L-selenomethionine improves feedlot performance in lambs

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Selenium, a trace element with important functions

Selenium (Se) is an essential trace element with functions in improving performance, reproduction, and immune status of animals. Feed is often insufficient in meeting the selenium requirements of the animal; therefore, it is important to supply additional selenium to the diet.

There are different types of inorganic and organic selenium available for supplementing the feed. Inorganic selenium can, for example, be added as sodium selenite. Sodium selenite is used for synthesis of selenoproteins and will partly be excreted. In ruminants, it is known that inorganic selenium can be transformed into non-absorbable elemental selenium by the microbiota in the rumen. This makes inorganic selenium ineffective to meet nutritional selenium requirements and causes selenium absorption to be low.

Selenium can also be supplied in organic form and has advantages over inorganic selenium. The organic form L-selenomethionine can be used for synthesis of selenoproteins, on top, it is used for storage of selenium in animal protein, allowing for a safe deposit of the trace element in the body. Therefore, L-selenomethionine is considered to be the most effective form of selenium.

Orffa provides dust free L-selenomethionine (Excential Selenium 4000).

Effects of L-selenomethionine on performance

The effects of L-selenomethionine (Excential Selenium 4000, Orffa Additives) on the feedlot performance of Dormer lambs was recently investigated in a practical trial in South Africa. The trial included 40 Dormer lambs; 20 rams, 20 ewes. Animals were divided into two groups that differed in the supplemented selenium source. The control group received 0,3 ppm selenium in the form of sodium selenite and a treatment group received the same amount of selenium in the form of L-selenomethionine. The trial lasted for 57 days, after which the animals were slaughtered. Meat quality and selenium content of the meat were determined.

Changing the dietary selenium source had a beneficial effect on growth performance. Animals showed a trend for higher final body weight (Figure 1) when they received L-selenomethionine ($p = 0,061$). On average, final body weight was 51,2 kg in the control group and 53,2 kg in the treatment group. Also average body weight gain and feed conversion ratio (FCR) improved by using L-selenomethionine. Body weight gain was 2,5 kg higher and FCR was 0,33 lower for the treatment group.

Selenium content of the meat, calculated on dry mass, was on average 0,41 µg/g in the control and 1,09 µg/g in the group receiving L-selenomethionine (Figure 2). This is a 165% increase of selenium in the muscle tissue and confirms that supplementation with L-selenomethionine significantly increases selenium content of the meat, compared to supplementation with sodium selenite ($P < 0,0001$). Therefore, lambs supplemented with L-selenomethionine have a better antioxidant status and can, upon stressful conditions, use the selenium that they have stored in their tissues. These results are perfectly in line with the fact that L-selenomethionine can be stored in animal protein, while sodium selenite cannot.

After slaughter, carcass weight was determined and was shown to be 0,5 kg higher for animals that received L-selenomethionine compared to sodium selenite. The carcasses were graded based on carcass fatness – A0 refers to no fat and A6 to totally overfat. The desired score lays between A2 and A3 carcasses. Carcasses from animals that received sodium selenite were graded on average with 2,5. In the animals that received Excential Selenium 4000, the average grade was 2,75. So both groups comply with the desired fatness between 2–3. Differences in grading were not significant.

L-selenomethionine outperforms sodium selenite as selenium source

Overall, L-selenomethionine (Excential Selenium 4000) improves feedlot performance of lambs, allowing for a higher final body weight and increased selenium deposition, resulting in a better antioxidant status and improved resistance against stress.

Figure 1: Initial and final body weight for control and treatment group

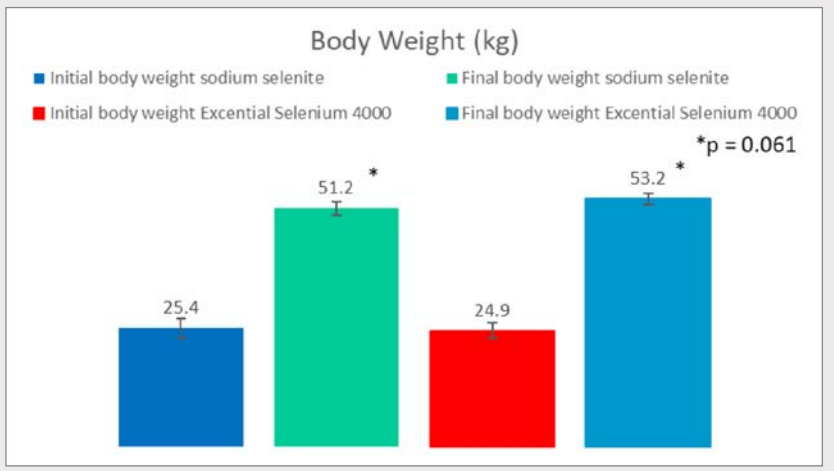

Figure 2: Selenium content in meat for control and treatment group