Reducing the dietary crude protein content in feed in Korea

In July 2021, the Ministry of Agriculture, Food and Rural Affairs of the Republic of Korea announced they were to revise standards and specifications to limit the content of crude protein (CP) in major livestock feeds to reduce surplus nitrogen in feed (first applied to pig feeds in December 2021).

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The national swine breeding phases are simplified, which used to be classified differently by each feed company, and -1% to -3% reduction of crude protein standards in these phases are now enforced at the national level. In this respect, the new measures are unconventional and rare on a global level (Table 1).

This announcement is currently applied only to swine feed. By 2024, the adjustment of the upper limit of CP content in feed is also expected on poultry and ruminants standards. A new standard is supposed to be applied to ruminant feed regarding fibre content.

The background of the revision on feed regulations is due to 2050 carbon neutrality declaration of Republic of Korea in the UN: to achieve the reduction of 710 million tons of greenhouse gas emissions by 2030 (-24.4% compared to 2017).

By gathering the voices of the feed industry, academic experts, and livestock producers, the newly defined regulation is based on the reduction of greenhouse gas emissions from the livestock sector out of 21.2 million tons (as of 2017) of total greenhouse gas emissions from agriculture and livestock.

Phase		Scope of use and purpose	Crude protein standard		
			Current	Secondary adjustment	Difference from current
Nursery pig		Before weaning	23% below	20% below	3%
Weaned pig	Early	7-11kg	21% below	17% below	4%
	Late	11-25kg	20% below		3%
Grower	Early	25-45kg	19% below	16% below	3%
	Late	45-65kg	18% below		2%
Finisher	Early	65-85kg	17% below	14% below	3%
	Late	85kg - slaughter	16% below		2%
Gestating sow			16% below	13% below	3%
Lactating sow			20% below	19% below	1%

Table 1. Adjustment plan for crude protein standards in the Republic of Korea.

It was subdivided into 4.4 million tons generated by intestinal methane fermentation and 4.9 million tons of nitrous oxide generated from livestock manure (total 9.4 million tons).

In addition, the Ministry of Agriculture, Food and Rural Affairs of Korea predicts that when 1% of CP in feed reduces through this revision, about 360,000 tons of nitrous oxide (N_2O) generated during the ripening process of livestock manure can be reduced. Additionally, up to 10% reduction in ammonia gas excretion is expected (Fig. 1).

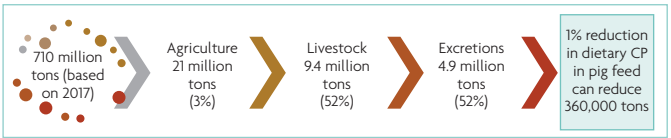
In addition, it is expected that feed cost can be reduced about $2.5~$3.3 per ton of feed by reducing the use of protein ingredients. This revision, which is currently being pre-tested for feasibility in various fields, was published in a revised version of the feed compendium in December 2021.

The response from the feed industry to this change in feed standards and specifications is very positive. Some Korean feed companies say that a slight CP change is necessary, however, most of the feed companies are already applying a low CP standard that is equivalent to this revision.

Therefore, no major change in swine feed formulations is expected at this moment. The expected CP reduction rate of Korea swine feed through the revision is about 0.6%.

In other words, this trend of reducing CP in feed suggests that the Korean livestock industry has been reviewing it for a long time.

Fig. 1. Greenhouse gas emission reduction flow of the Ministry of Agriculture, Food and Rural Affairs of Korea.



Benefits of low crude protein

In addition to the expected effect of low CP feed as an alternative to the carbon-neutral policy, low CP feed has economic benefits such as flexibility in the formulation in rising grain prices.

Low CP contributes to reduction of intestinal diseases such as diarrhoea and improvement of intestinal microflora, and improvement in animal welfare. Low CP also helps in the reduction of the negative impacts of antibiotics (AGPs) and antibacterial minerals (ZnO) bans. Therefore, it is aligned with the global trends of the livestock industry.

In addition, by reducing the amount of soybean meal used in feed, it is possible to use the arable lands more efficiently, which can contribute to resolving the global food crisis and to the stabilisation of grain prices.

However, an essential prerequisite for CP reduction is maintaining essential amino acid concentrations in feed using crystalline amino acids. L-Lysine, L-Methionine, L-Threonine and L-Tryptophan are generally prescribed amino acids in feed.

The recent spread of the low CP trend needs additional essential amino acids such as L-Valine, L-Arginine, L-Isoleucine, and L-Histidine.

In addition, the introduction of additional super low CP feeds and the expansion of the use of new raw materials will create a need for non-essential amino acids such as L-Glycine, L-Glutamate, and L-Serine.

As an eco-friendly bio company that produces eight essential amino acids for feed based on microbial fermentation, CJ Bio has been steadily making efforts to establish a trend towards low CP feed.

CJ Animal Nutrition Forum by CJ Bio, which started in 2014, is globally trying to lead and foster the low CP trend through monthly bulletins and opening various events and exhibitions. For the past 10 years, CJ Bio as a global leading company, has been steadily securing various verifications to the addition of amino acids in feeds, which will make low CP application feasible for the livestock industry. ■