



## Selenium in Poultry Breeder Nutrition

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Selenium (Se) is shown to be an essential element for poultry and farm animal nutrition. Severe Se deficiency is related to decreased production and reproductive performance of poultry. The importance of Se nutrition of Poultry males is related to high proportion of polyunsaturated fatty acids (PUFAs) in avian semen. As hatching process is an oxidative stress & so there is requirement to improve antioxidant defences of embryo to increase hatchability.

### Antioxidant System in the Chicks

Maternal diet plays a role in determining the development of antioxidant system in chick during embryogenesis and early post natal development (Surai, 2002a). The antioxidant system includes Fat soluble antioxidant (Vit E and carotenoid), water soluble antioxidant (Ascorbic acid and glutathione), enzymes like superoxide dismutase (SOD), GSH-Px and catalase, Se as part of Selenoproteins (Surai, 2006)

### Requirement of Selenium

- As per NRC (1994) Selenium requirement vary from .06 ppm (Laying hen) up to .2 ppm (turkey, duck).
- The natural form of selenium in plant based feed ingredients consists of SelenoMethionine (Se Met) being major form.
- There are 2 major Se sources for poultry, mainly inorganic Selenium mainly sodium selenite (SS) or selenite and organic selenium in form of selenomethionine (Se Met; mainly as Se-yeast+ or SE Met preparation).
- Research work shows that organic Se is more efficiently transferred from feed to egg and further to embryo providing effective amount of Se fro Selenocysteine synthesis and formation of active selenoproteins.
- 2-3 ppm of Selenium in organic form recommended for supplementation in breeders (Surai, 2006)

### Distribution in the Egg Contents

Se content of the egg depend on its concentration in hen's diet and on the form of dietary Se used. In general Se almost equally distributed between egg yolk (58%) and egg albumin (42%) recently it has been shown Se Met comprised 53-71% of total Se in egg albumen and 12-19% in egg yolk (Lipiec et al, 2010). Since SeMet is not synthesised by animals, one would expect inclusion of SeMet affect mainly Se level in albumen and lesser extent in egg yolk.

### **Maternal Effects of Selenium**

Recent development in areas of maternal programming and gene expression indicate maternal affects post natal development of chicks. Specific Selenoprotein (iodothyromine deiodinases) responsible for thyroid hormone metabolism (Surai,2006) and effects of Se on gene expression, one can expect specific effects of maternal Se on progeny (Surai and Fisinin, 2014).