

## **INCOME SITUATION OF STARCH POTATOES PRODUCERS IN POLAND**

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**Abstract.** As the results of researches it can be concluded that profitability of starch potatoes production has decreased in Poland. Strong dependence of income of starch potatoes producers on Euro exchange rate should be stressed. This rate exchange was advantageous in the first year of membership but it changed negatively for producers. There were also other factors which influenced on financial results of starch potatoes production to large extent, like climate conditions, mainly long-lasting droughts or too much rain, which caused losses in field cultivations.

**Key words:** starch potatoes, efficiency, profitability

### **INTRODUCTION**

Three full years of Polish agriculture's functioning in the European Union's structures passed on May 1, 2007. There were a lot of changes in the agricultural sector, which were undoubtedly the result of involving Polish agricultural market into instruments of the Common Agricultural Policy (CAP). Poles saw both chances as well as opportunities in Polish accession to the EU at the beginning of this process. Access to the EU financial resources and direct support for Polish farmers from the EU budget were perceived as these chances. Direct payments became a substantial instrument influencing profitability and competitiveness of agricultural production. Farmers' vocational situation [Bórawski 2006] has changed significantly after Polish accession to the EU because Polish farmers have gained prestige and respect. It is a result of farmer's improving social position as producer of food accessible on the European market. Direct payments are transfers of resources from public budget which increases directly farmers' income.

It should be noticed that these changes of conditions of particular market segments' functioning are diversified. There is a price increase in milk branch, farmers are more interested in purchase of additional quotas for milk production. Milk cooperatives raise

milk prices in order to gain new suppliers. Different situation takes place on pig meat market where a critical situation is recognized as a result of too much supply of pig meat on market, which causes unprofitable purchase prices.

The aim of this paper is to analyze income situation of starch potatoes producers in the period of four seasons of potato campaign, since 2003/2004 to 2006/2007 and attempt to indicate main factors generating financial results of this production activity.

The goal of the paper was also an endeavor of determination of development possibilities of starch potatoes producers and starch's producers in Poland in the perspective of production quota negotiated for Poland within accession to the European structures. Empirical data comes from 17 farms located on the area of two poviats: Siedlce and Sokołów in Mazovia voivodship.

## LEGAL REGULATIONS OF STARCH POTATOES' MARKET

Potatoes' market is not involved in regulation of the Common Agricultural Policy (CAP). Only potato starch is under regulations but as an element of cereal's market regulations. Starch' market was joined to the CAP in 1964. There is a guaranteed minimal price paid potatoes producers for potatoes provided to processing plants by starch's producers. Starch' market is regulated with use of contingents of starch production, which is 144.985 tones for Poland [ARiMR 2003]. Starch's quantity produced above this contingent has to be exported obligatory outside the EU borders before January 1, after economic year's end. Allotted low production quota [Ginter 2004] of potato starch indicates that the Community accession can causes problems because processing potential as well as national demand exceed this negotiated limit.

Next forms of regulation of potato starch production are contract agreements made between starch's producers and farmers producing starch potatoes. These agreements cannot exceed the contingent allotted to particular processing plants.

Starch's producers receive premium for each tone of starch production on condition that they pay the minimal price for farmers, which is a form of protection for potato producers. Premium for companies producing potato starch aims at evening production costs of starch with use of potato and corn starch. Premium is not accessible for potato starch production with use of potato, which do not fulfill determined health standards. It is paid for starch produced with potato consisting not less than 13% of starch.

There are also additional payments for starch production for non-food purposes, which aims at keeping competitiveness of European products towards the imported ones.

There are also instruments used within trade policy, like custom duties, SSG, contingent, licenses, export subsidies as well as export and import licenses.

## POTATO PROCESSING INDUSTRY IN POLAND

Industrial and food processing has become the main direction of potato utilization in many countries (Germany, The Netherlands, Denmark) [Lewandowski 2000]. Potato processing connects producers with customers to larger extent than edible potato market, it results from the determined requirements of the Common Agricultural Policy.

Starch is the main direction of potato processing in Poland. It should be noticed that this direction of potato processing has characterized by substantial changes in Poland recently. After the increase in the season 2003/2004 there were evident decrease in potato production for starch (Fig. 1). There was a considerable decline in the season 2004/2005 because in comparison with 2003/2004 it was 23% less. Observed situation was caused by limitation of contract agreement making between processing plants and farmers resulted from production quota allotted to Poland. The limit at the level of 145 thousand of tones restrained processing capacities of Polish plants.

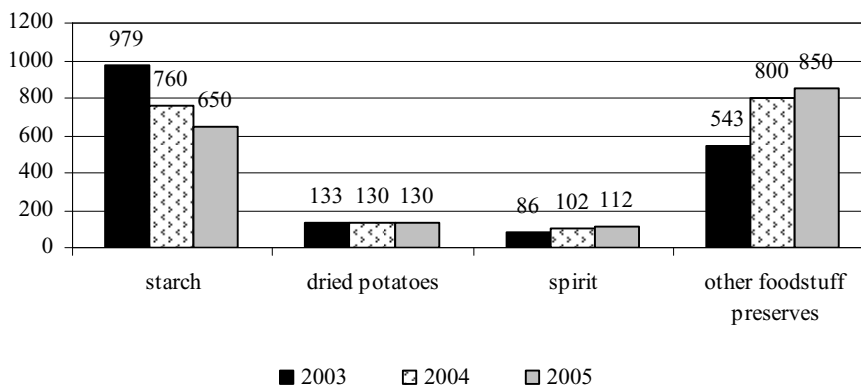


Fig 1. Industrial potato processing in Poland (thousand of tones)

Rys. 1. Przemysłowy przerób ziemniaków w Polsce (tys. ton)

Source: Own elaboration on the basis of [6].

Źródło: Opracowanie własne na podstawie [6].

Other directions of processing have not changed so much in these years. Industrial processing of potato into starch was 650 thousand of tones in the campaign of 2005/2006. Starch quota production allotted to Poland was not used at the level of 145 thousand of tones. Processing for dried potato was similar in subsequent potato campaigns. Increasing tendency was observed in processing potato into spirit. The same situation was also noticed in potato processing into other food commodities.

## RESEARCH RESULTS

Researches were conducted in farms producing starch potatoes in order to evaluate the income situation of starch potatoes producers. Researches were carried out on 5 farms on the area of Siedlce powiat and on 12 farms on the area of Sokołów powiat. The average area of examined farms was slightly changing in the analyzed period. It should be noticed that the area of investigated farms was very diversified – the value of coefficient of variation (CV) exceeded 100% (Table 1). The smallest examined farm has 10.0 ha of agricultural land and the largest about 20 times more – 205.0 ha of agricultural land. The area of starch potatoes cultivation was quite stable on the researched farms in particular years. The most differentiation was in the largest farms (Table 2).

Table 1. Land resources and area of starch potatoes cultivation (ha) on the examined farms in the years 2003–2007

Tabela 1. Zasoby ziemi oraz powierzchnia uprawy ziemniaków skrobiowych (ha) w badanych gospodarstwach w latach 2003–2007

	Analyzed years							
	2003/2004		2004/2005		2005/2006		2006/2007	
	Farm area (ha of agricultural land)	Of which potatoes (ha)	Farm area (ha of agricultural land)	Of which potatoes (ha)	Farm area (ha of agricultural land)	Of which potatoes (ha)	Farm area (ha of agricultural land)	Of which potatoes (ha)
Siedlce powiat								
x	19.4	4.9	20.2	4.8	20.2	5.7	21.0	4.5
SD	11.2	2.7	11.0	2.9	11.0	3.9	10.5	2.3
CV(%)	57.9	55.1	54.6	61.4	54.6	67.5	49.8	50.3
Sokołów powiat								
x	50.5	9.5	50.8	10.1	51.5	10.7	51.5	8.4
SD	56.8	10.9	56.6	11.4	57.0	10.9	57.0	8.2
CV(%)	112.5	114.5	111.3	112.2	110.6	101.8	110.6	98.3
Total								
x	41.4	8.1	41.8	8.6	42.3	9.2	42.5	7.2
SD	49.6	9.4	49.4	9.9	49.8	9.5	49.6	7.2
CV(%)	120.0	115.0	118.0	115.1	117.7	103.2	116.7	98.9

Source: Own researches.

Źródło: Badania własne.

Increase in the average area allotted to starch potatoes cultivation took place in the second and third years of analyzed period on the examined farms. There was raise of 5% in the season 2004/2005 in comparison with 2003/2004 and in the next season there was increase of 7% in comparison with 2004/2005. There was significant decrease of average area of starch potatoes cultivation and it was at the level of 22% in 2006/2007.

There was considerable increase in starch potatoes' prices observed in the first year of Polish membership in the European Union. It caused more interest in increase in this plant cultivation among Polish farmers. This situation can explain increase in the cultivation area of this material in the season 2005/2006. However it should be stressed very clearly that attempts to enlarge contract agreements taken up by farmers after the season 2004/2005 were negatively perceived. First of all, processing plants did not suffer from lack of this material and secondly rigid negotiated production quota did not allow to gain easily more material for processing. There was decrease in starch potatoes' prices in the season 2005/2006 as a result of lower Euro exchange rate than in the first year of membership.

Considerable changes in starch potatoes crop were observed in the time of researches on the examined farms (Table 2, Fig. 2).

The highest starch potatoes crop was observed in the year 2004/2005. It was influenced by very advantageous climate conditions. There were no long lasting periods without

Table 2. Production and economic results of starch potatoes production in the years 2004–2007  
 Tabela 2. Wyniki produkcyjno-ekonomiczne w produkcji ziemniaków skrobiowych latach 2004–2007

Specification	Analyzed years			
	2003/2004	2004/2005	2005/2006	2006/2007
Crop (dt·ha <sup>-1</sup> )	260	278	232	190
Starch content (%)	19.8	19.3	20.5	15.8
Starch quantity (kg·ha <sup>-1</sup> )	5148	5365	4756	3002
Potatoes price (zł·dt <sup>-1</sup> )	17.82	17.42	16.28	14.44
Payment (zł·ha <sup>-1</sup> )	2.06	5.70	5.13	4.41
Price + payment (zł·ha <sup>-1</sup> )	19.88	23.12	21.41	18.85
Income from sales (zł·ha <sup>-1</sup> )	5168.80	6427.36	4967.12	3581.50
Average production costs for 1 ha on the researched farms (zł·ha <sup>-1</sup> )				
1. Seed material	900	1050	1200	1300
2. Fertilizers	338	372	484	498
3. Plant protection chemicals	260	315	370	375
4. Transport services	650	700	800	800
5. Other	600	750	750	700
Total direct costs	2748	3187	3604	3673
Indirect costs	275	319	360	367
Total costs	3023	3506	3964	4040
Income from starch potatoes production per 1 ha on the researched farms (zł·ha <sup>-1</sup> )				
Gross margin	2420.80	3240.36	1363.12	-91.50
Agricultural income	2145.80	2921.36	1003.12	-458.50

Source: Own calculations.

Źródło: Obliczenia własne.

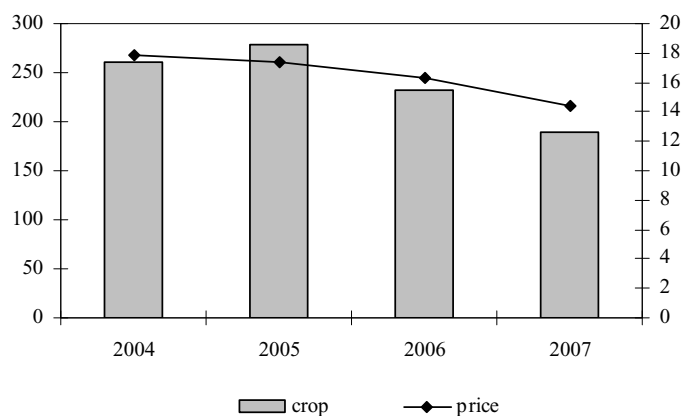


Fig. 2. Potatoes crop (dt·ha<sup>-1</sup>) and purchase price (zł·dt<sup>-1</sup>) in the years 2004–2007

Rys. 2. Plonowanie ziemniaków (dt·ha<sup>-1</sup>) i cena skupu (zł·dt<sup>-1</sup>) w latach 2004–2007

Source: Own elaboration.

Źródło: Opracowanie własne.

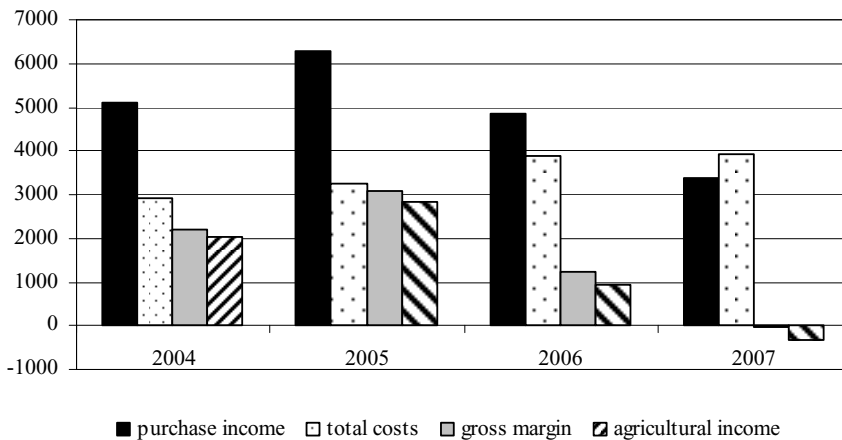


Fig. 3. Value of gross margin and agricultural income in starch potatoes production (zł·ha<sup>-1</sup>) in the years 2004–2007

Rys. 3. Kształtowanie się wartości nadwyżki bezpośredniej i dochodu rolniczego w produkcji ziemniaków skrobiowych (zł·ha<sup>-1</sup>) w latach 2004–2007

Source: Own elaboration.

Źródło: Opracowanie własne.

rain, especially in August, which to large extent decides on volume of gained crops in the case of starch potatoes. There was decline in crop of 19% in the season 2005/2006, which was caused by long lasting drought in this season. That is why potatoes producers for this purposes could not fulfill contract duties.

There were especially disadvantageous climate conditions in the season 2006/2007, which caused decrease in starch crop to the level of 190 dt·ha<sup>-1</sup>. The lowest contents of starch in the material was also observed, which is the main factor influencing on purchase price in the case of starch potatoes.

It should be added that the price is one of the basic parameters deciding on profitability of particular production activity. There were crucial changes in payments for one kg of produced starch in the analyzed period. The fact of Polish accession to the EU created very advantageous sell conditions for starch potatoes through high Euro rate exchange on the level of 4.30 zł €<sup>-1</sup>. It influenced substantially on 30% increase in agricultural income in the first year after accession. Also very high potatoes crop, the highest in the analyzed period, was very important factor. According to the data, decline in financial results started in this year on the examined farms till the deficit, which was observed in the season 2006/07.

Increase in direct costs was observed on the investigated farms during the analyzed period. Rise of expenditures involved seed material, level of applied fertilization, use of plant protection chemicals as well costs of transport to PEPEES JSC Starchworks in Łomża, the place of destination for all investigated farms. Level of indirect costs also increased in the analyzed period. High price increase [Rembeza 2007] of seed potatoes in 2006 and lack of seed potatoes from own production was a supply barrier in 2007. It influenced especially negatively on starch potatoes production.

Starch potato production characterized by crucial decline of profitability, which negative results were able to be noticed in the season 2006/2007.

It should be stated that increasing production costs in the seasons 2005/2006 and 2006/2007 were not recompensed by rise of starch potatoes prices on researched farms. Negative relationship was observed, costs were being increased whereas prices were being decreased. Decline in potatoes crops also contributed to worsening income situation in these seasons. Peculiarly dramatic income situation formed in the last year included in the analysis, which revealed lack of profitability of starch potatoes production.

## SUMMARY AND CONCLUSIONS

On the basis of conducted researches it can be stated that profitability of starch potato production in Poland is diversified. Polish accession to the EU had surely positive influence on income situation of Polish starch potatoes producers. Strong relationship between starch producers' income and Euro exchange rate should be stressed, which in the first year of membership was advantageous ( $4.30 \text{ zł}\cdot\text{€}^{-1}$ ). Euro exchange rate formed on the lower level in the following two seasons 2005/2006 and 2006/2007, respectively  $3.90 \text{ zł}\cdot\text{€}^{-1}$  and  $3.70 \text{ zł}\cdot\text{€}^{-1}$ .

There are also other factors which influenced on financial results of starch potatoes production to large extent, like weather conditions. Unfortunately disadvantageous conditions are more and more frequent in Poland (long-lasting droughts, too much rain). They are described as weather abnormalities and cause losses in field cultivations inter alia in starch potatoes.

Contract agreements between starch potatoes producers and plants producing starch are the guarantee of potatoes' purchase. The contingent allotted to Poland at the level of 145 thousand of tones does not allow to increase in the number of agreements with farmers or limits quantity of starch potatoes for particular producers of this material. It limits the scale of starch potatoes processing, which influences on rise of unit production costs, which subsequently decreases competitiveness of Polish potato processing plants.

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## **SYTUACJA DOCHODOWA PRODUCENTÓW ZIEMNIAKÓW SKROBIOWYCH W POLSCE**

**Streszczenie.** Na podstawie przeprowadzonych badań stwierdzono, że opłacalność produkcji ziemniaków skrobiowych w Polsce ulegała obniżeniu. Należy zaznaczyć ścisłą zależność wpływów pieniężnych dla producentów ziemniaków skrobiowych od kursu Euro. Kurs ten w pierwszym roku członkostwa był korzystny, natomiast w kolejnych latach ukształtował się na poziomie niekorzystnym dla producentów. Czynnikiem istotnie wpływającym na wynik finansowy z produkcji ziemniaków skrobiowych były warunki klimatyczne, a przede wszystkim długotrwałe susze bądź nadmierne opady, które powodowały straty w uprawach polowych.

**Słowa kluczowe:** ziemniaki skrobiowe, efektywność, dochodowość

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