

## ISSUES OF SUSTAINABLE FOOD PRODUCTION IN LATVIA

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The article presents main results of the first in Latvia study addressing the issues of the development of Latvia's sustainable food production. For detailed research two main themes for Latvia's agri-food sector's sustainability were chosen: 1) the issues related to further development of the organic farming and processing; where the special attention has been paid to organic milk processing; and obtaining of organic pigmeat and beef in different Latvia's regions; 2) quality and environment management systems enforcement - mandatory and voluntary and the trends of implementation of the international management standards (ISO 9001, ISO 22000; HACCP DS 3027:2002; ISO 14001). The publications, legal documents and databases of Latvia's governmental and non-governmental institutions were used as materials and the qualitative and quantitative research methods were applied for this empirical research. The assessment of present situation and the proposals for further development has been given.

**Key words:** sustainable food production, organic, management systems.

**JEL classification:** O13, O18, M11

### Introduction

The **aim** of this study was to clarify the circumstances, ways and potentialities of further food production development in Latvia, where production sustainability is one of the most important factors influenced by development.

The **object** of the research is sustainable food production and/or food chain.

The following questions concerning food sustainability are central to this study: issues and potentialities of organic farming and food production and trends of implementation of management systems in the food sector.

Group of EU researchers (A MISTRA Program, 2003) agrees that sustainability of the food chain can be analyzed with respect to three aspects:

1. Ability to satisfy future goals in terms of productivity, economy, natural resources etc.;
2. Efficiency in the use of production means; energy, fertilizers, pesticides, animal feeds etc.;
3. Ability to withstand disturbances; buffering capacity or robustness.

The food chain sustainability, like general sustainability, consists of different components of which usage of natural resources and environment protection is very important. Figure 1 shows the food chain's influence on these components through usage of natural resources and impact on environment at different stages of food chain; it is obvious that at all stages usage of energy and arising of waste (solid and liquid) plays an important role.

In our opinion there are two possibilities or directions for further sustainable food production development. First direction for further food chain development is food production in medium and large companies (industrialization and cost effective production) mainly for international and regional (EU, former USSR etc.) markets:

- Industrialization;
- Consolidation and modernization;
- Rising competitive capacity and innovations;
- Orientation on regional and world market;
- Quality (ISO 9000; ISO 22 000) and environmental (ISO 14 001, EMAS) management systems;
- Food quality brands.

Second direction for further food sector's development is food production in farms, small and micro-enterprises, which observe sustainable and environment-friendly food chain and produce added value food products mainly for domestic market:

- Production of local and artisan food;
- Organic food and market development;
- Local food market and distribution;
- Cooperation and innovations;
- Culinary tourism (slow food);
- Voluntary quality schemes.

In this paper we will look into development and implementation of sustainable food production provisions of both above-mentioned provisions of sustainable food production: 1) for small producers - organic farming; 2) for industrial producers - quality and management systems.

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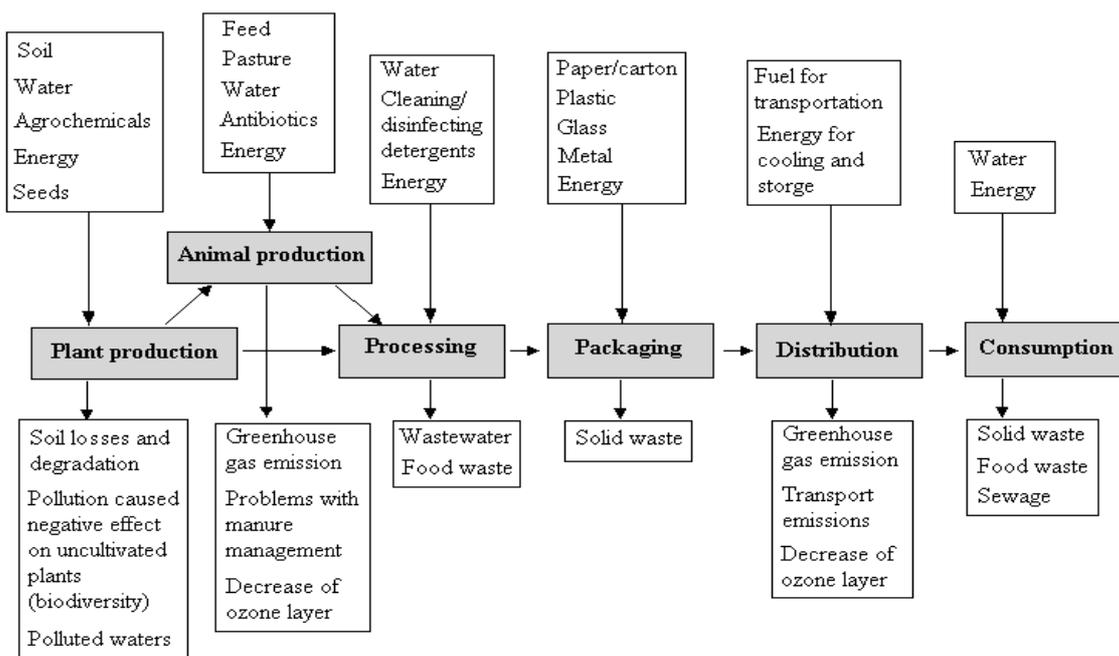


Fig. 1. The food chain's influence on some sustainability components - natural resources and environment  
 Source: authors' modification from Melece, 2005a

**Materials and methods**

The principal **materials** used for the study are as follows: legislation of Republic of Latvia and European Union; data from Ministry of Agriculture, Food and Veterinary Service of Latvia, Agricultural Data Centre, Association of Latvian Organic Agriculture and Latvian Association for Quality.

Both qualitative and quantitative research **methods** were used in this study: analysis, data grouping, reference, logical and abstract constructive and expert methods etc. Due to limited space only the most important results of the research are presented in the paper.

**Results and discussion**

**1. Development issues of organic farming and food production**

Nowadays, the organic farming has been suggested as a means to reduce energy needs in food production and to avoid depletion of the ozone shield which it is postulated results from the escape of nitrous oxide into the stratosphere following the use of nitrogen fertilizer (Foster et. al., 2006). Nonetheless, in 1977 researcher Samuel Aldrich (Aldrich, 1977) pointed out that farming under an organic farming system resulted in approximately 40 per cent loss of the original soil organic matter and nitrogen. He stressed that nitrogen fertilizer was available to offset the decline in nitrogen in soil, and his conclusion was that organic farming was not a viable system with capable of satisfying food needs in today's world.

Although consumer awareness of food safety issues in Latvia and a general societal consensus that agricultural production should be in balance with the ecosystem as a whole increases, there are still substantial problems related to the development of the organic sector: processing and marketing are poorly developed; there is a lack of certified organic seeds, and the levels of research, education and knowledge among farmers and consumers are low. Recently, however, there has been a major increase in the number of organic farms, mainly due to increased state support, including an action plan for organic farming.

In the last few years organic farming has become a growth production method that makes a major contribution to the multifunctionality of Latvia's agriculture, where EU institutions (European Parliament, 2005) consider that organic production providing healthy, high-quality products while at the same time bringing about a reduction in environmental pollution, encouraging the preservation and sustainable use of biodiversity, providing protection for cultivated land and preserving, or even creating, jobs.

In Latvia, organic farming started in 1989. An inspection system according to EU Regulation 2092/91 has been in force since 2001 (Melece, Romanova, 2006). Rapid development of the organic farming in Latvia began after the year 2001, when in the Republic of Latvia Law "On Agriculture" organic farming and state assign subsidies for this farming method (Latvijas Bioloģiskās lauksaimniecības asociācija, 2005) were defined. After Latvia's accession to the European Union in 2004, the number of organic farms has increased more than fourfold (Figure 2). The reason for popularity and rapid growth of organic farming in Latvia is support from the national government and the EU.

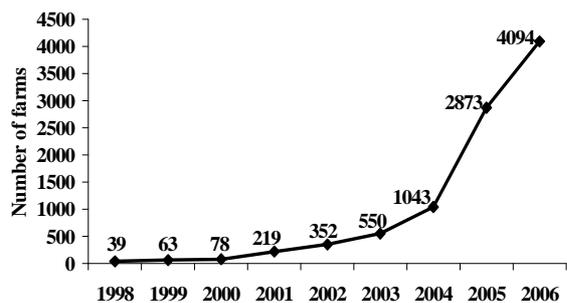


Fig. 2. Number of organic farms in Latvia, 1998 - 2006  
 Source: authors' calculations from data of Food and Veterinary Service

The method of organic farming is more widespread than conventional farming in Latgale's region (Preiļu, Balvu, Daugavpils, Krāslavas, Ludzas un Rēzeknes districts), and in Cēsu and Madonas districts where 40% from total number of organic farms is located. This is related to inhabitants' economic and social situation as well as with opportunities for agricultural development (Latvijas Bioloģiskās lauksaimniecības asociācija, 2005). Whereas, in Jelgava, Bauska, Dobeļe, Rīga, Saldus and Tukums districts, where traditional and intensive agriculture is well developed, the number of organic farms is considerably lower (Figure 3).

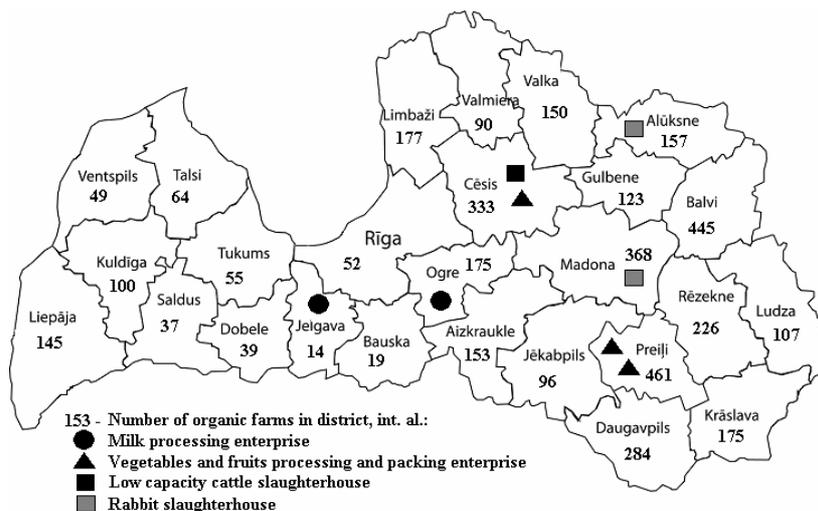


Fig. 3. Number of organic farms in Latvia's districts, 2006  
 Source: authors' calculations from data of Food and Veterinary Service

The findings of study conducted by Marketing House (Marketing House, 2006) show a trend that most active in organic farming are small farms with 10-29.99 ha of agricultural land per farm, which makes around half (~50 %) of all farms. Moreover, small farms have the biggest share of agricultural land for organic farming from 17.9 % to 31.2 %.

One of the features of Latvia's organic farming is multi-branch production. Most organic farms - 99.7 % - deal with plant growing, while 60.2 % are involved dairy livestock breeding. Relatively large number of farms is specialized in beef, vegetable and pig breeding, as well as fowl breeding.

One of the possible solutions to increase organic milk processing capacity - rather than establishing new companies - is to restructure the existing milk processing companies, forming organic milk processing lines.

Analysis of the milk farm distribution by districts, revealed that most of them are located in Latgale and Vidzeme regions, while the biggest proportion of milk processing companies are located in areas where organic farming is not too common, e.g, Jelgava, Bauska, Dobeļe, Tukums, Saldus and Rīga districts (Figure 4).

Analyzing the existing situation, we concluded - in order to ensure the sufficient number of organic milk processing companies; it is best to restructure the organic milk-processing companies in Liepājas, Talsi, Preiļi, Madona and Valmiera districts. Such organic milk-processing network would create a sufficiently even layout of these companies on the territory of Latvia, ensuring and creating favourable conditions for long-term production of organic milk.

Similarly, the largest proportion of organic pork farms are in the East of Latvia - Daugavpils, Balvi, Preiļi, Krāslavai districts. Currently there are no slaughterhouses in Latvia which could slaughter organically bred pigs, which is why organic farms have no motivation to breed pigs, as pork from pigs, slaughtered in the existing slaughterhouses, cannot receive marking proving that this meat is organic, therefore farmers cannot hope to set higher price.

At present there are pig slaughterhouses in almost all Latvia's districts (except in Gulbene district), besides most are concentrated in 100 to 140 km range around Rīga, as well as in Liepāja, Ventspils, Kuldīga and Daugavpils districts.

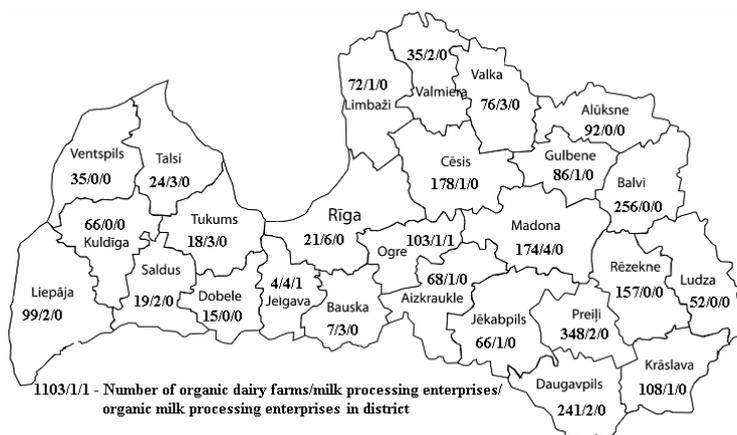


Fig. 4. Number of organic dairy farms, milk processing enterprises and organic milk processing enterprises in Latvia's districts, 2006  
 Source: authors' calculations from data of Food and Veterinary Service

In order to assess in more detail, which districts would require pig slaughterhouse restructuring, so organically bred pigs could be slaughtered there, it is necessary to assess the pork production in various Latvia's districts. Unfortunately, Latvia has no separate statistics on proportion of the organically bred pigs in total number of pigs; however, some conclusions can be made, observing the total number of pig distribution by districts.

Statistics data show that the largest number of pigs is in Liepāja, Jēkabpils, Rīga, Saldus, Talsi and Dobele districts, and it should be mentioned that these districts contain a relatively small number of organic farms (Figure 5). Hence we can assume that these districts have intensive pork production and restructuring of the existing pig slaughterhouses into slaughterhouses for organically bred pigs is not necessary.

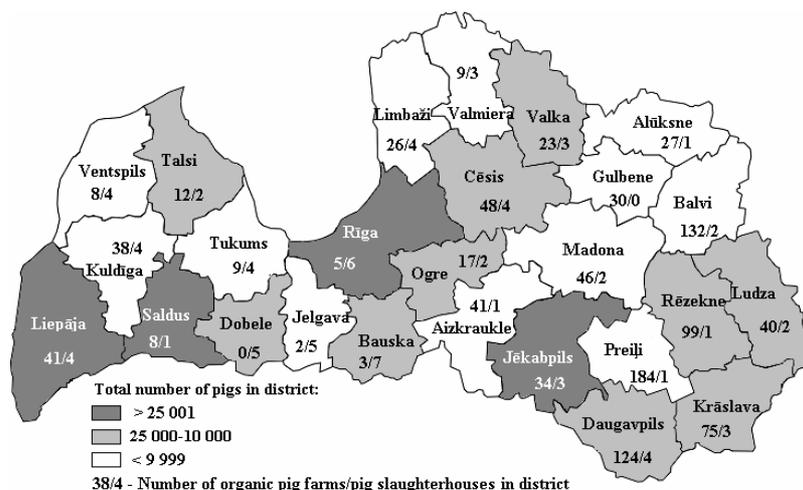


Fig. 5. Number of pigs, organic pig farms and pig slaughterhouses in Latvia's districts, 2006  
 Source: data from Food and Veterinary Service and Agricultural Data Centre

Considering the number of pigs and number of slaughterhouses and their location per district (Figure 5), in our opinion the most appropriate regions to have at least one organic slaughterhouse per district, could be in the following districts: Kuldīgas, Jelgavas, Daugavpils, Madonas and Cēsu.

Similar situation can be observed in organic beef sector. In order to assess organic beef production development opportunities, the following indicators were evaluated - number of organic farms, number of beef slaughterhouses, number of organic beef slaughterhouses and number of cattle in districts.

Having analyzed this information we conclude that in the districts with a large number of cattle and organic

farms, e.g. Liepāja, Daugavpils, Preiļi, Madona etc. districts, there is a lack of organic beef slaughterhouses (Figure 6) as currently in Latvia exists only one.

In order to maintain farmers' interest in organic beef production methods, it is very important to establish additional organic slaughterhouses. Provided that there is at least one beef slaughterhouse in almost every district (except Alūksne and Saldus districts) it is possible to restructure the existing slaughterhouses and develop lines in the slaughterhouses that are appropriate for organic cattle slaughtering. We suggest that this restructuring could be done in Kuldīga, Preiļi and Balvi districts.

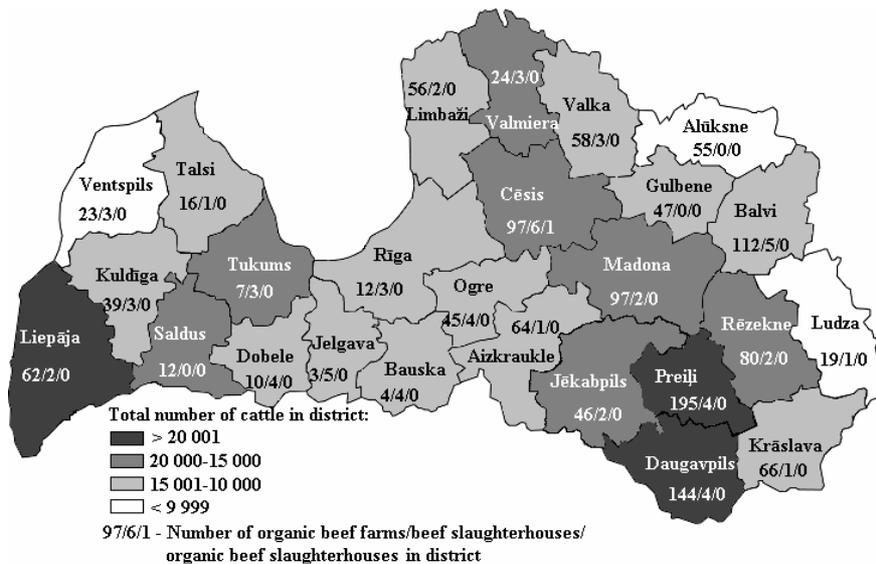


Fig. 6. Number of cattle, organic beef cattle farms, cattle slaughterhouses and organic cattle slaughterhouses in Latvia's districts, 2006  
 Source: data from Food and Veterinary Service; Agricultural Data Centre

2. Management systems

The management systems have been relatively divided in two major groups: 1) mandatory - to fulfill requirements of legislative rules and 2) voluntary - diverse management and assurance systems.

a. Quality management systems

The food chain quality management systems like other management systems are divided into two groups: first, for assurance mandatory requirements of food safety and quality, i.e. self-control systems based on HACCP principles, second, various voluntary management systems out of which the international standards series ISO 9000 are the most widely known. These standards represent requirements for the development and implementation of a quality management system in an enterprise or institution.

Food enterprises comprise only 2.8 % of the total number of enterprises and institutions, certified according to ISO 9001:2000 standard. Comparing all 20 certified Latvian food enterprises, we can see that most enterprises – 67 % - choose certification according to the quality management standard ISO 9001:2000 (Figure 7), 22 % of the food enterprises are certified in accordance with Denmark's standard HACCP DS 3027:2002 (there are no HACCP standards in Latvia) food safety management system and only 11 % are certified according to standard ISO 14001:2004 environment management system.

In order to increase exports of foodstuffs and competitiveness of food enterprises not only in Latvian, but also in the European Union markets, enterprises need to implement and certify quality management systems according to the international standards (ISO 9001:2000, HACCP DS 3027:2002, ISO 14001:2004 etc.). However, comparing the number of certified food enterprises in 2007 and 2004 we can observe a

negative tendency, showing that the number of certified enterprises decreased by 26%. Also, the structure of applied and certified standards of food enterprises has changed, because in 2004 55% of all certified enterprises were certified according to ISO 9001:2000, 33% according to Denmark's standard HACCP DS 3027:2002, but 12% according to standard ISO 14001:2004 (Melece, 2005b).

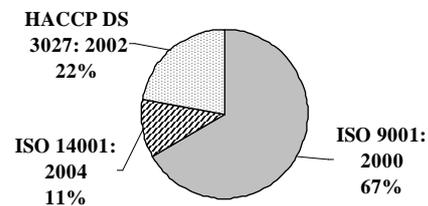


Fig. 7. The structure of applied and certified standards of food enterprises (n = 20) in Latvia, 2007  
 Source: authors' calculations based on data from Latvian Association for Quality<sup>1</sup>

The new standard - ISO 22000 is an international standard and defines the requirements of a food safety management system covering all organizations in the food chain from "farm to fork", including catering and packaging companies. There is only one company "GUTTA" - soft drink producer, which is certified in accordance with this standard.

Optimal working environment is also very important for long-term development. Approximately half of Latvia's enterprises (Matisāne, 2006) int. al. food enterprises do not comply with the basic requirements of Work Safety law. In Latvia, too little attention is being paid to the employee's safety.

<sup>1</sup> <http://www.lka.lv/modules.php?op=modload&name=News&file=sertif&parent=138&topic=139>

### b. Environment management systems

Similarly to food quality management, environment management has mandatory requirements, which are stressed out in legislation and voluntary schemes and standards.

At present Latvian legislative base for environmental (land, water, air) protection is established and corresponds with appropriate EU directives and regulatory frameworks (Integrated pollution prevention and control, Landfill of Waste, Water framework directives etc.). In accordance with legislation, enterprises involved in pollution activities, including farms of intensive animal rearing, must receive permission for polluting activities. Analyzing current dynamics of the integrated pollution permits and structure of enterprises we can conclude that for June 1, 2007 the number of enterprises with permission of category A polluting activities in Latvia reached 83<sup>1</sup>. In comparison with the year 2005 (Melece, 2005b), the number of enterprises increased by 13%. 7% of the certified enterprises are agro-food enterprises, mainly animal farms, meat and milk processing enterprises.

Whereas of all enterprises that receive permits of category B polluting activities in Latvia (n=842) 13% are agricultural, forestry and wood-processing enterprises, but food enterprises that has received permits of category B polluting activities make 21% of the total number of enterprises. Comparison of the 2007 and 2005 data (Melece, 2005b), revealed that the number of food enterprises with category B permits increased significantly, by 13%.

The schemes of voluntary certification are one of the various tools for environment protection, developed for environmental management systems. The best-known schemes are environment management standard ISO 14001 and the European Eco-Management and Audit Scheme (EMAS). Latvia's enterprises and institutions prefer certification of environment management systems according to standard ISO 14001, which include both standards' versions – 14001:1996 and 14001:2004. Currently 115 enterprises and institutions are being certificated and 3 of them are food enterprises.

### Conclusions and proposals

Latvia's food sector shows great potential for further development considering sustainability aspects or components through environmental friendly production systems and whole food chain.

The most appropriate regions to have at least one organic slaughterhouse per district could be in the following districts: Kuldīga, Jelgava, Daugavpils, Madona and Cēsu.

In some districts, for instance Liepāja, Daugavpils, Preiļi, Madona etc., with large number of cattle and organic farms, there is a lack of organic beef slaughterhouses.

The fitting of organic milk processing lines is necessary for successful and effective improvement of organic fo-

od production and increasing market share of organic food products.

It is best to restructure the organic milk processing companies in Liepāja, Talsi, Preiļi, Madona and Valmiera districts. Such organic milk processing network would create a sufficiently even layout of these companies in territory of Latvia, ensuring and creating favourable conditions for long-term production of organic milk.

The development of the production and processing of organic products is limited by the fact that co-operation among producers of agricultural goods has not been developed, and there is a shortage of specialized processing companies. As the processing of biological products remains undeveloped, most products are sold without being processed; some products are sold only after preliminary processing.

The trends of implementation of quality and environment management systems in the food sector, comparing with the situation in 2004, show signs of decreasing.

### References

1. Aldrich S.R. (1977). Conventional v. organic farming. Illinois Issues/21. Available at <http://www.lib.niu.edu/ipo/1977/ii770919.html>
2. A MISTRA Program (2003). FOOD 21 Sustainable Food Production/Program Plan Year 2004 (2001-2004). Available at <http://www.mat21.slu.se/publikation/pdf/Programplan2004.pdf>
3. European Parliament (2005). European Parliament Resolution on the European Action Plan for Organic Food and Farming (2004/2202(INI)). Official Journal 320 E, 15/12/2005, pp. 242 – 247.
4. Foster C., Green K., Bleda M., Dewick P., Evans B., Flynn A., Mylan J. (2006). Environmental Impacts of Food Production and Consumption: A report to the Department of Environment, Food and Rural Affairs. Manchester Business School. Defra. London, 199 p.
5. Latvijas Bioloģiskās lauksaimniecības asociācija (2005). Biobijetens Nr. 27 (3). Available at <http://www.ekoprodukti.lv/?id=28>
6. Marketing House (2006). Pētījums-apsekojums par bioloģiskās lauksaimniecības produkcijas ražošanas apjomiem Latvijā bioloģisko saimniecību aptauja, Working paper.
7. Matisāne L. (2006). Kādu atzīmi Jūs liktu savam uzņēmumam, novērtējot tā atbilstību Darba aizsardzības likuma prasībām// Kvalitāte, Nr. 4. Available at <http://www.lka.lv/images/File/desa/Inspecta.doc>
8. Melece L. (2005a). Management Systems of Sustainable and Qualitative Food Chain. Proceedings of the International Scientific Conference "Regional Development of European Countries No 9", pp 70-78, Latvian University of Agriculture
9. Melece L. (2005b). Quality and Environmental Issues of Food Chain in Latvia. Transactions of the Estonian Agricultural University. Proceedings of the International Scientific Conference "Perspectives of the Baltic States' Agriculture Under the CAP Reform", pp. 133-144, Institute of Economics and Social Sciences
10. Melece L., Romanova D. (2006). Sustainability of Agriculture and Environment: Dynamics of Main Agri-environmental Indicators in Latvia. Proceedings of the I International Conference "Sustainability Measurement and Modelling", 21 p. International Center for Numerical Methods in Engineering.
11. Zemkopības ministrija (2003). Bioloģiskās lauksaimniecības attīstības programma 2003. - 2006.gadam. Available at [http://www.zm.gov.lv/doc\\_upl/attistibas\\_programma.doc](http://www.zm.gov.lv/doc_upl/attistibas_programma.doc)

<sup>1</sup> [http://www.vidm.gov.lv/ivnvb/ippc/saraksts/LAKat\\_uzn.pdf](http://www.vidm.gov.lv/ivnvb/ippc/saraksts/LAKat_uzn.pdf)