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CHANGES IN FOREIGN TRADE IN AGRI-FOOD PRODUCTS BETWEEN THE EU AND CHINA

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Abstract. The aim of the paper was to identify the changes in bilateral trade in agri-food products between the EU and China, as well as to assess – in mutual relations – *ex post* competitive advantages of major groups of agri-food products in 2008–2015. The research is based on data from the Statistical Office of the European Union (Eurostat). The analysis covered the value, trade balance, shares in total trade and commodity structure of trade in agri-food products between the EU and China. Selected indices of revealed comparative advantage (XRCA, MRCA, RTA), Coverage Ratios (CR), Specialization Indicators (SI), and the indices of Intra-Industry Trade (IIT) were calculated for major product groups of the Combined Nomenclature. It was proved that bilateral trade in agri-food products between the EU and China has increased significantly in 2008–2015, and the EU transformed from an importer to a net exporter. Despite the intensification of mutual trade, the importance of China in the EU export of agri-food products remained relatively small. The structure of bilateral trade in agri-food products between the EU and China is consistent with the distribution of comparative advantages obtained by exporters and it is shaped under assumptions of the theory of similarity of preferences, the theory of product differentiation of the Armington type, and the Heckscher-Ohlin-Samuelson theorem of resources abundance. It can be considered that the Chinese agri-food sector is still in the stage of a factor-driven economy, while the agriculture and food industry in the EU countries has reached the stage of an innovation-driven economy.

Key words: export, import, agri-food products, competitive advantage, the EU, China

INTRODUCTION

The rapid development of the emerging economies, especially China, observed since the end of the 1970s, is leading to a shift in the global balance of power, creating a "new balance" in international trade and investment flows. The increasing internationalisation of the Chinese economy being a consequence of the reforms initiated by Deng Xiaoping in 1978, implementation of the "Open Door" Policy[1], the introduction of the "Go Global" strategy in 1999 and China's accession to the World Trade Organisation (WTO) in 2001, has placed the Middle Kingdom among the world's top economies. The strengthened economic position of China means new challenges for the developed countries, which are revising their foreign economic policies in an attempt to maintain their position in the global market.

[1] The reforms introduced were aimed, amongst others, at gradual marketization of the economy, opening onto the world not only in the economic, but also political and social sense, reconstruction of state structures of administrative nature, modernisation of agriculture, industry, national defence, science and technology, as well as democratisation of social life. Introduction of the "Open Door" Policy involved gradual abandonment of foreign trade planning and the Chinese economic self-sufficiency model associated with following the strategy of isolation and seeking independence from other countries. For more information, see Gawlikowski and Ławacz (2004), Kowalik (2005), Żmuda (2009), Zysk and Gromala (2013), Kędzierska (2015).

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China's main trade partner are the European Union (EU) countries. Despite the political and economic system differences, the economic ties between the EU and China strengthened considerably in the first decade of the 21st century. Following the global economic and financial crisis which upset the economic balance in the world, plans have been devised to stimulate the economies of China and the EU by reinforcing multi-dimensional cooperation, in particular by promoting trade exchange and the flow of foreign investment (Kędzierska, 2015). The most promising commodity and service exchange sectors are considered to be: infrastructure and transport, solutions for implementing technologies of energy generation from alternative sources, transfer of environmentally-friendly technologies[2] and high-technology machines and equipment (Puślecki, 2012). Because of the strategic importance of the agricultural sector in the economies of the countries in question and the priority given to the task of ensuring food security to their populations[3], another key area of bilateral cooperation between the EU and China is the agri-food industry. Hence, the aim of the paper was to identify the changes in bilateral trade in agri-food products between the EU and China, as well as to assess – in mutual relations – *ex post* competitive advantages of major groups of agri-food products in 2008–2015. The paper also attempts to indicate which of the neoclassical and modern theories of international trade provide the most comprehensive explanation of the current model of agri-food commodity exchange between the EU and China.

RESEARCH MATERIALS AND METHODS

The analysis is based on data from the Statistical Office of the European Union (Eurostat). The analysis covered the value, trade balance, shares in total trade and commodity structure of bilateral trade in agri-food products between the EU–27[4] and China in 2008–2015. This selection of the period analysed has enabled an objective assessment of the changes that took place in the trade exchange between the EU and China in the period when symptoms of the economic crisis appeared in the global economy and during the combating of its effects. For the major commodity groups identified according to the Combined Nomenclature (CN) of International Trade the following indices were calculated: selected revealed comparative advantage indices (XRCA, MRCA, RTA), coverage ratio (CR), Specialization Indicators (SI), the Grubel-Lloyd intra-industry trade index (IIT)[5].

The methods applied included descriptive analysis supported by tabular data presentation, analogy and comparison method and deductive reasoning method. Selected descriptive statistics measures were also employed.

[2] This arises from the present assumptions of both the European and Chinese economic models, which refer to the application of the principles of sustainable development in all areas of economic and social life.

[3] The need to ensure food security is particularly important for China, with 20% of the world's population and only 10% of the global arable land area and 6% of water resources (Hoering, 2011).

[4] Croatia was excluded from the analysis to maintain a constant basis of comparison (number of EU countries) in the entire period investigated.

[5] The revealed comparative advantage indices were calculated from the following formulae: $XRCA_{ik} = \frac{X_{ik}}{X_{im}} : \frac{\sum_{j,j\neq i} X_{jk}}{\sum_{j,j\neq i} X_{jm}}$, $MRCA_{ik} = \frac{M_{ik}}{M_{im}} : \frac{\sum_{j,j\neq i} M_{jk}}{\sum_{j,j\neq i} M_{jm}}$, $RTA_{ik} = XRCA_{ik} - MRCA_{ik}$, where: X – exports; M – imports; i, j – product categories; k, m – countries, and then they were generally evaluated with the use of relations between them. Positive values of RTA index with XRCA above unity indicate high competitiveness (+), whereas a negative RTA value with MRCA above 1 suggest that the country is not competitive (–). In the remaining cases the results of analysis are not definite (+/–). Export specialisation in a specific group of products was determined using the Export-Import Coverage Ratio (CR): $CR_k = \frac{X_k}{M_k} \cdot 100\%$ and the Export Specialisation Index (SI): $SI_k = \frac{X_{ik}}{X_k} : \frac{X_{im}}{X_m}$, with the CR ratio above 100% and high values of the SI index being considered desirable. The intra-industry trade intensity was determined by means of the Grubel-Lloyd index (IIT): $IIT_k = \frac{(X_{ik} + M_{ik}) - |X_{ik} - M_{ik}|}{(X_{ik} + M_{ik})} \cdot 100\%$. The existence of intra-industry trade, i.e. exchange where the exports and imports flows of goods from the same industry overlap to a large extent is indicated by values approaching 100%. In contrast, an IIT index close to zero points to the existence of inter-industry trade. For more information on the selection criteria for the indices to be used and the principles of interpretation of results, see Nosecka et al. (2011), Pawlak and Poczta (2011), Pawlak (2013).

VALUE AND BALANCE OF BILATERAL TRADE IN AGRI-FOOD PRODUCTS BETWEEN THE EU AND CHINA

In 2008–2015 the value of agri-food product exports from the EU to China rose steadily to reach EUR 8.9 bln in the last year investigated, i.e. 5.5 times as much as in 2008 (Table 1). Such a rapid growth in exports increased the importance of China as the recipient of agri-food products exported from the EU. The share of this country in overall EU exports of agri-food products increased by 1.5 percentage point in the period investigated to reach 1.9% in 2015. The role of China in the structure of agri-food product exports to countries outside the EU increased even more. In 2015 this market received 7.0% of overall exports to countries outside the EU, compared to a mere 2.0% in 2008. The above indicates that, without giving up concentration of trade within the Single European Market (SEM), the EU intensified trade cooperation with China at the cost of other trade partners outside the EU, e.g. the USA or Japan. Meanwhile, imports of agri-food products from China to the EU grew less rapidly. Following a ca. 33% increase, in 2015 the imports of this commodity group from China was at the level of EUR 6.2 bln, which corresponded to 1.3% of overall agri-food product imports to the EU and 4.7% of their imports from countries outside the EU, as in preceding years.

In 2008–2012 the trade in agri-food products between the EU and China showed an unfavourable deficit from the European point of view. It was not until 2013 that the value of exports of this commodity group from the EU to China exceeded, by EUR 236 mln, the expenditure on imports, and in subsequent years – as a result of a faster growth in exports compared to imports – the value of EU's positive balance of bilateral trade was improving. In 2015 the EU's trade surplus in the agri-food sector was nearly 12 times that of 2013, reaching EUR 2.7 bln (Table 1). The rapid growth in exports and the EU securing the position of net exporter of agri-food products to China was determined not only by the size of the Chinese market measured by the number of potential consumers, but above all by a faster rate of economic growth and the resulting increase in the real

Table 1. Foreign trade between the EU and China in 2008–2015
Tabela 1. Handel zagraniczny UE z Chinami w latach 2008–2015

Specification Wyszczególnienie	2008	2009	2010	2011	2012	2013	2014	2015	
	mln EUR								2008 = 100
Trade in agri-food products Handel produktami rolno-spożywczymi									
Export – Eksport	1 571.8	1 837.7	2 617.6	3 822.2	4 901.6	5 819.8	6 267.1	8 928.4	568.1
Import	4 660.4	4 306.8	5 082.7	5 716.8	5 680.5	5 583.6	5 670.0	6 221.2	133.5
Balance – Saldo	–3 088.7	–2 469.0	–2 465.1	–1 894.6	–779.0	236.1	597.1	2 707.2	–87.6
Share of agri-food trade with China in total agri-food trade of the EU (%) Udział handlu rolno-spożywczego z Chinami w handlu rolno-spożywczym UE ogółem (%)									
Export – Eksport	0.4	0.6	0.7	0.9	1.1	1.3	1.4	1.9	x
Import	1.3	1.2	1.4	1.4	1.3	1.3	1.3	1.3	x
Share of agri-food trade with China in extra-EU agri-food trade (%) Udział handlu rolno-spożywczego z Chinami w handlu rolno-spożywczym UE z krajami trzecimi (%)									
Export – Eksport	2.0	2.6	3.0	3.8	4.4	4.9	5.2	7.0	x
Import	4.6	4.8	5.2	5.1	4.9	4.8	4.7	4.7	x

Source: own calculations based on ComExt-Eurostat (2016).
Źródło: obliczenia własne na podstawie ComExt-Eurostat (2016).

income of the population[6]. The studies by Huan-Niemi and Niemi (2009) suggest that the largest growth in demand for agri-food products, higher than proportional to the income increase, was observed in the case of frozen pork, frozen fish and wine. The coefficient of income elasticity of demand for the import of these articles was equal to, respectively 1.65; 1.49 and 3.04. Maintaining the economic growth of China at the present level, resulting in an increase of individual incomes and the number of wealthy consumers, combined with a low productivity and low level of technological innovation in the Chinese agriculture[7] (Cieślik, 2013; Qiao and Wang, 2007) along with advancing industrialisation and urbanisation that reduces the area of agricultural land, as well as its quality and fertility, create a chance of further growth in the exports of agri-food products from the EU to China. The likelihood of this happening is real due to the fact that China's attempts to adapt for farming lands not previously used for this purpose, often unsuitable for intensive farming and characterised by a short growing season, often require high investment expenditures (Hoering, 2011). It is also worth mentioning that the Chinese demand for imports of agri-food products is not very sensitive to changes in absolute prices, remaining highly elastic to relative price changes (Huan-Niemi and Niemi, 2008). Thus, Chinese importers seek relatively cheap foreign suppliers, but simultaneously a growing number of wealthy consumers expect products of comparatively high quality and food safety level, ensured by the sanitary, veterinary and technical standards.

On the macroeconomic scale, China's accession to the WTO has proved to be an important stimulus promoting the development of trade between the EU and China, since it was reflected in the reduction of state intervention and major changes in the determination of customs duty rates, exchange rate regulation or subsidisation of domestic enterprises (Żmuda, 2009). However, with the exception of wine and beer exports, cuts in the customs duty rates following the decisions taken within the WTO did not cause significant changes in the volume of agri-food product exports from the EU to China (Huan-Niemi and Niemi, 2008). That is because its growth is still limited by numerous non-tariff barriers, such as the need to present appropriate certificates, marks or licences, which causes delays in customs clearance. Such requirements apply chiefly to the EU exporters of spirits, cereal, dairy products and meat products. Chinese food standards still differ from international ones, and therefore generate additional costs, reducing the profitability of export (Kita, 2014). Moreover, China maintains tariff quotas for wheat, maize, rice and sugar (Trade…, 2012). It is worth emphasising that, to promote mutual cooperation, the EU has been engaged in talks with China since 2007, with a view to entering into the Partnership and Cooperation Agreement (PCA), intended to supersede the 1985 "Trade and Economic Cooperation Agreement" (Puślecki, 2012). It is not a preferential agreement, so the negotiations related to trade matters are not aimed at reducing or eliminating customs tariffs but increasing the transparency of mutual relations through progressive liberalisation of non-tariff barriers, in accordance with the rules and obligations arising from WTO membership. However, while the EU countries expect China to show more involvement in international activities and implement European standards and solutions in its economic and political system, treating the PCA as a comprehensive agreement enabling China to achieve faster growth in line with the principles of open society, sustainable development and care for economic and trade relations with the EU, it is not a typical foreign policy practice for China to sign such an agreement. Furthermore, China has a negative attitude towards EU's activities in the developing countries and seek acceptance of the Chinese economic development model (Zhang, 2011; Kędzierska, 2015).

The volume of EU exports of agri-food products from China in 2008–2015 was affected by the fact that the import capacity of the EU markets, which remain China's main trade area, was diminished as a result of the global economic and financial crisis. It was also determined to a large extent by the EUR to CNY exchange rate and facilitated access to the EU market granted to China as part of the Generalised System of Preferences (GSP). As for the factors that hinder the development of mutual trade relations between the EU and China, Xie

[6] The significant impact of income changes on the size of demand for agricultural products was also proved by Yusoff and Salleh (1987) and Honma (1991).

[7] The Chinese agriculture is experiencing difficulties with the commercialisation of innovation. Although every year about 6000 scientific and technical projects supporting agricultural production are developed, only 30–40% of them are implemented. By comparison, in developed countries the share of technology innovations implemented in agriculture is 60–80% (Qiao and Wang, 2007).

(2010) mentions the considerable geographical distance that makes it impossible to gain the logistic advantage arising from lower transport costs and potentially shorter delivery times.

THE COMMODITY STRUCTURE OF EXCHANGE AND COMPETITIVE ADVANTAGES IN BILATERAL TRADE IN AGRI-FOOD PRODUCTS BETWEEN THE EU AND CHINA[8]

In 2008–2015 items of significance in the export of agri-food products from the EU to China were dairy products, as well as meat and edible offal. In 2015 these two commodity groups accounted for more than 30% of EU's overall revenues from agri-food product exports to China. The value of meat and edible meat offal exports of ca. EUR 1.8 bln was nearly 13 times that of 2008, whereas the exports of dairy products, having increased nearly 7-fold, brought nearly EUR 924 mln. About 25% (EUR 2.2 bln) of overall exports from the EU to China were cereals and preparations of cereals which, together with meat and edible meat offal, were among the product groups showing the fastest exports growth rate. In 2008–2015 their exports increased more than 21-fold and nearly 13-fold, respectively. At the same time, the exports of beverages, spirits and vinegar to China more than quadrupled. Overall, beverages worth more than EUR 1.7 bln were supplied to the Chinese market in 2015, which corresponded to nearly 20% of the total EU exports of agri-food products to China (Table 2).

The aforementioned facts indicate that the EU exports to China were dominated by basic products (cereals, preparations of cereals, meat, dairy products) with respect to which China has not achieved self-sufficiency and remains dependent on the global soil and water resources, along with high-added value articles (some spirits) that are not produced in China. This way, China imported the indispensable goods, as well as food articles meeting rigorous food safety standards, the demand for which rose with the growing purchasing power of the increasing group of wealthy consumers, adopting the western consumption patterns as the structural and system transformations took place in the economy. The increases in the imports of dairy products was determined not only by production, structural and economic factors, but also by the implementation of programmes promoting milk consumption in schools[9] (cf. Hoering, 2011).

What is important, the structure of export reflected the distribution of competitive advantages gained by EU exporters on the Chinese market. In the period analysed, EU exporters of cereals, preparations of cereals, meat, dairy products, as well as beverages and spirits were characterised by the greatest and still increasing competitive advantage (Table 3). This is indicated by the Relative Revealed Comparative Export Advantage Index (4.12 < XRCA < 73.95) and Relative Trade Advantage Index (3.88 < RTA < 73.94), as well as Import-Export Coverage Ratios (CR) far exceeding 100%, which demonstrates a positive trade balance in these commodity groups. In 2015 milk product export revenues were nearly 5.5 times greater (CR = 545%) than the expenditures on their imports from China, and reached EUR 754.5 mln (Table 2 and 3). For preparations of cereals, this surplus was more than 9-fold (CR=918%), in trade in beverages, spirits and vinegar – 34-fold (CR = 3428%), and in trade in meat and edible meat offal and cereals – 85- and 96-fold, respectively (CR = 8496% and CR = 9617%). In absolute terms, this meant positive trade balance values of EUR 1.3 bln, 1.7 bln, 1.8 bln and 808.5 mln, respectively. The EU's export specialisation compared to China, measured by the SI index value, was also the highest in the product groups in question. Their share in total EU's exports of agri-food products to China was between ca. 4 times (dairy products) and 67 times (cereals) as high as in China's exports to the EU. The asymmetry observed in the bilateral trade between the EU and China resulted in the inter-industry character of trade in these product groups (2% < IIT < 31%; Table 4).

In 2008–2015 the imports from China to the EU consisted mainly of fish, crustaceans and molluscs, horticultural products and oilseeds (Table 2). In 2015 the value of imports of the first of the commodity groups listed above was more than EUR 1.4 bln, i.e. about 27% more than in 2008. In both the years investigated a similar amount was

[8] Due to length limitations, this paper focuses on the evaluation of competitive advantages of product groups that have the largest share in the commodity structure of bilateral trade between the EU and China.

[9] Analogous consumption model transformations, caused by similar factors, are also observed in South Asian countries. Cf. Dorjee et al. (2003).

Table 2. Commodity structure of agri-food trade between the EU and China in 2008–2015
Tabela 2. Struktura asortymentowa handlu produktami rolno-żywnościowymi UE z Chinami w latach 2008–2015

Specification Wyszczególnienie	Export – Eksport				Import				Balance – Saldo	
	2008	2015			2008	2015			2008	2015
	mln EUR		%	2008 = 100	mln EUR		%	2008 = 100	mln EUR	
Cereals Zboża	38.3	817.0	9.2	2 133.9	18.0	8.5	0.1	47.1	20.2	808.5
Preparations of cereals Przetwory zbożowe	111.1	1 428.7	16.0	1 286.2	97.9	155.6	2.5	158.9	13.1	1 273.1
Edible fruit and nuts Owoce i orzechy	31.8	76.2	0.9	239.7	327.8	391.6	6.3	119.5	–296.0	–315.4
Edible vegetables Warzywa	3.0	9.0	0.1	303.9	463.8	538.0	8.6	116.0	–460.9	–529.0
Preparations of vegetables, fruit or nuts Przetwory z owoców, warzyw i orzechów	16.4	95.8	1.1	583.3	699.4	523.7	8.4	74.9	–683.0	–427.8
Oil seeds Nasiona oleistych	35.5	125.0	1.4	351.7	439.0	580.8	9.3	132.3	–403.5	–455.9
Oils and fats Oleje i tłuszcze	59.1	278.3	3.1	471.2	42.1	94.3	1.5	224.0	16.9	183.9
Sugar and sugar confectionery Cukier i wyroby cukiernicze	15.5	44.8	0.5	290.0	57.5	65.0	1.0	113.1	–42.0	–20.2
Coffee, tea, maté and spices Kawa, herbata, maté i przyprawy	7.0	39.7	0.4	565.5	181.4	437.3	7.0	241.1	–174.4	–397.6
Live animals Zwierzęta żywe	8.1	55.4	0.6	683.4	10.0	7.6	0.1	75.4	–1.9	47.8
Meat and edible meat offal Mięso i podroby jadalne	134.2	1 805.6	20.2	1 345.6	22.0	21.3	0.3	96.4	112.1	1 784.4
Meat preparations Przetwory mięsne	8.6	6.8	0.1	78.6	144.3	249.5	4.0	173.0	–135.6	–242.7
Fish, crustaceans and molluscs Ryby, skorupiaki i mięczaki	240.4	384.9	4.3	160.1	1 138.1	1 439.9	23.1	126.5	–897.7	–1 055.0
Dairy products Produkty mleczarskie	134.3	923.9	10.3	688.0	32.9	169.4	2.7	514.4	101.3	754.5
Beverages, spirits and vinegar Napoje bezalkoholowe, alkoholowe i ocet	403.6	1 718.4	19.2	425.7	30.0	50.1	0.8	167.0	373.6	1 668.2
Other Pozostałe	325.0	1 119.0	12.5	344.3	956.1	1 488.5	23.9	155.7	–631.2	–369.6
Total Ogółem	1 571.8	8 928.4	100.0	568.1	4 660.4	6 221.2	100.0	133.5	–3 088.7	2 707.2

Source: own calculations based on ComExt-Eurostat (2016).
Źródło: obliczenia własne na podstawie ComExt-Eurostat (2016).

spent by the EU on the import of fresh and processed fruit and vegetables from China. Overall, in 2015 the import of these product groups accounted for more than 45% of total expenditures on agri-food product import from China. The value of oilseed imports increased by nearly 33% in the period investigated, reaching almost EUR 581 mln in its last year. In 2008–2015 the most rapid growth was observed in the import of oils and fats, coffee, tea, maté and spices, as well as dairy products (between more then 2-fold and 5-fold increase). With the exception of tea and spices, accounting for 7% of EU's expenditures on food imports from China, the share of the remaining two commodity groups in the structure of China's exports to the EU was small – not exceeding 3%. As for other groups of products, the EU was a major importer of cashmere wool. With respect to all the dominant commodity groups in the structure of imports from China, the EU was a net importer. The highest deficit was observed in the trade in fresh and processed fruit and vegetables (overall, ca EUR 1.4 bln in 2008 and 1.3 bln in 2015) as well as fish (nearly EUR 898 mln in 2008 and 1.1 bln in 2015).

It appears that the structure of Chinese export to the EU was dominated by articles whose production requires considerable inputs of labour, which is low-paid in China[10], as well as those enabling farmers to earn a high income per hectare of arable land (fruit, vegetables, tea, herbs and spices) (cf. Huang and Rozelle, 2009; Hoering, 2011). In these areas, Chinese exporters to the EU generated the highest and systematically increasing (since 2008) *ex post* competitive advantages, as demonstrated by the values of revealed comparative advantages (6.68 < XRCA < 93.89 and 6.53 < RTA < 93.88 in 2015) and Coverage Ratio (374% < CR < 5982% in 2015) (Table 3). The considerable surplus achieved in the highly inter-industry trade (3% < IIT < 42%; Table 4) in horticultural products, oilseeds, tea, spices and fish encouraged Chinese exporters to specialise in exports to the EU

[10] Beside the low labour costs, the factors adding to the cost and price advantages of Chinese processors also include the absence of pension and social insurance contributions along with low taxes (Kędzierska, 2015).

Table 3. Competitiveness of the EU and China in bilateral trade in agri-food products in 2015
Tabela 3. Konkurencyjność UE i Chin w bilateralnym handlu produktami rolno-żywnościowymi w 2015 roku

Products group Grupa produktów	SI	CR (%)	XRCA	MRCA	RTA	General evaluation Ocena sumaryczna	Change in competitive advantage in relation to 2008 Zmiana przewag konkurencyjnych względem 2008 roku
1	2	3	4	5	6	7	8
Competitive advantage of the EU on Chinese market – Przewagi konkurencyjne UE na rynku chińskim							
Cereals Zboża	67.01	9 616.64	73.66	0.01	73.64	+	↑
Preparations of cereals Przetwory zbożowe	6.40	918.06	7.43	0.13	7.29	+	↑
Edible fruit and nuts Owoce i orzechy	0.14	19.46	0.13	7.80	–7.68	–	↓
Edible vegetables Warzywa	0.01	1.67	0.01	93.89	–93.88	–	↓
Preparations of vegetables, fruit or nuts Przetwory z owoców i warzyw	0.13	18.30	0.12	8.47	–8.36	–	↑
Oil seeds Nasiona oleistych	0.15	21.52	0.14	7.25	–7.12	–	↓
Oils and fats Oleje i tłuszcze	2.06	294.99	2.09	0.48	1.61	+	↓

Table 3 cont. – Tabela 3 cd.

1	2	3	4	5	6	7	8
Sugar and sugar confectionery Cukier i wyroby cukiernicze	0.48	68.97	0.48	2.09	–1.61	–	↓
Coffee, tea, maté and spices Kawa, herbata, maté i przyprawy	0.06	9.08	0.06	16.93	–16.87	–	↓
Live animals Zwierzęta żywe	5.10	732.13	5.13	0.20	4.93	+	↑
Meat and edible meat offal Mięso i podroby jadalne	59.20	8 495.55	73.95	0.01	73.94	+	↑
Meat preparations Przetwory mięsne	0.02	2.72	0.02	55.01	–54.99	–	↓
Fish, crustaceans and molluscs Ryby, skorupiaki i mięczaki	0.19	26.73	0.15	6.68	–6.53	–	↓
Dairy products Produkty mleczarskie	3.80	545.26	4.12	0.24	3.88	+	↑
Beverages, spirits and vinegar Napoje bezalkoholowe, alkoholowe i ocet	23.89	3 428.20	29.34	0.03	29.31	+	↑
Competitive advantage of China on the EU market – Przewagi konkurencyjne Chin na rynku UE							
Cereals Zboża	0.01	1.04	0.01	73.66	–73.64	–	↓
Preparations of cereals Przetwory zbożowe	0.16	10.89	0.13	7.43	–7.29	–	↓
Edible fruit and nuts Owoce i orzechy	7.38	513.98	7.80	0.13	7.68	+	↑
Edible vegetables Warzywa	85.85	5 982.26	93.89	0.01	93.88	+	↑
Preparations of vegetables, fruit or nuts Przetwory z owoców i warzyw	7.84	546.57	8.47	0.12	8.36	+	↓
Oil seeds Nasiona oleistych	6.67	464.78	7.25	0.14	7.12	+	↑
Oils and fats Oleje i tłuszcze	0.49	33.90	0.48	2.09	–1.61	–	↑
Sugar and sugar confectionery Cukier i wyroby cukiernicze	2.08	144.99	2.09	0.48	1.61	+	↑
Coffee, tea, maté and spices Kawa, herbata, maté i przyprawy	15.81	1 101.47	16.93	0.06	16.87	+	↑
Live animals Zwierzęta żywe	0.20	13.66	0.20	5.13	–4.93	–	↓
Meat and edible meat offal Mięso i podroby jadalne	0.02	1.18	0.01	73.95	–73.94	–	↓

Table 3 cont. – Tabela 3 cd.

1	2	3	4	5	6	7	8
Meat preparations Przetwory mięsne	52.85	3682.28	55.01	0.02	54.99	+	↑
Fish, crustaceans and molluscs Ryby, skorupiaki i mięczaki	5.37	374.07	6.68	0.15	6.53	+	↑
Dairy products Produkty mleczarskie	0.26	18.34	0.24	4.12	–3.88	–	↑
Beverages, spirits and vinegar Napoje bezalkoholowe, alkoholowe i ocet	0.04	2.92	0.03	29.34	–29.31	–	↑

Source: own calculations based on ComExt-Eurostat (2016).
Źródło: obliczenia własne na podstawie ComExt-Eurostat (2016).

Table 4. Indices of intra-industry trade in agri-food products between the EU and China in 2015 (%)
Tabela 4. Indeksy handlu wewnątrzgałęziowego produktami rolno-spożywczymi między UE i Chinami w 2015 roku (%)

Product group – Grupa produktów	IIT
Cereals – Zboża	2.06
Preparations of cereals – Przetwory zbożowe	19.65
Edible fruit and nuts – Owoce i orzechy	32.57
Edible vegetables – Warzywa	3.29
Preparations of vegetables, fruit or nuts – Przetwory z owoców i warzyw	30.93
Oil seeds – Nasiona oleistych	35.41
Oils and fats – Oleje i tłuszcze	50.63
Sugar and sugar confectionery – Cukier i wyroby cukiernicze	81.64
Coffee, tea, maté and spices – Kawa, herbata, maté i przyprawy	16.65
Live animals – Zwierzęta żywe	24.03
Meat and edible meat offal – Mięso i podroby jadalne	2.33
Meat preparations – Przetwory mięsne	5.29
Fish, crustaceans and molluscs – Ryby, skorupiaki i mięczaki	42.19
Dairy products – Produkty mleczarskie	31.00
Beverages, spirits and vinegar – Napoje bezalkoholowe, alkoholowe i ocet	5.67

Source: own calculations based on ComExt-Eurostat (2016).
Źródło: obliczenia własne na podstawie ComExt-Eurostat (2016).

market. In 2015, the share of these commodity groups in overall Chinese agri-food exports to the EU exceeded their share in the EU exports to China by a factor between more than 5 and nearly 86 (5.37 < SI < 85.85). Jing et al. (2010) prove that the relatively low share of intra-industry trade in the agri-food product exchange between China and its main trade partners is caused by the considerable transport distances and – despite the

transformations observed – the persisting disparities in GDP *per capita* and cultural differences, resulting in different consumption models. The inter-industry nature of the trade indicates that the role of China in the EU agri-food trade is largely determined by its resources of basic factors of production, above all unskilled labour. Meanwhile, the competitive advantage of the developed EU countries is chiefly influenced by the size and efficiency of use of advanced factors of production, such as skilled labour and capital[11].

SUMMARY

The analyses conducted indicate that in 2008–2015 there was a significant increase in the bilateral trade in agri-food products between the EU and China. As a result of a faster growth in the EU exports to China compared to the Chinese exports to the European markets, in 2013 the EU changed from a net importer into a net exporter of agri-food products, generating a trade surplus of EUR 2.7 bln in 2015. Despite the strengthening of trade ties with China at the cost of other non-EU countries (e.g. USA and Japan), the European Union's trade remains concentrated in the Single European Market, and the Chinese share in the EU agri-food exports remains relatively small (below 2%).

It could be concluded on the basis of the research conducted that the structure of bilateral trade in agri-food products between the EU and China reflects the distribution of comparative advantages gained by exporters on the target markets. In the period analysed, the EU exports to China were dominated by basic products (cereals, preparations of cereals, meat, dairy products) with respect to which China has not achieved self-sufficiency and remains dependent on the global soil and water resources, along with high-added value articles (some spirits) that are not produced in China. On the one hand, the Chinese imports from the EU has the features of indispensable imports. On the other, China imports from the EU include food articles meeting rigorous food safety standards, the demand for which is rising with the growing purchasing power of consumers, bringing about a convergence of consumption patterns. The trends observed are in line with the Linder hypothesis of preference similarity and Armington's assumption of product differentiation. According to the former, because of the increase in average individual income in China, its demand structure begins to approximate the European models, which promotes intensification of export from the EU to China. At the same time, despite the fact that the volume of exports is sensitive to relative price changes and Chinese importers seek relatively cheap foreign suppliers, a growing number of wealthy consumers expect products of comparatively high quality and food safety level, ensured by the sanitary, veterinary and technical standards. This means that the volume of imports of agri-food products from the EU to China is determined, to a certain extent, by product diversification according to the country of origin (Armington's theory). Meanwhile, the structure of Chinese export to the EU was dominated by articles whose production requires considerable inputs of labour, which is low-paid in China, as well as those enabling farmers to earn a high income per hectare of arable land (fruit, vegetables, tea, herbs and spices).

Thus, the EU countries gained a comparative advantage on the Chinese market in the categories of production that require high capital inputs and technological advancement, using the quality competition instruments for this purpose, whereas China made efforts to specialise and benefit from the export of labour-intensive materials and products that ensured a cost and price advantage on the EU markets in accordance with the Heckscher-Ohlin-Samuelson theory of resource abundance. It can therefore be concluded that the role of China in the EU's agri-food trade is largely determined by the resources of basic factors of production, above all, unskilled labour. By contrast, the competitive advantage of developed EU countries on the Chinese market is chiefly influenced by the size and efficiency of use of advanced factors of production, such as skilled labour and capital. Bringing Porter's concept of the four stages in the development of international competitiveness of domestic economy to the mesoeconomic level, the thesis could be proposed that, despite its on-going modernisation, the Chinese agri-food sector still remains in the factor-driven economy phase, whereas the agri-food sector of the EU countries have reached the stage of innovation-driven economy.

[11] The classification proposed by Porter (1990), dividing the factors of production into basic and advanced corresponds to Dunning's (1992) classification of production factors into natural and created.

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ZMIANY W HANDLU ZAGRANICZNYM PRODUKTAMI ROLNO-ŻYWNOŚCIOWYMI UE Z CHINAMI

Streszczenie. Celem artykułu jest zidentyfikowanie zmian, jakie dokonały się w bilateralnym handlu produktami rolno-żywnościowymi UE i Chin oraz oszacowanie – w układzie bilateralnym – pozycji konkurencyjnej *ex post* podstawowych grup produktów rolno-spożywczych w latach 2008–2015. W badaniach wykorzystano dane Urzędu Statystycznego Unii Europejskiej (Eurostat). Analizie poddano wartość, saldo obrotów, udziały w handlu ogółem oraz strukturę asortymentową bilateralnego handlu artykułami rolno-spożywczymi UE z Chinami. Dla podstawowych grup produktów, wyodrębnionych według Scalonej Nomenklatury Handlu Zagranicznego, wyznaczono wybrane wskaźniki ujawnionych przewag komparatywnych (XRCA, MRCA, RTA), wskaźnik pokrycia importu eksportem (CR), wskaźnik specjalizacji eksportowej (SI) oraz indeks handlu wewnątrzgałęziowego Grubela-Lloyda (IIT). Z przeprowadzonych analiz wynika, że w latach 2008–2015 bilateralna wymiana handlowa produktami rolno-żywnościowymi UE i Chin uległa istotnemu zwiększeniu, a UE przekształciła się z importera w eksportera netto. Mimo zintensyfikowania wzajemnych powiązań handlowych, znaczenie Chin w unijnym eksporcie produktów rolno-spożywczych pozostało stosunkowo niewielkie. Struktura bilateralnego handlu artykułami rolno-żywnościowymi UE i Chin kształtuje się zgodnie z rozkładem przewag komparatywnych uzyskiwanych przez eksporterów na rynkach docelowych oraz w myśl założeń teorii podobieństwa preferencji, zróżnicowania produktów Armingtona i obfitości zasobów Heckschera-Ohlina-Samuelsona. Można uznać, że chiński sektor rolno-żywnościowy nadal pozostaje w stadium gospodarki opartej o podstawowe czynniki produkcji (*factor-driven economy*), podczas gdy rolnictwo i przemysł spożywczy państw UE osiągnęły stadium gospodarki opartej o innowacje (*innovation-driven economy*).

Słowa kluczowe: eksport, import, produkty rolno-spożywcze, przewagi konkurencyjne, UE, Chiny

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