



## Feed Phosphate Market Update

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## Strategies to Reduce Phosphorus Loss In A Circular Economy

28 March 2019 - Although currently there is no specific environmental legislation in the European Union that would restrict the application of phosphorus in soil, it is one of the key causes of eutrophication, which the EU is aiming to reduce.

The phosphorus and nitrogen content of animal feeds is a major environmental pollutant as the overall phosphorus retention by animals is quite low in many standard feeds.

A key issue with animal feed is that not all the nutrients fed to the animals are digested by them. What is not digested is excreted into the environment as manure, urine or various gases.

The two most significant nutrients in excess are nitrogen and phosphorus, which are frequently applied to land in the manure.

However, excessive manure application or the combination of organic and inorganic materials can result in the accumulation of nutrients in the soil and potential nutrient run-off in waters.

This in turn leads to water eutrophication, a major concern in large parts of Europe (and the world).

### European Directives

The protection from/reduction of runoff of phosphorus into water is covered by various EU water legislations such as the Water Framework Directive, the Nitrates Directive, the Urban Waste Water Directive and the Marine Strategy Framework Directive.

For what concerns both soil and water, phosphorus is also covered by the Sewage Sludge Directive.

In addition, in 2013 the EU held a consultative communication on the sustainable use of phosphorus seeking to find a way to limit its impact on the environment.

The Water Framework Directive calls for control measures for a number of pollutants, such as organophosphorus compounds, metals, and materials in suspension. EU member states must address these substances in their river basin management plans.

The process of developing such plans involves the identification of point and diffuse pollution sources and the design of appropriate control measures, which can include addressing pollution from industrial, transport and other accidents.

### Eutrophication

As already mentioned, one of the major pollution problems facing European waters is eutrophication, a process whereby water bodies, such as lakes, estuaries, or slow-moving streams receive an excess of nutrients. These nutrients, such as nitrogen and phosphorus compounds, stimulate excessive plant growth, commonly known as algal bloom.

When dead plant material decomposes, dissolved oxygen levels in water fall, causing other organisms such as fish to die. Eutrophication symptoms are found in some 40% of European rivers and lakes, and in the North, Baltic, and Black Seas and significant parts of the Mediterranean Sea.

Nutrients can come from a variety of sources. Diffuse pollution from agriculture, such as nitrogen fertilisers applied to agricultural fields, manure from rearing of livestock and the erosion of soil containing nutrients are responsible for 50 to 80% of all water pollution.

The second largest source of water pollution is wastewater originating from sewage treatment plants.

## Manure As Fertilizer

Sludge is, however, rich in nutrients such as nitrogen and phosphorous and contains valuable organic matter that is useful when soils are depleted or subject to erosion. The organic matter and nutrients are the two main elements that make the spreading of this kind of waste on land as a fertiliser or an organic soil improver suitable.

Addressing these issues, the EU has called on member states to process more waste water in centralized systems. As a result, the annual production of dry matter increased from 5.5 million tonnes in 1992 to nearly 9 million tonnes by the end of 2005 and this is presumed to have further increased since.

According to industry estimates, about 11 million tonnes of nitrogen and 1-1.5 million tonnes of phosphorus are used annually in Europe. However, some of these nutrients are lost both in direct processing, consumption on the field, post harvesting, and through the use as animal feed.

At the end of the value chain, waste is created for example by large quantities of food that is wasted, municipal wastewater as well as manure – all of which are relatively rich in nutrients. The EU is estimated to produce 1.8 billion cubic meters of manure every year.

## Circular Economy

The EU principles of waste hierarchy and circular economy can therefore be applied to nutrients in agricultural and food systems.

The EU sets the following priority order for managing waste: prevention, (preparing for) reuse, recycling, recovery and, as the least preferred option, disposal (which includes landfilling and incineration without energy recovery).

## Strategies to Reduce Phosphorus Loss

A strategy to reduce phosphorus loss from manure is to remove it prior to land application.

One of the worst affected regions in the EU is the Baltic, where eutrophication is a severe environmental problem.

Here, agriculture is the single largest source of new nutrients to the Baltic Sea, contributing about half of the total waterborne nitrogen and phosphorus inputs.

According to various studies, about 70% of crop production in the region is fed to animals, while only 30% is consumed directly by people. In addition, each year about 23 million pigs, 16 million cows, and 244 million chickens in the area together produce manure containing two million tonnes of nitrogen and 0.4 million tonnes of phosphorus.

A large volume of that phosphorus could be “saved” by feeding animals enzymes, such as phytase to break down the phosphorus before it re-enters the eco-system as manure. This would not only be beneficial for the environment, but it would also save money for farmers.

[Please read our latest global phytase market report for more details](#)

## Conclusion

As we have seen, it is important to reduce phosphorus losses as it not only hurts the farmers’ bottom lines but also damages the environment.

Not only that, there is no substitute for phosphorus as it is an essential element. Furthermore, an estimated 90% of it is used as fertilizer, making it irreplaceable in the human food chain.

What is more, without access to phosphorus, Europe will be unable to feed its population, therefore action needs to be taken to reduce its loss into the environment.

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