

# Challenges of the vegetable and fruit market

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**Summary:** The situation of the horticulture sectors have been in the limelight of the professional and economic decision makers all over Europe. This article analyses the situation of the sector from economic point of view and reveals the main reasons of its low income and high risk. It concludes that one of the biggest problems is the trading uncertainty in the vegetable and fruit sector that is caused by the asymmetric market structure of the post-regime era. Since sizes of vegetable and fruit plantations do not allow producers to supply individually the extremely concentrated food retail trade or the processing trade they must find alternative ways for trading their products. The study introduces two alternative solutions. One alternative is foundation of modern multi-level producer co-operatives with the help of EU subsidies. Secondary and tertiary co-operatives may achieve better market position and lower trading price risk with managing production, professional marketing, and improving the information flow. The other alternative is searching for new trading channels such as local provision, restructuring of local markets, and direct trade (home delivery and pick-it-yourself programmes). The shorter producer-consumer distance means better quality at lower price for customers and income in the case of smaller amount of products for producers. It is concluded that both solutions together or separately may help individual producers in their trading problems. However, whichever way they choose, producers must co-operate.

**Keywords:** horticulture sector, economies of scale, transaction costs, co-operation, competitiveness, concentration

## Introduction

The changes in the Hungarian economy after the change of regime resulted in a rapid concentration of the Hungarian food trade and food industry. At the same time the transition of ownership in agriculture lead to partition of farms. The asymmetric market structure that was formed as a result of the two processes causes the producers' weak bargaining power. A further problem is that the high demand for investment and the exposure to the changeable weather of the recent years make the horticulture sector extremely risky. Many farmers have given up production because of the low income potentials and the high risk, while there are few new entrants.

This is not merely the problem of decrease in stock fund but this relatively work intensive sector could increase employment in the country. As it is declared in the *National Country Development Concept – 2020* the sector has an important role in job creation, in development of the rural society, in prevention of migration from the countryside, and in maintaining food supply and food safety, as well as in environmental (soil, water, natural ecosystem) protection by using appropriate technologies.

All conditions of horticultural production are given in Hungary (excellent habitat, qualified work force, production traditions, and valuable species) therefore part of the stock fund produced is exported besides covering domestic demand. Since the European Union does not limit the

vegetable and fruit production and trade, and there are 600 million potential consumers within a radius of 1500 km of our country farmers thought with good reason that joining the European Union would mean opportunities for the sector. However, these expectations have not been fulfilled. The volume of vegetable and food production stagnates, the export is not increasing, the production of the processing industry is declining, and the bargaining power against food traders is weakening. Therefore, it is worth examining the reasons behind these processes and how they can be changed.

## Cost and income conditions in the vegetable and fruit sector

The primary problem of the vegetable and fruit sector is that it is highly proportioned, therefore several farms are too small to be profitable. (Medina 2005) Small farms mean low volumes in production so unit costs are higher as indirect costs are distributed among few cost bearers. Besides this, transaction costs (for instance partner acquisition, contracting, administration, and other costs related to transactions between partners) are relatively higher for the same reason, which increases the total cost that may not be returned in the market price. (Novák and Farkasné 2005).

According to the economic typology of the European Union a farmer is that producer who produces 2 European Size Unit (ESU<sup>1</sup>) of Standard Gross Margin (SGM).

<sup>1</sup>One ESU is a Standard Gross Margin of EUR 1200 that is used to express the economic size of an agricultural activity.

The Standard Gross Margin (SGM) is calculated per unit area of crops and per head of livestock, using standardised SGM coefficients for each type of crop and livestock. SGMs are representative of the level of profit that could be expected on the average farm under “normal” conditions (i.e. no disease outbreaks or adverse weather). 2 ESU of SGM is 2,400 euros that means production of approximately 600–650,000 HUF Standard Gross Margin depending on the actual conversion rate. Those producers who produce less than 2 ESU are considered as households as opposed to farmers in the European Union. These producers are classified as “very small” in Hungary. (Keszthelyi and Kovács 2002)

Table 1 shows the profitability of different horticultural activities and the size of land needed for producing 2 ESU of Standard Gross Margin.

**Table 1:** The Standard Gross Margin produced by vegetable and fruit farms on 1 hectare and the size of land that produces the unit of 2 SGM income in Hungary

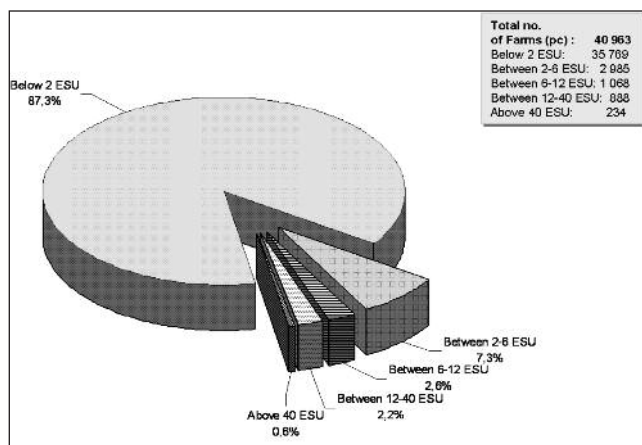
Activity	Standard Gross Margin/1ha (HUF/ha)	Land size needed for producing 2 ESU <sup>2</sup> (ha)
Fresh vegetable, melon, strawberry, (open field and below low covering, in field rotation)	505 736	1.3
Fresh vegetable, melon, strawberry, (open field and below low covering, in horticultural rotation)	627 796	1.0
Fresh vegetable, melon, strawberry – below passable covering (greenhouse, foil tent)	10 802 990	0.1
Fruit plantations, temperate zone fresh	583 157	1.1
Fruit plantations, nuts	283 088	2.3

Source of data of calculation: Agriculture of Hungary, 2010 and <http://www.szilberhorn.com/EUME-kalkulator.xls>

If we compare the data of Table 1 and Figure 1 we can see that 87.3% of producers belonged to the „very small” category in 2008 according to the criteria above, that is, they worked on such a small land that was not big enough to produce 2,400 euros of Standard Gross Margin.

Based on this it can be stated that the structure of farms is a significant obstacle of improving the profitability of the sector. Small farms mean low profitability and a kind of defencelessness against bigger market performers.

Because of the low profitability there is lack of capital for investments into modernising the plantations and the primary procession or applying modern trading solutions. The low level of return on capital together with the extreme weather conditions of the recent years jeopardize the return on



**Figure 1:** Distribution of horticultural and fruit growing farms according to SGM categories

Source of data of calculation: Agriculture of Hungary, KSH Budapest, 2008

valuable investments into the sector (plantations, cold-storage plants, packing factories) therefore this risky sector does not attract investors or creditors. Domestic and European subsidies are available in this sector as well but these are insufficient for solving the problems and changing the situation of producers. (Kapronczai et al. 2006)

## Market problems of the vegetable and fruit sector

### Foreign Markets

After joining the European Union farmers expected expansion in trading opportunities that has not come true. Figure 2 shows that export of unprocessed agricultural goods increased only.

However the vegetable and fruit sector is different: 70–75% of exported goods are processed products. In spite of this if we examine the comparative advantage of the sector after joining the European Union significant decrease of this can be experienced.

Figure 3 shows the yearly changes of comparative advantage of product groups between 2003 and 2009. The revealed comparative advantage (RCA) is calculated as follows:

$$RCA = \ln[(x/m)/(X/M)]$$

Where  $x/m$  is the export/import ratio of a certain product group, and the  $X/M$  value is the total export/import ratio. The higher is the value of the indicator the bigger is the comparative advantage of the sector, while a negative value indicates comparative disadvantage. (Módos et al.; 2008; Nagy 2010) It is clear from the data that except for crop and crop products all sectors have lost from the comparative

<sup>2</sup> Conversion rate of the calculation is 266.70 HUF/€, 1 SGM ≈ 320,000 HUF

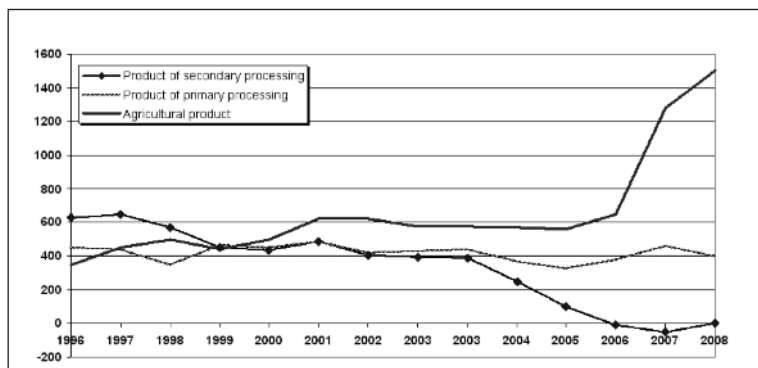


Figure 2: Balance of the Hungarian agro business (1996–2008)  
Source of data: KSH 2009

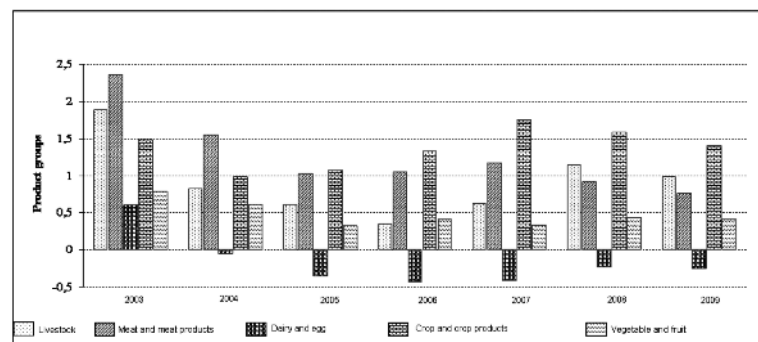


Figure 3: Changes of comparative advantage of Hungarian products in the EU-15 market  
Source: Nagy 2010

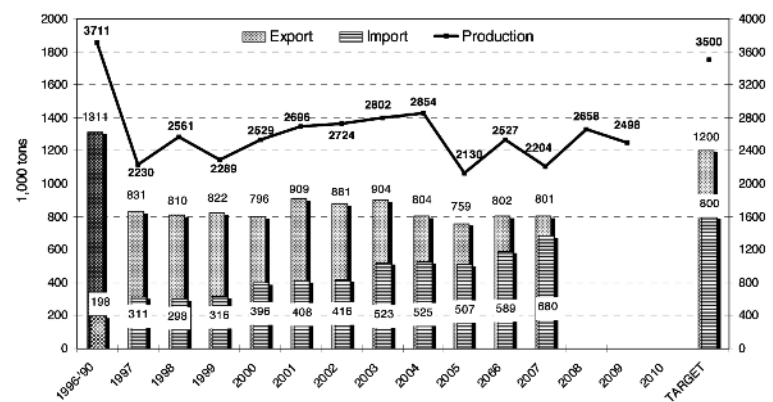


Figure 4: Vegetable and fruit production and foreign trade  
Source: FruitVeB 2009.

advantage to the EU-15 countries since joining. In the case of the vegetable and fruit sector our comparative advantage has dropped to the half of the value in 2003.

Besides examining the comparative advantage it is worth looking at the production and foreign trade performance of the sector. According to the data of the FruitVeB (Hungarian Vegetable and Fruit Inter-trade Organisation) the average yearly total production of Hungary is 3–3.1 million tons out of which 1.7–1.8 million tons are vegetable and 1.2–1.3 million tons are fruit (FruitVeB 2009).

As it is shown in Figure 4 the amount of export has hardly changed (8-900 thousand tons between 1997 and 2007)

while the import has been doubled since the middle '90s (311 thousand tons in 1997, and 680 thousand tons in 2007). 25–30 percent of the export is fresh product out of which 60–70 percent is fruit and the rest is vegetable. (FruitVeB 2011) The remaining part of the export is processed product, mainly tinned or frozen. Besides the southern fruits the import of vegetable and fruit of the temperate zone (tomato, paprika, grapes, apple) has increased and these are competing with the domestic products. (Juhász 2009) So, farmers have not been able to expand their markets after joining the European Union but at the same time the domestic market has become more competitive.

### Domestic markets

According to the National Statistic Office 60% (914 thousand tons, 226 billion HUF) of the vegetable and fruit trade were fresh products and 40% were processed products in Hungary in 2010. The domestic food industry is in crisis and buys up lower amounts of products which mean decreasing demand for producers. If year 2003 is the base, the total trade of the food industry decreased with 18% in 2008 within which domestic trade decreased with 24%. This meant significant decrease in the revenue of the industry. (FVM, 2010) The price of raw products increased while the amount of products bought up decreased which make the situation even more difficult. The state purchase price of vegetable increased with 36%, the amount purchased decreased with 47% in 2010. The amount of fruit sold for industrial purposes decreased with 25% and the average price increased with 12 percent. (KSH 2011) It resulted in price increase in processed products that lead to decrease in consumption.

Before the multinational trading companies appeared, direct delivery to small shops based on personal contact or selling in local markets were significant besides the intermediary role of wholesalers and wholesale markets. Those who cultivated small land or wanted to sell their surplus could easily find market for their products. At present nearly half of the vegetable and fruit retail is done by hyper- or supermarkets and discount chains. These market channels mean concentration of supply and strong bargaining power in purchase. If we consider international examples (Table 2) we can see that there is an extremely specific situation in Hungary compared to the USA and the EU-15 countries.

Since the biggest difference between Hungary and the other countries examined is in food retail it is practical to examine this area in detail.

The degree of market concentration that indicates the power structure of the market is measured by the

**Table 2:** Comparison of market structure and foreign capital

USA	EU-15	Hungary	
Level of concentration of farmers	high	medium	low
Share of the 4 largest processing companies of the food industry	≈50%	≈40%	15%
Share of the 4 largest food retailers	≈30%	19%	≈60%
Share of the foreign capital investment	not significant	varied	high

Source: Martinez (2007), Hendrickson-Heffernan (2007), Orbánné (2006), Juhász et. al. (2007) Planet Retail in. Kartali (ed.) 2008.

Concentration Ratio<sup>3</sup> (CR). (FARKASNÉ AND MOLNÁR 2006). For our research on the retail trade of horticultural market we used the CR-5 index. The CR-5 index shows the market concentration on the basis of the market shares of the 5 largest retailers. This index adds up the individual markets shares (S1, S2, S3, S4, S5) and shows the market share of the five largest enterprises. The categories of market structures are the following (DOBSON ET AL. 2003):

- dominant enterprise =  $S1 > 25$  percent and  $S1 > 2 \times S2$ ;
- duopoly =  $S2 > 15$  percent and  $S2 > 2 \times S3$ , but not dominant enterprise;
- asymmetric oligopoly =  $S1 > 15$  percent,  $S2 > 5$  percent and  $S1 > 1,5 \times S4$  and neither dominant enterprise nor duopoly;
- symmetric oligopoly = neither dominant enterprise nor duopoly nor asymmetric oligopoly and  $S > 5$  percent and at least 67 percent of the one above;
- not concentrated =  $S < 10$  percent and  $CR-5 < 33$  percent.

The countries of *Table 3* are put in order according to their CR-5 index of the year 2003.

**Table 3:** Comparison of the CR-5 index on the basis of the market share of the 5 largest retailer companies and the market structure

Country	CR-5	S1	S2	S3	S4	S5	Market structure
The Netherlands	70	38	15	7	5	5	Dominant enterprise
Finland	84	38	30	6	5	4	Duopoly
Hungary	67	18	18	12	11	8	Asymmetric oligopoly
Czech Republic	43	11	10	9	7	6	Symmetric oligopoly
Poland	24	10	4	4	3	3	Not concentrated market

Source: Dobson, W. P. Waterson, M., Davies, S. W. 2003

We calculated the CR-5 index of the Hungarian horticultural retail trade of the year 2010 (NIELSEN 2010)

which is 68.43 (S1=18.45; S2=15.36; S3=14.11; S4=10.55; S5=9.96), that is hardly different from that of 2003. It means that this market structure characterises the Hungarian food retail permanently.

*Table 4* shows the yearly revenues of the 10 largest Hungarian trading companies in 2008 and 2010. The data show that the market position of the 5 largest companies became stronger between 2008 and 2010 in spite of the decreasing consumption. In the case of Metro the deterioration of the situation can be explained by the heavy competition, that is, lower number of retailers purchase there.

**Table 4:** Sales revenue of main food retailers in Hungary

Retailer	Sales revenue 2008 (billion HUF)	Order 2008	Sales revenue 2010 (billion HUF)	Order 2010
Tesco	602.00	1	666.50	1
CBA	545.00	2	555.00	2
Coop	500.00	3	510.00	3
Spar	374.20	4	381.30	4
Real	348.00	5	360.00	5
Auchan	221.70	7	224.80	6
Lidl	164.70	8	221.00	7
Metro	262.10	6	209.90	8
Penny	161.50	9	160.80	9
Cora	105.50	10	96.60	10

Source of data of calculation: KSH and Nielsen 2008 and 2010

The supply co-operatives that are formed as a result of horizontal co-operation of retailers further increase the concentration of the market channel (*Metro*, *Spar* and *Praktiker* as *METSPA*, or *Cora*, *Csemege/Mach* and *Profi* as *PROVERA*). *CBA*, *Coop* and *Real* retailer chains are also supply co-operations themselves since the reason of foundation was achieving competitive advantage of common purchase. These co-operations are suitable for harmonising demand so that increase their bargaining power to suppliers. Large scale purchases result in lower unit costs, and it is also possible to harmonise logistics and marketing activities.

Not only the structure of food retail but consumer behaviour has changed remarkably since the change of regime. The amount of vegetable and fruit consumed has not changed but its structure has. Consumers require the same wide range of vegetable and fruit supply throughout the year.

The analysis of place of purchase shows that 45% of the vegetable and food trade was made by hyper- and supermarkets and discount chains in 2010. This ratio is even larger if we add the trade of retailer chains. (*Figure 5*) This fact proves that producers are in bad situation in the domestic

<sup>3</sup>The concentration ratio is the percentage of market share owned by the largest firms in an industry.

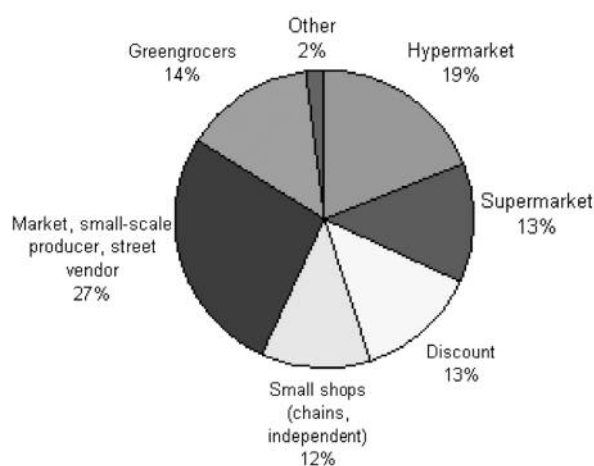


Figure 5: Vegetable and fruit purchase by retailer types 2010

Source: GfK Hungária 2011

market since they trade via a highly concentrated retail sector that covers nearly half of the market.

Stagnating real income, increasing food prices and the change of the consumption structure together cause the significant price sensitivity of Hungarian consumers when they buy vegetable or fruit. Low prices are so important that the quality and the place of origin are considered only in the case of a low price. A research made by GfK Hungária shows that the price-value ratio is the most important point of view that is followed by quality, price, form of conservation and the Hungarian origin. This order of priorities may be misleading because 90% of respondents selected price as the first priority when they were asked about other customers' preferences of decision making. (GfK 2010)

Market positions of the sector are further worsened by the increasing price of essential foods. KSH reported 5.4% price increase in June 2011 compared to the same period of the previous year. The most significant ones are flour (61.2%), sugar (52.0%), oil (36.7%), bakery products (17.4%), milk (16.7%), bread (13.3%), and cheese (12.1%). The price levels of horticultural products also increased, the average increase of vegetables was 22 percent and of fruits was 51 percent however it is expected to be decreased by lower prices of fresh products in the second half of the year.

Besides the food price increases there are other reasons of the changes of consumption structure. Several households are infected by the increase of foreign currency loan

instalments, household expenses (energy, water and canal dues, removal of refuse) and fuel. (*Trade magazin* 2011) Therefore it is not surprising that the low price level of hyper- and supermarkets as well as discount chains is such a big advantage that the traditional trading channels cannot compensate with other advantages (i.e. closeness to living place, better service, fresh and reliable food, known origin).

The decreasing sound demand is paired with increasing customer expectations. As a consequence the intermediating retail sector requires the following from suppliers: appropriate amount and standard quality of products (selected, cleaned, wrapped, usually certified) delivered by deadline at low price.

More and more Hungarian producers fail to meet the higher and higher requirements therefore they are excluded from this trading channel. Adding to this the fact that the food industry is in crisis therefore the industrial markets are narrowing we can state that these processes are strengthening each other and make the producers' market positions worse. Since the processing industry does not offer alternative market for producers food retailers become stronger.

Wholesale markets are still important players of the vegetable and fruit trade as they manage one-third of it. Although their importance is weakening they provide market for those who cannot fulfil the retailers' or the processing industry's requirements. Producers are defenceless in the wholesale market too, but they usually do not recognise this. They may benefit from trading without invoice but the forced low prices and the uncertified products put into circulation do not serve theirs or the sector's interest. (*Dudás* 2009).

### Possible answers to the challenges of the retail trade

Farmers have recognised that they have to react to the changes of the retail trade otherwise they will be at a disadvantage in the foreign and domestic markets as well.

One of these answers was the foundation of Producer Trading Co-operatives (PTC).

Data of *Table 5* show that one-fifths of the total sector revenue is provided by co-operatives. It is few compared to the higher concentration of food retail trade. There has not been significant change in the number of co-operatives or the

Table 5: Number of production organisations, production groups, their members, and size of cultivated land

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009*
No. of pre-listed PTC (pc)	4	12	25	69	101	77	64	58	63	65
No. of listed PTC (pc)	0	0	1	1	8	7	7	9	11	11
Land covered by PTC (ha)	1145	3320	9825	25139	25640	26122	29550	34982	35000	37089
No. of members of PTC (pers)	362	1165	4120	13450	23980	20514	20494	20177	20000	20605
Average no. of members (pers/org)	91	97	165	195	237	266	320	348	317	318
Size of land for 1 member (ha/pers)	3.16	2.85	2.38	1.87	1.07	1.27	1.44	1.73	1.75	1.8
Revenue / sector trade of PTC **	0.62	1.36	4.51	14.18	20.58	21.95	19.13	18.47	18.00	n/a

Source: FVM, 2008. FruitVeb, 2010, Dudás, 2009.

number of their members since joining the European Union in spite of the fact that the Union supports foundation of such organisations. There are several subjective and objective reasons of absenteeism. One of them is that the conditions of the operation are too difficult and require unreasonable administration in Hungary (Dudás 2009). It means unstable operational environment and high costs whereas the placer trade described above offers immediate income for producers, therefore, even members of PTCs often choose this channel unfortunately. Another reason of improper co-operation is the lack of trust among members and in the management (Dudás and Fertő 2009), and the different interests that are based on the different sizes of property.

The operation of primary PTCs – founded by producers – is production focused although their tasks should not be merely common procurement, managing production and trading products. (Takácsné et al. 2002) They try to concentrate supply as it is required but they are not able to become equal partners of retailers.

One option to overcome this disadvantage could be foundation of secondary PTCs which would not deal with production but would concentrate on managing production and marketing. These organisations could become counterpoles to purchasing centres of retail trade. The concentrated supply would increase producers' bargaining power, while the organisation of product preparation processes, the extension of product range, and the management of primary and secondary product processing would make domestic products more competitive. The secondary PTCs which employ professionals could collect and provide the necessary market information for producers for better planning that would contribute to flexible and fast reaction to the changing consumer requirements. The common marketing could further develop the producers' position. Branding, state of the art packaging and common marketing campaigns could improve trust in Hungarian products and therefore increase revenue. Secondary PTCs could be founded on territory or product group basis. The development of information and telecommunication technologies enables operation of virtual enterprises that operate without useless transport and storage of products which is an important factor in the case of vegetable and fruit. According to our estimation 8–10 secondary PTCs could co-ordinate the marketing operations of primary PTCs, however, this number depends on the principles of organisation and the financial resources available.

These activities require substantial investment and professional work force. Although these organisations may achieve decreasing transaction costs and higher wholesale prices as a result of the increased bargaining power, the operation of secondary PTCs require significant capital lock up at the beginning. Since the sector cannot raise the capital needed on its own domestic and European Union support would be essential. Redesign of the subsidisation structure could provide the necessary financial resource for this task.

Above this there should be a tertiary organisation of PTC that would be responsible for macro-marketing, research and

development activities, and innovation. This level would co-ordinate the export-import of the sector and could represent the sector interests as well.

The second alternative for producers is to sell directly to customers avoiding retailers. Direct trade – that has several forms operating in our country – should play more important role in local provision. Either producers reach consumers (local market, provision of local institutions, moving shops, producer's shop, home delivery, web shop) or the consumer reaches the producer ("pick it yourself", trade in farms, along patches or roads). The common feature of these solutions is that the shorter channel and the lower number of intermediaries decrease transaction costs and the profit realised by this is distributed between the producer and the customer. On the contrary this type of trade is appropriate for small amount of products at once which increases logistics costs. Development of this marketing channel also requires central support because these channels have been degraded in recent decades both the institutional background and the relationship structures have been liquidated.

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