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CHANGES IN THE CONSUMPTION OF AGRI-FOOD PRODUCTS AND FOOD SELF-SUFFICIENCY IN CHINA

ZMIANY W KONSUMPCJI I STOPNIU SAMOWYSTARCZALNOŚCI ŻYWNOŚCIOWEJ CHIN

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Summary: The aim of the article was to define changes in recent trends in consumption of agri-food products in China against the other countries, as well as to analyse the food self-sufficiency in China in the years 2003–2013. The results showed that the consumption of particular agri-food products of both plant origin (with exception of cereals and starchy roots) and animal origin increased in China. But the rate in consumption growth of the latter was higher than in case of plant origin products. In fact, rising socioeconomic status in China enables its population to change diets towards patterns observed in developed countries, which means a growing demand for animal origin products. The analysis of food self-sufficiency showed that only in terms of fruit, vegetables and eggs China produced enough to satisfy its domestic needs. On other markets a lack of self-sufficiency was observed. Relatively biggest shortages of production were noticed for vegetable oils, milk and sugar.

Keywords: consumption of agri-food products, food self-sufficiency, China.

Streszczenie: Celem artykułu było określenie zmian w konsumpcji podstawowych produktów rolno-spożywczych w Chinach w odniesieniu do innych krajów, a także analiza samowystarczalności żywnościowej Chin w latach 2003–2013. Zaobserwowano wzrost spożycia produktów rolno-spożywczych pochodzenia zarówno roślinnego, jak i zwierzęcego. Przy tym większą dynamiką charakteryzowała się konsumpcja tych ostatnich. Rosnący popyt na produkty pochodzenia zwierzęcego jest efektem wzrostu statusu społeczno-gospodarczego ludności w Chinach. Pociąga on bowiem za sobą zmiany w strukturze konsumpcji żywności w kierunku wzorców obserwowanych w krajach rozwiniętych. Analiza samowystarczalności żywnościowej Chin wykazała, że tylko w odniesieniu do owoców, warzyw i jaj Chiny produkują wystarczająco dużo, aby zaspokoić potrzeby rynku wewnętrnego. Na rynkach innych produktów rolno-spożywczych zaobserwowano brak samowystarczalności. Stosunkowo największe braki w produkcji odnotowano w odniesieniu do olejów roślinnych, mleka i cukru.

Słowa kluczowe: samowystarczalność żywnościowa, spożycie produktów rolno-żywnościowych, Chiny.

1. Introduction

Food self-sufficiency has been identified for a long time with the food security and used as one of its measures. The concept of food self-sufficiency has developed over years as the role of food self-sufficiency in particular countries [Pawołek 2015]. As the concept of food security can be understood at the individual, household, national, regional and global level as providing the consumers with financial and economic access to the food of the right quality,[1] the food self-sufficiency can be defined in broad terms: *The concept of food self-sufficiency is generally taken to mean the extent to which a country can satisfy its food needs from its own domestic production* [Thomson, Metz 1999]. In other words, this means that the volume of food needed to meet the minimum physiological needs of the country's inhabitants should be produced domestically.[2] Thus it can be said that there are two fundamental differences between concepts of food self-sufficiency and food security. While the first focuses only on national production as the source of supply, the latter looks also at imports and food aid (and considers it as a possible source of supply). Secondly, food self-sufficiency refers only to food availability of domestic production, while food security takes also into account issues of stability of supply and access to food by the population. So it should be borne in mind than food self-sufficiency does not guarantee food security within a country, although the two concepts relate to one another.

The global food crisis in 2007–2008, when a number of countries experienced food price crisis and its aftershocks, prompted a return to the policy of high self-sufficiency achieved by domestic production at the level enabling to meet the domestic consumption's needs. It is important that there are some countries that will address the challenges if they want to increase their level of food self-sufficiency because they lack the necessary natural resource base[3] and then, they are likely to continue to rely on imports to meet their food needs [Clapp 2017]. Thus for such countries that are not able to achieve self-sufficiency a trade can be an important source of food (a participation in global food trade system enriches the range of food products on domestic market). But on the other hand, as food supplies may be used to exert a pressure on international relations, relying on imports may jeopardize the economic interests of a country [Baer-Nawrocka 2015]. In addition, the high degree of concentration of sources of food imports can result in a more sensitive and instable global food system (see [Puma et al. 2015]).

When it comes to China, its food self-sufficiency is nowadays of particular concern not only for this country's food security strategy itself, but also for the world.

[1] These three aspects should be also characterized by the stability. This requirement implies the need to manage the risks associated with production, income and food quality effectively [Sapa 2016].

[2] But this does not mean, however, that all households in the country have access to all the food they need. In many countries that are net food exporters, a significant number of households suffer from undernourishment [FAO 2003].

[3] Their endowments of available land, water, and fertile soil cannot support sufficient agricultural production.

Especially that China's population accounts for 18.5% of global population and owes 7% of its arable land [Larson 2013; World Bank 2017]. Although each year the undergoing urbanization process in China "eats" 1 million hectares of arable land, desertification affects more than 2.5 thousand km^2 and 10% of the agricultural land is contaminated[4] [Fenby 2009], this country has showed a remarkable success in increasing agricultural production for the last several decades.[5] What is more, it has even dealt with reducing the number of its undernourished people to 12% in 2012 compared to 21% in 1990 [FAO-OECD 2013]. China is one of the largest food producers in the world but it is still a country where demand outpaces the domestic supply. And the latter, in turn, results from different soil and climate conditions on the one hand, while on the other, has a significant impact on diets of the people of China.

Having this in mind, the aim of the article was to define changes in recent trends in consumption of agri-food products in China against the other countries, as well as to analyse a food self-sufficiency in China in the years 2003–2013.[6]

2. Material and research method

To assess the level of food self-sufficiency, the indicator used in this type of analysis by the European Union and the Food and Agriculture Organization of the United Nations (FAO) was employed. This indicator is expressed as a percentage and indicates the degree of coverage of domestic needs (utilization) in a country (in China) by the main groups of agri-food products produced internally. Domestic needs/utilization consists of food consumption, processing for non-consumer purposes, losses, and, in the case of plant production, also the quantity of the commodity dedicated for feeding, as well as for sowing and planting [FAOSTAT 2017]. The self-sufficiency ratio (SSR) is measured using the following equation:

$$SSR = \text{Domestic Production} \times 100 / \text{Domestic utilization}.$$

The higher the SSR index, the greater is the self-sufficiency and capacity of a country to produce enough food for population. Due to the fact that this indicator

[4] Nowadays, over 40% of China's arable land is suffering from degradation, seriously reducing the country's capacity to produce food for the world's biggest population [*More than 40%*… 2014].

[5] Officially, more than 30% of the Chinese workforce is employed in agriculture, and the share of this sector in Chinese GDP stands currently at 9% [World Bank 2017]. This reflects the still significant role of agricultural production in the Chinese economy. For comparison, in developed countries, the proportions are as 15% and 4% (average values), respectively. China is also characterized by a relatively low productivity of land and agricultural workforce, as well as by the low degree of mechanization. On the other hand, in order to improve efficiency, a several times more fertilizers than in developed countries are used in this country – this makes Chinese agriculture one of the most degrading the environment. See more: [Cieślik 2013].

[6] The time range is dictated by the availability of data.

does not directly inform about the level of satisfying the food needs, the analysis of changes in the level of self-sufficiency was preceded by the analysis of the recent trends in consumption of basic agri-food products in *per capita* terms in China as in other countries.[7] The following agri-food products were included in the research: basic cereals, starchy roots, fruit (excluding wine), vegetables, sugar (in raw equivalent), vegetable and animal oils, fish, eggs, meat (beef, pork, poultry, sheep meat and goat meat), as well as milk (excluding butter).

3. Recent trends in consumption of basic agri-food products

Between 2003 and 2013, the agricultural production, as well as consumption in China grew at more than 3% *per annum* [FAO-OECD 2013]. At the same time the average production growth and food demand growth on the world market was at the level not exceeding 2%. Nowadays, China – together with Brazil, Russia, India and South Africa – is one of the world's new food centres, producing almost 40% of global agricultural production and consuming almost 45% of global food.

The largest increase in consumption among the Chinese people (slightly more than two-fold) was observed for milk. While in 2003 the average intake of this product per person was just over 16 kg, in 2013 it exceeded 33 kg (Table 1). The observed level of consumption was still twice-lower than in other Asian countries (excluding Republic of Korea) and more than eight times lower compared to the US or the EU citizens. It is worth pointing out that according to FAO-OECD estimates [2013], a 38% increase in consumption of dairy products in China by 2022 is expected, which will be followed by the import growth of dairy products to China (primarily from Europe, Australia and New Zealand). At the same time, it should be borne in mind that the increased demand for dairy products in China, covered by such dynamically growing import,[8] is not only a consequence of *per capita* income growth or population growth, but also of limited Chinese consumer trust in the domestic dairy products[9] [*Mleko i produkty*… 2014].

A similar dynamics of consumption in the analysed period was observed for fruit. In 2013 Chinese people consumed yearly more than 94 kg of this product on average. It was 10 kg less than in the US or in the EU at the same time, but by 42 kg more in *per capita* terms than on average in China in 2003 (Table 1). The smallest volume of fruit have been consumed *per annum* by India's citizens – between 2003 and 2013 the level of consumption raised from 36 kg to 56 kg. It was several dozen less than the global average.

[7] In order to show differences/similarities in recent trends in consumption of basic agri-food products per capita the analysis is related to China as to other Asian countries in different level of economic development, as well to the US and the EU.

[8] China is a net importer of dairy products [Kita 2017].

[9] In 2008–2009 there was a melamine crisis in China.

Table 1. Consumption of selected agri-food products in China and in particular countries in 2003–2013 (kg / person /year, mean values)

Specification	2003							2013						
	China	India	Japan	Rep. of Korea	EU	USA	world	China	India	Japan	Rep. of Korea	EU	USA	world
Cereals, including:	154.2	149.2	115.6	146.9	123.8	109.7	146.7	149.9	148.5	113.4	149.0	127.3	105.6	147.1
maize and products	6.9	6.7	14.4	15.8	7.0	13.2	16.5	6.8	6.3	9.2	12.5	7.7	12.2	17.9
rice (milled eqv.)	76.1	67.9	57.1	76.2	4.6	6.2	52.8	77.5	69.5	59.9	85.2	4.9	6.9	53.9
wheat and products	68.7	58.5	42.1	51.1	102.9	84.7	66.8	63.1	60.6	45.0	50.8	104.8	80.4	65.4
Sugar	6.3	19.7	19.1	19.0	36.1	32.7	20.4	6.7	20.9	16.2	21.8	34.5	31.7	20.5
Starchy roots	76.3	21.1	32.3	13.8	79.5	68.6	61.2	67.6	30.8	30.8	20.9	69.8	56.1	63.4
Fruit	51.9	36.2	55.2	65.1	99.3	114.4	63.5	94.2	56.4	52.9	66.9	103.7	104.5	77.9
Vegetables	269.0	66.3	107.7	216.4	121.8	126.7	120.3	347.8	88.7	102.3	205.9	109.4	114.0	140.5
Vegetable oils	7.2	7.6	15.0	13.8	17.9	26.5	10.3	7.4	8.7	15.3	18.0	19.6	30.2	11.4
Milk	16.3	62.3	79.2	26.6	239.5	260.9	80.8	33.2	84.5	72.1	29.1	236.4	254.7	90.0
Fish, seafood	25.4	4.8	65.6	52.7	21.7	24.0	16.4	34.7	5.0	48.6	52.8	22.5	21.5	19.0
Eggs	16.2	1.7	19.4	10.7	12.4	14.7	8.3	18.7	2.6	19.2	11.2	12.0	14.6	9.2
Meat, including:	47.6	4.1	45.0	53.1	84.3	123.2	38.4	61.8	3.7	49.5	63.6	81.3	115.1	43.2
bovine meat	4.2	1.8	1.8	13.8	17.0	9.4	9.4	5.2	0.8	9.2	14.5	14.9	36.2	9.3
mutton & goat meat	2.3	0.6	0.6	0.1	2.6	1.8	1.8	3.1	0.6	0.1	0.1	2.1	0.4	1.9
pigmeat	30.0	0.4	0.4	27.7	41.6	14.6	14.6	38.6	0.3	20.6	32.8	39.0	27.6	16.0
poultry meat	10.2	1.1	1.1	11.2	20.5	11.8	11.8	13.7	1.9	19.4	16.0	22.5	50.0	15.0
Animal fats	2.0	2.4	1.8	3.1	13.3	5.7	3.3	2.0	3.1	1.4	3.5	12.6	5.3	3.3

Source: [FAOSTAT 2017].

As far as vegetables are considered, the growth rate of consumption in China between 2003 and 2013 – compared to fruit – was lower, but the volume remained several times higher (Table 1). Chinese people consumed in the analyzed period from 269 kg to almost 350 kg of vegetables per capita, which have made them global leaders in this aspect (Table 1). It is important, because China is responsible for more than 50% of the world consumption of this kind of product [FAOSTAT 2017].

Between 2003 and 2013, the growth of total meat consumption in China by about 30% was observed (Table 1). In 2013 an average *per capita* meat consumption reached 62 kg, 60% of which was pork. It is worth pointing out that China is one of the leading producers of pork in the world – nearly half of global meat production comes from this country, and also one of the largest meat consumers – China is responsible for nearly 50% of the world's consumption of pork [FAOSTAT 2017]. As predicted, by 2022 the demand for this kind of meat will experience an upward trend but at lower rate than in the last ten years [FAO-OECD 2013]. As far as poultry is considered, an annual average volume consumed by the Chinese was close to the global average and to the level observed in South Korea, standing at 10–11 kg in 2003. In 2013 the average Chinese citizen consumed by 3.5 kg more, but it was still less than in developed countries (Table 1).

When assessing meat consumption it is also worth taking into account fish consumption which has grown rapidly in China in recent years. In 2013, the average quantity consumed *per capita* was higher by 35% than a decade earlier[10] (Table 1). It is estimated that the demand for aquatic products will continue to grow, but at lower growth rates. This will be affected by a number of interrelated elements, including: rising living standards, growing population, urbanization followed by changes in dietary habits as rising demand for animal origin products [Zhou et al. 2012].

As far as starchy roots are considered, between 2003 and 2013 the average quantity of consumed products *per capita* in China decreased by just over 10 kg, i.e. by 11%. Similar changes were observed in the EU and US, with consumption in 2013 at a very close level in comparison to China – it was on average 69 kg, 56 kg and 67 kg, respectively. The least starchy roots, relatively speaking, was consumed (twice and 3 times less) by citizens of India, Japan and South Korea (Table 1).

The smallest change – almost 3% decline – was observed in total cereal consumption. This drop was mainly related to the reduction of consumption of maize and wheat by Chinese inhabitants. Rice is a basic cereal in Chinese diet (as in other Asian countries) – currently it represents just over 50% of the total Chinese cereal consumption [FAOSTAT 2017, own calculations, Table 1]. In the years 2003–2013, the average person in Asia has consumed yearly from 54 kg of rice in Japan (2009) to almost 88 kg in South Korea (2011). It was several times higher as compared to volume which was noticed in the US or in the EU. It is also worth to point to

[10] Since 1980, a *per capita* fish consumption has increased by over 300%, at an annual growth rate of 9% [Ghose 2014].

a relatively high importance of wheat in the total cereal consumption in China (just over 40%, Table 1). The average volume of this product consumed in China annually *per capita* was higher than its average level in other Asian countries and at the same time it was practically similar to the global average (Table 1). But the consumption has experienced a downward trend over the years. In 2013, an inhabitant of China consumed over 8% less wheat than in 2003 (up to 63 kg per person). Probably this is the result of rural-urban migration leading to income's growth followed by, *inter alia*, changes in dietary habits (less cereals,[11] more vegetables and animal products) [Liu 2014; Zhang 2006; Zhang, Wang 2003].

There has been a favourable disproportion in the consumption of fats in favour of vegetable fats in China for many years. Between 2003 and 2013 the volume of consumption of the latter increased,[12] while the consumption of animal fats was rather stable. Thus it can be said that there is no tendency for their substitution with vegetable fats and that the volume of total consumption of animal and vegetable fats in China is increasing. However, these groups of products are generally less frequently consumed by Chinese inhabitants compared to the European or American ones (Table 1).

China (along with other countries in Asia and Oceania) is one of the largest consumers of sugar in the world.[13] However, the average annual consumption *per capita* in China is several times lower than in other countries (Table 1). In 2013, compared to 2003, it increased moderately by 6.5% to 6.7 kg. According to projections, the demand for sugar in China will continue to grow and in 2022 the consumption of this product may reach 14 kg *per capita* per year [FAO-OECD 2013; FAPRI-ISU 2011].

4. Food self-sufficiency in China

A slight decrease in consumption of cereal for food purposes and, at the same time, a significant increase in the consumption of this product group for feed purposes (a fivefold growth of utilization of wheat and a 60% increase of utilization of maize compared to 2003) accompanied by growing cereal supply caused changes in China's food self-sufficiency on this market between 2003 and 2013. It can be said that nowadays a comprehensive grain production capacity is steadily improving, and supply (which is increasingly diversified) and demand are almost balanced (Table 2). In the years 2006–2011 the total cereal production covered the needs of domestic

[11] The consumption of wheat *per capita* has decreased but the consumption of this cereal for feed purposes has increased. See also: [Huang et al. 2011; Hamshere et al. 2014; Zhou et al. 2012, 2014].

[12] The consumption of soybean oil and rapeseed oil, which had the largest share in total vegetable fats consumption in China, decreased.

[13] In 2003–2013 the consumption of sugar for food purposes in China accounted for 78% of domestic utilization, while in 2013 it was at the level of 47%. This is due to the growth in the utilization of sugar for processing [FAOSTAT 2017, own calculations]. See also: [*Światowy Rynek Cukru*... 2014].

market, but it should be noted that China is a net importer of this group of product. In 2013 China imported more than 5% of global cereals (in terms of value, as well as of quantity) and 4% of the world's grain.[14] And this figure is likely to rise in coming years [Horta 2014; FAOSTAT 2017]. On the other hand, the fact that Chinese agricultural sector produces almost 30%, more than 17%, and 21% of global production of rice, wheat, and corn,[15] respectively, shows its global importance. It should be also underlined that food self-sufficiency is expressed as "grain self-sufficiency" in Chinese terms [Lu 1998] and in such a meaning it has always been a main point of interest of government policy (as in other Asian countries[16]). As it roots from several elements coming from Chinese cultural, political and economic structures, in 1996 the target of 95% for the country's grain self-sufficiency was set up [Zha, Zhang 2013; Sun 2014]. Moreover, in its first official national grain security plan (published in 2008) the aim of producing 95% and 100% of Chinese grains and cereals respectively in the country by 2020 was maintained [Zhou 2015]. But some researchers suggest that if by 2033 grain food *per capita* consumption increases from today's 400 kg to 470 kg and China's population peaks at 1.5 billion as it is assumed, this country will be forced to increase somehow grain production by at least 35% over the next two decades [Zhang 2011]. On the other hand, the shrinking arable land with increasing needs will eventually force China to abandon its grain self-sufficiency goals and to transform it into a serious net grain importer.

The biggest shortage of supply in China was observed between the years 2003 and 2013 on vegetable oils' market (Table 2). Although the production of this group of products in China has witnessed an increase of more than 50% over the years and in 2013 exceeded 22 MnT,[17] its share in global supply accounted for 13% [FAOSTAT 2017, own calculations]. The utilization of vegetable oils, however, was more dynamic – it grew up by over 60% from 2003 (33.5 MnT). But, as at the beginning of the study period vegetable oils in China were mainly consumed as a food, the utilization of this group of products for non-food purposes has expand dynamically in recent years (it reached 22.8 MnT compared to 11.2 MnT in 2003). This is linked to production of biofuel used to support the process of undergoing industrialization in China. Nowadays this country is second (after India) world's largest importer of vegetable oils and the third largest producer and consumer of biofuel [*Światowy Rynek Zbóż*... 2013; Mittaine 2016].

On the other hand, small market surpluses were noted on the Chinese fruit and vegetables market, which, as it has been already pointed out, had resulted in consumption growth of these products (Tables 1 and 2). It is not without significance

[14] In national statistics, grains include cereals (rice, wheat, corn and coarse grains), beans and root tubers.

[15] Already, 70% of China's corn is used to feed livestock rather than people [Cambpell 2016].

[16] See: [Ghose et al. 2013].

[17] A majority of which constitute a rape oil. Two other significant producs are groundnut oil and cotton oil.

Tabela 2. Food self-sufficiency in China in 2003–2013 (%, average values)

Specification	2003–2005	2006–2008	2009–2011	2012–2013
Cereals, including:	92.5	102.4	100.5	99.2
maize and products	96.0	104.8	101.4	100.7
rice (milled eqv.)	94.3	99.4	99.8	101.6
wheat and products	86.6	103.9	101.4	96.2
Sugar	90.5	95.2	80.6	75.6
Starchy roots	93.3	90.1	87.9	85.4
Fruit	101.5	102.3	101.4	101.2
Vegetables	101.6	101.9	102.0	101.9
Vegetable oils	67.2	65.0	66.5	65.7
Milk	93.6	96.3	90.4	83.5
Fish, Seafood	91.9	95.9	95.2	94.8
Eggs	100.0	100.1	100.1	99.9
Meat, including:	99.3	98.4	98.0	97.4
bovine meat	98.3	98.5	96.5	93.1
mutton & goat meat	98.6	98.5	97.6	94.8
pigmeat	100.2	99.5	98.8	98.2
poultry meat	97.1	95.0	96.0	97.1
Animal fats	83.3	80.7	83.2	84.7

Source: [FAOSTAT 2017].

in this aspect that between 2012 and 2013 the volume of production of fruit in China doubled (151 MnT on average compared to 87 MnT in 2003–2005), while in case of vegetables an increase in production of over 30% was observed (in 2012–2013 it reached 576 MnT). Thus, a relatively higher growth rate in production than in consumption of both fruit and vegetables over the years has enabled China to cover its domestic needs at a level slightly above 100% (Table 2). It is worth noting that China is the largest global producer of these two groups of products – at the end of 2013, this country provided 23% of global fruit supply and over 51% of global vegetables supply [FAOSTAT 2017]. At the same time, these are the only agri-food products in which China's trade is characterized by a positive balance [Kita 2017].

Between 2003 and 2013 a deficit in the production of milk and all kinds of meat[18] was also observed (Table 2). Although China is one of the largest global meat producers – it provides more than a quarter of global meat production – a relatively higher consumption growth rate have made China not self-sufficient in terms of this product over the years. But still more than 95% of the supply of meat in total on the Chinese market is produced domestically. In 2012–2013 China produced on average 82 MnT of meat per year (compared to 64 MnT in 2003–2005), of which over 60% and 20% was constituted by pork and poultry, respectively [FAOSTAT 2017]. As far

[18] With the exception of pork in 2003–2005.

as milk is considered, the level of self-sufficiency was at 83–96% (Table 2). This situation is a consequence of the systematic increase in consumption over the last years (Table 1), faster than the increase in production. While volume of the latter increased by 52% in 2012–2013 compared to 2003–2005 and reached on average 41 MnT per year, the consumption, which over the years have accounted to more than 90% of total utilization, grew by 74% to 46 MnT. Slower production growth is largely due to reform of the production-processing chain following the melamine crisis in 2008–2009 [FAO-OECD 2013]. It is worth noting that the dairy sector in China is the fastest growing sector in the food industry, but on a global scale it has a marginal importance (in 2013 Chinese dairy production accounted for 5% of global supply). Thus it can be said that the demand for such group of products like meat and milk is rising together with the people's socioeconomic status in China. But to meet such rising demand is a challenge for China as these products require more land and water resources per unit production on the one hand, while on the other it involves a rising demand for feed grains[19] [Carter 2011].

Over the years a deficit in fish and seafood production compared to domestic demand has been noticed (Table 2). In 2003–2005 the production covered 92% of the domestic consumption, whereas in 2012–2013 the degree of self-sufficiency in this area increased by 3 p.p. The volume of production has risen over the years 2003––2013 at an annual growth rate of 3.5% [FAOSTAT 2017] but faster demand and *per capita* consumption growth have made China not self-sufficient in this area. Even though China is the world's largest seafood producer[20] and has the highest number of fishers and fish farmers there are water and land constraints followed by environmental challenges linked to strengthening sustainability and responsibility in the fish sector [Ghose 2014] that for now unable China to meet consumers' needs completely.

In 2003–2013 the level of self-sufficiency on egg market was stable at around 100% (Table 2), which means that volume of domestic production was sufficient to meet domestic demand for this agri-food product.

5. Conclusions

The analysis of food self-sufficiency shows that China is characterized by a very different degree of self-sufficiency in basic agri-food products. Between 2003 and 2013, only in terms of fruit, vegetables and eggs, China produced enough to satisfy its domestic consumption. On other markets the shortages of production were observed. The biggest negative changes in food self-sufficiency were noticed for

[19] And this in turn affects the "cereal balance" which is largely dependent on changes in feed requirements, which depends on the situation in animal production (see: Table 2).

[20] China's share in world fish production grew from 7% in 1960 to around about 35% today. But at the same time, this country is also one of the biggest seafood importer. The FAO-OECD [2013] forecasts show that by 2022 the country will become a global leader and will account for 63% of global fish and fish products production.

milk and sugar. The level of self-sufficiency for the latter in 2012–2013 compared to 2003–2005 decreased by over 16% despite the fact that the changes in production were more dynamic during that period than the changes in consumption. As far as milk is considered, the level of self-sufficiency has decreased by 10 p.p. over the years and it was largely as a result of a significant increase in the consumption of this commodity. On the other hand, the level of self-sufficiency in basic cereals, which has been at the centre of the Chinese government's attention, was varied. A small surplus of production covering domestic utilization at just over 100%, was observed only in the years 2006–2011.

It should be noted that the situation regarding the scale of coverage of food needs is often determined not only by the volume of domestic production in a country, but also by incomes earned by a society that determines the level and structure of consumption. So growing people's socioeconomic status in China encourages the growth of demand for food, which is followed by changes in consumption patterns towards "Eastern" ones, very similar to those in developed countries. The analysis showed that the consumption of particular agri-food products of both plant origin (with exception of cereals and starchy roots) and animal origin increased in China in the years 2003–2013. But the rate in consumption growth of the latter was higher than in case of plant origin products. The biggest increases were observed in consumption of milk (2 times) and particular kinds of meat (by ⅓), while among plant origin products the highest consumption growth was noticed for fruits (nearly 2 times).

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