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ANIMAL HUSBANDRY

Organic and regional feedstuffs for pigs and poultry

Sustainable organic diets for monogastrics in Europe

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ABSTRACT

Providing organic pigs and poultry with a balanced diet that is fully organic and based on regionally-grown feedstuffs is a challenge and particularly so when sourcing quality proteins that satisfy amino acid requirements. Across Europe, there is a serious shortfall in the amount of organic feed grown and the amount required. In the UK, the self-sufficiency rate for crude protein is only 30 %. The shortfall in monogastric feed is further exacerbated by half of the available protein being fed to ruminants. ICOPP and OK-Net EcoFeed projects have both identified the need to seek alternatives to reduce the need to import feedstuffs. Trials in different European countries offer some viable solutions including an increased and novel use of forages such as nettles and bio-refining grass leys to extract high-quality protein. Utilising byproducts from the human food industry and different processing techniques including sprouting seeds and on-farm heat-treating of regionally-grown soya and field beans offer further promising solutions. Alongside the trials, to help create balanced diets using organic and regional feedstuffs, a ration planning tool is being developed to support farmers and advisors at an individual farm level as part of the OK-Net EcoFeed project. Good knowledge exchange is key to help ensure that identified solutions are utilised as widely as possible and, as an organic knowledge exchange network, OK-Net EcoFeed has created a library of tools developed from past research and extension work to which will be added the results of trials currently being tested. All of the tools will be placed on the open access Organic Farm Knowledge platform.

INTRODUCTION

A goal in organic farming is to offer animals a balanced diet that is fully organic and based on regionally-grown feedstuffs. However, achieving this for pigs and poultry is problematic and the two biggest challenges are closely linked. Sourcing quality protein that satisfies specific amino acid (AA) requirements, particularly lysine and methionine is difficult. Overfeeding lower-quality protein can correct AA levels but leads to nitrogen pollution whilst underfeeding protein risks health and welfare problems as well as poor production. The higher quality protein sources, for example soya beans, are typically imported from other continents, such as China, increasing both human/animal feed competition issues and pollution problems associated with excessive food miles. In recognition of the problems facing the organic, monogastric farming sector, and to allow time to find solutions, European legislation has permitted the use of five percent non-organic feedstuffs until 2021.

SOME SOLUTIONS

It is estimated that 330,000 tonnes per year of organic animal feed are required for organic livestock in the UK but farmers are only able to grow 141,000 tonnes. At about 30 %, the self-sufficiency rate for crude protein is low, and for the AA methionine it is even lower, at only 14 %. ICOPP calculated that 49 % of crude protein is fed to ruminants and note that reductions here would help solve shortages in monogastric feed. The low self-sufficiency rates indicate that innovative and alternative feed sources must be considered including cultivated insects and byproducts from the human feed and fishing industries. Additionally, forage in organic animal diets is mandatory but its full contribution to monogastric nutrition is not well understood. A trial in the UK found that locally-grown protein sources, particularly peas, together with a lucerne-silage-based feed ration, can replace soya beans for growing pigs. Silage can also help subordinate sows increase feed intake when concentrates are restricted. If properly processed, sainfoin seeds can be used as a substitute for soya bean expeller for weaned piglets. The contribution of insects and invertebrates foraged from the range was also investigated and earthworms (**Table 1**) were found to offer the most potential for laying hens whose lysine requirements could be met with access to one square metre of land.

Table 1 Earthworm yields of dry matter, crude protein, lysine and methionine content from different farming systems

	Yield g/m²			
	Dry Matter	Crude Protein	Lys	Met
Pasture	23.1	11.9	0.78	0.22
Woodland	18.9	9.7	0.63	0.18
Agroforestry	30.3	15.6	1.02	0.28

The OK-Net EcoFeed project is working with farmers and other industry stakeholders to develop an organic knowledge network on monogastric animal feed across Europe.

Existing knowledge has been gathered to identify and share current solutions and developed factsheets are available on the Organic Farm Knowledge platform. Other key texts have been translated to further improve access to existing knowledge. Additional factsheets and videos are being created from trials in each participating country, the topics of which include bio-refining grass/clover to extract protein; how to grow and feed nettles and camelina; how to sprout and feed grain and seeds; improving gut health to optimise utilisation of nutrients; stabilising brewer's yeast as silage; on-farm processing of locally-grown soya; growing rotational protein fodder for foraging pigs and creating flexible seasonal feed plans based on exclusively homegrown and regional feedstuffs.

Alongside the trials, a ration planning tool is being developed to support farmers and advisors at an individual farm level in the development of balanced diets using organic and regional feedstuffs. To further increase the sustainability of organic monogastric feeding practices, farmers identified a broader need to understand more about the nutritional content of all available and potential feedstuffs and more about the nutritional requirements of different breeds at different ages and production stages.

Conclusion

Supplying fully organic and regionally-produced diets to organic pigs and poultry across Europe is a challenge but the ICOPP and OK-Net EcoFeed projects show that collaborating with farmers and other industry stakeholders and using a toolbox-like approach to research can identify solutions. Practical trial outcomes indicate that using novel and innovative feedstuffs can help to reduce the reliance on traditional protein sources such as soya beans. Forage is mandatory for organic livestock diets but its full potential as a quality protein feed is not yet realised. Identifying and sharing both existing potential solutions and project trial outcomes can help to progress learning and reduce inefficient repeat learning. The open-access Organic Farm Knowledge platform has been developed to help improve knowledge exchange.

References

1. Repository of knowledge for European organic farmers and other stakeholders: organic-farmknowledge.org
2. OK-Net EcoFeed project website: ok-net-ecofeed.eu
3. ICOPP publications and technical notes: tinyurl.com/y39um75o

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