THE EFFECT OF PROCESSED PRODUCTS ON HEALTH

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1. Introduction

Human capital is defined as "individuals who make up the labour force". Labor force's health has a positive effect on productivity. Population's productive work is the basis of the overall development of the country. So that, human health is the basis for the development of a productive society. In order to use human capital more efficiently, it is necessary for them to be physically healthy. If we look at the economic indicators of countries, we will see that people live longer in economically developed countries (WHO). The life expectancy of the population can be taken as a sign of ecological, social and economic development. In terms of productivity, health is considered important as much as education. Therefore, in order to measure the human capital stock, education and health must be combined. According to the human capital theory, the productivity of the person who develops his/her knowledge and skills increasing. However, a person needs to be educated in order to increase his knowledge and skills. No doubt, raising the level of health and education is indispensable. In the studies of researchers, it can be shown that the productivity of the workforce who is healthy and at the same time educated and trained is higher.

In order to ensure healthy living of people, the causes of diseases should be investigated first and these causes should be eliminated. It is clear that diseases have different causes. We can mention wrong nutrition as one of the most important of them. Malnutrition begins mainly with the consumption of processed products. Processed products constitute almost the basis of people's daily diet nowadays. Many people either don't know or care whether the food they eat is processed. But a large number of processed foods have been linked to health problems such as heart disease, diabetes and certain forms of cancer.

According to Michael Garcia, MD, a nutrition specialist at UCLA Health, if people understand what processed foods are, they can make better decisions for their health.

"The broadest definition of processed food is that any raw commodity that is altered from its natural state," according to Dr. Garcia. "The important thing to remember is there is quite a spectrum of processed foods, ranging from low to high. It could be anything from packaged spinach in a bag or a container all the way to a pastry or frozen pizza." The concept of "Genetically Modified Organisms (GMO)" has emerged to meet the growing need for food in the world and to find a solution to the problem of hunger. Healthy individuals also indirectly impact economic growth by having a healthy family which may subsequently create healthier future generations. Human health is an essential part of any society and economic activity. It also assumes a prominent position on the Maslow hierarchical ladder of human needs. As we can see in the current pandemic, the COVID-19 disease has disrupted many economic activities around the world because of its infectious nature, while its contagious effect has harmed global health.without good health conditions, an economy loses its ability to develop competitive productivity, which might subsequently hinder economic growth.

It can be concluded that in order to develop the economy, it is necessary to pay attention to the health of the members of the society. For this, first of all, it is necessary to investigate what affects health the most. According to research, processed foods are one of the aspects that have a negative impact on health. This article examines how several processed foods affect health. Based on real data, the econometric model has been established and the results have been analyzed.

2. LITERATURE REVIEW

The first things that come to mind when talking about processed food: they are packaged foodstuffs made up of many ingredients, containing artificial colors, flavors, and even various chemical additives. Processed foods, usually pre-prepared, called "ready-to-eat foods". It is claimed that it causes an epidemic of obesity and chronic diseases such as heart disease and diabetes, which are increasingly common. Nearly all food sold in supermarkets will be classified as "processed" to some degree, according to research. As soon as food is harvested, they

begin to deteriorate and lose their nutritional value; even apples in the fruit aisle go through four or more processing stages before being sold to the consumer. It is speculated that these foods are specifically designed to increase appetite so that people overeat and buy more. Some, but not all, of these foods are poor in fiber and nutrients. For example; sugary drinks, cookies, some crackers, chips and breakfast cereals, some frozen lunches and dinners, and meats. A study using data from the US National Health and Nutrition Examination Survey found that ultra-processed foods make up about 60% of the total calories in the US diet [4]. It has also been suggested that there is a relationship between increased sales of ultra-processed foods and an increase in obesity[3]. Additives commonly used in the production of highly/ultra-processed foods such as saturated fats, added sugar and sodium; Due to its effects on heart disease, obesity and high blood pressure, it has become a determinant of poor nutrition.[6],[7]. Ultra-processed foods are estimated to contribute about 90% of total calories from added sugars [4].

In 2015, the World Health Organization classified processed meats as cancer-causing nutrients in humans. The organization defined "processed meat" as being processed using salting, curing, fermentation, smoking, or other methods to enhance flavor or improve storage conditions. The statement was made after 22 scientists from the International Agency for Research on Cancer Working Group evaluated more than 800 studies on the subject. Considering the evidence about the harms of processed meats; colon cancer was first, followed by stomach cancer [8].

An analysis of the Nurses' Health Study and the Health Professionals Follow-up Study found that high consumption of highly processed foods such as processed meat and potato chips was associated with weight gain over 4 years[9]. Other research shows that the more highly processed foods are eaten, the higher the risk of a diet lacking in important nutrients. An evaluation of the diets of 9,317 US participants in an NHANES study (National Health and Nutrition Examination Survey) revealed that a high intake of ultra-processed foods was associated with a greater consumption of refined carbohydrates, added sugars, and saturated fats. At the same time, intake of fiber, zinc, potassium, phosphorus, magnesium, calcium and vitamins A, C, D and E decreased.Other research studies in France (NutriNet Santé) and the

USA (NHANES) have also found that consumption of highly processed foods is directly associated with higher all-cause mortality.

3. Data collection
Food processing ranges from basic technologies such as freezing or grinding to the inclusion of additives that increase shelf life or palatability. As a general rule, in daily nutrition; it is optimal to consume unprocessed or minimally processed foods. However, the use of processed foods is the choice of the consumer, and there are pros and cons that come with every choice. The food label and ingredient list showing the nutritional values can be instrumental in deciding when to include processed foods or not. There is evidence to suggest an association between certain types of food processing and adverse health outcomes (especially highly or overly processed foods). This relationship also applies mainly to highly processed foods that contain added sugars, excess sodium and unhealthy fats. In order to investigate the effects of processed foods on health, first of all, 3 types of processed foods and also the statistics of people who are sick were selected: fruit vegetable reserves, sweetened mineral and carbonated water, Margarine. The following table shows the data taken from the website of the The State Statistical Committee of the Republic of Azerbaijan.

TABLE 1

CONSUMPTION OF PROCESSED PRODUCTS IN AZERBAIJAN IN 2007-2021 AND THE NUMBER OF ALL PATIENTS

years	Consumption of Margarine	Consumption of fruit vegetable preserves	Consumption of sweetened mineral and carbonated water	The number of all patients
2007	16649	10584.6	21248	1557804
2008	15310	111486	21479	1596789
2009	15522	109208	18269	1620986
2010	18763	120503	21375	1604610
2011	20774	121902	23368	1618072
2012	22729	132337	27432	1686887
2013	24119	130913	28884	1739584
2014	28432	148153	31302	1852918
2015	13018	150709	29020	1824086
2016	27720	131918	22149	1867071
2017	30125	156678	23622	1875652
2018	32322	168235	30310	1895897
2019	36040	168546	29780	1936715
2020	42184	170508	28961	1800853
2021	41087	179981	41453	

The following econometric model was created based on the given data.

4. FORMULAS FOR NUMERICAL SOLUTION TO THE PROBLEM

The specification of the regression equation of the dependence number of all patients in the Republic of Azerbaijan on processed product is considered as follows:

$$LOG(BXS) = C(1) + C(2)*LOG(MRGRN(-5)) + C(3)*LOG(SVMAC (-8)) + C(4)*LOG(FVP(-8)) \quad (1)$$

Here, MRGRN shows the weight of margarine used during the years 2007-2021, SVMAC shows the weight of

Sweetened mineral and carbonated water used during the years 2007-2021,FVP shows the weight of fruit vegetable preserves during the years 2007-2021,BXS shows number of all patients during the years 2007-2021 .

The econometric evaluation of the regression equation in EViews Application Package (1) leads to the following conclusion:

$$LOG(BXS) = 13.995 + 0.101*LOG(MRGRN(-5)) + 0.037*LOG(SVMAC(-8)) + 0.006*LOG(FVP(-8)) \quad (2)$$

TABLE 2.
BASIC STATISTICAL CHARACTERISTICS OF THE MODEL (2)

Dependent Variable: LOG(BXS)			
Method: Least Squares			
Date: 05/30/23 Time: 09:00			
Sample (adjusted): 2015 2020			
Included observations: 6 after adjustments			

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.99	0.02	752.18	0.0000
LOG(MAGARINE (-5))	0.10	0.002	44.09	0.0005
LOG(SWEETENED_MINERAL_AND_CARBONATED_WATER(-8))	0.04	0.005	7.923	0.0155
LOG(FRUIT_VEGETABLE_PRESERVES (-8))	0.01	0.001	11.02	0.0081
R-squared	0.999	Mean dependent var		14.49
Adjusted R-squared	0.998	S.D. dependent var		0.03
S.E. of regression	0.001	Akaike info criterion		-10.61
Sum squared resid	2.28	Schwarz criterion		-10.75
Log likelihood	35.84	Hannan-Quinn criter.		-11.17
F-statistic	1007.2	Durbin-Watson stat		3.302
Prob(F-statistic)	0.001			

The statistical characteristics of model (2) show that the model is adequately derived [1].
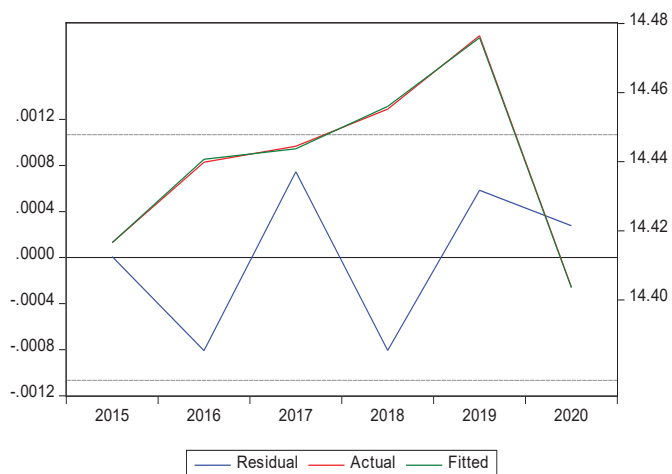
Fig. 1. Actual numbers of all patients according to model (2), fitted value found in the model and dynamics of residual difference between them

5. CONCLUSION

In the article, the impact of processed food consumption on disease cases was econometrically estimated. Results indicated that, all considered processed food have negative impact on human health, however the degree of this effect varies for different kind of food. Constructed econometric models showed that 1% increase in margarine consumption increases the all number of patients after 5 years by 0.1% , likewise, 1% increase in the use of sweetened mineral and carbonated water increases the number of all patients after 8 years by 0.04% and 1% increase in the use of fruit vegetable preserves increases the number of all patients by 0.006% after 8 years. The parameters and statistical characteristics of the regression equations of the above models were found in the Eviews10 (Econometric Views) Application Software Package using the Minimum Squares Method based on the relevant data in the tables and the adequacy of the model was checked. The main statistical characteristics of the model are given in the tables accordingly..

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XÜLASƏ

Məqalədə qeyri-sağlam qidaların insan həyatına təsiri araşdırılır. Sağlam olmayan qida deyildikdə ilk ağla işlənmiş məhsullar gəlir. Bu məqalədə Azərbaycanda istehlak edilən emal olunmuş qidanın miqdarı ilə bütün xəstələrin sayı arasında asılılıq təhlil edilmişdir. Azərbaycan Respublikasının Statistika Komitəsindən verilən məlumata görə, 2007-2021-ci illərdə emal olunmuş məhsulların istehlakına və bütün xəstələrin sayına görə ekonometrik model müəyyən edilib. Alınan nəticələrə əsasən müxtəlif emal olunmuş məhsulların xəstəliklərə təsiri ayrıca göstərilmişdir.

Açar sözlər: *emal olunmuş məhsul, ekonometrik model, sağlamlıq.*

ВЛИЯНИЕ ПЕРЕРАБОТАННЫХ ПРОДУКТОВ НА ЗДОРОВЬЕ

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РЕЗЮМЕ

В статье рассматривается влияние нездорового питания на жизнь человека. Когда говорят о нездоровой пище, первое, что приходит на ум, — это обработанные продукты. В данной статье была проанализирована зависимость между количеством потребляемой в Азербайджане обработанной пищи и количеством всех больных. На основе информации, предоставленной Статистическим комитетом Азербайджанской Республики, создана эконометрическая модель потребления продуктов переработки в 2007-2021 годах и количества всех больных. По полученным результатам отдельно показано влияние различных продуктов переработки на заболевания.

Ключевые слова: *обработанные пищевые продукты, эконометрическая модель, здоровье.*

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SUMMARY

The article examines the impact of unhealthy food on human life. When unhealthy food is said, the first thing that comes to mind is processed products. In this article, the dependence between the amount of processed food consumed in Azerbaijan and the number of all patients were analyzed. On the basis of the information given by The Statistical Committee of the Republic of Azerbaijan, an econometric model has been established according to the consumption of the processed products in 2007-2021 and the number of all patients. According to the obtained results, the effect of different processed products on diseases was shown separately.

Keywords: *processed foods, econometric model, health.*