

Impact of Russia's invasion of Ukraine on the Feed Industry **Vitamins, minerals and other micro nutrients**

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Amino acids and vitamins

Amino acids and vitamins are essential nutrients in an animal's diet. They are essential for growth, body development and reproduction, as well as animal well-being and general health. Some essential nutrients also improve feed conversion ratio efficiency by the animal, thereby reducing the overall volume of feed animals require. Some vitamins and amino acids can be synthesised in the body of an animal however most cannot and must be obtained through feed. Amino acids and vitamins are added in trace amounts to the total diets but have a powerful physiological effect on the animal's overall well-being.

The market

- China is the dominant supplier in the global market for amino acids and vitamins. Increased energy costs and Covid19 issues have caused uncertainty and disruption to the supply chain out of this region.
- EU reliance on China for these essential feed additives had previously been identified by industry as a vulnerability for the EU feed sector. This vulnerability was, and continues to be, exacerbated by Covid19.
- Unlike the current situation in feed material markets, we have not yet experienced severe price increases for amino acids and vitamins (although we have seen increases for the amino acid methionine which is an essential nutrient in pig and poultry diets for animal growth and must be included in those feed formulations). Currently the feed industry does not appear to be placing excessive forward purchasing commitments for these ingredients. If this changes, the price could increase dramatically or supplies could be rationed.
- China imported 29% of its corn from the Ukraine last year. Corn is the main raw material for the manufacture of amino acids in China and disruption in this vital supply may impact their ability to manufacture amino acids over the next 12 to 18 months.
- China is a significant consumer of soyabean meal (SBM) to feed their large swine herds. The price of SBM was surging before Russia invaded the Ukraine due to the drought in South America. SBM is an excellent source of protein and essential amino acids for pigs. With prices at record high, it is anticipated that Chinese producers will use more domestically produced amino acids as substitutes for SBM. This could also have knock on effects on the availability of amino acids for export.
- The global trend for feed formulators has been to reduce the number of amino acids and vitamins being formulated into diets. However, an animal's growth will be stunted without enough of some amino acids. This is the case for methionine and Lysine. There is therefore a limit to the level of reduction in formulations that can be achieved safely without impacts on animal growth, development and welfare.
- BASF, the world's largest chemicals group who manufacture feed additives, said it would have to stop production if natural gas supplies fell to less than half its needs. This would obviously have serious implications for feed additive supplies and it is important therefore to keep abreast of developments on sanctions on Russian gas.
- Developments on the Russian internal feed market could result in an increased demand from Russia for additives sourced from China. This may in turn impact the availability of Chinese feed additives for European supply. According to Russia's veterinary watchdog Rosselkhoznadzor, the trade sanctions on Russia, have not impacted supply of imported feed additives. Russian imports of feed products increased from the beginning of the year to 10 March compared to the same period in 2021 and imports of feed additives, mainly amino acids, increased by approximately 20%. According to Rosselkhoznadzor, Russia

was able to continue diversifying its international sources of feed and feed additive imports. In recent months supplies were authorised from companies in Belarus, the Kyrgyz Republic and China. Rosselkhoznadzor is also considering expanding the list of suppliers to other companies in China and to organisations located in Brazil, Argentina, and Turkey. It was also noted that any lack of deliveries of products could eventually be compensated by opening up to more international suppliers, China in particular. They are also working to amend regulatory documents concerning the circulation of feed and considering initiatives of Russian importers and local feed producers to simplify the control processes and registration of foreign shipments. Russian feed businesses are feeling the impact of higher logistical costs and foreign exchange fluctuations that have caused liquidity shortages for all Russian producers.

Macro minerals and trace minerals

Macro minerals such as calcium, magnesium, phosphorus, potassium and sodium and trace minerals such as iron, iodine, cobalt, copper, manganese, zinc and selenium are also critical in animal diets.

The market

- Russia is the world’s second largest exporter of feed phosphates representing 7% of feed phosphorus on the global market. Sanctions are leading to a gap in phosphate supply that cannot be easily filled.
- Sanctions may also affect the Russian owned Lithuania producers of feed Phosphates.
- The phosphate shortage may be helped by inclusion of Phytase in diets as it hydrolyses phytate substrates to release phosphorous in a free form which animals can absorb efficiently, resulting in a lower demand for supplemental inorganic phosphorus.

Reports from Irish Feed businesses

Phosphorous

- Monocalcium phosphate, a popular source of phosphorous, has more than doubled in price in the last few weeks.
- Norwegian company Yara International has reduced production of feed phosphorous dramatically due to high gas prices.
- French company Phosphea is a major player in the feed phosphorous market and have not provided quotes possibly due to uncertainty over supply and cost issues.

Table 1: Example of inclusion of monocalcium phosphate in feed

Feed Type	Inclusion in feed
Ruminant complementary feed	0.4 - 0.5% Monocalcium Phosphate
Pig complete feed	0.25 – 0.8% Monocalcium Phosphate

Magnesium

- Magnesium Oxide (Magnesium source) supply is indirectly linked to the Russia/Ukraine situation due to the dramatic increase in gas prices.
- Magnesium deficiency leads to grass tetany which is a highly fatal disease associated with low levels of magnesium in the blood. As grass is deficient in magnesium, it is vital to add magnesium to ruminant diets when animals are going out on grass.
- Magnesium Oxide is increasing in price in line with the increases in gas prices. The price has more than doubled in recent weeks and is expected to continue to climb.

Table 2: Example of inclusion of magnesium oxide in feed

Feed Type	Inclusion in feed
Dairy complementary feed	1.25 - 2% Magnesium Oxide
Pig complete feed	Not as relevant
Dairy High mag complementary mineral feed	15 – 30% Magnesium Oxide