Benefits of Organic Farming for Society

A. Häring[1] S. Dabbert[1], F. Offermann[2], H. Nieberg[2]

[1] Department of Farm Economics (410 A), University of Hohenheim, 70593 Stuttgart, Germany
[2] Federal Agricultural Research Centre, Bundesallee 50, 38116 Braunschweig, Germany

Abstract

Recent food scares have led to a boom in demand for organic products and have increased policy makers' awareness of the potential benefits of organic farming. However, policies specifically targeting organic farming support do not remain beyond dispute and a sound justification of these is necessary. The potential specific contribution of organic farming to some of the key objectives of the European Common Agricultural Policy, e.g. competitiveness of agriculture, farm income, food supply, food quality and minimisation of negative environmental impacts of agricultural production are discussed.

It is argued that organic farming can contribute to the objectives of the CAP, however, addressing the various objectives to different degrees. The environmental effects of organic farming seem to be largely positive in comparison to conventional farming on a per hectare basis in all categories, although other farming systems might perform better with respect to single indicators or when results are related to the amount of output produced. The quality of organically produced food seems to be higher than that of conventionally produced food for several indicators: the risk of food contamination with pesticides and concentrations of nitrate tend to be lower. Income levels from organic farming are on average comparable to income generated on conventional farms, and organic farming is clearly a profitable alternative for quite a few farms in Europe. Although small scale marketing and processing initiatives may contribute directly to rural employment, organic farming's contribution to rural development is expected to have little direct effects, e.g. on unemployment rates. However, indirect effects such as increased employment in tourism due to a positive "ecological" image of a region can be of importance.

In summary, organic farming can contribute to several of the declared policy objectives of the CAP. While it can be argued that an improvement in a broad set of indicators by organic farming might be more cost-effective than by other farming systems, the empirical information on this issue is scarce. Nevertheless, the positive effects on a broad range of policy objectives clearly justify the support of organic farming.

Introduction

In the European Union, organic farming has experienced a dynamic development in the 1990s. The organic farming area has nearly tripled from 1993 to 1999 (Foster and Lampkin 2000). This is partly debited to an increased consideration of organic farming in policy measures, either by policy measures targeting organic farming directly or policies with a potential application to organic farming. A first development resulted from the official definition and certification requirements for organic crop production in 1991 (EC Reg. No. 2092/91). The indirect consideration of organic farming in the agri-environmental measures (EC Reg. 2078/92) introduced financial aid applicable to organic farming (EC Reg. 2078/92) in most EU countries. Just recently, food scares have lead to a boom in demand for organic products and have increased policy makers' awareness of the potential benefits of organic farming. However, policies specifically targeting organic farming support do not remain

beyond dispute and a sound justification for policies supporting organic farming becomes increasingly important.

Potential contributions to agricultural policy objectives

Apart from the classic key objectives of the European Common Agricultural Policy competitiveness of European agriculture, farming income and food supply, food quality aspects and minimisation of negative environmental impacts of agricultural production have become increasingly important. Organic farming could be a measure on the way to achieve these goals, and therefore the specific contribution of organic farming to some of the stated objectives is discussed in the following.

Environmental performance

The cost for off-setting the negative external effects of agricultural production is an increasingly discussed issue. Attempts to quantify the external costs caused by single factors have been made by Waibel et al. (1998) estimating the external costs of pesticide use in Germany and recently by Pretty et al. (2000) trying to provide a first estimate of the external costs caused by agriculture in the UK. For the former Federal Republic of Germany, costs of 125 million Euro per year were estimated for the directly assessable effects of pesticides on health, water quality, residuals in food, and loss of species. Pretty et al. calculated the annual costs from contamination of drinking water with pesticides in the UK to be approx. 190 million Euro per year. Obviously pesticides are the most prominent example for a discussion of external costs which can be avoided by organic farming. Nevertheless, this example highlights the potential of organic farming to reduce external costs caused by other factors of agricultural production.

The most commonly used argument in support of organic farming is its positive environmental effects. However, a selective support of organic farming practices on those grounds are only justified if organic farming actually results in less negative environmental impacts than its counterpart, conventional farming. Obviously, organic farming - as any farming activity - affects the natural environment. However, an extensive analysis of the environmental effects of organic farming in comparison to conventional farming (Stolze et al. 2000) concluded that on a per hectare basis organic farming has less detrimental effects on the environment than conventional farming. The results of this analysis are summarised in Table 1. In spite of these apparently so clear and broadly positive results are based on a thorough analysis of the literature available in 1999 they require some further argument.

Organic farming seems to perform better with respect to all considered indicators, but large differences exist between the various indicators. Critiques might, therefore, argue that other farming systems are likely to have even less detrimental effects on certain indicators than organic farming. However, the advantage of organic farming in this respect is the broad positive impact on a wide array of environmental indicators.

The results presented might change over time and with developing legislation and policy. For example, organic animal husbandry standards were only defined in the year 2000 by EU legislation and the above mentioned results have not captured their effects on environmental performance, yet.

Relating environmental effects of agricultural production to the farmed area could give a misleading picture. One might argue, that the more appropriate factor to relate the environmental effects of agricultural production to is the quantity of output produced.

However, in the view of sustained surplus production in the EU this argument seems to be of minor relevance. Especially, when at the same time the issue of keeping marginal land in production is gaining importance in the EU.

Table 1: Assessment of organic farming's impact on the environment compared to conventional farming

INDICATORS	++	+	o	–	– –
ECOSYSTEM		X			
Floral diversity		X			
Faunal diversity		X			
Habitat diversity			X		
Landscape			X		
SOIL		X			
Soil organic matter		X			
Biological activity	X				
Structure			X		
Erosion		X			
GROUND AND SURFACE WATER		X			
Nitrate leaching		X			
Pesticides	X				
CLIMATE AND AIR			X		
CO_2		X			
N_2O			X		
CH_4			X		
NH_3		X			
Pesticides	X				
FARM INPUT AND OUTPUT		X			
Nutrient use		X			
Water use			X		
Energy use		X			

Legend: Organic farming performs: ++ much better, + better, o the same, – worse, – – much worse than conventional farming; if no data was available rating was "o the same"

X	Subjective confidence interval of the final assessment which is marked with **X**

Source: Stolze et al. (2000)

Food quality

The recent food scares in Europe have made consumers think more about the quality of the food they eat and the demand for organic food has increased dramatically indicating a high appreciation of the "quality" of organic food perceived by consumers. Extensive reviews of existing research results on the physically measurable quality of organically produced food in comparison to conventionally produced food (Woese et al. 1995; Stolze et al. 2000) have shown that no stringent conclusions about the quality of organically produced food in general can be drawn (Table 2). This is mostly due to a lack of results from comparative investigations of organic versus conventionally produced food. However, for some of the

indicators organically produced food performed better than conventionally produced food: The risk of contamination of food with pesticides and nitrate was found to be lower in organic food.

Table 2: The quality of organically compared to conventionally produced food

INDICATORS	+ +	+	o	–	– –
FOOD QUALITY			**X**		
Pesticide residuals		**X**			
Nitrate			**X**		
Mycotoxins				**X**	
Heavy metals				**X**	
Desirable substances				**X**	
BSE risk			**X**		
Antibiotic residuals		**X**			

Legend: Organic farming performs: ++ much better, + better, o the same, – worse, – – much worse than conventional farming; if no data was available rating was "o the same"

X Subjective confidence interval of the final assessment which is marked with **X**

Source: Stolze et al. (2000)

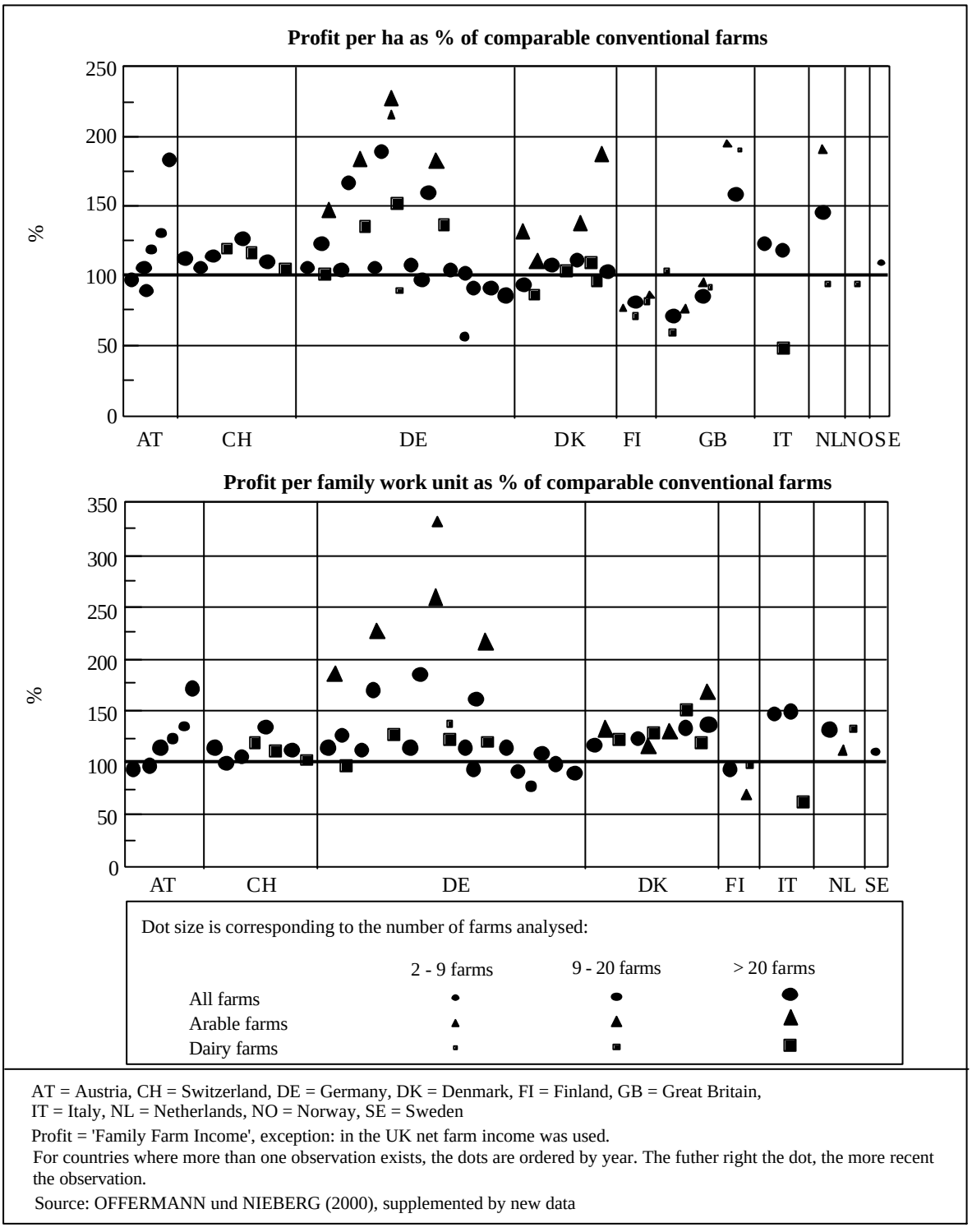
Existing research results on the risks associated with conventional animal produce offset the lack of results of comparative investigations concerning risk associated with organic versus conventional animal produce. For example, the risk of antibiotic residuals is assumed to be lower in organically produced meat since the sub-therapeutic application of antibiotics is strictly forbidden and therapeutic use avoided as far as possible and strictly controlled. The very recent discussion of BSE contaminated meat and the risk to humans also suggests a somewhat lower risk associated to organic meat in comparison to conventional meat. This is due to a long-time ban of animal meals in feed and the exclusive use of animals from controlled origin as far as possible. Nevertheless, BSE can also occur in organic herds.

The above discussion indicates there are risks associated to conventionally produced food which are unlikely to be found for organically produced food. Especially when applying the precautionary principle to food safety and agriculture organic farming seems to be an option.

Farm income

One of the main concerns of agricultural policy is to preserve the economic viability of farming in general and to ensure a sufficiently high income so farming families will continue farming. A comparative review of the economic situation of organic and conventional farms in Europe up to the year 2000 (Offermann & Nieberg 2000) shows that on average profits of organic farms are similar to those of comparable conventional farms, with nearly all organic farms achieving +/- 20 % of the profits achieved by the respective conventional reference groups (Figure 1). Despite this a high variance is observed, especially between countries, regions and farm types.

Figure 1: Profits of organic farms relative to comparable conventional farms in different countries, results of different studies 1992-2000



AT = Austria, CH = Switzerland, DE = Germany, DK = Denmark, FI = Finland, GB = Great Britain, IT = Italy, NL = Netherlands, NO = Norway, SE = Sweden

Profit = 'Family Farm Income', exception: in the UK net farm income was used.

For countries where more than one observation exists, the dots are ordered by year. The futher right the dot, the more recent the observation.

Source: OFFERMANN und NIEBERG (2000), supplemented by new data

Due to the high price premia realised in the observation period and the design of the general Common Agricultural Policy measures, e.g. set-aside or compensatory arable payments, organic arable farms seem to have been more successful on average than conventional farms. For organic dairy farms, in general relative profitability is higher if measured per family work unit than if measured per hectare utilisable agricultural area. This results from the fact that organic farms tend to be a bit larger than the reference farms and tend to employ more paid labour while using less family workers. In nearly all cases, profits per family work unit were

equal to or higher than profits from comparable conventional farms. However, a few of the organic dairy farms showed average per ha profits similar to the conventional reference group.

On the one hand, the economic performance strongly depends on the level of support payments for organic farming, which on average contribute approximately 16-24 % of profits in Austria, Denmark, Germany and Switzerland (Offermann & Nieberg 2000). Another study observed somewhat higher profit contributions of 22-46% in Germany, Denmark and Italy (Häring 2001), with arable farms being more dependant on direct payments for organic farming (35-46%) than dairy farms (22-33%). On the other hand, the market situation can be even more important. Examples from Great Britain and Germany show that organic price premia account for 40-73 % of profits of arable farms, while profit contribution by price premia is lower for dairy farms (10-48%) (Offermann & Nieberg 2000).

Time series of profits of organic and comparable conventional farms often exhibit a remarkable similarity over the years. This similarity may suggest that organic farms are subject to the same pressure to adapt to changing external conditions as conventional farms, possibly having similar consequences for structural change (farm growth) and rationalisation.

Rural development

Rural development has become a key issue of European agricultural policy and an array of policies are implemented to enhance economic development in rural areas, with the main objective of increasing income of rural households and reducing unemployment rates. Employment through agriculture is already low in rural areas in the EU and is expected to further decline as in many areas farms are still too small to benefit from economies of scale.

An argument often used to support organic farming is the observation that organic farming on average requires a higher labour input than conventional farming. For example, Offermann & Nieberg (2000) found labour input on organic farms to be on average 20% higher than on comparable conventional farms, mainly due to a substitution of chemical inputs by labour and a higher proportion of labour intensive activities. However, considering the small work force bound in agriculture and the size of the sub-sector of organic farming only minor effects are expected. For example, in a region where agricultural employment accounts for 5% of all jobs, a 20% increase in organic farming would result in a mere 0,2% increase of overall employment (Dabbert & Zanoli 2001). Therefore, the expected direct contribution of organic farming to rural employment rates is insignificant, but other, indirect factors justify further argument.

On the one hand, marketing and processing of organic products to date has mainly developed as small businesses closely related to primary organic production but legally independent. Many of these are either efforts of farm families to create additional income sources for increasingly unnecessary family labour, while others evolved from cooperating initiatives often creating employment opportunities in the long run.

On the other hand, organic farming might contribute to a positive image of rural areas not only for agriculture but also to other sectors of rural economies. Young farmers seem to increasingly favour organic farming (e.g. Tress 2000) and the conversion to organic farming could be a reason for them to remain farming instead of choosing other employment opportunities. A strong commitment to environmental goals might add to the appeal of a region for tourism, which will most likely have positive effects on companies from other sectors in choosing a certain region as business location. As a result, several regions exist which have tried to use the positive image created by organic farming as a motor for rural development (e.g. Biosphärenreservat Rhön in Germany).

In summary, although organic farming is expected to have little direct effects on unemployment rates in rural areas, small scale marketing and processing initiatives may contribute directly to rural employment. Indirect effects such as increased employment in tourism due to a positive "ecological" image of a region can also be of importance.

Surplus reduction and government expenditure

The Common Agricultural Policy is one of the main sources of expenditure of the European Union. For the planning period of Agenda 2000, the years 2000 to 2006, a projected 300 billion Euro will be spent (EC 2000). Traditionally, the two major sources of expenditure have been direct payments to producers and market support such as export subsidies and storage costs. With the objective of reducing storage costs and to stabilise market prices, surplus reduction itself has become a declared policy goal.

Organic farming can significantly contribute to surplus reduction since the observed yields are much lower in organic compared to conventional production. This holds especially true in plant production (Offermann & Nieberg 2000). For example, cereal yields in organic production are typically only 60-70% of those from conventional production, although comparative yield levels vary with country, region and crop. On the contrary to most organic crops, organic vegetable yields tend to be as high as conventional yields. While performances in livestock production are similar to those of conventional production, lower stocking densities observed on organic farms result in lower performances per hectare.

The most prominent source of expenditure for organic farming is direct payments paid within the agri-environmental programmes. These expenses amounted to 300 million ECU (1996) for the 15 EU countries (Lampkin et al. 1999) and are often quoted by critiques of organic farming. However, taking only costs related to the above mentioned reduction of surpluses and change in farming structure after conversion to organic farming into account, expenditure would be approximately reduced by half of the amount spent on direct subsidies (Zanoli & Gambelli 1999). This was the result of a comparison of the hypothetical situation of a Europe without organic farming (0%) with the observed situation in 1997. A similar calculation reported by Offermann (2000) puts the savings in arable area and headage payments under Agenda 2000 conditions at 13 % of the expenses for organic farming. Obviously, an increase in organic farming area would still result in higher expenditure than for conventional agriculture, but compared to other agri-environmental schemes the previously mentioned benefits might become increasingly important in the future.

Organic farming as a policy measure – a viable option?

The potential benefits of organic farming policy objectives have been highlighted in the previous sections. However, organic farming addresses the objectives of the CAP to varying degrees. The environmental effects of organic farming seem to be largely positive in comparison to conventional farming on a per hectare basis. In comparison to conventional food, organically produced food tends to be associated with less risk factors to human health. Income levels from organic farming are comparable to income generated on conventional farms. With respect to rural development organic farming is expected to have little direct effects, i.e. on unemployment rates, although small scale marketing and processing initiatives may contribute directly to rural employment. However, indirect effects such as increased employment in tourism due to a positive "ecological" image of a region can be of importance. In summary, it can be concluded that organic farming could contribute to several of the declared policy objectives of the CAP.

However, for policy design not only the relative contribution of organic farming to policy objectives in comparison to conventional farming is relevant, but the main issue is the absolute contribution of an activity to certain policy objectives at relatively lower costs than caused by an alternative activity. Based on the information available to date, no clear conclusion can be drawn if organic farming achieves the desirable effects at lower costs than other farming activities. Despite a certain "auto-funding" rate through reduction of public expenditure, critiques argue that costs for direct payments to organic farming are extremely high and that the same targets could be reached more cost effectively via other, more specific measures (Alvensleben 1998). This leads directly to the question of the required quantity and variety of specific measures to be implemented to achieve the same effects on such a wide array of targets as organic farming, and the costs caused by the implementation, administration and control of these. Therefore, it is concluded that organic farming can contribute to several of the declared policy objectives of the CAP. While it can be argued that an improvement in a broad set of indicators by organic farming might be more cost-effective than other farming systems, the empirical information on this issues is scarce. Nevertheless, the positive effects on a broad range of policy objectives clearly justify the support of organic farming.

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