

L-selenocystine and L-selenomethionine and their deposition in broiler muscle tissue

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BACKGROUND

Selenium (Se), as an essential trace element for animals, can be added to the diet in different forms, differing in chemical composition and bioavailability. Se can be in an inorganic form (e.g. sodium selenite or sodium selenate) or as part of an organic molecule (e.g. L-selenomethionine). It is well known that selenium supplementation in the organic form results in higher concentrations of selenium in tissues than when the inorganic form is used. Less well known is that this only applies to a specific form of organic selenium. L-selenomethionine is the preferred organic Se source as it is the only compound that can be directly incorporated in protein fractions and sustain the Se status of animals over time (especially in periods of stress). The effect of other organic sources, such as L-selenocystine, is less well known.

OBJECTIVE

The objective of this study was to confirm the bioavailability of specific organic selenium compounds on their Se deposition capability in broiler muscle tissue.

MATERIALS & METHODS

- Wheat-corn-soybean meal basal diet containing no added Se (control)
- One-day old male broilers
- 4 dietary treatments (starter diet, 1-14d)
 - 0,0 ppm Se (control)
 - 0,2 ppm Se from sodium selenite
 - 0,2 ppm Se from L-selenomethionine (Excential Selenium 4000)
 - 0,2 ppm Se from L-selenocystine
- 20 animals per treatment
- 4 pens of 5 animals per pen
- Representative samples of the left breast muscle (frozen until further analysis) of several broilers were taken on d1 (10 chicks) and on d14 (3 broilers per pen).
- Breast samples were analyzed for Se content by ICP-MS (Ghent University).



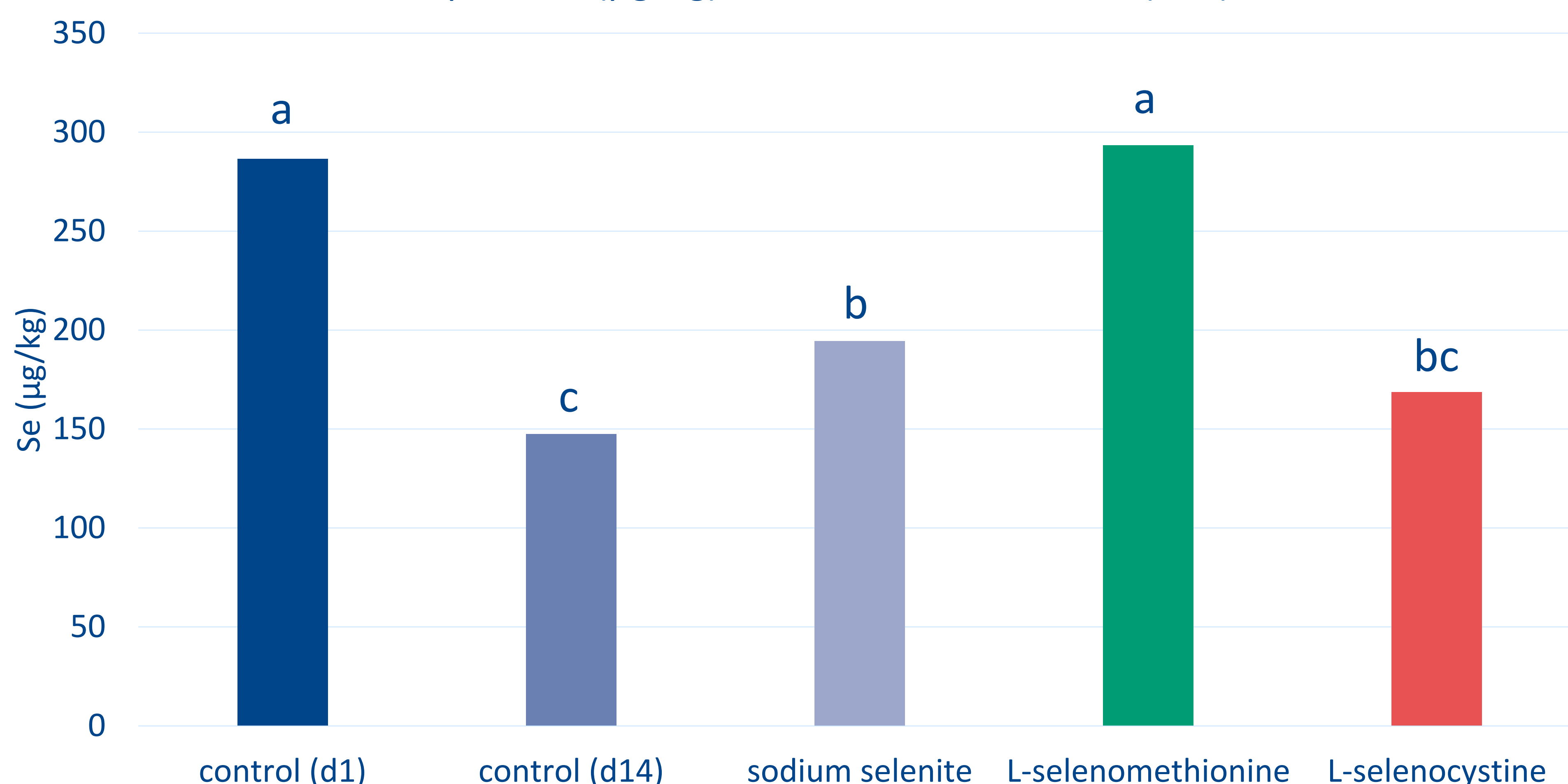
Destruction: Microwave destruction (HNO₃)_CEM_Mars 6
Analysis: ICP-MS_PerkinElmer Nexion 350d



Statistical analysis: linear mixed model with treatment as a fixed effect and pen as a random effect, in the statistical software program SAS 9.4.

RESULTS

Se deposition ($\mu\text{g}/\text{kg}$) in broiler breast muscle (d14)



P<0.05

CONCLUSION & DISCUSSION

This study confirms that L-selenomethionine is incorporated to the highest extent into muscle proteins. L-selenocystine, on the other hand, has no benefit over inorganic selenium to increase the Se content in broiler muscle tissue. In literature, L-selenomethionine is known to be deposited to a high extent in (muscle) proteins (Van Beirendonck *et al.* 2016, Vandaele *et al.* 2014, Delezie *et al.* 2014).