Links between Participants of the Fruit Supply Chain - Case Study Poland

Ewa Halicka
Faculty of Human Nutrition and Consumer Sciences
Warsaw Agricultural University
Poland

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Abstract
The links (relationships) between participants of agribusiness sectors play a significant role in the functioning of the food supply chain as a whole, the quality of final products and the consumer satisfaction level. Surveys conducted among fruit producers, processors, distributors and consumers indicate that the main factors leading to hold-up problems that influence the conduct and performance of the Polish fruit market include: significant fragmentation of production, weak position of farmers in setting transaction terms and low level of horizontal and vertical integration. Such issues as delayed payments, price instability and changing quality requirements characterize the producer-buyer relationships. The lack of efficient and reliable institutions (“rules of the game”), which facilitate the organization of transactions in modern market economies, results in a high level of losses, contract risks and opportunistic behaviour of “stronger” chain participants. The identification of hold-up problems in the fruit chain is also an important stage of market analysis aimed at adjusting supply to demand and at increasing the consumption level. According to FAO data fruit consumption in Poland is among the lowest in Europe and reached only 46 kg/person/year in 2000 compared to 116 kg/person/year in 15 EU countries. In order to identify the main determinants of consumer behaviour on the fresh and frozen fruit market surveys were distributed among circa 500 urban households. Research results showed that the main determinants of consumer behaviour regarding fruit are quality-related factors – freshness and taste and also price. Only 32% of the respondents evaluated the quality of Polish frozen fruit as high, 55% - as medium, 13% - declared it low.

INTRODUCTION
Significant fragmentation of all stages of the Polish fruit chain results in difficulties in creating efficient exchange relations in the sector. The low level of vertical integration can be linked to payment delays and insufficient market information, poor logistics as well as difficulties in predicting demand and making production and investment decisions – related to ex. cultivation methods and processing technologies. The relationships between agents functioning in the Polish fruit chain are\(^1\) in most cases not supported by formal (undersigned) contracts. This situation determines high transaction costs among chain participants, which include negotiation, information and monitoring costs (Hobbs, Kerr, Gaisford, 1999).

In the frame of new institutional economics (NIE) the links between all sector stages – from producer to consumer - should be analysed in order to propose institutional arrangements needed to reduce transaction costs at all levels. The NIE theory focuses also on property rights and contracts which constellation determines the functioning and performance of enterprises. The analysis of links (relationships) along all the fruit chain is based on identifying hold-up problems originating from problems with contract enforcement and high transaction costs.

\(^1\) since the abolition of the Cooperative Union - by the Legal Act of 20.01.1990, which initiated the liquidation of the movement.
MATERIALS AND METHODS

In order to evaluate the functioning of the Polish fruit chain both primary and secondary data was collected. Surveys on the basis of structured questionnaire interviews embraced 120 fruit farms, 35 processing companies and 71 distribution units - wholesalers, intermediaries and retailers. Respondents were asked to specify the main problems regarding co-operation in the sector and to identify changes that would have a positive effect on their performance. Additionally, in the second part of the study, 506 questionnaires were distributed among households in three major Polish cities - Warsaw, Wroclaw and Lublin. Consumers answered questions on the availability of fruit and its quality as well as their behaviour, needs and expectations regarding the market of domestic fresh and processed fruit.

Primary data collection was proceeded by an evaluation of the sector’s structure and economic indicators, including trends in fruit production, processing, distribution and consumption. Statistical data was gathered mainly from the Central Statistical Office (GUS) and Centre for Horticultural Research and Development (COBRO). Geographical aspects of fruit production led to the concentration of primary research in the central parts of Poland, namely the top-four fruit-growing voivodships: Mazowieckie, Lubelskie, Łódzkie and Świętokrzyskie. The size of the surveyed individual fruit farms varied from 3.7 to 48 ha. The largest investigated producer group consisted of 41 holdings of total area reaching 515 ha. In the case of the fruit processors 35 questionnaires were analysed, including both market leaders (such as Hortex Holding and Agros Holding companies) and small local units, employing 3-10 people. Questionnaires focusing on the relationships between distributors and other actors of the fruit-chain embraced altogether 71 distributors. This group consisted of such entities as: wholesale markets, multinational supermarkets, local fruit and vegetable stores and bazaar booths.

RESULTS AND DISCUSSION

In 2001, as in previous years, the fruit sector in Poland constituted c. 8% of the total agri-market output in terms of value (second place in total crop output). The fruit production stage is characterized by a high potential as well as significant fluctuations of produce price and crop level. The estimated total number of farms with orchards is 396 thousand, of which only 10% has an area size of more than 1 Ha². The average size of market-oriented farms with orchards in Poland is 3.74 Ha. The total number of farms producing berry fruit oscillates around 536 thousand (including 425 thousand strawberry plantations). Total fruit crops in the years 1991-2001 grew from 1.8 mln t to 3.4 mln t (Fig. 1) and is dominated by apples, strawberries and currants. Due to the low level of modern cultivation equipment and watering systems in small-scale farms the yield of production in Poland is relatively low. In 2001, however, apple yields reached a record high of 148 Hg/Ha, strawberries 37 Hg/Ha. Insufficient storage capacities in many small-scale farms has a big impact on the organisation of the fruit market, leading to high level of losses (spoilage) and instability of prices and quality level and low availability of domestic-grown fruit in the off-season months.

Processing companies in Poland are traditionally export-oriented and specialized in producing juices and frozen fruit. The Central Statistics Office (GUS) currently registers 1470 fruit and vegetable processing companies in Poland. However 73% of these units employs less than 10 people, 18% between 10 and 49 people, 7% from 50 to 249 employees and only 2% (5 companies) more than 250 people. This points to a large fragmentation of the industry as well as a very high level of competition (Fig. 2).

The yearly consumption of fruit varied between 1.4 and 2.2 mln t while companies processed around 50-60% of domestic fruit production. The per capita consumption of both fresh and processed fruit in Poland is low in comparison to other European countries. According to FAOSTAT the yearly fruit per capita supply in 2000 reached only 46.1 kg and was much below the European average (83.0 kg) and EU average (116.2 kg). It has to

² According to agriculture census, 1996.
be added that in general Central and East European countries have low fruit consumption. According to the Polish balance sheet data, the yearly fruit supply in 2000 equalled 51.1 kg per person (Fig. 3). It is worth noting that fruit consumption is showing a definite growing trend. However, the growth concerns mainly citrus and other imported, southern-grown fruit.

**Hold-up problems in the fruit sector**

Collected primary and secondary data indicated a large number of hold-up problems in the fruit sector in Poland. These include low level of horizontal integration and can be linked to:
- the reluctance to create producers’ groups among farmers,
- insufficient information flow,
- low economic qualifications and knowledge of market conditions,
- instability of prices,
- ineffective or changing legal regulations and difficulties in obtaining loans and financial support.

These factors, together with frequent transactions and insufficient know-how on managerial accounting and adjusting to market economy conditions have lead to high transaction costs between farmers and fruit buyers. Processing companies have problems with logistics (control of time and volume of deliveries), instability of market prices and insufficient reliable sources of information regarding demand. Fruit processing companies, which as a whole have been occurring losses since 1997, suffer from financial uncertainty which determines low investments. Payment delays from the part of distributors also worsens trade results - it is the distributors who have the most bargaining power and dominate in the prices and conditions of sales negotiation in the sector (Gellynck, Halicka and Viaene, 2002).

**Improving trade legislative regulations**

The distribution system in the fruit sector has been evolving very rapidly in the last 10 years. Newly established (since 1994), with the financial support of the Polish government, wholesale markets stand for better product quality control but also higher costs and final product prices. The vertical component of links in the fruit sector is characterised by the domination of distributors. Opportunistic behaviour regarding payments as well as the custom of ordering products after the season puts the processing companies in a weaker market position. These circumstances stimulate the processors to sign long-term agreements with distributors or create their own distribution chains. The strong position of distributors triggers opportunistic behaviour such as long payment delays resulting in financial and cash-flow difficulties of fruit producers and processors. In this situation, legal institutions regulating transactions in the sector have to be developed in order to reduce transaction costs and assure contract enforcement.

**Assuring consumer satisfaction and safety**

During the study the following hold-up problems influencing the consumption stage were identified:
- low level of yearly consumption,
- high prices of fresh and processed fruit (high margin of retailers) especially in the off-season months,
- low level of standardisation of products,
- insufficient information on the nutritional importance of fruit and quality specifications.

There are currently no regulations or national programmes aimed at increasing the consumption of fruit in Poland. A growth of the domestic demand level would be a very positive trend not only from the economic, but also from the nutritional point of view.

Consumers in Poland, just like in other countries, are gradually becoming more concerned about the quality of fruit, looking for certificates and traceability of products.
The implementation of a fruit gradation and safety control system with fully identifiable methods of production, conservation and packaging seems to be the key to increasing consumer satisfaction and demand. Fostering the development of an inspection system (embracing all stages of the chain) should be one of the most important priorities of institutional governance. This process is currently taking place and will be harmonised with EU regulations. Quality assurance schemes applied nationally or established locally and self-control systems will accelerate the reduction of monitoring costs (tests, controls) and increase the reputation of the companies/marketing groups.

In the light of the conducted surveys freshness, sensorial properties and price are the main determinants of consumer behaviour. About 31% of the households declared preparing their own frozen fruit. In the case of processed fruit (incl. juices and frozen fruit) the level of consumption in Polish households, according to household budget data, does not exceed 10% of the total fruit consumption. It is important to add that the consumption of fruit is characterised by high seasonal fluctuations resulting from changes in price, supply level and habits. Seasonal variations of consumption were proven to have been decreasing due to the development of foreign trade and changes in consumer preferences.

CONCLUSIONS

The fruit market chain in Poland is currently a complex system in which the production is dominated by small-scale non-integrated farming, the processing companies’ high potential is being adjusted to changing market conditions and the highly competitive distribution network is undergoing dynamic evolution. The process of horizontal integration at the producers’ level has to accelerate in order to strengthen the position of fruit growers. Currently there are only three formally registered fruit and vegetable producer groups in Poland.

In the light of the conducted surveys among urban households consumer sensorial properties and price determine consumer behaviour. The research showed the necessity to undertake complex activities aimed at stabilizing the market and increasing the consumption through education and promotion, especially in the off-season months and with the participation of companies functioning in the supply chain. The preparatory process preceding the integration with the EU is a chance to accelerate the needed changes at the organizational and institutional level.

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Literature Cited


Figures

Fig. 1. Fresh and processed fruit production in Poland, 1990-2001 (x ‘1000 tons).

<table>
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<th>Year</th>
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<td>679</td>
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Fig. 2. Fruit chain in Poland, 2001/2002.
* average crop volume 1991-2001 = 2.49 mln t/year
Fig. 3. Fruit consumption in Poland, 1990-2001 (kg/person/year).