

Analyzing clients' opinion on vegetarian diet, their safety and availability in the Egypt market

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Abstract

In our paper we focus on the clients' opinion on vegetarian diet, their safety and availability in the Egypt market. The analysis is based on a survey organized in the period between January 2024 and February 2024. From the methodological aspect, basic approaches of descriptive statistics have been used, as well as methods of association measurement. The test of robustness tested Chi-Square statistic. The robustness have been judged based on the p-values. Correlations have been tested through the Contingency coefficient and Cramer's V coefficient. From the survey it can be concluded that even though clients have some idea about vegetarian diet and trust them more compared to other classic food, they think that their market supply is not sufficient. Respondents consider media and internet, as the most important information source that they wish to be informed on vegetarian diet safety and control. Through the statistics of robustness, it was found out that the effect of gender, education, economic and activity had a better information vegetarian diet proved to be statistically significant.

Keywords: Chi-Square Test of Independence; Contingency Coefficient; Cramer's V Coefficient.

1. Introduction

Currently, most clients are beginning to realize the importance of a healthy lifestyle and consumption of healthy foods. A fairly wide selection of products that are labeled as organic appears in retail chains. These are products made mainly from raw materials from organic farming.

Ecological agricultural production has its principles, principles and rules. The impacts of the intensification of conventional agriculture on the environment were described and an analysis of the energy demand of both land management systems was carried out by Bertilson et al. (2008). According to Jordan et al. (2009), ecological agricultural production can be optimized through effective adaptation to local conditions and possibilities, and is also dependent on the dissemination of knowledge and research results focused on ecosystems and technologies. Registered organic operators, producers of organic products and producers of vegetarian diet, developing the green economy, must comply with strict conditions of production. Food quality and safety standards, such as ISO 22000, BRC 5 and IFS 5 and others, if properly applied, maintained and audited, represent a complex of management, management and preventive measures of food safety policy Golian et al. (2007, 2008). The Audio-Visual Information Center of the Ministry of Agriculture and Land Reclamation published in the Egypt Republic, registers as the 2022-2023 agricultural season witnessed a cultivated area of 9.8 million acres, with a crop area of 17 million acres; as a result of the agricultural intensification rate that represented 180 percent. The targeted crop structure for the 2023-2024 agricultural season represents 10 million acres of cultivated area, and 17.5 million acres of crop area.

Safe foods can be produce only from high-quality raw materials that meet the requirements of microbiological and chemical safety.

2. Material and methods

The aim of the paper is to investigate the opinions of clients on vegetarian diet, their safety and availability on the Egypt market, to identify the motives for buying vegetarian diet's foods and to obtain information about what information sources clients would be interested in.

The basis for the individual analyzes of the contribution was a questionnaire survey. From a methodological point of view, in addition to the basic methods of descriptive statistics, the method of measuring associations was also used in the paper. The existence of statistically significant relationships was verified by the χ^2 contingency test. We assessed the statistical evidence of relationships based on the significance of the test characteristic (p-value). The tightness of dependence was verified using the contingency coefficient and the Cramer coefficient. The calculations were carried out in the statistical software SPSS.

3. Results and discussion

The questionnaire survey was carried out between January 2024 and February 2024. It was attended by 400 respondents who answered 12 self-administered questionnaire questions regarding clients' opinions on vegetarian diet and 5 classification questions. In this post, we will focus on the analysis of selected questions.

In the sample set of 400 respondents, 68% were women and 32% were men. In terms of age structure, the age category of young people (under 25) was the most represented (55% of the total number of respondents). The second most numerous group (25%) is represented by the age category from (26 to 35 years), followed by the category of people aged from (36 to 45 years) (12%). People aged (46 to 55 years) accounted for 5% of the sample, and the oldest people (over 56) represented 3%. We assumed that the opinions of the respondents could be influenced by their education. In terms of education, it was (basic education) represented by 3.15%, (secondary education) 52.12% and (university education) 44.73%. We also investigated the respondents' current economic activity. The group of (employed) was most represented (45%), followed by the group of (students) (30%). The third position was occupied by a group of Businessmen (17%). The unemployed occupied the fourth position (7%) and retirees were the least represented (1%). In the survey, we were also interested in the respondents' income, through the question "Type of gainful activity". Most employees (54%) were included in the survey, followed by self-employed persons (20%). Company owners (8%) were in third place. (18%) of the respondents did not state their gainful activity. As part of the evaluation of the questionnaire's own questions, we first asked the respondents if they knew the concept of vegetarian diet. This term is known to 92% of respondents. Only 8% of respondents have not yet encountered this term (Figure 1).

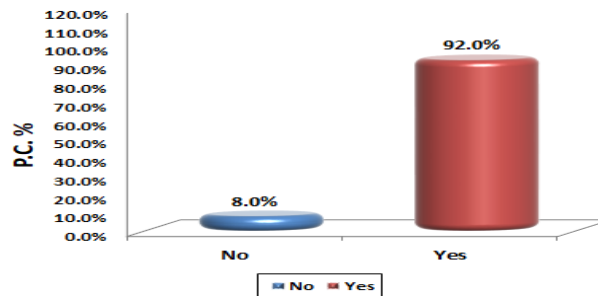


Fig. 1: Answers to the Question "Do You Know the Concept of Vegetarian Diet?".

In the questionnaire, we considered such classification questions in which we assumed the existence of an association in relation to the investigated objective. Associations were verified using the χ^2 contingency test. The results of testing in relation to (question 1) are presented in (Table 1).

Table 1: Results of Testing the Existence of Dependence of Answers to (Question 1) and Classification Variables

Classification variables	χ^2 value	p-value	Conclusion of the test: Is there a significance?	Contingency coefficient	Cramer coefficient
Gender	17.257	0,0001	Yes	0,2017	0,2087
Age	3.943	0.413	NO	0,1145	0,1149
Education	36.504	0,0000	Yes	0,3081	0,3113
Economic activity	26.881	0,0001	Yes	0,2721	0,2782
Type of gainful activity	6.917	0.074	NO	0.1472	0.1501

As documented in (Table 1), dependence was confirmed in terms of gender, education and economic activity. Based on the contingency coefficient and the Cramer coefficient, we can talk about a medium-strong dependence, while the greatest influence of education was confirmed, i.e. respondents with higher education were more likely to know the concept of vegetarian diet (Figure 2).

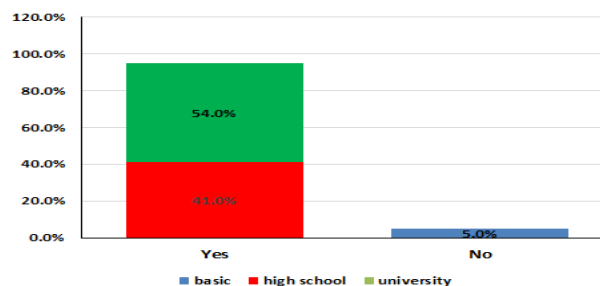


Fig. 2: Answers to the Question "Do You Know the Concept of Vegetarian Diet?" in Relation to Education in %.

The fact that the client knows the term "vegetarian diet" does not clearly indicate whether he also understands the true meaning of this word. We verified this fact with the second question, which read:

What do you think vegetarian diet is?

Individual answers are presented in (figure 3), from which it follows that almost all respondents (86.08%) know the meaning of the term vegetarian diet, i.e. consider vegetarian diet as products and food that come from a controlled and certified farming system.

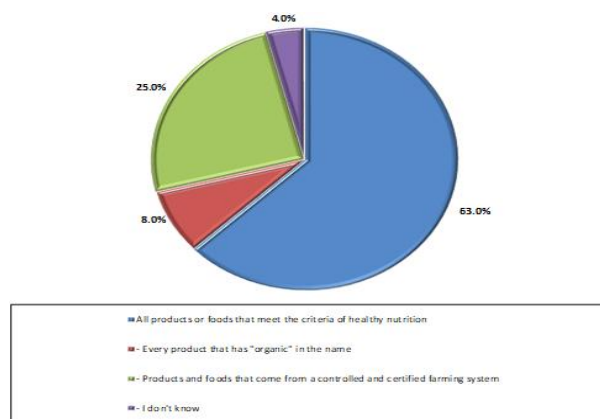


Fig. 3: Answers to the Question "What Do You Think Vegetarian Diet Is?".

When examining dependence, a statistically significant dependence (Table 2) was confirmed for gender, education, economic activity and type of gainful activity. Again, it was a moderately strong dependence (Cramer coefficient values from 0.14 to 0.23), the highest of which was between gender and the dependence of knowledge of the meaning of the vegetarian diet.

Table 2: Results of Testing the Existence of Dependence of Answers to (Question 2) and Classification Variables

Classification variables	χ^2 value	p-value	Conclusion of the test: Is there a significance?	Contingency coefficient	Cramer coefficient
Gender	20.31	0.0001	Yes	0.2112	0.232
Age	9.21	0.684	NO	0.1335	0.0765
Education	16.732	0.010	Yes	0.2081	0.1492
Economic activity	34.083	0.0006	Yes	0.2789	0.1803
Type of gainful activity	22.110	0.0085	Yes	0.2318	0.1451

Of the total number of respondents who marked "third option" as correct, up to 70% were women. (Figure 4) shows the structure of answers by gender in relation to the total number of respondents.

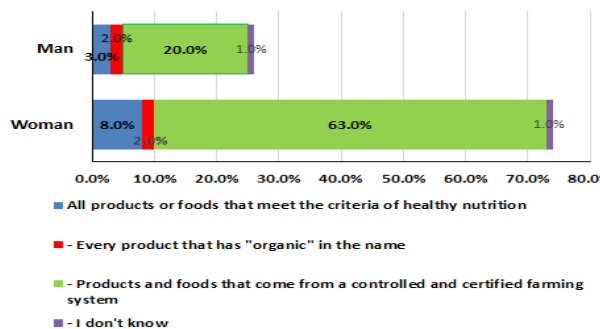


Fig. 4: Answers to the Question "What Is Vegetarian Diet?" in Relation to Gender in %.

The development of ecological thinking of organic production, knowledge about nutrition and a healthy lifestyle largely influence clients when buying food, so we also monitored the motives for buying vegetarian diet. The question asked was (question 3): Why do you buy vegetarian diet's foods?

- Higher trust.
- Higher quality compared to classic foods
- Better taste compared to classic foods.
- Other

As (Figure 5) documents, most of the respondents (44.5%) buy vegetarian diet's foods because they have higher trust in it compared to classic food and consider vegetarian diet consumption more suitable in terms of healthy nutrition and safety. The same percentage (22.5%) representation of answers was for option (higher quality compared to classic food) and for option (Better taste compared to classic foods). The option (other) was 10.5% of respondents buy organic food because of its better taste looks better.

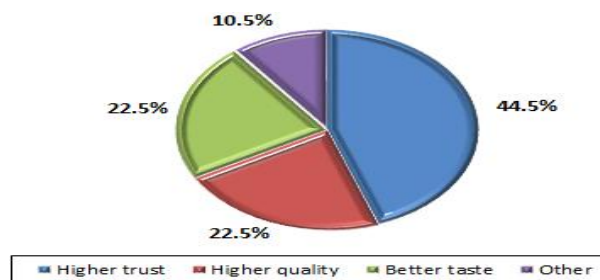


Fig. 5: Answers to the Question "Why Do You Buy Vegetarian Diet's Foods?".

As can be seen from (Table 3), no statistically significant dependence was confirmed for this question in relation to the investigated classification questions.

Table 3: Results of Testing the Existence of Dependence of Answers to (Question 3) and Classification Variables

Classification variables	χ^2 value	p-value	Conclusion of the test: Is there a significance?	Contingency coefficient	Cramer coefficient
Gender	7.045	0.0704	NO	0.1252	0.1353
Age	9.052	0.6984	NO	0.1552	0.1142
Education	10.906	0.0913	NO	0.181	0.1327
Economic activity	17.509	0.1314	NO	0.2107	0.1288
Type of gainful activity	8.195	0.5146	NO	0.1314	0.0782

As part of the survey, the sources of information on the production and control of vegetarian diet that the respondents would prefer were also determined. In the questionnaire, the respondents were asked the following question (question 4):

Would you like to learn more about food safety, organic farming, vegetarian diet production and control? If so, from what sources?

Yes Professional seminar

Media (radio, television)

Press

Internet

No

As (Figure 6) documents, most of the respondents (26.5%) obtaining information from both the (Internet and Media). The respondents (22.50%) representation of answers was not confirmed. The option (seminar) was (15.5%) of respondents. Among other sources, the possibility of obtaining information from the press (9.0% of respondents) was ranked last.

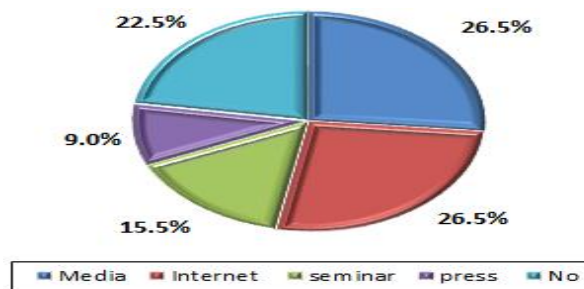


Fig. 6: Responses to the Question "Would You Like to Learn More About Food Safety, Organic Farming, Production and Control of Vegetarian Diet, Etc." from What Sources?"

We compared the results of our survey with the results of the survey by Matysik – Pejas (2009), according to which almost 48% of respondents consider television to be the most important source of information about organic farming products, 21% of respondents press, 10% family and friends, 7% regional events and radio 5%, which our results confirmed to some extent.

The existence of a statistically significant dependence was confirmed in the case of association with gender and age. The strength of significant dependence measured by Cramer coefficient ranges from 0.16 to 0.22 (table 4).

Table 4: Results of Testing the Existence of Dependence of Answers to (Question 4) and Classification Questions

Classification variables	χ^2 value	p-value	Conclusion of the test: Is there a significance?	Contingency coefficient	Cramer coefficient
Gender	16.073	0.0066	Yes	0.205	0.2219
Age	33.725	0.0280	Yes	0.3005	0.1602
Education	12.054	0.2814	NO	0.1756	0.1284
Economic activity	28.06	0.1079	NO	0.2549	0.1401
Type of gainful activity	21.019	0.1362	NO	0.2198	0.1296

The last question analyzed by us is aimed at finding out opinions related to the offer of vegetarian diet kinds.

We started from the following question (question 5):

In your opinion, the offer of vegetarian diet kinds on the Egypt market is:

Sufficient

Weak

I don't know

The results showed (Figure 7) that the majority of clients consider the offer of vegetarian diet kinds on the Egypt market to be weak (57.50%). (25.0%) of respondents could not comment on the question, and for (17.50%) of respondents, the offer is sufficient.

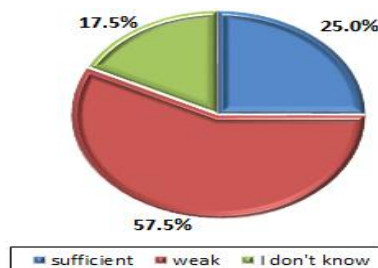


Fig. 7: Answers to the Question "in Your Opinion, the Offer Kinds of Vegetarian Diet on the Egypt Market Is:".

Statistically significant dependence, moderate, was confirmed only in relation to economic activity of the respondents (table 5).

Table 5: Results of Testing the Existence of Dependence of Answers to (Question 5) and Classification Variables

Classification variables	χ^2 value	p-value	Conclusion of the test: Is there a significance?	Contingency coefficient	Cramer coefficient
Gender	1.621	0.4446	NO	0.0466	0.0477
Age	9.034	0.3394	NO	0.1358	0.1024
Education	3.041	0.5509	NO	0.057	0.0546
Economic activity	22.016	0.0048	Yes	0.2401	0.1821
Type of gainful activity	12.012	0.0617	NO	0.162	0.1183

4. Conclusion

Based on the analysis of the input data and information of 400 respondents participating in our survey, it is possible to formulate the following conclusions. Almost all respondents faced the concept of vegetarian diet. Most of them consider vegetarian diet as products and food that come from a controlled and certified organic farming system. Respondents as motives for their purchase they report higher trust in vegetarian diets foods compared to classic foods for their safety and usefulness in terms of satisfying human nutritional needs. Most clients would welcome the opportunity to learn more about food safety, organic farming, vegetarian diet production and control. The respondents consider the media and the Internet to be the most important sources of information about organic agricultural products and vegetarian diet. Respondents see reserves in the offer kinds of vegetarian diet on the Egypt market, because they consider it insufficient. Vegetarian diets form a specific segment on the food market, we recommend that the offer kinds of vegetarian diets in retail chains be appropriately expanded in line with potential clients demand. We assume that with more significant awareness and targeted support for the sale of high-quality domestic production by the state, it will be possible to convince more residents to take a responsible approach to their health, and by using the vegetarian diet, have a preventive effect on the health of themselves and their loved ones against the occurrence of various diseases.

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