Some Factors Affecting Rural Women's Achievement Of Household Food Security In Some Villages In Kafr El Sheikh Governorate

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Abstract:
This study was conducted in an attempt to identify the factors affecting rural women's achievement of household food security and to determine the nature of the relationship between each of the independent variables studied and the degree to which rural women achieve household food security.
The research was conducted in Kafr El Sheikh Governorate, where three centres were randomly selected: Kafr El Sheikh, Desouk, and Qalin. One village was then randomly selected from each of the three centres: Mahalla Mousi, Al-Ajuzin, and Al-Bakatoush, in that order .
The number of rural families in the three villages was counted, reaching a total of 9,245 rural families. Their wives were selected to be included in the study, and using the Craigie and Morgan equation, the sample size was 349 respondents (housewives), with the number distributed according to the representation ratio of each of the three villages in the study, provided that they were responsible for managing their families' food affairs. Data were collected during July and August 2025. Frequencies, percentages, arithmetic means, Pearson's correlation coefficient, chi-square test, Cramer's coefficient of association, Cronbach's alpha, and partial regression coefficient were used in the analysis and presentation.

The most prominent findings were:
-Rural women's participation in achieving household food security, on average, reached 52.7%.
-There is a significant relationship between the degree of rural women's participation in achieving household food security and each of the following independent variables: the respondent's age, the Number of household members, monthly food expenditure, size of agricultural land holdings, size of animal holdings, size of poultry holdings, sources of information, geographical openness, multiple roles of the respondent, husband's profession, type of family, and the respondent's contribution to the family budget.

RESEARCH INTRODUCTION:

Food security is one of the major issues facing the world, one that has received the attention of international organizations and bodies. It is characterized by its multiple dimensions, including humanitarian, economic, and political dimensions.

Despite global progress in all areas over the past decades, the number of hungry people in the world continues to rise. Tens of millions of people have joined the ranks of those suffering from chronic malnutrition. In 2023, statistics showed that 735 million people around the world suffered from chronic hunger, equivalent to 9.2% of the world's population This represents an increase of 122 million people compared to previous years, which is equivalent to one in 11 people in the world. The vast majority of these hungry people in the world live in developing countries. At the same time, multiple forms of malnutrition have begun to threaten the health of millions around the world (Weber Isabella, Merle Schulken 2024, p. 2), (Food and Agriculture Organization, 2023).

Food insecurity in the Middle East and NOrth Africa region has also been a growing challenge. The United Nations estimates that the region has more than 55 million underNOurished people out of a population of 456.7 million. In 2020, the region's share of the total number of underNOurished people was Severe food insecurity in the world is 20%, which is equivalent to one in five people in Africa, a very high percentage considering that the region represents only 6% of the world's population (World Bank, 2021).

According to the 2023 State of Food Security and Nutrition in the World report issued by the Food and Agriculture Organization of the United Nations, the number of people suffering from malnutrition in Egypt during the years (2020-2022) reached about 7.8 million, representing a 7.2% increase due to the significant population growth rate of 43.5%. also Egypt ranking 77th globally. In addition, according to the 2022 Global Hunger Index, Egypt ranked 57th out of 121 countries (Egyptian Center for Thought and Strategic Studies, 2024), (Egyptian Food Bank, 2024, p. 24).

The percentage of those unable to meet their basic food needs, whether in terms of quantity or quality, reached approximately 27.8% of the total population (Rasha Assi, 2018, p. 3). Deficiencies in the quantity and quality of food below the required level lead to diseases. Undernutrition, stunted growth, and wasting account for two-thirds of deaths in children under five, most of which occur in low- and middle-income countries. Malnutrition also poses significant risks to the future of mothers and women (WHO, 2024).

A report issued by the United Nations revealed the reality of the hunger crisis in Egypt: 33 million people suffer from food insecurity and 9 million are under the burden of malnutrition. The rate of malnutrition increased from 6.2 million in 2016 to 9.4 million in 2023. Moderate food insecurity rates rose to include 33.1 million Egyptians, and severe food insecurity rates increased from 8.2 million to 11.5 million during the same period, with 28.3% suffering from it. Of women of childbearing age, anemia is a major concern, negatively impacting breastfeeding rates, which fell to 40.2% in 2022. Additionally, 44.4% of Egyptians are unable to afford healthy food (Food and Agriculture Organization, 2017, p. 76). Egypt is among 36 countries that account for 90% of the global burden of malnutrition.Achieving food security requires that all members of society have physical and economic access, at all times, to sufficient, safe, and nutritious food that meets their dietary needs, meets their food preferences, and ensures a NOrmal, active, and healthy life (Committee on World Food Security, 2020, p. 7).

The concept of food security is a complex concept with four basic dimensions and conditions: 1- The availability of food in sufficient quantities to meet people's needs, and that these goods are in good condition and safe for human use, i.e. of high quality; 2-

Access to food and its availability at all times, and it is based on two capabilities: the ability to access economic and social, and the ability to access physical. Economic access is determined by available income, food prices, and the availability of support Social access and obtaining it, while physical access is determined by the availability and quality of infrastructure, such as railways, communications, grain storage units, ports, and all the capabilities that facilitate the work of markets and the delivery of sufficient food supplies to all residents; 3- Food use, which includes two elements: the first element is measured by human body indicators of emaciation, underweight, and dwarfism, and the second element is measured by a number of indicators that reflect Food quality, preparation, and health and hygiene conditions; 4- Food supplies, price stability, or purchasing power, and that these goods are available to everyone and NOt to a specific group in society (Food and Agriculture Organization, 2013, pp. 20-23), (World Bank, 2025).

A family's entitlement to food is determined by three different and distinct influences. The first is the basket of resources owned, most NOtably land and labor energy. The second is the source of techNOlogy, as available techNOlogy determines the possibilities of production, which are affected by available knowledge , and thus by people's ability to organize that knowledge and make practical use of it, Third: Terms of exchange, i.e., the ability to buy and sell goods and determine the relative prices of different products. The dietary pattern that makes an individual consume certain types of food that may or may NOt meet his actual needs for healthy, balanced food, which canNOt be attributed only to the economic opportunities available to the individual, but also to the cultural and nutritional level, the environment, and the associated food customs and traditions (Badawi, 2013, p. 24).

Rural women constitute 49% of the rural population (Central Agency for Public Mobilization and Statistics, 2017). Rural women contribute to providing their families with food in more than one way. They produce their own food according to the capabilities available to them, through other roles such as: Preparing meals, manufacturing, preserving and storing food, rationalizing and organizing food consumption, which increases the efficiency of spending the limited family income, Undertaking other activities to manufacture rural food products such as dairy products or selling ready-made foods to meet living expenses, raise the standard of living of the family, and increase its income to help purchase additional food to improve the quantity and quality of meals (Al-Asaf, 2012, pp. 26, 27). Hence, it becomes clear that rural women can play a fundamental role in the basic pillars and dimensions of food security in terms of providing food, access to it, and the way it is used. Therefore, this study was conducted in an attempt to identify the determinants of rural women's participation in achieving household food security, the obstacles to achieving it, and proposals for overcoming these obstacles.

Research objectives:

1.To determine the degree of rural women's participation in achieving household food security in its four dimensions.

2. To determine the nature of the relationship between each of the independent variables studied and the degree of rural women's participation in achieving household food security.

3- Identifying the regression model between the characteristics of the rural women studied and the degrees to which they achieve household food security.

4- Identifying rural women's suggestions for overcoming the obstacles that prevent them from achieving household food security.

Importance of the research: This research is in line with one of the pillars of the 2030 Sustainable Development Strategy, which concerns the importance of rural women's participation in achieving food security for their families. By identifying the level of rural women's achievement of food security within their families, accurate and clear information

can be provided on all dimensions of the food security problem, enabling the development of successful policies and solutions to achieve household food security.

Research hypotheses:

-There is a significant relationship between the independent variables studied, which are: (the age of the respondent, the number of years of the respondent's education, the number of years of the husband's education, the Number of household members, the amount spent monthly on food, the level of the family's housing, the size of agricultural land holdings, the size of animal holdings, the size of poultry holdings, and the contribution to making family decisions. Information sources, geographical openness, the respondent's work, the husband's profession, the type of family, the respondent's contribution to the family budget) and the degree of rural women's participation in achieving family food security.

-The quantitative independent variables studied are among the factors that predict the degree to which rural women achieve household food security. Each of the quantitative independent variables studied makes a unique and meaningful contribution to explaining the variation in the degree to which rural women achieve family food security.

THEORETICAL FRAMEWORK:

The Concept of Food Security:

The World Bank defined food security as access by all people, at all times, to sufficient food for an active and healthy life (World Bank, 1986, p. 1).

The concept of food security, according to the definition of the Food and Agriculture Organization of the United Nations (FAO) in 1993, means providing food to all members of society in the quantity and quality necessary to meet their needs on an ongoing basis for a healthy and active life (Arab Monetary Fund, 2016, p. 171).

Dimensions of Food Security:

According to the Declaration issued by the 2009 World Summit on Food Security, food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and preferences and ensures an active and healthy life (FAO, 2013, p. 16).

Previous studies:

Several authors (2012) Boakye-Achampong, et al; (2014) Kalansooriy, Chandrakumara; (2015) Ben; (2015) Braimah have shown that household food security depends on backyard gardening, growing, producing, and preserving a number of crops, and income from non-agricultural activities carried out by women. Women play a huge role in ensuring food security for the family in all three dimensions of food security. In terms of the availability of food at home, they contribute significantly to agriculture, and their contribution to income is crucial in obtaining food, especially in low-income families .

Suleiman, Heba Abdel Aziz (2021) Several factors; (2014) Karen On the other hand, a study showed affect women's ability to generate sustainable livelihoods and establish food security for their families, namely: lack of access to markets, lack of access to human capital, health, education, improved agricultural inputs, improved seeds, fertilizers, pesticides, and environmental factors such as plant diseases, pests, weather; as well as lack of capital, customs, and women's social roles. Social and cultural aspects also play a major role, and there is evidence of the impact of some independent variables such as: agricultural land tenure, social participation, and family cohesion.

Other studies, such as those by Marfat Al-Sayed (2014), Rasha Assi et al. (2018), and Fatima Saad et al. (2021), have also shown that the highest level of food security was achieved by females compared to males. The level of food security achieved by rural women ranged from moderate to high in the areas of crop production, animal production, poultry

production, storage and preservation of some agricultural crops, and manufacturing of some food products for either domestic consumption or sale. It also shows that a large proportion of them engage in many activities to produce food for the family in quantities that achieve self-sufficiency

RESEARCH METHOD:

The research was conducted in Kafr El Sheikh Governorate, then three were randomly selected, namely: Kafr El Sheikh, Desouk, and Qaleen, then one village was randomly selected from each of the three centers, namely: Mahalla Moussa, Al-Ajuzin, and Al-Bakatoush, in that order.
The number of rural families in the three villages was identified (Information and Decision Support Center, Kafr El-Sheikh GoverNOrate, 2025), and reached 2006, 3066, and 4173 rural families in the villages of Mahalla Moussa, Al-Ajuzin, and Al-Bakatoush, in that order. Thus, the total number of rural families reached 9245. Their wives were selected as comprehensive for the research, using the Krejci equation. Morgan, the sample size was 349 female respondents (households), and by distributing the number according to the percentage of representation of each of the three villages in the research area, the number of female respondents in the village of Mahalla Moussa was 76, and in the village of Al-Ajuzin 116, and 157 female respondents in the village of Al-Bakatoush, provided that she is responsible for managing her family's food affairs.

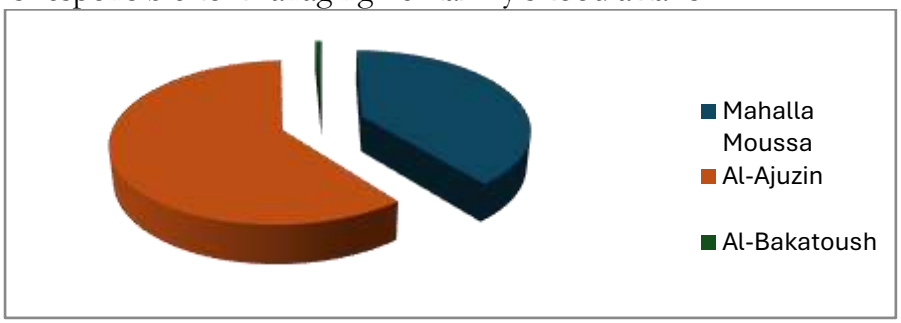

Figure 1: Distribution of the research sample

-Methodology used: This study relied on the descriptive-analytical approach
-Data collection: Data was collected through personal interviews with the respondents using a questionnaire during the months of August and September 2025.
Standardization of tools: Calculation of questionnaire validity and reliability:
First, tool validity: Tool validity was calculated in two ways:
(a) Content validity: To ensure the validity of the research tools, the preliminary version of the questionnaire was presented to a number of professors specializing in agricultural extension and rural communities to give their opinions on the suitability of the statements in the questionnaire and their relevance to its purpose, in addition to the linguistic formulation. Some suggested modifying the wording of certain statements, and the modifications were made in accordance with the reviewers' opinions, with a minimum agreement rate of 90% for each statement. Thus, the content was validated, and no statements were deleted from the questionnaire.
b) Internal consistency reliability: The internal consistency reliability of the research tools was calculated by finding the Pearson correlation coefficient between the score of each statement and the total of its dependent dimension, as shown in Table (1).

Table (1): Pearson correlation coefficient values between the score of each statement and the total of its dependent dimensions for the household food security questionnaire

Stability or sustainability		Use or benefit		Access or obtain		Abundance or availability	
Association	The phrase	Association	The phrase	Association	The phrase	Association	The phrase
**0.448	1	**0.353	1	**0. 471	1	**0.347	1
**0.590	2	**0.463	2	**0.593	2	**0.379	2
**0.462	3	**0.379	3	**0.537	3	**0.548	3
**0.510	4	**0.445	4	**0.400	4	**0.497	4
**0.435	5	**0.537	5	**0.541	5	**0.528	6
**0.426	6	**0.490	6	**0.593	6	**0.435	7
**0.600	7	**0.525	7	**0.537	7	**0.559	8
		**0.442	8	**0.532	8	**0.506	9
		**0.238	9			**0.506	10
		**0.409	10				
		**0.593	11				
		**0.416	12				
		**0.472	13				
		**0.518	14				
		**0.436	15				
		**0.596	16				

***Significant at the 0.05 level ** Significant at the 0.01 level**

Table (1) shows that all questionnaire items achieved a statistically significant correlation with the total score for the dimension to which they belong at the 0.01 level, indicating that the questionnaire is internally consistent.

(c) Construct validity: The construct validity of the research tools was calculated by finding the Pearson correlation coefficient between the sum of each dimension and the total sum of the questionnaire. Table (2) illustrates this:

Table (2): Pearson correlation coefficient values between the score of each dimension and the total score of the questionnaire.

Pearson correlation	Dimensions
**0.895	Abundance or availability
**0.874	Access or availability
**0.913	Use or utilization
**0.803	Stability or sustainability

**** Significant at the 0.01 level**

The results in Table 2 show that there is a statistically significant correlation between the score for each dimension of the intellectual capital questionnaire and the total score for the questionnaire, with values ranging from 0.913 to 0.803), all of which are significant at a

significance level of 0.01 and indicate a strong correlation, demonstrating that the questionnaire has a good degree of internal consistency.

Second: Reliability: The reliability of the instruments was calculated in two ways:

1- Internal consistency method: Cronbach's alpha was calculated using the Statistical Package for the Social Sciences (SPSS/PC), Mehrms, 1984, p. 277) Lehmen; Okasha, Al-Banna, 1999)

The value was 0.909, which is considered strong evidence of the scale's reliability.

2- Split-half method: The scale items were divided into two halves. The first half consisted of 21 items, and the second half consisted of 20 items. According to the correlation coefficient between the two halves, it reached 0.886, which is significant at the 0.01 level and represents the stability coefficient of half the scale. The Spearman-Brown correction coefficient was used with the following equation: (Barakat, 2000, p. 29; Raja Abu Alam, 2011, p. 492)

$$M\,T\,S = \frac{2\,R\,A\,.\,B}{1 + R\,A\,.\,B}$$

Where M T S: corrected stability coefficient R A . B= correlation coefficient between the two halves of the scale

The stability value according to this equation was 0.940, which is a high stability coefficient.

- Constructing the scale:

The food security indicators issued by the Food and Agriculture Organization of the United Nations (FAO) were relied upon, with the aim of reaching food security and nutrition in the world. The most important of these indicators are: availability, access (physical, social, economic), effective use (anthropometric indicators, food quality and processing, health and hygiene), stability (FAO, 2000), (FAO, 2013, pp. 20-23).

Research variables and how to measure them:

First: Independent variables:

- Respondent's age: This refers to the number of years the respondent has lived from birth to the date of data collection, to the nearest calendar year. The arithmetic mean was 32.72 years, with a standard deviation of 6.58.

- Number of years of education for the respondent and her husband: This refers to the number of years the respondent/spouse completed at various levels of formal education.

-**Multiple roles for the respondent**: This refers to the roles the respondent performs, whether as a full-time homemaker or holding any other work or job. This was measured using a NOminal scale consisting of the two previous categories, and coded as 2 and 1, respectively.

-Husband's occupation: refers to the type and nature of the work the husband performs as a means of earning a living, which is considered his primary source of income. It was measured using a NOminal scale consisting of five categories: working in agriculture, crafts, self-employment, private sector employee, and government employee. Discriminatory numbers were given (1, 2, 3, 4, 5) respectively.

-The Number of household members: refers to the number of members of the respondent's family, including the wife, husband, children, and other relatives, who reside together in one dwelling and lead a shared social and economic life at the time of data collection. It is expressed as a numerical value. The arithmetic mean was 7.17 individuals, with a standard deviation of 1.67.

- Family type: This refers to whether the family is simple, consisting of only two generations, or composed of more than two generations (complex or extended). It was

measured using a NOminal scale consisting of two categories, assigned the discriminant numbers 1 and 2, respectively.

-Respondent's contribution to the household budget: This refers to whether the respondent contributes her income to the household budget or NOt. This was measured using "yes" and "NO" and given code numbers of 2 and 1, respectively.

-**Monthly expenditure on food**: This refers to the total monthly expenditure of the respondent on food and drink, measured in Egyptian pounds, at the time of data collection. The arithmetic mean was 2420.13 sources, with a standard deviation of 610.55.

-Family housing standard: refers to the qualities, components, and characteristics present in the respondent's family's home that would make it a good shelter for the family. It was measured using 15 statements, and appropriate scores were assigned. The scores were then totaled to express the overall score for the family's housing standard. The arithmetic mean was 24.18, with a standard deviation of 5.84.

- **Agricultural land holding size**: This refers to the total area of agricultural land in carats used by the respondent's household for agricultural production at the time of data collection, whether owned, rented, or shared.

- Animal holding size: It refers to the heads of farm animals and their types that the family of the respondent owns or possesses, represented in their various forms, namely: buffalo, local cows, Friesian cows, sheep, and goats. They were measured by converting them into animal units by giving the following grades: buffalo and Friesian cow 1.25 animal units, local cow 1 animal unit, sheep 0.2 animal units, and goats 0.07 animal units) Suwailem, 2015, p. 155). The animal units were then summed to express the overall degree of animal holding size.

- Size of poultry holding: It refers to the number and type of domestic birds owned or possessed by the household of the respondent, represented in their various forms, namely: poultry, ducks and geese, rabbits, pigeons and quails, and turkeys. It was measured by converting them into poultry units by giving the following grades: turkey 7 poultry units, duck and goose 3 poultry units; chicken and rabbit 2 poultry units, pigeon and quail 1 poultry unit. Then the poultry units were collected to express the overall degree of poultry holding size (Iman Ibrahim, 2001, p. 162).

-Contribution to family decision-making: It means the extent of the respondent's participation in making decisions related to her family's affairs, and it was measured through (8) different decisions. The response categories were (large, medium, limited, NO), and the grades were given (4, 3, 2, 1) in order, and the degree of stability of the scale was estimated using the alpha coefficient, and it was 0.892, which is a value that indicates the validity of the scale. The scores were then totaled to express the total score for contributing to family decision-making, and the arithmetic mean was 18.23 points, with a standard deviation of 4.65.

-Sources of information: It refers to the sources from which the respondent obtains her knowledge regarding her participation in achieving food security for her family, and the degree of exposure to those sources. It was measured through (9) sources. The response categories were (always, sometimes, rarely, never), and grades were given (4, 3, 2, 1) in order. Then the grades were collected to express the total grade of the sources of information, and the arithmetic mean was 20.75, with a standard deviation of 5.17.

-Geographical openness: It refers to the extent to which the respondent travels outside her village. It was measured through (5) statements, on a scale consisting of four categories: always, sometimes, rarely, never, and the grades were given as 4, 3, 2, 1 respectively. The degree of reliability of the scale was estimated using the alpha coefficient, and it was 0.771, which is a value that indicates the validity of the scale. The scores were then totaled to

express the total score for geographical openness, and the arithmetic mean was 10.66, with a standard deviation of 2.86.

Second: Dependent variables:

Household food security:

This refers to the ability of each member of a rural household to meet their needs for healthy, balanced, and safe food, which enables them to lead a healthy and active life through the contributions of rural women. This includes availability, access, utilization (body mass index, food safety and quality), and stability. Household food security was measured through a set of axes, as follows:

1- Knowledge of the concept of household food security:

This was measured through (9) statements, and given the discriminatory numbers 1, 2, 3, 4, 5, 6, 7, 8, and 9, respectively.

2- Rural women's participation in achieving household food security:

This refers to the practices undertaken by rural women to achieve household food security, represented by abundance, access, utilization (body mass index, food safety and quality), and stability. The following is a description of each of these variables:

1- Abundance or Availability:

It refers to the practices undertaken by rural communities to provide families with food. This is NOt limited to quantity, but also includes the quality and variety of food. It was measured through (10) statements, and a scale consisting of two responses, yes or NO, was used. Grades 2 and 1 were given, respectively, and then the grades were summed to express the total grade for the scale of abundance or availability. The arithmetic mean was 14.04, with a standard deviation of 2.25.

2- Access or Obtaining:

It refers to the practices undertaken by rural people to gain economic, social, physical or actual access to sufficient quantities of food. It was measured through (8) statements, and a scale consisting of two responses, yes or NO, was used. Scores were given as 2 and 1, respectively. The scores were then summed to express the total score for the scale of access or obtaining food. The arithmetic mean was 11.22, with a standard deviation of 2.04.

3- Use or benefit:

It refers to the practices that rural people undertake to prepare food and benefit from it to achieve optimal nutrition and the body's use of the various nutritional elements, as the person's nutritional practices, how food is prepared, the diversity of his diet and its distribution within the family affect the person's nutritional status, and it was measured through (16) phrases divided into two elements, which are: Body mass index, food safety and quality components (8) statements for each, and a two-response scale of yes or NO was used. Scores of 2 and 1 were given, respectively. The scores were then totaled to express the total score for the use or benefit scale. The arithmetic mean was 11.40, 12.11, 23.51 points, with a standard deviation of 1.87, 1.91, 3.58, respectively.

4- Stability or sustainability:

It refers to the practices undertaken by rural communities to ensure that food is secure and sufficient at all times (NOt achieved in the event of a rise in the prices of some commodities or a shortage due to periodic or sudden shocks, whether economic or climatic). It was measured through (7) statements, and a scale consisting of two responses, yes or NO, was used. The scores were given as 2 and 1, respectively. The scores were then totaled to express the overall score on the stability or sustainability scale. The arithmetic mean was 10.00, with a standard deviation of 1.69.

A simple correlation coefficient matrix was calculated between the four dimensions. Using the reliability equation, the overall reliability of the rural women's participation in achieving

household food security scale was estimated at 0.909. This represents a high reliability score, which allows the results to be reassured and allows the four dimensions to be combined into a single scale for research purposes. Accordingly, the scores of the four dimensions of household food security were summed to obtain the overall score for rural women's participation in achieving household food security. The average score was 58.78, with a standard deviation of 9.04.

- Obstacles to achieving household food security:

This refers to the difficulties and obstacles that rural women face in achieving household food security. It was measured in an open manner and NOt by choosing between alternatives, so that it reflects the order of priorities of those obstacles from their point of view. Therefore, we find that the number of rural women differed in determining the degree of importance of those obstacles, as the importance categories ranged between (high, medium, weak). The grades were given (3, 2, 1) respectively, and thus the relative importance of each obstacle individually ranged according to the theoretical range between (1-1047) grades.

- Proposals for achieving family food security:

This means developing solutions for how to reduce these obstacles. It was measured through (12) proposals, and rural women were allowed to choose more than one proposal. A score was given for each proposal, and the frequency of each proposal was collected and then arranged in descending order.

Description of sample characteristics:

Table 3 shows that more than three-quarters of rural women (79.9%) are aged between 25 and 40, and that three-quarters of rural women and their husbands (74.2%) (78.5%) have at least a secondary education, about two-thirds of rural women (61.3%) are full-time housewives, and (29.5%) of the respondents' husbands work in agriculture, and more than half of rural women (59.3%, 57%) live in medium-sized families ranging from 6 to 8 members, and are simple in order, and about half of rural women (48.4%, 47.9%) spend between 2,350 and 3,150 pounds per month on food, and the family's standard of housing is average. One-fifth of the respondents (43.8%) have small agricultural holdings, 49.3% of the respondents own between 5 and 7 livestock units, while 40.7% of respondents own 25-39 poultry units, and more than half of rural women (56.4%, 52.1%) are their sources of information, and their contribution to family decision-making is average. Finally, about one-fifth of rural women (43%) have average geographical openness.

Table (3) Distribution of rural women according to the characteristics studied

%	Number n=349	Categories	%	Number n=349	Categories
9- Monthly expenditure on food			**1-Age of the subject:**		
37,0	**129**	**Low (less than 2350) pounds**	**34,1**	**119**	**Young (20-30) years old**
48,4	**169**	**Medium (2350-3150) pounds**	**45,8**	**160**	**Middle-aged (31-39) years old**
14,6	**51**	**High (3200 and above) pounds**	**20,1**	**70**	**Old (40 and above) years old**
10-Family housing level			**2- Number of years of education of the respondent**		
27,5	**96**	**Low (15-21) degrees**	**25,8**	**90**	**w (less than 9) years**
47,9	**167**	**Medium (22-28) degrees**	**49,9**	**174**	**Medium (9-15) years**

24,6	86	High (29-35) degrees	24,3	85	High (16 and above) years
11. Size of agricultural land holdings			3-Number of years of education of spouse		
No possession	No possession	No possession	No possession	No possession	Low (less than 9) years
Small (12-24) carats	Small (12-24) carats	Small (12-24) carats	Small (12-24) carats	Small (12-24) carats	Medium (9-15) years
Medium (25-35) carats	Medium (25-35) carats	Medium (25-35) carats	Medium (25-35) carats	Medium (25-35) carats	High (16 and above) years
Large (26 and above) carats	Large (26 and above) carats	Large (26 and above) carats	4-Multiple roles of the researcher		
12-Size of livestock holdings			38,7	135	Performs any work or job
8	28	No possession	61,3	214	Full-time homemaker
(2.5-4.5) animal units	129	(2.5–4.5) animal units	5-Husband's occupation		
49,3	172	(5-7) animal units	5,1	18	Not working
5,7	20	(7.5-9.5) animal units	29,5	103	Working in agriculture
13-Size of poultry holdings			28,7	100	Craftsman
8,6	30	(10-24) Dajnia units	27,5	96	Freelance work
40,7	142	(25-39) Dajnia units	9,2	32	Employee
(40-54) Dajnia units	125	(40-54) Dajnia unit	6. Number of household members		
14,9	52	(55 and above) Dajnia units	14,3	50	Small (3-5) individuals
11. Contribute to family decision-making			59,3	207	Medium (6-8) individuals
32,1	112	Low (8-16) degrees	26,4	92	Large (9-12) individuals
Medium (17-23) degrees	182	Average (17-23) degrees	7-Type of family		
15,8	55	High (24-32) degrees	43,0	150	Simple
10. Sources of information			57,0	199	Extended
28,7	100	Low (9-18) degrees			8-Contribution of the respondent to the family budget
56,4	197	Medium (19-26) degrees	40,7	142	Yes
14,9	52	High (27-36) degrees	59,3	207	No
12. Geographic openness					
22,9	80	Low (4-8) degrees			
43	150	Medium (9-11) degrees			
34,1	11	High (12-16) degrees			

RESULTS AND DISCUSSION:

First: Rural women's participation in achieving household food security:
1: Availability or availability:

A- Percentages of the distribution of scores for rural women's responses according to their participation in achieving abundance or availability:

Table (4) shows the numerical and relative distribution of rural women's responses according to their participation in achieving abundance or availability. The table data shows that: About three-quarters of rural women participate in achieving abundance or availability, at a rate of (72.2%). Regarding "providing the family's food needs at a reasonable price, even if it is available in aNOther village." About half of rural women (51.0%, 48.7%), respectively, participate in "providing plant-based alternatives to meat, poultry, and fish (animal protein), and reusing leftover food to make new meals instead of throwing it away." Two-fifths of rural women (45.3%, 41.8%) participate in "raising poultry at home to use it for food when needed." To it, the availability of wheat and rice stocks at home. A third (38.4%, 34.4%) participate in "preserving vegetables and fruits when available to make jams and pickles, determining the foods that family members need and providing them weekly." A quarter of rural women (28.7%, 23.5%) participate in "providing a variety of food for family members according to their age and effort, Maintaining that family members eat three meals a day. It was also found that (21.5%) of rural women participate in "raising cattle, sheep and goats to meet the family's food needs."

Table (4) Numerical and relative distribution of rural women's responses according to participation in achieving abundance or availability

Phrases	Contribution			
	Yes		NO	
	number	%	number	%
-Providing the family's food needs at an affordable price, even if they are located in aNOther village.	252	72.2	97	27.8
-Providing plant-based alternatives to meat, poultry, and fish (animal protein).	178	51.0	171	49.0
-Reusing leftover food to make new meals instead of throwing it away.	170	48.7	179	51.3
- Raising poultry at home to use as food when needed.	158	45.3	191	54.7
- Maintaining a stockpile of wheat and rice at home.	146	41.8	203	58.2
-Preserving vegetables and fruits when available for making jams and pickles.	134	38.4	215	61.6
-Determining the food needs of family members and providing them weekly.	120	34.4	229	65.6
-Providing a varied diet for family members based on their age and ability.	100	28.7	249	71.3
-Ensuring that family members eat three meals a day.	82	23.5	267	76.5
-Raising cattle, sheep, or goats to meet the family's nutritional needs.	75	21.5	274	78.5

B- Rural women's level of participation in achieving abundance or availability:

Table (5) shows the level of rural women according to participation in achieving abundance or availability. It is clear from it that 37.8% of rural women are at the low level, 48.7% at the medium level, and 13.5% at the high level.

Table(5) Level of respondents according to participation in achieving abundance or availability

Categories	number	%
Low (10-13) degrees	132	37.8
Medium (14-16) degrees	170	48.7
High (17-20) degrees	47	13.5
Total	349	100

2: Access or Obtaining:

A- Percentages of the distribution of scores for rural women's responses according to participation in achieving access:

Table (6) shows the numerical and relative distribution of rural women's responses according to participation in achieving access or obtaining. The data in the table shows that: about two-thirds of rural women participate in achieving abundance or availability, with a percentage of They participate in "going to markets that have all kinds of food, NO matter how far away, to ensure low prices." Two-fifths of rural women (43%) participate in "buying vegetables and fruits from large markets because the price is lower at any time and any place." A third (39.3%, 37.2%, 33.5%) participate in "using the ration card to obtain the family's basic food needs, shopping from neighboring villages in the absence of markets for goods." Food, taking advantage of any food that can be obtained as gifts from family and friends. It was also found that a quarter of rural women (29.8%, 24.4%) participate in "providing clean places inside the home to store crops and grains when needed, choosing good fruits even if they are more expensive."

Table (6) Numerical and relative distribution of rural women's responses according to participation in achieving access or obtaining

Phrases	Contribution			
	Yes		NO	
	number	%	number	%
-Meeting family needs within your budget	219	62.8	130	37.2
-Going to markets that stock all food items, NO matter how far away, to ensure low prices	181	51.9	168	48.1
-Purchasing vegetables and fruits from larger markets, where prices are lower	150	43	199	57
-Using a ration card to obtain your family's basic food needs	137	39.3	212	60.7
-Shopping in nearby villages if there are no food markets available invillage	130	37.2	219	62.8
-Take advantage of any food you can receive as gifts from family and friends.	117	33.5	232	66.5
- Provide clean spaces inside the home to store crops and grains when needed.	104	29.8	245	70.2
- Choose good-quality fruits, even if they are more expensive.	85	24.4	264	75.6

B- The level of rural women's participation in achieving access or obtaining:

Table (7) shows the level of rural women according to their participation in achieving access or obtaining. It is clear from it that 34.7% of rural women are at the low level, 52.7% are at the medium level, and 12.6% are at the high level.

Table (7) Rural women's level according to participation in achieving access or obtaining

Categories	number	%
Low (8-10) degrees	121	34.7
Medium (11-13) degrees	184	52.7
High (14-16) degrees	44	12.6

Total	**349**	**100**

3: Utilization:

- Utilization through the body index:

A- Percentages of the distribution of scores for rural women's responses according to participation in achieving utilization through the body index:

Table (8) shows the numerical and relative distribution of rural women's responses according to participation in achieving utilization through The body mass index (BMI) of (68.5%) is for "taking care to prepare foods that protect the body from anemia." Also, about half of the rural women (48.7%, 47.3%) participate in "taking into account the different needs of family members for different nutritional elements according to their different ages, taking into account proper nutrition during different life stages, taking care to prepare foods Beneficial for the skin color of family members as it is a sign of health and disease. Two-fifths of rural women (43%) participate in "buying the difference in quantity and quality of food provided to each individual according to the effort expended." More than a third (39.8%, 37.2%) participate in "taking care to ensure that food contains leafy vegetables such as cabbage, lettuce, or cauliflower, and ensuring the provision of Healthy nutrients for every family member. It also showed that a quarter of rural women (29.8%, 22.9%) participate in "providing nutritionally balanced meals for family members, monitoring family members' diets in case of fatigue or exhaustion."

Table (8) Numerical and relative distribution of rural women's responses according to participation in achieving use or benefit

Phrases	Contribution			
	Yes		NO	
	number	%	number	%
A- Benefiting from food through the body index:				
-Ensure proper preparation of foods that protect the body from anemia.	239	68.5	110	31.5
-Take into account the varying nutritional needs of family members depending on their age.	170	48.7	179	51.3
- Ensure proper preparation of foods that are beneficial to the skin color of family members, as it is a sign of health and illness.	165	47.3	184	52.7
- Vary the quantity and quality of food provided to each individual according to the effort exerted.	150	43	199	57
- Ensure that your diet includes leafy greens such as cabbage, lettuce, or cauliflower.	139	39.8	210	60.2
- Ensure that every family member has access to healthy nutrients.	130	37.2	219	62.8
- Provide nutritionally balanced meals for family members.	104	29.8	245	70.2
- Monitor family members' diets if they feel tired or exhausted.	80	22.9	269	77.1
B- Benefiting from food through food elements, safety and quality:				
- Avoid using industrial detergents when washing fruits and vegetables.	255	73.1	94	26.9
- Avoid frying in oil more than once, as this can be hazardous to health.	214	61.3	135	38.7
- Avoid using newspaper to store food, as this can expose it to contamination.	189	54.2	160	45.8
- Boiling milk thoroughly before consumption is important to kill microbes.	183	52.4	166	47.6

- Be sure to wash knives and cutting boards used for meat, poultry, and fish with detergent before using them with other foods.	**180**	**51.6**	**169**	**48.4**
- Avoid leaving food out of the refrigerator for long periods of time to prevent spoilage.	**159**	**45.6**	**190**	**54.4**
- Avoid storing water in plastic containers, as this can be a health hazard.	**146**	**41.8**	**203**	**58.2**
- Install screens on kitchen windows to prevent rodents and insects from entering.	**114**	**32.7**	**235**	**67.3**

B-Rural women's level of participation in achieving benefits through the body index:

Table (8) shows the level of rural women according to participation in achieving benefits through the body index. It is clear from it that 31.5% of rural women are at the low level, 53.3% at the medium level, and 15.2% at the high level.

-Benefiting from the elements of food safety and quality:

A-Percentages of the distribution of scores for rural women's responses according to participation in achieving benefit through the elements of food safety and quality:

Table (14) shows the numerical and relative distribution of rural women's responses according to participation in achieving benefit through the elements of food safety and quality. The data in the table shows that: about three-quarters of rural women participate in achieving Benefiting from the elements of food safety and quality by (73.1%) for "avoiding the use of industrial detergents when washing vegetables and fruits." About a third participate in "NOt frying in oil more than once because it is dangerous to health." Also, about half of rural women (54.2%, 52.4%, 51.6%) participate in "Avoid using newspaper to store food to avoid contamination. Boiling milk well before consuming it is important to kill microbes. Make sure to wash knives and cutting boards used for meat, poultry and fish with detergents before using them with other foods. A fifth (45.6%, 41.8%) share the phrase "avoid leaving food outside the refrigerator." For a long time, to prevent it from spoiling, avoid storing water in plastic containers because of its health risks. It was also found that a third of rural women (32.7%) participate in "installing a screen on the kitchen window to prevent the entry of rodents and insects."

- Rural women's level of participation in achieving utilization or benefit:

Table (9) shows the level of rural women according to participation in achieving utilization or benefit. It is clear from it that 31.8% of rural women are at the low level, 50.1% are at the medium level, and 18.1% are at the high level.

Table (9) Level of respondents according to participation in achieving use or benefit

Categories	**number**	**%**
Low (16-21) degrees	**111**	**31.8**
Medium (22-26) degrees	**175**	**50.1**
High (27-32) degrees	**63**	**18.1**
Total	**349**	**100**

4- Stability or purchasing power:

A- Percentages of the distribution of scores for rural women's responses according to participation in achieving stability or purchasing power:

Table (10) shows the numerical and relative distribution of rural women's responses according to participation in achieving stability or purchasing power. The table data shows that: About half of rural women participate in achieving stability or purchasing power. (53%, 49.6%, 48.1%) of the respondents said they "compared food prices before buying, replaced some missing basic foods with alternative foods, and made sure to manufacture food when vegetables and fruits are available in the market." A fifth (44.4%, 41.3%) said they "have a food supply at home to avoid rising prices, and store fruits." Vegetables are guaranteed to be available during off-seasons. A third of rural women (36.4%) participate in "selling some field produce to help buy other food for the family." It was also found that more than a quarter of rural women (27.5%) participate in "using the ration card to benefit from price differences."

Table (10) Numerical and relative distribution of rural women's responses according to participation in achieving stability or purchasing power

Phrases	Contribution			
	Yes		NO	
	number	%	number	%
- Compare food prices before purchasing.	185	53	164	47
- Replace some missing staple foods with alternatives.	173	49.6	176	50.4
- Ensure food processing when vegetables and fruits are available in the market.	168	48.1	181	51.9
- Keep a stock of food (wheat, rice, legumes) at home to avoid price increases.	155	44.4	194	55.6
Storing fruits and vegetables ensures they are available during off-seasons.	144	41.3	205	58.7
	127	36.4	222	63.6
Selling some farm produce helps purchase other food for the family.	96	27.5	253	72.5

B-The level of respondents' participation in achieving benefits through food safety and quality elements:

Table (11) shows the level of rural women according to participation in achieving stability or purchasing power. It is clear from it that 39.3% of rural women are at the low level, 44.7% are at the medium level, and 16% are at the high level.

Table (11) Level of respondents according to participation in achieving stability or purchasing power

Categories	number	%
Low (7-9) degrees	137	39.3
Medium (10-11) degrees	156	44.7
High (12-14) degrees	56	16
Total	349	100

4- Household Food Security

Table (12) shows the level of rural women according to their participation in achieving household food security. It shows that 32.4% of rural women are at the low level, 52.7% at the medium level, and 14.9% at the high level.

Table (12) Rural women's level according to participation in achieving household food security

Categories	number	%
Low (41-54) degrees	113	32.4

Medium (55-68) degrees	**184**	**52.7**
High (69-82) degrees	**52**	**14.9**
Total	**349**	**100**

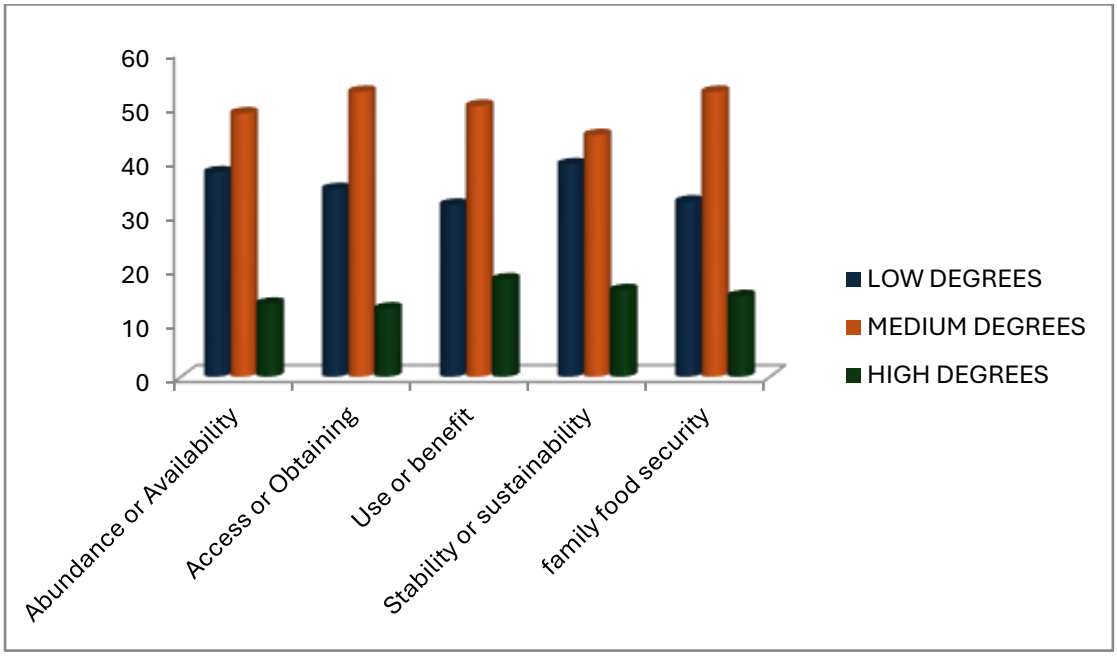

Figure 2: Rural women's level according to participation in achieving household food security

We conclude from the previous results that the majority of rural women (85.1%) have a low to medium level of participation in achieving household food security. This can be explained in light of the social and economic characteristics of rural women, as the education of the respondent and her husband, the majority of whom are in the middle category, may allow the middle level of education to participate in achieving some dimensions. Also, the economic components of the majority owning agricultural holdings (12 At least one carat), in addition to five rural women (45.9%), (44.1%), (41.5%) who have livestock of buffalo, cows, sheep and goats that bring them money through selling and storing agricultural crops produced from agricultural land and animal products produced from farm animals that can achieve food security The family in its four dimensions (the amount spent monthly on food in the middle class) as shown in Table (1) is a strong indicator of the standard of living and material, the consequences of which are achieving a low and medium level of family food security.

SECAND: The nature of the relationship between the independent variables studied and the degree of rural women's participation in achieving household food security:

To determine the nature of the relationship between each of the independent variables studied and the degree of rural women's participation in achieving household food security, the first statistical hypothesis was formulated: "There is NO significant relationship between the following independent variables: (The age of the respondent, the number of years of the respondent's education, the number of years of the husband's education, the Number of household members, the amount spent monthly on food, the level of the family's housing, the size of the agricultural land holdings, the size of the animal holdings, the size of the poultry holdings, the contribution to making family decisions, the sources of information, the geographical openness) and the degree of participation Rural women

in achieving household food security. To test the validity of this hypothesis, a simple correlation coefficient (Pearson) was used.

1- Simple correlation coefficients (Pearson):

A- Relationships between the studied quantitative independent variables and the degree of rural women's participation in achieving household food security:

The results of Table (13) showed a positive correlation at a significance level of 0.01 between the variables: age The research, the amount spent on food monthly, the size of agricultural land holdings, sources of information and the degree of rural women's participation in achieving abundance or availability, and the values of the simple correlation coefficient reached 0.213, 0.190, 0.151, 0.469. It was also evident that there was a positive correlation at a significance level of 0.05 between the variables: the size of animal holdings, the size of poultry holdings, geographical openness and the degree of rural women's participation in achieving abundance or Availability, and the simple correlation coefficient values reached 0.123, 0.107, 0.122. While it is clear that there is a negative and statistically significant correlation at the 0.05 level between the Number of household members and the degree of rural women's participation in achieving abundance or availability, as the simple correlation coefficient value reached -0.108. However, NO relationship was found There is a significant correlation between the following: the number of years of education of the respondent, the number of years of education of the husband, the level of family housing, contribution to family decision-making, and the degree of rural women's participation in achieving abundance or availability, where the values of the simple correlation coefficient reached: 0.098, 0.097, 0.092, 0.081, respectively.

It is also evident that there is a positive correlation at a significance level of 0.01 between the variables: the age of the respondent, the amount spent on food monthly, the sources of information and the degree of rural women's participation in achieving access or obtaining. The values of the simple correlation coefficient reached 0.210, 0.171, 0.441. It is also evident that there is a correlation Positive at a significance level of 0.05 between the variables: number of years of education of the husband, level of family housing, size of agricultural land holdings, size of animal holdings, geographical openness and the degree of participation of rural women in achieving access or obtaining, and the values of the simple correlation coefficient reached 0.129, 0.112, 0.117, 0.108, 0.111. However, NO significant correlation was found between each of: number of years of education of the respondent, the Number of household members, size of holding

Poultry, contribution to family decision-making, and the degree of rural women's participation in achieving access or obtaining food were found to be 0.092, 0.095, 0.079, and 0.085, respectively. A positive correlation at a significance level of 0.01 was also evident between the following variables: the respondent's age, monthly food expenditure, and sources of information, and the degree of rural women's participation in achieving access or obtaining food. Benefit, and the values of the simple correlation coefficient reached 0.175, 0.249, 0.467. It was also evident that there was a positive correlation at a significance level of 0.05 between the variables: the respondent's years of education, the number of years of the husband's education, the level of the family's housing, and the degree of rural women's participation in achieving use or benefit, and the values of the simple correlation coefficient reached 0.107, 0.115, 0.105. However, there was NO significant correlation between each of: the Number of household members, size of agricultural land holdings, size of animal holdings, size of poultry holdings, contribution to family decision-making, geographical openness and the degree of rural women's participation in achieving use or benefit, where the values of the simple correlation coefficient reached: 0.081, 0.099, 0.018, 0.093, 0.086, 0.083 respectively.

Table (13) Results of simple correlation coefficients (Pearson) between the studied quantitative independent variables and the degree of rural women's participation in achieving household food security

Simple correlation coefficient values					
Independent variables	Abundance or availability	access or obtain	Use or benefit	Stability or purchasing power	Household food security
- Age of the respondent	0.123**	0.210**	0.175**	0.213**	0.232**
- Years of education of the respondent	0.098	0.092	0.107*	0.098	0.001
- Years of education of the husband	0.097	0.129*	0.115*	0.097	0.031
- The Number of household members	-0.108*	0.095	0.081	-0.108*	-0.128*0*
- Monthly food expenditure	0.190**	0.171**	0.249**	0.190**	0.147**
- Family housing standard	0.092	0.112*	0.105*	0.092	0.069
- Size of agricultural land holdings	0.151**	0.117*	0.099	0.151**	0.115*
- Size of livestock holdings	0.123*	0.108*	0.018	0.123*	0.106*
- Size of poultry holdings	0.107*	0.079	0.093	0.107*	0.109*
- Contribution to family decision-making	0.081	0.085	0.086	0.081	0.095
- Sources of information	0.469**	0.441**	0.467**	0.469**	0.371**
- Geographical exposure	0.122*	0.111*	0.083	0.122*	0.113**

***Significant at the 0.05 level ** Significant at the 0.01 level**

It was also found that there is a positive correlation at a significance level of 0.01 between the variables: the age of the respondent, the amount spent on food monthly, the sources of information and the degree of rural women's participation in achieving stability or purchasing power. The values of the simple correlation coefficient reached 0.197, 0.161, and 0.468. It was also found that there is a positive correlation at a significance level of 0.05 between the variables: the number of years of education of the respondent, the number of years of education of the husband, and the size of the holding. Animal husbandry, poultry holding size, contribution to family decision-making, and the degree of rural women's participation in achieving stability or purchasing power. The simple correlation coefficient values reached 0.130, 0.113, 0.119, 0.126, and 0.119. While there is a clear negative and statistically significant correlation at the 0.05 level between the Number of household members. The degree of rural women's participation in achieving stability or purchasing power was found to be -107.0, but NO significant correlation was found between the level of family housing, the size of agricultural land holdings, and geographical openness, and the degree of rural women's participation in achieving stability or purchasing power, as the values of the simple correlation coefficient were: 0.096, 0.065, and 0.093, respectively.

Finally, it was found that there is a positive correlation at a significance level of 0.01 between the variables: the age of the respondent, the amount spent on food monthly, the sources of information and the degree of rural women's participation in achieving household food security. The values of the simple correlation coefficient reached 0.232, 0.147, and 0.371. It was also found that there is a positive correlation at a significance level of 0.05 between the variables: the size of agricultural land holdings, the size of animal holdings, the size of poultry holdings, and openness. Geographical and the degree of rural women's participation in achieving household food security, and the values of the simple correlation coefficient reached 0.115, 0.106, 0.109, 0.113. While it is clear that there is a

negative and statistically significant correlation at the 0.05 level between the Number of household members and the degree of rural women's participation in achieving household food security, as the value of the simple correlation coefficient reached -128.0, but it was NOt found that there is a significant correlation between each of: the number of years of education The researcher, the number of years of the husband's education, the level of the family's housing, contribution to family decision-making, and the degree of rural women's participation in achieving family food security, where the values of the simple correlation coefficient were: 0.001, 0.031, 0.069, 0.095, respectively.

This can be interpreted as the older the respondent, the more knowledge able and experienced they are in the various ways they can contribute to achieving household food security. Furthermore, economic factors, such as the family's housing level and the size of agricultural land holdings, indicate the ability of the rural woman or her family to purchase or be exposed to the means of transmitting knowledge and information. An indicator of her status and position within her community, and thus her keenness to maintain this status through acquiring knowledge and applying that knowledge , and thus her participation in achieving family food security.

The more years of education a rural woman receives, the more her awareness and cognitive abilities are shaped. This knowledge is essential for ensuring food security for her family, and the more likely she is to apply that knowledge . The husband also plays a role as a mediator or intermediary through which many ideas and knowledge are passed on to his wife. There is no doubt that the number of years he has studied has an impact on his experience, openness, and the amount of knowledge and information he possesses.

In addition to the fact that living and being with many members of the family (not simple) increases the nutritional needs and living requirements of those members, the ability and willingness of the housewife to seek knowledge and care about meeting their nutritional needs decreases without considering the beneficial, sufficient and nutritious food, or preserving its components, safety and quality.

In addition to the fact that the respondent is exposed to a number of knowledge sources, she gains a greater degree of knowledge than her less exposed counterpart. At the same time, the senses addressed by these sources are diverse and varied, which increases understanding and comprehension of the advisory content they convey regarding achieving family food security.

B-The nature of the relationship between the qualitative independent variables studied and the degree of rural women's participation in achieving household food security:

To determine the nature of the relationship between the qualitative independent variables studied and the degree of rural women's participation in achieving household food security, the third statistical hypothesis was formulated: "There is NO significant relationship between the qualitative independent variables." The following study was conducted: the multiple roles of the female respondent, the husband's profession, the type of family, the female respondent's contribution to the family budget, and the degree of the female respondent's participation in achieving family food security. To test the validity of this hypothesis, chi-square and Cramer's coefficient were used to measure the strength of the relationship.

1-Multiple roles of the respondents:

The results of Table (14) showed a higher percentage of rural women in the (medium and high) categories who practice any work or job and participate in achieving abundance or availability than their counterparts who are full-time housewives, as the percentage was 57.8%, 15.6% compared to 39.3%, 12.6%. The calculated chi-square value was 16.07, which is significant at the 0.01 level. The value of Cramer's correlation coefficient reached

0.215, which means that there is a significant relationship between the multiple roles of the respondent and her participation in achieving abundance or availability.
It is also evident that the percentage of rural women in the (medium and high) categories who practice any work or job and participate in achieving access or obtaining is higher than their counterparts who are full-time housewives, as the percentage was 60%, 17% compared to 48.1%, 9.8%. The calculated chi-square value was 14.34, which is significant at the 0.01 level, and the coefficient value was Kramer's correlation coefficient of 0.203 means that there is a significant relationship between the multiple roles of the respondent and her participation in achieving access or obtaining.

Table (14) Distribution of rural women according to t Multiple roles of the respondent and level of participation in achieving family food security

Kramer relationship intensity	Chi-square value	Total		high		middle		low		Level of participation / Multiple roles of the respondent	Dependent variable
		%	number	%	number	%	number	%	number		
0.215**	16.07**	100	135	15.6	21	57.8	78	26.7	36	Working in any job or position	Loyalty or availability
		100	214	12.6	27	39.3	84	48.1	103	Full-time housewife	
		100	349		48		162		139	Total	
0.203**	14.34**	100	135	17	23	60	23	23	31	Working in any job or position	access or obtain
		100	214	9.8	21	48.1	42.1	42.1	90	Full-time housewife	
		100	349		44		23		121	Total	
0.192**	12.92**	100	135	19.3	26	60	81	20.7	28	Working in any job or position	use or benefit
		100	214	17.3	37	43.9	94	38.8	83	Full-time housewife	
			349		63		175		111	Total	
0.133*	6.18*	100	135	17.8	24	45.9	62	36.3	49	Working in any job or position	Stability or purchasing power
		100	214	15.9	34	43	92	41.1	88	Full-time housewife	
		100	349		58		154		137	Total	
0.150*	7.87*	100	135	15.5	21	60.7	82	23.7	32	Working in any job or position	Household food security
		100	214	14.5	31	47.7	102	37.8	81	Full-time housewife	
		100	349		52		184		113	Total	

***Significant at the 0.05 level ** Significant at the 0.01 level**

It is also evident that the percentage of rural women in the (medium and high) categories who work in any job or position and participate in achieving employment or benefit is higher than their counterparts who are full-time housewives, as the percentage was 60%, 19.3% compared to 43.9%, 17.3%. The calculated chi-square value was 14.34, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.203, which means that there is a significant relationship between the multiple roles of the respondent and her participation in achieving employment or benefit.
It was also shown that the percentage of rural women in the (medium and high) categories who work in any job or position and participate in achieving stability or purchasing power is higher than their counterparts who are full-time housewives, as the percentage was 45.9%, 17.8% compared to 43%, 15.9%. The calculated chi-square value was 6.18, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.133, which is what This means that there is a significant relationship between the multiple roles of the female respondent and her participation in achieving stability or purchasing power.
Finally, the percentage of rural women in the (medium and high) categories who work in any job or position and participate in achieving food security was higher than their counterparts who are full-time housewives, as the percentage was 60.7%, 15.5% versus 47.7%, 14.5%. The calculated chi-square value was 7.87, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.150, which means that there is a significant relationship between the multiple roles of the respondent and her participation in achieving food security.

2- Husband's Profession:

The results of Table (15) showed a higher percentage of rural women in the (medium and high) categories whose husbands work in a government job and participate in achieving abundance or availability than their counterparts whose husbands do NOt work, with the percentages being 46.9%, 28.1%, and 27.8%, 11.1%. The calculated chi-square value was 29.27, which is significant at the 0.01 level. The value of Cramer's correlation coefficient was 0.290, which means there is a significant relationship between the respondent's work and her participation in achieving abundance or availability.
It is also evident that the percentage of rural women in the (medium and high) categories whose husbands work in a government job and participate in achieving or obtaining is higher than their counterparts whose husbands do NOt work, as the percentage was 53.1%, 21.9% compared to 33.3%, 11.1%. The calculated chi-square value was 36.07, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.227, which means that there is a significant relationship between the respondent's work and her participation in achieving or obtaining access.
It is also evident that the percentage of rural women in the (medium and high) categories whose husbands work in a government job and participate in achieving employment or benefit is higher than their counterparts whose husbands do NOt work, as the percentage was 50%, 21.9% compared to 33.3%, 11.1%. The calculated chi-square value was 31.39, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.300, which means that there is a significant relationship between the work of the respondent and her participation in achieving employment or benefit.

Table (15) Distribution of rural women according to the husband's profession and level of participation in achieving family food security:

Kramer relatio	Chi-squar	Total		high		middle		low		Level of particip ation	Dependent variable
		%	numbe r	%	numbe r	%	num ber	%	num ber		

nship intensity	e value									Husband's profession	
0.290**	29.27**	100	18	11.1	2	27.8	5	61.1	11	Unemployed	Loyalty or availability
		100	103	11.6	12	44.7	46	43.7	45	Works in agriculture	
		100	100	16	16	45	45	39	39	Craftsman	
		100	cat	21.9	21	45.8	44	32.2	31	Freelance	
		100	32	28.1	9	46.9	15	25	8	Employee	
		100	349		60		155		134	Total	
0.227**	36.07**	100	18	11.1	2	33.3	6	55.5	10	Unemployed	access or obtain
		100	103	13.6	14	45.6	47	40.8	42	Works in agriculture	
		100	100	15	15	50	50	35	35	Craftsman	
		100	96	17.7	17	52.1	50	30.2	29	Freelance	
		100	32	21.9	7	53.1	17	25	8	Employee	
		100	349		55		170		124	Total	
0.300**	31.39**	100	18	11.1	2	33.3	6	55.6	10	Unemployed	use or benefit
		100	103	12.6	13	45.6	47	41.7	43	Works in agriculture	
		100	100	16	16	46	46	38	38	Craftsman	
		100	96	19.8	19	50	48	30.2	29	Freelance	
		100	32	21.9	7	50	16	28.1	9	Employee	
		100	349		57		163		129	Total	
0.296**	30.53**	100	18	5.6	1	44.4	8	50	9	Unemployed	Stability or purchasing power
		100	103	13.6	14	37.9	39	48.5	50	Works in agriculture	
		100	100	20	20	44	44	36	36	Craftsman	
		100	96	20.8	20	52.1	52	25	24	Freelance	
		100	32	21.9	7	56.2	18	21.9	7	Employee	
		100	349		62		161		126	Total	
0.215**	32.17**	100	18	11.1	2	27.8	5	61.1	11	Unemployed	Household food security
		100	103	11.6	12	44.7	46	43.7	45	Works in agriculture	
		100	100	16	16	45	45	39	39	Craftsman	
		100	96	21.9	21	45.8	44	32.3	31	Freelance	
		100	32	28.9	9	46.9	15	25	8	Employee	
		100	349		60		155		134	Total	

***Significant at the 0.05 level ** Significant at the 0.01 level**

It is also evident that the percentage of rural women in the (medium and high) categories whose husbands work in a government job and contribute to achieving stability or purchasing power is higher than their counterparts whose husbands do NOt work, as the

percentage was 50%, 21.9% compared to 33.3%, 11.1%. The calculated chi-square value was 31.39, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.300. It means that there is a significant relationship between the work of the respondent and her participation in achieving stability or purchasing power.

3- Family Type:

The results of Table (16) showed a higher percentage of rural women in the (medium and high) categories who live in simple households and participate in achieving abundance or availability than their counterparts who live in extended households, where the percentage was 41.3% and 22%, compared to 40.7% and 21.1%. The calculated chi-square value was 16.51, which is significant at the 0.01 level. The value of Cramer's coefficient for the strength of the relationship was 0.217, which indicates a significant relationship between family type and its participation in achieving abundance or availability.

It is also evident that the percentage of rural women in the (medium and high) categories who live in simple households and participate in achieving access or obtaining is higher than their counterparts who live in extended households, as the percentage was 43.3%, 24.7% compared to 42.7%, 17.1%. The calculated chi-square value was 35.28, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.318, which means that there is a significant relationship between the type of household and its participation in achieving access or obtaining.

It is also evident that the percentage of rural women in the (medium and high) categories who live in simple households and participate in achieving use or benefit is higher than their counterparts who live in extended households, as the percentage was 46%, 27.3% compared to 45.2%, 16.1%. The calculated chi-square value was 15.42, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.210, which means that there is a significant relationship between the type of household and its participation in achieving use or benefit.

Table (16) Distribution of rural women according to the type of family and the level of rural women's participation in achieving household food security

Kramer relationship intensity	Chi-square value	Total	High		Medium		Low		Level of participation / Family type	Dependent variable
		%	number	%	number	%	number	%	number		
0.217	16.51**	100	150	22	33	41.3	62	36.7	55	Simple	Abundance or availability
		100	199	21.1	24	40.7	81	47.2	94	Extended	
			349		57		143		149	Total	
0.318	35.28**	100	150	24.7	37	43.3	65	32	48	Simple	access or obtain
		100	199	17.1	34	42.7	85	40.2	80	Extended	
			349		71		150		128	Total	
0.210	15.42**	100	150	27.3	41	46	69	26.7	40	Simple	use or benefit
		100	199	16.1	32	45.2	90	38.7	77	Extended	
			349		73		78		117	Total	
0.224	17.58**	100	150	25.3	38	38	57	36.7	55	Simple	

		100	199	14.1	28	37.2	74	48.7	97	Extended	Stability or purchasing power
			349		66		131		152	Total	
0.206	14.85**	100	150	23.3	35	46.7	70	30	45	Simple	Household food security
		100	199	10.1	20	44.2	88	45.7	91	Extended	
			349		55		158		136	Total	

**** Significant at 0.01 probability level * Significant at 0.05 probability level**

It is also evident that the percentage of rural women in the (medium and high) categories who live in simple households and participate in achieving stability or purchasing power is higher than their counterparts who live in extended households, as the percentage was 38%, 25.3% compared to 37.2%, 14.1%. The calculated chi-square value was 17.58, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.224, which means that there is a significant relationship between the type of household and its participation in achieving stability or purchasing power.

Finally, it is clear that the percentage of rural women in the (medium and high) categories who live in simple households and participate in achieving household food security is higher than their counterparts who live in extended households, as the percentage was 46.7%, 23.3% versus 44.2%, 10.1%. The calculated chi-square value was 14.85, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.206, which means that there is a significant relationship between the type of household and its participation in achieving household food security.

This can be explained by the fact that profession is one of the most important factors in determining status in society. An individual's status in society is often measured by the position he holds. It also provides him with the opportunity to interact with others, learn about their culture, and add some knowledge to it regarding achieving family food security. A husband who works only in agriculture makes this More informed about the information and knowledge that falls within his area of interest to meet his cognitive needs, unlike other professions that enable him to mix with different cultures

The fact that a rural woman lives in a simple family indicates that she has fewer household burdens and the freedom to seek information and acquire knowledge , compared to a rural woman who lives with her family or her husband's family, where rural traditions require seeking the opinions of others and submitting to them.

4- The respondents' contribution to the family budget:

The results of Table (17) showed a higher percentage of rural women in the (medium and high) categories who contribute to the family budget and participate in achieving abundance or availability than their counterparts who contribute to the family budget, as the percentage was 42.3%, 21.8%, compared to 40.1%, 10.6%. The calculated chi-square value was 16.10, which is significant at the 0.01 level, while the value of Cramer's coefficient for the strength of the relationship was 0.221. It means that there is a significant relationship between the respondent's contribution to the family budget and her participation in achieving abundance or availability.

It is also evident that the percentage of rural women in the (medium and high) categories who contribute to the family budget and participate in achieving access or obtaining is higher than their counterparts who contribute to the family budget, as the percentage was 42.2%, 26.1% compared to 41.1%, 13.5%. The calculated chi-square value was 39.94, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.338. It means that there is a significant relationship between the respondent's contribution to the family budget and her participation in achieving access or obtaining.

It is also evident that the percentage of rural women in the (medium and high) categories who contribute to the family budget and participate in achieving use or benefit is higher than their counterparts who contribute to the family budget, as the percentage was 50%, 21.8% compared to 47.3%, 15%. The calculated chi-square value was 16.72, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.219.

Table (17) Distribution of rural women according to contribution to the family budget and the level of rural women's participation in achieving family food security

Kramer relationship intensity	Chi-square value	Total	high			middle		low		Level of participation / Contributing to the family budget	Dependent variable
		%	number	%	number	%	number	%	number		
0.221	16.10**	100	142	21.8	31	42.3	60	35.9	51	Contribute	Abundance or availability
		100	207	10.6	22	40.1	83	49.3	102	Do NOt contribute	
			349		53		143	31.7	153	Total	
0.338	39.94**	100	142	26.1	37	42.2	60	45.4	45	Contribute	access or obtain
		100	207	13.5	28	41.1	85		94	Do NOt contribute	
			349		65		145	28.2	139	Total	
0.219	16.72**	100	142	21.8	31	50	71	35.9	40	Contribute	use or benefit
		100	207	15	31	47.3	98	37.7	78	Do NOt contribute	
			349		62		169		118	Total	
0.248	21.49**	100	142	26.8	38	35.9	51	37.3	53	Contribute	Stability or purchasing power
		100	207	20.8	43	33.8	70	45.4	94	Do NOt contribute	
			349		81		121		147	Total	
0.227	18.04**	100	142	24.6	35	45.8	65	29.6	42	Contribute	Household food security
		100	**207**	**13**	**27**	**44**	**91**	**43**	**89**	**Do NOt contribute**	
			349		**62**		**156**		**131**	**Total**	

**** Significant at 0.01 probability level * Significant at 0.05 probability level**

It is also evident that the percentage of rural women in the (medium and high) categories who contribute to the family budget and participate in achieving stability or purchasing power is higher than their counterparts who contribute to the family budget, as the percentage was 35.9%, 26.8% compared to 33.8%, 20.8%. The calculated chi-square value was 21.49, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.248. It means that there is a significant relationship between the respondent's contribution to the family budget and her participation in achieving stability or purchasing power.

Finally, it is clear that the percentage of rural women in the (medium and high) categories who contribute to the family budget and participate in achieving family food security is

higher than their counterparts who contribute to the family budget, as the percentage was 45.8%, 24.6% compared to 44%, 13%. The calculated chi-square value was 18.04, which is significant at the 0.01 level, and the value of Cramer's coefficient for the strength of the relationship was 0.227. This means that there is a significant relationship between the respondent's contribution to the family budget and her participation in achieving family food security.

Therefore, we can partially reject the second statistical assumption and partially accept the research assumption.

Third: The regression model between the characteristics of the rural women studied and their levels of household food security:

To conduct the regression analysis test, the linearity of the study data and the normality of the data distribution were verified, and the results were as follows:

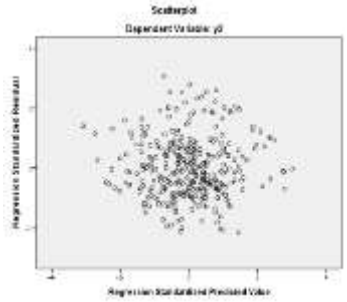	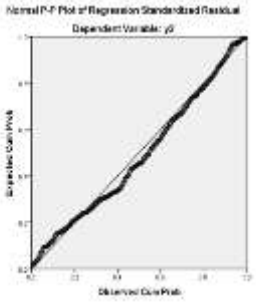	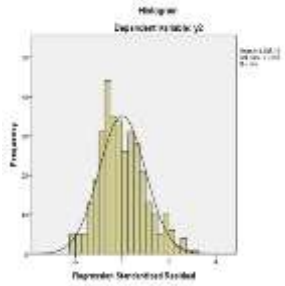
Figure (3) shows the distribution of residuals with expected values, which indicates that there is no specific pattern for residuals, and this is consistent with the linearity condition.	Figure (2) shows that the residuals cluster around the line, confirming that the data are normally distributed. Figure (3) shows that the residuals are distributed around the line, confirming that the data are normally distributed.	Figure 1 shows that the data is normally distributed.

Figures (1, 2, 3) show that the residuals are randomly distributed and do not follow a specific pattern. It is also clear that the linearity condition is met in the study data, and that the study sample is moderately distributed, all of which are conditions for performing a regression analysis test.

The results in Table (18) show that the multiple correlation coefficient (R=0.710) and the R-squared coefficient

(R Square=0.504).

Table (18) R and R Square values

Std. Error of the Estimate	Adujsted R Square	R Square	R	Model
7.246	0.358	0.369	0.607	

Table (19) shows that the independent variables: monthly food expenditure, size of agricultural land holdings, sources of information, and geographical openness are statistically significant (P>0.01), and the independent variables: age of the respondent, and

size of livestock holdings are statistically significant (P>0.05), and therefore act as predictors of the degree to which rural women achieve household food security. Thus, the linear regression equation according to the table will be as follows:
Y =39.409+ 0.138 age of the respondent + 0.297 monthly food expenditure + 0.213 size of agricultural land holdings +0.422 size of livestock holdings + 0.712 sources of information + 0.381 geographical openness.
Therefore, we can partially reject the third statistical hypothesis and partially accept the research hypothesis.

Table (19) Regression model coefficients

Sig	t	Standardized Coefficients	Unstandardized Coefficients		Regression model
		Beta	Std. Error	B	
0.000	12.632	-	3.120	39.409	Constant
0.023	2.238	0.100	0.060	0.138	Age of respondent
0.000	3.648	0.192	0.081	0.297	Monthly food expenditure
0.000	6.246	0.309	0.034	0.213	Size of agricultural land holdings
0.031	2.163	0.094	0.195	0.422	Size of livestock holdings
0.000	6.899	0.407	0.103	0.712	Sources of information
0.006	2.775	0121	0.137	0.381	Geographical openness

***Significant at the 0.05 level ** Significant at the 0.01 level**

Fourth: Obstacles to achieving household food security:

The results of Table (20) showed that the obstacles to achieving household food security, ranked in descending order of importance from the perspective of rural women, were as follows: high food prices (90.7%), limited income (jobs), lack of the necessary financial resources to purchase food (83.1%), weak state oversight role on food quality and safety. Food by (77.8%), moNOpoly of traders and control of prices of essential foods by (70.3%), high prices of agricultural production requirements by (66.4%), poor planning of food purchasing operations by (61.5%), increase in food loss and waste in the field from harvest to storage by (58.2%), increase in food loss and waste in the home from choosing poor types to storage and poor management of stocks in the home (53%), lack of nutritional awareness to instill and promote healthy eating patterns (nutritional value of food, available food alternatives, food safety and quality) (47.9%), lack (unavailability) of sufficient information, knowledge and skills that enable the acquisition, preparation and consumption of nutritionally adequate meals, how to consume or use food more efficiently (40%), scarcity of food supply in village markets (38.1%), distance of markets from Place of residence (30.3%), lack of transportation and its high price (26.7%), lack of clean and safe water for human use (20.2%), and finally the negative effects of climate change and lack of awareness of its dangers and how to avoid it (17.4%).

Table (20) Distribution of rural women according to the degree of impact of obstacles to achieving family food security from their point of view:

Obstacles	**Relative importance**	**Importance**			**%**
		High	**middle**	**weak**	

1- High food prices	270	56	28	950	90.7
2-Limited income (employment) Lack of financial means to purchase food	230	70	40	870	83.1
3-Monopoly and control of essential food prices by traders	210	65	55	815	77.8
4-Weak role of the state in monitoring food quality and safety	195	58	35	736	70.3
5- High prices of agricultural production inputs	190	46	33	695	66.4
6- Poor planning of food purchases	174	50	22	644	61.5
7- Increased food loss and waste in the field, from harvest to storage	163	26	47	163	47
8- poor quality selection to storage	151	12	45	151	45
9-Lack of nutritional awareness to instill and promote healthy eating habits (nutritional value of food, available food alternatives, food safety and quality)	132	30	38	132	38
10-Lack (unavailability) of sufficient information, knowledge, and skills for (how to consume or use food more efficiently)	119	4	29	119	29
11-Limited food supply in village markets	97	6	51	97	51
12-Distance of markets from residential areas	83	16	26	83	26
13-The lack of transportation and its high cost	65	21	32	65	32
14-The lack of clean and safe water for use	52	12	22	52	22
15-The negative effects of climate change and the lack of awareness of its dangers and how to avoid them	47	9	16	47	16

Fifth: Rural women's proposals to achieve household food security:

The results of Table (21) showed that the surveyed rural women's proposals to achieve household food security, ranked in descending order of importance, were as follows: Providing diverse opportunities to develop household income so that they can purchase the food they need (90.0%), activating the state's oversight role to protect the consumer (80.0%), and providing support for all agricultural production requirements (75.6%). Adopting a fair pricing policy that protects farmers from price fluctuations by (68.2%), implementing guidance programs to educate individuals on how to provide sufficient and nutritious meals by (57.3%), implementing guidance programs to educate individuals on how to maintain food safety and quality elements by (51%), and implementing a guidance program to educate individuals on how to consume or use food more efficiently by (47%), activating food protection laws Agricultural land (38.4%), provision of silos and refrigerators to store surplus crops (27.5%), and adjustment of planting dates to accommodate changes in weather conditions (18.9%). The above demonstrates the diversity of rural women's proposals to achieve household food security, which focus on increasing and diversifying household income, tightening market and price controls, and raising awareness to instill and promote healthy eating patterns. (adequate and nutritious food, food ingredients, safety and quality, more efficient consumption or use of food).

Table (21) Distribution of rural women according to proposals to achieve family food security

Reasons	Repetition	%
1-Trying to develop and improve family income to purchase their food needs.	**314**	**90.0**
2-Activating the state's supervisory role to control markets and rising food prices**.**	**279**	**80.0**
3-Supporting all agricultural production requirements**.**	**264**	**75.6**
4-Determining a fair price for agricultural products in advance through the state.	**238**	**68.2**
5-Educating individuals on how to provide adequate and nutritious meals**.**	**200**	**57.3**
6- Spreading a culture of healthy eating to reduce malnutrition**.**	**178**	**51**
7- Educating individuals on how to consume or use food more efficiently**.**	**164**	**47**
8- Enforcing laws to protect agricultural land**.**	**134**	**38.4**
9-Providing silos and refrigerators to store surplus agricultural products**.**	**96**	**27.5**
10- Adjusting planting dates to suit changes in weather conditions**.**	**66**	**18.9**

Recommendations:

- Improving rural women's participation in achieving household food security, as the study revealed deficiencies in each area.
- Supporting rural women with sound practices to preserve food quality and safety, with an emphasis on practices with the lowest rates of food security. This contributes to achieving household food security.
- Increasing attention to young rural women and those living with extended families, providing them with the knowledge and sound practices to achieve food security for their families, as they are the least likely to practice it.
- Emphasize education, given its positive impact on sound practices for achieving food security for rural families.
- Raise awareness of the obstacles rural women face in achieving household food security in Egypt, given the critical importance of their awareness of these obstacles to their participation in achieving it.

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