



Available Online

Journal of Economic Impact

ISSN: 2664-9764 (Online), 2664-9756 (Print)

<http://www.scienceimpactpub.com/jei>

IMPACT OF POPULATION AGE STRUCTURE ON FOOD CONSUMPTION STRUCTURE OF RESIDENTS IN BEIJING

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ARTICLE INFO

Article history

Received: September 18, 2021

Revised: October 25, 2021

Accepted: October 28, 2021

Keywords

Food structure

Nutritional needs

AIDS

Demand elasticity

ABSTRACT

Based on the Beijing panel data from 1990 to 2019, this paper expands the traditional Almost Ideal Demand System (AIDS) model by introducing the nutritional needs indicators by age structure and quantitatively analyzes the structure and characteristics of household food consumption in Beijing. The study estimates and compares the income elasticity, price elasticity, nutritional demand elasticity of food consumption structure, and the per capita food consumption in Beijing is predicted. The results show that commodity prices and income are still the key factors affecting consumer demand. The change in the population's age structure also has a corresponding impact on the consumption structure. The consumption structure of Beijing is in the stage of optimization, and relevant departments should formulate relevant policies to increase farmers' income and stabilize prices.

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<https://doi.org/10.52223/jei3032107>

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INTRODUCTION

After the reform and opening-up, China's economy has achieved rapid development. The per capita income of residents has been increasing. At the same time, the level of residents' consumption has been continuously improving. The food consumption structure of residents has undergone significant changes, from mainly plant food to both plant food and animal food (Li, 2007); the consumption of animal foods has increased. At the same time, China is not only a country with a large territory but also a country with a large population, and there are regional differences and urban-rural differences in the consumption structure of residents. Under the background of Rural Revitalization in the new era, Beijing, as the national economic, political and cultural center, correctly grasp the characteristics of residents' food consumption, promote the optimization of residents' food consumption structure, and provide a scientific basis for the formulation of relevant policies.

In recent years, China's social transformation has accelerated, and the transformation process of population age structure has been accelerating. According to the data released by the National Bureau of Statistics, China's elderly dependency

coefficient has increased with the increase of years from 1990 to 2020, from 8.3% in 1990 to 19.7% in 2020; On the contrary, the child dependency coefficient shows a decreasing trend with the increase of years, from 41.5% in 1990 to 26.2% in 2020. There are several small ups and downs during this period, but on the whole, the child dependency coefficient in China is greatly reduced.

The article first summarizes the research results of previous scholars on food consumption structure from two aspects of influencing factors and evolution trend of food consumption structure; secondly, it analyzes the difference in the food consumption structure of urban and rural residents, at the same time, and the changes of age structure and nutrient intake of different age groups in Beijing were introduced; again, the data is quantitatively analyzed using the AIDS expansion model, and finally, conclusions are drawn, and targeted recommendations are made.

Academia has always paid more attention to the structure of residents' food consumption, and a large number of research results have emerged. Researches are mostly focused on two aspects. On the one hand, the literature analyzes the

influencing factors of food consumption structure. Some scholars study the food consumption structure from the perspective of population urbanization. Funing and Jing (2012) believe that urbanization has changed the structure of residents' food consumption, increased the proportion of consumption of animal products, and increased the total food demand. Wang and Qianjun (2012) used the LA-AIDS model to explore the changes in the food consumption structure of rural residents. The conclusion shows that the grain consumption of rural residents shows a downward trend, meat changed from luxury goods to necessities, and aquatic products are still flexible luxury products, but their elasticity value is declining year by year. Liu et al. (2015) used the AIDS model to conduct an empirical analysis on the consumption structure of Beijing's urban and rural residents and concluded that there are differences in the consumption structure of urban and rural residents, and rural residents are more sensitive to the price reaction of leisure food such as tobacco, wine, drink, and dried fruit. There are also some scholars who study the consumption structure from the perspective of income level. Xiong and Wang (2017) used linear system models to analyze the impact of multiple key influencing factors on household consumption based on survey data. The conclusion shows that the income level has a significant impact on the consumption demand of aquatic products and milk of urban residents. Yang et al. (2021) used the QUAIDS model to analyze the changing characteristics of the price of various dairy products on consumer demand and used the Tobit model to further verify that income and price are the main factors affecting the growth of urban residents' dairy consumption, and with the increase of residents' income level, the consumption of various dairy products will also further increase. Other scholars analyzed the structure of food consumption from the perspective of the age structure of the population. Wang and Huang (2015) conducted a study on the relationship between the age of the Chinese urban and rural population and the consumption of residents. The conclusion shows that urban and rural residents will change their consumption with the increase of children's dependency ratio and elderly dependency ratio, which will affect the consumption structure. Deng et al. (2018) concluded through the econometric model that all kinds of food consumption patterns show significant age characteristics, and the aging population has no significant inhibitory effect on food consumption. Guo et al. (2019) used the survey data of urban residents in Beijing to analyze that the middle-aged and elderly people's consumption demand for livestock and poultry meat has decreased, and they prefer to consume plant-based food. On the other hand, it is to study the evolution trend of future food consumption structure. Zheng et al. (2015) used the QUAIDS model and believe that the proportion of food expenditure will continue to decline, and animal food expenditure will further increase. Yin et al. (2020) believe that after the per capita GDP exceeds 15000 dollars, the total food consumption will grow slowly, the residents' demand and consumption of green food will continue to increase, and the consumption structure will continue to be optimized.

The research methods of food consumption structure are divided into the following: some scholars use the Almost Ideal

Demand System (AIDS) model. The AIDS model is based on simultaneous equations, regards demand as a function of consumption expenditure and price, and considers all consumed goods into one system with clear economic significance; some scholars also used the ELES model for empirical analysis (Wang et al., 2017). The ELES model considers the impact of consumer demand and household income on the consumption structure of residents. This model is one of the commonly used econometric models for studying the consumption needs of residents; some scholars use the Double-Log model, Rotterdam model (Yao et al., 2020) UAIDS model (Yang et al., 2021), and other methods for research. Most of the previous literature has studied the impact of population age structure on consumption structure. At the same time, there is little research on the impact of population age structure on various food consumption. In view of this, the characteristics of this paper are as follows: (1) discussing the impact of China's future population age structure change on food consumption demand (2) carefully analyze a series of elastic including the impact of population age structure on all kinds of food consumption demand.

Current Situation of Residents' Food Consumption in Beijing

The transition process of the age structure of China's population is accelerating. In the process of change, China's economic and social development will be affected by a series of influences, and at the same time, it will bring corresponding changes to the food consumption structure of residents. In the final analysis, residents' food consumption demand is derived from physiological needs; that is, calorie intake needs to be determined by age, gender, and work intensity (Zhong and Xiang, 2012). On the basis of physiological needs, the food consumption structure of residents is also formed by factors such as income, food prices, and consumption habits, and other factors. The following discusses the food consumption structure of Beijing residents from several aspects.

The food consumption structure of urban and rural residents has been continuously optimized:

The food consumption of rural residents in Beijing lags behind that of urban residents, but the overall performance is a constant trend. It can be seen from Figure 1, per capita grain consumption: from 1990 to 2002, the per capita grain consumption of rural residents was higher than that of urban residents, and the per capita grain consumption of urban residents was less than 60% of that of rural residents. After 2002, the per capita grain consumption of rural residents showed a downward trend, gradually equal to that of urban residents but still higher than that of urban residents. Per capita meat consumption: since 1990, the per capita meat consumption of urban residents has been higher than that of rural residents, the per capita meat consumption of urban residents shows a downward trend, and the per capita consumption of rural residents shows an upward trend, reaching the consumption level of urban residents in 2018. Per capita poultry consumption of rural residents in 1990 was about 15% of that of urban residents. From 1990 to 2019, the per capita poultry consumption of urban residents increased first and then decreased. The per capita poultry consumption of rural residents increased year by year, which was still lower

than that of urban residents by 2019. Per capita egg consumption: the per capita egg consumption of urban residents has maintained a relatively stable trend, and the per

capita egg consumption of rural residents is increasing year by year. By 2018, the per capita egg consumption of rural residents will reach the consumption level of urban residents.

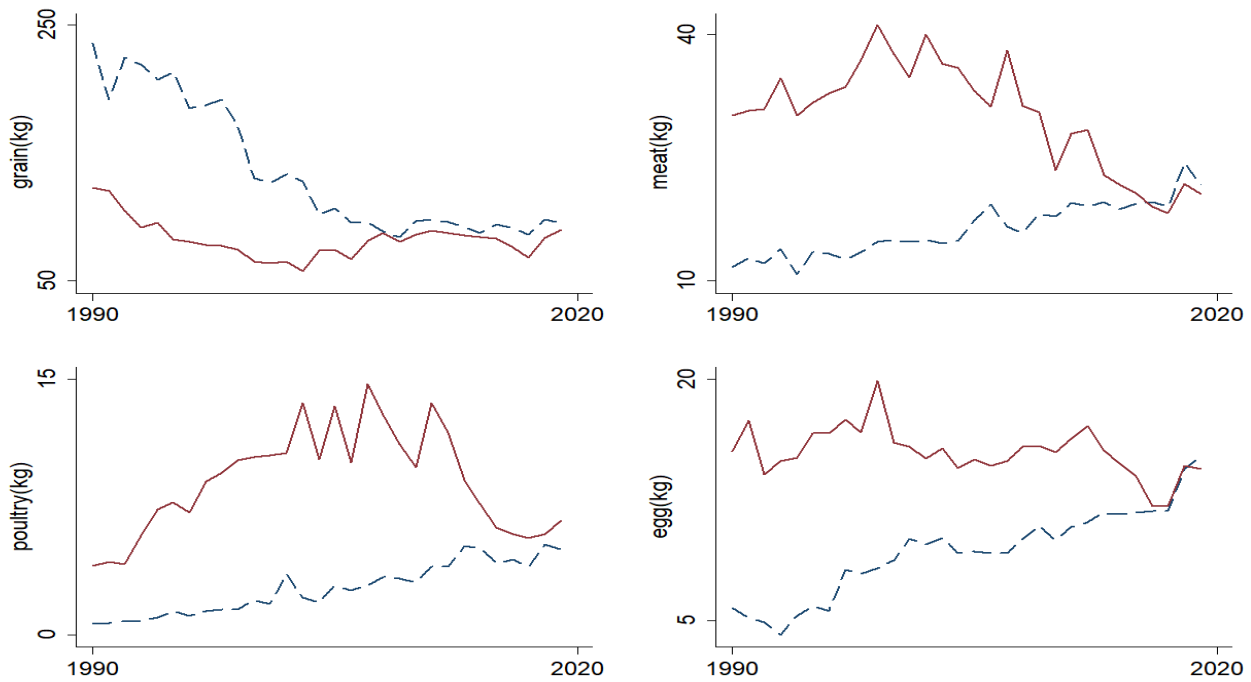


Figure 1. Per capita food consumption of urban and rural residents in Beijing from 1990-2019 (solid lines are urban residents and dotted lines are rural residents).

Note: In the per capita food consumption of urban residents in Beijing, the data of grain, meat, poultry, and eggs from 2000 to 2014 are missing. The per capita consumption data is replaced by the result that the per capita consumption expenditure of urban residents in that year is divided by the commodity price of the fair market in that year. The per capita consumption of grain is the sum of rice, wheat, and maize, and the per capita consumption of meat is the sum of pork, beef and mutton.

The age structure of Beijing's population is aging: It can be seen from Figure 2 that the proportion of children aged 0-14 in Beijing has been on a downward trend since 1990. It declined rapidly from 1995 to 2000, falling below 15%, and remained stable after 2015, with a slight decline trend; the proportion of the labor force

aged 15-64 increased year by year from 1990 to 2012. After 2013, the proportion began to decline, with a rapid decline, and began to rise in 2018; the proportion of the elderly aged 65 and above increased rapidly from 1990 to 2005 and tended to be stable after 2015, with a slight upward trend.

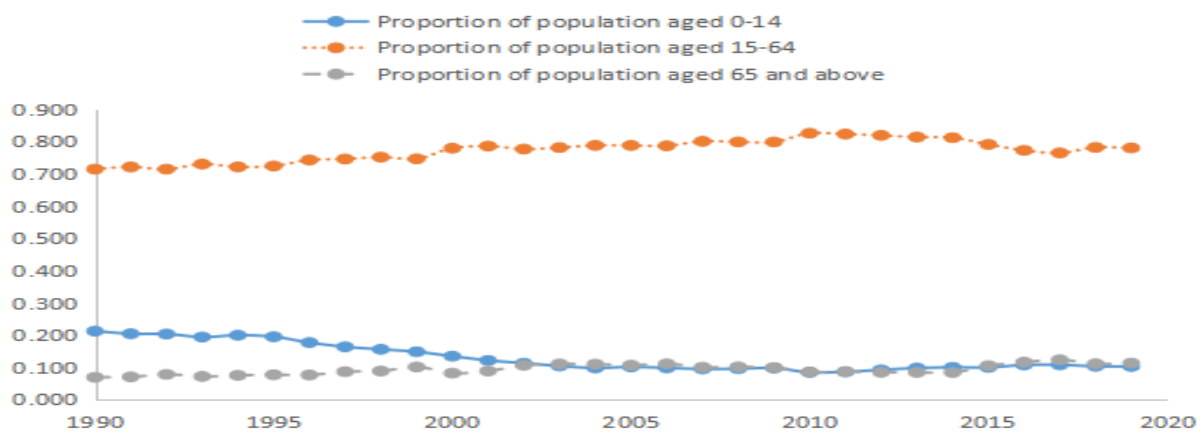


Figure 2. The proportion of the population of each age group in the total population of Beijing from 1990 to 2019.

Age and nutritional needs: The intake of food nutrients required to maintain human body functions is related to age. According to the recommended intake of nutrients for different age groups in the 2013 "Reference Intake of Dietary

Nutrients for Chinese Residents". Daily energy intake: 5.83 MJ/d for adolescents and children aged 0-14; 9.75 MJ/d for adults aged 15-64; 8.63 MJ/d for seniors aged 65 and above. The daily protein intake is 35.57 g/d for adolescents and

children aged 0-14; 61.88 g/d for adults aged 15-64; and 60 g/d for seniors aged 65 and above.

METHODOLOGY

Data Source and Analysis

The per capita food consumption and food market prices of Beijing residents from 1990 to 2019 used in this article are derived from the Statistical Yearbook of China and Beijing from 1990 to 2019; data center of the National Bureau of Statistics data center; "the National Agricultural Product

Cost and Benefit Data Compilation"; "China Animal Husbandry and Veterinary Medicine Yearbook"; "China Agricultural Product Price Survey Yearbook; China Dairy Industry Yearbook"; "China Rural Household Statistics Yearbook"; "China Prices"; China Animal Husbandry Information Network 4.0

It can be seen from Figure 3 and Figure 4 that food consumption expenditure is greatly affected by its own price. Most of the relationship between the two shows a linear distribution, which is suitable for the aids model.

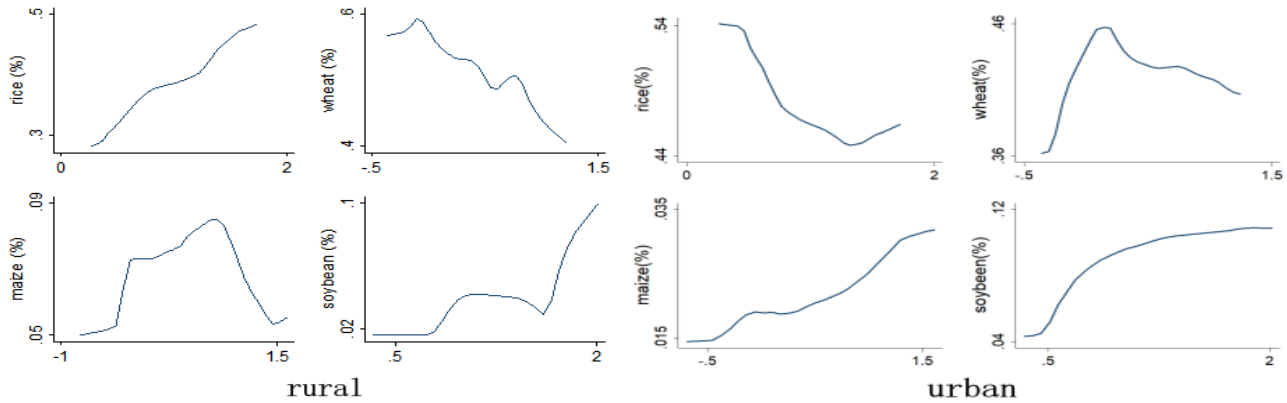


Figure 3. Trend chart of grain expenditure share and its own prices in Beijing residents' grain consumption structure (Logarithm of price).

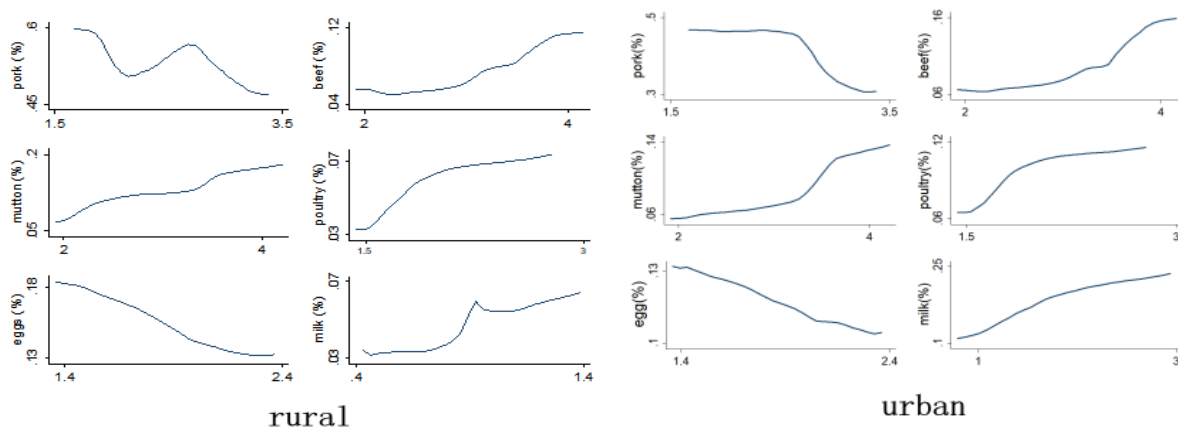


Figure 4. Trend chart of expenditure share of livestock and poultry products and its own prices in the consumption structure of livestock and poultry products by residents in Beijing (Logarithm of price).

Model Description

AIDS model: This article intends to use the approximate ideal demand system model - the AIDS model to estimate the price elasticity of demand for food consumption structure. The AIDS model is a classic model for studying consumption structure, which was proposed by Deaton and Muellbauer (1980). The model considers that the consumption share of a certain commodity is affected by its own price and the price of other kinds of commodities in consumption, as well as the level of household expenditure. The expenditure function of the AIDS model can be expressed as:

$$\log(C(u, p)) = \alpha_0 + \sum_{i=1}^n \alpha_i \log p_i + \frac{1}{2} \sum_{i=1}^n \sum_{j=1}^n \gamma_{ij}^* \log p_i \log p_j + u\beta_0 \prod_{i=1}^n p_i^{\beta_i} \tag{1}$$

u is the utility, p is the price vector, the first derivative of the above formula can be obtained, and the formula for the optimal demand and the expenditure share of each commodity can be obtained as:

$$w_i = \alpha_i + \sum_{j=1}^n \gamma_{ij} \ln(p_j) + \beta_i \ln\left(\frac{x}{p}\right) \tag{2}$$

Among them, w_i is the proportion of the consumption expenditure of the i-th commodity in the total consumption expenditure, p_j is the price of the j-th commodity, x is the total per capita expenditure of consumers, and p is the current price index. The current price index p can be expressed as:

$$\ln p = \alpha_0 + \sum_{i=1}^n \alpha_i \ln p_i + \frac{1}{2} \sum_{i=1}^n \sum_{j=1}^n \gamma_{ij} \ln p_i \ln p_j \tag{3}$$

The coefficients of the AIDS model need to meet the basic conditions: additivity: $\sum_{i=1}^n \alpha_i = 1, \sum_{i=1}^n \beta_i = 0$;

homogeneity: $\sum_{i=1}^n \gamma_{ij} = 0$; symmetry $r_{ij} = r_{ji}$.

The expenditure elasticity coefficient of the i-th commodity is:

$$\epsilon_i = 1 + \frac{\beta_i}{w_i} \tag{4}$$

AIDS model expansion: Residents' food consumption structure is not only affected by commodity prices and residents' income but also related to residents' age structure. The age structure of China's population is undergoing a rapid transition, and the transition of the age structure of the population is bound to have an impact on the structure of food consumption. This paper constructs an index of the elasticity of nutritional demand of age structure to reflect the influence of the change of age structure on the food consumption structure of residents. This article will try to expand on the basis of the AIDS model to analyze a specific factor that affects the consumption structure, introduce the age structure nutrition demand factor to expand the basic form of the model, and analyze the impact of age structure nutrition demand on the residents' food consumption structure.

Age structure nutritional requirements, that is, the proportion of the population of each age group is multiplied by the recommended nutrient intake of this age group, and the weighted nutritional requirements of each age group are added. This article divides the population into three age groups, 0-14 years old is the first group; 15-64 years old is the second group; The population aged 65 and over are divided into the third group.

$$n = \sum_{k=1}^3 \theta_k g_k \tag{5}$$

n is the daily per capita nutritional requirement, θ_k is the proportion of the population of the k-th group, and g_k is the recommended nutrient intake of the k-th group.

The function of grain is to provide the required energy for the human body, and the function of livestock and poultry products is to provide the required protein for the human body. Therefore, when selecting nutrients in the grain consumption structure, g is the recommended energy intake; in livestock and poultry products consumption structure, g is protein intake.

Introduce the age structure nutritional requirement index into the traditional AIDS model and expand it. The form of the expanded model is as follows:

$$w_i = \alpha_i + \sum_{j=1}^n \gamma_{ij} \ln(p_j) + \beta_i \ln\left(\frac{x}{p}\right) + \lambda_i \ln(n) \tag{6}$$

Among them, w_i is the proportion of the consumption expenditure of the i-th commodity in the total consumption expenditure, p_j is the price of the j-th commodity, x is the total per capita income of consumers, p is the current price index, and n is an index of nutritional requirements for age structure. The current price index p can be expressed as:

$$\ln p = \alpha_0 + \sum_{i=1}^n \alpha_i \ln p_i + \frac{1}{2} \sum_{i=1}^n \sum_{j=1}^n \gamma_{ij} \ln p_i \ln p_j \tag{7}$$

AIDS expansion model coefficients need to meet basic conditions, additivity: $\sum_{i=1}^n \alpha_i = 1, \sum_{i=1}^n \beta_i = 0, \sum_{i=1}^n \lambda_i = 0$; homogeneity: $\sum_{i=1}^n \gamma_{ij} = 0$; symmetry: $r_{ij} = r_{ji}$.

The income elasticity coefficient of the i-th commodity is:

$$\epsilon_i = 1 + \frac{\beta_i}{w_i} \tag{8}$$

The elasticity coefficient of nutritional demand for the i-th commodity is:

$$\delta_i = 1 + \frac{\lambda_i}{w_i} \tag{9}$$

RESULTS AND DISCUSSIONS

It can be seen from Table 1 that the price elasticity of grain demand of rural residents in Beijing is estimated to be negative, which satisfies the law of demand. First of all, in the grain consumption structure, the absolute value of the price elasticity of rice, wheat, and soybeans is greater than 1, indicating that rural residents are more sensitive and flexible to the prices of these three types of commodities. Secondly, rice and wheat have cross-price elasticity, indicating that residents' demand for rice and wheat is greatly affected by the prices of other grains, and grain types have a greater pulling effect on each other; The cross-price is symmetrical, and the increase in the price of wheat will increase residents' demand for rice and beans, At the same time, the impact of rice and beans on wheat demand is also positive and complimentary. Finally, rural residents' demand for wheat and maize lacks income elasticity, indicating that the residents' demand for these two kinds of food is not sensitive to the change of family income, and the consumption tends to be stable. Residents' demand for rice and beans is income elastic, and the income demand elasticity is greater than 1, which indicates that with the increase of household income, residents will be more inclined to consume these two types of commodities.

Table 1. Price elasticity, income elasticity and nutrition elasticity of grain consumption structure of rural residents.

| Items | Price elasticity | | | | Income elasticity | Nutrition elasticity |
|---------|------------------|---------|---------|---------|-------------------|----------------------|
| | Rice | Wheat | Maize | Soybean | | |
| Rice | -2.4399 | 1.3155 | 0.1429 | -0.3444 | 1.3259 | 6.1784 |
| Wheat | 1.3834 | -2.0695 | -0.2562 | 0.2415 | 0.7008 | -3.5338 |
| Maize | 1.0819 | -1.7989 | -0.8494 | 0.8123 | 0.7541 | -5.1915 |
| Soybean | -2.5938 | 1.7070 | 0.9566 | -1.5393 | 1.4694 | 9.3921 |

Table 2. Price elasticity, income elasticity and nutrition elasticity of livestock and poultry consumption structure of rural residents.

| Items | Price elasticity | | | | | | Income elasticity | Nutrition elasticity |
|---------|------------------|---------|---------|---------|---------|---------|-------------------|----------------------|
| | Pork | Beef | Mutton | Poultry | Eggs | Milk | | |
| Pork | -1.2272 | -0.1582 | 0.2385 | 0.0208 | -0.1236 | 0.3147 | 0.9350 | -4.3115 |
| Beef | -1.1283 | -0.1103 | 0.3450 | -0.1761 | 0.1042 | -0.0388 | 0.9515 | 3.2152 |
| Mutton | 0.8203 | 0.1755 | -1.2962 | 0.0442 | -0.2598 | -0.6209 | 1.1370 | 5.4497 |
| Poultry | 0.0871 | -0.2075 | 0.0976 | -0.1858 | -0.2353 | -0.6405 | 1.0843 | 8.3978 |
| Eggs | -0.4388 | 0.0470 | -0.2033 | -0.0925 | -0.5723 | 0.2775 | 0.9824 | -0.1855 |
| Milk | 3.3796 | -0.0927 | -1.8595 | -0.9402 | 0.8892 | -2.7341 | 1.3576 | 25.4054 |

It can be seen from Table 2 that the estimation of the price elasticity of livestock and poultry products of Beijing rural residents is negative, which meets the law of demand. Firstly, the price elasticity of pork, mutton, and milk are all greater than 1, which is flexible and sensitive to prices; Residents are not sensitive to price changes of beef, poultry and eggs, and lack flexibility, and consumption tends to stabilize. Secondly, the cross-price elasticity is symmetric, and most rural residents lack cross-price elasticity in

demand for livestock and poultry commodities. The rise in the price of poultry will make residents tend to increase the consumption of pork and mutton. When the price of poultry rises due to the lack of price elasticity of poultry, residents tend to reduce the consumption of beef to ensure the consumption demand for poultry. Finally, rural residents' demand for mutton, poultry, and milk is income elastic. When income increases by 1%, demand increases by 1.137%, 1.084%, and 1.358%, respectively.

Table 3. Price elasticity, income elasticity and nutrition elasticity of grain consumption structure of urban residents.

| Items | Price elasticity | | | | Income elasticity | Nutrition elasticity |
|---------|------------------|---------|---------|---------|-------------------|----------------------|
| | Rice | Wheat | Maize | Soybean | | |
| Rice | -0.4419 | -0.4679 | -0.0251 | -0.0182 | 0.9532 | 1.118 |
| Wheat | -0.5391 | -0.3992 | -0.0226 | -0.0041 | 0.9650 | 0.662 |
| Maize | -0.4788 | -0.3764 | -0.1040 | -0.0649 | 1.0242 | -0.649 |
| Soybean | -0.1562 | -0.0995 | -0.0140 | -0.9325 | 1.2022 | 1.718 |

Table 4. Price elasticity, income elasticity and nutrition elasticity of livestock and poultry consumption structure of urban residents.

| Items | Price elasticity | | | | | | Income elasticity | Nutrition elasticity |
|---------|------------------|---------|---------|---------|---------|---------|-------------------|----------------------|
| | Pork | Beef | Mutton | Poultry | Eggs | Milk | | |
| Pork | -1.2701 | -0.1811 | 0.2756 | 0.0283 | -0.1454 | 0.3685 | 0.9243 | -2.8806 |
| Beef | -0.7317 | -0.3894 | 0.2221 | -0.1121 | 0.0667 | -0.0242 | 0.9686 | 7.7151 |
| Mutton | 1.0407 | 0.2130 | -1.3666 | 0.0462 | -0.3221 | -0.7828 | 1.1716 | 5.7631 |
| Poultry | 0.0515 | -0.1163 | 0.0551 | -0.5536 | -0.1288 | -0.3544 | 1.0465 | 5.7858 |
| Eggs | -0.5066 | 0.0549 | -0.2346 | -0.1054 | -0.5081 | 0.3200 | 0.9797 | -2.0633 |
| Milk | 2.1266 | -0.0669 | -1.1550 | -0.5990 | 0.5598 | -2.0889 | 1.2233 | 5.2083 |

It can be seen from Table 3 that the estimation of the price elasticity of grain by urban residents in Beijing is negative, which meets the law of demand. Firstly, in the grain consumption structure, the absolute value of the price elasticity of rice, wheat, corn, and soybean is less than 1, indicating that urban residents are not sensitive to the price changes of these four kinds of food, and the consumption tends to be stable. Secondly, the cross-price elasticity of demand between these four kinds of food is very small, and the consumption of these four kinds of food by urban residents is less affected by the price of other kinds of food, which is relatively stable. Compared with the self-price elasticity of

demand, the consumption demand of urban residents for these four kinds of grain depends more on the change of the price of the commodity itself. Finally, the absolute value of demand income elasticity of corn and soybean is greater than 1, indicating that with the improvement of residents' income level, urban residents will be more inclined to consumption of corn and beans.

It can be seen from Table 4 that the estimation of price elasticity of livestock and poultry products by urban residents in Beijing is negative, which meets the law of demand. Firstly, in the consumption structure of livestock and poultry products, the absolute value of price elasticity of pork, mutton

and milk is greater than 1, which is elastic. Urban residents are more sensitive to the price changes of these three foods, indicating that urban residents are more inclined to consume these three foods and are more sensitive to price changes. Secondly, the cross-price elasticity between commodities is symmetrical. From the cross-price elasticity, it can be seen that pork and mutton are complementary. When the price of mutton rises, urban residents tend to increase their consumption demand for pork, beef and poultry. When the price rises, mutton lacks its own price elasticity, Residents tend to reduce the consumption of eggs and milk to ensure the consumption demand of mutton. Compared with the self-price elasticity of demand, the consumption demand of urban residents for these six types of livestock and poultry products depends more on the change of the commodity's own price. Finally, the income demand elasticity of mutton, poultry and milk is greater than 1. With the improvement of residents' income levels, urban residents are more inclined to increase the consumption of mutton, poultry, and milk.

From the elasticity of nutritional demand of age structure, it can be seen that consumption demand is greatly affected by the elasticity of nutritional demand of age structure and is more sensitive. With the increasing proportion of the elderly and the pursuit of residents' nutritional needs, Beijing residents will reduce their consumption demand for wheat and corn and tend to increase consumer demand for rice and beans. Beijing residents will reduce their demand for pork and eggs and increase demand for livestock and poultry products such as beef, mutton, poultry and milk.

Combined with the estimated changes of population age structure in Beijing in 2020, 2030 and 2050 (Duan et al., 2021), the age structure nutritional demand in 2020, 2030 and 2050 is obtained. Using the obtained age structure nutritional demand elasticity, it is estimated that the per capita grain consumption (the sum of rice, wheat and corn) of Beijing residents shows a downward trend, and the consumption of livestock and poultry products (the sum of pork, beef, mutton, poultry and eggs) shows an upward trend, but the overall change range is small. In 2020, 2030 and 2050, the per capita grain consumption of rural residents in Beijing will be 101.4 kg, 99.8 kg and 106.1 kg respectively; the per capita consumption of livestock and poultry products was 41.7 kg, 41.9 kg and 42 kg, respectively. In 2020, 2030 and 2050, the per capita grain consumption of urban residents in Beijing will be 95.6 kg, 94.1 kg and 99.9 kg, respectively; the per capita consumption of livestock and poultry products was 42.7 kg, 44.3 kg and 46.6 kg, respectively.

It can be seen from the elasticity of nutritional demand that the change of population age structure will drive the change of nutritional demand, thus affecting the food consumption structure of residents. With the increase of nutritional demand in the grain consumption structure, rural residents in Beijing prefer the consumption of rice and soybean. In addition to rice and soybean, urban residents also increase the consumption of wheat; in the consumption structure of livestock and poultry, urban and rural residents in Beijing prefer the consumption of beef, mutton, poultry and milk. With the increase of residents' income, the proportion of residents' energy from grain is decreasing, and the proportion from

meat, milk and other livestock and poultry products will gradually increase. In the grain consumption structure, rural residents in Beijing are more inclined to consume rice and soybean. In addition, urban residents also increase the consumption of corn; in the consumption structure of livestock and poultry, urban and rural residents in Beijing are more inclined to consumption of mutton, poultry, and milk. It can be seen from the price elasticity that the self-price of food is greater than the cross-price elasticity, that is, the demand for various types of food by residents, which is mainly affected by changes in the price of the food itself, while changes in the prices of other commodities have a relatively weak impact on the consumption of this food.

CONCLUSIONS

In summary, Beijing residents' consumption of mutton, poultry and milk still has great room for development; Residents' income is still the key factor affecting residents' food consumption structure. In the future, residents will no longer be satisfied with "full", but pay more attention to a reasonable and healthy diet. Finally, the consumption structure of residents will reach a coordinated and balanced proportion of consumption demand for animal and plant food. Therefore, relevant departments should promote farmers' incomes and gradually increase residents' incomes; stabilize food prices, especially the most basic and important food prices such as grains and livestock and poultry products, control the prices of livestock products within a certain range, and avoid excessive price fluctuations. These are important measures to ensure residents' food consumption and nutritional intake.

Acknowledgments

This research was supported by the National Key R and D Program Project (2017YFE0104600).

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