

Variables Associated with Household Food Consumption Expenditure in Alexandria

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Abstract: This study seeks to study some socio economic and behavioural variables associated with Household Food Consumption Expenditure in Alexandria. A quantitative study was conducted on a simple random sample of 150 housewives who frequented non-governmental organisations (NGOs). Data were collected by using a questionnaire through personal interview and analysed statistically using (SPSS V.22). Results indicate statistically significant relationships between the percentage of household spending on food and several socio-economic variables. The regression model explains 26.1% of the variation in food expenditure share ($R^2 = 0.261$), with a statistically significant F value, indicating acceptable explanatory power. The regression analysis confirms that monthly income is the most significant determinant of the proportion of income spent on food, with higher income associated with a lower expenditure share. Monthly income shows a significant negative association with food expenditure share, suggesting that as income increases, the proportion of income allocated to food declines, consistent with Engel's law. Other variables such as age, education and family size show partial or indirect relationships. Behavioural factors, such as consumption rationalisation and purchasing motives, remain underdeveloped limiting households' ability to optimise their resource use and management. Recommendations include developing and delivering specialised training and guidance programmes in rational consumption and financial management across all aspects of daily life through targeted Home Economics programmes.

Keywords: *Food consumption, Family expenditure, Consumer motives, Rational consumption*

Introduction

Consumer behaviour research enables better understanding and forecasting not only of the subject of purchases, but also of purchasing motives and purchasing frequency (Schiffman & Kanuk, 2004). Cultural, social and economic factors can affect family consumption and guide family behaviour toward one consumption pattern over another (Boufarsen et al., 2018).

Engel's functions are widely used in household budget analysis to examine consumer demand using cross-sectional data under constant price assumptions, where demand for goods and services is influenced by multiple factors identified in economic theory (Eman et al, 2023).

An Engel function demonstrates the relationship between a consumer's income (or total expenditure) and the amount of a specific good or service consumed (Lewbel & Pendakur, 2008). A study conducted by the Central Agency for Public Mobilisation and Statistics in 2013 (CAPMAS, 2013) indicated that the average actual consumption of an Egyptian household was EGP 25,827.9 (approx. 429 Euro as at 2026), and the average annual household consumption expenditure was EGP 25,388.6 (approx. 422 Euro as at 2026). More recently, food was identified as the main expenditure item in the family budget in Alexandria (Elenezi, 2016).

Background to the study

Purchasing is a vital part of family life, where rational consumers aim to maximise benefits through informed buying decisions. Household consumption expenditure reflects purchasing power and spending behaviour on goods and services and serves as an important indicator for analysing economic growth, inflation and overall economic performance (Abdelgalil, 2004). Consumption represents the main objective of production, as consumers seek not only to satisfy basic needs, but also to achieve wellbeing and a decent standard of living while maintaining balance between income and expenditure (Ghanem and Al-Jaouni, 2010).

It has long been known that consumer behaviour is shaped by cultural, social, psychological and economic factors. Cultural traditions, social values, media, advertising and reference groups significantly influence consumer preferences and decisions (Hawkins et al., 1998). Psychological factors such as needs, motives, perceptions and attitudes interact with economic conditions, where purchasing power, income, saving behaviour, inflation and credit availability affect consumption patterns and consumer satisfaction (Abdel Hamid, 2010; Boufarsen et al., 2018; Qamar et al., 2022). Globalisation and improved transportation have promoted a widespread consumer culture that encourages higher spending and adoption of new consumption patterns (Jadoon et al., 2021). Advertising also plays a strategic role in shaping consumer behaviour by influencing emotions, beliefs and purchase intentions, particularly when advertisements are appealing, informative and relatable (Arora & Jain, 2021; Cherkaoui et al., 2024; Kotler, 2003).

Food consumption specifically is similarly influenced by multiple psychological, social and cultural factors (Guiné, 2021, Jayasinghe et al., 2025), as well as environmental factors such as variety available, price, package size, lighting and social interaction (Wansink, 2004). Engel's Law is widely used to analyse food-related consumption patterns, assess welfare and living standards, estimate income elasticity and inform policies on poverty, inequality and food security (Burzig & Herrmann, 2012). Engel's Law specifically states that as income rises, the

share of income spent on food decreases despite possible increases in total food spending (Si & Clements, 2019).

All the above literature highlights that consumer behaviour and expenditure are shaped by interacting factors, with food spending being the most essential component. Household budget surveys, such as those by the Egyptian agency CAPMAS, (2013), show that food expenditure is a key indicator of societal well-being, with lower-income households allocating a higher share of their income to food.

In light of economic changes—declining purchasing power, rising prices, market diversification, advertising influence and population growth—the present study focused on analysing household food consumption in Alexandria. It was grounded in the importance of meeting basic nutritional needs while examining how shifting economic and living conditions affect spending patterns. Indeed, this study can be also considered a means of measuring living standards and nutritional status, enabling the identification of best practices that can be implemented for women through Home Economics lessons. These practices would aim to improve food consumption habits, thereby enhancing the nutritional status of family members and rationalising spending. Furthermore, the study serves as an indicator that can assist development planners in formulating appropriate economic policies to achieve social and economic development for families.

Study problem

The Information and Decision Support Centre [IDSC]'s (2025) report on the Egyptian food and beverage sector highlights demographic factors, urbanisation and natural demand trends that support increased spending. Specifically, the Egyptian market has suffered from persistently high inflation over the past five years, posing challenges as low- and middle-income consumers feel the strain. This is expected to continue until 2028, with continued growth in food and beverage spending anticipated as inflationary pressures subside and the underlying drivers remain strong. The main downside risks over the next 10 to 12 months are attributed to regional geopolitical shocks and commodity price volatility.

The research problem lies in the exacerbation of income inequality between social classes in general, in Alexandria, as a result of several economic variables, such as the decline in the exchange rate, the resulting high inflation rate and the Russian-Ukrainian war. This has led to the emergence of new economic problems in Egyptian society due to negative changes in spending and consumption patterns regarding food commodities, which in turn has resulted in a decline in the standard of living and an increase in the food gap.

Research objectives

This research aims to study some socio-economic variables related to household food consumption expenditure in Alexandria, by achieving the following objectives:

- 1- Identifying some characteristics of the respondents.
- 2- Determining the percentage of expenditure on basic food items from the respondents' household budgets.
- 3- Determining the level of consumption rationalisation practices
- 4- Identifying the respondents' motivations for spending on food
- 5- Studying the correlational or regressive relationships between the percentage of spending on food items among the Alexandria respondents (as a dependent variable) and some of the respondents' socio-economics characteristics; (respondent's age, husband's age, respondent's education, husband's education, family size, monthly income).

Theoretical framework

This research is based on the following three theoretical constructs and concepts:

1. The classical theory of Consumer Demand

Economic theory assumes the existence of a utility function for each consumer. This concept of utility is based on the existence of monetary income for each consumer, as well as the availability of a number of different goods and services. The main problem facing the consumer is how to allocate their limited income among these goods and services in a way that maximises their satisfaction.

The utility function has a maximum value and is capable of being maximised. Consumers strive to maximise the utility they derive from various goods and services, provided that their income equals their expenditure. There are many demand functions that take many different mathematical forms. This depends on: a) the price of the good, b) the quantity of the good consumed, and 3) the consumer's income (Inoua & Smith, 2020).

2. The concept of Demand Functions

Ghanem and Al-Jaouni (2010) explain that an individual exhibits rational behaviour when satisfying their needs by maximising utility within their available resources, despite the observed variations in individual or family spending patterns on different goods and services. Researchers in economics and statistics have identified standard patterns for how individuals allocate their spending on food, clothing, housing and other major expenditures. These patterns appear in a regular, familiar and predictable manner across different societies.

Indeed, one of Engel's laws states that the average individual or family's consumption behaviour changes regularly with changes in income level. The percentage of income spent on necessities decreases as income increases. The percentage of income spent on luxury goods increases as income increases. As for goods that fall between necessities and luxuries, the percentage spent on them is expected to remain constant regardless of income level.

3. The Engle Functions

Consumer demand for any good or service depends on several factors identified by economic theory, including consumer income, the price of the desired good, the prices of substitute or complementary goods and consumer preference (Wu, 2023). Engle functions are among the most widely used demand functions in household budget analysis, looking at consumer demand using cross-sectional data, based on the assumption of price stability. Price stability is a feature of household budgetary surveys which are conducted over a short period (a specific week or month of the year). Therefore, no significant changes in the prices of goods and services are expected during the survey period, and their stability can be assumed. For the same reasons, consumer preferences can also be assumed to be constant over the same period. Consequently, all consumers will encounter the same prices, and these variables can be considered constant when dealing with the data. This means that spending on a good or group of goods depends solely on income.

Regional food expenditure patterns

Several studies have examined household consumer spending, particularly food expenditure in relation to household characteristics and the broader economic environment (Chai & Moneta, 2010; Huang & Chen, 2022). Boufarsen's study (2018) examined the motives and attitudes of consumer behavior related to food waste reduction, the findings showed a significant negative relationship between consumers' attitudes toward reducing food waste and the housewife's education level, household income, and family size among both Kuwaiti and Egyptian households. The study found that the primary motivations for purchasing and preparing excessive amounts of food differed between the two countries; among Kuwaiti households, the main drivers were pride and social prestige among friends and relatives, the desire to receive praise from family members and relatives, and a sense of social responsibility to share surplus food with the poor. In contrast, Egyptian households were mainly motivated by pride and prestige, personal satisfaction, and the desire to receive praise from neighbors and relatives through the exchange of a variety of food dishes during different social occasions. In Nigeria, Umeh and Asogwa (2012) identified an indirect relationship between household income and the share of food expenditure, alongside a direct relationship with non-food expenditure, especially housing, clothing, education, and health expenses. Donkoh et al. (2014) reported that in Ghana food expenditure represented 40% of total household expenditure, while self-produced food consumed by households accounted for an additional 10.5%.

A 2019-2020 survey on Income and Expenditure and Consumption conducted by the Central Agency for Public Mobilisation and Statistics CAPMAS (2020) and the 2025 report of the IDSC describe the relative distribution of actual household expenditure/consumption across major items (table 1), as well as the relative distribution of actual household consumption expenditure on food and beverage items (table 2) in Egypt.

Table 1 *The Relative Distribution of Actual Household Expenditure/Consumption Across Major Items*

Item	%	Item	%	Item	%
Food and drinks	31.1	Housing and related expenses	19.2	Transportation	6.7
Education	5.7	Services and healthcare	10.4	Communications	2.5
Furniture and furnishings	4.3	Clothing, fabrics, and footwear	5.6	Restaurants and hotels	4.8
Alcoholic beverages and tobacco	4.2	Miscellaneous goods and services	4.4	Culture and Entertainment	2.3

Source CAPMAS study 2019-2020 (Percentages add up to slightly over 100 due to rounding.)

The distribution of household expenditure across major consumption items provides an informative overview of prevailing spending patterns. A substantial share of total expenditure is directed toward food and drinks and housing-related expenses, together accounting for more than half (50.3%) of household consumption, which underscores the central role of basic needs in shaping household budgets.

Table 2 *The Relative Distribution of Actual Household Consumption Expenditure on Food and Beverage Items**

Item	%	Item	%	Item	%
Meat	26.1	Cereals and bread	13.7	Milk cheese eggs	13.0
Vegetable	16.2	Fish	6.4	Fruits	5.6
Oils fats	7.9	Sugar	4.8	Non-alcoholic drinks	4.1
Others**	2.3				

*Source CAPMAS 2019-2020; **Ketchup, mayonnaise, spices, vinegar etc.

As seen in table 2, household food expenditure was primarily concentrated on essential food groups, with meat representing the largest share (26.1%), followed by vegetables (16.2%), cereals and bread (13.7%) and milk, cheese and eggs (13.0%). Moderate spending is observed for oils and fats (7.9%), fish (6.4%) and fruits (5.6%); while smaller shares are allocated to sugar,

non-alcoholic beverages and other minor food items. Overall, the pattern reflects food consumption largely oriented toward staple and core dietary components.

The study by Eman et al (2023) in the Gharbia governate in Egypt, illustrates that the relative importance of monthly urban household spending on plant-based goods increased among lower-income groups, while the relative importance of monthly urban household spending on animal-based goods increased among higher-income groups compared to lower-income groups.

Furthermore, the expenditure elasticity of food groups was found to be less than one in both urban and rural areas. An examination of the effect of regional variation on expenditure functions for the low-income group revealed that bread and cereals and vegetables are considered essential food groups, with expenditure elasticity of 0.422 and 0.454, respectively. In the high-income group, the expenditure elasticity of vegetables, bread and cereals and oils and fats was 0.621, 0.525 and 0.455, respectively. Regarding the problems faced by respondents, the high cost of living was the primary concern, cited by approximately 76.8% of the total sample, while the proposal to control prices was supported by approximately 74.3% of the total sample.

In October and November 2022, the International Food Policy Research Institute (IFPRI) surveyed more than 6,000 'poor' and 'near-poor' households in Egypt to assess changes in consumption habits following the economic pressures that emerged after March 2022 (Abay et al., 2023). The findings showed that households reduced consumption of many unsubsidised food items, while subsidised food consumption remained relatively stable. For instance, 85% of households reported reducing meat consumption, and 75% reduced chicken and egg consumption due to rising prices. These reductions are concerning because such foods are important sources of protein and essential nutrients, indicating a potential decline in dietary quality. Fish and milk consumption were similarly affected by substantial price increases. The survey also revealed that poor households were the most vulnerable to food price inflation because they allocate a larger share of their income to food consumption. In this context, the national food subsidy program (Tamween) plays a significant role, reaching approximately 73% of 'poor' and 'near-poor' households in Egypt (Abay et al., 2023).

From the previous studies we can conclude that food is generally the primary expenditure item in the household budget, with a high percentage of income allocated to food items. Furthermore, the average expenditure on food and food commodity groups increases with rising income levels, and other variables. A critical perspective across these studies suggests that, although they collectively highlight the impact of income and inflation on food consumption patterns, differences in geographic context, socioeconomic conditions and methodological approaches may affect the comparability and generalisability of findings. On the other hand, they provide a broader understanding of how economic pressures, subsidy

systems and household characteristics interact in shaping consumer behaviour and expenditure patterns. Of note is a study by Hassieb and Anwar (2015), conducted in villages in Alexandria and Buhaira governorates, which found that household consumption rationalisation practices had not reached advanced levels of rationalised spending.

Study hypothesis

There are no correlational or regressive relationships between the percentage of spending on food items among the Alexandria respondents (as a dependent variable) and some of the respondents' socio-economic characteristics, (respondent's age, husband's age, respondent's education, husband's education, family size, monthly income).

Research methodology

Sample choice and data collection

One hundred and fifty (150) women were randomly selected from among those who frequented a local Non-Governmental Organisation (NGO) and invited to participate in the study. After receiving consent, data was collected through personal interviews using a questionnaire specifically designed for this purpose after pilot-testing. The collected questionnaire data was coded and entered and stored securely on a computer. Data collection took place in September 2025.

Data analysis

The data used in the study include average consumer spending by household income, size, type, age and education. The research adopted a descriptive quantitative approach. The operational definitions are presented in table 3.

Measurement of independent and dependent variables involved both raw scores and calculated scores. Raw scores were used for the respondent's age, husband's age, family size and monthly family income, and the average age of children was measured by summing the ages of the different children divided by the number of children. Education levels were adopted from UNESCO International Standard Classification of Education (ISCED) (UNESCO, 2012) taking into account local classifications. Parents' education was divided into four levels: Illiteracy (0), Primary (1), Lower Secondary (basic education) (2), Upper Secondary (3) and Tertiary (4).

The Rational consumption variable was measured through 10 statements reflecting the respondents' practices to rationalise consumption (table 4). Using a Likert scale, respondents were given the options "always," "sometimes" and "rarely" with scores of 1, 2 and 3 for positive practices aimed at rationalising consumption, and scores of 3, 2 and 1 for negative practices that would lead to excessive food consumption. Thus, the respondents' scores ranged between 10 and 30. The scores obtained by the respondents were then divided into three categories:

incorrect practices (less than 17 points), somewhat correct practices (17-23 points) and correct practices (more than 23 points).

Table 3 *Operational Definitions Used for Data Analysis*

Item	Definition
Household consumption expenditure	The amount of household spending on food consumer goods as a percentage of household income.
Actual consumption	Household Consumption Expenditure + In-Kind Transfers + Subsidies
Total expenditure	Household Consumption Expenditure + Non-Consumption Expenditure (Transfer Payments)
Consumption rationalisation practices	Set of procedures that the respondents take to rationalise food consumption during the stages of purchasing, preparing, storing, and serving food to family members.
Motives for Purchasing Food	Stated reasons that drive individuals to purchase various food items, considering the products available on the market, their purchasing power, and their available financial resources. (Motives are the basis of all purchasing behaviour when a need arises, that stimulating behaviour in a way that achieves the desired satisfaction. [Mohamed, 2007])
Percentage of Income Spent on Food	The amount of household income spent on food as a percentage of the total monthly household income.

Table 4 *Measuring the Rational Consumption Variable*

Item	Statement on consumer practice
1	Making logical choices to maximise their personal satisfaction (utility) within budget limits, by weighing costs and benefits
2	Making logical choices to maximise their personal satisfaction (utility) by possessing consistent preferences and having complete information
3	Making some food items, such as jam from available household resources
4	Making cakes and sweets at home as a cheaper option than store-bought
5	Preparing more meals than the family needs during holidays and special occasions
6	Accurately determining the nutritional needs of family members to reduce food expenses
7	Minimising food waste at all stages of preparation
8	Excessive consumption of food items due to eating habits
9	Frequent visits to supermarkets increasing the desire to consume food items different from usual
10	Not considering religious habits when determining the quantity of food consumed.

The variable considering motives for purchasing food products was measured through ten statements reflecting the respondents' reasons for purchasing food products (table 5). The respondents were given choices of “always”, “sometimes” and “rarely” with scores of 3, 2 and 1 for positive statements and the opposite for negative statements. Thus, the respondents' scores ranged between 10 and 30. The scores were divided into three categories: irrational motives (less than 17 points), somewhat rational motives (17-23 points) and rational motives (more than 23 points).

Table 5 *Measuring the Motives for Food Purchase Variable*

Item	Statement on motive
1	Being influenced by media, newspapers, friends' opinions
2	The way food products are displayed and the external packaging which makes choosing quicker
3	Going to buy food products after seeing advertisements and promotional campaigns
4	Not buying any food product without comparing it with alternative products
5	Buying a quantity of goods that may exceed actual needs and storing them
6	Considering the tastes and preferences of family members
7	Buying food products that highlight social status among neighbours and friends
8	Choosing expensive food products due to their nutritional value
9	Buying the most well-known brand of food products
10	General prior purchasing experience

The dependent variable was measured through two questions: A direct question about the approximate amount of household income spent on food items in the previous month and a second question asking respondents to mention the quantity of certain food items consumed in the month preceding the study and the unit price. The food items included 24 products in different groups, namely: vegetables and fruits; meat, poultry, fish, eggs, beans and lentils; grains, flour, pasta, rice, potatoes, bread; dairy products, canned goods; fats such as cooking oil, margarine, ghee; tea; sugar, soft drinks, and others. The percentage of the family's monthly income spent on food was calculated as the Total amount of money spent on food / Monthly household income. The respondents were then divided according to the percentage of income spent on food into three categories: (less than 50%), (50-75%), and (more than 75%).

Results

Study sample demographics

The results in table 6 reveal that the majority of respondents (81.4%) were under 50 years old with 42.7% and 38.7%, respectively, being young and middle-aged. Similarly, the majority of respondents (79.3%) had husbands under 50 years old. At this relatively middle age, the adults

would be expected to be more experienced and knowledgeable about household spending and consumption (Eberhardt et al, 2019).

Just over half (53.3%) of the respondents had children whose average age was less than 14-years-old, with implications for increasing material needs for food, clothing, education, healthcare, recreation and other necessities. Results indicated that more than half of the respondents (52.7%) had a small family size, which could influence the scale of their living needs and requirements.

A fairly high percentage of respondents had a basic education (74.7 %), while a smaller proportion of their husbands (47.3%) had a basic education

With respect to household income, 91.3% of the respondents had low to average income, with 48.0% having an income of 1500 to less than 4000 EGP/ month (25-67 Euro as at June 2026) and 43.3%, having an income of 4,000 to less than 6,000 EGP/month (67-100 Euro as at June 2026). The third category included respondents with an income level of more than 6,000 EGP/month (100+ Euro as at June 2026). A majority of respondents' households (58.7%) benefitted from financial or in-kind support.

Financial income management is a key aspect of daily family activities, highlighting the vital role of the homemaker in fostering awareness among family members regarding sound consumption patterns within income and budgetary means and instilling values and habits that ensure resource conservation (Basabrin, 2018).

Table 6a Distribution of Respondents According to Select Socio-Economic Characteristics

Variable			n			% (N=150)		
Family size								
Small (less than 5 members)			77			51.3		
Moderate (5-7 members)			63			42.0		
Big (7+ members)			10			6.7		
Total			150			100		
Variable	n	% (N=150)	Variable	n	% (N=150)	Variable	n	% (N=150)
Housewife's age			Husband's age			Children's age		
Young (> 40 years)	64	42,7	Young (> 40 years)	59	39.3	>14 years	80	53.3
Middle (40- >50)	58	38.7	Middle (40- >50)	60	40.0	15- 25	61	40.7
Old (+50)	28	18.6	Old (+50)	31	20.7	26- 36	9	6.0
Total	150	100		150	100	Total	150	100

Table 6a Distribution of Respondents According to Select Socio-Economic Characteristics (CONTINUED)

Variable	n	% (N=150)	Variable	n	% (N=150)
Housewife's Education			Husband's Education		
Basic education	112	74.7	Basic education	71	47.3
Upper Secondary	34	22.7	Upper Secondary	42	28.0
University	4	2.7	University	37	24.7
Total	150	100	Total	150	100
Variable	n	% (N=150)	Variable	n	% (N=150)
Income			Household benefits from financial or in-kind support		
Low (1500- >4000 EGP)	72	48.0	Yes	62	41.3
Moderate (4000- >6000 EGP)	65	43.3	No	88	58.7
High (acceptable) (6000+ EGP)	13	8.7			
Total	150	100	Total	150	100

Percentage of spending on food from the household budgets of respondents

Table 7 presents the distribution of respondent households according to the proportion of their monthly income allocated to food expenditure. Results reveal that the largest share of respondents (41.3%,) spent more than 75% of their monthly income on food. This is a striking result, suggesting that a substantial proportion of households faced severe budget constraints, where food consumption dominated overall expenditure. Such a high share typically reflects limited income levels, high food prices, or both, and may leave little room for other essential needs such as healthcare, education, and housing.

A considerable proportion (36.0%) allocated between 50% and 75% of their income to food. Households in this category were also likely under notable economic pressure, although relatively less constrained than those in the highest bracket. Their spending pattern suggests a continued prioritisation of food, likely at the expense of other essential needs, savings or discretionary consumption.

In contrast, only (22.7%) of respondents spent less than 50% of their income on food, suggesting comparatively better economic conditions, or more efficient consumption patterns. These households may have greater financial flexibility and the ability to diversify their expenditures beyond basic food needs.

Table 7 *Distribution of Respondent Households According to the Percentage of Monthly Income Spent on Food*

Percentage of monthly income spent on food	n	% (N=150)
Less than 50%	34	22.7
50% - 75%	54	36.0
More than 75%	62	41.3
Total	150	100

Correlational and regression relationships between the percentage of spending on food items and demographic characteristics of respondent households

Table 8 shows the results of multiple linear regressions looking at the share of the household income spent on food as the dependent variable and multiple demographic characteristics as independent variables. The results indicate statistically significant relationships between the percentage of household income spent on food and several socio-economic variables, and the six variables collectively correlate with the percentage of expenditure on food items with a multiple correlation coefficient of 0.506, which is a significant correlation. The F-value reached 7.572, a significant value at the 0.01 level. This means that the six independent variables collectively explain 26% of the variance in the percentage of expenditure on food items, and the remaining percentage is attributed to other factors not included in the study.

The partial regression coefficient for each of the variables – the education of the respondent, education of the husband, and family size - is significant at the 0.01 level. As the number of years of education of the respondent and the number of years of education of the husband increases, the percentage of expenditure on food items decreases and, as the family size increases, the percentage of expenditure on food items increases. Meanwhile, the partial regression coefficient of the relationship between the age of the respondent and of the husband is significant at the 0.05 level, indicating that increased age of both the respondent and the husband leads to a higher percentage of spending on food.

This is confirmed by the simple correlation coefficient, demonstrating that the relationship between each of these five variables and the percentage of spending on food is constant (or intrinsic) and unaffected by excluding the effects of the other variables.

Table 8 *Correlational and Regression Relationships Between the Percentage of Spending on Food Items and Demographic Characteristics of Respondent Households Dependent and the Independent Variables*

Independent variables	Partial regression coefficient	t-value	t-significance level	Correlation coefficient
Respondent's age	0.975	1.864	0.080	0.173*
Husband's age	1.025	1.803	0.058	0.226*
Respondent's education	0.770	1.593	0.113	- 0.0446**
Husband's education	0.385	0.863	0.380	- 0.407**
Family size	1.107	0.700	0.485	0.252**
Monthly income	0.007	2.367	0.019	-0.317**

*sig. at 0.05; **sig. at 0.01; Multiple correlation coefficient value = 0.506; F value =7.573**; R2 value 0.261

In other words, while the correlation coefficient (r) shows a significant relationship between monthly income and the percentage of spending on food, this relationship was not significant in the partial regression coefficient. This means that the effect of the monthly income variable diminishes when the effects of the other variables are excluded.

These results can be interpreted as follows: As the ages of the respondents and the husband increase, along with family size, the percentage of spending on food increases. The percentage of spending on various goods increases as living needs and requirements rise, including food as a basic commodity. As the number of years of education of the woman being interviewed, the number of years of education of her husband, and the family's monthly income increase, the percentage of spending on food items decreases. One can propose that a more advanced education leads to a higher income employment and/or

provides the knowledge and information to accurately determine what is needed to meet the nutritional needs and requirements of family members. Furthermore, the higher age of the head of the household provides the experience and expertise necessary to efficiently select and purchase food items within the family budget.

These results are consistent with those of the Alali (2008) study, which found that average spending on food items increases with family size, the head of household's education level and age. However, they differ in that average spending on food and food groups increases with income. Indeed, monthly income shows a significant negative association with food expenditure share, suggesting that as income increases, the proportion of income allocated to food declines, consistent with Engel's law.

Education levels of both respondents and husbands are also negatively correlated with food spending share, indicating that higher educational attainment may be associated with more diversified expenditure patterns. In contrast, respondent and husband age show positive correlations with food expenditure share, implying greater prioritisation of healthy food consumption among older households; possibly seeking to buy food with higher nutritive quality to meet health needs, which foods may also be expensive.

Dietary transition based on income

Table 9 demonstrates a dietary transition associated with rising income, moving from plant-based dominance toward increased consumption of animal-based products. It indicates the average household income levels among the respondents alongside the percentage distribution of food expenditure between plant-based and animal-based products across the three income categories.

At the **low-income level** (average income: 3280.30 EGP [55 Euro as at June 2026]), households allocate a slightly higher share of their food expenditure to plant-based products (53.0%) compared to animal-based products (47.0%). This reflects reliance on relatively cheaper and more accessible food items such as grains, legumes and vegetables, which are typically staple components in lower-income diets, despite the slight high prices of legumes in the markets

In the **moderate-income category** (5830.20 EGP) [97 Euro as at June 2026]) the distribution remains relatively balanced, with plant-based expenditure at 52.6% and animal-based at 48.4%. This suggests only a marginal dietary shift, indicating that households in this bracket begin to diversify their diets, but still maintain a strong dependence on plant-based foods. The limited change implies that income increases at this stage are not yet sufficient to significantly alter consumption patterns.

A more pronounced shift is observed in the **higher-income group** (9970.5 EGP) [166 Euro as at June 2026]), where expenditure on animal-based products rises substantially to 56.8%, heavily surpassing plant-based expenditure (43.2%). This highlights a qualitative transition in diet, as households with higher incomes tend to consume more protein-rich and often more expensive food items such as meat, dairy and poultry. It reflects changing preferences, improved purchasing power and possibly greater awareness of the value of nutritional diversity.

Table 9 Average Expenditure (in EGP) on Plant- Versus Animal-Sourced Foods According to Income Categories

Categories of household income	Average of household income spent on food (EGP)	Expenditure on plant-based products (%)	Expenditure on animal-based products (%)
Low monthly income	3280.3	53.0	47.0
Moderate monthly income	5830.2	52.6	48.4
High monthly income	9970.5	43.2	56.8

Rationalising consumption

Data in table 10 show the distribution of households according to their level of consumption rationalisation practices. Results portray that the majority of households (80.7%) fell within the moderate level of consumption rationalisation. This indicates that a large proportion of the respondents demonstrated a reasonable, but not optimal, degree of awareness and

behaviour regarding efficient resource use and expenditure management. These households were likely practicing some cost-saving and planning strategies, but not in a consistently rigorous or highly efficient manner. In contrast, a minority of respondents (14.0%) fell within the low level of consumption rationalisation, suggesting limited engagement in rational consumption practices. This group may have lacked sufficient awareness and/or skills to manage consumption effectively.

Only a very small proportion (5.3%) of respondents fell within the high-level category. This indicates that very few households exhibited strong and consistent consumption rationalisation behaviours, such as careful budgeting, prioritisation of needs over wants and efficient management of their resources.

Table 10 *Level of Consumption Rationalisation Practices*

Consumption Rationalisation Level	N	%
Low	21	14.0
Moderate	121	80.7
High	8	5.3
Total	150	100

(Based on scoring criteria: Low=less than 17 point; Moderate=17-23 points; High=24-30 points)

Motives for purchasing food products

Studying motives helps explain consumer behaviour. It provides important insight into consumer behaviour patterns, particularly in relation to decision-making processes in food consumption. Table 11 shows that the motives for purchasing food products among the respondents were categorised into irrational, somewhat rational, and rational levels. The majority of respondents (76.7%) fell within the somewhat rational category. This indicates that most households exhibited a balanced but not fully optimised approach to food purchasing decisions. While they may have considered factors such as price, quality and necessity, their choices were not always consistently guided by strictly rational or planned behaviour. This suggests partial awareness and application of informed decision-making.

A notable proportion (21.3%) were classified under irrational motives. This group likely made purchasing decisions influenced by factors such as impulse buying, marketing stimuli, habits, or social pressures rather than careful

evaluation of needs and resources. Such behaviour may contribute to inefficient spending and less optimal food consumption patterns.

In contrast, only a small number of respondents (2.0%) fell into the rational category, indicating that very few respondents consistently based their food purchasing decisions on well-informed, needs-aligned and economically efficient criteria. This highlights a significant gap in fully rational consumer behaviour within the respondents.

Table 11 *Distribution of Respondents According to Their Rationality Level of Motives for Purchasing Food*

Level of rationality of motives	N	%
Irrational motives	32	21.3
Somewhat rational	115	76.7
Rational	3	2.0
Total	150	100

(Based on scoring criteria: Low=less than 17 point; Moderate=17-23 points; High=24-30 points)

General discussion

Nearly one half (41.3%) of the study respondents spent over 75.0% of their monthly income on food, reflecting the increasing financial pressure associated with food expenditure among these households. These results are consistent with the studies of Donkoh et al. (2014) and Umeh and Asogwa (2012), which emphasised that household food expenditure represents a substantial share of family income, particularly among low and middle income families. The results also support the more recent study of Abay et al. (2023) regarding the effect of rising food prices on Egyptian households' dietary and spending patterns.

The shift towards a high animal foods diet as income increases, apart from reflecting easier economic accessibility, possibly stems from a desire for consuming more variety and more social status-giving foods (Steckley, 2025). The CAPMAS (2019-2020) study had shown that the percentage of food expenditure for animal-based products was approximately 45%, whereas in the present study high-income households were spending over 56% of their income on such foods. This finding shows the strength of cultural food norms, given that the current EAT-Lancet report is proposing a plant-forward diet for

both human health and planetary health reasons, apart from food justice goals (Rockström et al., 2025).

A high proportion (80.7%) of the respondents showed a moderate level of consumption rationalisation practices while much fewer respondents (5.3%) showed high rationalisation practices. Similarly, the majority of respondents exhibited somewhat rational motives for purchasing food products (76.7%), whereas fully rational purchasing motives emerged for only 2.0% of the study sample. The predominant levels of rational consumption practices and purchasing motives may be explained by inadequate knowledge and skills to counter the influence of marketing and environmental factors on consumer behavior and specifically food purchasing, as discussed by Guiné (2021), Jayasinghe et al. (2025) and Wansink (2004). These authors highlighted the role of social, psychological and environmental stimuli in shaping consumers' food purchasing decisions requiring informed and skilled individuals so that decisions are both wise and responsible in relation to individual and family wellbeing.

The study hypothesis proposed that there are no relationships between the percentage of spending on food items and some socio-economic characteristics of respondents, including age, education, family size and monthly income. However, the descriptive results have suggested that socio-economic conditions may still play an important role in shaping household food expenditure patterns. As already indicated, the high percentage of respondents allocating more than 75% of their income to food may reflect the impact of limited household resources and inflationary pressures, which also aligns with Engel's theory that lower-income households devote a larger share of their income to food consumption. The results are also congruent with those of Eman et al (2023) and Hassieb and Anwar (2015) who demonstrated that household demographic and economic characteristics significantly affect food expenditure patterns in Egyptian families. Therefore, although the hypothesis assumes the absence of significant relationships, the observed expenditure trends imply that socio-economic variables remain influential factors in determining household food consumption and expenditure behaviour.

Conclusion

Main findings

This study confirms that in a sample of Alexandrian women and their households, monthly income is the most significant determinant of the proportion of income spent on food, with higher income associated with a lower expenditure share. Other variables such as age, education and family size show partial or indirect relationships. A higher income was also seen to impact the proportion of foods which are animal-sourced which has implications for human health and planetary health, but also possibly for perceived social status and hedonic value. Notably, behavioural factors such as consumption rationalisation and purchasing motives remain underdeveloped in the study sample, limiting households' ability to optimise their resource use and management.

Study limitations

This study was conducted with a group of women attending particular NGO in Alexandria. Although the demographics show a varied profile, one cannot generalise the findings to all women and households in Alexandria, even those with a lower-income. Moreover, the study was conducted in a period where global food supply and food prices were being impacted by the volatile global economic and food security scenario which may have changed since the time of data collection. Nonetheless, as much detail as possible was presented to give the context for the study and facilitate any comparison.

Recommendations

In light of the study's findings, some recommendations are suggested for policy, practice and research especially in the education and economic sectors:

- Advocating for the inclusion of Home Economics education programmes in all formal educational stages, focusing on resource management, rationalising consumption and spending on healthy, sustainable food in particular;
- Promoting consumer awareness programmes in food management to improve rational purchasing, budgeting practices and plant-forward diets sensitive to personal nutrition needs and cultural principles;

- Providing targeted nutrition education to family food gatekeepers through different NGOs to support balanced, sustainable and cost-effective diets;
- Providing financial management training programmes to adults through different channels to improve skills for accurately identifying needs and evaluating different commodity alternatives, which would help individuals make optimal use of available resources under current economic conditions.
- Increasing opportunities to augment household income (employment, wage support), especially in low-income families to reduce the high food expenditure burden.
- Conducting further research on household food expenditure, incorporating other variables that may affect the percentage of consumer spending which were not included in this study;
- Conducting research on resiliency and dietary patterns among low-income families to identify good practices and use to inform school or programme curricula and educational interventions on responsible resource management, smart consumption and healthy and sustainable lifestyles suite to the Egyptian context

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