



S9.72 - Salts in rations with wet feed for fattening pigs and sows

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1. Welcome

GMP+ International provides the GMP+ Community with support, guidance and (background) information on the GMP+ FC scheme 2020 by means of our so-called "Support documents". These documents contain explanations and give examples of how the requirements can be implemented.

Different kind of supporting materials have been developed and include various tools, ranging from Frequently Asked Questions (FAQ) lists to webinars and events.

A special type of support documents are the reports of several studies, created by technical institutes, universities or research institutes. When considered still valuable, these documents are offered to the GMP+ Community as part of the Support Documents of the GMP+ FC 2020 scheme.



2. GMP+ Recommendations for feed

The recommendations are based on the report 'Salts in rations with wet feeds for fattening pigs and sows'. This report is based on a study¹ carried out in 2008 on orders of PDV, the former manager of the GMP+ FC scheme.

This chapter gives the summary of this report

2.1. Summary

In the GMP+ FC scheme maximum limits for minerals in wet by-products are set. The objective of the maxima for minerals in the system is to avoid health problems of pigs. Above the "action limit" suppliers need to communicate with users to give a warning and or adapt the advice to use. Above the "rejection limit", products should not be used at all.

The aim of this study is to evaluate problems in the field of pig farming, that could be related to increased levels of salts in wet by-product rations. Based on new limits for mineral levels in complete rations, new "action limits" per product will be proposed.

In the common practise of fattening pigs only incidentally symptoms are shown that could be related to a combination of increased mineral levels in combination with limited water supply. The symptoms in the field correspond well with the literature : sniffing, pale color, pushing with the head to the wall.

Based on the literature it can be concluded that above all an oversupply with sodium will result in problems mentioned above.

In many cases fattening pigs are not supplied with extra water apart from the water in the ration. Normally the dry matter content in the total ration is between 23 and 25 %. Based on a number of case studies it can be concluded that this practise does not result in health problems as long as the sodium content in the ration is below 3 g/kg (on the basis of 88% DM). In a ration with 20 % DM a sodium level of 4 g/kg (on the basis of 88% DM) did not result in health problems.

In the cases with obvious health problems the sodium levels were 7 g/kg (on the basis of 88% DM) and / or DM contents were significant higher. With similar DM intake of 2 kg/day, an increase of the DM content of the ration of 1 % results in an increase of the water intake of 0,3 L/day. No indications are found for a relation of problems with levels of potassium and chlorine in the rations.

The inventory of the use and the mineral levels in wet by-products learned that communication and information by suppliers is not adequate and transparent with respect to origin, name of the product, composition and mineral levels.

¹ This study is carried out by Hemke Nutri Consult



Problems with health only incidentally occur when using whey permeate, wheat alcohol by product, residues from pea processing and mixes of these products. None of the analysed samples had mineral levels above the "condemnation limit". A high number of samples had mineral levels above the "action limit", without any communication on warning or change of advice to use.

In general the levels of minerals in the wet by products corresponded well with the expected levels. With exception of products from egg processing, which were significantly higher in salt levels.

In all product sheets levels of Na, K and Cl are available, but for sulphate no information and analysis data are available. Levels of DM are analysed with simple methods on the farm. On the basis of this information complete rations are supplied with extra water.

The literature indicates the relevance to optimize the electrolyte balance (dEB). This is more important when using higher sodium levels. Optimum dEB levels improve digestion, daily gain and feed conversion. For fattening pigs an optimum dEB (Na+K-Cl) of 200 – 400 meq/kg is recommended.

A limited survey on problems related to oversupply of salt in the ration in combination with limited water supply in sows was carried out. Problems mentioned do not seem to appear in sow nutrition. The most important reason for this, is the lower DM content of the rations used : 17 – 20 %.

The literature indicates that the optimum for dEB in sows in lactation is lower in comparison to fattening pigs. Optimum levels of 50 – 100 meq/kg result in lower urine pH, higher feed intake of the sows and lower piglet mortality.

2.2. Relevant recommendations

The next recommendations are relevant:

- a) Supply pigs with extra water in the first hour after a meal. Using nipples with lower water flow can reduce over-consumption of water.
- b) Communicate clear and transparent about the origin, name, level of minerals and chemical components and advice to use wet by products. Communication via the website is regarded to be insufficient.
- c) It is recommended to also communicate the conserving agents used.
- d) It is recommended to use dEB when optimizing rations.
- e) It is recommended to start monitoring the levels of sulphates in wet by- products and other components of the ration.

Based on maximum levels for sodium in rations of 3 gram / kg 88 DM and DM contents of 23 -35 %, it is recommended to adapt the maximum inclusion levels of wet by products in the rations, depending their sodium level. In combination with an optimum dEB of 300 meq/kg and Sodium levels of 3 g/kg (88% DM) also limits for Potassium and Chlorine in the rations for fattening pigs are calculated to be 12,8 g K/kg (88% DM) and 4,5 g Cl/kg (88% DM).



A guide for maximum inclusion levels of wet by products in ration for fattening pigs, based on mineral levels and use of combinations of products is listed in the table below:

Product	Na (g/kg DM product)	Max inclusion % in DM
Cheese whey	8,6	10
Curd whey	8	10
Feed whey	11,9	7
Permeate	13	6
	20	4
	40	2
Wheat alcohol prod.	8	10
	15	6
	25	4
Egg mix	40	2,5

Recommendations for water supply of sows in gestation are taken over from a CVB review dated 1995.

For individually housed sows in gestation the basic demand is 2 L/kg feed, with addition that depends on the conditions :

- Sodium in the feed : For each gram sodium more than 1,3 g/kg feed the water requirement increases 0,35 L/day.
- Potassium in the feed : For each gram of potassium above 9,0 g/kg feed the water requirement increases 0,1 L/day.
- NSP in the feed : for every 100 gram NSP above the standard of 210 g/kg feed the water requirement increases 0,15 – 0,2 L/day.
- Room temperature : For each °C above 20 °C the water requirement increases 0,2 L/day.

In a group housing system it is recommended to supply 0,5 L of water extra, in order to avoid the slow drinkers do not drink enough.

At GMP+ International, we believe everybody, no matter who they are or where they live, should have access to safe food.

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