



## → Powerful Nanotechnology driving chicken immune system

NanoSel<sub>fs</sub>™ is the outcome of patented technology containing selenium in highly bioavailable zerovalent nanoparticle form (< 50 nm particle size)

### Ingredients

Zerovalent nanoparticles of selenium at 3000 mg per kg (0.3%)

### Why is NanoSel<sub>fs</sub>™ unique in its class ?

Invati and nanotechnology are inseparable. We have developed proprietary technology (patented) of producing zerovalent selenium nanoparticles, NPs (< 50 nm particle size). The particle size of selenium NPs in NanoSel<sub>fs</sub>™, as detected by dynamic light scattering (DLS), is in the range 10 – 50 nm. Additionally, the carrier used in NanoSel<sub>fs</sub>™ is light and ensures homogenous mixing in poultry feed.



### How does NanoSel<sub>fs</sub>™ stack up with the competition ?

Parameters	Competition	NanoSel <sub>fs</sub> ™
Type	Organic — Methionine chelate or yeast enriched	Zerovalent selenium nanoparticles (NPs) of size < 50 nm
Consistency	Organic selenium is presented as selenomethionine (directly or yeast fed). The chelation strength varies across manufacturing process and goes through inconsistency in bioavailability. Moreover, the catalytic surface area of native selenium is significantly lower than selenium NPs.	Selenium as zerovalent NPs have large surface area, higher catalytic efficiency, and higher biological activity. It has upto 3000X greater catalytic surface area than native selenium, significantly enhancing the biological activity. Moreover, our proprietary technology (patented) ensures consistent performance and bioavailability.
Input cost	Organic selenium production has higher input cost – methionine, yeast culture, and chelation process rendering end product costly to the consumers.	Our proprietary (patented) technology of producing selenium NPs has the benefit of significantly better performance at lower input cost and greater value for money to consumers.



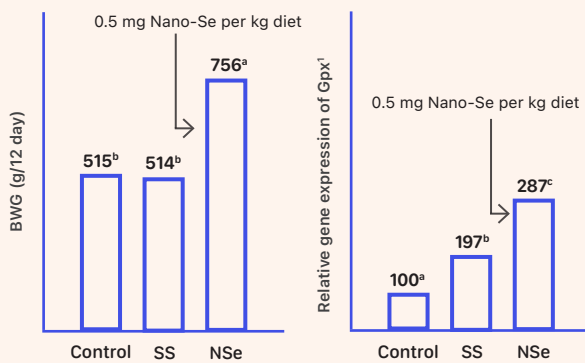


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Selenium nanoparticles in NanoSel<sup>TM</sup> fs have been proven to improve growth indices, immune parameters, egg and meat quality in commercial layers and broiler, respectively.

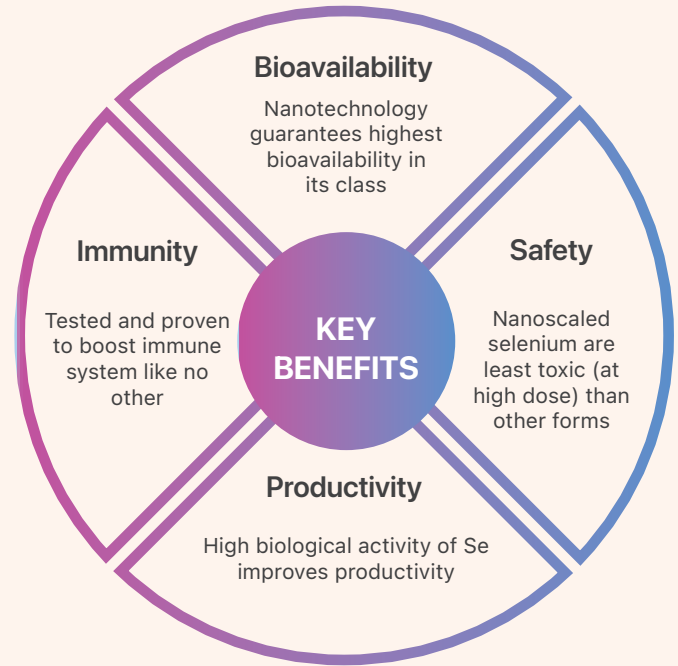
### Research reviews

#### Controlled trial of Nano-selenium in broilers

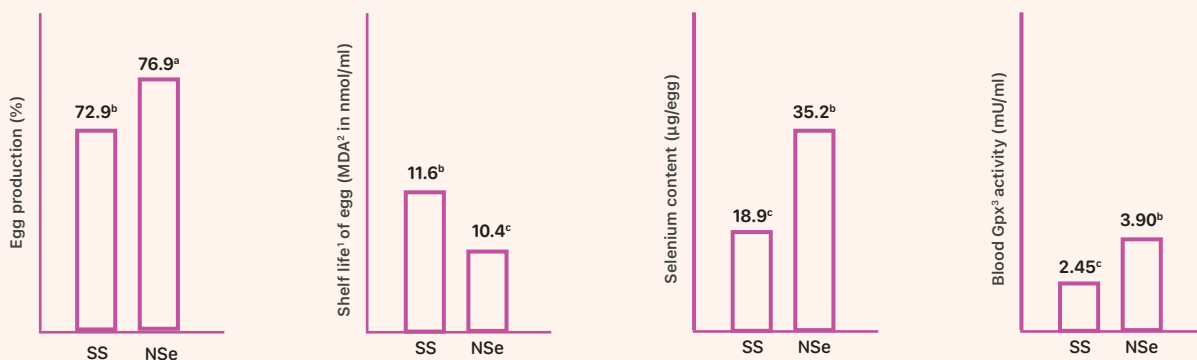


Thirty broiler chicks at 15 days old were randomly divided into three dietary treatments, namely **Control** (basal diet without any supplementation with selenium); **SS** (basal diet + 1 mg sodium selenite/kg diet); and **NSe** (basal diet + 0.5 mg Nano-Se/kg diet). The birds were given the experimental diets from 15 to 27 days old. (Source: Saleh and Ebeid, 2019)

<sup>1</sup>Glutathione peroxidase



#### Controlled trial of Nano-selenium in commercial layers (32 – 45W)



One hundred and eighty silver Montazah laying hens (Egyptian local developed strain) aged 32 weeks were housed in individual cages in a semi-open house. Birds were divided randomly into treatments and fed a basal diet (vitamins and minerals mixture without Se). The experiment involved two sources of selenium viz, **SS** (sodium selenite) and **NSe** (Selenium nanoparticles) fed at **0.25 ppm** till 45 weeks age. (Source: Radwan et al., 2015)

<sup>1</sup>Stored eggs after 15 days of laying at 16 °C with 65% relative humidity; <sup>2</sup>Malondialdehyde; <sup>3</sup>Glutathione peroxidase

### Inclusion level

100 g per MT feed equivalent to 0.3 ppm Nano-selenium or as recommended by poultry nutritionist



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