A NEW STANDARD FOR ORGANIC LAYER RATIONS

Whilst organic egg production is growing, formulating sustainable organic diets still has challenges. Limitations on ingredients can result in over supply of certain nutrients. With higher cereal levels there is less 'room' in the diet to provide fibre optimally.

Additives used in conventional diets to improve productivity and health may not be allowed. Another issue has been availability of organic oil to supply energy in layer diets. In sourcing this key ingredient, ForFarmers has been able to revolutionise organic layer rations; addressing many of the nutritional issues faced. It has also meant that the diets can be manufactured as a mash; improving feed efficiency and flow through the feeding tracks; resulting in less waste.

ForFarmers launches its new range of organic layer feeds

Access to organic soya oil, has enabled ForFarmers to revolutionise organic layer diets, with its new range of organic feeds. Iain Campbell, Poultry Specialist at ForFarmers, explained that until now UK feed mills haven't had ready access to organic oil due to limited, holding tank space and cultivation of organic soya. "Due to the nutritional needs of organic poultry, we've used our resources and

purchasing power, to source organic soya oil manufactured in Europe." Organic formulations have previously been constrained by space, as higher levels of cereals, in particular maize, were included in order supply sufficient energy to birds. "Egg production requires a lot of calories. Including organic oil means we can supply the energy hens need, and free up space in the diets."

ForFarmers has many years of experience supplying feed to organic livestock producers, along with diverse technical and manufacturing knowhow. "Personally, I've been working with organic layer customers – both established and new conversions – offering nutrition and management advise throughout my tenure. These years of experience with producers meant we knew exactly what they want and what the birds needed."

Diets are now being manufactured at their Penrith mill

Organic egg producers use the same layer genetics as in free-range and colony-cage systems, therefore requiring the same level and quality of nutrition. Iain described how, "with the Natural Organic range ForFarmers is providing exactly that. This phased feeding system is now being supplied to both organic egg and pullet producers within our customer base. The diets sit within the company's VitaFocus layer range. These new rations also utilise nutritional concepts, which support shell and egg quality, as well as size; over longer laying cycles.

Organic regulations

Organic hens need at least the same level and quality of nutrition in order to achieve their full potential, as conventional birds. The majority of the raw materials used in organic diets must be organically certified. However, depending on the particular certification body – around 5% of the raw materials of agricultural origin may be non-organic.

Nonetheless, certain raw materials are prohibited, including:

- Materials produced with the use of genetically modified organisms or products derived from them
- Synthetic amino acids
- Artificial colourants and flavours
- Ingredients that have been extracted using solvents
- Animal by-products.

Whilst in conventional diets produced in Europe, the use of fishmeal is cost prohibitive and may be undesirable – it is used in organic diets, particularly for young animals, in order to achieve amino acid requirements. However, if organic diets for pigs and poultry are being made in the same mill as diets for ruminant animals – fishmeal cannot be used to due potential contamination.

Organic raw materials

Whilst there are organic cereal growers across Europe, much of their produce goes into human food. Farmers can achieve higher prices from manufacturers making organic bread, breakfast cereals, snack bars etc. As such much of the cereals used by organic feed manufacturers come from outside Europe. Ukraine is a common source of organic wheat for example. Collaboration between organic cereal growers and feed mills in Europe has been discussed, in order to increase acreage.

Protein raw materials are a further challenge, as soyabean meal is called for in organic formulations. Not generally grown in Europe, the majority of organic soyabean meal currently comes from China and India. Sunflower meal is also used, for its protein and energy contribution as well as fibre level – the provision

To meet the nutritional requirements of organic hens, wheat, barley, maize and soya will be used, along with sunflower, to provide fibre.

of which is also a requirement of many organic standards. This can be sourced from Europe but may also often come from further afield. Peas and beans may also feature more often in organic rations. Raw material buyers also face issues where countries of origin have political or economic problems, making supply unreliable.

There has been significant research into homegrown protein raw materials in order to address sustainability in agriculture. As the transport of soya from South America significantly adds to food miles, whilst its cultivation is linked to deforestation. Crops such as lupins have the potential to supply protein in monogastric diets, along with increased use of oilseed rape but the supply of organic material is currently limited.

Formulation

Feed ingredient limitations have already been discussed but what are the implications on formulation. Meeting nutritional requirements for organic hens is less of a challenge, than for broilers or pigs for example. However, similarly fish meal will be attractive cost-wise, in order to achieve the desired methionine level. Wheat, barley, maize and soya will be used, along with sunflower, to provide fibre. As organic hens cannot be beak trimmed, managing aggression is important. Fibre is known to help but with the use of high protein ingredients, there is not much space left – so free choice fibre provision is a useful option. In certain housing systems, the lower stocking density can result in sub-optimal densities. In which case, energy levels may need to be increased to ensure that egg size/number is maintained.

Prairie meal, a concentrated maize by-product following starch extraction, is often used. Which as well as adding to protein levels, also helps with yolk colour. Pigments that would

be added to conventional layer diets are not permitted in organic rations, although a concentrated alfalfa source can be used. These products add yellow pigments but not red, so yolks are yellow rather than orange, which can reduce their visual attraction for consumers.

Another challenge when formulating organic diets is delivering amino acid requirements without access to pure individual amino acids, which inevitably leads to the oversupply of protein. Andrew Fothergill, National Poultry Advisor with ForFarmers, explained that, "when a layer's diet is too high in protein, gut health is negatively affected, which can lead to wet litter; problems with flies and potential disease transmission."

Positive consequences

Access to organic soya oil, allows formulation of a wheat-based diet, as most conventional layer rations are. "It avoids the need for maize, a higher energy cereal source. Wheat delivers better feed structure to promote gizzard function – a significant driver of gut health. Removes the need for fishmeal, which is required when diets are short of space and need high protein density ingredients to make space for energy. Conventional birds are rarely fed fishmeal, as it isn't nutritionally necessary", detailed Andrew. Also, vegetable protein sources, like soya have more value in terms of feed structure and fibre content than fish. Which is a cost burden in layers diets but is still needed to formulate chick diets, due to the higher levels of protein required.

Andrew described how, "In the new diets we are able to more easily meet energy requirements from oil supplementation and are able to more fully exploit medium energy ingredients such as sunflower meal. This, as well as providing protein, is an excellent source of structural fibre. Which improves gizzard function and helps support intestinal health."

Methionine sparing

Andrew added that achieving the level of methionine required for optimal egg production, is a particular issue. "The new diets include feed materials that support the bird's functional methionine requirements and methionine regeneration; freeing up other sources of this amino acid for structural processes; essential for increased productivity and egg size." If diets don't contain enough methionine nutrient availability of the whole ration may be reduced.

Methionine can be described as having two distinct roles to play:

- Structural - as a building block of protein (egg/feather/muscle)
- Functional – as a methyl donor in metabolic pathways

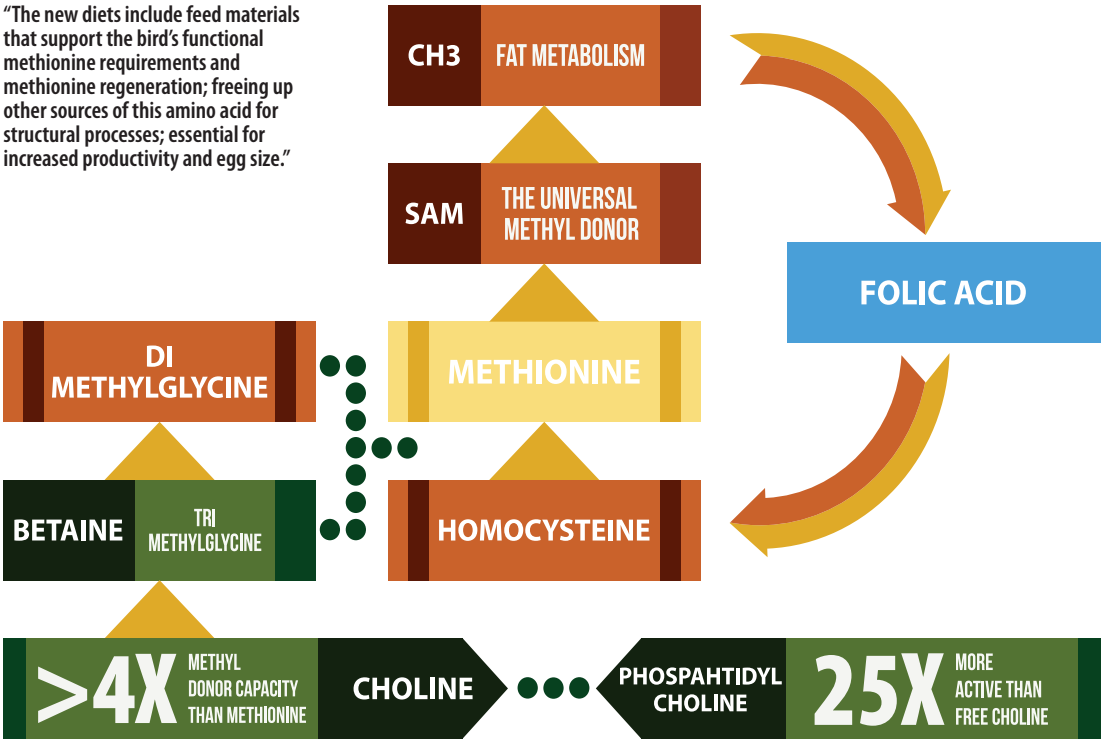
Under organic farming systems, adding pure methionine to the diet is prohibited, but feed materials naturally rich in methionine can be added. There are also feed ingredients rich in methyl-donors choline and betaine available. This allows the naturally occurring methionine in the diet to be directed to production. "We have identified two feed materials with potential to feed into the methionine pool, either directly, as precursors or regenerators of active molecules, or by way of providing functional activity and sparing methionine for productivity," he explained.

Enzyme opportunities

The use of GM technology in enzyme production prohibits the access of many feed enzymes to organic farmers. However, phytases and carbohydrases are widely used in conventional layer diets:

- To degrade phosphorus held as phytate in plants
- To degrade long polymer chains of xylan and ß-glucans in cereals

"The new diets include feed materials that support the bird's functional methionine requirements and methionine regeneration; freeing up other sources of this amino acid for structural processes; essential for increased productivity and egg size."



There is no available product to assist with phosphorus utilisation, available for use in organic diets. However, ForFarmers has identified one multi-functional enzyme, produced naturally without GM technology, which is acceptable to organic production systems. Andrew described how the product is, "primarily designed to aid the digestion of feed by assisting the breakdown of components from cereals; the multi-enzyme product helps overall digestive efficiency, promotes intestinal health and helps reduce excreta moisture content."

Trials in organic broilers showed a significant improvement in FCR of 0.1 - between 0 and 35 days. "The product will undoubtedly improve feed efficiency in laying hens, albeit probably to a lesser extent. It will also reduce excreta moisture and therefore quality of environment in the house – drier litter, leading to better foot / leg health, fewer flies etc." Components in cereals increase the viscosity of intestinal contents, reducing the freedom of nutrients to be digested. Enzymes restore fluidity to intestinal contents and by breaking down the viscous polymers, release sugars which specifically feed the 'good' bacteria. "Together these effects improve digestion, leading to improved efficiency."

Feed form

"Most organic layer feed is produced in the form of a crumb, to mitigate the problem of a lack of oil resulting in dry, dusty feed," explained Andrew. "A mash is undoubtedly the best way to feed laying hens – the availability of organic oil has allowed us to produce our organic rations in this form. There are significant advantages in terms of gizzard function, digestibility and efficiency." Along with supply of nutrients an improved feed form is of benefit to feed manufacturers, poultry producers and the birds themselves. Hens often play with and spill crumb, but with its excellent grist quickly these mash diets are a much more efficient way to feed laying hens.

A capital investment project to install a holding tank specifically for organic oil, along with a dedicated delivery system, was required to realise the company's plans at Penrith mill. "This allows quantities of oil to be directly metered into the mixer, which is linked to the mill's computerized manufacturing and formulation software. The use of oil further improves the quality, consistency, flow through feeding systems and palatability of the diet.

Supporting health & productivity

There are a wide range of additives available to nutritionists; enzymes, probiotics, phytochemicals, essential oils – to name a few. Depending on the situation products can be included to assist in digestibility, gut health, immunity. But for those producing organic feed – options are very limited. Some of these products will be ruled out of organic diets, due to the use of synthetic carriers or their production methods – e.g. solvent extraction or GMO. Others maybe entirely naturally derived but lack the relevant organic accreditation. Unfortunately, due to the relatively small size of the organic market many manufacturers don't see getting organic certification for their products as worthwhile. Whilst there are positive lists for ingredients in organic feed, they will be listed separately and may be different for different accreditation bodies. Combination additives can also be an issue. For instance, the addition of a specific organic acid may be allowed but including a blend would need specific approval. This means that options for nutritional control of salmonella are restricted.

In order to ensure animal welfare, antibiotics are allowed to be used in organic diets when animals are sick. A veterinary prescription and derogation for the organic certification body is required. However, the withdrawal period for them and other medications such as wormers are often longer for organic production and the number of times they can be used in a flock is restricted.

Market challenges

One of the biggest challenges if the market for organic eggs, pig and poultry meat grows is the availability of organic raw materials, particularly the distances they may be travelling. Alongside meeting amino acid requirements without oversupplying protein. These issues challenge the financial and environmental sustainability of this niche market. With a drive to reduce antibiotic use, prevent disease and support immunity – organic producers are also limited in the use of nutritional additives – although the extensive nature of the production systems makes this less of a challenge. It seems sensible therefore, for organic feed producers to have open dialogue, with organic accreditation bodies around raw material availability and specific additive use. "In terms of promotion of organic diets, it has been difficult to add value with formulations focusing on meeting basic nutrient requirements, until now!", Andrew enthused.

Fulfilling a need sustainably

Iain concluded, "our customer base needed a new product, fed as a mash, that allowed organic birds to fulfil their genetic potential. The industry was desperate for it and we have provided it this in this new organic range." With their experience in the organic market ForFarmers has been technically striving to improve products offered through innovation." With government backed focus on sustainability throughout agriculture, the time was right for ways to improve organic diets for layers. The technological advances will lead to less feed waste, more efficient egg production – through maximisation nutrient availability from raw materials. By reducing oversupply of protein, potential pollution issues are reduced and gut health, along with welfare is supported. It will also help to

reduce the mileage travelled of organic raw materials – although this issue still needs work.

ForFarmers started manufacturing the new range at the Penrith mill in February. "Most of the organic egg producers I work with have switched, or are in the process of switching, to the new range. They have quickly noticed improvements in shell quality, seeing less seconds. Also reporting greater feed intake, which means more nutrients available for egg production." Many comments have focused on the feed form, the mash flows very well through feeding systems, with less wastage. With growth in the organic poultry market– it is an exciting time for ForFarmers. "By investing technically in our diet offering, we are now able to supply the ration that all organic egg producers need. With the benefits of a mash, this cutting-edge nutritional development, allows organic layers to fulfil their genetic potential."