

Effects of *saccharomyces cerevisiae* fermentation product (SCFP) postbiotic in Labrador Retrievers during exercise and transport stress

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Introduction

Saccharomyces cerevisiae fermentation product (SCFP) is a dietary postbiotic compound shown to support digestive health and immune function in several species^{1,2}. In dogs, SCFP has been shown to enhance immune capacity and reduce inflammation³.

Objective and Design

Two studies were conducted to evaluate the effects of a SCFP postbiotic (Diamond V Mills, Inc. ; Cedar Rapids, IA) on immune function, stress, and body composition in Labrador Retrievers during exercise and transportation stress challenges.

Study 1

- 36 Labrador Retrievers (18 male/18 female) >5 yrs
- 3-wk adaptation period followed by a 14-wk series of distance defined running regimens (DDER)
- Subjects randomly allocated to three groups of 0 mg/d, 250 mg/d, and 500 mg/d of SCFP

Study 2

- 36 Labrador Retrievers (18 male /18 female) >5 yrs
- 3-wk adaptation period followed by an 8-wk series of DDER and a single transport stress event
- Subjects randomly allocated to two groups of 0 mg/d or 250 mg/d SCFP

Study Parameters Measured Over Both Studies

- Weekly body weights
- Daily feed intake
- Daily stool quality
- Body composition (DXA; GE Lunar Prodigy)
- Activity (Actical® Accelerometer Collar) during DDERs
- Running Speed (Garmin® GPS Collar) during DDERs

Biomarkers Measured Over Both Studies

- Saliva cortisol (CORT)
- Total Antioxidant Capacity (TAC)
- Thiobarbituric Acid Reactive Substances (TBARS)
- C-reactive Protein (CRP)
- Creatine Kinase (CK)
- Haptoglobin (HAP)
- Serum Amyloid A (SAA)
- Tumor necrosis factor-alpha (TNF-α)
- Serum Immunoglobulin E (IgE)
- Serum Immunoglobulin G (IgG)

Results

Subjects fed SCFP showed:

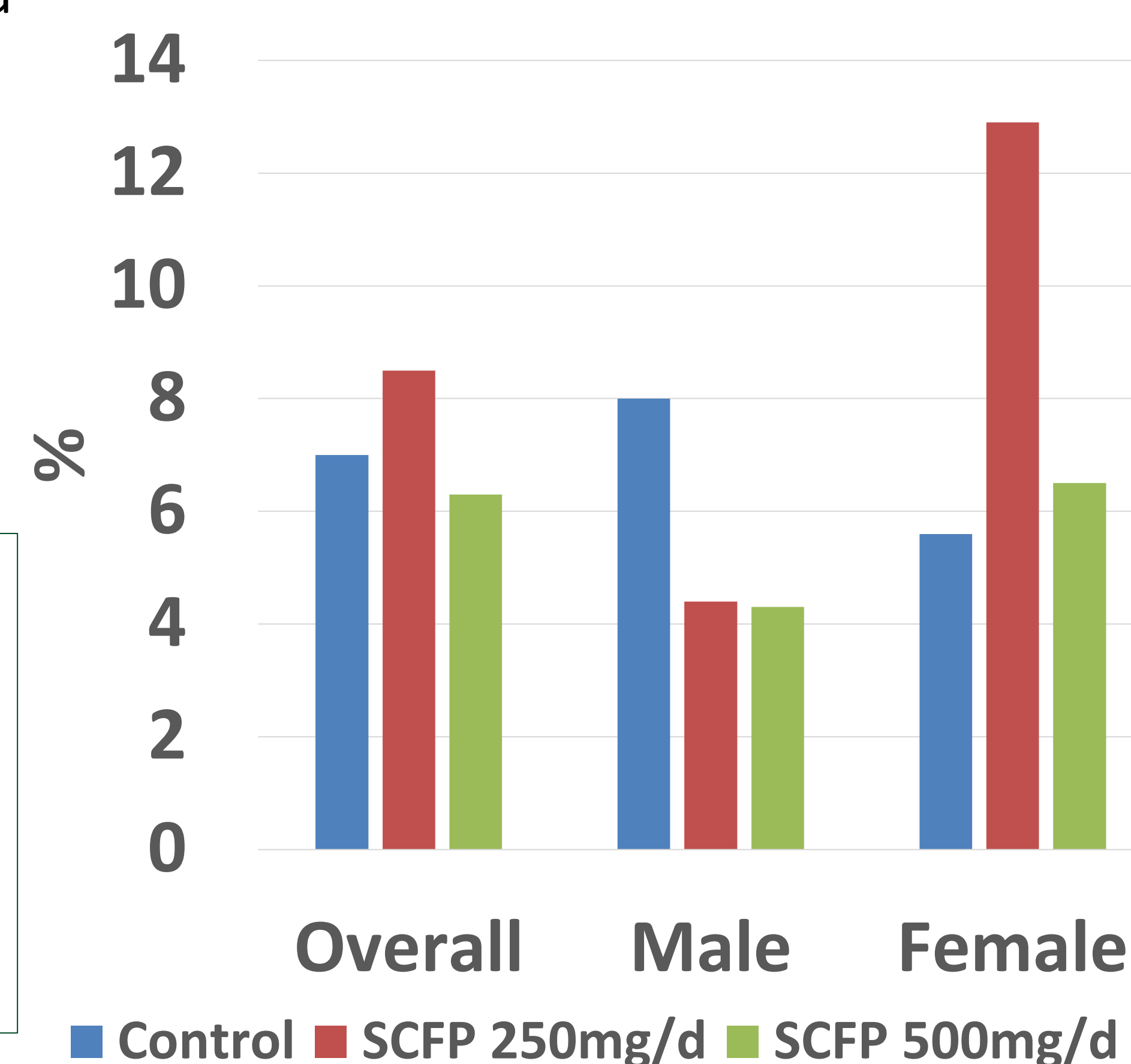
- Numeric net increases in lean mass (Figure 1).
- Numeric increases in stool quality.
- Significantly higher activity during exercise vs CON (Table 1).
- Significant higher running speed during exercise vs CON (Table 1).

Subjects fed SCFP experienced the following immune and stress biomarker results (Table 2):

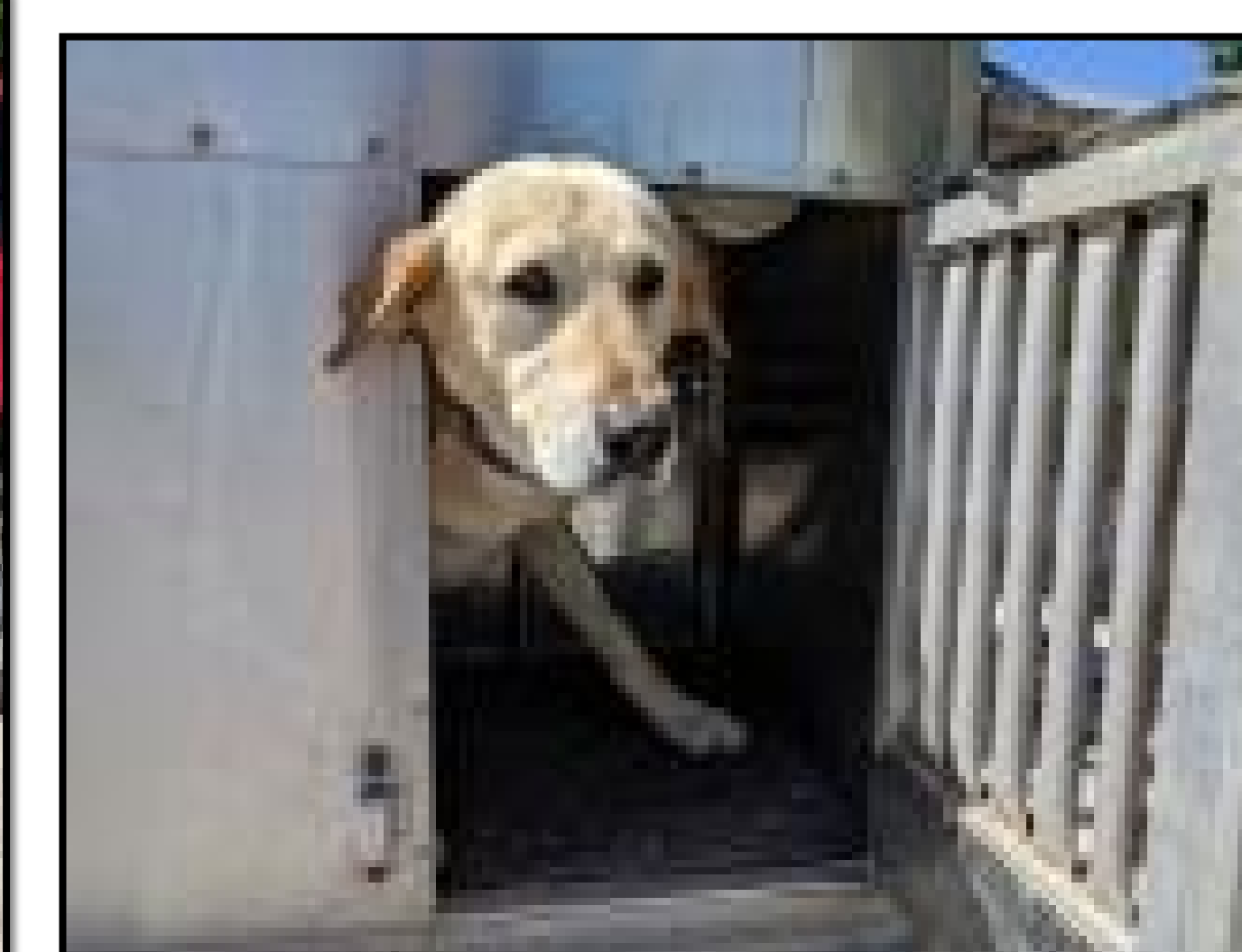
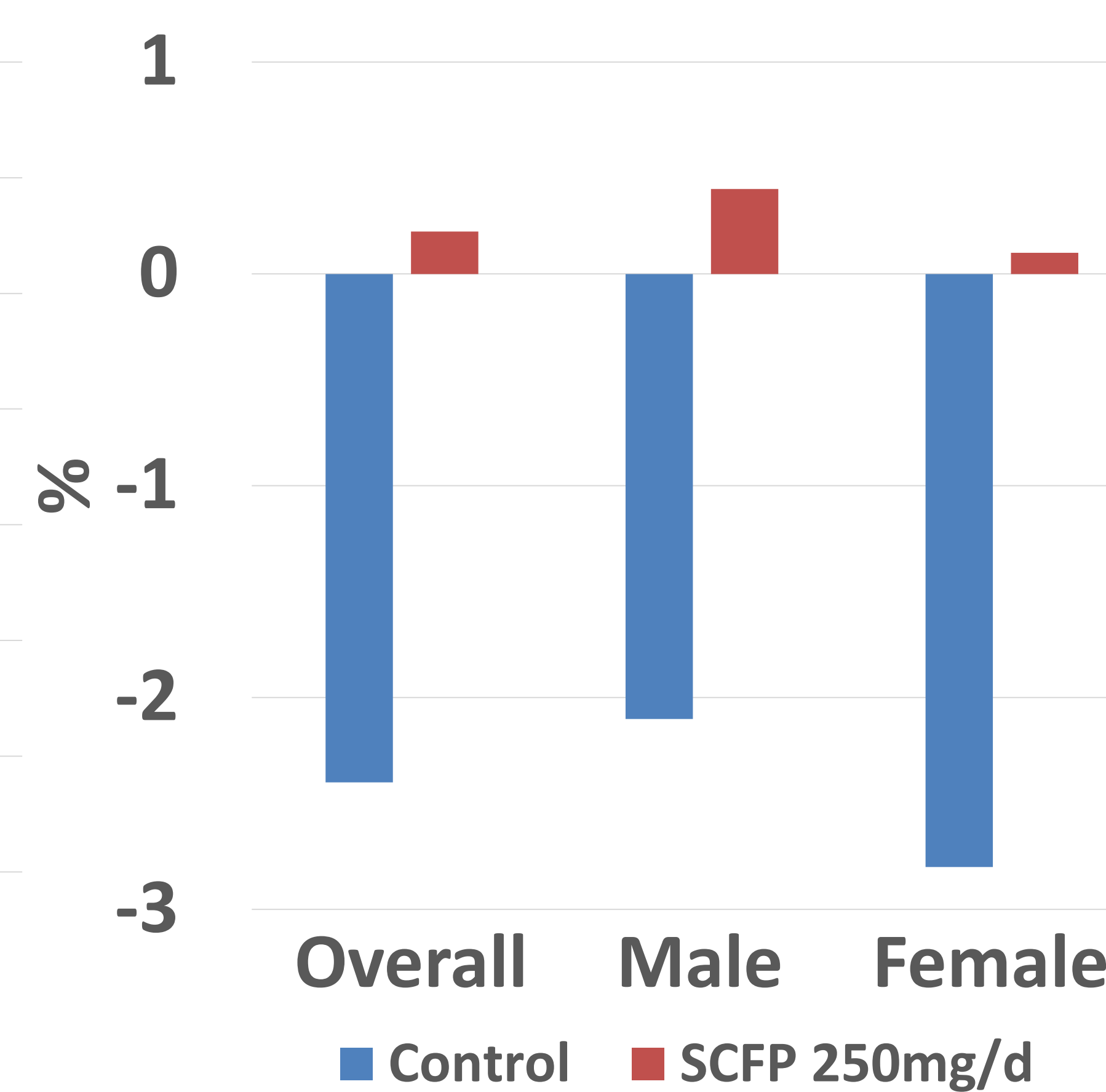
- 500 mg/d SCFP group exhibited lower CK ($P < 0.03$),
- Increased HAP ($P < 0.001$);
- Increased SAA ($P < 0.05$);
- Increased TNF-α ($P < 0.007$);
- Increased CORT
- Improved TAC ($P < 0.001$)
- Reduced TBARS ($P < 0.01$)
- Reduced IgE ($P < 0.001$)
- Reduced IgG ($P < 0.001$)
- Increased CRP during transport ($P < 0.001$)

Figure 1.

Lean Mass Change – Study 1



Lean Mass Change – Study 2



Pictured: Transport Stress Event

Results

Table 1. Activity and Running Speed

Parameter	Distance (km)	Control	SCFP 250mg	P-value
Activity, kg/BW	4.8	150,000	160,000	<0.02
Activity, kg/BW	6.4	250,000	275,000	<0.06
Activity, kg/BW	8.0	300,000	350,000	<0.04
Activity, kg/BW	16.0	550,000	675,000	<0.07
Running Speed, kph	3.2	11.25	11.75	<0.06
Running Speed, kph	4.8	12.25	12.60	<0.007
Running Speed, kph	8.0	12.10	12.40	<0.07

Table 2. Immune and Stress Biomarkers

Variable	Control	SCFP 250mg	SCFP 500mg	probF		CON vs. SCFP
				Linear	Quadratic	
Creatine Kinase, ng/ml	4.09	4.93	2.86	0.05	0.41	0.03
C-Reactive Protein, ug/ml	5.26	5.14	7.22	0.00	0.71	0.00
Haptoglobin, mg/ml	3.28	3.94	3.81	0.00	0.00	0.00
IgE, ug/ml	18.82	17.91	16.22	0.00	0.38	0.00
IgG, mg/ml	466.00	451.91	451.73	0.18	0.00	0.00
Serum Amyloid A, ug/ml	1.37	0.85	2.09	0.02	0.94	0.05
Total Antioxidant Capacity, Trolox mM	2.73	2.60	2.81	0.02	0.00	0.00
TBARS, nmol/ml	12.76	7.58	9.75	0.01	0.08	0.12
TNF-α, pg/ml	13.01	22.32	15.88	0.02	0.12	0.01

Conclusion

These results demonstrate that Labrador Retrievers supplemented with SCFP may exhibit improved vitality, utilization of nutrients, immune function, and reduced cellular damage when subjected to exercise and transport stress.

References

- ¹Khalouei H, Seranatne V, Fehr K, Guo J, Yoon I, et al. (2020). Effects of *Saccharomyces cerevisiae* fermentation products and subacute ruminal acidosis on feed intake, fermentation, and nutrient digestibilities in lactating dairy cows. *Can J Anim Sci.* 101(1), 143-157.
- ²Knoblock CE, Shi W, Yoon I, and Oba M. (2019). Effects of supplementing a *Saccharomyces cerevisiae* fermentation product during the periparturient period on the immune response of dairy cows fed fresh diets differing in starch content. *J Dairy Sci.* 102(7), 6199-6209.
- ³Lin C, Alexander C, Steelman AJ, Warzecha CM, de Godoy MRC, et al. (2019) Effects of a *Saccharomyces cerevisiae* fermentation product on fecal characteristics, nutrient digestibility, fecal fermentative end-products, fecal microbial populations, immune function, and diet palatability in adult dogs. *J Anim Sci.* 97(4), 1586-1599.