

Black soldier fly larvae meal: an alternative protein source for sheep feed

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INTRODUCTION & AIM

Globally, growing demand for animal-based food could be met through livestock intensification. However, intensive systems raise concerns about animal welfare and limitations associated with the sustainability of input use. Insect meal shows great potential as a protein source for ruminants, particularly as a substitute for soybean expeller. This study investigates alternative, environmentally sustainable feed sources for sheep, with the aim of evaluating the effects of replacing soybean expeller with black soldier fly larvae (BSFL) meal on key indicators, including animal performance, ruminal fermentation profiles, and animal welfare during the fattening phase of Merino lambs.

METHOD

Merino lambs were fattened for 50 days with two diets: soybean expeller (S) and insect meal (IM). Animal performance was measured by individual body weight, body condition score, feed intake, average daily gain, and feed conversion ratio. Animal welfare was evaluated using hematological parameters as stress indicators, including glucose levels, cortisol levels, and total protein concentrations. At the end of the experiment, rumen fluid was sampled and analyzed.

CONCLUSION

This study provides a foundation for considering insect meal as a protein source in ruminant diets, with the potential to partially or fully replace soybean expeller.

No significant differences between diets were found in productive performance, ruminal fermentation, or stress indicators of Merino lambs, suggesting that BSFL meal could be a viable and competitive alternative.

RESULTS & DISCUSSION

Animal performance

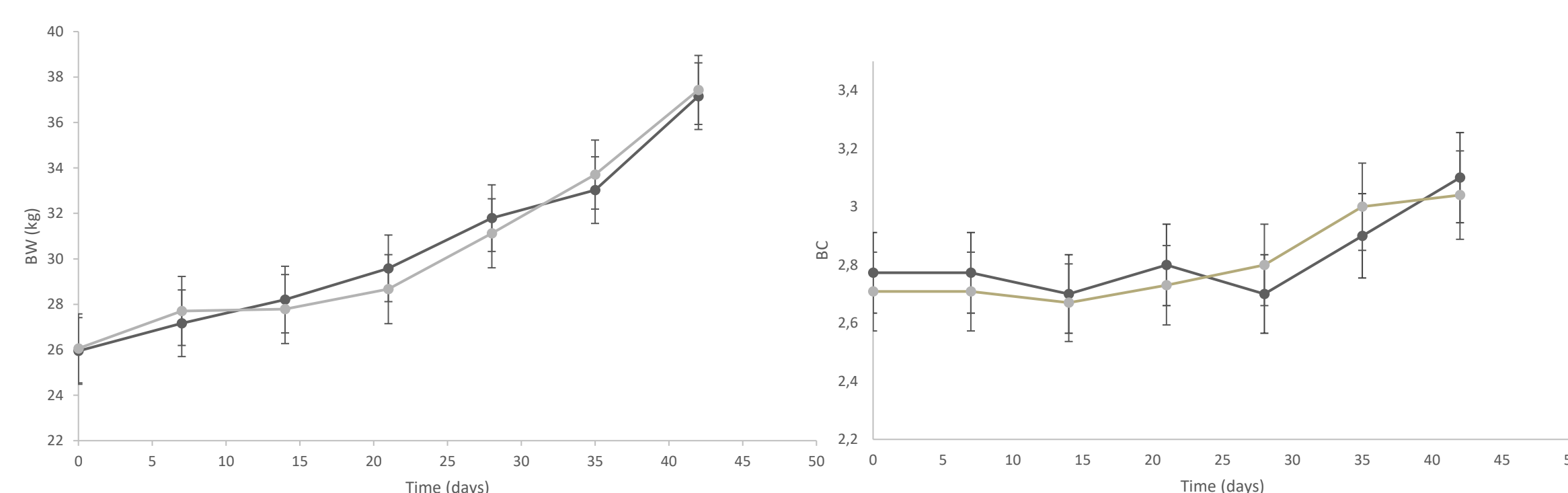


Figure 1. . Body weight (BW) (left) and body condition (BC) (right) during the trial period for both diets: insect meal (IM) (black) and soybean expeller (S) (grey). Data represents the mean and standard error.

Table I. Effect of diet on productive variables. Data are presented as least square means with standard error.

	S	IM	SEM	P-value
ADG, g día ⁻¹	228	225	18.8	0.90
FI, g día ⁻¹	1,349	1,267	43.6	0.21
FCR	6.0	5.8	0.36	0.75

Abbreviations: average daily gain (ADG), feed intake (FI), feed conversion rate (FCR), soybean expeller (S), insect meal (IM).

Ruminal fermentation

No dietary effects were observed on ruminal pH and N-NH₃ concentration, total VFA concentration, acetate (A), propionate (P), butyrate percentages or the A:P ratio

Animal welfare

Cortisol, plasmatic proteins and glucose levels did not show significant differences between diets at any of the time points analyzed. The diet × time interaction was not significant (p>0.05). Animals supervision did not show any alteration in any observed parameters, demonstrating that the animals were in good condition and without differences between groups.