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Abstract. The primary objective of supply chain management is to fulfill customer demands through the most efficient use of resources, including distribution capacity, inventory and labor. A variety of optimizing aspects of the supply chain include acts as a go-between with suppliers to reduce bottlenecks. The sales and operation planning is becoming a requirement for doing well supply chain implementation.

There are many key opportunities for improving the export and competitive performances of the sector of certified food products and eco-products. Romania has great openings for promoting and developing the ecological agriculture due to an agricultural area of 14.8 million hectares and unpolluted soils.

One of the major points is to confine and maintain a greater part from the nationwide element of value chain during the orientation of production and sales towards primary products. It is also required a better promotion of Romanian food products on external markets, as well as a more intensive niche marketing and consolidation of the existing ones. Another concern is to create a suitable manufacturing, processing and marketing system for food products, aimed to suit the needs of national and foreign markets. The development of the research area of activities related to food products and markets has to be also increased.

Keywords: Agri-production systems, Quality, Supply Chain, Management

1. Introduction – Romanian Agriculture in figures

Agriculture plays an important role in the Romanian economy. Some of the most important data, which characterized Romanian agriculture, are presented below. The evolution of Romanian agricultural holdings, considering an agricultural holdings as a single unit both technically and economically, that has single management and which produces agricultural products, was 7.656.000 in 2001, 4.484.890 in 2003, 4.256.150 in 2005 and 3.931.000 in 2007 (Eurostat). There are also other agricultural holdings with another gainful activity than agricultural production. Other gainful activity is an activity that do not comprise any farm work but which directly related to the holding using its resources (area, machinery, buildings, etc.) or the products of the holding and which have an economic impact on the holding. It is carried out by the holder, his family members or one or more partners on a group holding. For example such activities are: providing accommodation, processing of farm products, renewable energy production.

According with the research of OECD, Center for Cooperation with nonmembers, after the revolution, the property restitution has left 91,6% of all private farms, or 54,5% of the country's arable land, in plots smaller than 5 hectares. This surface is enough to provide subsistence income for a family. A negative aspect is the lack of the investment capital and the neglected infrastructure. The storage facilities, farm equipment, irrigation systems have deteriorated significantly in the last decade when the state ownership no longer applies. The evolution of the number of agricultural holdings according with the area of holding is listed in the following table.

Table 1. Evolution of agricultural holdings [1000] (Source: Eurostat)

	2003	2005	2007
Agricultural holdings with area < 5 ha	4205	3870	3530
Agricultural holdings with area < 5-20 ha	256	355	370
Agricultural holdings with area < 20-50 ha	9	16	16
Agricultural holdings with area > 50 ha	14	13	14

The attention for organic farming is growing. The National Federation of Ecological Agricultural (FNAE) comprises about 4000 farmers (Ucenic, 2003). The government is also concerned about this topic and promoted organic agriculture, in particular in mountainous areas. The organic crop area reached in 2006 about 65111 ha.

2. Agri- Production Systems

Intensive agriculture is an agricultural production system differentiated by the high inputs of capital, labor, or heavy usage of technologies such as pesticides and fertilizers relative to land area. It is in dissimilarity to a lot of varieties of sustainable agriculture such as organic farming or extensive agriculture. These types involve a comparatively little input of resources and labor, relative to the area of exploited land and which spotlight on maintaining long-term ecological health of farmland.

Map of Europe obviously shows areas of intensive agriculture concentration. This is the South of Europe, mainly Mediterranean region: Spain, Greece and South of Italy. Some areas can be found also in Portugal and Romania.

Industrial agriculture is a variety of up to date farming that refers to the industrialized production of livestock and crops. The techniques of industrial agriculture are technical -scientific, economic and political. They consist of innovation in agricultural machinery and farming methods, genetic technology, techniques for achieving economies of scale in production, the establishment of new markets for consumption, the application of patent protection to genetic information, and global trade. These methods are well-known in developed nations and increasingly common international. Most of the food products available in supermarkets are produced using these methods of industrial agriculture.

The goal of industrial agriculture is to have smaller cost products and to create greater productivity. The challenges and problems of industrial agriculture include the costs and benefits of both current practices and proposed changes. In long run, it is required a shift to a sustainable agriculture form of industrial agriculture

Sustainable agriculture passes on to the ability of a farmhouse to turn out food for an indefinite time, without causing rigorous or permanent damage to ecosystem. The two main issues of sustainable agriculture are:

- the long run impact of a range of practices on soil and processes essential for crop productivity
- the socio-economic aspects.

To design a sustainable and fair agricultural system creates permanent challenges. The farming model most frequently promoted all over the world, based on simple and homogeneous systems, failed in terms of sustainability and equity. Small-scale family farmers have not gained to a large extent from this model. (Funes – Monzote, 2009)

By rising new businesses that have as center of attention sustainable product service systems, the organizations are capable to better serve their consumers, to hold on to clients, to decrease costs and to increase margins. The sustainable gains are a result of lower costs. (Nijs, 2005)

Another concern is to create a suitable manufacturing, processing and marketing system for the ecological products, aimed to suit the needs of national and foreign markets. The development of the research area of activities related to the eco products and markets has to be increased. The Romanian eco-agriculture went one step backward when it was excluded from the National Program for Rural Development. It is strongly required the financial support because the capital accumulation is very slow.

The agriculture of the future has to be in the same time sustainable as well as highly productive. The traditional agriculture is not able to provide enough food for all people. One of its impacts is to make available a set of models and practices for a better development of sustainable agriculture. The new approach which implements ecological concepts to design modern sustainable agricultural production systems is known as agro-ecology. (Gliessman, 2007).

One of the main characteristics of an agro-ecosystem is the presence among its output of the so called by Gliessman, the “consumption and markets”. The structure of the agro-ecosystem, according with the same author, is presented below.

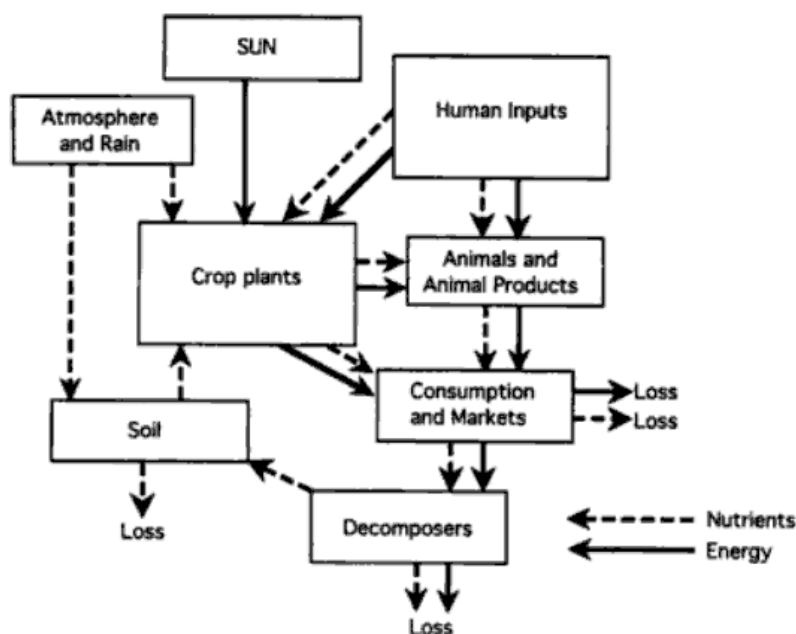


Figure 1. The components of an agro-ecosystem (Source: Gliessman, 2007)

Ecosystems provide food, fuel and materials for protection; additionally they supply a variety of benefits that are difficult to quantify and have rarely been priced. Contemporary inducements support increased agricultural production at the outlay of ecosystem services.

3. Romanian Food Industry

Structural changes took place in the Romanian food industry in the context of globalization. Generally the Romanian sector respected the same trends and influences as the European food industry. Was noticed a deeper integration in the markets. A more favorable environment for increasing trade and investments was created as a result of the institutional changes. Some general trends are evident in food supply and demand despite the large number of individual developments. The most important are the increasing differentiation, a higher polarization and a growing convergence.

The increasing differentiation depends on consumer attitudes and desires. Consumer demand for food breaks down into an increasing number of groups. The demand also became more differentiated at the level of the individual consumer. On the supply side, the food market became more and more segmented. This applies for production and product characteristics. In a saturated food market, innovation is essential for securing or expanding market shares.

The polarization regards the identifiable split in demand between high-end products and cheap offers, as a function of income, among consumers. The middle market segment lost market share, fact that represented a problem particularly for food industry SMEs.

Certain developments suggest growing convergence, which means that despite the growing diversity of the food supply, differences are distorted. The increasing demands of general food, environmental and animal protection regulations had also a leveling influence. It makes difficult for consumers to identify and evaluate differences in quality.

A competitive food industry has to focus on consumer markets, with strong innovation and marketing skills and a solid commitment to food safety and builds strong partnership with its farmer suppliers. The dairy sector should continue to focus on the development of branded products where these have been successful, while also recognizing the potential of newer value added products.

The competition level became greater after the appearance of many foreign competitors. On the other hand, the national firms were more exposed to new investors. The questions to be addressed are related to

the actual path of transformation affecting food industry in the light of new competing conditions and market access. Among the characteristics of the structural change from food industry are market integration, greater importance of own label products in the retailing segment, advertising and innovation related costs. (Nilson, 2002)

In the last years, trade increasingly expressed competitive advantages generated in the context of industrial development led by technological innovation. It has resulted also from the internationalization of industrial production. Within the agri-food system, the commodities account for a large share of trade but processed products have become more significant in recent years. The intensity of concentration among both firms and countries is another feature of international food trade in latest years.

Some factors played a decisive role on business performance in the food industry, in the recent context of globalization. Among them are: the market integration, the increase of foreign direct investment, the growing power of retailers and the costs of advertising and innovation.

New investment has made competition in host countries tenser mostly where market oriented industrial policy has been enforced. The multinational firms have directed their investment decisions towards different sectors, attracted by local advantages.

The fact that small firms cannot compete should not be seen as market failures, but as a result of how real competition worked. The big companies have been generally responsible for the increase of the food industry's FDI in recent years. It happened either as installing new plants or setting up joint ventures or other forms of contracts.

The trends of recent years indicated an obvious superiority of large investors in food industry. While the degree of attractiveness to inbound FDI varies among sectors of activity, should be taken into concern its impact on national economic development.

According to the Romanian Agency for Foreign investment (ARIS), foreign companies account for 35% of share capital and turnover and these averages are primarily reflected in food industry, metallurgy, non-metallic minerals, electrical equipment, transport and machines. The sectors with large FDI are also those with the greatest productivity gains.

The business units tended to compete in a more open environment due to the fact that the geographical and national borders stopped to limit the market expansion. In addition, a key element that influenced their success was the rate and features of technological transfer, the degree to which present firms could absorb innovations and became more competitive.

On the other hand, in Romania, as in all developing countries were market segmentation follow the existing patterns of income concentration, the food consumption was often determined quantitatively, slowing down the product differentiation.

The existence together of a diversity of forms and dimensions, typical of food industry, is a sign of the fact that market niches are still not reached by large companies. It also shows the implementation of winning strategies adopted by small and medium sized firms, mainly towards cooperation with other companies. Despite a predominant presence of large companies, reflecting the concentration process, a wide range of small and medium sized firms is still responsible for a considerable share of output and employment.

The transformation process which took place in food industry was the result of initiatives taken by large firms to expand their influence, basically through external growth, or merger and acquisition, as opposed to internal growth through the creation of new assets. The direction towards which firms expand is thus determined not only by their competitiveness by re-sourcing to technology, increasing scale, advertising, but also by their ability to spot the right opportunities to expand production. (Linda, 1993)

4. Structural changes in food industry

Much effort was made by the companies from food industry to differentiate products by means of designing and advertising. The competition in food industry is mainly determined by the challenge of making something different, though essentially similar to competing brands. It is recognized that larger firms have invested far more in technology than smaller ones.

The structural changes were related to the market conditions and the performance of the business units. At least three elements acted to place limits to small and medium sized manufacturing firms to some extent detain them to the borders of market: regional trade integration; greater importance of own label products; and costs of advertising and R&D.

A large market is essential for firms to grow, and more importantly to combine product differentiation and economy of scale. The firms obtained a higher rate of return because they exploit conditions for vertical integration by incorporating different stages of production. A researched conducted at European Union level found that the main motives for mergers in food industry were related to strengthening their position in the market and diversification of investments.

The widespread growth of own label products by large retailers was another element which affected the structural changes. Some big chains of supermarkets appeared and developed very fast in Romanian market. This fact generated that while supermarkets became larger in size, operating in a national scale, their own brands turned into a high barrier to entry for competitors. Although small and medium sized firms have been able to survive as own label suppliers, the recent trends towards concentration have limited their space.

The increasing weight of retailers with own-label products affected competition within food industry in two different ways. Firstly, the retailers were able to better monitor consumers' behavior due to their proximity with final consumers. They had lower costs of market research and advertising in comparison with the manufacturing sector. Secondly, the retailers have a larger scale of operation. It was advantageous for some manufacturers to use their full production capacity for supplying retailers. (The Economist)

Last but not least, the sunk costs, especially R&D and advertising costs intensified the concentration level in food industry. The larger companies are more capable to absorb high levels of advertising expenditures, principally when market becomes larger. In Europe, food industry shows the highest level of advertising in comparison with the other sectors. The food industry started to make their products more attractive to consumers by increasing expenditures in advertisement.

The innovations represent a strategy that raises considerable the barriers to new entrants by establishing a high threshold, reinforcing in consequence the concentration process. Despite the fact that food industry is largely dependent on innovation which takes place in basic industry like chemical, many created products are a result of strategies developed by the final sectors, food industry, according to the challenges posed by market conditions. The practice demonstrated that when neither of these strategies is adopted successfully, the only way out to survive is by reducing prices.

One of the main problems of the Romanian manufacturing was the financial blocking. The matrix representation of the analyzed industrial sectors, in the basis of ratios overdue debts/turn over and gross profit/turnover, reported to the manufacturing mean, which was considered 1 is presented in the following figures. It consists of four dials, each of them representing a specific situation for these ratios.

The first dial includes the sectors that had the ratio gross profit/turnover less than the mean of manufacturing, and the weight of overdue debts greater than the corresponding mean of the manufacturing. It represents the set of industries with maximum vulnerability from the point of view of resources allocation.

The second dial comprises the sectors that had the ratio gross profit/turn over less than the mean of manufacturing, and the weight of overdue debts smaller than the corresponding mean of the manufacturing. It corresponds to the group of industries with an uncertain relative position.

The third dial consists of the sectors that had the ratio gross profit/turn over greater than the mean of manufacturing, and the weight of overdue debts less than the corresponding mean of the manufacturing. It embodies the industries with the most favourable situation from the point of view of resources allocation. The food sector belongs to it.

The forth dial contains the sectors that had the ratio gross profit/turn over greater than the mean of manufacturing, and the weight of overdue debts greater than the corresponding mean of the manufacturing. The same as the second dial, it corresponds to the cluster of industries with an uncertain relative position.

The Government of Romania identified four directions among its main concerns as key priorities for decreasing financial and economic vulnerability for the period 2006-2009. The four main areas of support are:

- achieving sustainable private sector led high growth;
- enhancing governance and the quality of public institutions;
- promoting social and economic inclusion;
- upgrading infrastructure and environmental standards.

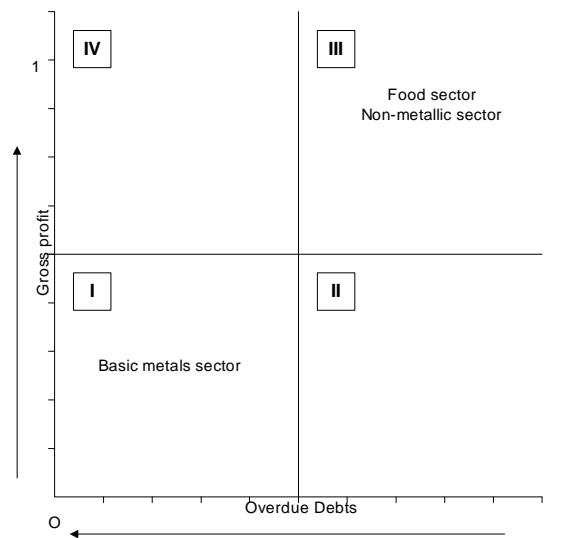


Figure 2. The financial and economic vulnerability reported to the total manufacturing (Source: Mereuta et al, 2000)

The synthesis of structural sectorial diagnosis of manufacturing revealed the strengths and the weaknesses for the selected sectors. The food sector had the subsequent characteristics:

- the strengths:
 - the dynamic of investments;
 - the internal competitiveness
 - the profitability of exploitation;
 - the global profitability;
 - the rate of overdue debts;
 - the privatization level;
 - the labour productivity
 - the level of energy- intensive usage.
- the weaknesses:
 - the external competitiveness.

On the whole, the food sector has an obvious favourable situation. In order to increase the external competitiveness and to consolidate the internal competitiveness it is necessary to rethink the economic policies, especially about Romanian agriculture. Its output strongly influence the results obtained by the food sector. (Ucenic, 2007a)

5. Supply Chain

Michael Porter established a basic value chain model for the first time in 1985 in his work “Competitive advantage”. The model consists of a succession of activities found to be widespread to a great variety of firms. He identified two activity categories: primary and supporting. The activities carried out by a specific organization can be analyzed into primary activities and supporting activities. The primary activities directly add value to the venture’s production factors, which are collectively named as the “value chain”. They consist of those concerned in the production, marketing delivery and servicing of the product. Support activities take account of those providing purchased inputs, technology, human resources, or overall infrastructure functions to sustain the primary activities.

A supply chain, logistics network, or supply network is a synchronized system of businesses, people, activities, information and resources involved in moving a product or service in physical or virtual manner from supplier to customer. Supply chain activities transform raw materials and components into a finished product that is delivered to the end customer. Supply chains link value chains. (Nagurney, 2006) There are a variety of supply chain models, which address both the upstream and downstream sides.

The primary objective of supply chain management is to fulfill customer demands through the most efficient use of resources, including distribution capacity, inventory and labor. A variety of optimizing aspects of the supply chain include acts as a go-between with suppliers to reduce bottlenecks.

Sales and operations planning is becoming a requirement for doing well supply chain implementation. With globalization of sourcing and manufacturing, shifting resources, facilities and inventories across the world, a greater extent of corporations are relying on effective supply chain planning to accurately coordinate supply, based upon actual and forecasted demand.

Keys to accomplishment consist of a committed governance model, an integrated, networked and formal sales and operation planning process from sales and marketing to the supplier base, with an added interest of innovation and vision. (IBM Institute for Business Value)

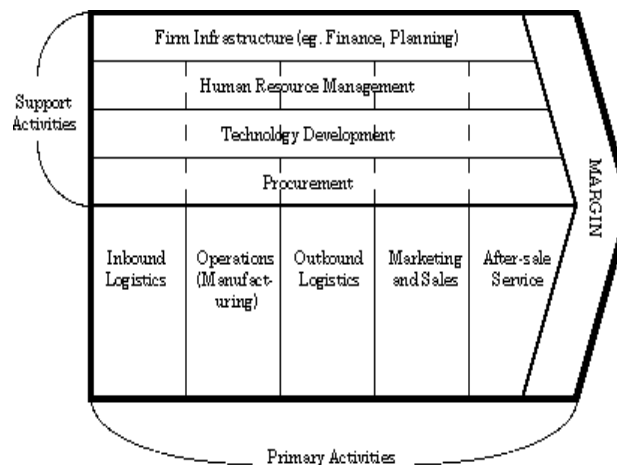


Figure 3. Value Chain (Source: Porter, 1985)

6. Romanian Food Supply Chain

The food supply chain consists of a set of links and dependencies from farms to food consumers. Food Supply Chain Management jointly gets the main of these disciplines and intends to afford a perceptive of the chain, to support those who manage parts of the chain and to enhance the development of research activities in the discipline. (Bourlakis, 2003)

There are some main concerns that should be identified and putted into operation in order to develop the food segment and to improve the competitiveness of the products on their way to export markets.

One of the major points is to confine and maintain a greater part from the nationwide element of value chain during the orientation of production and sales towards primary products. It is also required a better promotion of the Romanian ecological products on the external markets, as well as a more intensive niche marketing and consolidation of the existing ones. (Ucenic, 2007a)

The procedure of scheming of the Romanian export strategy targeted on ecological products is on the rise in the framework of market globalization and the tendency towards healthy products. Simultaneously with the expansion of market necessities, it is indispensable to generate a plan which encloses the required steps for responding at the great demand for ecological products at European level, both from qualitative and quantitative standpoint. The market of ecological products is improving constantly and has a twelve-monthly enlargement of 20 %, according with governmental reports. (Ucenic, 2007c)

Almost all eco-food Romanian products are for export because inside the country it is only a small niche of consumers. One of the explanations is the lack of information and eco-culture of Romanian consumer.

Romania is one of the most promising retail markets in Europe because of the developing of modern retail formats, increased interest of foreign investors and growing consumer incomes. The retail industry is not saturated. Many chains are competing for the market share.

In 2007 the Romanian retail market grew at a rate of 17.8% and was worth RON 104.4bn (€31.3bn). This increased by another 16.5% in 2008, to RON 121.7bn (€38bn), according to “Retail in Romania 2008”, a report recently published by PMR.

In 2007 the grocery market developed more rapidly than that of non-food, by 27.8%. For 2007 as a whole, spending on food products accounted for more than half of all spending, excluding cars and fuel. This situation, which is unusual for developed economies, has been caused by a reduction in the importance of self-grown food in the grocery supply chain in Romania. People who once relied on their own farms are increasingly often going to shops instead, thus increasing the value of food retail sales.

In addition, the rising prices of food products, caused by poor harvests, have contributed to increases in grocery spending, as consumers were unable to reduce the volume of foodstuffs consumed and were thus forced to pay more. (PMR)

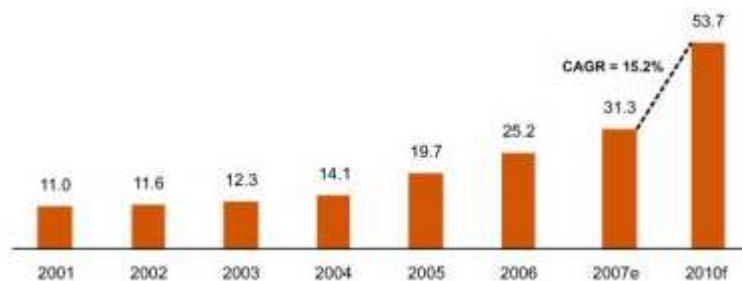


Figure 4. Turnover of Retail Trade in Romania (Source PRM, 2007)
[e-estimated, f-forecasted]

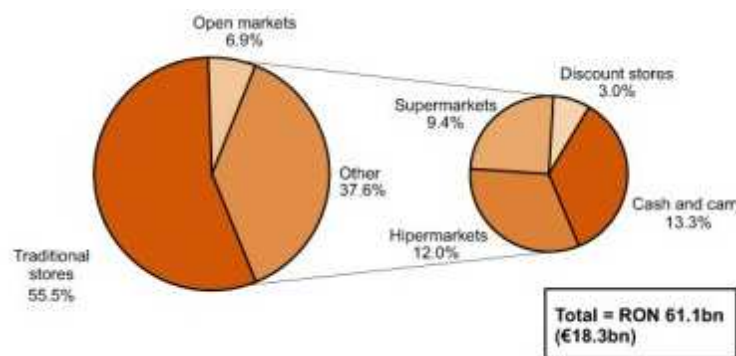


Figure 5. Romanian Grocery Retail in 2007 (Source PRM, 2007)

The other formats appeared more recently. The first were the Profi discount stores, established in 2000. The very first hypermarket chain which debuted in Romania was Carrefour (in 2001). This remained the only hypermarket brand in Romania for two years, until Louis Delhaize introduced its Cora chain.

However, in 2005 and 2006 Romania was flooded with foreign retail projects. During this period a number of well-known grocery chains appeared in the country, including Plus Discount, Auchan, Real and Spar.

The grocery retail increased in the rate of development. In 2006, according to PMR estimates, the market share of large shops (hypermarkets, supermarkets, discounters and cash and carry stores) was 35.5%, whereas in 2007 this figure grew to 37.6%.

At the end of 2007, there were 70 hypermarkets in Romania, operated by seven companies. PMR estimates, however, that, despite the modest store count, the share of hypermarkets as a proportion of the grocery market was quite substantial, around 12%. This means that Romanian hypermarkets are turning over a substantial amount, more than we would expect from a population with limited purchasing power. For example, a typical Carrefour outlet situated in Bucharest is the third most frequently visited Carrefour hypermarket in the world.

Discounters preparing to enter Romania are in a particularly promising situation, as this arena is the least developed modern format in the country. Many potential customers in small and medium-sized towns do not yet have access to such outlets.

7. Conclusions

The production of commodities in global markets became so competitive that only the most cost-efficient businesses will survive.

The next years mark a phase of fast increasing of human environmental impact. Upcoming agricultural performance will outline the world from the point of view of species and utility to society. Technological advances and current economic forces, including large agricultural subsidies have both increased food availability and decreased the real costs of agricultural commodities during the past 50 years. (Tilman et al, 2001)

The transition from intensive agriculture, to industrial agriculture and agro-ecosystems was a necessity. Romania tries to follow the same path in spite of some difficulties. The food sector has an obvious favourable situation. In order to increase the external competitiveness and to consolidate the internal competitiveness it is necessary to rethink the economic policies, especially about Romanian agriculture. Its output strongly influence the results obtained by the food sector.

The Romanian food supply chain has some specificities. Small counter stores still dominate the retail network in Romania but the growth of preferences for hypermarkets was together with Russia the highest in the region. Discount chains have achieved very high preference rate in Russia, Poland, Czech Republic and Hungary, however, the fastest growth has been recorded in Romania. The players who will understand better the Romanian food consumer behaviour will increase their market share in spite of the global economic crisis.

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