

# Level of L-selenomethionine in Se-yeast as quality indicator

Several producers offer selenised yeast products for animal nutrition. To evaluate the quality of selenised yeast products, it is important to evaluate the L-selenomethionine (L-SeMet) concentration.

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To evaluate the quality of selenised yeast products, it is important to evaluate the L-SeMet concentration.

L-S-eMet is the only compound that can be incorporated directly in animal tissues (meat, eggs, milk), thereby enhancing the selenium (Se) pool and ensuring optimal supply during periods of stress (e.g. growth, disease, heat, reproduction). The level of L-SeMet in selenised yeasts is regulated by the European Union (EU). Minimal levels were proposed by selenised yeast suppliers during the evaluation of these feed additives and finally these values were integrated in the EU regulations. In other words, all selenised yeast have to oblige with these

minimal values in order to be sold in the EU. The minimal value for L-SeMet in the legislation is, depending on the source, 63% for the majority of the selenised yeasts (only one selenised yeast has a minimal value of 70%). Meaning that 63% (or 70%) of the total Se content in selenised yeast products must be in the form of L-SeMet.

## Commercial sample review

To assess the L-SeMet content in commercially available selenised yeast products, a market survey was initiated in 2018. In this survey, a total of 13 samples were collected from 4 different producers. These samples were analysed for total Se and for Se in the form of L-SeMet. The survey was set up by Orffa in co-operation with an independent laboratory (Sciensano, Belgium). The analysis method applied is specific for L-SeMet and is based on HPLC-ICP-MS after enzymatic extraction and results are shown in *Figure 1*.

The commercial sample review 2018 shows that only two batches are conform with the 63% minimal value that is written down in EU regulations. This is unremarkably low, considering the findings of the commercial sample review performed in 2015, where 28 samples were tested on the same parameters and not less than 17 batches were below the minimal 63% required (*Figure 2*). Four selenised yeasts with a minimum selenium content of 3000 ppm were included in the review of 2018, but three lack conformity. Producer A consistently produces selenised yeast with extremely low (under the legal limit) L-SeMet levels. Customers are buying selenised yeast products on the basis of the L-SeMet content and are often not aware of these low, varying levels in the products. It is difficult to analyse L-SeMet accurately and is therefore not performed routinely in every laboratory or by all customers. The Se content is more regularly analysed, but this gives no information on the L-SeMet content, which is the only compound of interest.



### Considerations for nutritionists

It can be concluded from these two market studies that there is a major variation in the level of Se in the form of L-SeMet between different commercial samples of selenised yeast, even the new 3000 ppm products show non-conformity. The overview shows differences between producers, as well as large variations between batches of the same producer. This variation has also been described in scientific literature and has been confirmed in other commercial reviews. Nutritionists are increasingly aware of this variation and request guarantees from their suppliers concerning the L-SeMet content of the products. In view of these results, product preparations containing pure L-SeMet are better alternatives as they provide the animal with 100% bio-available L-SeMet, compared to only 50% bio-available L-SeMet for the selenised yeast products (taking into account the 80% digestibility of yeast protein).

Van Beirendonck et al. 2016 shows that the deposition of Se in the muscle is linearly correlated to the amount of L-SeMet in the diet, confirming the benefit of pure L-SeMet preparations. Two selenised yeasts, sourced from the market, were incorporated in the deposition trial and compared with an L-SeMet product (Excellen Selenium 4000 – Orffa Additives BV, the Netherlands; 0.16% Se in the form of pure L-SeMet). One selenised yeast contained 69% Se as L-SeMet and the other contained 26% Se as L-SeMet. The highest deposition was obtained by adding pure L-SeMet. More importantly, results showed a clear dose-response for Se-deposition on L-SeMet level, indicating that indeed L-SeMet concentration is the perfect quality indicator for selenised yeast products. To build up Se reserves in tissues it is best to supply product preparations containing pure L-SeMet. In this way, adequate amounts for the production of selenoenzymes are available for the animal during (oxidative) stress conditions (e.g. growth, heat, reproduction etc.)

Figure 1 - Commercial sample review selenised yeasts (n=13) from 4 producers (2018).

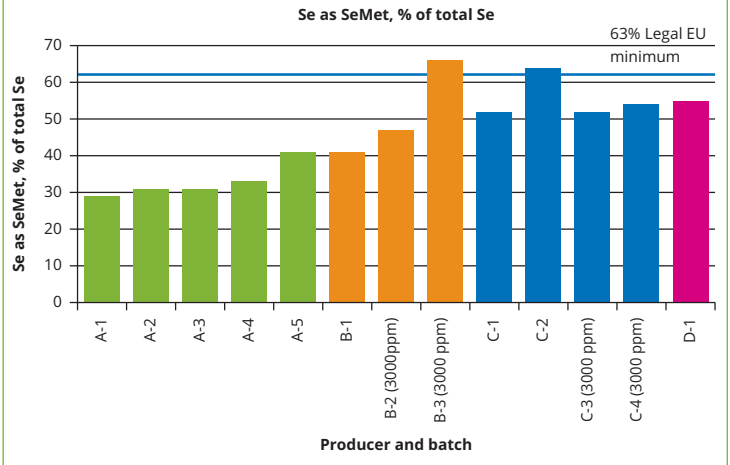


Figure 2 - Commercial sample review selenised yeasts (n=28) from 7 producers (All About Feed, 16 Oct 2015).

