Effect of L-Selenomethionine on feed intake and selenium deposition in milk from high-yielding sows

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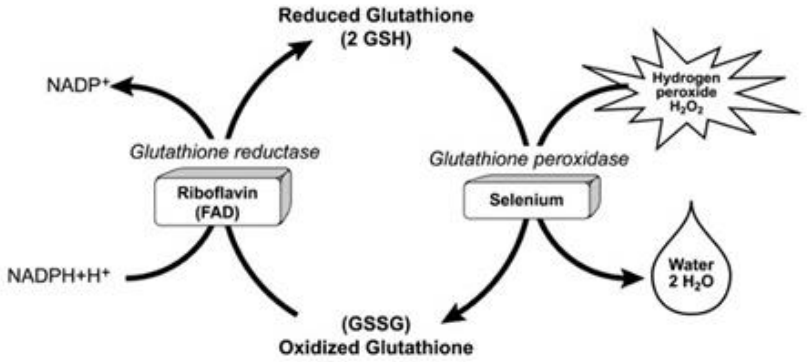
Session 60. Sow + gilt nutrition and management – Room: Baeckeland 3

Introduction (1)

- Selenium (Se) is an essential trace element of fundamental importance to health due to its antioxidant, anti inflammatory and chemopreventive properties attributed to its presence within at least 25 selenoproteins (Pappas, 2008)



- Major biological functions of selenium (EFSA, 2006):
  - Antioxidant to prevent oxidative stress
  - Proper thyroid function
  - Maintenance of cellular redox status
  - Reduction of oxidized ascorbic acid, which in turn can recycle tocopheroxyl to tocopherol
  - Development and maintenance of immunocompetence
  - Detoxification of heavy metals and some xenobiotics
  - Anticarcinogenic effects of some methylated selenium compounds

Introduction (2)

Se in the diet

Se in the metabolism

L-Selenomethionine

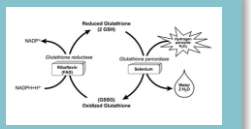
Other Se compounds
- Selenocysteine (Se-Cys)
- Other (organic) Se intermediates
- Inorganic Se

H_2Se
Selenide

de novo
Se-Cys

Incorporation in animal proteins
- Se status, storage in tissue, Se reserve for later mobilization (protein turnover)
- Se transfer to offspring
- Se enrichment of animal products, meat, milk, eggs

Seleno enzymes
- Glutathion peroxidase
- Antioxidant role
- Immunity



Excretion
Via breath and urine

Introduction (3)

Mahan & Peters, 2004

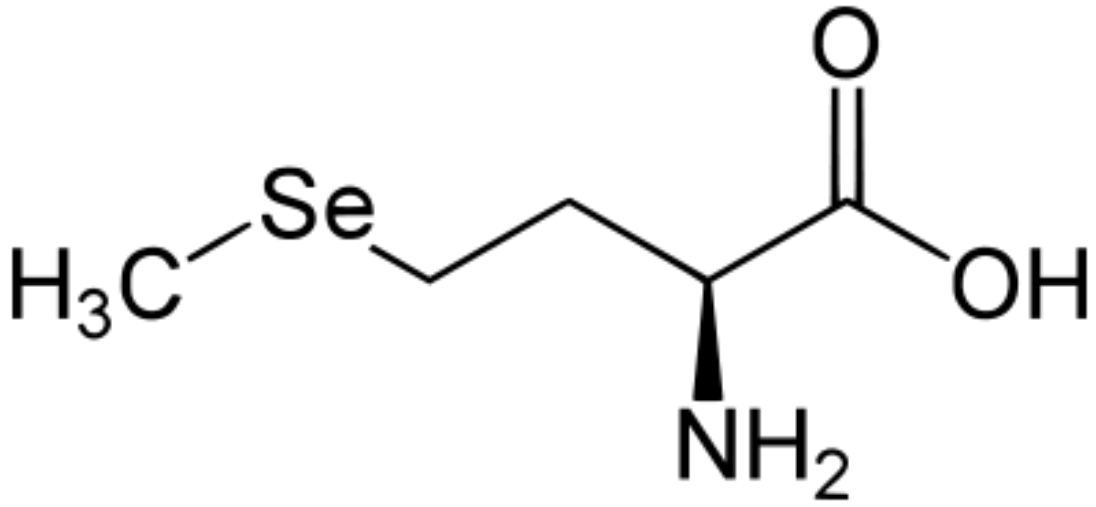
- The Se profile of piglets was affected by the sow's body Se reserves, dietary Se concentration, and source of Se.
- Many reports indicated that feeding organic Se-enriched yeast improved the amount of Se transferring from sows to pig offspring.

Kim YY, Mahan DC (2003)

- However, the extent of Se deposition and antioxidant status in offspring was inconsistent for the different organic Se-enriched yeast sources, which contained different proportions of selenomethionine.

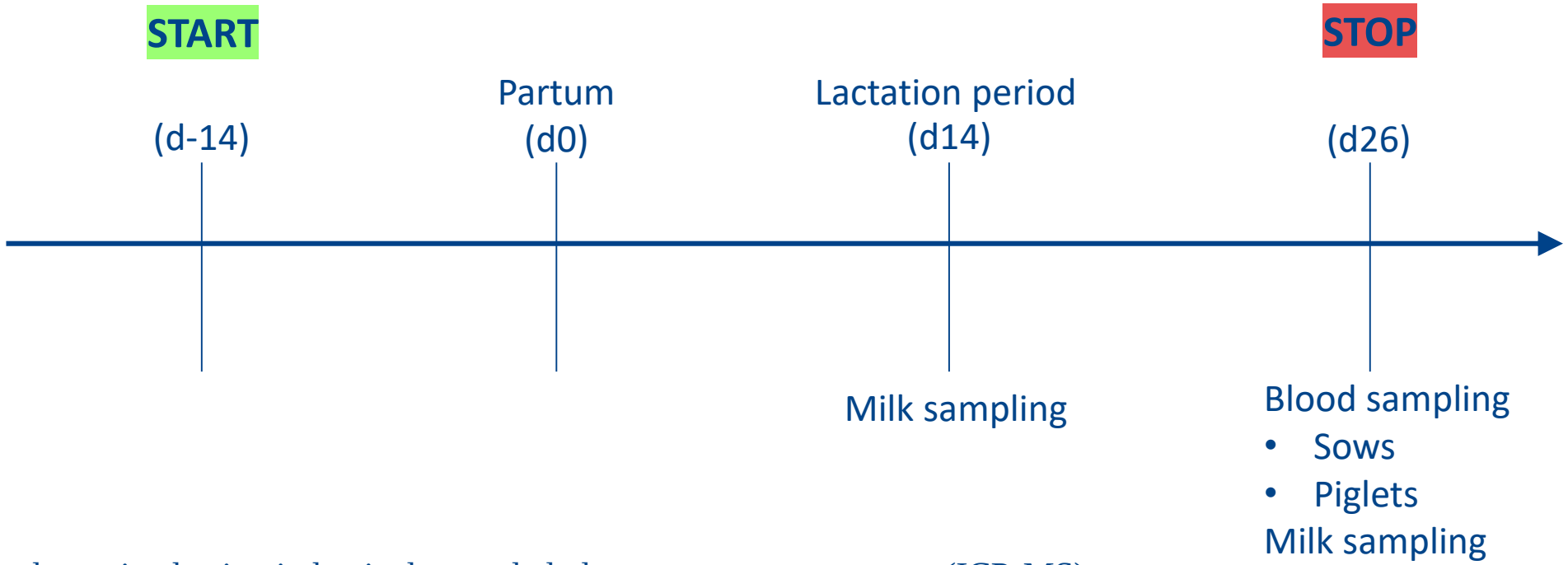
Objective

- To evaluate the effect of providing L-Selenomethionine in sows compared to sodium selenite



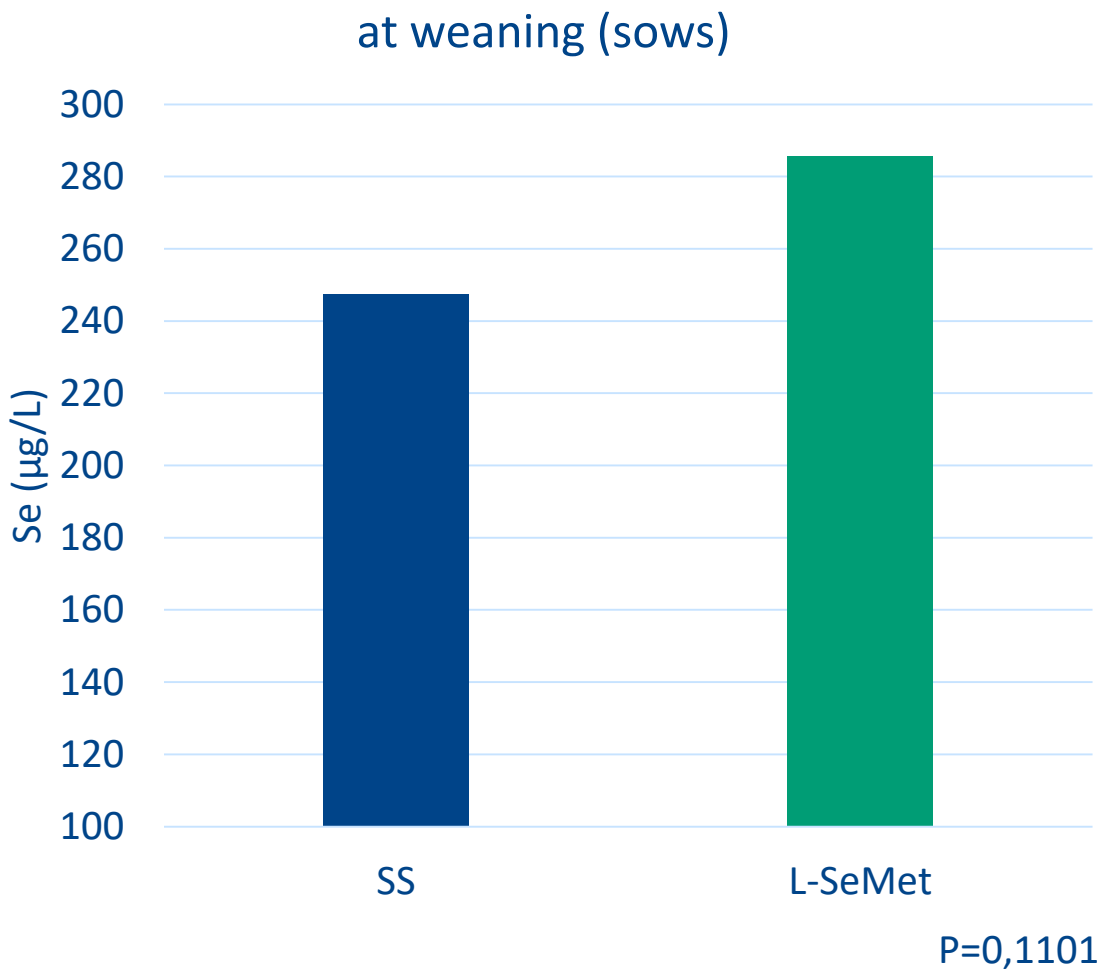
Materials & Methods

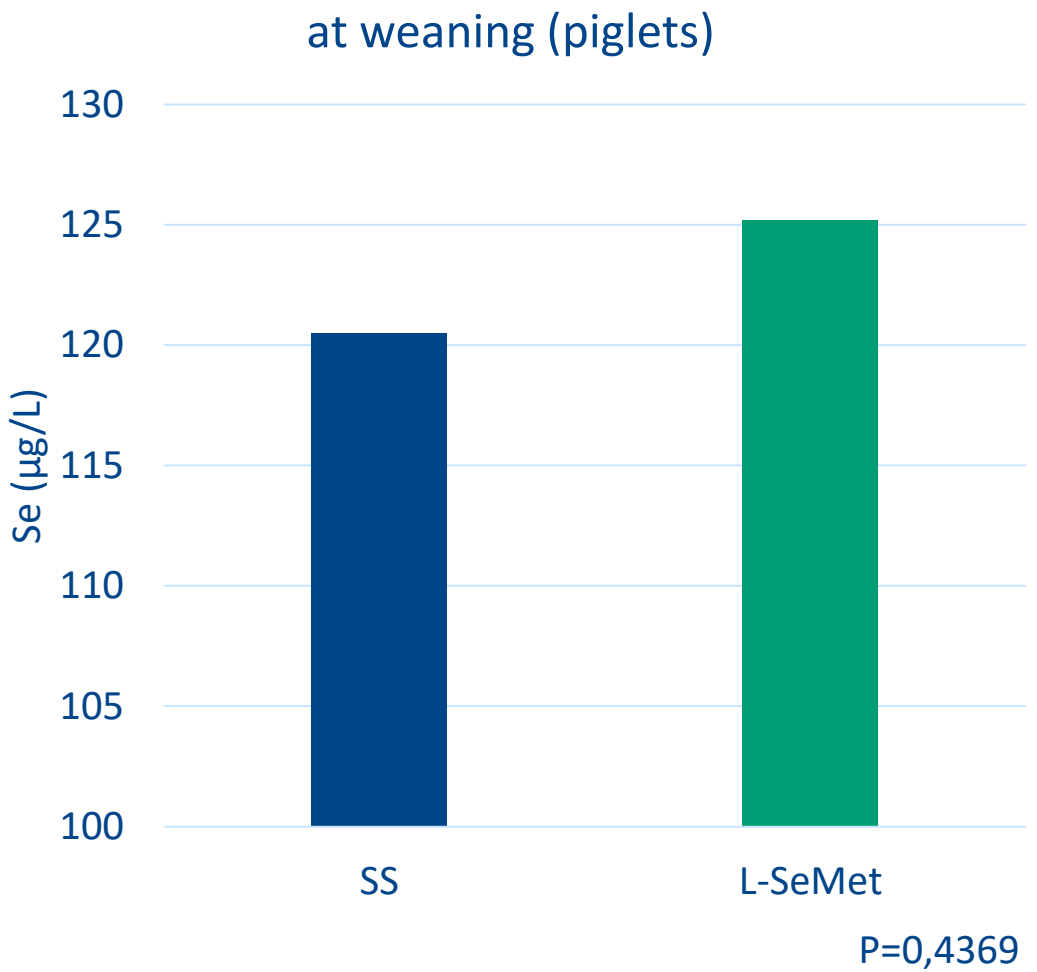
	Sodium selenite (SS)	L-Selenomethionine (L-SeMet)
Se (ppm)	0,2	0,2
# sows (Topigs20)	6	5



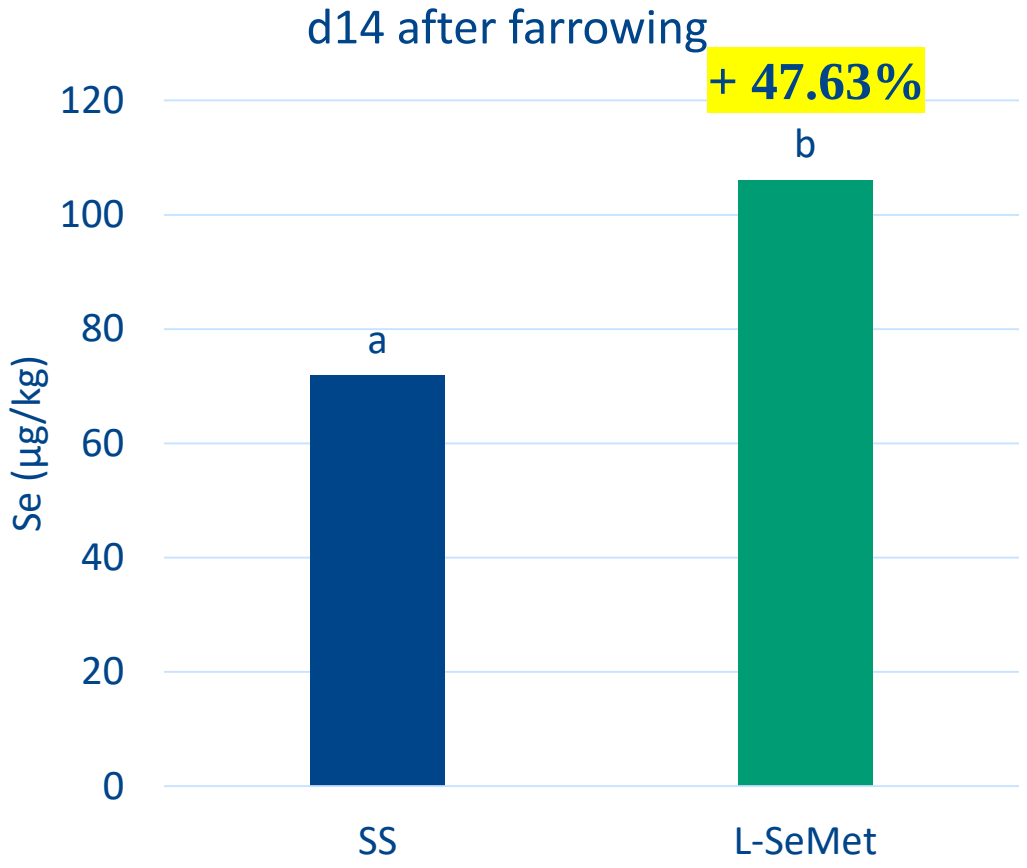
Total Se was determined using inductively coupled plasma mass spectrometry (ICP-MS).
Data was analysed with a MIXED model, with treatment as a fixed effect and parity as a covariate in the statistical package SAS 9.4.

Results (1) – selenium conc. in serum

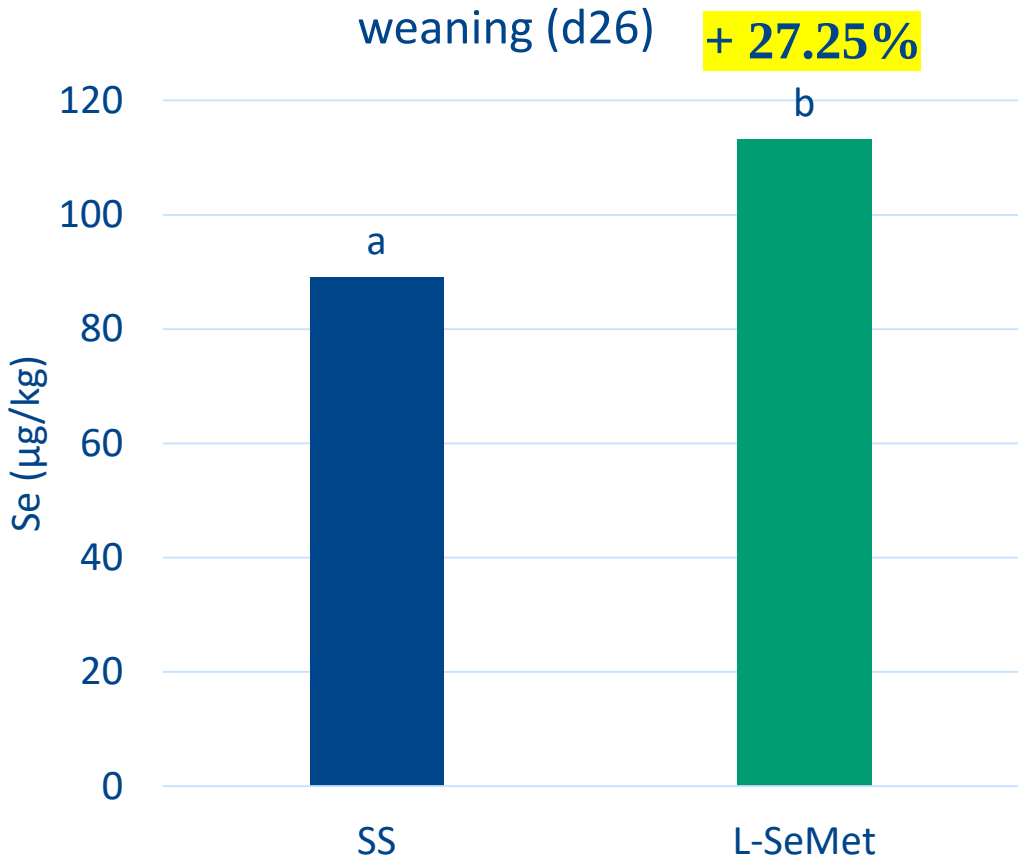




Results (2) – selenium deposition in milk

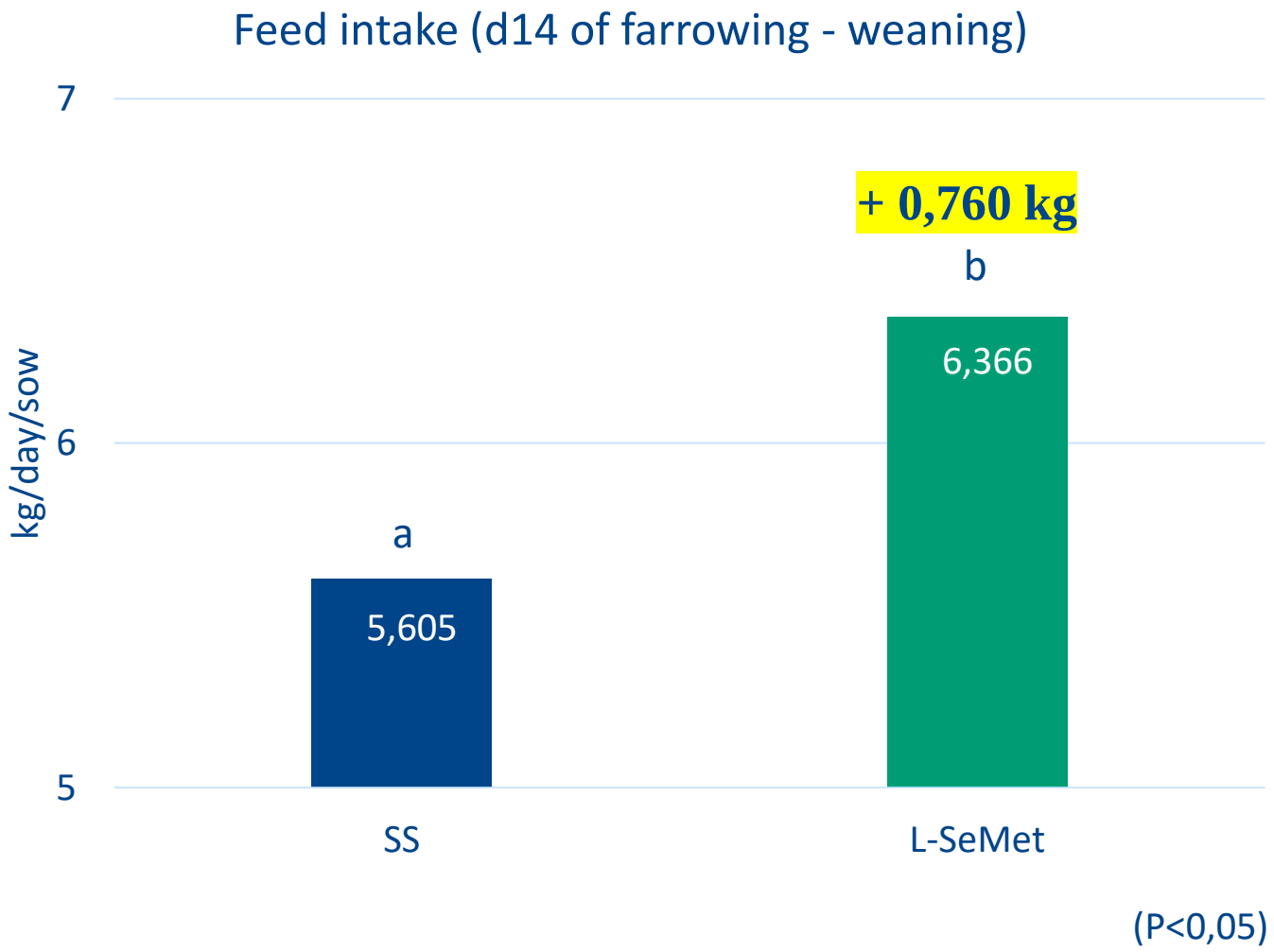


(P<0,001)

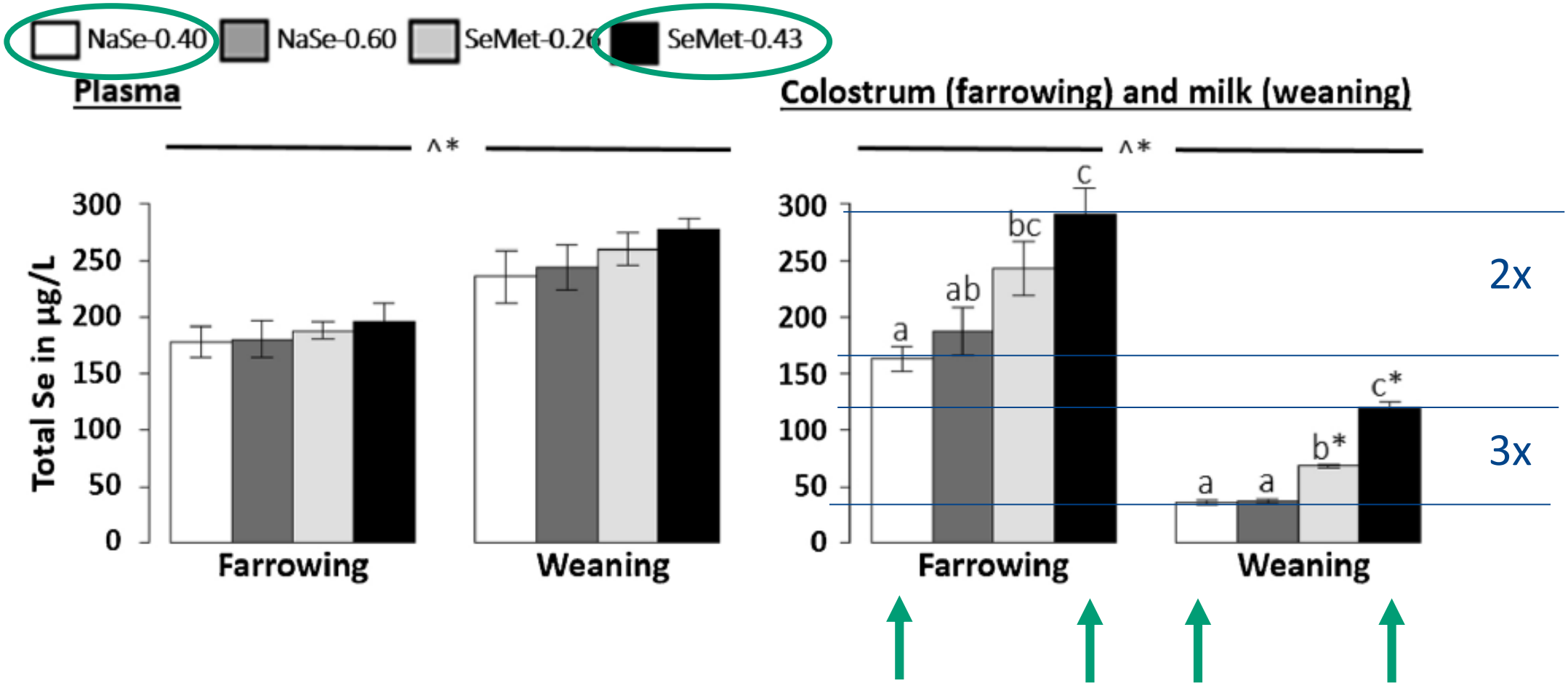


(P<0,002)

Results (3) – Feed intake sows



Discussion (1) - selenium deposition in milk



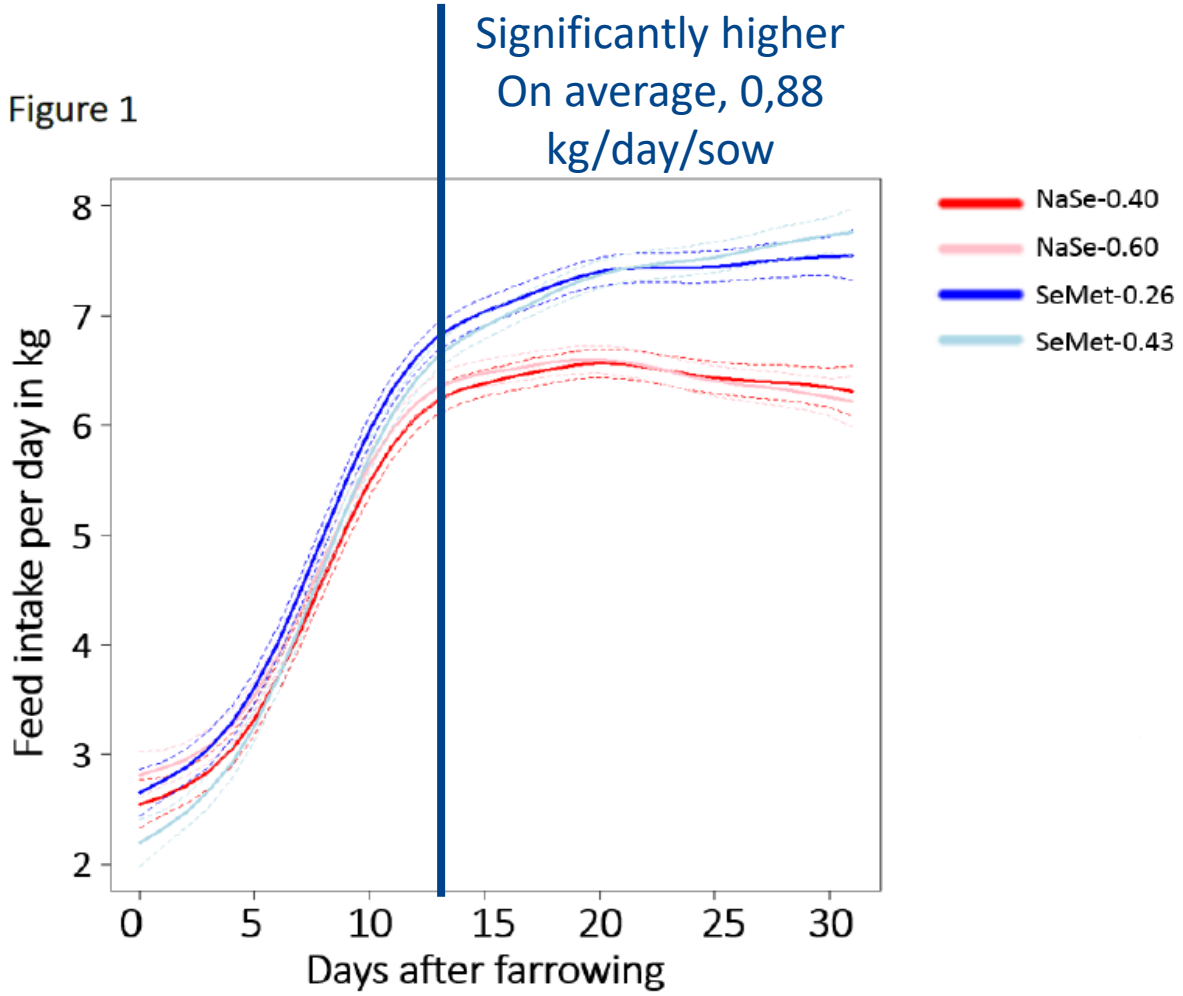
Falk et al. 2019

Discussion (2) - Feed intake sows

- Smell?
  - Clear perception of different odours between diets
  - Attractant to feed (highly developed olfactory system pigs)

- Higher protection against oxidative stress?
  - Hybrid more prone to nutritional stress
  - Taheri et al. 2016

Figure 1



Falk et al. 2019

Conclusion

- The addition of L-Selenomethionine in sow diet has the following effects:
  - Numerical increase is seen for the selenium conc. in serum (sows and piglets)
  - **Significant increase (p<0,002)** in selenium conc. in milk
  - **Significant increase (p<0,05)** in feed intake between day 14 after farrowing and weaning

Thank you for your attention

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