Organic trace minerals improve animal production sustainability

In animal feed industry there are many challenges surrounding organic trace elements. Ultimately, they play an important role in sustainability as they can help to reduce environmental impact while preserving the welfare of workers in the production chain.
They also enable better quality products in line with public health regulations to be produced for the end consumer.

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The animal production industry is facing increased pressure from legislators and consumers to provide sustainable meat, eggs and dairy products. This creates new challenges: supporting animal health and welfare while reducing carbon footprint, improving production efficiency while reducing the use of antibiotics and, finally, improving quality while remaining economically competitive. Trace minerals such as copper (Cu), iron (Fe), zinc (Zn) and manganese (Mn), are essential micronutrients. They not only support growth performance but are also needed for good development, fertility and health or immunity, and the high quality of final products.
In commercial diets, trace minerals are often supplemented in inorganic form. This is an easy choice as legal limits still allow high levels of supplements and they are generally inexpensive. Because of their limited bio-availability, high doses are needed to meet nutritional requirements. This often results in an imbalance and environmental pollution. Supplementation with more bio-available organic trace minerals such as B-Traxim glycinates may offer a better solution to support sustainability because this choice makes sense for every stakeholder along the feed production chain, right up to the end consumer.

Sustainability along the production chain

In premix production, organic trace minerals guarantee safety from a health point of view. Inorganic minerals are often very fine particles in fractions of less than100 microns that can cause lung damage if inhaled by workers. Because of their larger particle size and therefore the absence of dust, glycinates from Pancosma are safer to use thus contributing to the welfare of production workers.
As feed is by far the highest cost component in livestock systems, it is important to ensure that diets are formulated with an optimum cost to return ratio. Therefore, trace minerals that do not offer an adequate return on investment (ROI) will be the most expensive, regardless of the cost. Studies suggest that binding Cu, Zn, Fe and Mn with amino acids and peptides can enhance the bio-availability of these trace minerals, thereby leading to better overall livestock performance in terms of improved milk production, growth, accumulation in tissues, reproduction and general health status. Moreover, this enhanced bio-availability allows dietary mineral supplementation to be reduced by up to 50% while still maintaining performance. We can therefore expect that animals will easily achieve their genetic potential while minimising trace mineral supplementation and excretion.
Although trace minerals do not directly affect quality parameters, they can still influence them. Iron influences the colour of beef, while as part of the antioxidant system, Cu, Zn and Mn are important for cell integrity, notably after slaughter to limit drip loss. In the dairy industry, a lower somatic cell count has been established with the use of organic Zn, resulting in greater profitability of the milk and a safer product for the consumer. In the meantime, by meeting basic physiological needs essential trace elements reduce the incidence of diseases related to trace element deficiencies and so contribute to animal welfare. Finally, trace elements accumulate well in tissues which fits in with the United Nations' human health programme that encourages trace element accumulation in meat products to meet the particular needs of the human population.

Reducing environmental impact

Owing to high supplementation, elements concentrated in manure are accumulated in the soil where they may pose a medium or long-term toxicity risk to plants and micro-organisms. Zinc, for instance, can achieve concentrations of around 200 ppm within 120 years if its slurry application is not reduced. Soil microbial activity and mass are adversely affected at even lower Cu and Zn concentrations in soil (30 to 50 and 100 to 200 ppm, respectively). Lowering the level of trace element supplementation is key to extending this timescale and minimising the environmental impact.
Organic minerals were designed to reduce antagonistic relationships within the gastrointestinal tract and therefore increase the bio-availability of trace elements. Studies comparing the bio-availability of glycinate to sulphate have shown good results in favour of the organic source while still maintaining at least the same performance. Männer and others in 2006 found a 31.1% improved absorbability in piglets, while Spears and others in 2004 found bio-availability almost doubled in ruminants when in the presence of a strong antagonist. Consequently, less input also means less output. This superior absorption means that the supplement dose can now be reduced while maintaining or even improving animal performance.

Answer to new challenges

Their high bio-availability means that organic trace minerals can answer new challenges arising from the legislation in favour of reducing the input and output of minerals while supporting animal health and welfare. In this context, where the pressure exerted by legislation and consumers is growing, the relevance of organic trace minerals is only increasing. These additives positively support sustainability along the production chain by providing safety to workers handling the product; maximising return on investment by reducing the cost of supplements and improving performance through lower supplementation. Finally, their bio-availability reduces the environmental impact by lowering the mineral output that leads to soil pollution and a long-term toxicity risk.

References available on request.

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