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CONSUMPTION OF DOMESTIC VEGETABLES PRODUCED IN GREENHOUSES: A SOCIO-DEMOGRAPHIC PROFILE OF THE CONSUMER

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Abstract: In recent years farmers producers of vegetables in greenhouses of Albania have faced a number of problems within this cluster such as production standards, costs and sales. The decline in sales is related to domestic consumption; the facts from the markets of Tirana, support that the consumption of domestic products may not yet be a priority of consumers. The decline in consumption of domestic products affects farmers' incomes and the well-functioning of markets. Consumption of domestic vegetables produced in greenhouses can be affected by demand factors, including age, perception on food safety and consumers' education. The literature supports impact of the above factors to the consumption. The paper's objective is a measurement of the potential impact of variables such as age, food safety, consumers' education and family members to the consumption of domestic products in the markets of Tirana. The results of the statistical model used shows that above variables affects to the consumption. The findings provide a socio-demographic profile of the consumer of domestic agricultural products produced in greenhouses and may serve for other future researchers.

Keywords: Consumption, age, food safety, education, family members, domestic production.

1. Introduction

The production of vegetables in greenhouses represents an important industry for Albanian agriculture. Over the last 30 years this activity has expanded and mainly in the south–western area, which represents the largest agricultural production region in the country. Between the years 2000–2016 the surface of greenhouses in Albania has expanded by 462ha–1403ha¹. Greenhouse farmers favored by annual temperatures and the advantages of specialization for years, have the capacity to produce 3 agricultural crops during 1 calendar year. However, in recent years farmers have faced a number of complicated problems; some of which are related to global events, such as the pandemic Covid–19 (2019–and the effects thereafter) and some others related to problems within this cluster, such are production standards, costs and consequently sales in the market. The decline in sales has particularly affected farmers' their family economy and sustainable regional development.

Production standards and technology followed affect the safety of agricultural products and consequently consumption, and several times this issue has been the subject of discussions in Tirana markets. In this theater of developments the dynamics are also characterized by various other interactions. Worrying have been e.g. migration indicators, especially among youngest and the most qualified, and these socio–demographic changes may have also an impact in this context. Given the changes in the structure of consumers demand, there may be changes in demand factors and consumption of domestic agricultural products produced in greenhouses. The facts from the markets of Tirana, support that the consumption of domestic products may not yet be a priority of consumers. In fact, sustainable consumption have a multi–plane importance, influencing the realization of production and the well–functioning of markets, sustainable development, economic growth, etc.

The sustainable consumption represents a "puzzle" of importance in the picture of the economy, if we look it in the light of the competitiveness of domestic production and more specifically of domestic consumption and implications. *Consumption* of domestic vegetables produced in greenhouses can be affected by socio–demographic changes with an impact on demand factors, including *age*, perception on *food safety* and the consumers' *education*. Testing the above factors and assessing their impact on the consumption of domestic agricultural products, illustrating with a case study from the markets of Tirana represents a subject with curiosity (1) theoretical and research and (2) practically informative for market actors or consumer protection organizations. (3) Assessing the functioning of domestic markets and the potential implications represent a primary task for market monitoring institutions.

The research literature in recent years has a growing and multidisciplinary focus on the issue of food consumption and the most influential factors in different countries. The age have an influence on fruit and vegetable consumption². High vegetable consumption may be associated with slower rate of cognitive decline with older age³. The proportion of a low consumption of vegetables increases with age⁴. Concerns about food safety influence the way in which consumers confront the question of where, how and from whom they buy their fresh vegetables⁵. While the

¹ INSTAT. (2017): Albanian Institute of Statistics. www.instat.gov.al.

² Hobbs D.A., Ashouri A., George T.W., Lovegrove J.A., Methven L. (2014): The consumer acceptance of novel vegetable–enriched bread products as a potential vehicle to increase vegetable consumption. *Food Research International*, Elsevier, Vol. 58, (April), p. 15–22.

³ Morris M. C., Evans D. A., Tangney C. C., Bienias J. L., Wilson R. S. (2006): Associations of vegetable and fruit consumption with age–related cognitive change. *Neurology*, 67, p. 1370–1376.

⁴ Lindström M., Hanson B.S., Wirfalt E., Ostergren P.O. (2001): Socioeconomic differences in the consumption of vegetables, fruit and fruit juices. The influence of psychosocial factors. *European Journal of Public Health*, Vol. 11, p. 51–59.

⁵ Wertheim–Heck, S.C.O., Spaargaren G., Vellema S. (2014): Food safety in everyday life: Shopping for vegetables in a rural city in Vietnam. *Journal of Rural Studies*, Elsevier, Vol. 35, (July) p. 37–48.

safe vegetable production and distribution affect to the wide spread of the consumer trust, the state failure in food safety protection reported widely between developing countries⁶. There is augmentation of respondents “worrying about food–safety problems” in EU and it comprise a significant share of 48% of European consumers (and Bulgarian consumers 75%) indicate that consumed food by using improper using pesticides/chemicals “very or fairly likely” can damage their health⁷. Increases in education leads to higher likelihood of preferences for vegetables⁸. The lower paternal educational level it is negatively associated with the consumption of vegetables⁹. Factors, especially the age and the level of education influence to the consumption of fresh fruits and vegetables¹⁰. According to social class and household members or being married, compared to being single may affect a persons vegetables intake via eating and socio–cultural norms or home availability of vegetables and so on¹¹. Previous research have demonstrated that family members' eating habits are similar, by reveals that vegetable intake predicts also the vegetable intake by spouses, children and adolescents¹². The age of consumers, educational level and the perception safety, are the main determinants of consumer's¹³.

2. Objectives and hypotheses

The main objective of the paper is to test the potential impact of several variables, such as age, food safety and consumer education of the interviewees to the consumption of the agricultural domestic products, illustrating with a case study from the markets of Tirana and more specifically with the consumption of tomatoes produced in greenhouses.

Specific objective

Through findings and recommendations, to create a socio–demographic profile of the consumer in the markets of Tirana who consumes agricultural domestic vegetables produced in the greenhouses.

The study hypotheses are:

- H1 — the age of consumers affect to the consumption of domestic produced tomatoes;
- H2 — perception of food safety affect to the consumption of domestic produced tomatoes;
- H3 — the education of consumers affect to the consumption of domestic produced tomatoes.

A research question of interest has also been formulated for research purposes; does the family structure (expressed according to the number of family–members) affect to consumption of domestic tomatoes produced in greenhouses?

⁶ Pham V.H., Mol A.P.J., Oosterveer P.J.M. (2009): Market governance for safe food in developing countries: the case of low–pesticide vegetables in Vietnam. *Journal of Environment Management*, Elsevier, Vol. 91, Issue 2, p. 380–388.

⁷ Bachev H. (2011): Management of chemical and biological risks in agri–food chain. Institute of Agricultural Economics, Sofia. MPRA, Munich Personal RePEc Archive.

⁸ Dettmann, R., Dimitri C. (2007): Who's buying organic vegetables? Demographic characteristics of US consumers. *Journal of Food Distribution Research*, p. 49–62.

⁹ Valmórbida J.L., Vitolo M.R. (2014): Factors associated with low consumption of fruits and vegetables by preschoolers of low socio–economic level. *Jornal de Pediatria*, 90 (5), p. 464–471.

¹⁰ Dhaoui O., Nikolaou K., Mattas K., Baourakis G. (2020): Consumers' attitude towards alternative distribution channels of fresh fruits and vegetables in Crete. *British Food Journal*, Vol. 122, Issue 9, p. 2823–2840.

¹¹ Kamphuis C., Giskes K., de Bruijn G., Wendel–Vos W., Brug J., van Lenthe F. (2006): Environmental determinants of fruit and vegetable consumption among adults - a systematic review. *British Journal Nutrition*, Vol. 96, p. 620–635.

¹² Hannon P.A., Bowen D.J., Moinpour C.M., McLerran D.F. (2003): Correlations in perceived food use between the family food preparer and their spouses and children. *Appetite*; Elsevier, Vol. 40, Issue 1, p. 77–83.

¹³ Wang F., Zhang J., Mu W., Fu Z., Zhang X. (2009): Consumers' perception toward quality and safety of fishery products, Beijing, China. *Food Control*, Elsevier, Vol. 20, Issue 10, p. 918–922.

The above variables and the research question are measured by the perception of consumers in the markets of agricultural–food products in the city of Tirana (October 2019 – January 2020). They are:

- Age;
- Food safety
- Education
- Family members

3. Measurement procedure

A questionnaire was construct for the realization of the paper and after testing in advance in a focus group and adaptation with some adjustments it was used in the study area (in the agricultural–food markets in the municipality of Tirana), by interviewing consumers (220) according to random choice procedures. The above variables are measured by scales (1–5) and interviewed consumers have been responded to the respective questions according to scaling applied.

Based on data provided a linear statistical model is used to test the above variables. The significance of the variables under review is presented in the following table (table 1).

Table 1. The significance of variables by linear statistical model
Dependent variable: Greenhouse domestic tomato consumption

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
Const.	2.14772	0.581600	3.693	0.0003	***
Age	-0.187793	0.0736681	-2.549	0.0115	**
Food safety	0.137132	0.0812592	1.688	0.0929	*
Education	0.135518	0.0837695	1.618	0.1000	*
Family members	0.268099	0.0962954	2.784	0.0058	***

Statistics based on the weighted data:

Sum squared resid	656.3224	S.E. of regression	1.747187
R-squared	0.113160	Adjusted R-squared	0.096661
F(4, 215)	6.858465	P-value(F)	0.000033
Log-likelihood	-432.3992	Akaike criterion	874.7984
Schwarz criterion	891.7665	Hannan-Quinn	881.6505

Statistics based on the original data:

Mean dependent var	3.495455	S.D. dependent var	1.168450
Sum squared resid	280.2938	S.E. of regression	1.141793

Source: Data processed by authors.

4. Conclusions and discussions

The paper in accordance with the objectives provides an analytical presentation of the problem of consumption of domestic vegetables according to consumer characteristics, by presenting a case study from the markets of agricultural–food products in Tirana, Albania.

The age, according to linear statistical model (table 1) results a very influential factor to the trend of tomato consumption in the markets of Tirana. With increasing the age of consumers, demand trend for domestic vegetables produced in greenhouses falls and this also can be explained by the decline in consumption generally with aging. However it is important to note that dietary

foods with vegetables of older age affect to the healthy nutrition, longevity and protect against disease and this problem in addition to consumption has a number of implications. Findings indicate that higher consumption of vegetables is significantly associated with a lower risk of depressive symptoms¹⁴. The migration of the youngest abroad may also affect the decline in consumption generally.

Food safety, results an influential and positive factor to the trend of consumption of domestic tomatoes. With increasing of standards of food safety throughout the chain from production to marketing the chances increase for the consumption of more domestic vegetables in the markets. Important external and internal factors may be involved. Increased competition with foreign products may call into question the production practices and standards of domestic products. Consumers may be faced with other more competitive alternative offers. The perception is important for the consumer behavior of buyers and consequently deserves more attention to possible causes. The issue of food safety is related to production, sales in the domestic market, exports and competitiveness.

Education, according to measurements results an influential factor to the trend of tomatoes consumption. We pointed out that the vegetable diet is recommended for nutritious food being widely considered as a diet with multifaceted and positive effects. Information on nutritious and healthy food goes hand in hand with the levels of consumers' information, their culture, their social status and their level of education. Similarly, the problem of domestic products produced in greenhouses quickly sensitizes consumers' with a higher level of education, resulting in consequences for their consumer readiness. Higher levels of education correspond to youngest and the migration may have an impact on declining consumption. Studies suggest that education improve vegetable liking and intake¹⁵.

Family members, results a very influential factor. Even intuitively in fact this finding is not a surprise. The family or coexistence between individuals is an entity that is identified by values, beliefs and common attitudes. Moreover, in the case of a multi-member family, parents develop an important responsibility not only for providing and preparing food for other family members, but also for orienting preferences towards more nutritious foods and this is a natural function of parenting. This experience is further transferred between older and younger children. On the other hand, for many reasons the family with more members tends to be more oriented by cooking at home than by other alternatives. Promoting consumption of a multi-member family maybe deserves more attention.

The paper presents a socio-demographic profile of potential consumer of the domestic agricultural products in the markets of Tirana. However the question for future research is still valid: Who consumes domestic agricultural products produced in greenhouses?

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