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The Search for Alternative Protein Sources

When it comes to producing feed for food-producing animals, sourcing proteins is by far the biggest sustainability challenge. The feed industry continuously explores potential alternative protein sources, always with feed safety as the primary requisite that needs to be complied with. In the margins of EXPO Milano, FEFAC organised a workshop on alternative protein sources on 9 October 2015, together with its Italian feed industry member association ASSALZOO. About 130 participants, including experts from EFSA, the European Commission and supply chain partners, discussed the viability of alternative feed protein sources such as insects, algae, protein sources of vegetable and marine origin and single cell protein like yeasts, with a specific focus on their risk assessment and management.

Alberto Allodi, member of the FEFAC Council & Praesidium

Though pea concentrate and seaweed show encouraging short term results as vegetable protein sources when it comes to nutritional value, yield and carbon foot print, Marinus van Krimpen from the Wageningen University clearly stated that in the long run the most promising economic alternative to imported soya would be soya produced in the EU. As EU farmers currently manage to harvest more net protein of a hectare of wheat than of a hectare of soy, Van Krimpen stressed that yields from EU soy production need to increase from 3 to 5 tonnes per hectare to become a sustainable alternative.

Elaine Fitches from PROteINSECTS and Antoine Hubert from IPIFF (International Platform of Insects for Food and Feed) presented the qualitative and economic aspects of insect farming. Insects have high levels of highly digestible protein (up to 60%) and can harvest up to 150 tonnes per hectare in a very short life cycle. To become a sustainable protein supplier to the feed industry though, the experts differed on the ideal feed substrate. IPIFF members prefer to stick to vegetable substrates, meeting current EU legal requirements, with possible extension to former foodstuffs of animal origin like meat in the future. The EU-funded FP7 project PROteINSECTS pleas for exploration of other substrates such as manure and catering waste, which are not permitted in any type of EU livestock farming (including insect farming) for the time being. Tilemachos Goumperis from EFSA highlighted that generally speaking insects are safe for feed and food use, based on available data, but noted the need for more research in the area of microbiological risks and chemical contamination.

Both Fitches and Hubert called on the Commission to review the part of the legislation that places processed insect protein under the same slaughtering requirements as all other non-ruminant processed animal protein. The current requirement to carry out the slaughtering of insects in a registered establishment is not feasible. Tackling this first legal hurdle would at least allow insect farming, which has seen a strong professional development over the past 5 years in other world regions, to be used in aquaculture. Martha Ponghellini, acting head of unit of DG SANTE, pointed out that new feed materials such as insects should not be

considered “novel feeds” in the sense that they are new sources, but rather in the light of the innovation introduced at production level in order to reach an industrial processing scale. The participants agreed that when it comes to the consumer acceptance of insect inclusion in animal feed diets, there is still a lot of work to be done as well.

As regards proteins of marine origin, Enrico Bachis from IFFO, the Marine Ingredients Organisation, made clear that fish meal resources are declining and fish by-products from fisheries (trimmings) and aquaculture are the key alternatives for the time being. Meal made from fisheries by-products has a very good amino acid profile; however, compared to wild-caught fish meal, it holds lower levels of protein content and higher levels of ash. Furthermore, for aquaculture by-products stricter regulation applies (intra-species recycling ban) and there is an increased risk of chemical and antibiotic residues. As far as algae are concerned, autotrophic production in large water tanks would likely be the most viable production method to deliver feed proteins in the future. Despite the fact freely available sunlight and CO_2 are used, meaning no competition for raw materials, the cost of production still has to come down to move from food to feed as an outlet. Bachis further highlighted the valuable protein source provided in the form of krill; however, this source is physically limited and may increasingly come into competition with direct food use. The growing of carnivorous marine worms, which can be fed on fish waste, has so far not proved to be financially viable and appears to accumulate contaminants.

Philippe Tacon from COFALEC, the Confederation of Yeast Producers, showed that single cell proteins, in the form of bacteria, yeast, fungi or microalgae, which can be grown on agricultural, human or animal waste, provide an interesting source of proteins, especially for aquaculture. Yeasts contain 49% of highly digestible protein on average with an amino acid profile close to soya and fish meal. They can be produced directly for feed purposes (primary yeasts culture) or indirectly, for example the fermentation by-products resulting from breweries. Yeasts are also placed on the market in the form of Dried Distillers Grains with Solubles (DDGs), usually originating from the bioethanol industries in the USA and Brazil. Controls on primary yeasts are however very strict, due to potential contamination of pathogenic microorganisms and the possible presence of material from GMMOs (Genetically Modified Microorganisms), which triggers GMO food and feed legislation.

From left to right: Antoine Hubert (IPIFF), Marta Ponghellini (DG SANTE), Daniela Battaglia (FAO), Lea Pallaroni (ASSALZOO), Angela Booth (AIC), Enrico Bachis (IFFO), Philippe Tacon (COFALEC), Marinus van Krimpen (Wageningen University), Alberto Allodi (ASSALZOO)

With this workshop, FEFAC and ASSALZOO have allowed supply chain partners, risk assessors and risk managers to put all cards on the table when it comes to the evaluation of the risk profile and economic viability of alternative protein sources. Angela Booth, AIC and Chair of the FEFAC Sustainability Committee, was right to state that the feed chain partners supplying to our industry need to take their responsibilities in assuring feed safety and facilitating access to information on risk profiles. In his concluding statements, Peter Radewahn, Chair of the FEFAC Animal Nutrition Committee, stated that the alternative protein sources discussed in Piacenza should never be considered a waste, both in legal and conceptual terms, and that the EU Commission has to work on the legal obstacles that impair the contributions of these feed materials. In my view it is clear though that, despite the laudable efforts for looking into alternative proteins, the EU feed industry will still rely on imports of predominantly soy from the Americas as the major sources of protein for the foreseeable future to fulfil the needs of our livestock sector.

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