Relation between selenomethionine content in dietary selenium sources and selenium deposition in broiler muscle tissue

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INTRODUCTION

Selenium is an essential trace element for animal nutrition. Dietary selenium sources can be divided into organic and inorganic selenium. Organic selenium allows to build Se reserves in tissues, mainly in muscles, in the form of seleno-methionine which can be used in stress conditions to improve antioxidant defenses (Surai, 2016). The aim of this study was to investigate the relation between the selenomethionine (SeMet) content in dietary selenium sources (two different selenized yeast products (SeYeast) and L-selenomethionine (L-SeMet)) and the selenium deposition in broiler muscle tissue.

MATERIALS & METHODS

- Male broilers
- 4 dietary treatments (starter diet, 0-14d)
  - 0,2 ppm Se from Sodium selenite (NaSe)
  - 0,2 ppm Se from SeYeast low (26% Se in form of SeMet)
  - 0,2 ppm Se from SeYeast high (69% Se in form of SeMet)
  - 0,2 ppm Se from L-SeMet (Excential Selenium4000)
- 20 animals per treatment
- 4 replicates of 5 animals per pen
- Breast samples of 3 broilers per pen were taken on d14 and analyzed for Se content by ICP-MS (Ghent University).

Table 1: Treatments and levels of added Se in form of SeMet

	Se source	Added total Se, mg/kg	% Se in form of SeMet*	Added Se in form of SeMet, mg/kg
T1	NaSe	0,2	0	0
T2	SeYeast low	0,2	26%	0,052
T3	SeYeast high	0,2	69%	0,138
T4	L-SeMet	0,2	100%	0,2

**SeMet content analyzed by HPLC-ICP-MS, after twofold enzymatic extraction (protease/lipase at pH 7.5) in a water bath at 37°C (CODA-CERVA-VAR).*

RESULTS

Figure 1: Se deposition in broiler muscle tissue

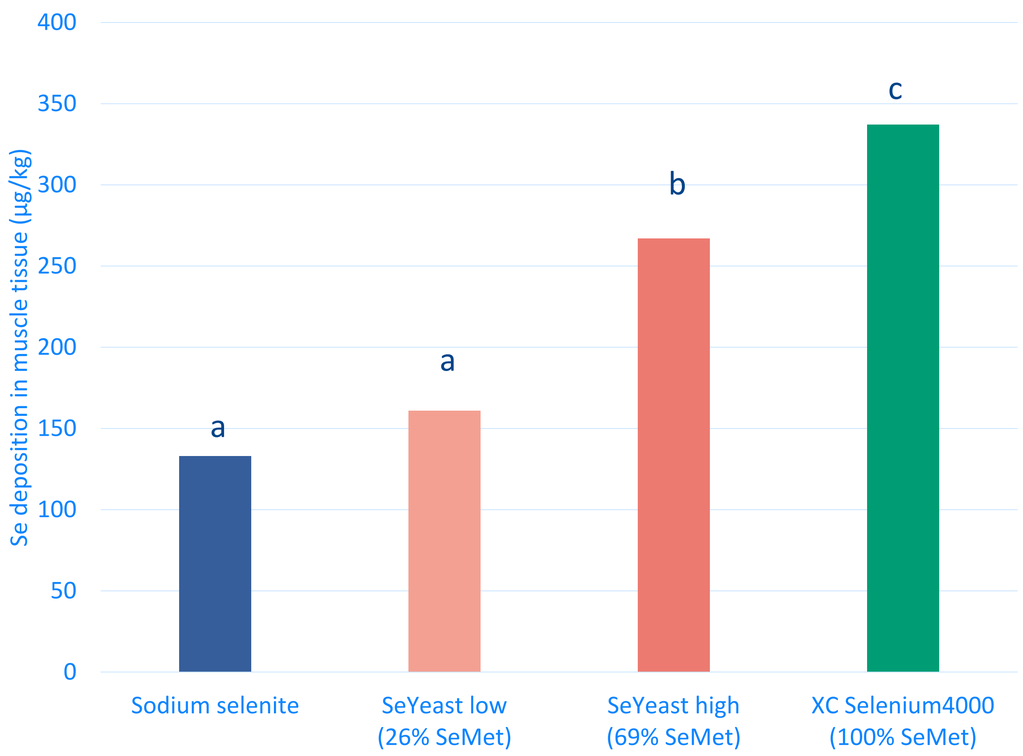
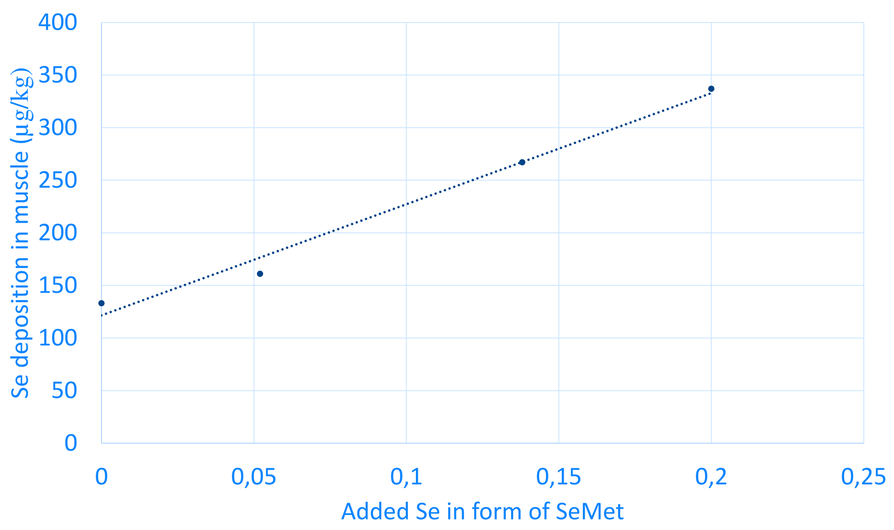


Figure 2: Se deposition as function of added SeMet in diet



- Se deposition in muscle is related to the added Se as Selenomethionine in the diet (P<0.0001, Figure 1).
- Linear regression of the data shows a fit with a R^2 of 0.7186 (Figure 2).

CONCLUSION

This study shows that selenium deposition in broiler muscle tissue is related to the added selenomethionine in the diet (P < 0.0001). SeYeast with high SeMet content results in higher Se deposition compared to SeYeast with low SeMet content (P < 0.0001). L-Selenomethionine supplementation results in the highest Se deposition.