

The effects of dietary organic selenium supplementation on growth performance, blood metabolites, and antioxidant enzyme activity in fattening lambs

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Received: 02.07.2025

Accepted: 03.12.2025

Abstract

This study aimed to evaluate the effects of dietary organic selenium (Se) supplementation on growth performance, hematological parameters, and selected blood metabolites in fattening Baluchi lambs. A total of 24 male lambs (initial body weight; BW, 18.4 ± 1.7 kg) were assigned to a completely randomized design with four dietary treatments and six replicates per treatment over a 75-day period. Prior to the experimental phase, lambs were acclimated to individual cages and a basal diet for two weeks. The dietary treatments included a control group (basal diet without organic selenium supplementation) and three experimental groups receiving 0.25, 0.5, and 0.75 mg Se/kg feed in the form of an organic selenium-methionine supplement. The results indicated that selenium supplementation had no significant effect on average daily feed intake, final body weight, average daily gain (ADG), or feed conversion ratio (FCR). Furthermore, there were no notable alterations in hematological parameters, including red and white blood cell counts, hematocrit values, or hemoglobin concentrations, attributed to selenium supplementation. Likewise, the levels of thyroid hormones, specifically triiodothyronine (T3), tetraiodothyronine (T4), and thyroid-stimulating hormone (TSH), did not exhibit any significant changes in relation to dietary selenium intake. Importantly, the activity of blood glutathione peroxidase (GPX) demonstrated a linear increase corresponding to increased selenium supplementation. Additionally, a quadratic influence of dietary supplemental Se on blood urea concentration was observed. Specifically, lambs receiving 0.25 mg and 0.5 mg of Se/kg of diet revealed elevated concentrations of circulating urea compared to those on the control diet. However, no significant differences were detected in malondialdehyde, creatinine, triglycerides, or cholesterol levels among treatment groups. In conclusion, the administration of dietary organic selenium at levels up to 0.75 mg/kg did not influence growth performance nor demonstrated any negative effects on blood cells and metabolic status of the lambs. Nevertheless, it resulted in a notable enhancement of glutathione peroxidase activity, underscoring the pivotal role of organic selenium in enhancing the antioxidant system of fattening lambs.

Key words: Antioxidant enzyme, Fattening lambs, Growth performance, Hematology, Selenium

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