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L-Selenomethionine improves meat quality of finishing pigs

Selenium is an essential trace element with importance for human and animal health. Selenium plays an important role in the antioxidant defence system of animals. Natural feed ingredients are often low in selenium and therefore it is important to add additional selenium to the feed. This trace element can be supplemented to the diet in organic forms such as selenized yeast and L-selenomethionine (Excellential Selenium 4000) or inorganic form such as sodium selenite. A major benefit of supplementing feed with L-selenomethionine is the fact that L-selenomethionine is the only form of selenium that can be stored in animal protein and can provide a safe deposit of selenium inside the animal.

Oxidation is a major cause of declining meat quality and selenium plays an important role in reducing oxidation reactions in the meat, both pre- and post-slaughter. A study was performed at the University of Lavras in Brazil, that aimed to identify the differences in meat quality when diets of finishing pigs were supplemented with different levels of sodium selenite, different levels of L-selenomethionine or a combination of both sources.

In total 128 hybrid pigs were divided into 8 treatments that differed in the supplemented selenium amount and source; sodium selenite at 0.3 (control) or 0.6 ppm, L-selenomethionine at 0.3, 0.4, 0.5 or 0.6 ppm or a combination of 50:50 sodium selenite and L-selenomethionine at 0.30 or 0.60 ppm total selenium in the diet. After 30 days, the pigs were slaughtered and several meat quality characteristics were determined including drip loss, cooking loss, objective colour, lipid oxidation and pH.

sodium selenite and L-selenomethionine, drip loss was higher compared to the sodium selenite supplemented group.

Regarding cooking loss, the lowest loss ($P < 0.05$) was found for the L-selenomethionine supplemented groups, followed by the combination of sodium selenite and L-selenomethionine group and the sodium selenite group respectively. This reduction in drip loss and cooking loss indicates more marketable meat and increased juiciness of the meat, allowing for more profit and higher consumer satisfaction.

Colour is an important determinant in the acceptance of food. Regarding objective colour, the L-selenomethionine supplemented group showed a lower yellow index I ($P < 0.05$) compared to the other groups. These lower yellow index values could indicate higher preservation of cell membranes and proteins since this index indicates the oxidation of colour pigments in the meat. These results indicate that L-selenomethionine provides better antioxidant status to maintain the optimal meat colour. The L-selenomethionine supplemented group was shown to have the lowest levels of malondialdehyde (MDA) ($P < 0.05$) regardless of the supplemented level, which indicates that L-selenomethionine allows for higher oxidative stability of the meat. In summary, observed reduction in yellow index of the meat of the L-selenomethionine supplemented pigs indicates lower oxidation of the pigments. These results are in line with the observed lower MDA levels for this group, highlighting the higher oxidative stability of meat by animals that receive L-selenomethionine. In turn, higher oxidative stability is associated with higher meat quality.

The groups supplemented with sodium selenite was shown to have a lower final pH compared to the other groups ($P < 0.05$). It was hypothesized by Silva et al. (2019) that a lower pH indicates a reduced binding capacity of muscle proteins for water and lower repulsion between muscle filaments which causes the shrinking of the myofibrils. The authors suggested that this is related to a better antioxidant balance.

Overall, it can be concluded that finishing pigs that received Excellential Selenium 4000 as the dietary selenium source improved the physiochemical properties of the meat and showed better meat quality compared to the other groups.

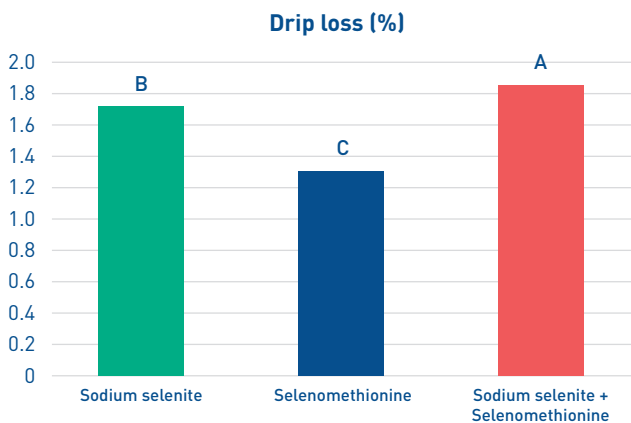


Figure 1: Dietary selenium source influences drip loss

Meat juiciness depends on the moisture levels in the meat. Both drip loss and cooking loss reduce the juiciness. Drip loss was shown to be affected by the dietary source of selenium. Lowest drip loss values were found for pigs supplemented with L-selenomethionine (figure 1). For the combination of

Silva et al. (2019). *Different levels of selenomethionine on the meat quality and selenium deposition in tissue of finishing pigs*, Journal of Animal Physiology and Animal Nutrition, 103 (6), p. 1866-1874, DOI: 10.1111/jpn.13179

L-selenomethionine is stored in animal tissue

L-selenomethionine improves meat quality

L-selenomethionine reduces drip loss and cooking loss

L-selenomethionine increases oxidative stability of meat

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