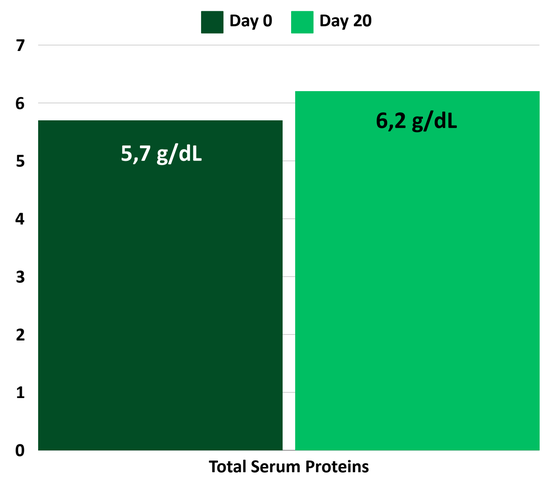
A stabilization in hemoglobin and hematocrit levels was also observed, indicating that the treatment did not induce adverse effects on the general health of the animals.

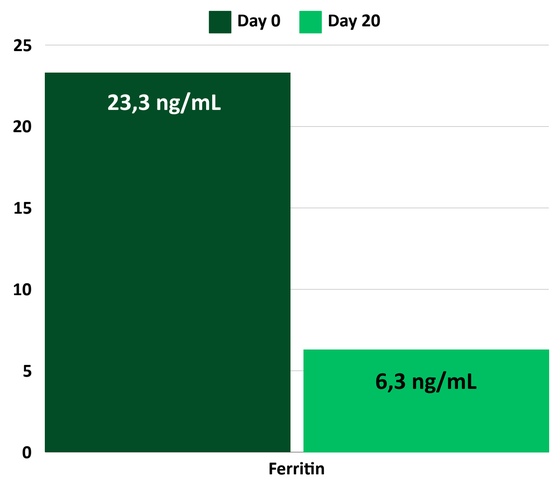
In the biochemical profile, albumin levels showed a slight improvement, going from 2.34 g/dL to 2.50 g/dL, and total serum proteins increased slightly from 5.7 g/dL to 6.2 g/dL, suggesting a positive effect of fermented whey in maintaining nutritional status and protein integrity.

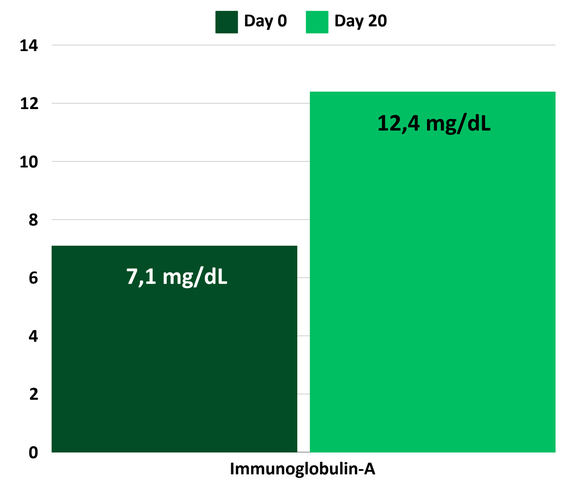
Ferritin, a marker of inflammation, showed a significant decrease, from 23.3 ng/mL to 6.3 ng/mL after 20 days of treatment, corroborating the hematological data indicating a reduction in inflammation.

In addition, immunoglobulin-A increased from 7.1 mg/dL to 12.4 mg/dL, and C-reactive protein remained stable at 3.2 mg/dL, suggesting that fermented whey may contribute to a balanced immune response without exacerbating inflammation.









CONCLUSIONS

The in vivo results demonstrate that whey fermented with *S. boulardii* can promote a positive modulation of the immune response and reduce inflammatory biomarkers, suggesting a relevant therapeutic potential for chronic inflammatory conditions.

These findings support the use of fermented whey as a functional food with anti-inflammatory and antioxidant properties. Future studies are needed to validate these effects in human clinical models.