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## **SUGAR AND SUGAR BEET PRODUCTION IN HUNGARY AND POLAND IN THE YEARS 1995-2014**

### *PRODUKCJA CUKRU I BURAKÓW CUKROWYCH NA WĘGRZECH I W POLSCE W LATACH 1995-2014*

**Key words: sugar, sugar beet, sugar market, EU, Hungary, Poland**

*Słowa kluczowe: cukier, buraki cukrowe, rynek cukru, UE, Węgry, Polska*

*JEL codes: Q13, Q17*

**Abstract.** The work contains a comparison of the changes at the sugar market in Hungary and in Poland in the years 1995-2014. Sugar beet crop area in Hungary has decreased by 87% and in Poland by 48%, while beet root harvest dropped by 25% in Hungary, but remained unchanged in Poland. Sugar beet production was abandoned – either by choice or necessity – by 62% of farmers in Hungary (in the years 2000-2014) and by 87% in Poland (1995-2014). In the 20 year period sugar beet production shrunk in Hungary by 73% and in Poland it grew by 29%. Between 1995 and 2008 11 out of 12 sugar factories in Hungary were closed, while in Poland out of 76 factories, 19 remained operational through that period and 18 remained a year after. Sugar exports in 2013 grew compared to 1995 by 15 times in Hungary, but by 253 times in Poland. Sugar imports in Hungary grew 105 times, in Poland it dropped by 40%. Lifting of sugar production quotas in the EU in 2017 can result in complete abandoning of sugar production in Hungary and its further growth in Poland. Hungary has nevertheless been strengthening their position as the leading producer of isoglucose in the EU.

### **Introduction**

Extending of the European Union in 2004 by 10 new member states, including Hungary and Poland, brought about improvement of the economic situation of sugar producers and sugar beet farmers. Unfortunately, already in 2006 the sugar sector reform was introduced and it resulted in a considerable decrease of sugar production in Poland, and to even more extent in Hungary. Sugar production quotas are to be lifted in 2017. It shall be the most significant event of the EU sugar market. An extensive characterization of the Polish and Hungarian sugar markets has been provided by Piotr Szajner and Robert Garay [2014], covering the years 2000-2012.

The aim of the present work is to compare the changes at the market of sugar production and sugar beet production in Hungary and in Poland in the years 1995-2014. A hypothesis was assumed in the research, that a strong limitation in sugar production occurred in Hungary, while in Poland it was possible to maintain the level of sugar production.

### **Material and methods**

The following data has been used in this work: Association of Sugar Industry Engineers and Technicians (STC), Comite Europeen Des Fabricants De Sucre (CEFS), Central Statistical Institute of Hungary (KSH), covering the years 1995-2015, and FAOSTAT data on sugar trade covering the years 1995-2013. Sugar yield has been calculated as the ratio of sugar production volume and sugar beet cropping area in Hungary in the period of 1995-1999, and in the period of 1995-2002 in Poland. For the investigated traits the coefficient of variability (CV) has been calculated, along with the standard deviation (SD). The results are summarized in a table format.

## Results and discussion

The EU sugar market observed significant dynamics of change, resulting from the sugar market reform in the years 2006-2010 [Artyszak 2012b, 2013b]. Sugar beet area in Hungary in the years 1995-2014 shrunk by 87% and in Poland by 48% (tab. 1). At the same time, sugar yield increased respectively by 112% and 145%.

Sugar beet harvest in the investigated period shrunk by 25% in Hungary and remained practically unchanged in Poland. Sugar beet cropping was abandoned by 62% farmers in Hungary (in the years 2000-2014) and by 87% in Poland (1995-2014). Hungary is dominated by large farms, which results in much larger than in Poland, average sugar beet plantations. It is to be noted, that the plantation size has been systematically growing in Poland, suggesting concentration of production, while in Hungary in 2014 it was strongly decreased due to increase in the number of farmers involved in its cropping.

In general, variability of cropping area and the related sugar beet harvests was substantially larger in Hungary than in Poland. The changes in sugar beet production in Poland were varied across different regions of the country Artyszak [2012a, 2013a, d, e]. The area of sugar beet production is concentrated in the Central Transdanubia region of Hungary, taking 34% of the total harvested area of the crop. There are significant production in the Central Transdanubia (17%) region and in the Northern (18%) and the Southern Great Plain (18%). The distance between the crop area and the factory are also influencing the competitiveness of the sector, since the recently mentioned parts of the country are relatively far from the refinery.

Sugar production in the analysed countries in the years 1995-2014 was subject to strong fluctuations (tab. 2). This was from 66 thousand tonnes in 2008 up to 563 thousand tonnes in 1996 in Hungary. In Poland sugar production ranged from 1389 thousand tonnes to 2,299 thousand tonnes in the same period. In the 20-year period, sugar production in Hungary shrunk by 73%, while in Poland it grew by 29%. The sugar production quota for Hungary is 105,420 tonnes and for Poland it is 1,405,608.1 tonnes per annum [Regulation 1308/2013]. It is to be stressed, that Hungary remains the largest EU-based producer of isoglucose, which is a substitute of beet sugar. The quota for isoglucose for Hungary is 250,265.8 tonnes and for Poland it is 42, 861.4 tonnes per annum [Regulation 1308/2013]. The domination of isoglucose production over beet sugar was indicated by P. Szajner and R. Garay [2014].

Between 1995 and 2008, 11 out of 12 sugar factories in Hungary were closed. At the same time in Poland, out of 76 plants, 19 remained operational, and 18 still in business a year after. Decreased number of sugar refineries resulted in extended sugar campaigns. In Hungary it became longer by 150% compared to the year 2000 and in Poland it was up by 68% compared to 1995.

Variability of export and import of sugar, and the related balance was in the years 1995-2013 considerably larger in Hungary, than in Poland (tab. 3). During the investigated period, the sugar trade balance for both countries was in most cases positive. In Hungary it was however negative 6 times (2001, 2003, 2008, 2009, 2011 and 2012). In the case of Poland, the balance was negative twice, in 1995 and in 2009.

In 2013, sugar exports compared to 1995 in Hungary were increased 15 times, and in Poland it was 253 times larger. The imports in Hungary increased 105 times, while in Poland it shrunk by 40%. As a result, the positive sugar trade balance in Hungary improved by 13 thousand tonnes and in Poland by 524 thousand tonnes. Foreign trade results were shaped mainly by the sugar market reform in the years 2006-2010 [Artyszak 2013c].

Large changes of the sugar market became the share of other countries in the EU, including the Czech Republic and Slovakia [Smutka et al. 2016]. The Czechs and Slovaks significantly reduced respectively their production capacities of beet sugar and their sugar beet production itself. Only 9 sugar factories survived until present (including 7 in the Czech Republic and 2 in Slovakia). Their output is about 500 thousand tonnes of sugar per annum (70% is produced in the Czech Republic and the rest in Slovakia). The current production performance is able to cover the domestic demand in both countries. Their role in the EU sugar market is rather limited, but the position of their sugar industries is stable. Both countries are able to maintain a high level of self-sufficiency and both are capable to participate in the European exports of sugar and sweeteners.

Table 1. Sugar beet production in Hungary and Poland in the years 1995-2014

Tabela 1. Produkcja buraka cukrowego na Węgrzech i w Polsce w latach 1995-2014

Years/Lata	Country/ Kraj	Area [thous. ha] Powierzchnia uprawy [tys. ha]	Sugar yield/Plon cukru [t/ha]	Sugar beet production/ Zbiory/ buraków [mln t]	Number of growers/ Liczba plantatorów	Average size of plantation/ Średnia wielkość plantacji [ha]
1995	HU	118	4.1	4.19	n.d.	n.d.
	PL	378	4.2	13.35	258,864	1.5
1996	HU	118	4.8	4.67	n.d.	n.d.
	PL	454	5.1	17.93	259,559	1.7
1997	HU	98	5.0	3.69	n.d.	n.d.
	PL	401	5.2	15.92	209,662	1.9
1998	HU	80	5.5	3.36	n.d.	n.d.
	PL	383	5.5	15.14	166,584	2.3
1999	HU	66	6.6	2.93	n.d.	n.d.
	PL	352	5.1	12.55	137,149	2.6
2000	HU	55	4.9	2.03	1,013	53.9
	PL	312	6.5	13.22	111,934	2.8
2001	HU	68	6.3	3.02	1,071	63.1
	PL	301	5.1	11.49	99,414	3.0
2002	HU	55	6.2	2.39	752	73.8
	PL	309	6.5	14.06	95,062	3.3
2003	HU	48	5.3	1.76	795	60.4
	PL	297	6.5	12.12	83,429	3.6
2004	HU	65	7.7	3.50	809	79.9
	PL	296	6.8	12.83	77,963	3.8
2005	HU	58	8.4	3.43	809	72.1
	PL	278	7.4	11.31	72,790	3.8
2006	HU	46	7.6	2.30	809	56.8
	PL	240	7.1	11.4	63,722	3.8
2007	HU	36	6.1	1.63	679	53.4
	PL	215	8.9	10.04	60,832	3.5
2008	HU	7	10.2	0.42	74	87.8
	PL	176	7.9	9.13	40,988	4.3
2009	HU	14	9.2	0.73	114	122.8
	PL	192	8.6	9.85	39,986	4.8
2010	HU	14	8.1	0.81	155	90.3
	PL	195	7.5	9.96	38,208	5.1
2011	HU	13	8.8	0.85	173	75.1
	PL	197	9.7	11.61	35,860	5.5
2012	HU	18	6.6	0.88	221	81.4
	PL	193	9.5	12.28	35,861	5.4
2013	HU	16	7.4	0.99	237	66.2
	PL	185	9.6	11.23	35,723	5.2
2014	HU	15	8.4	1.06	389	28.3
	PL	198	10.3	13.49	34,591	5.7
Change 2014 to 1995/ Zmiana 2014 do 1995	HU	-103	+4.6	-3.13	-624*	-25.6*
	PL	-180	+6.1	+0.14	-224,273	+4.2
CV [%]	HU	68.7	24.4	58.3	65.5	30.0
	PL	30.4	25.5	17.5	74.3	35.6
SD	HU	34.6	1.7	1.3	354	21.3
	PL	84.3	1.8	2.2	72,731	1.3

HU – Hungary/Węgry; PL – Poland/Polska, CV – coefficient of variation/współczynnik zmienności, SD – standard deviation/odchylenie standardowe

\*compared to 2000/w stosunku do 2000 roku, n.d. – no data available/brak danych

Source: own study on the basis of data on CEFS 2010-2015, KSH 1995-2004, STC 1995-2004

Źródło: opracowanie własne na podstawie danych CEFS 2010-2015, KSH 1995-2004, STC 1995-2004

Table 2. Sugar production in Hungary and in Poland in the years 1995-2014  
 Tabela 2. Produkcja cukru na Węgrzech i w Polsce w latach 1995-2014

Years/ Lata	Country/ Kraj	Sugar production [thous. t]/Produkcja cukru [tys. t]	Number of factories operating/ Czynne cukrownie	Length of the campaign [days]/Długość kampanii [dni]
1995	HU	480	12	n.d.
	PL	1577	76	66
1996	HU	563	12	n.d.
	PL	2299	76	86
1997	HU	489	12	n.d.
	PL	2086	76	74
1998	HU	439	11	n.d.
	PL	2091	76	68
1999	HU	438	9	n.d.
	PL	1806	76	55
2000	HU	268	7	48
	PL	2013	76	57
2001	HU	425	7	69
	PL	1540	71	49
2002	HU	341	6	64
	PL	2018	65	67
2003	HU	252	6	48
	PL	1945	57	70
2004	HU	499	5	105
	PL	2001	43	87
2005	HU	491	5	101
	PL	2054	40	88
2006	HU	349	5	70
	PL	1707	31	88
2007	HU	221	4	67
	PL	1919	29	94
2008	HU	66	1	70
	PL	1389	19	89
2009	HU	125	1	115
	PL	1646	18	117
2010	HU	121	1	117
	PL	1466	18	101
2011	HU	122	1	117
	PL	1911	18	103
2012	HU	112	1	125
	PL	1803	18	109
2013	HU	116	1	118
	PL	1713	18	93
2014	HU	130	1	120
	PL	2041	18	111
Change, 2014 to 1995/ Zmiana 2014 do 1995	HU	-350	-11	+72*
	PL	+464	-58	+45
CV [%]	HU	55.1	75.9	31.5
	PL	13.0	55.8	23.4
SD	HU	167	4.1	28.4
	PL	241	25.6	19.6

Explanations – see tab. 1/objaśnienia jak w tab. 1

Source: see tab. 1

Źródło: jak w tab. 1

Table 3. Balance of foreign trade in Hungary and Poland in the years 1995-2013

Tabela 3. Bilans handlu międzynarodowego cukrem na Węgrzech i w Polsce w latach 1995-2013

Years/Lata	Country/Kraj	Export/Eksport [t]	Import/Import [t]	Balance/Bilans [t]
1995	HU	12 863	1 579	11 284
	PL	1 818	148 745	-146 927
1996	HU	7 738	668	7 070
	PL	84 330	36 283	48 047
1997	HU	37 086	3 512	33 574
	PL	430 609	48 382	382 227
1998	HU	118 907	6 734	112 173
	PL	286 154	10 558	275 596
1999	HU	45 645	12 613	33 032
	PL	379 415	1 925	377 490
2000	HU	25 412	5 937	19 475
	PL	368 004	54 276	313 728
2001	HU	8 096	14 307	-6 211
	PL	246 984	61 340	185 644
2002	HU	66 824	24 886	41 938
	PL	203 358	67 062	136 296
2003	HU	30 383	40 262	-9 879
	PL	413 497	69 860	343 637
2004	HU	44 963	41 002	3 961
	PL	408 806	55 126	353 680
2005	HU	194 764	63 969	130 795
	PL	653 598	53 979	599 619
2006	HU	212 798	93 614	119 184
	PL	699 634	68 691	630 943
2007	HU	146 653	99 253	47 400
	PL	344 487	41 232	303 255
2008	HU	145 070	254 737	-109 667
	PL	399 461	93 792	305 669
2009	HU	153 431	216 854	-63 423
	PL	186 477	203 426	-16 949
2010	HU	254 661	200 465	54 196
	PL	355 000	135 240	219 760
2011	HU	193 705	224 219	-30 514
	PL	289 280	148 744	140 536
2012	HU	285 366	288 988	-3 622
	PL	521 797	71 763	450 034
2013	HU	190 051	165 552	24 499
	PL	460 330	83 707	376 623
Change, 2013 to 1995/ Zmiana 2014 do 1995	HU	+177 188	+163 973	+13 215
	PL	+458 512	-65 038	+523 550
CV [%]	HU	78.8	107.3	269.1
	PL	48.5	65.9	69.6
SD	HU	90 165	99 307	58 823
	PL	171 893	50 451	193 239

Explanations – see tab. 1/objaśnienia jak w tab. 1

Source: own study on the basis of data on FAOSTAT 1995-2013

Źródło: opracowanie własne na podstawie FAOSTAT 1995-2013

## Conclusions

1. The sugar market in Hungary and in Poland in the years 1995-2014 underwent extensive changes. Hungary lost significance as a beet sugar producer, while Poland was able to maintain their position.
2. The reason for considerable limitation of production was the decision of the foreign owners to shut down refineries in 2008, in exchange for large economic compensations.
3. Lifting of the sugar production quotas in the EU in 2017 can result in complete abandoning of beet sugar production in Hungary and a production increase in Poland. At the same time, Hungary have been strengthening position as the EU leading isoglucose supplier.

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## Streszczenie

Porównano zmiany, jakie zaszły na rynku cukru na Węgrzech i w Polsce w latach 1995-2014. Powierzchnia uprawy buraków cukrowych na Węgrzech zmniejszyła się o 87%, a w Polsce o 48%, zbiory buraków uległy zmniejszeniu odpowiednio o 25% w przypadku Węgier i nie uległy zmianie dla Polski. Zuprawy buraków cukrowych zrezygnowało lub zostało do tego zmuszonych 62% plantatorów na Węgrzech (w latach 2000-2014), a 87% w Polsce (w latach 1995-2014). W ciągu 20 lat produkcja cukru na Węgrzech zmniejszyła się o 73%, a w Polsce wzrosła o 29%. W latach 1995-2008 zamknięto na Węgrzech 11 z 12 cukrowni, a w Polsce z 76 pozostało czynnych w tym okresie 19, rok później 18 zakładów. W roku 2013 w stosunku do 1995 eksport cukru z Węgier zwiększył się 15-krotnie, a z Polski 253-krotnie. Import zaś wzrósł na Węgrzech 105-krotnie, a w Polsce zmalał o ponad 40%. Zniesienie limitów produkcji cukru w UE w 2017 roku może spowodować całkowite zaprzestanie produkcji cukru na Węgrzech, a jej wzrost w Polsce. Węgry umocnią jednak pozycję największego producenta izoglukozy w UE.

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