



Estimating Demand for Imported Food Categories in Iraq

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Abstract

Iraq is highly dependent on international markets to provide food for its residents. As imported food prices are highly dependent on crude oil prices in global markets, any shock in oil prices will have an impact on food consumption in the country. As a result, it is essential to study the demand for imported food at every time period. To the best of our knowledge as researchers, as not even a single study is available in the literature, this paper is considered the first to study the demand for imported food groups in Iraq. Therefore, the main objective of this research is to estimate demand elasticities for several imported food categories in Iraq. This study uses an Almost Ideal Demand System model to analyze the demand for imported food in Iraq from 1980-2003 and 2003-2020. Data are collected from secondary resources. The main results show that some food categories become demand inelastic after they were demand elastic in the first period. In contrast, demand for some food groups become more price sensitive in the second period after it was less price sensitive in the first period. There are also changes in some food categories after they became luxuries in the second period. The findings of this study provide valuable insights into the changing dynamics of food import demand in Iraq and have policy implications by helping the decision-makers to invest more in the local production of some food groups.

Paper type: Research paper

Keywords: Demand Analysis, Elasticity, Food Imports, Almost Ideal Demand System (AIDS), Iraq.

1. Introduction

Agriculture sector is a crucial part of the economy of Iraq (Schnepf, 2004). It is the one of the major contributors to the Gross Domestic Product (GDP) with a share of five percent of the GDP (FAO, 2021). In terms of cultivated areas, the major cereals produced in Iraq are wheat and barley, followed by maize, and rice (Lucani and Saade, 2012). Although wheat dominates cereal production in Iraq, its production is only enough for the 60 percent of the country's total domestic demand (UNISCO, 2019). As demand for food is increasing significantly, Iraq imports a wide variety of agricultural products including cereals, fruits, vegetables, and livestock products from abroad.

Among the staple food, rice was the top food commodity that was imported to Iraq in 2016. Over the last decade, rice production in Iraq was only able to meet 8-21 percent of domestic consumption (FAS, 2016) while the rest were being imported. This was mainly due to the limited land availability for rice production in addition to the lack of water resources. This made Iraq among the world's top ten rice-importing countries in 2016 (FAS, 2016). Overall, the quantity of cereals imported is heavily dependent on the quantity of cereals produced in a particular year. When the local production is high, demand for imported goods is less unless the production is not high enough to meet the local food demand.

Iraq has been more self-sufficient in livestock than in crop production. Figure 1 illustrates the total quantity of cereals produced and imported (in million tons) to Iraq in the years 2000-2021. A decrease in cereal production is noticed during four shocks to the Iraqi economy. The first decrease in cereal production happened during the war against Iraq in 2003. The second decline in cereal production was in 2008 during the world economic crisis. The third shock was during the fight against the Islamic State in 2014 while the last shock in production was during the Corona pandemic. Other than these four shocking periods, a positive trend in cereal production is noticed during this time period. Iraq's agricultural output largely serves the local market. In terms of the international trade, Iraq food imports exceed food exports. The main food commodities imported to Iraq are wheat and wheat flour, chicken, sugar, and eggs.

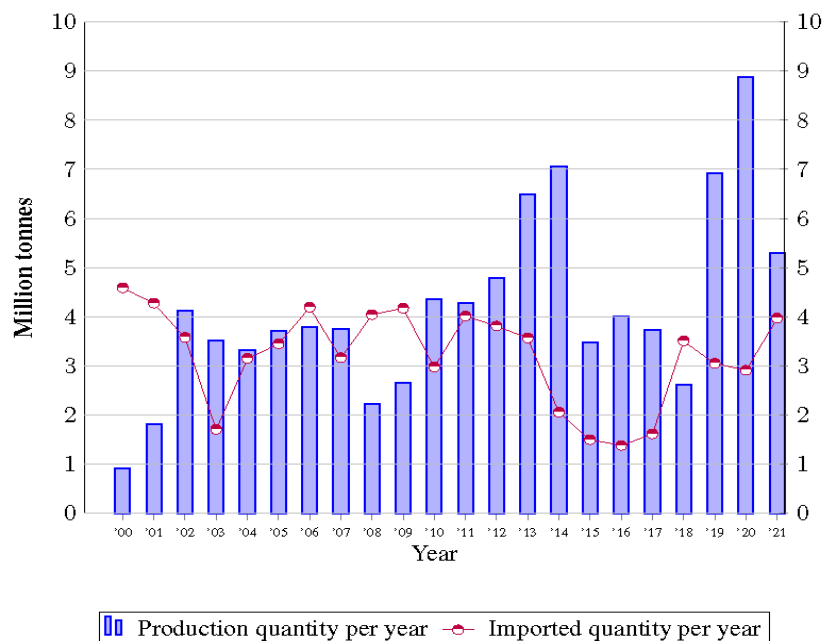


Figure 1: Total Cereal Production and Imported to Iraq in years 2000-2021.
Source: FAOSTAT, 2021.

1.1 Literature review

Few studies have estimated the demand for imported food in Iraq. Al-Sahoo and Al-Badri (2016) estimated demand elasticities for imported chicken meat in Iraq from 1985-2013 using the Ordinary Least Squares model. The results showed that demand for imported chicken meat was elastic as the estimated own-price elasticity was -1.16 implying that the demand for imported chicken meat was sensitive to price changes in the long run. The estimated income elasticity of imported chicken meat was 7.55 implying that chicken meat was a luxury good as an income increase would cause chicken consumers to demand more chicken meat.

The study by Abdul-Mageed and Jabra (2016) used a linear version model of an almost ideal demand system (LA/AIDS) to examine the meat consumption demand elasticities in Iraq using data from 1990-2012. The results showed that uncompensated own-price elasticities for fish, chicken, and red meat were -0.92, -1.47, and -0.87, respectively. This indicates that demand for fish and red meat was inelastic while consumers showed price sensitivity for chicken. These results consistent with the previous study as the demand for imported chicken was elastic in Iraq. The estimated results of cross-price elasticity showed that fish and chicken were substitute goods as the estimated elasticity was positive. Each of the fish and chicken was considered normal and necessary goods while red meat was considered a normal and luxury good.

Alazawi and Aljumaili (2020) analyzed the demand for meat consumption in Iraq from 2004 to 2018 using the AIDS model. The study found that the proportion of money consumers spend on red meat has increased compared to their expenditure on poultry and fish. Based on the results, the uncompensated price elasticity of poultry and fish was inelastic, while the demand elasticity for red meat was elastic. Each of these products was considered complementary to the other. The estimated expenditure elasticities indicated that red meat, poultry, and fish were essential commodities for Iraqi consumers.

Fawzi and Alwasity (2021) studied the factors that contributed to the import of table eggs to Iraq using data from 2003-2018 and then using the result in predicting the imports of eggs over the years 2019-2025. The results of the OLS regression model showed that a growing population was the main factor in increasing the demand for table eggs. The study predicted that demand for table eggs would increase to more than 100 million eggs in 2025. The study revealed that there is no governmental policy towards subsidizing egg production to support the production of eggs in Iraq.

Finally, estimating demand elasticities of imported tea in Iraq was conducted by Kadhim (2022) using 1990-2020 observations. The results obtained by Autoregressive Distributed Lag revealed that demand for imported tea was inelastic in the short period, but elastic in the long period. In addition, tea was considered a necessary product for Iraqi consumers.

The problem of this research is that previous studies on estimating demand elasticities for imported products have focused on a limited number of food products as individual items. This research will address this limitation by examining a broader range of food products as a group. In addition, as Iraq went through political and economic changes, estimating demand elasticities for all the years as one category might be underestimated or overestimated. Therefore, it is recommended to study demand elasticities at different time periods to get reliable estimates.

The main objective of this study is to estimate demand elasticities for imported food categories in Iraq. As most of the food available in local markets are imported, estimating demand elasticities would help policymakers to redesign the agricultural development plan by investing more in the production of those products that have an elastic demand. The previous studies estimated demand elasticities at the product level. As estimating demand elasticities for a large number of products makes the analysis complicated, our study included the products with the same characteristics into groups and estimated elasticities at the aggregated level. The results of this paper would be of interest to food producers that import their products to Iraq in addition to the policymakers in the Iraqi government who are responsible for developing food production and consumption in Iraq.

This study uses data from 1980 to 2020 to calculate demand elasticities. As Iraq went through different political and economic situations, this study calculated demand during two different periods, the first period is 1980-2003 while the second period is 2003-2020. Using the Almost Ideal Demand System (AIDS) model, this study calculated uncompensated own-price, compensated own-price, and income elasticities for five food categories which are staples, livestock products, dairy products and eggs, fruits and vegetables, and vegetable oil and fat. In the next sections, a summary of the most relevant previous studies is presented, followed by in detailed description of the data and the model used. Then, the main results of this study are presented and it is followed by the discussion and conclusion of this analysis.

2. Material and Methods

The AIDS model that is originally designed by Deaton and Muellbauer (1980) is the standard method for estimating demand systems. Numerous empirical studies on demand analysis have widely used this model (Alnashwan, 2004; Janda, McCluskey, and Rausser, 2008; Tshikala and Fonsah, 2012; Abdul-Mageed and Jabra, 2016; Xu et al., 2016; Alnafissa and Alderiny, 2020; Satari Yuzbashkandi and Mehrjo, 2020; Zin, 2022; Zhu, 2023).

2.1 Empirical AIDS model

The AIDS model is presented as (Deaton and Muellbauer, 1980b):

$$w_i = \alpha_i + \sum_{j=1}^n \gamma_{ij} \ln P_j + \beta_i \ln \left(\frac{x}{P} \right) \quad (1)$$

Where w_i represents the share of expenditure of commodity i ; related to Staples, Livestock products, Dairy products and eggs, Fruits and vegetables, and Vegetable oil and fat; P_j is the price for imported food Commodity j ; α_i , β_i , and γ_{ij} are coefficients to be estimated; β_i is the change in the budget share of product i in regard to expenditure when the is no change in prices. The product is luxury when $\beta_i > 0$ and it is necessity if $\beta_i < 0$. Two food products are considered substitutes when $\gamma_{ij} > 0$ while they are complements if $\gamma_{ij} < 0$. The letter X is total amount spent on all the imported food groups which is given by $X = \sum_{i=1}^n p_i q_i$ where q_i is the quantity demanded for good i . P is the price index represented by:

$$\ln P = \alpha_0 + \sum_{i=1}^n \alpha_i \ln(p_i) + \frac{1}{2} \sum_{i=1}^n \sum_{j=1}^n \gamma_{ij} \ln(p_i) \ln(p_j) \quad (2)$$

It can be noticed that this price index is not linear. In other words, linear estimation of the system is not possible using this price index (Mohanty and Peterson, 1999). As a result, Deaton and Muellbauer (1980b) recommend the use of the linearized version, namely Stone's price index used for a linear approximation of the AIDS model. The Stone price index is defined as:

$$\ln P = \sum_{i=1}^n w_i \ln p_i \quad (3)$$

2.2 Demand function constraints

In order to be consistent with consumer demand theory, the following restrictions should be applied on the parameters of the budget share to make sure the model is consistent with the theory of consumer demand.

2.2.1 Adding-up

The "adding-up" restriction implies that the summation of the estimated budget shares equals to one, $\sum_{i=1}^n w_i = 1$. This "adding-up" condition is guaranteed when

$$\sum_{i=1}^n \alpha_i = 1; \sum_{i=1}^n \beta_i = 0; \sum_{i=1}^n \gamma_{ij} = 0 \quad (4)$$

1.1.1 Homogeneity

The homogeneity constraint means that the demand function is homogeneous to the degree of zero in the changes to total expenditure and prices. Guarantees that there is no "money illusion," which can be translated as when total expenditure and prices are increased by a fixed amount, there would be no change in the demand of the imported amount. It is fulfilled if

$$\sum_{j=1}^n \gamma_{ij} = 0 \quad (5)$$

1.1.2 Symmetry

Symmetry means that there is no change in the Hicksian cross-price elasticities. It can be imposed by setting

$$\gamma_{ij} = \gamma_{ji} \quad (6)$$

2.3 Demand elasticities

In the field of economics, the elasticity of prices can be calculated using either the Hicksian demand equation or the Marshallian demand equation. The former is calculated by maximizing utility with respect to a budget constraint, whilst the latter is calculated by minimizing the total expenditure with respect to a particular level of utility. The elasticities obtained from the Marshallian demand equation are commonly referred to as uncompensated elasticities, whereas those derived from the Hicksian demand equation are known as compensated elasticities.

Expenditure elasticities are calculated by taking the partial derivative of the logarithm of the Marshallian demand for product j , in regard to the logarithm of total expenditure (Deaton and Muellbauer, 1980; Taylor, 2014).

Expenditure elasticity of demand for good i can be calculated as:

$$\eta_i^E = 1 + \frac{\beta_i}{w_i} \quad (7)$$

The uncompensated (Marshallian) price elasticity of demand is:

$$\varepsilon_{ij}^M = -\delta_{ij} + \frac{\gamma_{ij}}{w_i} - \frac{\beta_i}{w_i} w_j \quad (8)$$

The compensated (Hicksian) price elasticity of demand is:

$$\varepsilon_{ij}^H = -\delta_{ij} + \frac{\gamma_{ij}}{w_i} + w_j \quad (9)$$

The term δ_{ij} is the Kronecker delta. It equals one for calculating own-price elasticities, while equals zero when calculating cross-price elasticities.

$$\delta_{ij} = \begin{cases} 1, & \text{if } i = j \\ 0, & \text{if } i \neq j \end{cases} \quad i, j = 1, 2, \dots, n \quad (10)$$

Adding up restrictions ensures $\sum w_i = 1$. Therefore, the share equation of the fifth food category which is vegetable oil and fat is deleted from the estimation process to avoid the singularity. As the parameters of the deleted equation can be recovered by adding up property, it does not matter which share equation to be eliminated. A Seemingly Unrelated Regression (SUR) technique was employed for estimating elasticities to avoid possible error correlations in each equation.

2.4 Data

Our data are annual time series observations covering the period 1980 through 2020. Data were obtained from the Food and Agricultural Organization (FAO) of the United Nations Trade Statistics Division database⁽²⁾. The data on Agricultural products imported into Iraq consists of five broad food categories which are staples, livestock products, dairy products, fruits and vegetables, and vegetable oil and fat. There are studies that estimated demand elasticities of imported foods at the group level (Sahinli and Fidan, 2011; Walters and Jones, 2016). Data are available at the following link.

https://www.researchgate.net/publication/371274733_Import_of_Food_Categories_to_Iraq#fullTextFileContent

Staples comprise Rice, Wheat, Barley, Sugar, Chickpeas, Lentils, Maize, Tea, beans, and Potatoes. Animal products include all meat forms, frozen or fresh from poultry, hogs, cattle, sheep, goats, and game meat. Dairy products include all types of dried milk, evaporated, and condensed milk, butter, cheese, and eggs. All fruits and vegetable types were categorized under a single group of fruits and vegetables, that are imported fresh, which is justified by the fact that these products are considered as final products. Finally, vegetable oils and fat include olive oils, and the other hydrogenated and boiled oils and fat from vegetables plants.

All the expenditures are in United States dollars and all the quantities are expressed in tons. Per-unit values (\$/ton) for every food groups were calculated. Unit prices were obtained from the expenditure value and quantities. Since the actual market prices of products were unavailable, the unit values (expenditure/quantity) of each food groups were utilized as proxies for prices. Total expenditures were calculated from the sum of import volumes of all categories. In contrast, the shares were calculated by dividing each import volume of each category by the total expenditure.

This link provides a comprehensive overview of the data that was used in this study.

3. Discussion of Results

3.1 Descriptive results

The descriptive results provide useful information on import for different food categories in Iraq. Table 1 summarizes the average market shares, prices, quantities, and expenditures of each food category during the studying period. In terms of market share, staple foods are the most imported food category to Iraq followed by vegetable oils and fats while livestock products are the food group that is least imported to Iraq during the study period. Among commodity groups, dairy products and eggs were the most expensive followed by livestock products while fruits and vegetables were the least expensive food category. As several factors have an impact on the food prices in international markets, the study by Mohammed (2022) showed that fluctuations in oil prices in international markets have an impact on imported food prices in Iraq in the short-run and long-run periods.

3.2 Empirical results

3.2.1 Price elasticity

The concept of price elasticity can be separated into two categories: own price elasticity and cross price elasticity. Furthermore, these two types of elasticity can be expressed in either uncompensated (Marshallian) or compensated (Hicksian) price elasticities. The Hicksian demand only reflects the substitution effect of price changes, while the Marshallian demand reflects both substitution and income effects. In other words, the uncompensated demand function shows the relationship between quantity purchased and price of a product when other prices and the consumer's budget or income remain constant. This function is derived by the maximizing of consumer's utility while keeping the budget fixed. On the other hand, Hicksian demand function examines the relationship between price of a product and the quantity purchased while keeping other prices and utility constant. This function is derived by the minimizing of the consumer's expenditure while keeping the utility fixed.

Table 1: Descriptive Statistics of Food Groups Imported by Iraq, 1980-2020.

Commodity Group	Mean	Std. Dev.	Minimum	Maximum
Yearly Market Share (%)				
Staples	49.0	12.6	26.3	76.8
Livestock Products	7.7	6.4	0.0	23.0
Dairy products and Eggs	12.5	6.0	1.6	25.0
Fruits and Vegetables	10.0	9.6	0.4	34.9
Vegetable Oil and Fat	20.9	14.1	5.5	66.8
Annual Unit Price (\$/ton)				
Staples	588.58	263.68	312.72	1144.57
Livestock Products	940.40	898.77	0.00	3557.12
Dairy products and Eggs	2137.06	703.32	1220.55	4330.22
Fruits and Vegetables	509.57	134.26	306.00	856.11
Vegetable Oil and Fat	801.76	161.80	445.55	1137.04
Annual Quantity (1,000 tons)				
Staples	3288.29	1182.41	733.40	5247.74
Livestock Products	376.62	384.90	0.00	1384.62
Dairy products and Eggs	198.04	237.28	6.96	792.33
Fruits and Vegetables	762.28	1154.09	15.18	4066.90
Vegetable Oil and Fat	496.42	260.40	97.74	1124.46
Annual Expenditure (USD \$ Million)				

Staples	1084.96	601.37	185.10	2284.48
Livestock Products	215.71	230.45	0.00	878.76
Dairy products and Eggs	386.17	416.34	17.60	1481.98
Fruits and Vegetables	391.06	564.40	5.08	1788.34
Vegetable Oil and Fat	417.84	281.97	81.35	1278.55
Source: Computed by author from data from FAOSTAT, 2022.				

3.2.2 Uncompensated own-price and cross-price elasticities (1980-2003)

As shown in Table 2, the own price elasticity for all food categories are statistically significant at the 99% confidence level and carry a negative sign, consistent with the demand theory. The estimated demand elasticities revealed that each livestock product category and fruits and vegetables group are less responsive to their own price changes as their estimated own-price elasticities are smaller than one. In contrast, the rest of the food groups are more responsive to their own price changes as their estimated own-price elasticities are greater than one. This suggests that if prices rose, the demand for these food groups would fall sharply, especially for vegetable oil and fat with the highest own-price elasticity. Its estimated demand elasticity implies that if the price of vegetable oils and fats increases by one percent, the quantity demanded decreases by 9.8 percent, holding other factors constant.

Cross-price elasticities, values that do not lie on the diagonal of the elasticity matrix, measure the change in quantity demanded by one food groups when the price of another food group is changed by one percent. A negative sign indicates that the groups under consideration are complements while a positive sign indicates that groups are substitutes. For example, in the case of livestock products, the estimated cross-price elasticities for staple foods and vegetable oil and fat indicate that these two groups are complements of livestock products.

3.2.3 Expenditure elasticities (1980-2003)

The estimated expenditure elasticities are significant at 99% confidence level for all commodity groups as shown in Table 2. All expenditure elasticities are positive meaning that an increase in income would increase consumption of all food products. Based on the results, all food groups are luxury goods except for the fruits and vegetable group as it considers normal but necessary products.

Table 2: Uncompensated Demand Elasticities for Food Categories in Iraq (1980-2003).

Elasticity of Demand For	With Respect to Price change of					
	Staples	Livestock Products	Dairy products and Eggs	Fruits and Vegetables	Vegetable Oil and Fat	Income Elasticity
Staples	-1.311*** (0.215)	-0.027 (0.028)	0.137*** (0.050)	0.079*** (0.031)	-0.108 (0.135)	1.229*** (0.114)
Livestock Products	-0.767*** (0.321)	-0.565*** (0.109)	0.049 (0.091)	0.014 (0.048)	-0.983*** (0.294)	2.252*** (0.234)
Dairy products and Eggs	0.632** (0.357)	0.093** (0.055)	-1.139*** (0.163)	-0.143*** (0.060)	-0.915*** (0.231)	1.472*** (0.196)
Fruits and Vegetables	1.365*** (0.504)	0.134** (0.067)	-0.288** (0.150)	-0.885*** (0.244)	-1.089*** (0.274)	0.763*** (0.239)
Vegetable Oil and Fat	2.602 (2.471)	2.777*** (0.592)	0.998 (0.807)	-0.649* (0.381)	-9.886*** (2.256)	4.158*** (0.280)
Note: The diagonal values are own price elasticities, while the values off the diagonal are cross price elasticities. ***p < 0.01, **p < 0.05, *p < 0.1. The standard errors are shown in parentheses.						

3.2.4 Compensated own-price and cross-price elasticities (1980-2003)

The compensated own-price elasticities in Table 3 are all inelastic, with a negative sign and significant at the 99% confidence level, except for the vegetable oil and fat group, which is elastic. The compensated cross-price elasticity of demand results show that nearly all of these food groups are substitutes, as their cross-price elasticities were positive sign and significant. This means that a price increase in one food group would drive to an increase in demand for other food group.

Table 3: Compensated Demand Elasticities for Food Categories in Iraq (1980-2003).

Elasticity of Demand For	With Respect to Price change of				
	Staples	Livestock Products	Dairy products and Eggs	Fruits and Vegetables	Vegetable Oil and Fat
Staples	-0.632*** (0.166)	0.063** (0.035)	0.259*** (0.049)	0.128*** (0.029)	0.182 (0.150)
Livestock Products	0.478** (0.268)	-0.401*** (0.123)	0.271*** (0.090)	0.103*** (0.044)	-0.451* (0.281)
Dairy products and Eggs	1.446*** (0.274)	0.200*** (0.066)	-0.993*** (0.158)	-0.085* (0.059)	-0.568** (0.259)
Fruits and Vegetables	1.787*** (0.412)	0.190*** (0.081)	-0.212* (0.147)	-0.855*** (0.244)	-0.909*** (0.306)
Vegetable Oil and Fat	4.901** (2.327)	3.080*** (0.601)	1.409** (0.801)	-0.484* (0.374)	-8.906*** (2.321)

Note: The diagonal values are own price elasticities, while the values off the diagonal are cross price elasticities. ***p < 0.01, **p < 0.05, *p < 0.1. The standard errors are shown in parentheses.

3.2.5 Uncompensated own-price and cross-price elasticities (2003-2020)

The estimated Marshallian own-price elasticities of food groups are shown in Table 4. All estimated elasticities have a negative sign and are statistically significant. The demand for vegetable oil and fat was the most sensitive to a change in its own price, while demand for fruits and vegetables is the least sensitive to a change in its own price. This implies that a percent change in the quantity demanded of fruits and vegetables is less than a percent change in the price of this food group.

3.2.6 Expenditure elasticities (2003-2020)

The expenditure elasticities are all positive sign, statistically significant at $p < 0.01$. These results show that staple foods were necessities while other food groups were normal and luxury goods. However, the income elasticities revealed that vegetable oil and fat were the most sensitive to changes in consumer spending on food groups.

Table 4: Uncompensated Demand Elasticities for Food Categories in Iraq (2003-2020).

Elasticity of Demand For	With Respect to Price change of					Income Elasticity
	Staples	Livestock Products	Dairy products and Eggs	Fruits and Vegetables	Vegetable Oil and Fat	
Staples	-0.977*** (0.17)	0.086** (0.044)	0.371*** (0.072)	-0.178* (0.112)	0.051 (0.113)	0.647*** (0.089)
Livestock Products	0.015 (0.297)	-1.723*** (0.251)	-0.058 (0.169)	0.706** (0.346)	-0.656*** (0.255)	1.715*** (0.370)
Dairy products and Eggs	0.69*** (0.246)	0.004 (0.1)	-1.416*** (0.179)	-0.402** (0.221)	-0.179 (0.200)	1.303*** (0.177)
Fruits and Vegetables	-0.924*** (0.308)	0.291** (0.161)	-0.452*** (0.178)	-0.566* (0.441)	-0.268 (0.311)	1.920*** (0.271)
Vegetable Oil and Fat	-10.43*** (2.37)	2.619* (1.72)	1.890 (1.761)	8.599*** (2.697)	-8.627*** (2.307)	5.954*** (0.219)

Note: The diagonal values are own price elasticities, while the values off the diagonal are cross price elasticities. ***p < 0.01, **p < 0.05, *p < 0.1. The standard errors are shown in parentheses.

3.2.7 Compensated own-price and cross-price elasticities (2003-2020)

Except for the fruits and vegetables group, the estimated compensated own-price elasticities are negative sign and significant with inelastic demand for the staple foods group. The compensated cross-price demand elasticities reveal that most of these food commodities were substitute goods, as their cross-price demand elasticities were positive sign and significant as shown in Table 5.

Table 5: Compensated Demand Elasticities for Food Categories in Iraq (2003-2020).

Elasticity of Demand For	With Respect to Price change of				
	Staples	Livestock Products	Dairy products and Eggs	Fruits and Vegetables	Vegetable Oil and Fat
Staples	-0.713*** (0.144)	0.136*** (0.042)	0.473*** (0.077)	-0.062 (0.111)	0.165* (0.122)
Livestock Products	0.715*** (0.220)	-1.590*** (0.235)	0.213 (0.189)	1.014*** (0.384)	-0.352 (0.257)
Dairy products and Eggs	1.222*** (0.200)	0.105 (0.093)	-1.210*** (0.189)	-0.169 (0.215)	0.051 (0.212)
Fruits and Vegetables	-0.141 (0.254)	0.440*** (0.151)	-0.149 (0.190)	-0.222 (0.436)	0.071 (0.321)
Vegetable Oil and Fat	-8.006*** (2.333)	3.082** (1.720)	2.831* (1.770)	9.667*** (2.671)	-7.574*** (2.345)

Note: The diagonal values are own price elasticities, while the values off the diagonal are cross price elasticities. ***p < 0.01, **p < 0.05, *p < 0.1. The standard errors are shown in parentheses.

4. Conclusion

Examining food demand and estimating elasticity coefficients provides useful information to better understand how different populations consume food as a function of income and food prices. Estimated income and price demand elasticities of imported food are valuable for policymakers and businesses to predict likely changes in the quantity of food imports demanded given expected changes in import prices and consumer expenditure. The estimated elasticities can be used to simulate the effects of market changes on import quantities and expenditures. This information can be useful in studying the impact of trade policies on domestic consumers.

Own-price, cross-price, and income elasticities were estimated econometrically. All estimated own-price elasticities are negative, consistent with economic theory. Demand for staples was elastic in the first studied period, while it became inelastic in the second studied period. This is an indication that the production of staples in Iraq is negatively affected by environmental changes and other factors leading to increasing demand for imported staples. Therefore, it is recommended that more investment happens in the domestic production of these food categories to meet the demand for these products in case the price of imported products increases, and also to guarantee food security for the entire nation. In contrast, demand for livestock products changed from inelastic demand to elastic demand as there is more attention from the government to develop local livestock production in Iraq. The demand for food categories remains unchanged in all studied periods.

The estimated expenditure elasticities suggest that income-related measures generally have a larger effect on promoting food consumption than price-based policies. Staples were considered luxury products in the first period but they became necessities after that as the country imports different types of these products in large amounts. In contrast, fruits and vegetables became luxuries in Iraq after they were necessities. As the cost of producing some domestic fruits and vegetables is high and it cannot compete with the higher quality of imported goods, the Iraqi markets are dominated by imported fruits and vegetables. In practice, any attempt to enhance the dietary program of Iraqi households would increase demand for those products that are considered luxuries by the Iraqi people. Compared to other food categories, the annual average price of imported dairy products and eggs was the highest, suggesting an increase in the domestic production of these products to assure cheaper and more affordable prices of these products for consumers. It will also increase job opportunities and increase revenues for local investors.

As this study estimated demand elasticities for imported food groups, it is recommended that future studies conduct demand analysis at the household level to capture the impact of demographics on the demand for different food types in Iraq. By conducting such studies, the policymakers would have a better insight into the food environment and therefore helping them to improve the food system in Iraq.

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تقدير الطلب على فئات الأغذية المستوردة في العراق

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المستخلص البحث

يعتمد العراق إلى حد كبير على الأسواق العالمية في توفير الغذاء لسكانه. وتعتمد أسعار الأغذية المستوردة بشكل كبير على أسعار النفط الخام في الأسواق العالمية، لذا فإن أية صدمة في أسعار النفط سوف تؤثر على أسعار السلع المستوردة، ومن ثم على حجم استهلاك المحلي من هذه السلع في البلد. عليه لا بد من دراسة الطلب على الأغذية المستوردة في كل فترة زمنية. ووفقاً لمعرفتنا بصفتنا باحثين، لا توجد دراسة متاحة من الدراسات السابقة تقدم تقديراً لمرونة الطلب على الأطعمة المستوردة كمجموعات. لذا، يُعتبر هذا البحث الأول الذي يدرس الطلب على مجموعات الأغذية المستوردة في العراق. وبالتالي، فإن الهدف الرئيسي لهذا البحث هو تقدير مرونة الطلب على عدة فئات من الأغذية المستوردة في العراق. وباستخدام نموذج نظام الطلب المثالي تقريباً لتحليل الطلب على الأغذية المستوردة في العراق من عام 1980 إلى عام 2003 ومن عام 2003 إلى عام 2020. وقد تم الحصول على البيانات الخاصة بالدراسة من المصادر الثانوية. وأظهرت النتائج الرئيسية أن بعض فئات الأغذية تصبح غير مرنة بعد أن كانت مرنة في الفترة الأولى. وبالمقابل، يصبح الطلب على بعض مجموعات الأغذية أكثر حساسية للسعر في الفترة الثانية بعد أن كان أقل حساسية للسعر في الفترة الأولى. هناك أيضاً تغييرات في بعض فئات الأغذية بعد أن أصبحت سلع كمالية في الفترة الثانية. توفر نتائج هذه الدراسة رؤى قيمة حول ديناميات الطلب على الاستيراد الغذائي في العراق ولها آثار سياسية من خلال مساعدة صناع القرار في الاستثمار في الإنتاج المحلي لبعض مجموعات الأغذية.

نوع البحث: ورقة بحثية

المصطلحات الرئيسية للبحث: تحليل الطلب، المرونة، واردات الغذاء، النظام الطلب الأقرب للأمثالية (AIDS)، العراق.

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