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Transformation of Polish Agriculture : The Case Study of the Potato Sector [1]

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O. Introduction

Political transformations initiated in 1989 and a reform package introduced since the beginning of 1990 have multidimensional impact upon all branches of agriculture. The objective of this paper is to present transformation of the potato sector to meet two great challenges of the 90s:

1) adaptation to conditions of the market economy and requirements of the period of transition of the overall economic and social system;
2) to meet international competition under increasing trade liberalization (GATT negotiations and processes of European integration).

This paper is based on results of a broad research project, conducted in 1994-1996 under the "COPERNICUS" research scheme of the European Union, on the potato economy in Poland, covering literature studies, analysis of statistical data and unpublished industrial reports, a consumer survey and a series of visits and consultations giving opportunity to share experiences and opinions of experts of different sectors of the potato economy: cultivation, storage, processing and marketing.

I. The potato sector in Poland. An outline

1. Cultivation

Poland occupies the center of a vast area which is the most suitable for potato cultivation, covering Northem France on the West and Ural mountains on the East. As the weaker soils dominate in the country, a remarkable part of them is put under the potato cultivation (the potato is generally recognized as a less demanding crop) (1).

As compared with the Netherlands, Belgium or Germany, some different features of the potato cultivation in Poland have to be pointed-out:

• dispersed production - the average acreage of potatoes is 0.8 ha per farm. It makes more difficult to raise yields, introduce mechanization or develop storage facilities;
• cultivation mainly for inner usage at the farmyard. The potato is marketed only occassionally in over 70% of farms, no more than 7% of the farms are specialized in commercial potato production. Such a situation conditioned the responses of agriculture to market signals;
• domination of unspecialized production for different destinations makes it easier to adapt to fluctuations of harvests but conserves traditional production of average quality, not diversified enough for different potato final uses;
• remarkable share of inner farm inputs in costs of production (seed material, manure and labour).

The level of agrochemicals applied is much lower than the European average. Pesticides are in common use to combat the Colorado beetle only and they are much seldom applied against the potato blight. The costs vs-returns ratio is the main explanation for these but one more factor is of importance - the varieties cultivated in Poland are generally more disease-resistant (2).

2.Acreage, yields and harvests

Total acreage of the potato is remarkable as its share in crop structure is above 15%. A high contribution as from European countries only the Netherlands surpass Poland (about 18%).

Potato cultivation is quite common in family farms and the collectivized sector even before 1989 - played a minor role, sharing less than 10% in the total acreage of the potato.

The maximum acreage of the potato was recorded in 1962-2910 thousand hectares (19.1% share in crop structure). Then, the drop in cultivated area can be observed, at the beginning a slow one and accelerated since the second half of the 70s to reach the actual 1.7 million hectares.

Potato yields have increased at much slower rate than other crops, especially cereals, with occasional periods of stagnation and yield decrease, mainly caused by drought conditions. The average yields reached 19 tons/hectare for the period 1986-1990 to fall down (unfavourable weather conditions, decline of inputs and qualified seeds use) to 16.1 tons/hectare for 1991-1994 period.

Harvest recorded are the results of change of the acreage and yield fluctuations. For three years (1968, 1970, 1973), the most aboundant results - they surpassed 50 million tons. During last some 20 years a downward trend has dominated, bringing the actual production to the range of 23.1-29 million tons.

The share of potato in crop structure is regionally conditioned. Regions of South and South-Eastern Poland are the mostly saturated in the potato ones (over 20% share in some voivodships) and just opposite holds true for some Nothern provinces (less than 10% in crop acreage).

Nevertheless, in spite of decreasing acreage and bad harvests in some last years, the position of Poland as one of world's major producer is unthreatened (nearly 10% in total acreage and over 10% in world's harvests) (3).

3. Disposal and storage

Poland is, perhaps, the only one country in Europe where dominant form of the potato use is feeding, mainly for pigs (for such a purpose around a half of harvests are consumed). It prevails, especially, in small farms with weak soils where a reasonable alternative to this is still lacking.

The volume of potatoes reserved for self-supply at rural families is, more or less, stabilized at the level of 2.5 million tons or, in rough terms, a half of total direct potato consumption (potato consumption in rural families, higher by 35-50% of that one of urban families, is estimated for 170 kg per caput yearly).

Usually, some 70% of produced potatoes are consumed on farm. Only some 3.5-5 million tons (14-17% of harvests) feed the channels of the market. This is divided between potato industry (630-1000 thousand tons), export (140-1200 thousand tons) and domestic consumption (data for 1991-1995 period) (6).

Potato storage can compete for a title of "Achilles heel" of the potato sector. Assuming harvests of the range of 30-33 million tons, some 24-27 million tons of tubers have to be stored, at least for two months. From such an amount, only c. 400 thousand tons can find place in store-houses, other 100 thousand tons - in technical clamps with mechanical ventilation. The bulk of the rest is kept traditionally, in ground clamps or cellars. The storage wastes and losses are estimated for 10-15%. In addition, the quality of stored tubers can be remarkably reduced (decrease of vit. C content, increased presence of reducing sugars, worsened tuber's appearance, darkening of the flesh and invasion of diseases).

4. Processing

Processing of the potato into stanch and spirits is well established in Poland with its traditions going back to 19-th century. As raw material is aboundant, potato retains its exclusive position in starch manufacture. Some 16 plants have a capacity to process some 1.6 million tons of tubers a year (including some 10% into food dried products), but, in fact, they are only exploited in some 30-60%, nowadays. Distilleries, before the second world was an integral part of estates and later incorporated into State farms, were capable to process some 1.7 million tons of potatoes into about 70% of total spirit production (6).

The relatively new, and most rapidly expanding one, is the sector of potato food processing. At present, it is capable to manufacture:
- c. 25 thousand tons of dried products (from 200 thousand tons of tubers)
- c. 40 thousand tons of French frites (from 80 thousand tons of potatoes)
- c. 10 thousand tons of chips (from 40 thousand tons of potatoes)
- c. 2 thousand tons of other products (lumps, dumplings, pillars, etc), from 3 thousand tons of potatoes.

5. Market organization

The potato market in Poland is not developed enough to have a regulatory impact more pronounced. On the market, the most dominant form is a transaction in cash, with direct bargaining between the producer and the buyer, without involvement of trade entreprises. In particular, the potato market suffers from the lack of well-defined, specialized wholesale entreprises. It enhances fluctuation of prices and their differences between particular regions (5).

6. Consumer survey on potatoes and potato products consumption

The survey included 329 citizens of three towns of different size and of different regions: rural Mogilno and Ostroleka and industrial Katowice.

The survey confirms the importance of self-supply, spread even among inhabitants of cities (potatoes produced at a plot or bought in direct contacts with the producer). Typically, the fresh potato is prepared for consumption at home. Processed potatoes are rarely consumed, frites and chips being the most popular.

Some interesting differences between respondents from the 3 cities were defined. For example, at least 40% of those from Magilno and Ostroleka are supplied with potatoes from plot cultivated by themselves or directly from farmers, while in Katovice - less than 7%. Therefore, over 2/3 of respondents know, as a rule, who is the producer of their potatoes, while in Katowice it is slight - by above 5%. Questioned citizens of Katowice much more often buy potatoes in smaller quantities (less than 5 or even 2 kg) while those of two other towns usually prefer larger deliveries (even over 50 kg) during autumn. Furthermore, most of them know which variety they consumed perfectly well, while a half of answers from Katowice declare they never know it.

Based on the results of the consumer survey it can be concluded that there is a good prospect to increase the consumption of processed potato products, the most important constraint being the relatively high price.

II. Impact of system transformation upon the potato sector

1. Cultivation

The tendency to decrease the acreage of potatoes seems to be weakened as a result of rapid changes introduced at the beginning of the 90s. And differences between dynamics of changes of particular regions have been enhanced. Those with large proportion of State sector (Northern and Southern Poland) experienced remarkable reduction in the potato area while the tendency of an increased one could be observed even in regions close to urban agglomerations with strong prevalence of peasant farming.

Another impact of the introduced and undergoing reforms over the potato sector: as production means became much more exepensive, farmers reduced the dosages of fertilizers and pesticides applied.

In the former system exchange of the seed potato falled into administrative plans. Mainly the State farms were involved in seed potato reproduction.

Removal of administrative regulation and ownership transformations of the collectivized agriculture together with altered input: output price relations brought a disruption of the potato seed economy. Both, the acreage of seed plantations and seed potato harvests diminished many-fold. Some seed potato producing regions, as Gdansk voivodship, became even "importers" of potato seeds.

2. Processing and storage

Traditional sector of potato processing at the beginning of the 90s experienced a critical situation:

1) remarkable inflation and increase of prices of purchased potatoes made it difficult to serve credits and to pay for the raw material;

2) introduction of market-controlled prices enhanced technological weakness of plants with outdated technologies and equipment (surpluss demands for water and energy, wastage of some valuable constituents like potato proteins, etc.);

3) the break of the network of linkages between processing plants and potato producers under the radically changed economic conditions with resultant increase of costs of raw material (plant's competition for scarce potatoes in the same area, purchases far away from the factory and decreased starch content);

4) structural adjustment and ownership transformation. The Association of Potato Industry was dissolved to make room for the Polish Potato Industry "Polziem" Ltd and the plants have entered the privatization pathway.

While the conditions of the period of transition put starch industry and distilleries into difficult position to rely in efforts of adaptation on own resources mainly, they were much more merciful for the food processing sector. At first, those plants have been much more modern, established usually not earlier than in the 70s and, furthemore, some of them became private at the eve of the turn of 1989. So, in changed economic environment, the potato food processing has become an alternative activity for foreign investors as confirmed by large "Farm-Frites - Avico" Dutch entreprise of Lebork or "Star-Food" of Tomaszow, a Greek company producing chips built in the 90s. Some other plants were bought from the State as "Chio-Chips - Convent".

After 1990, processing of the potato into spirits was sharply reduced to about 200 thousand tons a year - or about 10 fold collapse! High costs of the potatoes (bad harvests) resulted in purchasing mainly the potatoes of reduced quality (frozen tubers for example) and the State farms within which distilleries were managed entered a painful ownership transformation.

Economic difficulties of "Centrala Nasienna" Seed Trading Companies and gardering - apicultural cooperatives pressed to close some store-houses. In spite of these, a development of potato storage facilities can be clearly observed, mainly as an investment of the potato food processing plants.

3. Market organization

After 1989, the old-fashioned market structures of the State monopole experienced disintegration while the resultant vacuum has been filled by newly established entreprises, in majority private.

In spite of signs of sanation, the potato market is still at the initial stage of its adjustment to the new situation. Some movements can be observed to create producers associations as joint action of seed producers of Gdansk voivodship, supported by local agricultural extension center.

The potato economy has been influenced by changes in the foreign trade. The collapse of the trade with ex-COMECON countries was manifested by the drop of potato export to the CIS countries. And imported processed potato products have entered the market - for the first time in more significant quantities. They compete with domestic production but - at the same time - indicate market requirements, informing more manufactures which kind of products is worth to develop.

For the first time in the post-war history the trade balance during 1992-1994 period became a negative one. Dried potato products, chips and frites were imported as never did appear before 1989.

Just recently, it could be observed that more production can successfully compete with foreign one, gradually replacing it from the market.

III. Ending remarks and conclusions

1. The most dynamic factor of changes in the potato sector has been a developing market, with increased demands but new opportunities as well. It is best-confirmed by response from potato food processing, where quite new plants emerged. Even at present stage, this sector can integrate specialized potato production.

2. At actual stage, the State policy toward the potato sector is still of great importance, though (credit policy, taxes, promotion of the potato products on the markets, especially foreign ones, support for farmers joint-action and rural cooperatives, improvement of State agricultural extension service network, etc).

It has to be underlined that - in the period of transition - the State remains a regulator of the economic processes.

3. After the collapse of the former system of seed economy the recovery processes are onward. Breeding, seed reproduction and trading falls into the scope of business of recently established potato breeding and seed companies. More and more farmers recognize that seed production is an opportunity worth to be considered.

4. For the edible potato production two forms of development can be suggested: association of producers, operating storage - trading bases or integration of producers by specialized wholesale entreprises. Depending on the option, storage facilities will be developed by farmers themselves or by the trade entreprises.

5. Except of the construction of new store-houses, the modernization of existing facilities and adaptation of already available buildings will continue. Some store-houses which were put out of operation because of the structural adjustment have to be re-opened.

6. Stock production will continue to be a major direction of the potato processing. After the initial shock, the condition of plants has improved and many of them introduced plans of modernization. A gradual recovery of export of processed potatoes can be expected.

Distilleries in a new economic situation will never regain the former position. Nevertheless, the production of potato spirits can be rised well above the actual minimum level if the State will continue a policy to encourage addition of the spirit into engine fuel, a more ecologically-friendly petrol (tax policy measures for example).

7. Privatization of starch potato industry is going on. Unfortunately, there are still lacking effective solutions to assure potato producers share in the plant ownership. It is an urgent issue because no action means that at one moment it can be too late. ...

8. The emergence of specialized potato wholesale market will enable gradual improvement of the quality of the potato traded (uniform tuber size and variety, cleaned and washed potatoes, lack of mechanical or illness damages, proper labelling, etc.). This is a pre-condition to regain the lost foreign markets and to enter new ones.

9. *Last but not least* the Polish potato sector confirms a phenomenon known from other branches, as well - that after initial decreased activities caused by shock of transformations and payments of their costs - a continuous restructuring takes place with resultant departure from burdens of the old systems and adjustment to new requirements of an open market economy.

Poland will persist as a major potato producer, giving in the long run a solid background for the wealth of the potato industry, storage and marketing.

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Table 1

Trends of changes in the potato production in Poland

Num-ber	Years	Cultivation area		Change	Share in the crop structure %			Yields in tons per 1ha		Harvests (mln t)	Commercial production	
		Altogether in thous ha	Share of the indivi-dual farms at that	of the ac-reage as compared with for-mer period	Total	Indivi-dual farm	State farm	Total	State farms		In mln tons	Share %
1.	1934-38	2756	-	-	17,5	-	-	13,8	-	38,0	-	-
2.	1947-50	2465	-	-	17,4	-	-	11,9	-	26,8	-	-
3.	1951-55	2628	86,9	+ 165	17,3	18,6	11,1	11,7	9,9	30,8	4,4	14,3
4.	1956-60	2780	89,8	+ 152	18,1	19,3	11,0	13,1	11,8	36,3	4,8	13,2
5.	1961-65	2843	92,4	+ 63	18,6	19,9	9,9	15,4	14,8	43,7	6,7	15,3
6.	1965-70	2745	92,0	- 93	18,1	19,6	9,6	17,6	17,4	47,9	7,2	15,0
7.	1971-75	2654	91,1	- 91	18,0	19,9	9,2	17,7	17,1	47,1	7,0	14,9
8.	1976-80	2409	90,9	- 245	16,5	19,4	6,4	17,8	17,6	42,7	7,5	17,6
9.	1981-85	2179	91,7	- 230	15,1	17,9	5,2	16,8	16,7	36,5	6,2	17,0
10.	1986-90	1904	92,3	- 275	13,2	15,9	4,6	19,0	20,8	36,1	7,0	19,4
11.	1991-94	1737	96,4	- 167	12,9	15,3	2,3	161	147	28,0	4,4	15,7

Source: Own calculations based on the GUS data (table 2-7)

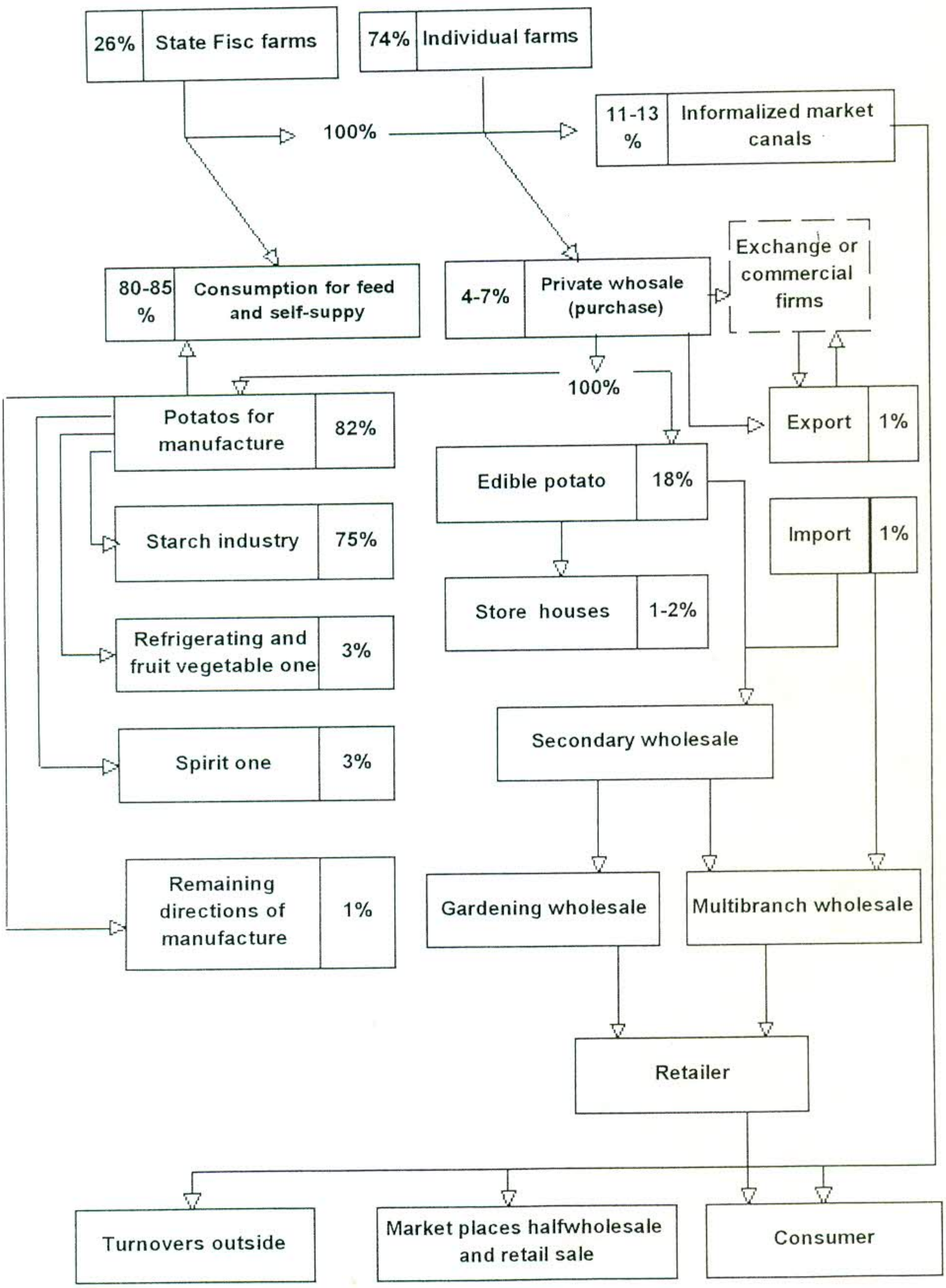

Figure 1 Potato market channels in 1994

- - - - - - - - in the future

Source: K. Pieniążek own elaboration