



Ganoderma lucidum (Reishi) as a Functional Nutraceutical in Dogs: Effects on Metabolic Biomarkers, Digestive Efficiency, and Fecal Quality

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Abstract: This study evaluated the effects of *Ganoderma lucidum* (Reishi) supplementation on metabolic profile, serum biochemistry, fecal characteristics, and nutrient digestibility in dogs presenting metabolic imbalance. Fifteen client-owned dogs received oral Reishi powder (0.1 g/kg/day) for 45 days. Significant improvements were observed in hepatic biomarkers, lipid metabolism, glucose regulation, and protein digestibility. Alkaline phosphatase, bilirubin, triglycerides, and cholesterol significantly decreased following supplementation, while glucose concentrations normalized. Digestive efficiency improved through reduced fecal output and increased protein digestibility. The findings support the use of Reishi as a promising nutraceutical strategy in canine nutrition.

• Introduction

Metabolic and digestive disorders are increasingly common in companion dogs, highlighting the need for functional nutraceutical strategies. *Ganoderma lucidum* (Reishi) is a medicinal mushroom rich in β -glucans, polysaccharides, and triterpenes with recognized hepatoprotective, antioxidant, and metabolic regulatory effects. This study evaluated the effects of dietary Reishi supplementation on serum biochemical parameters, fecal characteristics, and nutrient digestibility in dogs with metabolic imbalance.

• Material and method

Fifteen client-owned dogs from western Romania presenting overweight status, body weight fluctuations, or altered feeding behavior were included in the study. Dogs received oral supplementation with *Ganoderma lucidum* powder at a dose of 0.1 g/kg body weight/day for a period of 45 days. Clinical evaluation was performed using questionnaire-based assessments, while serum biochemical profile, fecal physico-chemical characteristics, and apparent nutrient digestibility were evaluated before and after supplementation. Serum biochemical analyses were conducted using the Fuji Dri-Chem 4000i automated biochemical analyzer. Apparent digestibility coefficients were determined using the total fecal collection method and AOAC-standardized analyses for crude protein, crude fat, crude fiber, and dry matter. Comparative analyses between pre- and post-supplementation values were performed using paired statistical tests, with statistical significance established at $p < 0.05$.

• Results and discussions

Metabolic and Hepatic Biomarkers (Fig. 1)

- Reishi supplementation significantly improved hepatic and metabolic parameters:
- ALP decreased from 207.5 ± 20.7 to 89.5 ± 8.9 U/L
- Total bilirubin decreased from 2.75 ± 0.27 to 1.65 ± 0.16 mg/dL
- Triglycerides decreased from 197.0 ± 19.7 to 63.5 ± 6.3 mg/dL
- Total cholesterol decreased from 214.0 ± 21.4 to 154.0 ± 15.4 mg/dL
- Glucose normalized from 35.0 ± 3.5 to 79.5 ± 7.9 mg/dL
- These findings suggest improved hepatic function, lipid metabolism, and metabolic homeostasis.

Digestive Efficiency (Fig. 2, 3)

- Digestive performance improved following supplementation:
- Fecal output decreased from 185.0 ± 18.5 to 132.0 ± 13.2 g/day
- Protein digestibility increased from $72.5 \pm 7.2\%$ to $81.3 \pm 8.1\%$
- Fecal crude protein significantly decreased
- The results indicate enhanced nutrient absorption and improved protein utilization.

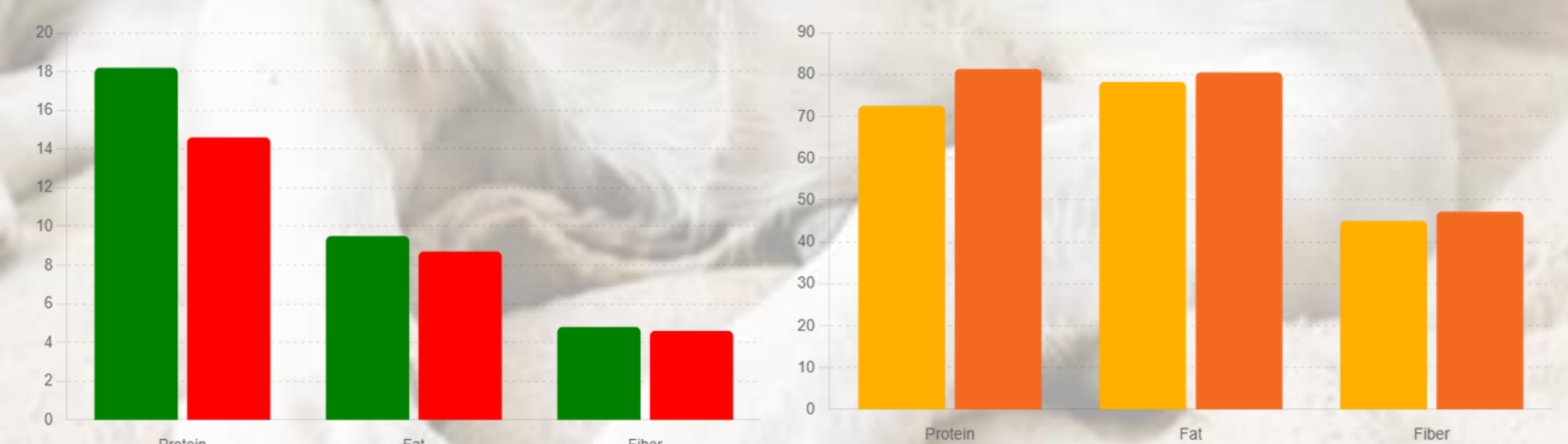


Figure 2. Changes in fecal composition (crude protein, crude fat, and crude fiber) in dogs before and after Reishi supplementation.

Figure 3. Comparison of digestibility coefficients for protein, fat, and fiber in dogs before and after Reishi supplementation.

Scientific Interpretation

- The observed improvements in metabolic and digestive parameters suggest that *Ganoderma lucidum* may positively influence hepatic metabolism, lipid regulation, and nutrient utilization in dogs. The bioactive compounds present in Reishi, particularly polysaccharides, β -glucans, and triterpenes, are known to exert antioxidant, anti-inflammatory, and hepatoprotective effects, which may contribute to enhanced metabolic homeostasis and digestive efficiency. These findings support the growing interest in medicinal mushrooms as functional nutraceuticals in companion animal nutrition.

Conclusions

The present study demonstrated that dietary supplementation with *Ganoderma lucidum* improved metabolic profile, hepatic biomarkers, and digestive efficiency in dogs presenting metabolic imbalance. Reishi supplementation contributed to better lipid and glucose regulation, reduced fecal output, and enhanced protein digestibility, supporting its potential as a functional nutraceutical in canine nutrition and metabolic health management.



Figure 1. Radar plot illustrating the overall improvement of key biochemical markers in dogs following Reishi supplementation.