

Effects of alternative protein sources on performance and nutrient digestibility in yearling Florida native ewes

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INTRODUCTION

- Soybean meal is the most used protein source worldwide in the diets of production animals; however, it has high economic cost, and price fluctuations (Obeidat et al., 2019).
- Black soldier larvae fly meal is emerging as a sustainable and nutrient-rich alternative protein source, offering a promising solution for future food security challenges





The Black Soldier Fly Larva (BSFL) has advantages compared to other insects, such as high digestible protein content, high feed conversion, short reproductive cycle and high nutritional value



EnviroMeal



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Objective

To evaluate the effects of partially replacing soybean meal with Black soldier fly larvae (*Hermetia illucens*) frass on nutrient digestibility, growth performance, and blood profile of yearling Florida native ewes

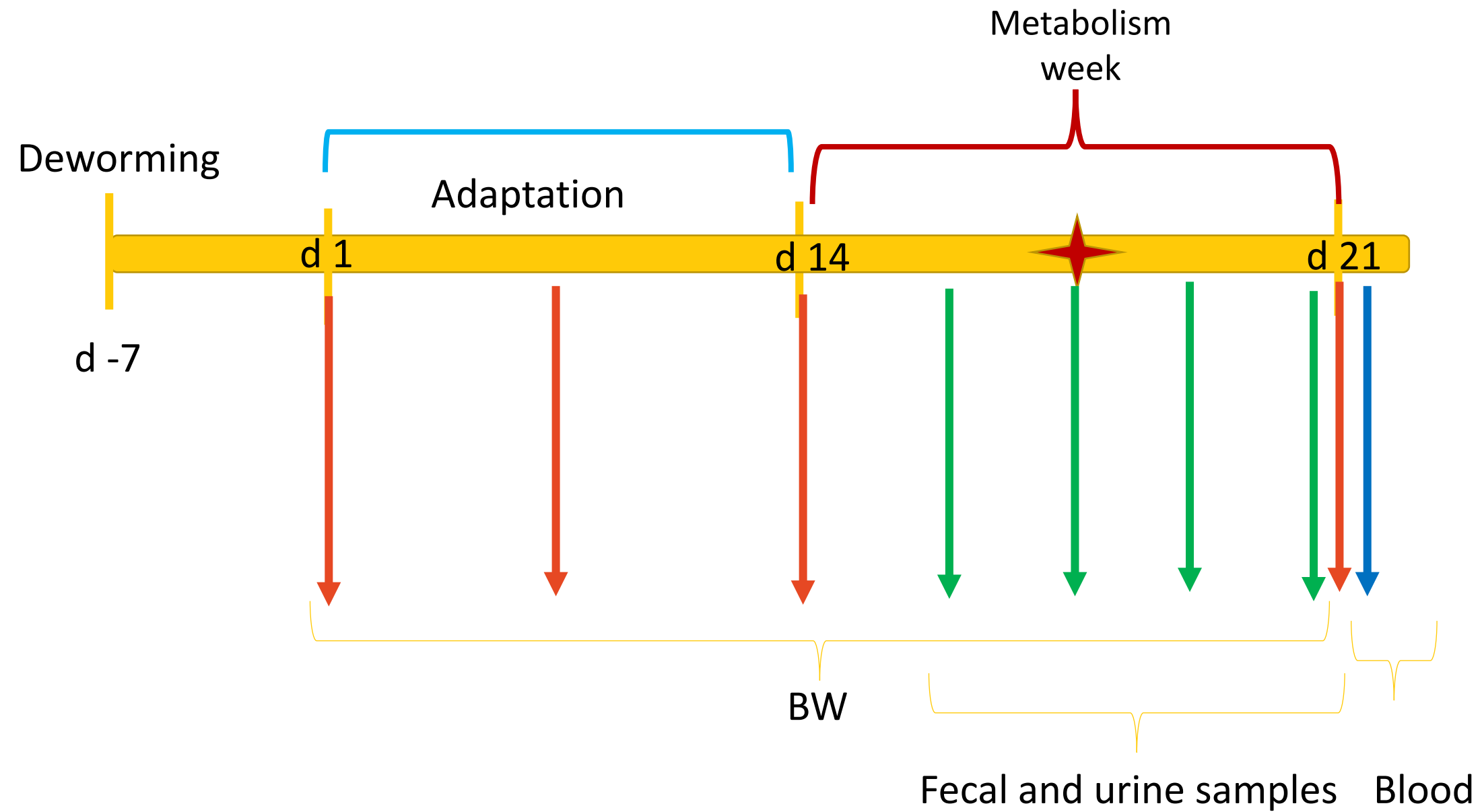


Treatments

- **Control (CON)**: Animals fed coastal bermudagrass hay- and soybean meal-based diet
 - **BSFL-25**: 25% of soybean meal was replaced by Enviroflight[®] FRASS
 - **BSFL-50**: 50% of soybean meal was replaced by Enviroflight[®] FRASS
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- **Replicated Latin square design (3 x 3)**
 - **6 ewes**

Adaptation: d 1-14
Digestibility: d 15 to 21

Experimental period



MATERIALS AND METHODS

- Performance:

- 2 animals/treatment/period
- Adaptation period: Individual pens
- Collection period: Metabolic crates
 - Daily feed intake and refusal (4 days)
 - Final body weight (last day)

- Digestibility

- Water consumption during collection days
- Total feces in 24 hours
- Total urine in 24 hours
- Blood sample at the end of the collection period

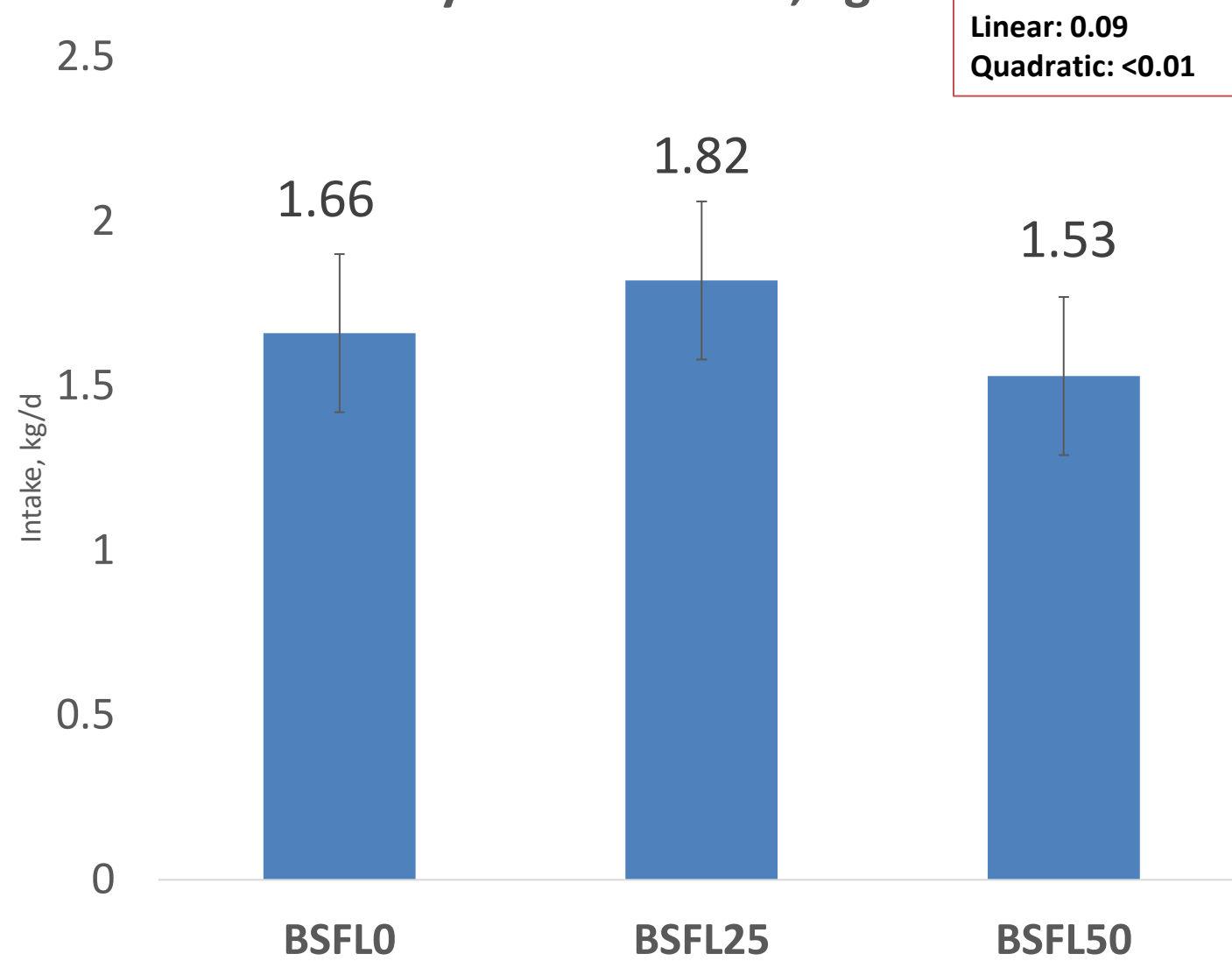


Ingredient and chemical composition of experimental diets

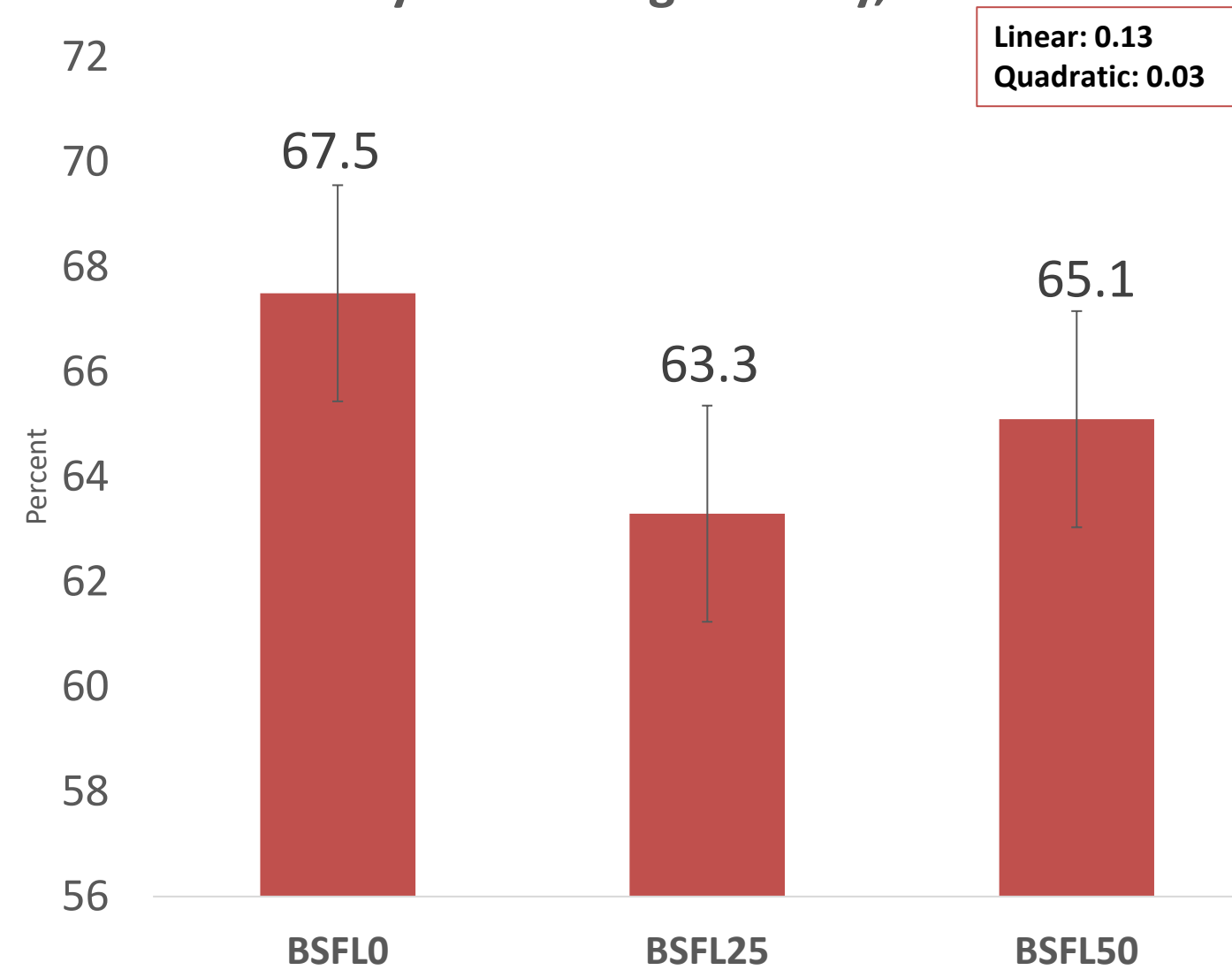
Ingredients, %	Control	BSFL25	BSFL50
Bermudagrass hay	40	40	40
Grain mix,	45	45	45
Soybean meal	10	7.5	5.0
BSFL Frass	0	2.5	5.0
Molasses	5.0	5.0	5.0
Nutritional composition of diets			
DM, % as fed	92.9	92.9	92.9
CP, % DM	13.9	13.2	12.4
NDF, % DM	42.8	43.2	43.6
ADF, % DM	21.1	21.1	21.2
EE, % DM	2.48	2.57	2.67
Starch, % DM	11.8	12.0	12.2
Ash, % DM	5.73	5.80	5.87

RESULTS

Dry matter intake, kg

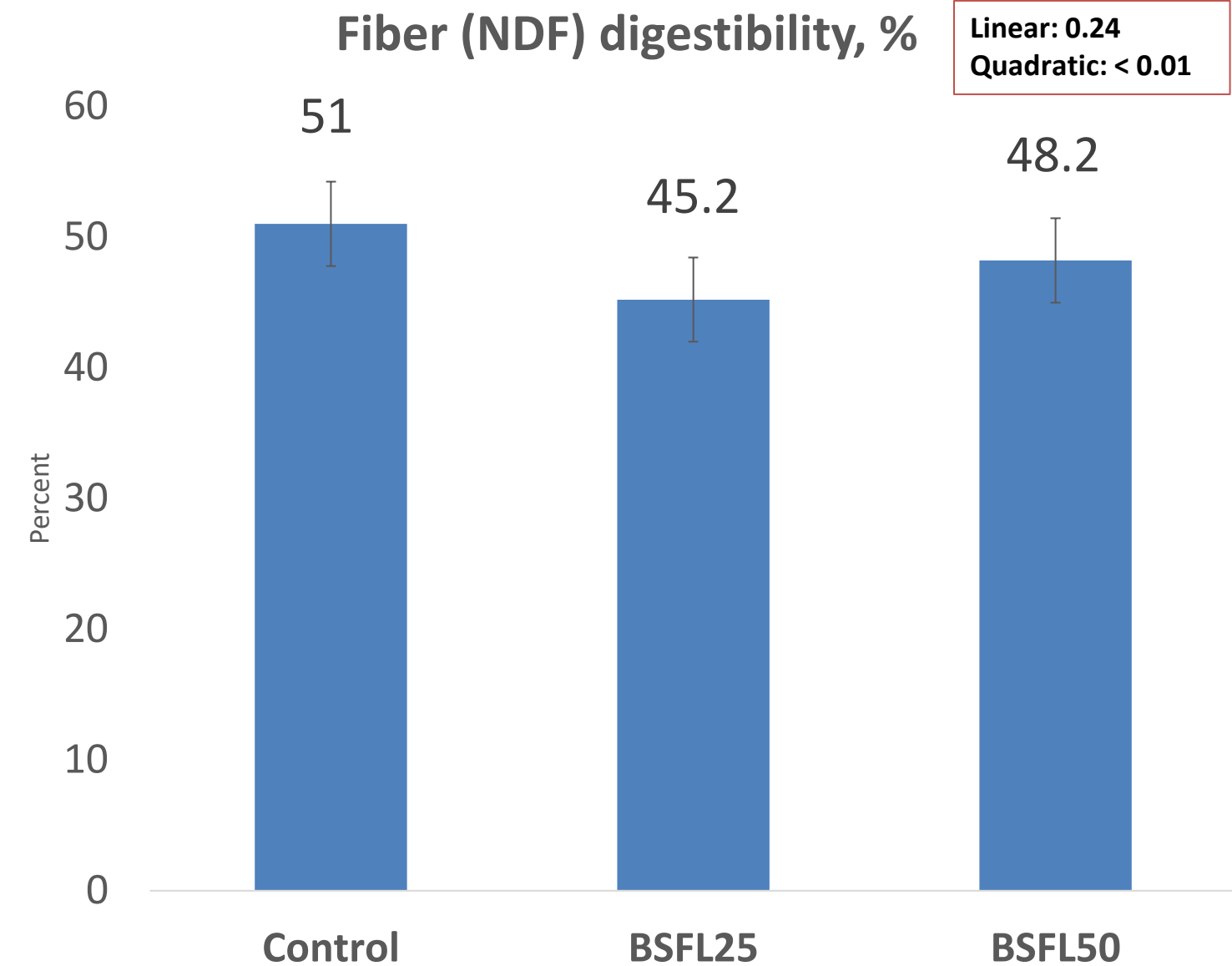
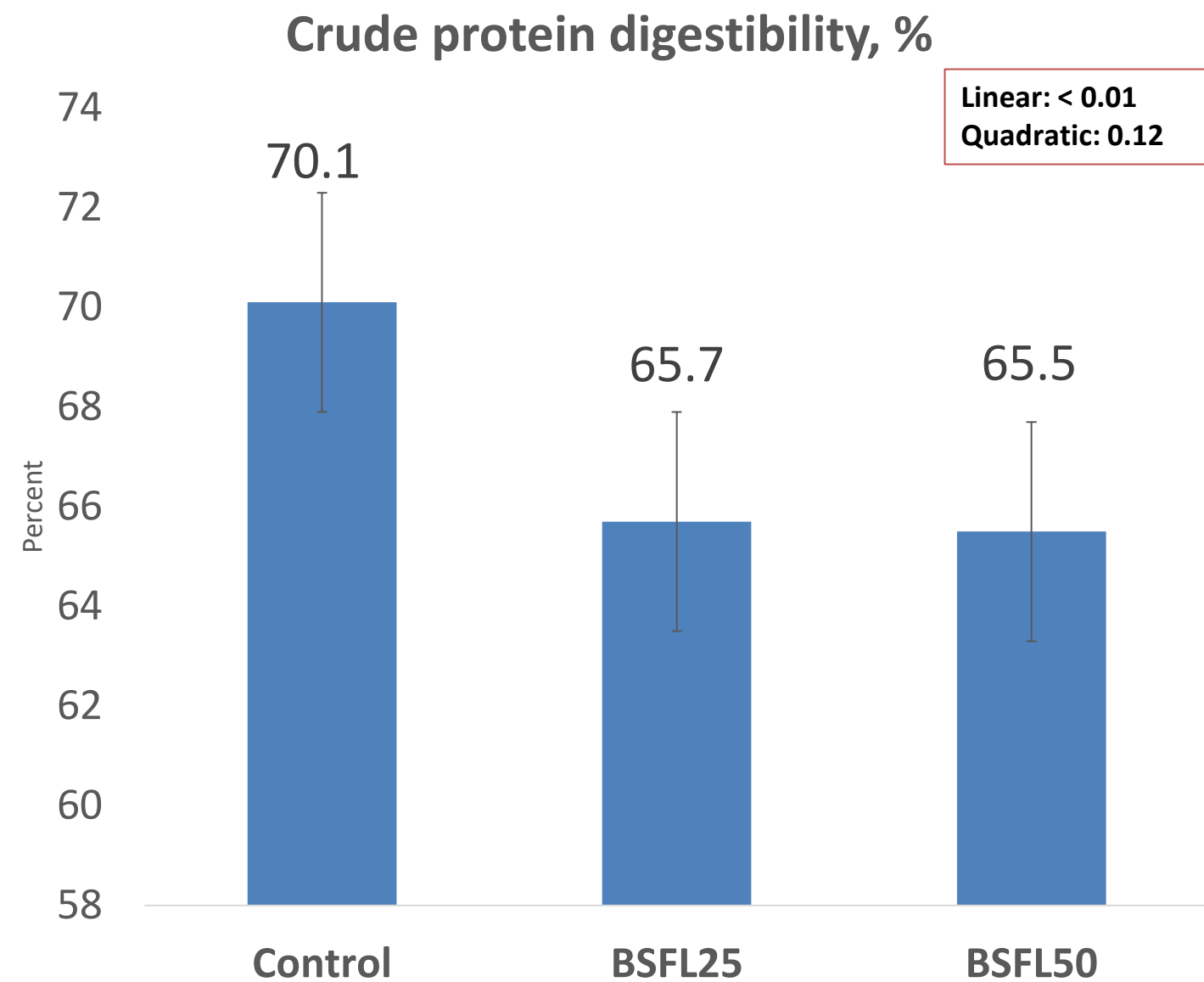


Dry matter Digestibility, %



Dry matter digestibility decreased while intake had variable response with inclusion of Frass

RESULTS - DIGESTIBILITY



Crude protein and fiber digestibility was decreased with inclusion of Frass

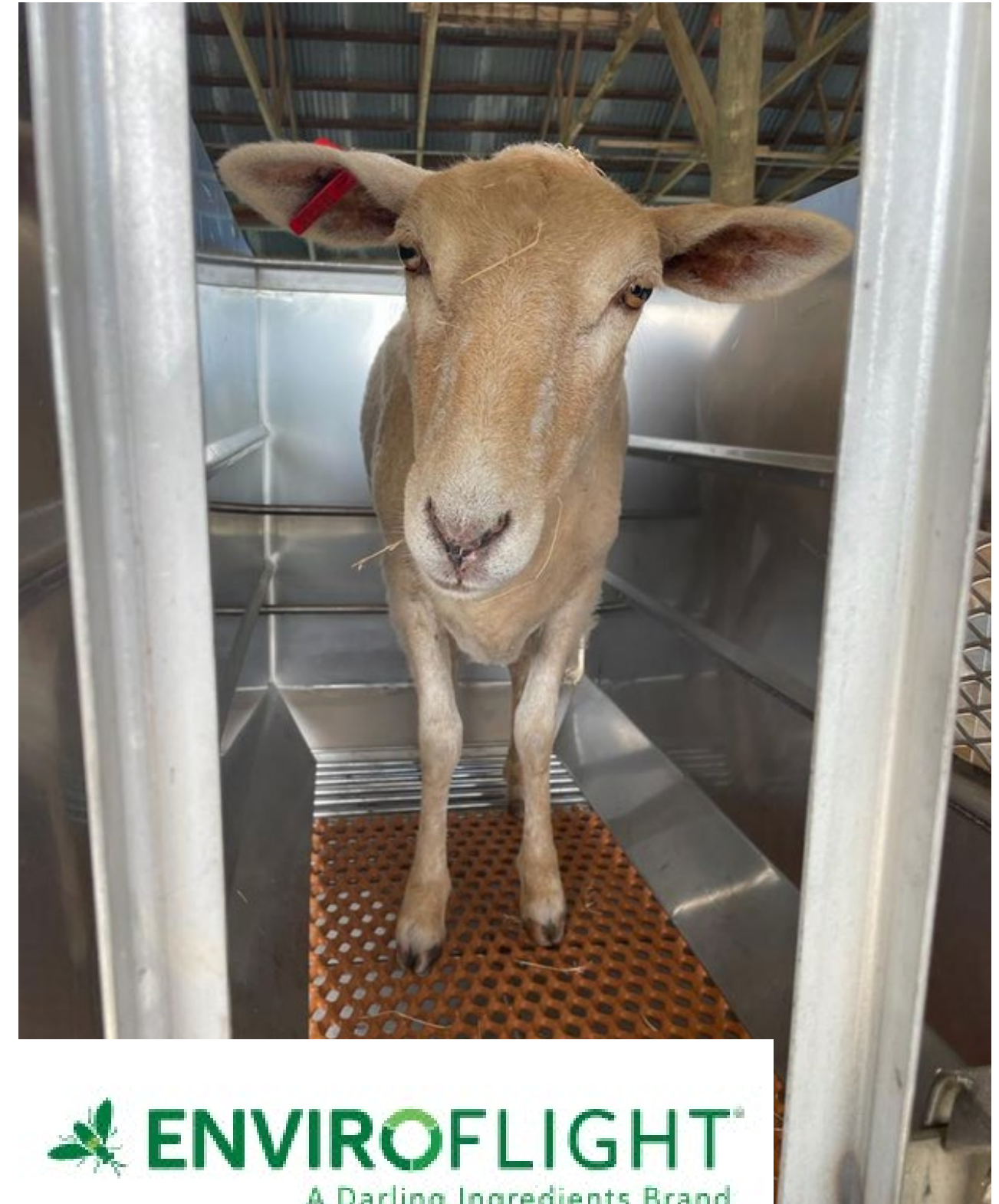
Item	Treatments				<i>P</i> -values		
	Control	BSFL25	BSFL50	SEM	Linear	Quadratic	TRT
Glucose, mg/dL	68.2	70.3	69.2	7.12	0.83	0.69	0.89
BUN, mg/dL	14.3	14.1	14.0	0.20	0.08	0.82	0.20
Water consumption, L	3.99	4.58	3.69	0.93	0.26	<0.01	<0.01

Frass inclusion had no effects on glucose, and blood urea nitrogen but water consumption increased when FRASS replaced 25% of soybean meal

CONCLUSIONS

- FRASS inclusion negatively impacts intake, and nutrient digestibility in ewes
 - No treatment effects were observed on blood metabolites
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- Further research is needed to explore the long-term implications of incorporating black soldier larvae fly larvae into animal diets, considering their impact on growth and overall performance.

Questions



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