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## The Average Cost of Residents' Diet in Yerevan

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### ABSTRACT

Food prices are important in the context of meeting humans' basic needs including diet. Therefore, this study aims to assess the cost of the average diet in the capital of Armenia, Yerevan, where one-third of the population resides. Consumption patterns were studied using a 24-hour recall survey amongst the Yerevan population considering the age range between 18 and 65. Overall, 1264 respondents from 12 districts of Yerevan have participated in the survey. Afterwards, the average cost of per capita monthly diet was calculated and theoretically compared with the healthy diet cost reported in the literature sources.

### Introduction

The Republic of Armenia is an upper-middle income country (The World Bank, 2019) which is geographically landlocked and has a diplomatic relationship only with Georgia and Iran from the neighboring countries. Its population is estimated around 3 million, one-third of which resides in the capital, Yerevan (FAO, 2019).

Even though there have been multiple reforms in the country and the economic progress is noticeable, the overall growth has been weak. The level of self-sufficiency in the country is 64 % regarding the most important food, which mainly includes potato, fruits and vegetables. Overall, in terms of the food's self-sufficiency, Armenia

is a net food importer and the prices of the food items are highly dependent on the international prices (WFP, Armenia: Cost of the Diet, 2018). Around 23.5 % of the population was living below the poverty line back in 2018 and 16 % of the whole population was food insecure, while the same indicator in 2008 was 8 % showing a worsening situation in the country (NSS, Armenia-Poverty Snapshot over 2008-2018, 2019). In general, the high percentage of the household members was included in the profile of the insecure households among the unemployed household heads and members who are lacking proper education (NSS W. C., 2017).

Generally, the households or individuals which are food insecure have also poor dietary patterns, since they tend

to buy food products by considering quantity rather than quality (WFP, 2018). Among the significant reasons of poor dietary patterns, the income-related burdens should be highlighted.

According to the data published by Statistical Committee of the Republic of Armenia the regional average salary per person is almost uniformly distributed. In 2018, the average annual nominal salary in the Republic of Armenia was 172727 AMD and 190958 AMD in the capital city of Yerevan. Under these conditions, the nutritional diet may not be affordable and people may spend a big proportion of the salary for the healthy food consumption. If individuals are not able to afford a nutrition-rich diet, they don't have another choice rather than the energy-dense food consumption. Fats and oils, added sugars, refined grains, potato chips are considered as energy-dense food, which provide calories at the lowest cost, while low energy-dense foods include meat, fish, vegetables and fruit, which are relatively expensive especially for the vulnerable layers of the society, who receive middle or low salary.

The assessment of the food and nutrition along with the individual expenditures are vital to get information about the population's well-being and nutrition status. Many food scientists and economists have covered this topic in their research papers and tried to compose a healthy diet structure, which is acceptable in terms of the food's nutritional and energy values (Ghazaryan, 2018). These recommendations are particularly important for the individuals whose food consumption patterns compose a big share of their income. Those people represent more vulnerable layers of the societies who have an income status from low to upper-middle level.

Currently with the rapid improvement of technology more models and methods are developed by the scientists and researchers, whose ultimate goal is to provide a hypothetical diet, the cost of which is minimized and the nutritional value of the foods included in it is maximized. One of the most widely known methods is the "Cost of the Diet" method developed by the "Save the Children" NGO, which applies the linear programming to recommend the acceptable amount and combination of the foods that meet the needs of energy, micronutrients and macronutrients intake among individuals (Global Nutrition Report, 2019).

Taking into consideration the aforementioned information, it is important to understand whether the residents of Yerevan can afford themselves to purchase healthy food and decide the proportion of the cost within the spending. Therefore, the main objective of this study is to assess the cost of the average diet in the capital of Armenia, Yerevan. The data analysis conducted in the frame of this study is

aimed at tracking the average daily consumption of an individual, calculating the average cost of the consumption per day based on the data acquired.

## Materials and methods

### *Collection of food consumption data*

The food consumption data collection was conducted from 2018-2019 including all the months, since the diet of the population is influenced by the seasonality. Food consumption survey has been designed and conducted by the Informational-Analytical Center for Risk Assessment of Food Chain of CENS. The survey has been conducted with one of the most widely used methods, namely the 24-hour recall method.

Two important points should be particularly mentioned as advantages of this method:

- The 24-hour recalls take the seasonality and food availability into consideration
- It allows collecting some additional information such as timing, frequency, brands which can be very useful for the study (FAO, 2005).

The 24-hour recall questionnaire is usually composed of the list of foods and beverages along with the drinking water and sometimes the food supplements as well, which had been consumed during the previous day or during the 24 hours prior to the recall interview. Not only do these surveys generally collect information about the types and amounts of food consumed, but also about the source of the foods such as whether they were bought from the grocery stores, cooked at home, etc (Nutritools, 2020). It also collects information about the time of the day and place where the foods are consumed. The abovementioned information is received due to the help of the interviewer, who recalls that with a memory, who is also trained beforehand for providing the necessary information.

The number of respondents in the survey is 1264, who live in the capital city of Yerevan (respondents from all 12 districts have been included in the study). The surveys have been conducted with the face-to-face option and anonymously. The questionnaire was composed of general demographic questions such as the name of districts of respondent's residence, age, gender, weight, height, education (higher or other), specialty as well as whether the respondent follows a specific diet (e.g. vegetarian, vegan, special diet for losing some weight or fighting against some diseases). The respondents mentioned the number of the members in their households and also provided the average monthly income with a range. It is worth mentioning

that the age range of the respondents was from 18-65. Data treatment and statistical analysis has been done using SPSS software.

### Collection of data on consumed food prices

In the frame of this study the data on prices (AMD) of the consumed foods per kg (as of 2019) were collected. The prices were taken from the Statistical Committee of Armenia (NSS, Price and Price Indexes, 2020), if they were available, and in case of the missing prices, the average market price of the products was calculated collecting them from two of the biggest supermarket chains “Yerevan City” and “SAS” (online store). The price of the consumed food per kg was converted to the price of food per gram.

### Diet cost assessment

The average cost of residents’ diet in Yerevan was evaluated multiplying the price (AMD) of food per gram by the average daily consumption of that particular food item in grams.

### Results and discussions

The data on the average daily consumption of food products in Yerevan is presented in the Table. They provide valuable information about the dietary habits among the study population.

**Table.** Cost of the average daily food consumption, AMD\*

Food product	Average daily consumption (gram per day)	Average price as of 2019 (AMD per kg)	Average cost of the daily diet (AMD)
1	2	3	4
Bread	210.7	468	98.6
Rice	21.3	775	5.5
Buckwheat	39.2	565	11.1
Grain wheat	9.2	515	2.4
Pasta	46.8	547	10.6
Waffle and cookies	8.5	1195	10.2
Milk	69.0	418	28.0
Plain yogurt	40.0	450	18.0
Sour cream	27.5	1142.5	31.5
Cheese	21.6	2193	47.3
Cottage cheese	21.1	2550	53.9
Ice cream	16.6	1694.5	28.2

1	2	3	4
Butter	6.4	5070	32.4
Spread	2.3	1112	2.6
Potato	116	270	31.3
Watermelon	45.0	231	10.4
Melon	8.0	334	2.7
Apple	35.0	457	16.0
Pear	3.5	1119	3.9
Apricot	7.5	250	1.9
Peach	4.5	310	1.4
Plums	3.2	220	0.7
Cherries	3.5	520	1.8
Grape	18.0	680	12.2
Strawberry	4.2	500	2.1
Cabbage	31.2	183	5.7
Cauliflower	2.3	150	0.3
Frying greens	10.3	1200	12.4
Mixed Greens	7.3	1200	8.8
Cucumber	45.0	400	18.0
Eggplant	16.0	170	2.7
Pepper	14.0	300	4.2
Green bean	12.8	400	5.1
Pumpkin	1.6	250	0.4
Marrow vegetables	3.8	150	0.6
Tomato	63.0	157	9.9
Carrot	5.3	190	1.0
Beetroot	1.6	230	0.4
Onions	8.9	324	2.9
Banana	8.5	630	5.4
Persimmon	3.3	1500	5.0
Orange	5.4	645	3.5
Tangerine	7.6	725	5.5
Beef	50.5	3060	154.5
Pork	14.1	3035	42.8
Chicken	41.26	1595	65.8
Sausage	4.1	1900	7.8
Pork sausage	8.4	2200	18.5
Pelmeni and khinkali	2.1	1150	2.4
Fish	7.9	1670	13.2
Egg	29.0	1320	38.5
Coffee (Dry)	13	2500	32.5
Sugar	11.3	291	3.3
Total average cost of the daily diet			935.46

\*Composed by the authors

Based on the combination of the data on food prices and daily consumption among Yerevan's adult residents, the average daily expenditure on their diet is calculated to be equal to 935.46 AMD. Furthermore, the monthly expenditure on the diet will be 28100 AMD. Hence, people who earn minimum salary of 68000 AMD, have to spend 41.3 % of salary for the food intake. Indeed, this indicator is not the desired one, because apart from the food, people have other needs and wants and the leftover of the salary after the food consumption will be very small to meet the basic human needs: clothing, entertainment, education, etc.

It is worth mentioning that at the end of 2018 the Statistical Committee of Armenia reported the minimum consumer basket as 61113 AMD in the Republic of Armenia and out of this, 34527 AMD composes the food basket; however, for the same year, the World Bank reported that the food basket costs 27807 AMD (Haroyan, 2019).

In addition, a study on the cost of the healthy diet proposed a model, which meets the basic nutritional requirements of the individuals and the diet cost (Ghazaryan, 2018). According to the study \$ 2.00 is necessary to apply the general recommendations for the Dietary Reference Intakes (DRI), which does not take the age and sex into consideration. Therefore, the monthly cost for the proposed model is \$ 60 or 28824 AMD. In other words, this model is slightly more expensive than the actual consumption that we have calculated. This is an important conclusion, which states that the residents of Yerevan can afford themselves buying healthy food which is nutrition-dense rather than energy-dense. However, do they usually consume nutritional food given the amount of money found? Based on the data provided by the National Statistical Committee of Armenia on the food basket, the cost of the average daily food consumption of our respondents through the 24h recall method and comparing them with the cost of the proposed model mentioned above, we can state that people can have a food intake, which is healthy.

However, a further research should be done to ensure that these foods which are consumed by the individuals participated in surveys correspond to the dietary recommendations for the healthy food, which contains the sufficient amount of micro and macro nutrients, energy and so on. In essence, even though the cost of healthy diet is close to the cost of actual consumption among the individuals, there is a risk that foods consumed by those people is not healthy enough and doesn't contain the necessary vitamins, micronutrients or vice versa, they may exceed the amount of some elements necessary for the daily intake. The reasons for the associated risk are but not

limited to the level of education, lack of the care, cultural perspectives, people's tastes, preferences and so on.

### Conclusion

In this research paper we compared the actual cost of the consumption with the numbers provided by the National Statistical Committee of Armenia and the World Food Program. Factually, the average monthly food consumption calculated is not very different from the cost calculated by the abovementioned organizations. However, the concerned issue regarding the results is that the actual consumption doesn't take the nutrition into account. Therefore, further research is necessary to cover the nutritional part of the diet as well to explore whether Armenians can afford themselves to buy healthy food, which will not cause health problems.

Based on the findings of this study, we recommend increasing the awareness of healthy diet among population through different mediums, such as social media, TV, Radio, etc. Another recommendation is for the Government to review and increase the minimum salary (wage) of the population, so that they can also spend some proportion of their income on other things: entertainment, education, clothing or just for saving. Also, the Government can adopt some assistance programs for the low-income families involving the private sector in the programs as well.

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