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AGRI-FOOD PRODUCTION, FOOD PRICES AND HOUSEHOLD INCOMES: AN ASSESSMENT OF ECONOMIC ACCESS TO FOOD IN UZBEKISTAN

Akhmedova Nafisa Amirddin qizi
Senior Lecturer, PhD
Tashkent State University of Economics

Abstract: Uzbekistan has reduced the prevalence of undernourishment to below 2.5%, yet economic access to food remains the most challenging pillar of its food security. This paper examines the relationship between agri-food production, food prices and household incomes in Uzbekistan during 2018–2025, using official data from the National Statistics Committee and the Food and Agriculture Organization (FAO). An income-to-food-price affordability index is constructed, and the relationship between agricultural growth and food inflation is examined. Agricultural output increased by 28.5% over 2018–2025, equivalent to an average annual growth rate of 3.2%, while food prices rose by 143.2%, exceeding the increase in the overall consumer price index (131.6%). Between 2020 and 2025, nominal per capita income grew faster than food prices, resulting in a 38.6% increase in the affordability index. The most substantial improvements occurred in 2024–2025, when food inflation declined to 2.4% and 5.5%, respectively. Higher agricultural growth was associated with lower food inflation in the following year (r = −0.59, with a one-year lag). The findings suggest that both agricultural production growth and household income growth contribute to improved economic access to food, although these gains remain strongly influenced by remittance-driven incomes and fluctuations in meat prices. The study recommends measures to enhance livestock productivity, develop market infrastructure and provide targeted support to low-income households.

Key words: food security, economic access to food, food inflation, household income, agricultural growth, Uzbekistan.

Аннотация: В Узбекистане распространённость недоедания снизилась до уровня менее 2,5%, однако экономическая доступность продовольствия остаётся одним из наиболее значимых направлений обеспечения продовольственной безопасности. В статье исследуется взаимосвязь между производством агропродовольственной продукции, ценами на продовольствие и доходами домохозяйств в Узбекистане за период 2018–2025 гг. на основе официальных данных Национального комитета по статистике Республики Узбекистан и Продовольственной и сельскохозяйственной организации Объединённых Наций (ФАО). Разработан индекс экономической доступности продовольствия, основанный на соотношении доходов населения и цен на продукты питания, а также исследована взаимосвязь между ростом сельскохозяйственного производства и продовольственной инфляцией. За 2018–2025 гг. объём сельскохозяйственного производства увеличился на 28,5%, что соответствует среднегодовому темпу роста 3,2%, тогда как цены на продовольствие выросли на 143,2%, превысив рост общего индекса потребительских цен (131,6%). В 2020–2025 гг. номинальные доходы на душу населения увеличивались быстрее, чем цены на продовольствие, в результате чего индекс экономической доступности продовольствия вырос на 38,6%. Наиболее существенные улучшения наблюдались в 2024–2025 гг., когда продовольственная инфляция снизилась до 2,4% и 5,5% соответственно. Более высокие темпы роста сельскохозяйственного производства сопровождались снижением продовольственной инфляции в следующем году (r = −0,59 при лаге в один год). Полученные результаты свидетельствуют о том, что рост сельскохозяйственного производства и доходов домохозяйств способствует повышению экономической доступности продовольствия, при этом достигнутые улучшения в значительной степени зависят от доходов, формируемых за счёт денежных переводов, и колебаний цен на мясную продукцию. В исследовании предложены меры по повышению продуктивности животноводства, развитию рыночной инфраструктуры и оказанию адресной поддержки домохозяйствам с низкими доходами.

Ключевые слова: продовольственная безопасность, экономическая доступность продовольствия, продовольственная инфляция, доходы домохозяйств, рост сельскохозяйственного производства, Узбекистан.

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INTRODUCTION

Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food (FAO, 1996). Countries that have achieved adequate food availability may still face challenges related to economic access, as households may find it difficult to afford a nutritious diet when food prices rise faster than incomes. Sen (1981) demonstrated that hunger is frequently associated with limitations in food entitlements rather than insufficient supply. The global food price increases of 2007–2008 further demonstrated that rising food prices can increase poverty among vulnerable households (Ivanic & Martin, 2008).

Uzbekistan provides a relevant case for examining these relationships. According to FAO estimates, the prevalence of undernourishment has remained below 2.5% since the early 2010s, while moderate or severe food insecurity declined from 28.9% in 2000 to 6.9% in 2022. Agricultural output has increased annually since 2017. Nevertheless, food prices have remained a major contributor to consumer inflation throughout much of this period, and approximately 13% of the population could not afford a healthy diet in 2024. Given that households allocate a substantial proportion of their budgets to food, changes in food prices significantly influence household welfare, consistent with Engel's law (Houthakker, 1957).

Previous studies of food security in Uzbekistan have primarily focused on agricultural production, self-sufficiency and institutional reforms in the agricultural sector. Comparatively less attention has been devoted to the combined dynamics of agricultural output, food prices and household incomes, which jointly determine economic access to food. This study addresses this research gap.

The objective of the study is to assess changes in economic access to food in Uzbekistan during 2018–2025 and identify the factors influencing these changes. Three research questions are examined: (1) Did agricultural production growth keep pace with increases in food prices? (2) Did household incomes increase faster or more slowly than food prices? (3) Is higher agricultural growth associated with lower food inflation? The study contributes an affordability index constructed entirely from official statistical data, which can be updated annually to monitor the economic access dimension of food security.

LITERATURE REVIEW

Concept of Food Security. The definition adopted at the 1996 World Food Summit identifies four pillars of food security: availability, access, utilisation and stability (FAO, 1996). Pinstrup-Andersen (2009) emphasises that national food self-sufficiency does not necessarily guarantee food security at the household level, as access depends on purchasing power and distribution. Barrett (2010) argues that food security measurement should extend beyond calorie availability to include indicators of economic access and vulnerability, particularly because many food-insecure populations live in countries with sufficient aggregate food supplies.

Food Prices, Household Incomes and Economic Access. Sen's (1981) entitlement approach conceptualises food access as a function of income, prices and transfers. Empirical studies of the 2007–2008 global food price crisis demonstrated that rising food prices particularly affected net food purchasers, including urban households and landless rural households. The overall effect on poverty depends on the balance between household food production and purchases (Deaton, 1989; Ivanic & Martin, 2008). Headey and Fan (2008) attributed the increase in food prices to a combination of supply shocks, energy prices, biofuel demand and trade restrictions, demonstrating that food price dynamics are influenced by factors extending beyond domestic agricultural production.

Agricultural Growth and Food Prices. Faster growth in domestic agricultural supply is generally expected to reduce relative food prices, particularly for non-tradable or bulky agricultural products such as vegetables and fruit. For internationally traded commodities, including grain and meat, domestic prices are also influenced by regional and global market conditions, which may weaken the relationship between domestic production growth and local food prices.

Evidence from Central Asia and Uzbekistan. Agricultural reforms in Central Asia have contributed to a shift in production towards smallholder and household farms (Lerman & Sedik, 2018). In Uzbekistan, dehkan (household) farms accounted for 62.3% of total agricultural output in 2025, including 81.3% of meat production and 90.6% of milk production. Previous research by the author examined priority areas for strengthening food security within an innovation-driven economy (Akhmedova, 2026). Existing studies on Uzbekistan have rarely integrated agricultural output, food price and household income series into a single indicator of economic access to food. The present study addresses this gap.

RESEARCH METHODOLOGY

The study uses annual official statistical data covering the period 2018–2025. The combined analysis of household incomes and food prices covers 2020–2025, corresponding to the period for which a consistent series of per capita income data is available (Table 1).

Table 1. Data Sources, Measurement Units and Periods of the Indicators Used to Assess Economic Access to Food in Uzbekistan (2018–2025)[1]

Indicator	Unit	Years	Source
Agriculture, forestry and fisheries output, growth rate	% of previous year, comparable prices	2018–2025	National Statistics Committee (SIAT dataset 1476; press release of 23.01.2026)
Consolidated consumer price index	December to December, %	2018–2025	National Statistics Committee
Food products price index	December to December, %	2018–2025	National Statistics Committee
Total income per capita, nominal and real growth	% of previous year	2020–2025	National Statistics Committee
Prevalence of undernourishment; moderate or severe food insecurity; cost and affordability of a healthy diet	% of population	2022–2024	FAO (FAOSTAT, SOFI)

Indicators. Three measures are calculated.

1. The relative food price index shows whether food became more or less expensive compared with other goods and services:

$$RFP_t = \frac{FPI_t}{CPI_t}$$

where FPI is the food products price index and CPI the consolidated price index (both December to December). A value above 1 means food inflation exceeded overall inflation.

2. The affordability index shows whether per capita income grew faster than food prices:

$$AFI_t = \frac{Y_t / Y_{t-1}}{FPI_t}$$

where Y is nominal total income per capita. A value above 1 means a household could buy more food with its income than a year earlier. Cumulative values are obtained by chaining the annual indices.

3. The output–price association is measured with the Pearson correlation coefficient and a simple least-squares slope between the growth rate of agricultural output and food inflation, both in the same year and with a one-year lag.

All calculations were made from the published indices without any adjustment. Because the series are short, the correlation analysis is descriptive and does not establish causality.

Artificial intelligence (AI) tools were used to a limited extent, accounting for approximately 10% of the overall research preparation process. Their use was primarily confined to language refinement, technical editing, and structural support. The selection of research methods, analysis and interpretation of findings, formulation of scientific conclusions, and overall responsibility for the research content remained with the author.

ANALYSIS AND RESULTS

Output and prices. Agricultural output grew in every year of 2018–2025, by 3.2% a year on average and by 28.5% cumulatively. Food prices rose much faster: by 143.2% over the same eight years, against 131.6% for the consolidated CPI. The relative food price index was above 1 in every year from 2018 to 2023, so food became steadily dearer relative to other goods. The trend reversed in 2024–2025 (Table 2).

Table 2. Agricultural output growth and consumer prices in Uzbekistan, 2018–2025

Year	Agricultural output, % of previous year	CPI, Dec/Dec, %	Food price index, Dec/Dec, %	Relative food price (FPI/CPI)
2018	100.3	114.3	114.9	1.005
2019	103.1	115.2	118.6	1.030
2020	102.9	111.1	115.3	1.038
2021	104.0	110.0	113.0	1.027
2022	103.6	112.3	115.6	1.029
2023	104.1	108.8	109.7	1.008
2024	103.1	109.8	102.4	0.933
2025	104.4	107.3	105.5	0.983

Source: National Statistics Committee of the Republic of Uzbekistan; relative food price calculated by the author.

1 Author's development

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Composition of Agricultural Output Growth in 2025. In 2025, total agricultural output reached 538.9 trillion soums, representing an increase of 4.4%. Crop production grew by 7.2%, driven primarily by increases in grain (+13.0%), melons (+16.2%) and grapes (+7.6%). Livestock production increased by 1.6%, with meat and milk production rising by 1.5% and 1.2%, respectively. This difference in growth rates is particularly relevant to food price dynamics. Meat prices were a major contributor to food inflation in 2025 and early 2026, with year-on-year increases of 27.4% for lamb and 24% for boneless beef.

Household Incomes and Food Affordability. Nominal per capita income increased by 13–22% annually during 2020–2025. With the exception of 2020, when real per capita income declined by 1.8%, income growth exceeded food inflation in each year. The affordability index increased cumulatively by 38.6% over 2020–2025, indicating that households could purchase approximately 39% more food with their per capita income in 2025 than in the base year of 2019. More than half of this improvement occurred in 2024–2025, when the index increased by 13.4% and 10.5%, respectively (Figure 1).

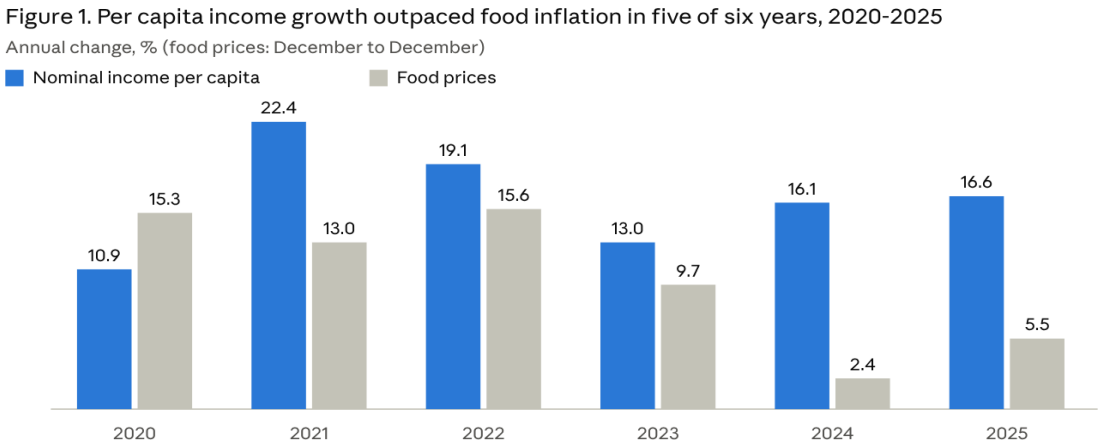


Figure 1. Annual Growth Rates of Nominal Per Capita Income and Food Prices in Uzbekistan, 2020–2025 (%)[2]

In 2020, food prices increased by 15.3%, compared with nominal income growth of 10.9%. From 2021 onwards, income growth consistently outpaced food inflation, with the gap widening considerably in 2024–2025.

Agricultural Output Growth and Food Inflation. The contemporaneous correlation between agricultural output growth and food inflation during 2018–2025 was weak and negative ($r = -0.33$). However, the relationship became stronger when a one-year lag was introduced ($r = -0.59$, 2019–2025). Each additional percentage point of agricultural output growth was associated with food inflation approximately 2.7 percentage points lower in the following year. Given the limited sample of seven observations, this finding should be interpreted as indicative rather than conclusive.

Improvements in Economic Access Driven Primarily by Income Growth. Agricultural output increased by approximately 3% annually, while food prices nearly doubled every five years until 2023. Economic access to food improved during 2020–2025 primarily because nominal household incomes increased faster than food prices, rather than as a result of declining food prices. This finding supports the entitlement approach proposed by Sen (1981), according to which household purchasing power is a key determinant of food security in countries with adequate aggregate food supplies.

Sustainability of Household Income Gains. Transfers accounted for 26–29% of household income during 2022–2024, while remittances from labour migrants were among the principal drivers of income growth in 2025. Changes in migrant earnings, potentially resulting from economic developments in host countries or exchange-rate fluctuations, could affect household incomes and moderate the improvements achieved in food affordability. Regional differences also remain substantial. In 2025, real per capita income increased by 14.8% in Fergana Region, compared with 0.6% in Andijan Region.

Agricultural Supply Growth and Product-Specific Price Dynamics. The negative lagged correlation between agricultural output growth and food inflation is consistent with the expectation that favourable harvests contribute to price stabilisation in subsequent seasons. This relationship is particularly evident for perishable agricultural products that are predominantly traded within domestic markets. In 2025 and early 2026, the prices of pumpkins, aubergines, tomatoes and cucumbers declined by 20–60% year on year following favourable harvests. Meat prices exhibited a different pattern. Livestock production increased by approximately 1.5–1.6%

2 Source: National Statistics Committee of the Republic of Uzbekistan; 2025 from preliminary data

annually, with a substantial share of production concentrated in household farms characterised by relatively low productivity. Meat prices were also influenced by regional market conditions. Consequently, meat became a major contributor to food inflation, with official reports indicating that meat alone accounted for 13% of total inflation in January 2026.

Regional Comparison. Uzbekistan's inflation rate of 7.3% in 2025 was its lowest since 2016 and remained below that of Kazakhstan, where households currently allocate more than half of their consumer expenditure to food. This comparison suggests that improvements in food affordability in Uzbekistan during 2024–2025 were substantial, although they occurred against a background of relatively low household incomes and a high proportion of expenditure devoted to food.

Policy Implications. Three priority directions emerge from the findings:

1. Improving Livestock Productivity. Given the contribution of meat and milk prices to food inflation, support measures should increasingly focus on developing fodder supplies, improving livestock breeding, strengthening veterinary services and facilitating the integration of household farms into cooperatives and agricultural clusters.

2. Developing Market Infrastructure. Investments in storage facilities, cold-chain logistics and wholesale markets could help reduce seasonal fluctuations in fruit and vegetable prices while ensuring that a greater proportion of the benefits from increased agricultural production remains within the domestic market.

3. Strengthening Targeted Social Support. Given the importance of remittances for household incomes and the differences in food affordability across regions, social protection measures should be linked to regional food price monitoring. The affordability index could serve as an early-warning indicator to support timely and targeted assistance to low-income households.

CONCLUSION AND RECOMMENDATIONS

Uzbekistan has made substantial progress in ensuring food availability, while economic access remains the pillar most sensitive to external and domestic economic fluctuations. During 2018–2025, agricultural output increased by 28.5%, while food prices rose by 143.2% and grew faster than the overall consumer price index until 2023. Between 2020 and 2025, food affordability improved by 38.6%, primarily because nominal per capita incomes increased faster than food prices. The most significant improvements occurred in 2024–2025, when food inflation declined to 2.4% and 5.5%, respectively. Higher agricultural growth was associated with lower food inflation in the following year, although this relationship was less pronounced for meat products, which have become a major contributor to food price pressures.

The proposed affordability index is straightforward, relies exclusively on official statistical data and can be updated annually. It can serve as a national monitoring instrument for assessing the economic access dimension of food security, complementing FAO indicators such as the prevalence of undernourishment and the Food Insecurity Experience Scale.

Based on the findings, the following recommendations are proposed:

1. Enhancing Agricultural and Livestock Productivity. Priority should be given to improving livestock productivity through the development of fodder supplies, modern breeding practices and veterinary services. Strengthening cooperation among household farms and agricultural clusters could contribute to more stable food supplies and moderate price fluctuations, particularly for meat and dairy products.

2. Strengthening Food Market Infrastructure. Further investment in agricultural storage facilities, cold-chain logistics and wholesale distribution networks is recommended to reduce seasonal food price fluctuations and improve market efficiency. These measures could facilitate more effective distribution of agricultural products and enhance the economic accessibility of food for households.

3. Improving Food Affordability Monitoring and Targeted Social Support. The proposed affordability index should be incorporated into regular food security monitoring to identify changes in household purchasing power and regional differences in economic access to food. Particular attention should be given to strengthening targeted social protection measures for low-income households and reducing their vulnerability to food price fluctuations and changes in remittance income.

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