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FEFAC Position on the development of a European Protein Plan

Introduction

The European Commission has announced it will publish a European Protein Plan by the end of 2018, based on a preparatory market study. The European compound feed sector is the largest industrial user of proteins of vegetable origin. Protein quality and availability reflecting the specific animal nutrition requirements, which is determined by the demand for essential amino-acids of farm animals, is the "key driver" which needs to be analysed in order to evaluate the future market potential of home-grown protein sources.

A comprehensive approach focusing on competitive supply of plant-based proteins for the mainstream market is of key importance, covering the contribution of all vegetable protein sources from forages, cereals and oilseeds and protein crops. This approach needs to take into account protein quality, i.e. concentration level of proteins, nutrient density, digestibility, presence of antinutrients, as well as plant species based crop efficiency and the respective sustainability taking into account the nitrogen life cycle & efficiency.

A successful EU protein plan shall aim to map out and link up all supply channels for vegetable proteins in view of optimising their use in animal nutrition, in particular by identifying the key actions to improve the competitiveness of European protein production. Any misguided attempt to reshape the current supply and demand balance through arbitrary policy and market management measures may only adversely impact the competitiveness of the EU livestock sector and thereby the sustainability of the EU protein production model.

A successful EU protein plan shall also take into consideration the non-plant sources of proteins, i.e. animal or microbial proteins sources. Although they constitute a minor proportion of the present protein supply, they meet the need of certain animal species in a more efficient way than proteins of vegetable origins.

Part A. The Global Context in Protein Supply and Demand

The growing global demand for products of animal origin puts pressure on the global demand mainly for protein-rich ingredients, which need to be produced sustainably. The global supply of protein-rich feed ingredients is highly concentrated through the production of soybean meal, being the protein source of choice for the global feed sector that best meets animal nutrition requirements on digestibility, palatability, availability, consistency, concentration, amino acid profile and absence of anti-nutrients. The fastest growing animal production sectors at global level are aquaculture and poultry, which have the highest demand on protein quality.

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Growth is anticipated for EU poultry and dairy production according to the DG AGRI 2017-2030 agricultural markets outlook. Despite expected progress in feed protein efficiency in animal nutrition, Europe's needs in protein-rich feed ingredients are also expected to increase. The European Union should therefore attempt to secure strategic access to the protein supplies for its livestock sector as its share of global soy imports is decreasing. In 2009 Europe lost its 'preferential buyer status' for soy imports to China, meaning its own specific customer demands have lost importance in a global market that is dominated by three exporting countries (US, Argentina, Brazil).

The market expectation is that protein will increasingly become the limiting factor and resource on the global agricultural commodity market. Therefore the development of a European Protein Plan is timely and necessary. The strategic dimension of protein supply should be felt throughout the supply chain, with efforts to keep on improving nitrogen and protein efficiency from fertiliser use, plant breeding, feed formulation & processing and manure management.

Notwithstanding the advances in plant breeding, cultivation and processing technology, Europe will not be able to reach self-sufficiency when it comes to vegetable protein supplies. A strong reliance on protein imports from third countries will therefore be here to stay for the foreseeable future.

Part B. The role of protein in animal nutrition

Meeting the physiological requirements of farm animals through feed formulation

The nutritional requirements depend on animal species, age, livestock production system, physiological stage, etc. As far as protein is concerned, animal requirements are expressed as digestible proteins for ruminants and digestible amino acids for other species. There is no harmonised nutritional system in the EU to evaluate the digestibility of proteins and therefore the animal requirements and the nutritional value of the feed materials are not evaluated in the same way across the EU. The animal nutritionist formulates the feed against these specific nutritional requirements, while taking into account the different protein sources, their nutritional value and also their possible negative effects on nutrition (antinutritional factors) and the environment (nitrogen and phosphates release in manure). The optimisation of allocating the necessary proteins or amino acids is a sophisticated balance between nutritional value of the feed materials available, the nutritional needs of farm animals, the economic efficiency and the protection of the environment.

In the feed formulation process, all protein contained in the feed materials are taken into account by the animal nutritionist, even when the protein content is low and the reason for the incorporation of the feed material is for other nutritional reasons (e.g. energy supply for cereals). This also means that the more a compound feed manufacturer is required to incorporate low protein feed materials, the more concentrated the protein content in protein-rich feed materials and the more balanced the amino-acids profile shall be.

Linking the suitability of protein sources with farm animal requirements

Protein sources are not universally interchangeable and for the different nutritional requirements, different protein sources are needed. Protein concentration, digestibility and amino acid profile are the factors that determine the functional quality and suitability for a category of animal.

Concentration: Young animals (piglets) or fish species require highly concentrated (>60%), digestible protein sources, such as fish meal, microbial proteins, insect proteins or other non ruminant processed animal proteins (for fish only) or skimmed milk powder.

Vegetable protein sources such as soya are not concentrated enough in pre-ceacal digestible amino acids. Feeding fattening pigs or dairy cows with highly concentrated protein is of low economic interest, considering that the cost of a protein unit is usually higher in very highly concentrated protein sources vs. medium or low protein concentration feed.

Digestibility of the source of proteins: An animal's ability to digest a specific protein source varies across the species and depends not only on the protein fraction itself, but also on other elements such as the presence of antinutrients or the nature of other nutrients. A typical example is grass, which is an excellent source of proteins for ruminants but is poorly assimilated by monogastrics due to the high presence of cellulose and lignin.

Amino-acid profile: The nutritional requirements of farm animals (except for ruminants) are not expressed in terms of total protein requirements, but as amino acids, in particular the essential ones (lysine, methionine). Therefore, by nature and in relation to its amino acids profile, a feed material may be more suitable for one category of animal vs. another.

It must be stressed that what matters for the animal is the quality of the protein source, irrespective of the plant breeding technology used for its production (genetically modified organism or not).

Improvement of protein quality of feed materials through plant breeding and processing

The protein value of a vegetable feed material can be improved at different stages of the chain starting with plant breeding.

It is possible to increase the protein concentration or the digestibility of a feed material via plant selection or via physical process, e.g. elimination of antinutrients & fibre components or concentration of the protein via fractionation (dehulled rapeseed meal), fermentation or hydrolysation process (soy protein concentrate). These physical processes are commonly applied in the EU in oilseed crushing, but still less for dried distiller grains (co-product of bioethanol production from cereals).

These concentration processes are efficient but may increase the cost of the protein unit. Where possible, concentration in proteins should be improved at an early stage of the chain (e.g. (improvement by plant breeding selection of the protein content in rapeseed to increase protein content in rapeseed meal).

For ruminants a key nutritional benefit can be obtained in preventing degradation of the protein in the rumen. To this end, rumen protection methods are used to bind the protein (e.g. via chemical substances or heat treatment) during its transit in the rumen.

It is also possible and common practice nowadays to correct the amino acid profiles of a diet via supplementation by free amino-acids.

Improving protein quality of feed materials by processing is possible but costly. Advances in plant breeding tackling protein yield and quality are suitable.

Recent evolution in animal nutrition and feeding practices - Innovation potential

Optimising the supply and demand of protein in animal nutrition also means reducing the protein surplus to improve nitrogen efficiency. This has been achieved in different ways in the recent past

- Reduction of protein content in feed: feed formulators used to take a security margins in terms of diet concentration in essential nutrients (e.g. certain amino acids) to avoid any risk of nutrient deficiency in the animal. These security margins could be reduced overtime, (crude protein levels in fattening pig diets decreased over the past three decades from 18.5 to 15.5%), partly triggered by environmental considerations, but

first and foremost made possible by the improvement of the methods for the management of the variability in the composition of feed materials and extension of the range of synthetic amino acids.

- Introduction of new feeding systems, e.g. via phase feeding: as the animals need change overtime, feed with different compositions are delivered corresponding to the different phases of the animal's growth or stage of performance. This is specifically the case for pig production and increasingly in dairy feeding.

These evolutions proved to be sustainable in practice and a better exploitation of the genetic potential of farm animals still allows in theory for a margin of reduction of 2 units in the levels of proteins in the diets for fattening pigs providing the quality of proteins is improved and the range of available free amino acids is extended.

However, the history of animal nutrition science shows that the evolution of the protein use pattern may need to be developed in a stepwise, incremental manner. It is essential to evaluate what the impact of using a new protein source is on the health & welfare of an animal, and therefore on its performance. It took 10 years for the veal sector to incorporate vegetable protein sources in diets in large proportions to compensate for the lower supply of skimmed milk powder. Similarly, it took 15 years for the salmon feed industry to reduce the inclusion rate of proteins of marine origin in fish feed diets by 60%. Today, innovation has even made it possible to produce salmon without any feed ingredients of marine origin but it will still take some time before it can become the standard for mainstream production.

Part C. The relative competitiveness of EU vegetable protein sources

Vegetable protein sources in Europe have a historic handicap in terms of competitiveness compared to imported vegetable protein. Protein crops, including oilseeds, are less protected from international competition than cereals grown in the EU. Price support for their development, either directly with coupled payments or indirectly with fiscal incentives for the EU biofuels policy (RED), are a key factor for EU vegetable production to be competitive. The EU biofuel policy has, as a side effect, contributed significantly to the EU protein supply the past decade with protein meal concentrates derived from particularly rapeseed and sunflower oil crushing, despite being part of the renewable energy policy. This contribution is valuable and shows that any European Protein Plan should not, and perhaps cannot stimulate EU protein production in isolation. A comprehensive impact assessment of the general framework of EU policies affecting homegrown protein production is needed to bring the strategic dimension of reducing the EU protein deficit more to the forefront.

The competitiveness of European vegetable protein is best served when it can be incorporated in mainstream market solutions. Market niches such as organic and non-GM have their legitimate place, but they lack impact on the long term investments in vegetable protein development.

Improving the competitiveness of vegetable protein sources requires optimised resources management (e.g. grazing practices) and agronomic practices to increase nitrogen efficiency.

Part D. The 7 key recommendations

1. The need for a comprehensive long term action plan

The EU needs to develop a comprehensive, long-term action plan regarding the competitiveness of EU protein production while meeting EU commitments to the United Nations Sustainable Development Goals. The protein dimension needs to become visible & explicit in the different EU policy frameworks affecting EU protein supply.

2. New assessment tools to analyse policy impacts

New and/or improved assessment tools are essential to accurately evaluate all relevant EU policies which impact the supplies of home-grown protein sources used in animal nutrition, including forages, cereals, oilseeds, protein crops and other 'non-vegetable' protein sources. The CAP "post 2020", the Renewable Energy Directive, the implementation of the COP21 agreement (GHG reduction targets) in the livestock sector at national level, the Circular Economy policy, the plant breeding technology policy and the EU legislation on crop protection are examples of such policies.

3. Make the EU FeedMod operational

The existing EU FeedMod modelling tool should be made operational and routinely updated and used to accurately assess trends in animal nutrition demand for proteins and amino acids requirements for the EU livestock population.

4. Include forage production and grazing in the EU protein balance sheet

In the next phase of development of the EU protein balance sheet, the protein supplied through forage production and grazing need to be included. These are the most important sources of vegetable proteins for the feeding of ruminants.

5. Development of a regional supply and demand model

The potential feed uptake of home-grown vegetable proteins depends to a great extent on local/regional solutions reflecting specific animal nutrition demand patterns at local /regional level. A regional supply and demand model should be developed to capture impact of greening measures on protein production and assess usage of locally/regionally produced protein sources in feed and livestock production.

6. Fostering pre-competitive research in animal nutrition and plant breeding science

Joint EU research projects are required to link animal nutrition science with plant breeding science to address current identified challenges on protein quality (concentration levels, amino-acid profiles, antinutritional factors etc) of vegetable protein sources, including rapeseed, sunflower and soy. As far as possible trade-off (e. g. benefit of home-production of protein source like rapeseed meal vs. its high non-digestible phosphorous content excreted by animals in the environment) should also be included in research projects.

7. A level playing field for the "non-GM" feed market

The signatories of the "EU soy declaration" fail to recognise the absence of a harmonised EU legal definition of "non-GM" feeding requirements and the use of respective claims for animal products. The EU should assess the best options to ensure a level playing field for the "non-GM" feed market niche and related product claims for products of animal origin. However FEFAC stresses that the GM vs non-GM debate has no impact on protein quality and requirements for the farm animals, but may negatively affect the competitiveness of EU feed production due to higher cost of sourcing of non-GM protein sources.