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Research on organic farming. Case Study: Romania, during 2006 - 2012

[1] Elena Cofas, [2] Ana Ursu

[1] University of Agronomic Sciences and Veterinary Medicine, Faculty of Management Economical Engineering in Agriculture and Rural Development, Romania, [2] Research Institute for Agricultural Economics and Rural Development Bucharest, Romania

[1] E-mail: cofasela@yahoo.com, [2] E-mail: iceadrana@yahoo.com

Abstract *Organic farming is a relatively new sector, but great perspective for Romania; our country receive proper conditions to develop organic farming as well as fertile and productive soil and low pollution countryside, compared to economically developed countries, which are experiencing a high level of industrialization and use of agricultural technologies super intensive based heavily on chemical fertilizers and synthetic pesticides. Organic crops are represented in our country most forage crops and pastures, cereals, oilseeds and protein plus vegetable material, berries, mushrooms, medicinal and aromatic plants harvested from the wild flora.*

Therefore, practicing proper organic farming and a market capitalization of its products must be based on specialized knowledge and a strict observance of the principles and practices this system of agriculture.

Key words agriculture, ecology, production, system

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Introduction

Organic farming (also called organic or biological) appeared in Europe as a result of negative experiences from the use of synthetic chemicals, agricultural technologies generated by type super intensive industrial based on excessive mechanization and automation of production technology and due to the use of large quantities of fertilizers and pesticides for plant protection and plant nutrition and plant growth in feed (antibiotics, hormones etc.).

Organic farming emerged in the early twentieth century, but the principles of this system of agriculture was promoted after the Second World War by consumers and physicians concerned about the effect of food on human health. Theoretical OA were made between 1920 - 1960, immediately after the start of the industrialization of agriculture and enacting "green revolution" by Rudof Steiner in Germany, the founder of the concept of 'biodynamic agriculture', Sir Albert Howard in England on whose ideas founded the school of "organic agriculture", H. Muller in Switzerland, author of the concept of 'organic-biological agriculture' and C. Lemaire and J. Boucher in France, the founders of the school of 'biological agriculture'.

"Organic farming" is a protected term and Romania assigned by the EU to define this system is similar to the terms of agriculture, 'organic agriculture' or 'biological agriculture' used in other Member States. The industrial agriculture, with its accompanying shortcomings tends to be replaced by 'organic' ('sustainable agriculture'). It began to be more clearly outline from the last decade in our country. Agriculture was from its inception "green", but in recent years searching for application in agriculture and systematic vision of modern technologies. Organic farming promotes farming by those means which provides a balance between agro ecosystems and ambiance and is based on the use of those means and methods offered by the company, the scientific and technical achievements that ensure high yields, consistency and quality in terms of protection environment.

Organic farming actually becomes synonymous with agriculture coming years, which ensures the integrity of the biosphere, to maximize the production capacity of agro ecosystems and obtaining good quality products that will provide the necessary food while reducing fossil energy consumption, maintaining

or increase the natural fertility of soils, improving human living environment and environmental protection as a whole.

Results and discussion

1. Alternative farming systems

Since 1980, biologists and environmentalists who dealt with the protection of wildlife have fired the first warning sign showing that without a change of mentality and way of looking at natural resources, especially renewable ones, they will disappear and with them the whole civilization will collapse. Little by little , as researched and farmers have shown a growing interest in better farming practices integrated into the cycles of nature. They began to formulate concepts and principles for the transition to alternative models of agriculture. Organic farming has emerged as a practical alternative to intensive conventional (industrialized) agriculture based on maximizing yields through the use of in, stimulating the production of energy - intensive nature in large quantities in order to increase agricultural production continue for a population growing, mostly urban.

Over time were mainly developed three alternative farming systems with names and specific guidance by their promoters:

- ✓ **biodynamic agriculture**

The system was initiated in 1924 with the promoters philosopher Rudolf Steiner and implemented by agronomist E. Pfeiffer. It is based on the theory that all human-nature - universe must be approached holistically, harmonized and mutually inter- relations, all biological processes in the biosphere with its four levels, soil-plant -animal- man had a rhythmic character (daily, monthly, seasonal, annual), resonating rhythms of the earth, moon, sun and the cosmic phenomena. Biodynamic farming system using biodynamic preparations starter role organizers harmonized driving force of biological and biochemical processes in soil or compost, which influences microbial life or animals and plants where vegetative and generative processes influence. This optimizes rooting germination and fruition of plants, thus fertility at animals and balance homeostasis, enhancing health and resistance to diseases and pests.

However, the widespread practice of biodynamic farming is not possible or at least not be a realistic goal, whereas in the present circumstances cannot be covered needs of food and raw materials worldwide for a growing population. This type of agriculture is more a way of life, a philosophy that cannot be generalized globally.

- ✓ **organic agriculture**

Theoretical principles of organic agriculture system were based on 30-40 years of last century by Sir Albert Howard and Lady Eve Balfour. As a defining element, the system excludes agricultural practice using all renewable natural resources, including fossil fuels. The organic agriculture is based on the theoretical full use of natural soil fertility and the factors that favor. Nutritive materials for growing plants is provided by legumes in crop rotation and mineral elements in the deeper layers of the soil are brought to the surface by using the rotation of deep-rooting plants.

Also used in tandem with intake plant groups and different requirements in terms of macro-and microelements (eg vegetables - grass association), with a special focus on life especially complex soil mycorrhizae which increase availability to plants mineral elements exerting a protective effect against the plant pathogens from the soil.

- ✓ **biological agriculture**

In the 1940s, Hans Peter Rush and H. Muller introduced the idea of biological agriculture that emphasizes on renewable resources to ensure food security of the population. This is defined as production systems which avoid the use of synthetic fertilizers, pesticides, plant growth regulators, animal growth of the feed additions. Technological elements are allowed and practiced various methods of sowing, use of plant resources after harvest, manure, legumes, green manure, mechanical cultivation, use rock powders - source mineral for maintaining high fertility, biological control and physical pests, diseases and weeds.

Fundamental goals of this model of biological agriculture are:

- maintaining soil fertility long,
- avoid all forms of pollution that can be caused by agricultural techniques,
- production of sufficient quantities of food of high nutritional quality,

- minimizing the use of fossil energy - energy recoverable in agricultural practice,
- livestock living conditions consistent with their physiological needs.

At present, organic farming principles conquer increasingly becoming an inseparable part food market of agricultural policy in developed countries economically, which have an organization of farming laws, ordinances and regulations.

- ✓ **ecological agriculture (sustainable)**

Most experts, relying on the provisions of Regulation (EC) 834/2007 and Regulation 889/2008 of the Commission, argue that ecological agriculture has the same definition of 'organic' or 'biological'. Given the content of structural concepts: agro - field , field, land , culture - all the material and spiritual values created and accumulated by mankind over time, cross - home, family , marriage, household, environmental and logic - science, study, research and practical realities, it can be stated that "organic agriculture is the science or art of keeping the administration or control of farm creatures and their environment for the benefit of humanity through modern means and methods that do not harm the environment".

It has been estimated that there are about 16 different names used in the world of what we call generic organic farming. Some of the best known names are organic agriculture, regenerative farming and sustainable agriculture. In many countries there are major differences between these concepts. Principles and practices behind these different names are similar and were expressed concisely document standards of the International Federation of Organic Agriculture Movement (IFOAM).

According to IFOAM standards, organic farming aims:

- to produce high-quality food in sufficient quantity;
- to work with natural system ;
- to encourage and enhance biological cycles within the farming system;
- to maintain and increase long-term fertility of soils;
- se what is perhaps more renewable resources in agricultural systems;
- to work as much in a closed system;
- ensure all living animals to enable them to fulfill all aspects of their innate behavior;
- to avoid all forms of pollution that may result from agricultural techniques;
- to maintain the genetic diversity of the agricultural system and its surroundings, including the protection - plant and wildlife habitats;
- to enable farmers to obtain an adequate income and satisfaction in their work, including ensuring a safe workplace.

For farmers who practice organic farming, these principles provide the basis for daily practice of this system of agriculture. These relate directly to organic farming techniques , such as using large rotations using manure and manure; avoidance of soluble fertilizers; ban intensive livestock; incentives to avoid antibiotics and hormones; the use of mechanical and thermal control of weeds; emphasizing processing and sale of farm products directly to consumers; use of overtime when strictly necessary.

The role of organic farming is to produce food cleaner, suitable human metabolism in full correlation with environmental conservation and development. One of the main goals of organic farming is the production of agricultural and food products fresh and genuine processes designed to respect nature and its systems. Organic farming has a major contribution to sustainable development, increasing economic activities with significant added value and increase interest in rural areas. Organic farming can be defined as a production system which avoids or synthetic compounds exclude general use of fertilizers, pesticides, growth regulators and livestock feed additives. Organic farming systems rely on crop rotation, use of crop residues, animal manure, manure, off-farm organic wastes.

2. Analysis system for organic farming in Romania

At present, the system of organic farming in the EU is regulated by Council Regulation 2092/1991 for crops and Regulation 1804/1999 on the animal. Three terms are used to define this system of agriculture as follows: the term 'organic' (United Kingdom), the term 'biological' (France, Italy, Belgium, Greece, Luxembourg, Hungary, Bulgaria etc.) and the term 'ecological' (Germany, Austria, Spain, Denmark, Holland, Portugal, Sweden, Finland, Romania etc.).

In order to extend the system of organic farming in Romania, in this regard has been established national legal regulations for the production, processing and selling organic products in line with international standards. Among these, we mention: Government Emergency Ordinance no. 34/2000, Law no. 38/2001; H. G. No. 917/2001 for approving the methodological norms for the application of these regulations (including annexes norms) etc. For the implementation of the provisions of these regulations, operating the National Organic Products (NAEP), as a specialized service in the Ministry of Agriculture, which ensure compliance with all legal requirements and provides specific control on organic production methods of food products.

Plant technologies are developed in the spirit of these regulations, economic efficiency and clean, prevent environmental damage and maintain basic resources of agriculture. Crop rotation should be located on parcels converted to organic farming as the best run, some that improve soil fertility (such as plants and green manure legumes), using only organic fertilizers and admitted to the exclusion of all pesticides that pollute production and the environment.

Organic farming is a dynamic sector in Romania, which has seen an upward trend in recent years, both in the vegetable and animal production sector. According to data from the Ministry of Agriculture and Rural Development, the number of registered organic operators is growing. Number of operators (producers, processors and traders, importers and exporters) registered in the organic farming system to MARD in 2012 was 15 544 operators; comparing to 2010, the number of operators increased by 60.1%. This increase was due, in particular, the existing support measures for the conversion period granted under Art. 68 of Regulation (EC) no. 73/2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers.

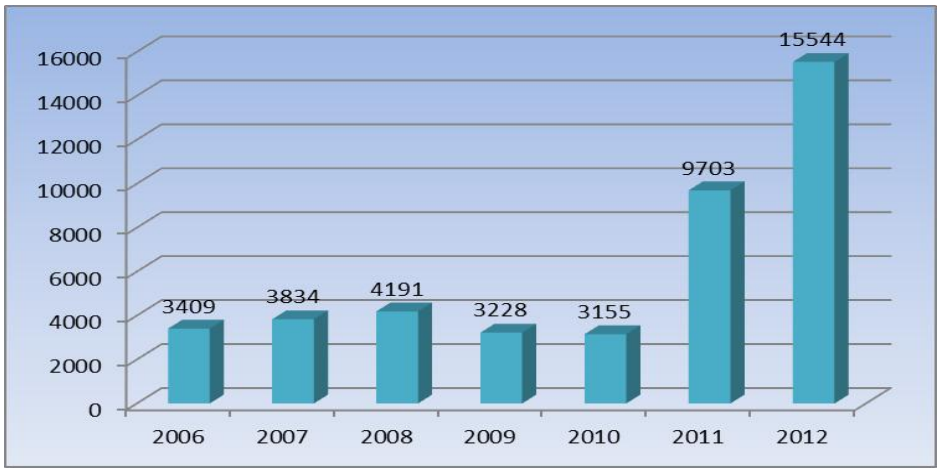

Fig. 1 Number of registered organic operators in Romania
(processed data source: www.madr.ro)

Of the 15.544 registered operators in 2012, 15.190 are farmers, processors 103 and the remaining traders. In fig. 1 is represented the dynamics of nationally registered organic operators for the period 2006-2012. High dynamic in 2012 compared to previous years is mainly due to the fact that many manufacturers of small size farms (subsistence) were enrolled in the conversion due to the subsidy granted by the legislation in force, were between 1.500 and 6.000 euro. In these circumstances, after 2007-2010, the number of operators has remained at about 3.000-4.000, in 2011 were registered operators 9.703, most of them being "small farmers, subsistence plots of land holding three up to 20 acres or farmers with 3-5 cows, 50-100 sheep or 10 hives" (www.madr.ro).

If we analyze the territorial distribution of these operators in organic farming in 2012 (fig. 2) we can see that most of these operators meet record in Suceava (31.4 %), their number being 4.358. Suceava is followed, in order, Bistrita-Năsăud counties with 3.754 operators (22.8%), Iasi with 3.088 operators (7.1%), Caras Severin with 2.990 operators (6.1%), Botosani with 1.929 operators, Mures with 1.440 operators, Salaj with 1.162 operators and Tulcea with 1.010 operators.

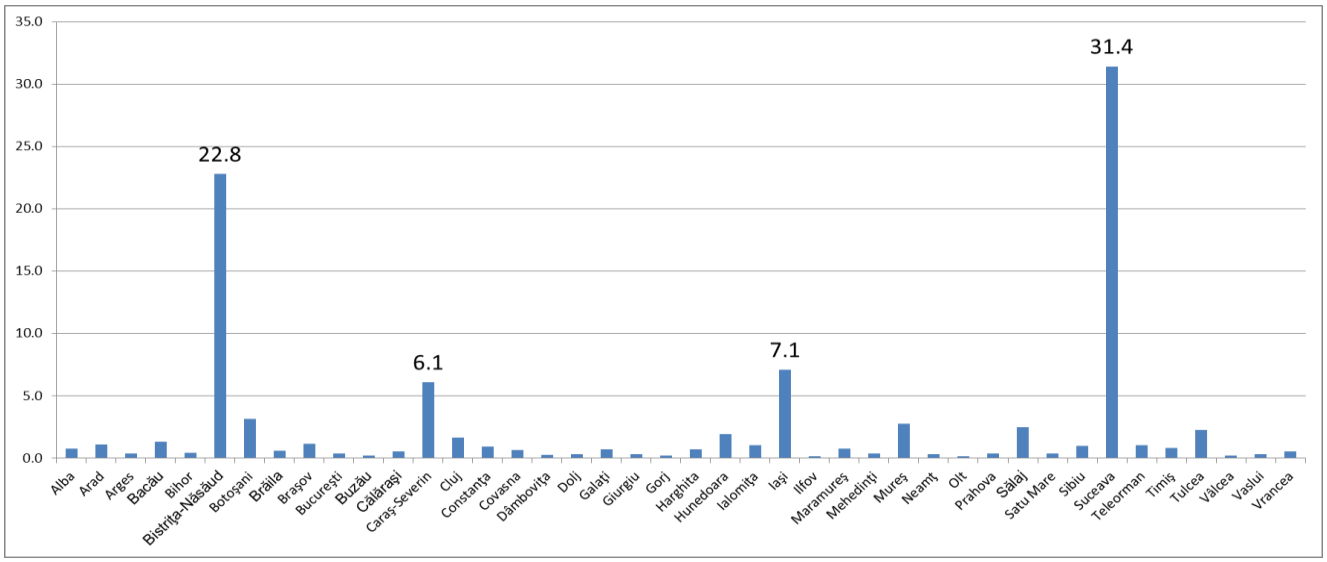

Fig.2 Structure of registered organic operators counties in 2012
(data source: www.madr.ro)

As noted above, the processors of organic products is poorly developed in 2012 recorded only 103 operators. Their territorial distribution (fig. 3) shows that Timis and Bucharest have each about 8-9% of the number of operators, Mehedinti County about 6% and Arad, Calarasi, Constanta, Tulcea, Ilfov Prahova each have about 4% of the total.

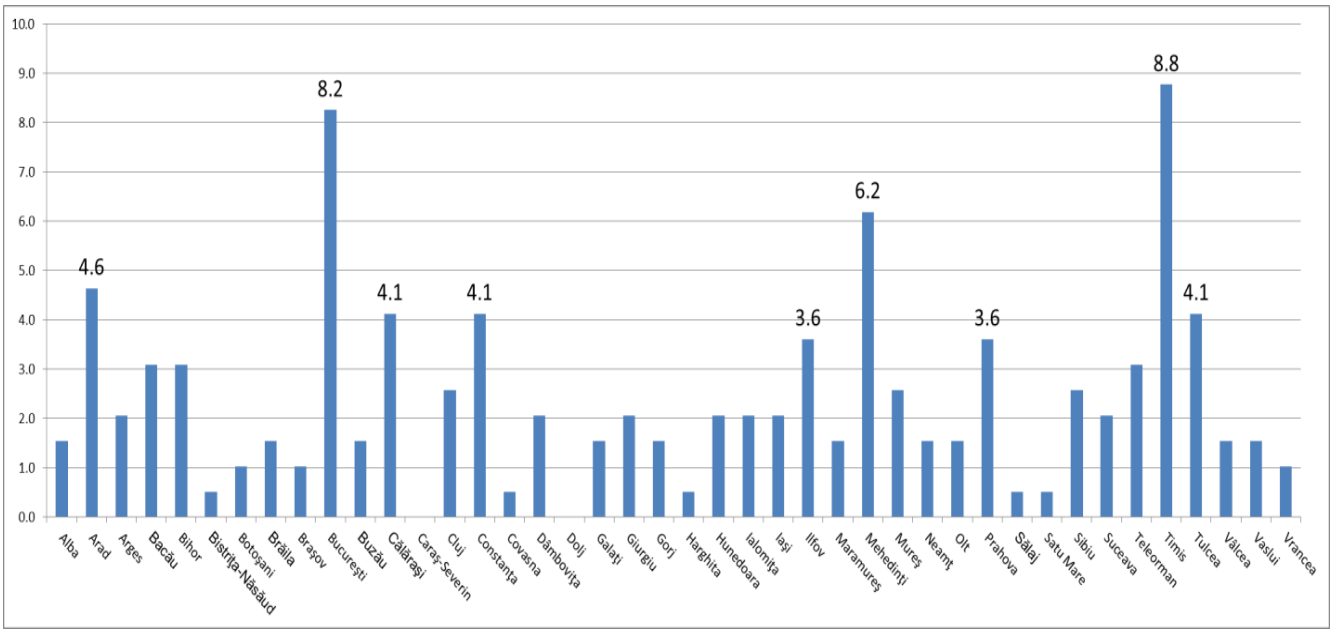

Fig.3 Structure in the environmental sector processors counties registered in 2012
(data source: www.madr.ro)

Analyzing the evolution of surface organic cultivation for the period 2008-2011 (fig. 4), we can see that by 2010, the highest share in total cultivated area to hold crops on arable land (56% in 2010). In 2011, however, nearly 60% of the surface is spontaneous flora, is about 338.000 hectares and only 26% is arable crops, is approx. 148.000 hectares. For 2012, the areas of pasture and forage have the largest share in the total area - 37% (about 111.000 ha) followed by cereals 32% (about 98.000 ha), oilseeds and protein 15% (46.000 ha).

Tab. no. 1 – The values of surfaces grown in organic farming system

Indicatory	2006	2007	2008	2009	2010	2011	2012
The area cultivated in organic farming, arable crops (ha)	45605	65112	86454	110014	148034	147581.6	174644
The area cultivated in organic farming, permanent crops (ha) of pastures and hayfields	51200	57600	46007	39232.8	31579.1	78197.51	105835.6
The area cultivation in organic farming, permanent crops (ha) of orchards and vineyards	294	954	1518	1869.4	3093.04	4166.62	7781.33
Collection of spontaneous flora (ha)	38700	58728	81279	88883.4	77294.4	338051	1082138

(data source: www.madr.ro)

Based on the data presented in table 1 were analyzed by dynamic values can be observed that in the same period, the amount recorded in the areas of organic farming increased from 13.844 ha to 30.817 ha, 16.973 ha, respectively, equivalent an increase of 211.4%, reaching in 2011 to about 568.000 hectares. The area cultivated in organic farming - crops on arable land increased continuously during the period under review, in 2011 being 126.7% higher than in 2007. Dynamics was the highest in terms of area cultivated with crops permanent - orchards and vines, 336.8%, respectively. Cultivate pasture and meadow area exceeded 2007 levels only in 2011, with only 35.8%, while the area occupied by the spontaneous flora recorded in 2011, an increase of 475.6% compared to 2007.

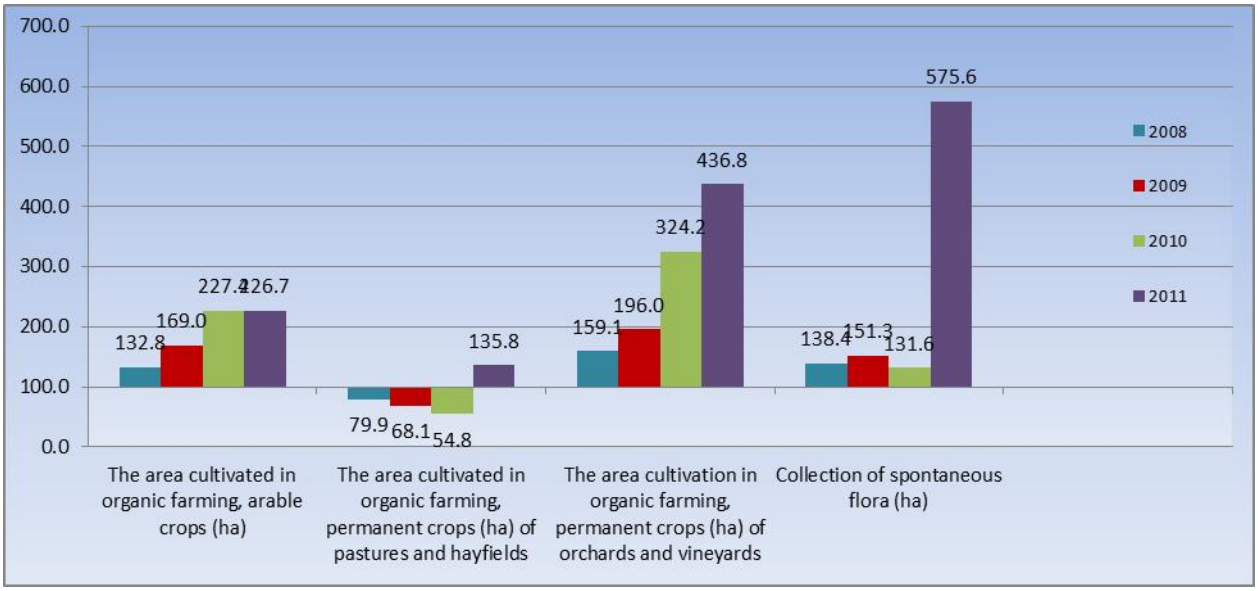

Fig.4 Dynamics of surfaces cultivated in organic system in 2008-2011

(processed data source: www.madr.ro)

Situation analysis for the specific applications submitted for 2012 show that small operators in the sector of organic farming - crop production, with holdings from 0.3 to 5 ha , representing approx. 65 % . To meet the demands of supporting farm operators associations small vegetable sector, required to maintain the system to cover the fee for inspection and certification and continuing production, the Government has proposed specific means to be balanced in favor of operators with smaller holdings.

A holding area in organic farming, vegetable production varies from approx. 100 square meters for growing vegetables in greenhouses, up to approx. 2000 ha for growing field crops. The average area of farms in 2011 was about 20 to 22 ha. The total output produced from certified organic farming crop production in 2011 was approx. 134.580,3 tones to 18325.83 tons in 2007.

In the livestock sector has been an increasing trend of farmed livestock environmental , and largely due to the support measures coming from the state, by HG No. 759 of 21 July 2010 and the National Rural Development Programme 2007-2013. However, interest in organic production of livestock is much smaller compared to the number of operators in the plant. To qualify for support from the state, both beneficiaries of crop production , livestock production and those (species: birds, cattle and sheep / goats) must meet the following conditions:

a. be registered each year requesting specific support to the Ministry of Agriculture and Rural Development as organic producers;

b. have a contract with an inspection body and certification body approved by the Ministry of Agriculture and Rural Development;

c. hold a certificate of conformity/master certificate/certificate issued conversion confirmation manufacturer inspection and certification body that issued the policy;

d. have no outstanding debts to the state budget or local government.

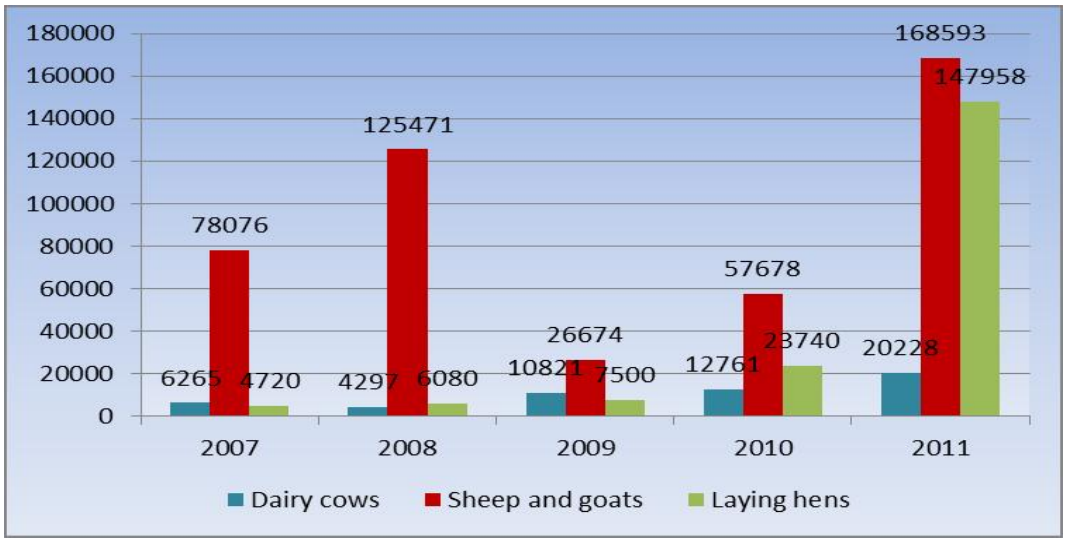

Fig.5. Evolution of livestock (heads) in 2007-2011
(data source: MARD)

Livestock raised organically have averaged an upward trend (figure 5). Thus, in 2011 compared to 2007, the number of dairy cows increased by 222.9 % (from 6265 to 20228 heads heads), sheep and goats by 115.9 % (from 78076 to 168593 heads heads) and the number of laying hens by 2134.7 % (from 4720 end to the 147.958 heads). In 2012 recorded growth of livestock kept by the organic production method, especially sheep and goats – 160.000 heads while 85.000 heads are laying hens and 60.000 dairy cows.

Regarding the processed products in 2012 was an increase in the number of processors and products (from 48 units in 2007 to 103 in 2012). Among the most important 103 certified organic processing units in the year 2012, 41 are for storing grain, honey and bee products 19 and 8 for pasta, flour and bakery products. Most organic products are in the bakery, they had a total share of 24.6 % of all organic products, processed cereals followed by 15.38 % to 13.78 % and dairy. In the year 2012, the total processed organic product in Romania is 312.

Of operational data it holds MARD there is only one operator in the flesh, at the other extreme, the highest number of processing units is in grains. In the interval 2007 - 2012 the number of processors has increased steadily, with a slight decrease in 2009, which demonstrates that the market for organic products is a continuous process.

In farm production stage prohibiting genetically modified organisms (GMOs and their derivatives) of synthetic fertilizers and pesticides, growth stimulators and regulators, hormones, antibiotics. In the food processing stage restricting the use of additives, complementary substances and synthetic chemicals used in the preparation of organic food.

Conclusions

At the end of this article we can draw the following conclusions:

1. Adopting European legislative framework and increasing subsidies have made in Romania surfaces organically grown to meet development between 2007-2012 to 211.4 % reaching an area of 568.000 hectares. Approximately 60 % of the cultivated area is spontaneous flora (338.000 hectares) and only 26% of crops on arable land (148 hectares).
2. Increased number of producers due up many small producers with small size farms (subsistence) retraining program because of the subsidies amount and the creation of new corporations or associations. Thus starting from a number of producers around 3000-4000 years 2007-2010 reached in 2011-9703 and 2012-10176 manufacturers. In 2012 , there were 39 registered operators in aquaculture, beekeeping 207 operators , 194 processors, 110 traders, 13 exporters and 24 importers.
3. Concentration level of these operators is the following counties : in Suceava and Bistrita Nasaud are found 54.2 % of the total organic producer in Tulcea, Calarasi counties found 69 % of the total aquaculture operators. Mures County found 43 % of beekeepers, and Timis, Bucharest, Mehedinti, Arad, Calarasi, Constanta, Tulcea, Ilfov Prahova works 50 % of the processors.

Traditional goal of maximizing agricultural production is offset by a range of rural and environmental concerns and the fact that limited natural resources must be better managed. Major questions and criticisms of modern intensive farming practices is the fact that it:

- ✓ damages soil structure ;
- ✓ harm the natural environment;
- ✓ creates potential risks of disease through food;
- ✓ caused a reduction in food quality;
- ✓ is an energy- intensive;
- ✓ involves intensive livestock production systems that are ethically unacceptable.

Organic farming actually becomes synonymous with agriculture coming years, which ensures the integrity of the biosphere, to maximize the production capacity of agro ecosystems and obtain good quality products. It will require a more conscientious and imaginative work and provide an abundance of food while reducing fossil energy consumption, maintaining or enhancing natural fertility of the soil, improving the living environment of human and environmental protection as a whole.

In Romania, the competitiveness of organic products is determined by the following factors:

- Number of operators in the sector is growing and stands and processors increase. Area under cultivation in organic farming is growing from year to year.
- The organic market is expanding and is characterized by diversification of products on the market from year to year.
- Increasingly more consumers are aware that along with the quality and value of organic products for health, organic farming has a major contribution to sustainable development. Awareness by the public of the importance of organic farming in rural areas, can be a solution to revitalize the countryside. Organic production based on non-use of synthetic chemicals and respect animal welfare is a solution of sustainability.

Given the competitiveness of organic products, agricultural potential and demand for organic products increasingly higher Romania, an important factor is the continued support of organic production and processing sector for such products as one of the solutions to increase the competitiveness of agriculture Romanian.

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