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Healthy food and feed? An answer from COST

COST Action FA0905: Mineral-improved Crop Production for Healthy Food and Feed



Food security and malnutrition

European crop production has largely focused on securing food and feed availability and maximising yield per unit area, in order to feed a growing world population. Although increased cereal production has played a major role in fighting hunger worldwide, the consumption of food rich in minerals has not increased proportionally. Today 40 % of the world population suffers from micro-nutrient deficiencies, leading to malnutrition and consequently a

reduced immunity to infectious and parasitical disease or to degenerative illness such as cancer, diabetes, and cardiovascular diseases.

The challenge for agriculture

Even in northern Europe most soils are deficient in providing adequate selenium (Se) in resultant food crops. This malnutrition has led to the development of infectious and parasitical disease or degenerative illnesses as mentioned above. Numerous epidemiological studies have permitted linking the population's diet to the risk of disease. However, the density of minerals in our existing agricultural crops is low, and only few plant-based foods are able to provide the daily recommended intake for any given mineral in a reasonable serving size.

Approximately 50 % of the cereal-cultivated soils globally have low amounts of plant-available zinc, indicating that there is an urgent need for enhancing concentrations of zinc and other micronutrients in cereal-based foods.

A high mineral status is an important quality aspect of food and feed, in order to enhance its nutritional value and reduce the need for costly mineral supplementations. In addition to mineral deficiencies, some toxic minerals, such as cadmium and arsenic, are also threatening human and animal health. These are a result of excessive applications of sewage sludge and manure which has led to the accumulation of various heavy metals in many agricultural soils in Europe.

An answer from COST

To tackle this issue, COST Action FA0905 'Mineral Improved Crop Production for Healthy Food and Feed' gathers scientists who are investigating this phenomenon, at both European and global level. This network gathers approximately 270 participants, from 30 COST and non-COST countries.

Through its multidisciplinary networking approach, dealing with all aspects of the food and feed production chain, this COST Action is identifying current bottlenecks and providing solutions to these major issues in the food and feed scientific domain. The coordinated efforts of motivated scientists from complementary disciplines and different countries are greatly needed to provide innovative scientific solutions to the global plagues of malnutrition, obesity and unsafe food and feed – which all have consequences for both animal and human health.

The main objective of COST Action FA0905 is to identify the bottlenecks limiting the content of minerals available in nature (iron, zinc, magnesium and selenium) in the crop destined for animal and food consumption. The goal is to then increase their content in food and feed and to simultaneously ensure that the contamination of food and feed by the cadmium and arsenic

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- ▶ [COST Action FA0905 on the website of the Norwegian University of Life Sciences \(UMB\)](#)

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available in nature is kept within safety standards, so as to improve and protect human and animal health.

The added-value of networking

Within COST Action FA0905, scientists work in several working groups to facilitate the exchange of information and ideas, stimulate the synergy among fellow researchers, institutions and countries, to address specific topics and to plan joint experimental work. This invaluable exercise is coupled with the exchange of young scientists between the different organisations from the participating countries, through Short-Term Scientific Missions (STMS) and training schools.

The Working groups of COST Action FA0905 represent agronomy, plant biology, food processing and human and animal nutrition. They provide yield added value at all levels and ensure the excellence of European research and development on production and exploitation of sustainable, nutritious, safe and healthy food and feed, for better human and animal health.

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