

Vitamin B2 supplementation for laying and parent hens in organic poultry systems

Problem

Vitamin B2 (riboflavin) is needed as a supplement in poultry diets. In the organic sector, GMO-free sources/supplements are obligatory. New production strains for GMO-free vitamin B2 are being developed in Europe due to recent shortages at overseas producers. Non-GMO sources of vitamin B2 are more expensive than their GMO-based counterparts.

Solution

To optimise feed production costs and reduce dependency on external sources, levels of vitamin B2 supplementation in organic production need to be re-evaluated for several types of animals.

Outcome

Data from project experiments indicate that hens in organic systems can be supplemented with a maximum level of 4.0 mg/kg feed without impacting the performance and animal health of the hens and their offspring. This level of supplementation is lower than the 5-7mg/kg feed recommended by Blum et al. (2015).

Applicability box

Input used

- | | |
|--------------------------------------|--|
| <input type="checkbox"/> Copper | <input type="checkbox"/> Anthelmintics |
| <input type="checkbox"/> Mineral oil | <input type="checkbox"/> Antibiotics |
| <input type="checkbox"/> Fertilisers | <input checked="" type="checkbox"/> Vitamins |

Geographical coverage

Europe

Application time

Any time of the year

Animal species / category

Laying hens (chicken)

Period of impact

One laying period

Application point

Production of premixes and chicken feed

Target

Feed safety; animal welfare and health

Practical recommendations

- For organic laying hens, a riboflavin supplementation of 3.0 mg/kg of feed is considered safe. A riboflavin supplementation below this level may still not affect egg quality, laying performance, body weight development, nor any health and welfare indicator. However, a supplementation level of 1.5 mg/kg of feed leads to a decline of riboflavin concentrations in the egg yolks and livers, which may be considered the first signs of deficiency.
- For organic parent hens, a riboflavin supplementation of 4.0 mg/kg of feed is considered as a safe level. Hatched chicks from parents that received a lower riboflavin supplementation may show reduced feed intake and growth rates as the first signs of riboflavin deficiency.
- According to the literature, providing fresh or ensiled forages (pasture or silages) will enhance the natural riboflavin supply of poultry. Such feeding strategies may counterbalance lower supplementation levels than recommended above.



Pictures 1-3: Organic laying and parent hens (Photos: Florian Leiber, Hannah Ayrle & Nele Quander-Stoll, FiBL)

On-farm application

System approach

Vitamin mixtures are produced by several companies. To avoid vitamin deficiencies, companies may add relatively high levels of vitamins, and conditions in organic production systems are not accounted for. Updating vitamin B2 requirements for organic poultry is necessary because organic poultry production differs from conventional poultry production in terms of feed composition and genotypes. Supplementing not more than the optimal level of vitamins is in line with the organic principles, aiming at using only the necessary minimum to be as independent as possible from external inputs.

Evaluation

Regular evaluation of the animals must include monitoring of health and performance. Any difficulties in coordination of motion and paroxysms or morphological deviations of the animals' legs should be considered serious signs of riboflavin deficiency, indicating insufficient vitamin B2 supply.

Further information

Further readings

Blum, R. et al. (2015). Vitamins in Animal Nutrition. Available at https://fefana.org/wp-content/uploads/2017/08/2015-04-15_booklet_vitamins.pdf.

Weblinks

- [New European GMO-free Vitamin B2 product at the market](#)

About this practice abstract and RELACS

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RELACS: 'Replacement of Contentious Inputs in Organic Farming Systems' (RELACS) builds on results of previous research projects and takes far-advanced solutions forward. As a system approach to sustainable agriculture, organic farming aims to effectively manage ecological processes whilst lowering dependence on off-farm inputs. The RELACS partners will evaluate solutions to further reduce the use of external inputs and, if needed, develop and adopt cost-efficient and environmentally safe tools and technologies.

Project website: www.relacs-project.eu

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