

Managing phosphorus cycling in agriculture

Market survey regarding reduction of phosphorus in pig feed



Introduction

The current manure policy aims to prevent the overuse of fertilisers and manure applications, so that the desired environmental quality is achieved. The manure market plays a major role in this. In the shorter term, solutions are required to take the pressure off the manure market. The manure innovation programme “customised feeding” sets out the policy to reduce the amount of phosphorus in animal feed.

Approach

This section of the manure innovation programme highlights:

- the effect of the use of reduced phosphorus pig feed on the price thereof;
- the expected distribution in global prices of raw materials for animal feed;
- the effect of the use of reduced phosphorus pig feed on the national phosphate surplus;
- the effects of reducing phosphate excretion in pig farming on the amount of manure to be processed and the costs involved.

In order to obtain insight into these aspects, Wageningen UR:

- conducted in-depth interviews with experts from the animal feed industry;
- performed calculations in order to obtain insight into the significance of another raw material composition for the cost price of pig feed;
- performed calculations in order to obtain insight into the effects of reduced phosphate emission from manure on the phosphate surplus and the manure disposal price.

In order to gain insight into the effect of another raw material choice on the cost price of feed, the raw material model from the animal feed industry was used. In order to gain insight into the effects of reduced phosphate emissions on the phosphate surplus and the manure disposal price, the MAMBO model (economic model for calculations concerning the manure and ammoniac problem) was used. The basic assumption is that the amount of phosphorus in pig feed can be decreased by reducing the indigestible part of the gross phosphorus. To do this, other raw materials are required than are currently often used in the pig feed. Thus the demand for raw materials with a relatively high level of digestible phosphorus will increase while the demand for raw materials with a relatively high level of indigestible phosphorus will decrease.

Results 2010

More favourably composed raw materials are more luxurious and more expensive and not available in all cases. Raw cellulose-rich products are less favourable. Waste products from ethanol production (wheat yeast concentrates and Distiller's Dried Grains with Solubles) are offered for lower prices but contain relatively little digestible phosphorus and a relatively high level of indigestible



phosphorus.

Model calculations show that through changes in raw material composition:

- phosphorus reduction of up to 20% is possible with a slight increase (up to 2%) in the feed price for sows and fattening pigs but not for piglets.
- Reduction of the phosphorus level in pig feed by 10 – 20 % results in a reduction in the farm surpluses by 6 – 10 million kg phosphate.
- This reduction in the phosphorus level in pig feed results in 25 – 40 % less manure processing and cost savings of 18 – 48 million euro's per year.
- Reduction of the phosphorus level in pig feed leads to another raw material choice.

Another raw material choice has no consequences for the international raw materials market. However the by-products in European bio-ethanol production, which contain high levels of indigestible phosphorus, are difficult to place and their price declines strongly.

With reference to the results of the model calculations, the animal feed industry points out that:

- Exclusion of raw materials can lead to higher rises in feed prices than indicated by the model calculations.
- Overuse of raw materials with little indigestible phosphorus can negatively affect animal health (diarrhoea or constipation).
- Pig farmers do not request reduced phosphorus feed because they are focused on improving his economic results and are not willing to take risks.

The composition of pig manure currently does not have a direct impact on the costs of manure disposal for the pig farmer. By tightening the use norms, a change in the mineral composition of pig manure (N the same, less P_2O_5) is better able to meet the needs of the crops grown. Moreover, per hectare more manure can be used when the manure contains less phosphate. As a result of the above-mentioned effects, the demand for pig manure can increase, thus halving the processing costs of pig manure.

Points for attention

- Pig farmers and representatives from the animal feed industry are insufficiently aware that when the phosphorus in pig feed is reduced, the amount of digestible phosphorus remains the same and still meets the needs of the animal.
- If changes in feed compositions coincide with problems related to the technical results or the health of the animals, the new feed composition will be regarded as the cause without a clear reason.
- Pig farmers do not like changing feed composition due to the risk of higher cost prices and lower technical results.
- The pig farmer does not feel motivated to use pig feed with less phosphorus.

Recommendations

- Aim for maximum use of the feed footprint so that manure processing is no longer necessary or do not use the feed footprint at all and focus solely on the processing of pig manure
- Investigate which interventions are required to remove existing barriers and routines among pig farmers so that they are more committed to using reduced phosphorus feed.
- Support them by making available frequently and easily measurable identifying instruments which are rapidly accessible and which can help them monitor and if necessary adjust farm processes.
- Provide an external incentive to the farmer at farm level which ensures that the

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- No. 27 Biochars from digested fattening pig slurry
- No. 28 Market survey into reduction of phosphorous in pig feed
- No. 29 Feeding management to reduce phosphate in animal husbandry
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