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Organic Animal Husbandry Still Needs a lot of Scientific Support: The Example of Germany

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Abstract

Organic farming is based on the idea of an environmentally-friendly food production system with high animal welfare standards. Nevertheless, reality shows many problems in reaching these goals. There are many problems in animal health and welfare that remain unresolved and present a challenge for individual producers and the industry as a whole. These include: , achieving balanced, 100%-organic, feed rations that produce adequate growth rates and high product quality, animal-friendly transport and slaughtering, sustainable use of local resources and, last but not least, profitability and efficient use of resources.

Beside these internal issues organic farming is increasingly being asked to give answers to the main challenges facing humanity: food security and safety for an ever-increasing world population, climate change, increasing pressure on non-renewable resources (energy and crude fertilizer like rock phosphate), losses in agricultural and natural biodiversity and last but not least development of rural areas.

Key words: Organic livestock, animal health, scientific support, husbandry

The organic livestock market

Livestock contributes significantly to the income of organic farmers. For example, in 2008 German organic farmers sold products with a value of €1.2 billion, 46% of which was derived from livestock products. About 461,000 tons of organic milk (1.6% of the market share) and 50,000 tons of organic beef (4.3%) were produced. Organic eggs comprise 3.3% (425 million) of the total egg consumption in Germany. Organic sheep and goat meat account for the largest percentage of market share (8.8%) of animal husbandry products, but the total amount is relatively small, at 3,600 tons. At the other end of the scale organic pig and poultry meat have less than one percent of the market share.

Organic Animal Husbandry does not always fulfil its promises

Animal welfare is a central objective of organic farming and one of the most important reasons why consumers purchase organic products. In 1980 IFOAM set out its objective of "providing farm animals with living conditions based on animal welfare and an ethical basis" This subsequently became incorporated into the European organic farming standards (as defined in 834/2007/EC). The reality, however, often differs from this aim.

- Hybrid poultry - bred for cages and intensive keeping – are kept on organic farms and often show severe difficulties in behaviour (including feather pecking and cannibalism) and health problems. Male chicks from laying hen populations are still killed instead of fattened. No farm-reared breeds of poultry or double purpose breeds are used because they do not fulfil the performance and production requirements of farmers. Poultry is still kept in large flocks, with several thousand animals in one barn.
- In pig production, the castration of piglets is an unsolved problem. Conventional pig production has forced the abolition of castration but this is causing problems in organic pig farming as it has an impact on farming practice (i.e. the keeping, feeding and housing of boars), the

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environment (i.e., the climatic impact of anaesthesia), profitability (i.e. production cost advantages, marketing sacrifices) and meat quality (i.e. odour, tenderness, juiciness, low intramuscular fat content). Another problem in this sector is the mortality rate of piglets, which is higher in organic than in conventional systems.

- Last but not least the organic dairy sector also experiences problems. The removal of horns from beef cattle is still widely practiced on organic farms. The life expectancy of organic dairy cows is no higher than in conventional dairy systems and the use of animal medications is not significantly less (although more natural medications are used). The tethering of cows is still permitted on small organic farms (with less than 35 cows) and is widely practiced. Milk production is still heavily reliant on the use of cereals, the organic ration can contain up to 40% concentrates: 50% in the high lactation phase and in practice even more.

Feeding livestock is one of the most difficult problems. As a consequence of the BSE crisis, omnivores, such as pigs and poultry, have been turned into vegetarians/vegans yet are still expected to maintain rapid daily weight gains (and therefore need a high level of intake of essential amino acids). While conventional animal husbandry permits the use of synthetic essential amino acids, these are not allowed in organic agriculture. But plant based organic feeds have not closed this protein gap for fast-growing young animals like piglets and broilers as well as high yield animals like sows and laying hens. The "vegan" diets for these animals does not contain sufficient essential amino acids. However from the start of 2012, 100% organic feeding will be required by law in the EU, although the problem of how to close this gap has not yet been solved.

In can be concluded from the numberous status qou analysis in Germany since (carried out in the German Federal Organic scheme; Bundesprogramm Ökologischer Landbau), that on many organic farms animal husbandry is unsatisfactory in terms of both animal welfare and production yields. This creates both an economic and an image risk.

How can science help?

Organic animal husbandry can be improved through scientific efforts, communication and the application of results. The main focal points should be animal productivity and welfare, resource efficiency, green house gas mitigation, biodiversity, product quality and, last but not least, profitability. In 2000, the German government established the Institute of Organic Farming, to develop sustainable and efficient organic farming systems with a focus on animal husbandry. It has a 600 ha experimental station with modern laboratories, stables and equipment, where about 100 staff members, including more than 30 scientists, carry out interdisciplinary research in dairy farming, pig production and keeping goats and sheep.

Example 1: Comparison of dairy cow breeds

Since 2004 we have been experimenting on our research farm, comparing the high-yielding German Holstein dairy cow, which is widely utilized in both conventional and organic dairy production, with the locally typical German Rotbunten, an old 'dual-use' breed (Aulrich et al. 2011). We have a special barn with two identical halves, where two herds of 50 animals each are kept separate, but under the same management conditions in terms of stabling, feeding and milking. We are conducting a long-term study, collecting and comparing breed-specific data for numerous criteria, particularly related to performance and health. We are investigating the very high-risk period after calving, when milk production increases and it is difficult to provide the dam with all its calorific requirements. The results showed that the Holstein experienced more metabolic stresses, but that this did not necessarily lead to an increased incidence of disease. In terms of udder health – a key issue in dairy farming - the Holstein performed better than the Rotbunten. This leads us to question the common assumption that higher productivity is inevitably accompanied by an increased susceptibility to disease and to argue that management plays a critical role. We recommend that

organic farmers choose the breed that baest suits them and their operation and not be dogmatic about origin. This, however, does not negate the very strong argument for preserving old local breeds in the interest of biodiversity.

Example 2: 100% organic feed for pigs

The Institute has also studied the ability of pigs to overcome the problems associated with the amino-acid deficiency during the initial fattening period through later compensatory growth. This deficiency occurs when 100% ecological feed is used. It was found that the experimental group, which received significantly more food in the later stages than the control group(s), gained more weight in the later stages and the overall rate of feed conversion remained unaffected. Our results led us conclude that it is possible to achieve economically sustainable growth performance and 'butcher-quality' pigs with 100% organic rations (Weissmann 2011).

Example 3: Biological control of endo-parasites (Gastro-Intestinal-Nematodes)

On organic farms, grazing young cattle, sheep and goats are vulnerable to infection by gastro-intestinal nematodes. This is a major problem for animal health, which is of considerable economic importance. Subclinical helminth infections can result in up to a 40% reduction in live weight gain among lambs and a 6-30% reduction in their food intake. Parasitized sheep can suffer a 40% loss in wool production and a 15% decline in milk production. Over the past 30 years parasite control in sheep and goats has been almost exclusively achieved by the use of proprietary de-worming drugs (anthelmintics) but nematodes are becoming increasingly resistant against these drenches (Epe et al. 2009).

Laboratory research on *D. flagrans* has demonstrated the potential of this biological agent to catch the larvae of endoparasites by constructing sticky trapping nets in the dung pad. The spores of nematophagous fungi are robust in the stomachs and gut. By feeding the spores each day, every dung pad contained spores ready to work. However, our field trials showed only a limited benefit in feeding *D. flagrans* to the ruminants and we could not confirm the laboratory results. Quite probably the development of the trapping nets in dung pads was limited by heavy rainfall and better application methods (such as using a releasing device – e.g. bolus) could be developed. Further research here would be useful (Koopmann & Klocke 2010).

The use of tanniniferous plants (e.g chicory) and plant extracts (e.g. oak bark) is another possible option in an integrated strategy to control nematodes (Rahmann & Seip 2007). Shrubs are an excellent source of tannins and other important micronutrients for small ruminants and browsing shrubs seems to have positive impacts on animal health and welfare. Yet farmers need to select varieties that are well-adapted to local conditions. The Institute is analyzing local shrubs for their growth and their anthelminitic effects on goats and sheep. Recent findings are promising but have not yet been validated for scientific publication. They show the potential of developing new strategies to prevent and control endoparasites, not only in organic farming, but also in conventional systems. This takes time and a lot of effort.

Scientific Challenges

Scientific support of organic husbandry has already achieved much in the past ten years. Animal research is a long and complex business. The organic animal husbandry research agenda should focus on the following issues

- Reducing the negative environmental impacts (CO_2 emissions, dust, smells, nitrates) from organic animal husbandry.
- Increasing the efficiency of the use of on-farm and local resources.
- Improving animal health and longevity

- Increasing product quality and production output per animal.
- Guaranteeing and securing competiveness on global markets.

Solutions can only be found in an interdisciplinary system approach in the context of New Farming System Research and Development (NFSR+D). Much remains to be done, let us press on (Rahmann and Godino 2012).

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Organik Tarım ve Çayır-meralar

Rüştü HATİPOĞLU*

Özet

Tarım sistemlerinin entansifleşmesi 20 yüzyılı son çeyreğinde Özellikle gelişmiş ülkelerde kamuoyunun gıda maddeleri üretim metotlarına ilgi duymasına neden olmuş ve gıda güvenliği, kalitesi, hayvan refahı ve tarımsal üretim sistemlerinin çevre üzerindeki etkileri tartışılmaya başlanmıştır. Bu tartışmalar sonucu organik yöntemle üretilen ürünlere olan talep hızla artmıştır.

Dışarıdan girdi kullanımını sınırlayarak, kendi kendine yeterli sistemlerde ürün üretimini esas alan organik tarımda tarım sisteminin tüm bileşenleri yakın ilişki içersinde bulunur ve çayır-meralar bu karmaşık ilişkiler ağında önemli bir rol oynar. Çayır-meralar organik bitkisel üretimde bitki besin maddeleri döngüsünün, organik hayvansal üretimde ise hayvan beslenmesinin temelini oluştururlar. Çayır-meraların organik tarımdaki bu fonksiyonlarını yerine getirebilmeleri için organik tarım esaslarına uygun olarak idare edilmeleri gerekir. Bu nedenle organik tarımda çayır-mera idaresinin amacı merada otlayan hayvanları sağlıklı şekilde tutmak ve topraktaki besin maddeleri düzeyini muhafaza etmektir.

Bu bildiride, ülkemizdeki organik tarım yönetmeliğinde çayır-meralarla ilgili düzenlemeler gözden geçirilmiş ve organik tarımda çayır-mera idaresinin temel hedefleri ve bu hedeflere ulaşma yöntemleri tartışılmıştır.

Anahtar kelimeler: Organik Tarım, Organik Çayır-Mera, Organik Hayvancılık

Organic Agriculture and Pastures

Abstract

Intensification of agricultural systems during the last quarter of the twentieth century caused to the increased public interest in the methods employed in food production and the subjects of food safety and quality, animal welfare and environmental impacts of agricultural production systems had been started to be discussed. As a result of these discussions , the demand for foods produced by organic methods has increased dramatically.

In organic agriculture based on production of foods in the self sufficient systems by the restriction of utilization of inputs from the outside of the biological system, the components of the organic agriculture system interact closely and pastures play the central role in this complex web. Pastures are main basis both of the nutrient cycle in the organic plant production and of the animal nutrition ,n the organic animal husbandry. In order to carry out their mentioned functions, pastures must be also organically managed. Therefore, the main aims of the organic pastures are to maintain high animal health status and to maintain soil nutrient status.

In this oral presentation, arrangements related to the pastures in the organic agriculture regulation of our country were reviewed, and main purposes and methods to attain these purposes were discussed.

Key words: Organic agriculture, organic pasture, organic animal husbandry

Giriş

Gezegenimizde var olduğu tahmin edilen 11 milyon türden tanımlanabilen 1.9 milyon türün (Chapman, 2009) birisi olan İnsanoğlu'nun yeryüzündeki yaşamını ve neslini devam ettirebilmesi için en önemli gereksinimini diğer canlılarda olduğu beslenme oluşturmaktadır. Bu nedenle, insanoğlunun yeryüzüne ortaya çıktığından beri en önemli amacı beslenmesini garanti altına almak

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