



Analysis of the Price Conditions of the Market for Agricultural Products and Food Products of Smart Cities of Belarus in the Conditions of the Common Agricultural Market

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ABSTRACT

The penetration of information technology has given a new impetus to the development of cities. At the same time, the rapid growth rates of cities create problems in providing food for their residents. In the article, the authors assess the provision of food products to residents of smart cities in Belarus. The results of the study showed that even though prices in different regions for the same products may vary significantly, deviations in the cost of the food basket will be insignificant, that is, they will be within the permissible value of the mathematical error of the calculations performed.

KEYWORDS: food security, consumer spending, consumer prices, price index, urban agriculture, peri-urban agriculture

Introduction

Creating comfortable living conditions in "smart cities" is closely related to solving the problem of providing their residents with food and its accessibility, as well as the simultaneous development of urban and suburban agriculture. In world practice, these issues are regulated by ISO 37120:2018, ISO 37122:2019 and ISO 37123:2019. Identical standards have been introduced and are in force in the Russian Federation. They identify the main indicators characterizing the financing of initiatives in food security, urban and suburban agriculture development, collection and disposal of household food waste, and coverage of the online cartographic system of food suppliers (Karpovich, Drahun 2023). In the Republic of Belarus, the issues of providing residents with food are regulated by the doctrine of national food security, developed for the period up to 2030 (National Center, 2023).

Results

By the "Model Concept for the Development of Smart Cities in the Republic of Belarus", Minsk, regional centers, and 11 regions (Baranovichi, Pinsk, Novopolotsk, Orsha, Polotsk, Mozyr, Lida, Borisov, Soligorsk, Molodechno, Bobruisk) are involved in the process of digital transformation (Ministry, 2024). The development of the food supply system for "smart cities" is not provided for in the framework of the adopted documents.

According to the Doctrine of National Food Security of the Republic of Belarus, the share of food costs in the structure of consumer spending should not exceed 35.0%. However, in practice, household spending on food products in 2010-2022 varied in the range of 35.7–39.1%, which is higher than the acceptable value of 35.0% (Figure 1).

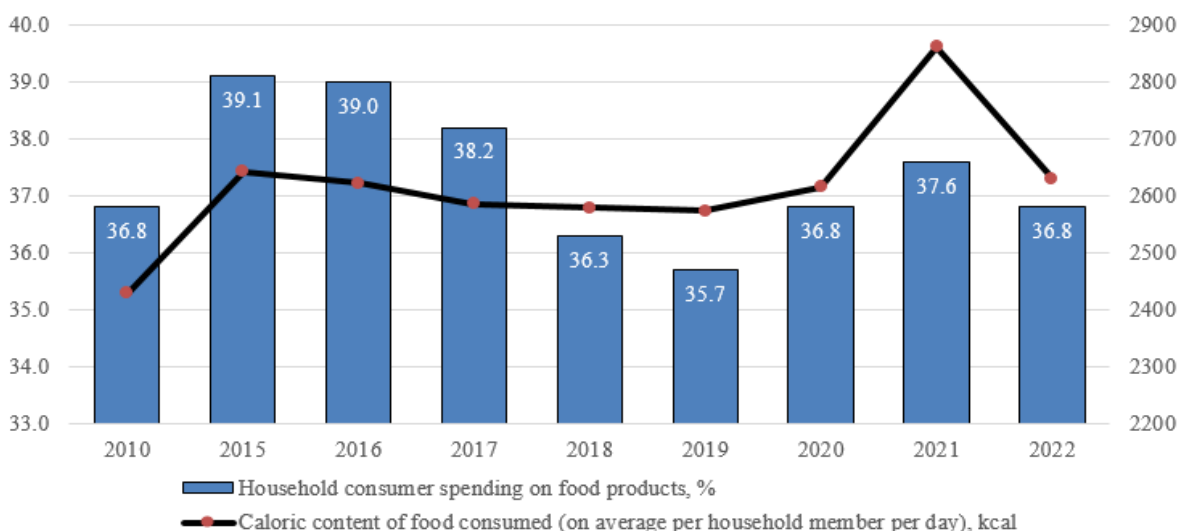


Figure 1. Changes in the structure of consumer spending of the population of the Republic of Belarus in 2010-2022, % (Belstat, 2024)



The excess of the share of food costs, as well as the failure to achieve a rational norm of the energy value of the diet of 3400-3500 kcal, indicates a lack of income for the population. The solution to this problem is based on the need to develop and take measures aimed at increasing the real incomes of the

population, including by curbing unjustified price increases for food products of domestic and imported production.

The dynamics of changes in the level of prices for food products in Belarus, nuclear power plants, neighboring countries, and the world are presented in Table 1.

Table 1. Consumer price index, in% compared to the previous year

	Consumer price index, in% compared to the previous year							
	2015	2016	2017	2018	2019	2020	2021	2022
The EAEU	114,1	107,7	104,1	103,2	104,4	103,9	107,2	113,9
Armenia	103,7	98,6	101,0	102,5	101,4	101,2	107,2	108,6
Belarus	113,5	111,8	106,0	104,9	105,6	105,5	109,5	115,2
Kazakhstan	106,6	114,6	107,4	106,0	105,3	106,8	108,0	115,0
Kyrgyzstan	106,5	100,4	103,2	101,5	101,1	106,3	111,9	113,9
Russia	115,5	107,1	103,7	102,9	104,5	103,4	106,7	113,8
Neighboring countries:								
Latvia	100,2	100,1	102,9	102,5	102,8	100,2	103,3	117,3
Lithuania	99,1	100,9	103,7	102,7	102,3	101,2	104,7	119,7
Poland	99,1	99,3	102,1	101,8	102,2	103,4	105,1	114,4
Ukraine	148,7	113,9	114,4	110,9	107,9	102,7	109,4	120,2
BRICS	104,5	104,0	102,6	103,1	103,4	104,3	103,6	105,1
EU-27	100,1	100,2	101,6	101,8	101,4	100,7	102,9	109,2
OECD	100,7	101,2	102,3	102,6	102,1	101,3	104,0	109,5
The world as a whole	101,4	101,6	102,2	102,4	102,2	101,9	103,4	108,0

Note: the source EEC (EEC, 2024)

The analysis of the consumer price index indicates that in Belarus in the period under review, the highest growth rate of consumer prices was observed both about world prices and within the EAEU, except certain years when the price growth

rates in the Russian Federation and Kazakhstan were higher. In part, this situation may be related to lower prices for identical goods in Belarus and other countries, which remain at present. (Table 2).

Table 2. Average consumer prices in the EAEU member States for food products for November 2023, US dollars per unit of measurement

Products	The EAEU countries				
	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia
Beef (except boneless meat), kg	9,30	3,47	5,68	6,13	5,69
Pork (except boneless meat), kg	8,49	3,35	4,77	5,39	3,81
Poultry meat, kg	4,19	1,95	3,12	3,92	2,56
Live and chilled fish, kg	7,14	3,02	2,92	4,08	3,13
Boiled sausage of grade I, kg	6,41	2,43	6,08	5,41	5,63
Butter, kg	13,66	7,32	8,38	5,55	9,37
Sunflower oil, l	1,85	1,66	1,61	1,72	1,43
Sour cream 15-20%, kg	4,31	2,33	4,14	3,74	3,09
Fresh whole pasteurized milk, l	1,31	0,63	0,83	1,08	0,82
Hard, soft, rennet cheeses, kg	6,56	6,84	10,59	6,63	8,50
Chicken eggs, a dozen	1,87	1,03	1,12	1,37	1,24
Granulated sugar, kg	1,16	0,83	0,89	0,95	0,81
Buckwheat groats, kg	2,56	1,02	1,24	1,03	0,98
Rice, kg	2,46	1,31	1,43	1,67	1,35
Premium wheat flour, kg	1,00	0,50	0,85	0,74	0,55
Rye and rye-wheat bread, kg	1,85	0,84	0,99	0,75	0,82
Pasta made of premium wheat flour, kg	2,08	1,03	1,27	1,59	1,20
Potatoes, kg	0,55	0,24	0,29	0,35	0,30
Tomatoes, kg	2,15	2,38	1,57	1,27	2,32
Cucumbers, kg	1,64	2,10	1,40	1,76	1,63
Fresh white cabbage, kg	0,52	0,31	0,33	0,46	0,35
Onion, kg	0,67	0,43	0,23	0,36	0,37
Table beetroot, kg	0,68	0,32	0,53	0,55	0,38
Carrots, kg	0,79	0,33	0,37	0,46	0,46
Apples, kg	1,32	0,89	1,29	0,96	1,31

Note: the source EEC [5]



Price analysis shows that the lowest prices for food products, This is due to the price level of agricultural raw materials (Table except for several commodity items, have developed in Belarus. 3).

Table 3. Average producer prices for certain types of agricultural products for October 2023, USD per unit of measurement

Products	The EAEU countries				
	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia
Crop production					
Wheat, t	250	166	202	240	112
Barley, t	248	135	136	233	108
Vegetables	512	717	...	385	522
white cabbage, t	347	177	164	272	...
cucumbers, t	647	598	469	577	659
Tomatoes, t	520	1 013	990	553	736
table carrots, t	369	148	225	348	189
beetroot canteen, t	353	151	346	344	136
onion, t	429	195	134	269	143
Potatoes, t	339	63	208	283	116
Sugar beet, t	-	31	31	-	49
Fruits and berries, t	417	175	...	865	...
pome fruits, t	504	174	385	346	369
Berries, t	2 991	3 849	2 620	2 553	941
Livestock products					
Cattle (live weight), t	7 468	1 120	2 058	2 801	1 560
Pigs (live weight), t	6 556	1 180	1 699	2 211	1 319
Bird (live weight), t	7 086	868	1 974	2 009	1 347
Raw milk, t	438	301	...	375	315
raw cow's milk, t	438	301	439
Fresh eggs, 1000 pieces	157	63	78	107	74

Note: the source EEC [5]

Discussion

At the same time, the difference in the price level for individual commodity items in different EAEU countries contributes to the development of mutual internal trade. Belarus has the greatest competitive advantage in this area of cooperation since its prices are lower for most items. However, this situation may negatively affect the pricing strategy of exporters when setting prices or providing discounts to buyers, since the price of

products is the determining factor that shapes the organization's profit in the market and its competitiveness (Karpovich, 2022).

An analysis of average prices for individual food products in retail trade organizations in Belarus showed that regardless of the region, the republic maintains a fairly even price level (Table 4). At the same time, it can be seen that higher prices for some goods of one group are offset by lower prices for goods from another.

Table 4. Average prices for individual food products in retail organizations, BYN

Region	Year	Beef (except boneless meat), kg	Pork (except boneless meat), kg	Chickens (chickens, including broilers), kg	Frozen fish, undivided (cod), kg	Boiled sausage of the highest grade, kg	Butter, kg	Sunflower oil, l	Pasteurized milk with 2.5-3.6% fat content, l	Hard, semi-hard cheeses, kg	Dietary chicken eggs, a dozen	Granulated sugar, kg	Premium wheat flour, kg	Rye and rye-wheat bread, kg	Pasta, kg	Potatoes, kg	Fresh white cabbage, kg	Onion, kg	Apples, kg
Brest region	2020	7,98	6,76	4,27	3,29	7,81	16,00	4,22	1,64	16,05	2,77	1,79	1,24	1,88	2,89	0,91	0,53	0,92	2,34
	2021	7,64	8,23	5,63	3,61	8,20	17,53	5,36	1,77	16,39	2,93	1,80	1,30	2,28	3,31	1,54	1,70	1,36	2,05
	2022	8,03	9,11	5,98	4,80	9,37	20,53	5,81	1,88	20,89	3,31	2,68	1,54	2,87	3,88	1,07	0,78	1,38	2,57



Region	Year	Price Index Values																		
		2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020

Note: the source [4]

The calculation of the average annual regional price the apparent "price leadership" of the Mogilev region, proves index and the gap based on the data in Table 4 (Figure 2), despite their stability and balance.

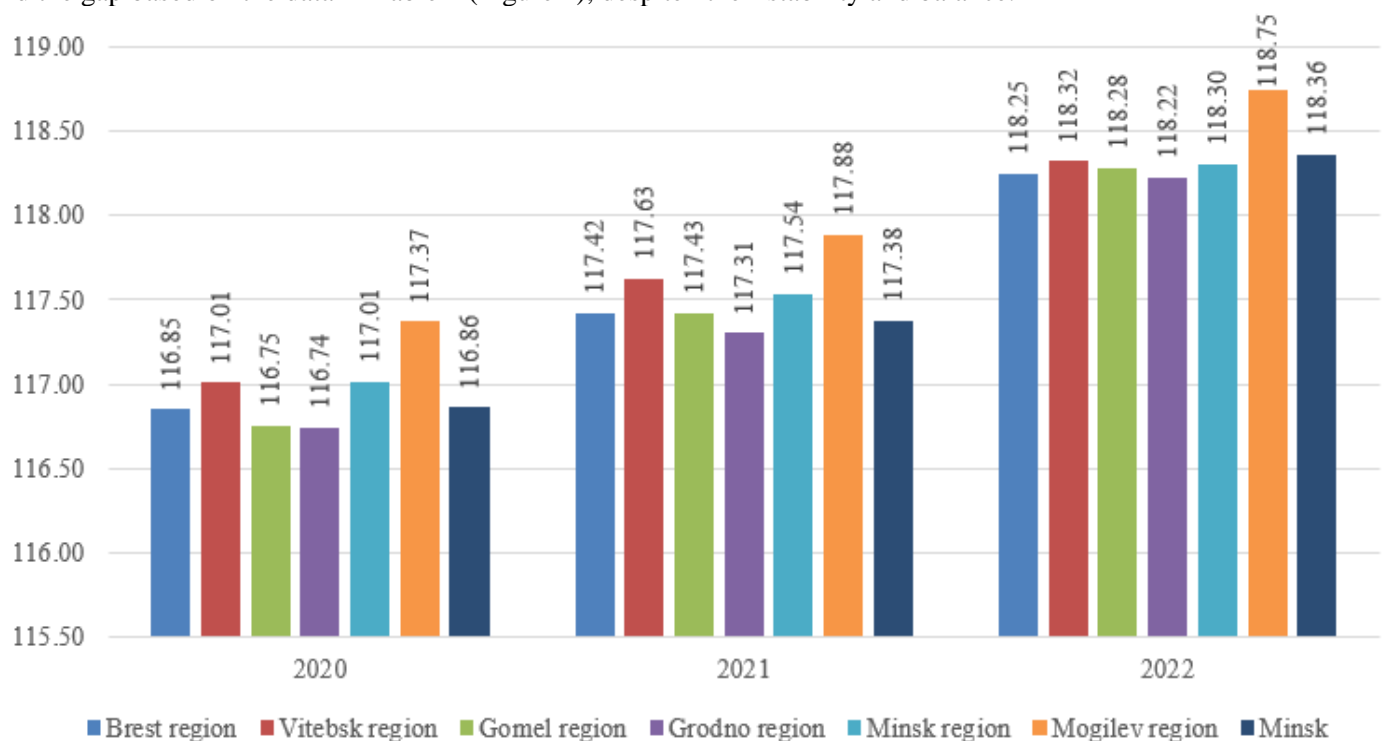


Figure 2. The average annual regional price index of the food basket by regions and Minsk, 2020-2022



Conclusion

Thus, the analysis of the price situation on the market of agricultural products and food products showed that despite the failure to achieve certain indicators of food security, relatively high rates of price growth for food products remain low in the Republic of Belarus for the main food groups. At the same time,

we consider it advisable, within the framework of the implementation of the concept of "smart cities" in Belarus, to develop regional (urban) programs to ensure food security, the development of suburban and urban agriculture to make more effective use of land plots not involved in economic turnover in the conditions of the common agricultural market.

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