THESES OF DOCTORAL (PhD) DISSERTATION

FÖLDES FRUZSINA

Mosonmagyaróvár

2008

1. INTRODUCTION, AIMS

Recently a significant improvement can be experienced within the agricultural production regarding such environmentally friendly technologies that mainly target the production of healthy, nutritious, quality foodstuff by taking environmental characteristics into account, and adapting to them. To achieve such goals mentioned above and to bring sustainable, environmentally humane economical systems that is ecological economy to the forefront, not only the changes in the agricultural and environmental policies of the European Union, but also the long-term programs of international and world organizations greatly consented to, thus setting an example for the Hungarian agricultural production and food production. In Hungary – following the trends of conventional agriculture – within the organic farming plant cultivation has a larger significance, organic animal husbandry only started to develop in the past few years. The lack of balance between organic plant cultivation and organic animal husbandry sector is shown among others by the commercial role of the goods produced. So far organic vegetable products represent the larger share in domestic commerce. That was greatly influenced by the fact that uniform legal and economical bounds about organic animal husbandry came to light far later, thus blocking organic animal products from entering the market.

While numerous research results are reflecting upon changes that move the organic farming ahead, nevertheless in many cases we can only get an overall picture about this kind of animal husbandry, production of goods and the marketing possibilities of animal products by approximate estimates, sources published with several years delay. Thus the scarcity of available data and the lack of continuous data gathering greatly make the evaluation of achievements accomplished so far difficult. This is leading up to unanswered questions not only in scientific and professional circles, but among consumers showing more and more special requirements, and the producers aiming to fulfill such needs, resulting in the need of conducting further research. The basic aim of the dissertation is a general status report about organic animal husbandry in Hungary – especially in the West-Danubian Region-, and the analyzing of the procession and trade tendencies of animal eco-products regarding the offer and demand of the market, and also consumer requirements. According to that, the target of the research is the exploration of strong and weak points of the relationship between participants of this product line, involving the following areas:

- examination of the nature of production in organic animal husbandries, and the marketing possibilities of the produced products
- exploration of the state of processing organic animal products;
- examination of the role of organic animal husbandry products in retail, the thorough analyzing of demand and offer;
- examination of consumer price differences between organic products and conventionally processed;
- examination of consumers' preferences and spending willingness regarding organic animal products.

2. MATERIAL AND METHOD

The research that this dissertation is based upon was conducted between 2004-2007 at the Agricultural Economy and Marketing Professorship of the Department of Agriculture and Food Sciences of the Western Hungarian University. For the realization of the research tasks plotted in AIMS we used both "ecoscopic" (secondary) and "demoscopic" (primary) data gathering methods.

Secondary research was directed toward the exploration of rules, legal and economic borders of organic animal husbandry, the role of native species in organic animal husbandry, the domestic and European tendencies of organic animal husbandry and production of organic animal products, the role of these products in the commercial trade, and the examination of additional charge typical to eco-products. The collecting of statistic data was conducted based on the Hungarian Central Statistics Agency (KSH), the Price Monitoring System of the Institute of Agricultural Economy Studies (AKI PÁIR), the databases of Biokontroll Hungária Ltd. and the European Union, the EUROSTAT.

The primary research was conducted though the complex examination of the product-field consisting of four main components, such as the examination of basic material producers, the processors, the traders and consumers. The data required for analysis and evaluation was collected through questionnaires and also personal interviews and professional consultations. After the data collected through the questionnaires was coded, it was processed with the help of the Microsoft Excel program, while the construction of econometric models - that were part of the empiric evaluation about the consumption of animal eco-products – was conducted employing the EViews software.

3. RESULTS AND EVALUATION

Organic Animal Husbandries in Hungary

In Hungary, in the system of organic farming, animal husbandry doesn't get the needed emphasis, and that is certified by our own research conducted within **organic animal husbandries**. Besides the quantitative data gathered through the research, the faults experienced in sale, support system and producers' contacts are all pointing to the marginal state of animal husbandry both on a regional and on a countrywide level.

The organic-farms –except for those occupied in producing breeding stocks (31% of the sample) – are employed in other economical activities too, independent of the available supplies, the scale and direction of animal husbandry, to lower the sales risks caused by possible market anomalies, thus compensating for the income deficit that would be a result of the above. On the one hand this points to the complexity of the economy system (the synergy of the usually required breeding, producing and auxiliary services, functions), and on the other hand - according to our experience - this is a certain economic bond for the farms that were examined. Within other activities, touristy services are appearing, in which the animals that are bred there take crucial part.

Opposed to the international practice, in the examined farms 79% of the genetic base of organic animal husbandry is native species, which apart from their good adaptive abilities - due to their external appearance - contribute to the façade of rural areas and thus boosting village tourism. Regarding the roles of native, local breeds we only experienced smaller differences between assorted breeds of livestock compared to the percentage mentioned above.

During the time of the examination, there weren't significant changes in the structure of the animal stock involved. The exceptional, over 70% rate of bovine stock (dairy cows and beef cows) greatly determines and confines the produced goods, and that projects the need for the development of organic animal -goods production, the widening of organic-goods supply and the reformation of the structure of animal husbandry. There was a 77% improvement between 2001-2006 regarding the changes in the animal stock, which is mainly due to the dynamic expansion of porcine and goat stocks, and opposed to that a drastic, 81% decline can be observed in the poultry stock.

The examined farms - according to characteristics determined by natural guidelines – can be classified as 17, 4% small, 34,7% medium and 47,8% large farming facilities, although we have to take note that we can't regard the large ones as being very strongly funded in all of the cases.

During the research we determined that for 58% of the examined organic animal farms, the maximal fulfillment of animal welfare and veterinary rules is still a task to be tackled, even though the risk factors of food safety in this organic farming system are the greatest, partially due to the restrictions implemented on pesticides used in organic feed production, veterinary treatments and animal medicines. Approaching this from the consumer side, if we only look at recent years' food scandals, most of them can be connected to goods of animal origins, and on account of that food safety and food hygiene get a special attention in conventional food production too. From this point of view, due to the risk factors mentioned above, even the strict control system applied to organic animal products doesn't mean a 100% guarantee for consumers. Because establishing the right practice in animal care plays an important role in providing a better veterinary system, this field is signifying the necessity of education and information of animal keepers on these subjects.

Less than half of the farms sell their goods of animal origins as organic products. According to international experience, in the case of products originating from grazing-based animal keeping, selling at conventional markets at a conventional price is the more relevant, which is not an uncommon phenomenon in the domestic practice of bovine and ovine husbandry. The processes that presented themselves earlier on international levels are starting to enter domestic circumstances, while at the same time anomalies presenting themselves in the outside market sales are having a significant effect here also.

Regarding the classic economic principles, we come across a contradiction, because according to our own research results, the higher price premium, the higher income is not always realized by the sales of fully processed highly priced goods, although we can't neglect the role of home and outside market sales. We observed the upper margin of the producer's organic profit - being between 5-120% - typically during outside market breeder sales, and the lower during the home market sale of milk and dairy products.

Regarding home and outside market sales, the former rate of 20%-80% has changed to 40%-60%, from which we can deduce a development of the home consumer market and also a strengthening of international competition. The farms we examined sold their produced basic materials and livestock at a higher rate at home markets, which can be regarded as a positive sign, although this doesn't result in the development of a larger scale animal husbandry on account of the separation of the home product fields. There was no change in the homeland distribution strategy of the products. Independently from the direct and indirect methods of sale, the dominant way of selling is the single-route trade among producers that is they only sell through one channel at a time. This can be brought in connection with the amount of the wares offered, which doesn't make it possible for them to sell in several directions, and ensure a continuous supply of goods. Furthermore it's not a negligible factor that the home market has only started developing in the last two-three years, so the contact system between participants of the product field is only in development.

While in indirect sales the processing plants, the wholesalers and the bio stores are the ones who prevail, due to the strategy and price policies of supermarkets and store chains, still less than 10% of the producers make use of this sales channel. Because the producer contacts are underdeveloped, on account of the lack of cooperation and necessary information, and also due to the problem stated above, the market bargain position is also unfavorable. Besides that the unilateral contracts offered by store chains only offer possibilities for setting up short term supplier contacts. This unfavorable situation is also further complicated by the different legal fees and long paying intervals that lay a burden on the producers, which affects the production's money flow negatively on the supplier side. Further difficulties are caused by the continuously growing rate of imported goods in the organic animal product area, against which the atomized producer segment can't compete in all cases. The problems described above bring our attention to the necessity of developing producer integrations that are – to our knowledge – haven't developed in the home practice, because in the earlier years they were mostly interested in outside market sales. Besides the problems of home sales we could witness numerous positive steps ahead naturally, as the direct sales show. In the sale of animal eco-products market garden sales enjoy great popularity, which has only lost a little importance in the past few years, also home sales and home delivery are dynamically developing.

Though organic animal husbandry fulfills a multifunctional role, identically to traditional animal husbandry, besides numerous other economical activities, basically the production of goods secure the farm's livelihood and development, in which the state's role, and the predictable, regulated economical environment also plays crucial part. The support aimed at the development of organic animal husbandry and helping with the changeover are not part of the present support system, and their absence can block the development of organic animal husbandry on the long-term, the realization of structural changes in this kind of animal husbandry, and because in recent times the lack of support denied domestic producers some irreclaimable advantages which effected the international competitiveness of farms negatively.

Regarding the organic animal husbandry in the West-Danubian Region, we haven't experienced a significant difference compared to the results of the countrywide research. Similar to countrywide tendencies, in the animal stock involved in organic farming the species bred are dominated by native and local breeds). In the West-Danubian Region until 2004 there were only four farms were involved in ecological animal husbandry under the surveillance of the organization providing the research data. Following that, only one additional farm has converted, and no further ones have been registered at the surveying institution.

Neither the number of organic animal husbandries nor the changes in the livestock numbers show us the organic-farming development of the region. While until 2003 we experience raising tendencies regarding the livestock involved in organic farming, in 2004 the stock declined by 17,7% and the livestock of the region made up only 11.61% of the country's organic-stock, opposed to last years' 14-16%. The structure of the region's livestock developed according to countrywide rates, in the time of the examination the bovine stock had the most crucial role. Among the organic-products produced, milk, cheese and butter is sold with a minimal margin of a few percents, on a price defined by commercial units with a larger market share. Regarding bio-meat (bovine, porcine, ovine) the sale at conventional markets is characteristic, and at the same time a good counter-example in the domestic distribution was the farm that by ensuring continuous supply, realized a profit of 120% by the process plant-sale of veal and mart although basing its production on a British mart breed.

Process of animal organic-products

In Hungary there are a rather low number of plants occupied in the **process of animal organic-products**. From the plants we examined, two only do primary process as lease-work; in two plants they also do conventional production parallel to organic product procession, while the last four plants produce 100% of their goods by the use of materials from organic-farming.

As producer sales data shows, the processing plants base their acquisition of materials necessary for production upon the quality material production of Hungarian animal eco-husbandries which is usually secured by year long or longer term contract relationships. Even so, it means a problem that plants often have to encounter the lack of continuous supply and large amount of homogenous materials coming in, to which a possible solution would be the development of producers' integrations mentioned earlier. Import type acquirement only happens occasionally, that is when the processors can get the needed quality materials at a more favorable price, or there's no sufficient supply of certain materials.

The majority of the goods (bio-eggs, bio-meat and dairy) produced by the processing plants included in the sample were brought into circulation through a home commercial network; there are only three plants with a larger processing capacity that are involved in outside market sales. Regarding the changes in the home demands, the processing plants report an incline in the consumers' expectations, and on account of that, more than 50% of them are planning the introduction of new products in the near future. Besides that, product development is a crucial part of their sales policies regarding competitiveness, because imported goods are appearing in an increasing number on the shelves of home stores

While producers are characterized by single-route sales, processors sell multi-route that is the eco-products can get to the end consumers through an average of four to five distribution channels. The most significant market for the processed goods are special bio-shops, wholesalers and supermarkets, and also ex-works-sale, delivery sales, market sales and outlet sales take an equal share from distribution. Determining the prices, most plants included in the sample take costs into consideration, thus using classic, cost-based pricing. According to them they realize an average of 20-30% profit with every animal organic-product, so they don't differentiate processors' profits.

In the West-Danubian Region – according to available data – the distinctiveness of the process of animal eco-products is represented by three participants. From them, one was only involved in primary process as lease-work which didn't mean a continuous income for the plant, as it wasn't influencing the yearly income in a significant way so the company stopped this activity. Another participant who is involved in processing beside animal organic-husbandry can only sell their bio-milk and dairy with a profit below 10%, and bio-meat as conventional goods. On the regional level this company processing plant and animal eco-grade materials can be described as having the widest product range and the largest amount of sales, its products being quite popular at home and East-European markets. Though with its long-term producer's contracts the company secures an adequate profit and income for the material producers, from these the farmers of the West-Danubian Region don't benefit most of the time, because their offer of goods is not concentrated enough in all cases.

Retail sales of organic animal products and the development of consumer prices

Through the research, besides exploring the uniquities of **retail trade** we also examined organic animal product offer and consumer prices. Retailers' product lists show very large diversity. Most of the sales places investigated by us (77% of the sample) the product line consisted of different wheat, bakery, sugar and alcohol products, canned and baby foods, vegetables, fruit products, food supplements. These stores don't carry organic animal products, which they explain with the vegetarian costumer group, the low demand for organic animal products, and the difficulties by measuring up to food health and food safety rules, the storage equipment's need of extra capital, and lack of space. Only 20% of them are planning the expansion of their product line with such products dependant on consumer requirements.

While measuring up to the requirements and rules of animal eco-products sales, the installment of the necessary equipment, and the expansion of the store area all indeed require a serious boost of capital, at the same time the lack of information is still significant in these days. As consumer researches show, in lots of cases not only the potential but the actual organic-buyers don't have sufficient information. Parallel to that, the low – although increasing – demand for animal eco-products can't be explained clearly by the lack of solvent customers, or the more significant rate of customers following a vegetarian diet, because consuming eco-products is still often mistaken for vegetarian diet, although it doesn't mean a diet lacking of dairy, meat and eggs. In order to encourage and help the consumption of organic animal products, to strengthen the regular and casual consumer base, to win potential buyers, we recommend such informative marketing task-programs that bring to common knowledge the properties of organic production and the products sold on a wider scale.

Regarding the availability of organic animal products, these products can be found in the product line of 23% of the sample, although from the complete product list they represent a low, 3-5% section, which points to the underdeveloped consumer group beside the meek product offer.

There's a stronger customer force for milk and dairy products – partially due to the wider product offer – and the goods can be found on both the shelves of special bio-shops or supermarkets that support convenience shopping. As a positive result, according to the answers there's an incline in the demand for meat products also. In the case of this product group, consumer needs are often fulfilled with the involvement of wholesalers through importing, and on account of that the sale channel will be longer and that generates an unavoidable further increase in price with these products belonging to the high-end price group anyway. This refers to the scarcity of home acquisition possibilities, and the lack of basic goods, but there are also faults in distribution too.

While in the case of dairies availability is not a concern anymore, the opportunities for purchasing fresh meat and meat products mostly arise when direct purchasing from organic farms, the marketplace or certain specialized small shops. From this point of view we recommend the support of more profitable sales through conventional meat stores and butchers beside the convenience-shopping-oriented supermarkets serving a wider consumer population. On one hand these commercial units are already complying with the basic rules applying to sales, and they already possess the necessary equipment, so according to this, the widening of the product list and the sale of organic meat wouldn't mean much boost needed to their capital, and furthermore the immediate contact between the customers and staff would make information and advice would predominate more, which would result in the broadening of the consumer base and the popularity of organic products.

Consumer organic overpricing, that is the difference between organic products' and conventional products' price varied within an interval of 8-168%, observing the bottom margin by salami and the top by pork thighs. Among the products we examined, milk's average consumer overprice was 69%, and for products with a higher overprice such as hard and semi-firm cheese it was 167%. Pork originating from eco-husbandry was 130-168% - 151% on average -, beef was 26-65% more expensive to obtain for consumers. We experience a 106% difference between the consumer overprice of bio-pork and beef, which can be explained by the costs of bio-feed needed to produce pork. In an international comparison, the average Hungarian consumer price premiums of bio-milk and pork is close to the maximum of the price premium noted in 15 member countries of the European Union, while the overprice on bio-eggs and beef is closer to the minimum. We can't make far-reaching, realistic deductions without up-to-date price information, because our international data represents the year 2002, and the Hungarian prices we acquired in 2007. Tracking the changes in overprices and a seasonal examination could both contribute to useful deductions, unfortunately for now it wasn't realizable on account of the lack of timeline and continuous data collection. Based on this, the construction of a market information system can be recommended that will – based on the mutual cooperation of the participants of the product field – significantly help their orientation, and from this point of view we can recommend researching the possibilities of home and international information systems' adaptation.

Examination of consumer habits

One of the basic goals of the research is the **examination of the reasons for existence of animal organic products** in the light of consumer habits and **consumer preferences**, and to do this, we had 400 consumers providing us with data.

Evaluating the data acquired by questionnaires through econometric and conventional statistic methods, it had been determined that bio-product consumption is affected by four factors, those are geographical location, gender, education and income, that is the purchase of eco-products can be expected the most from women with a high level educational degree and a higher income, and this probability is further increased by a residence in Budapest.

Of the full sample used for the basis of the research made up of 400 people, 59,5% had already bought organic products. The purchase of different organic products didn't affect the other, so cross-consumption is not characteristic, which was supported by the conducted correlation research. From the designated four organic products, 55,46% of the consumers bought one kind of product, 34,03% bought two kinds, 10,5% of them bought three or four kinds of products, which was affected roughly the same by purchase-probability factors.

By the purchase of the four organic products examined, namely vegetables and fruit, milk and dairy, meat and eggs, regarding the eco-overprice consumers paid, we experienced a higher overprice at bio-milk (52,7%) and organic meat (68,2%), and opposed to that according to the customers' own experience, on average they paid 32,8% more for bio-eggs and 46,7% more for vegetables and fruit originating from eco-farming. When we compare these overprices based on consumers' experience to overprices measured in retail businesses, we experience a significant deviation, which can be connected to the place of purchase and the price-differentiating role of various sales channels.

According to the research results regarding the purchase of eco-products we can assume that the consumer base of the examined products is diverse. From the social-economical factors characteristic to the consumers, the purchase-influencing effect of educational degree can't be certified only in the case of organic eggs, while in case of the other three products (vegetable, fruit, milk and dairy) and meat the effect of educational degree is practically identical. Although by the probability research on actual realization of eco-product purchase we determined that income basically determines if the individual will buy an organic product, on the other hand, according to the results of product-specific research organic meat is the only product we examined where income has a significant positive effect. This observation is coherent with our research result according to which consumers paid the highest overprice in case of organic meat, so considering present prices, regarding future changes in organic meat consumption we can deduce that from organic animal products, the target market of potential bio-meat consumers can be characterized primarily by consumers living at a higher standard possessing a higher income.

Regarding the frequency of purchase among the consumers making up the sample, only 24% of them will purchase eco-products daily/weekly, 35% of them monthly and 41% yearly, so the number of regular buyers can be pronounced fairly low. The frequency of organic products making it into the consumers' basket – according to our studies' results – was affected mostly by income, and beside that the probability of purchase was also larger among subjects interviewed in Budapest, and at the same time the expected frequency of purchase wasn't affected by age and size of household. Similar to results from earlier researches, during our own examination we deduced that a significant number of eco-product consumers are women, because the possibility of actual purchase and also frequent regular purchasing is to be expected from women, while daily and weekly shopping is also usually conducted by women.

Considering the place of purchase we experienced a large overlap, so regarding the organic product consumers we examined we can deduce that they aren't attached to a certain sales channel, and that is partially caused by the small number of sales places where the offer of eco-products satisfies consumers' demands in every aspect. If we take sales strategies we experienced on different product fields into consideration – the single-route sales of producers and multi-route sales of processors -, it becomes inevitable that in order to reach a wider level of consumers, it is an important and resolvable task for producers to concentrate on multiple sales channels at the same time in product distribution.

Even though there's more and more information available about organic farming and organic products these days, the consumers that never bought organic products can be characterized as uninformed, and on top of that, education levels are lower in this group. From them 52% will further reject the purchase of eco-goods, which is explained by high price, availability and low income. The product acceptance of the remaining 48% as a potential consumer group can be attributed mostly to the endeavor for a healthy life as a long term "investment", although the paying willingness that is the financial sacrifice toward this "investment" is under 25% in every product examined, which falls far short of actual consumer overprices. From all above we can deduce that if the consumer is confronted with an overprice higher than this, they would show a rejective-type behavior similar to the non-purchasing group.

4. NEW AND NOVEL SCIENTIFIC RESULTS

1. The regional examination of organic animal husbandry brought results similar to the countrywide tendencies. Following the early dynamic development in organic animal husbandry, we discovered a decline in both the number of stock included in organic farming and in the number of animal eco-farms, for which the main reasons could be identified as sales difficulties and lack of support.

2. Although the raw materials and products produced by organic farms are being sold at home markets at a larger rate, the low level of product output and process, the separation of the levels of product fields and the moderate demand are not resulting in the development of a larger scale animal husbandry for the present.

3. Through the examination of the role of organic animal products in the retail trade and the examination of consumers' organic overprices we determined that the low availability of organic animal products and the narrow product range are obstructing the further widening of the consumer base and beside that, consumers' organic overprices - which often surpass 100% - are narrowing the potential customer base down to buyers with a higher standard of living.

4. We experienced a high overlap regarding the place of purchase of organic products that is the organic product consumers are not bound to a single sales channel. While the multi-route selling strategy employed by processors fits into this situation perfectly, the producers' single route sales strategy does not make it possible to a reach of wider range of consumers.

5. Comparing the organic overprice - based on consumer experience - of organic farm produced vegetables, fruit, milk and dairy products, meat and eggs to true eco-overprices recorded in retail stores we experience a significant difference, which can basically

be associated with the price-differencing role of the different distribution channels.

6. Through product-specific researches - among economical-social factors that affect purchase - we could only detect a significantly positive effect of consumer's income regarding organic meat, but at the same time it had, no influence on the purchase of organic eggs, organic milk and dairy, organic vegetables and organic fruit.

5. PUBLICATIONS

Original papers published in scientific journals:

FÖLDES F.-GODA M.-MOLNÁR B. (2005): Market expectations of ecological products in Hungarian Animal Husbandry, Gazdálkodás, Angolnyelvű különkiadás 2005. XLIX. évfolyam 12. különszám

FÖLDES F.-GODA M.- BÓDI CS. (2008): Az állati eredetű ökotermékek fogyasztói árvizsgálata, Élelmiszer, táplálkozás és marketing – megjelenés alatt

FÖLDES F.-DÖME B. (2008): Az állati eredetű ökotermékek fogyasztói vizsgálata ökonometriai modellezéssel, Gazdálkodás- megjelenés alatt

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Erdei Ferenc III. Nemzetközi Tudományos Konferencia, Kecskemét, 2005. augusztus 23.-24.

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Channel (SIXTH FRAMEWORK PROGRAMME) konferencia, Budapest, 2006. április 5.-7.

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