L-selenomethionine in broiler breeder and broiler nutrition

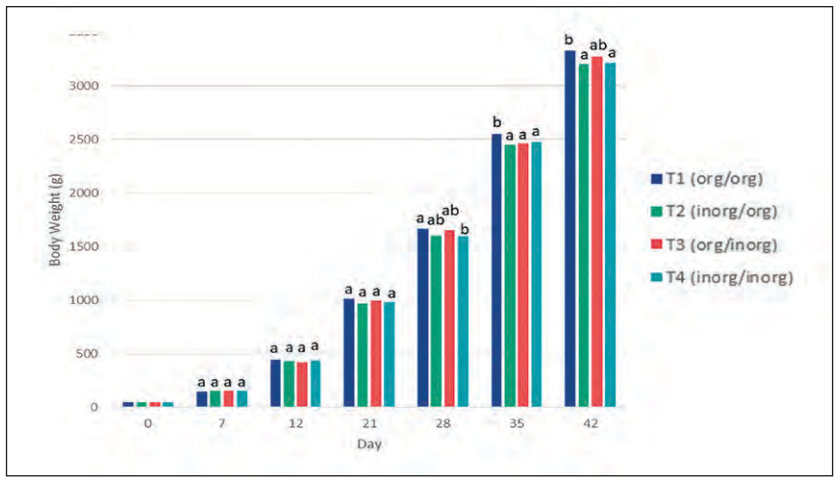

Figure 1 – Average body weight of broiler offspring per treatment, letters (a, b) indicate significant differences (P < 0.05).

	T1 (org/org)	T2 (inorg/org)	T3 (org/inorg)	T4 (inorg/inorg)
Mortality (%)	2	3	6	6
Feed conversion ratio (FCR)	1.68	1.71	1.75	1.76
Drip loss (%)	1.04a	1.18a	1.67ab	2.02b
Selenium deposition breast muscle (mg/kg)	0.48	0.51	0.25	0.24

Table 1 – Results (mortality, FCR, drip loss, selenium deposition). Letters (a, b) indicate significant differences (P < 0.05).

			P-value	
	Sodium selenite	L-SeMet	Selenium	Stocking density
Body weight (g)	2377.6a	2429.8b	0.002	0.32
Body weight uniformity (%)	85.32a	87.43b	0.003	0.93
FCR	1.35b	1.327a	0.04	0.23
Shear force (breast ; g)	3868.5*	4408.7*	0.05	0.92

Table 2 – Average results for sodium selenite and selenomethionine treatments (body weight, FCR, body weight uniformity, shear force). Letters (a, b) indicate significant differences (P < 0.05), * indicates trend (P < 0.10).

SELENIUM is an essential trace element with functions in animal health, reproduction, performance and reducing oxidative stress, and can thus contribute to better health status of breeders.

Selenium can be added to the diet in organic or inorganic forms.

Organic selenium in the form of l-selenomethionine has the unique property, compared to other selenium sources, of being able to be stored in animal protein, such as eggs and animal tissue.

Thereby, selenium can be transferred to the offspring via the egg and supply a continuous source of selenium to the animal during high stress periods, such as high stocking densities.

In this article, two trials will be described to show the beneficial effects of l-selenomethionine in broiler breeders and broilers.

L-selenomethionine in broiler breeders positively affects the broiler offspring

The first study aimed to investigate the effects of different selenium sources in broiler breeders on the performance of broiler offspring.

The trial was carried out at the facilities of the National University of Luján in Argentina.

Two sheds with 45-week-old breeders were used for the trial.

The breeders were fed two different diets consisting of two selenium sources – sodium selenite or l-selenomethionine (Excential Selenium 4000 by Orffa Additives).

In week 55 of age, eggs were collected and incubated.

In total, 180 chickens from each treatment were selected.

The chickens originating from the various groups were divided over four different treatments, distributed in 24 pens with a randomised block design, leaving six replications per treatment.

Chickens from broiler breeders supplemented with l-selenomethionine were fed two different diets:

- T1 – Regular diet + 0.3ppm selenium (l-selenomethionine) – org/org
- T3 – Regular diet + 0.3ppm selenium (sodium selenite) – org/inorg.

Chickens from broiler breeders supplemented with sodium selenite were fed two different diets:

- T2 – Regular diet + 0.3ppm selenium (l-selenomethionine) – inorg/org
- T4 – Regular diet + 0.3ppm selenium (sodium selenite) – inorg/inorg.

For the broiler offspring from day 28 of age onwards, birds receiving T1 (org/org) showed significantly higher body weights (P = 0.0001) compared to birds receiving T4 (inorg/inorg) (see Figure 1).

At 35 days, birds receiving T1 continued with a higher body weight compared to the other three treatments (P = 0.0001).

At the end of the trial, day 42, birds receiving T1 still showed significantly (P = 0.0001) higher body weights compared to T2 and T4.

Lower drip loss percentages (see Table 1) were observed in the treatments that received organic selenium in the broiler diets.

It was shown that meat from birds receiving T1 (org/org) and T2 (inorg/org) had significantly lower drip loss percentages compared to meat from birds receiving T4 (inorg/inorg).

Selenium deposition was shown to be numerically higher for the treatments receiving organic selenium in the offspring diets.

L-selenomethionine improves performance in broilers

The second study

☛ continued P13

L-selenomethionine in broiler breeder and broiler nutrition

☛ from P12

aimed to investigate the effects of l-selenomethionine on improving performance in broilers, while increasing stocking density.

This trial included 1630 broiler chickens (Ross 308), divided over six treatments, five pens per treatment.

Treatments included a negative control with sodium selenite (0.3mg Se/kg feed) and a treatment group with l-selenomethionine (Excential Selenium 4000 by Orffa Additives) (0.3mg Se/kg feed).

The two treatments were applied for three different stocking densities – standard stocking density (50 birds/pen or 29.84kg/sq m), +10 percent stocking density (55 birds/pen or 32.84kg/sq m) and +16 percent stocking density (58 birds/pen or 34.63kg/sq m).

The birds were all fed the same corn and soybean meal-based pelleted diet, with the only difference being the type of selenium.

The trial lasted 35 days and production parameters were recorded during the trial.

This second trial showed that replacement of sodium selenite with l-selenomethionine significantly increased body weight at all stocking densities applied.

Body weight uniformity – standard deviation of individual body weight in each pen/average body weight of the pen – was improved and feed conversion ratio was significantly reduced for all stocking densities applied.

L-selenomethionine showed a trend towards lower shear force of breast meat.

Conclusions on use of l-selenomethionine in broiler breeders and broilers

Overall, the first trial showed that l-selenomethionine does not only allow for positive effects when fed to broilers, but also allows for long-lasting positive effects in offspring when fed to broiler breeders.

The significant improvements in body weight and drip loss that were found for the l-selenomethionine supplemented groups – in breeders and/or offspring – indicate potential for a more economical production.

When combining these results with the second trial, where it was shown that l-selenomethionine improved performance, tenderness and flock uniformity compared to sodium selenite in broilers, this hypothesis on economic benefits is confirmed once more.

In conclusion, l-selenomethionine allows for significant improvements in bird performance.

The best results can be obtained when both broiler breeders as well as broiler offspring have a diet supplemented with l-selenomethionine.

Jolien van Soest
Central Technical Manager
Orffa Additives