Effect of Feeding Additional Whey Protein (Hilmar PROteylze™ Pet) to Senior Labrador Retrievers for Maintaining Lean Mass and Minimizing Inflammation

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INTRODUCTION
Like all aging mammals, humans and dogs experience changes in body composition and immune function. Supplemental crude protein (CP) may help with changes in body composition, but the type of protein and the composition of amino acids also plays a role. Supplemental proteins may also benefit senior dogs in the recovery or stress and inflammation caused by exercise.

This study examined the effects of additional protein from whey (Hilmar PROteylze™ Pet) or pea isolates on body composition, immune function, and inflammation in exercised senior Labrador Retrievers.

METHODS AND MATERIALS

26-week study
36 senior Labrador retrievers, aged 7 years +

Exercise Regimen:
• Twice per day
• 2.2 km runs alongside an all-terrain vehicle
• Dogs wore GPS and accelerometer collars to track distance, speed, and activity

Diets and Treatments:
• Basal diet with AAFCO minimum CP (45 g/1000 kcal, 18%) + 1 of 3 treatment diets and treatments
• Dogs wore GPS and accelerometer collars to track distance, speed, and activity
• Twice per day

Exercise Regimen:
26-week study

This study examined the effects of additional protein from whey (Hilmar PROteylze™ Pet) or pea isolates on body composition, immune function, and inflammation in exercised senior Labrador Retrievers.

RESULTS

Serum cytokines (Table 1)
- Whey protein had decreased concentrations of IL-12, MCP-1, and SCF at week 26 compared to control with Pea intermediate (P ≤ 0.05).
- There were tendencies for Whey and Pea to have smaller changes in IL-12 (P = 0.08) and SCF from weeks 0 to 26 (P = 0.06).

Plasma Amino Acids (Table 2)
- None of the amino acids differed by groups at baseline (P ≥ 0.14).
- Whey protein had elevated levels of taurine, threonine, a-amino butyric acid, valine, methionine, isoleucine, leucine, lysine, and proline (P < 0.01).
- Pea protein elevated plasma asparagine, tyrosine, phenylalanine, and ornithine (P < 0.01).
- Plasma cytokines analyzed by Lumines Mann pipette at week 0 and 26.

PBMC Proliferation
- Spontaneous proliferation was lower in pea and whey diets vs the control (P < 0.01).
- Proliferation after challenge with pokeweed mitogen was lower in whey vs Pea (P < 0.001).

Body Composition
- Whey and Pea groups had less change in fat % and fat mass (kg) compared to Con (P < 0.01).
- Whey protein dogs had a greater increase in lean mass (P = 0.02) and reduced change in lean:fat ratio (P = 0.04) compared to Pea and Con from week 0 to 26. Regression slopes lean:fat ratio over weeks 0, 20, and 26 differed (P < 0.03) (Figure 3).

CONCLUSION

Supplemental Hilmar PROteylze Pet at 1.5 x the AAFCO CP minimum requirement provides superior support for senior Labrador Retrievers during a light exercise regime. Dogs fed Hilmar PROteylze Pet were able to maintain lean mass better and had improved lean:fat ratio. In addition, inflammation was reduced after 26 weeks as seen through serum cytokines and our FRK Total Gait Inflammation Index scores. Plasma amino acid profiles will differ depending on the protein source despite providing similar levels of crude protein. The availability of differing amino acids may help mitigate the negative body composition and inflammation responses resulting from aging and exercise stress.

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Figures

Figure 1. FRK Total Gait Inflammation Index scores over the course by treatment over weeks 0, 4, 8, 16, and 26.
Figure 2. Body fat mass (kg) and body fat percentage regressions at weeks 0, 20, and 26 by treatment.
Figure 3. Lean mass (kg) and lean mass to fat ratio regressions at weeks 0, 20, and 26 by treatment.

Tables

Table 1. Select serum cytokines by week and change from week 0 to 26.

Table 2. Plasma amino acids concentrations at week 26 and absolute change in concentration