

Open Schools Journal for Open Science

Vol 3, No 3 (2020)



Obesity free

P. Papadopoulou, T. Paggeiou, P. Ntakoula, P. Argyri

doi: [10.12681/osj.23365](https://doi.org/10.12681/osj.23365)

Copyright © 2020, P. Papadopoulou, T. Paggeiou, P. Ntakoula, P. Argyri



This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/).

To cite this article:

Papadopoulou, P., Paggeiou, T., Ntakoula, P., & Argyri, P. (2020). Obesity free. *Open Schools Journal for Open Science*, 3(3). <https://doi.org/10.12681/osj.23365>

Obesity free

P. Papadopoulou¹, T. Paggeiou¹, P. Ntakoula¹, P. Argyri²

¹11th grade, Evangeliki Model High School of Smyrna, Athens, Greece

² Mathematician, Evangeliki Model High School of Smyrna, Athens

Abstract

Regarding the theme of the United Nations Sustainable Development Goals¹, we decided to concern ourselves with the 3rd goal, “Good Health and Well-Being”², the 12th goal, “Responsible Consumption and Production”³ and the 17th goal, “Partnerships to achieve the Goal”⁴. Concerning our action involving obesity, we have conducted a very detailed research. We realized that obesity and child obesity are both huge problems, since the rates around the world nowadays are very high. In an attempt to understand the reasons behind this, we designed a questionnaire, so we could test how healthy our classmates’ lifestyle is. Then we contacted a nutritionist and they helped us make an informational leaflet about obesity, which we distributed to others. Lastly, we designed an online game concerning eating habits. While we did our research, we found out that our daily eating choices impact the environment greatly. Thus, changing our eating habits for the better may prove to be the most effective way to help the environment.

Keywords

Obesity; child obesity; environmental impact; eating habits; healthy lifestyle

¹ <https://www.undp.org/content/undp/en/home/sustainable-development-goals.html>

² <https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-3-good-health-and-well-being.html>

³ <https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-12-responsible-consumption-and-production.html>

⁴ <https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-17-partnerships-for-the-goals.html>



Introduction

Obesity is a condition caused by excessive accumulation of fat in the body. It has adverse effects on health, leading to reduced life expectancy and / or increased health problems [14], [6]. Obese people are classified as obese when the body mass index (BMI) - a measurement taken by dividing a person's weight in kilograms by the square of his height in meters - exceeds 30 kg / m².

Obesity is caused usually due to excessive intake of foods, high energy density, lack of physical activity and genetic predisposition. In some cases, the primary cause is genes, endocrine disruption, medication or psychiatric illness [4], [9].

Nutrition and physical activity are the basis for treating obesity. The quality of nutrition can be improved by reducing consumption of foods high in energy, such as those rich in fat and sugar and by increasing fiber intake. Anti-obesity medicines may be prescribed in order to reduce one's appetite or to inhibit fat absorption in combination with proper nutrition [10], [7].

Obesity is one of the leading preventable causes of death worldwide, with an increasing incidence both in adults and children. Authorities regard it as one of the most serious public health problems of the 21st century [1]. In most parts of the modern world (especially the western one), obesity is a stigma, even though it was considered a symbol of wealth and fertility at other times in history, which is still the case in some parts of the world today [6], [13].

Child obesity

42% of boys and 38% of girls in Greece are overweight, while 20% of boys and 14% of girls are obese, according to the latest data from the World Health Organization's Childhood Obesity Initiative. Out of the obese boys, Greece with 20% is third after Cyprus and Italy (21% both). Greece is fourth with 14% of girls being obese, followed by Italy, while Cyprus (19%), Spain (17%) and Malta (15%) are in the top three.

Environmental impact

Eating healthy food is almost always also best for the environment, according to more sophisticated approaches. Scientists believe that food production including growing crops, raising livestock, fishing and transporting all that food to our plates is responsible for 20% to 30% of total global greenhouse gas emissions. In addition, 33% of the ice-free land on our planet is being used to grow our food, researchers say.

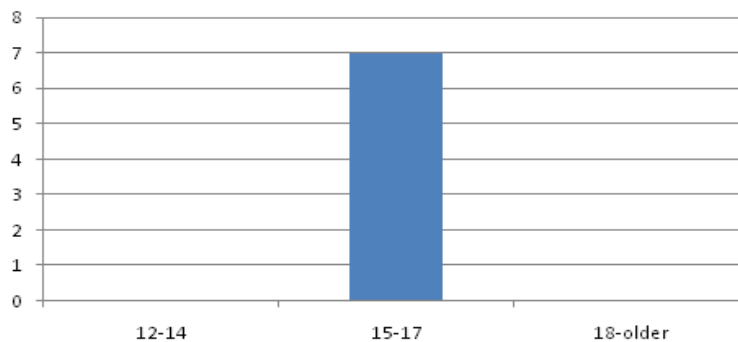


A new study published in PNAS found that if citizens in 28 high-income nations like the United States, Germany and Japan actually followed the dietary recommendations of their respective governments, greenhouse gases related to the production of the food they eat would fall by 13% to 25%. There are three ways the environment is affected by our diets — greenhouse gas emissions, land use and eutrophication, which is the addition of nutrients to water sources that can lead to toxic algae blooms and lack of oxygen in the water. Eutrophication is usually caused by the discharge of animal waste (dung) and plant fertilizer [3].

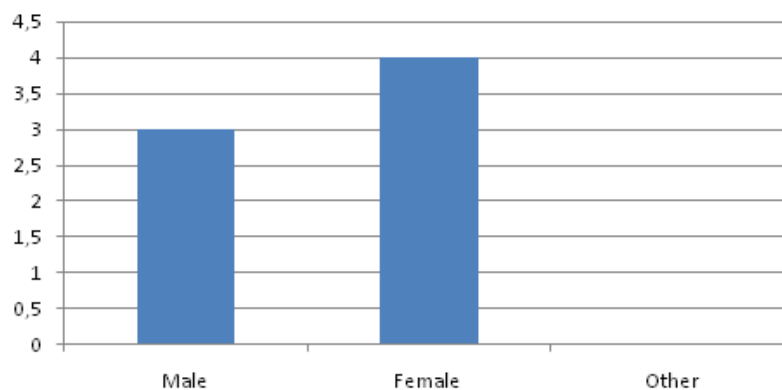
Research: Questionnaire

As part of our research, we prepared a questionnaire⁵ based on our problem and forwarded it to our classmates. The questions concerned the eating habits of our peers and their own perspective on the issue of healthy eating.

1.Age



2.Gender



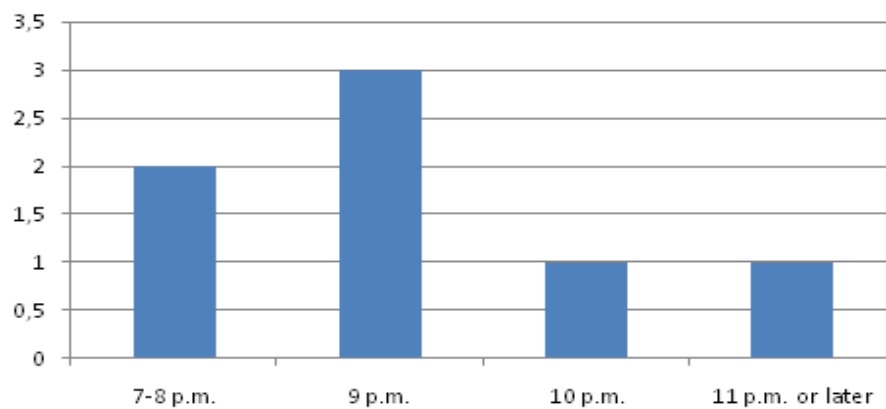
⁵ <https://www.surveymonkey.com/r/F8GXCWT>



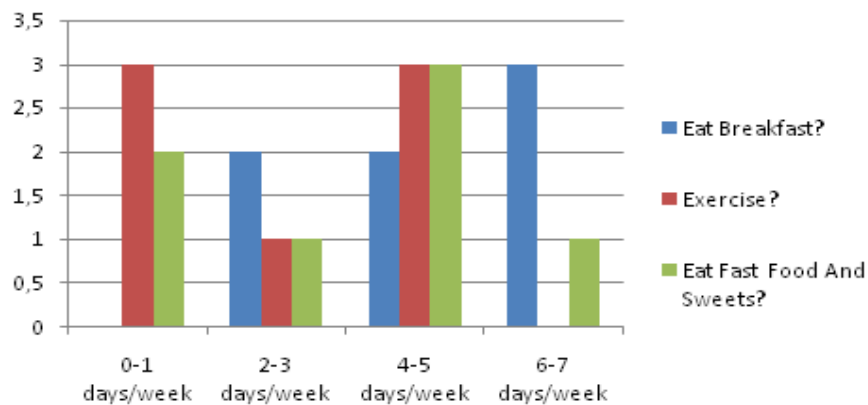
3. What is usually your main meal? How is it prepared?



4. At what time do you eat dinner?



5. How often do you...

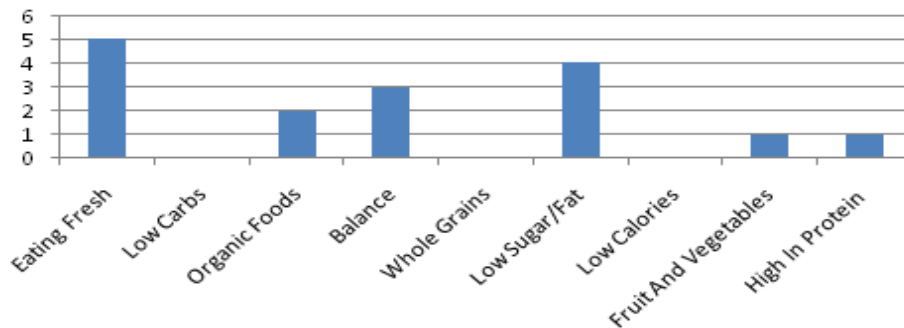


6. What does your school/work lunch consist of?

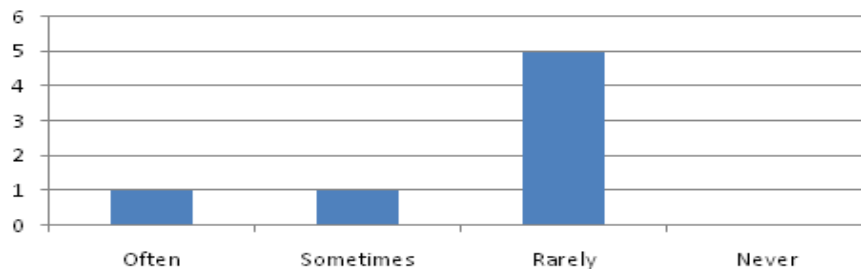
Answers:

- Sandwich, juice
- One or two sandwiches
- A sandwich
- Fruit like a banana or an apple
- It depends
- I don't actually have one

7. What are the main healthy diet characteristics for you?



8. How often do you do any research on your own on the nutritional value of foods?



9. What do you think we can do to reduce the high levels of obesity?

Answers:

- People should be informed about the characteristics of a healthy diet from an early age, therefore schools should spend more time teaching students how to eat healthier
- We should promote exercise and teach at schools what a balanced diet looks like
- Inform people
- Limit fast food consumption
- People should exercise more
- People need to exercise more so you need to give them a purpose, in other words you need to motivate them
- Maybe one could try to inform people about the problems obesity causes and how easy it is for one to become obese

Research: Interview with an expert

After the questionnaire we considered an expert's opinion necessary, so we contacted a nutritionist, and interviewed her.

The interview was as follows:

- What would improve our diet?
- The cornerstone of a healthy diet is replacing processed foods with vegetable foods.
- What does protein help?
- Protein provides the energy we need in our daily lives while enhancing mood and cognitive function.
- Should we avoid fats strictly?



- Not all fats are the same, bad fats lead to wrong dietary choices and increase the risk of certain diseases. Conversely, good fats protect the brain and heart (e.g. $\Omega 3$).

- What do you suggest about fats?

- By incorporating healthy fats into our diet we can improve our mood, enhance our well-being, and even get a stylish silhouette.

- What are the good fats?

- Are monounsaturated and polyunsaturated e.g. $\Omega 9$, $\Omega 3$, $\Omega 6$

-What else should we include in our diet?

-Calcium is important for bone strengthening. Lack of it contributes to anxiety, depression, and difficulty sleeping. It is also advisable to include carbohydrates, which are one of the main sources of energy in the body.

-General tips for a good diet:

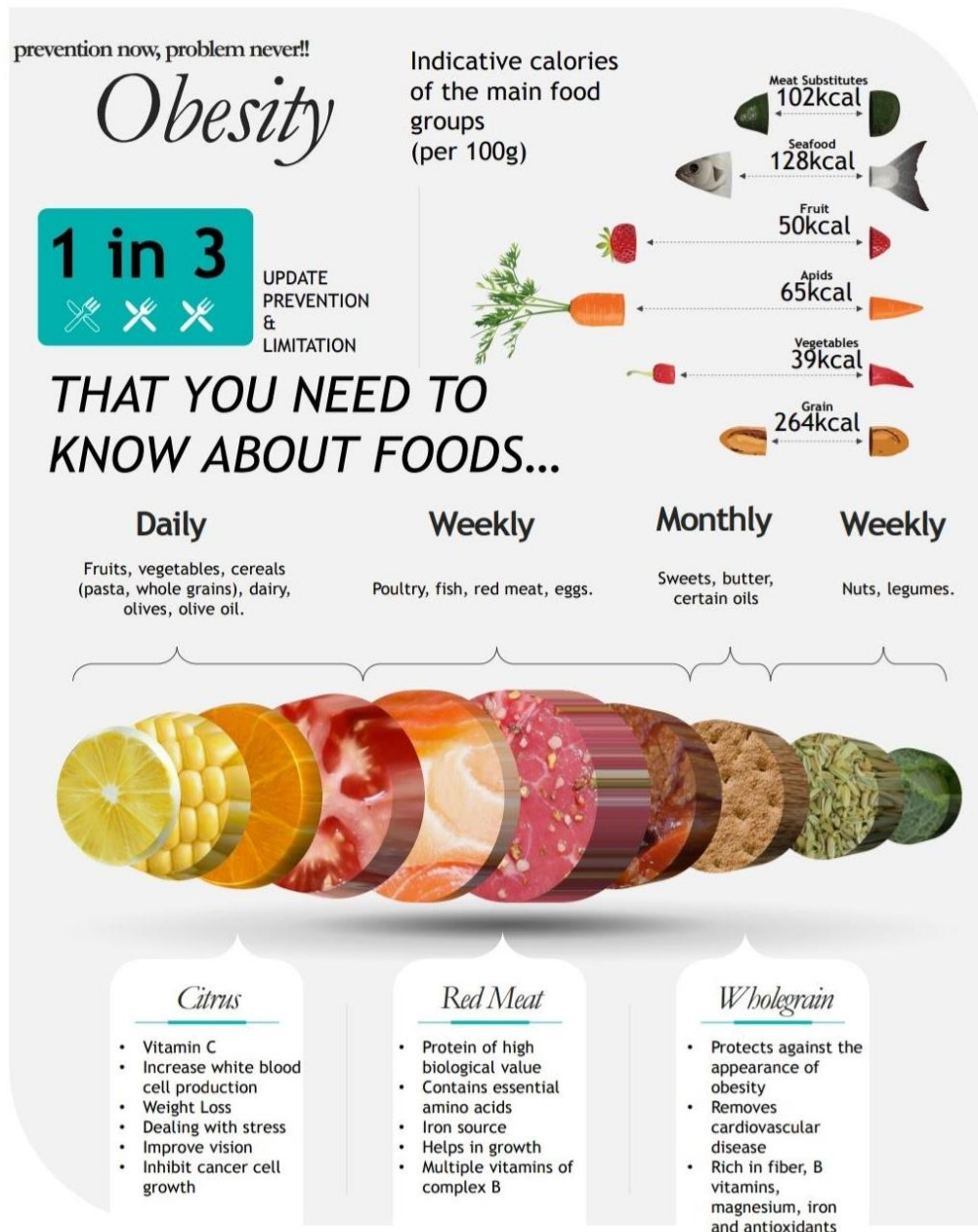
- Drink plenty of water
- Eat low-calorie foods
- Eat a lot of fruit
- Put vegetables into meals
- Be selective in evening snacks (low calorie / not heavy snacks)
- Eating with friends to eat slowly
- Eat several small meals a day
- Include protein in every meal
- Be active



Action: Leaflet

About our action, we created a brochure listing information on obesity, its effects and its treatment. The nutritionist helped us with the composition from which we got the above interview. We distributed the leaflet to passers-by in one of the busiest parts of Athens, Syntagma Square, in order to inform and raise the awareness of the general public.

You can see the brochure here:



Action: Game

Another action we took to raise awareness of our fellow citizens was to create a game⁶. With this action we sought to inform not only our adult comrades, as they usually do not prefer computer games, but also younger ones, who will find it more appealing. The game takes place in a supermarket and the player is called with the help of the keyboard buttons to select healthy foods to fill his basket and earn points. When his score reaches 15 points, he wins. But the player must be careful not to touch the unhealthy choices, as this will result in losing lives, of which he has only 5. Through the game, younger people learn to make the right dietary choices and in their daily lives in a fun and engaging way.

Research: Lessening our environmental impact

There are a lot of ways in which we can help lessen our impact on the environment:

1. Firstly we can change the type of food we consume. Meat takes a significant environmental toll, as raising animals requires far more land and resources than raising vegetables, in terms of the foods the animals eat as well as the water the animals and their foods consume. Farming cattle has led to substantial destruction of the Amazon Rainforest as well as the prairies of the U.S., as World Watch Institute says [8]. Eating mainly vegetable-based foods rather than meats greatly reduces our impact on the environment. Fish farming can be fairly sustainable when it involves fish that are lower on the food chain, like tilapia and shellfish [12].
2. Reducing food waste also lowers the environmental impact of our eating habits. The EPA calls the amount of food wasted by Americans "staggering," noting that Americans threw 33 million tons of food waste into landfills in 2010. This food waste accounted for 14% of the entire solid municipal waste stream that year. Planning meals strategically will help us reduce our own food waste. In other words, we should purchase only what we will use for specific meals we've planned, and eat our leftovers for lunch. Instead of going to the grocery store to look for dinner ideas, we should look in our kitchen and consider what meals we can make from what we already have [2].
3. We can also try to eat locally. Globalization has made it possible to find foods from overseas in our supermarket every day, but this comes with substantial environmental costs. Trucking food in from large farms across the country, rather than buying food from local farmers, also harms the environment. Eating locally reduces our carbon footprint by minimizing emissions from transport. This may mean giving up exotic fruits, or eating them more sparingly [5]. Eating seasonally - allowing our diet to fluctuate

⁶<https://scratch.mit.edu/projects/366905529>

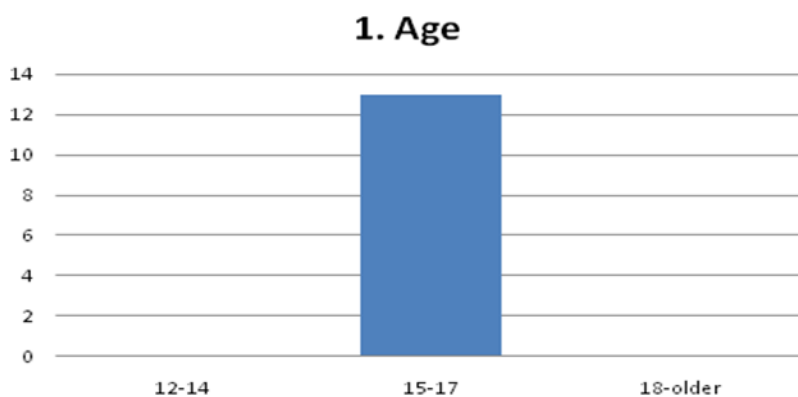


based on what grows in our area during each particular season - is a key component of eating locally.

4. Agricultural runoff harms water quality and ecosystems too. However, eating organic food reduces the amount of chemicals that travel into the ecosystem and water supply from farming. Farmers who use integrated pest management techniques rather than spraying pesticides and herbicides keep environment safer while protecting our health, as the U.S. Environmental Protection Agency (EPA)⁷ says. Likewise, farmers who carefully manage their nutrient amendments and water use protect the environment from nutrient runoff that pollutes ecosystems [11]. Asking vendors at a local farmers market about their practices may help us determine whether we're purchasing food from responsible growers.
5. Composting food scraps rather than throwing them into the trash also helps the environment. We should compost our vegetable scraps so they'll become useful material instead of waste.

Analysis of results

A few months after the start of the project and our first questionnaire, we had to analyze the results and the impact on the school space. So we repeated the process with the questionnaire and the same questions, urging our classmates to supplement it with their new data and changing habits.

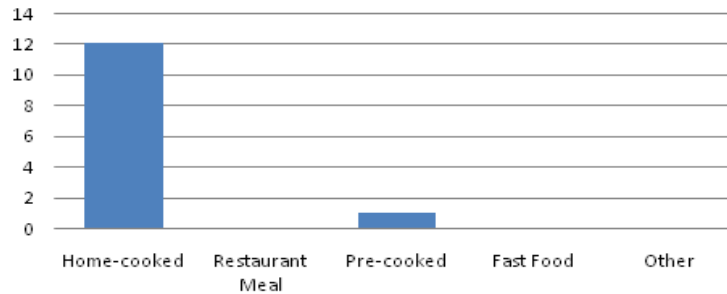


⁷ <https://www.epa.gov/>

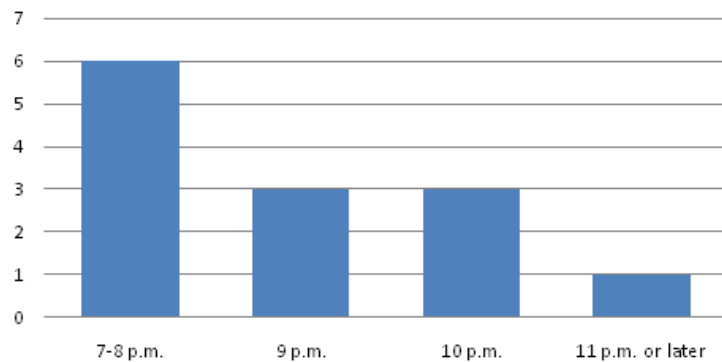




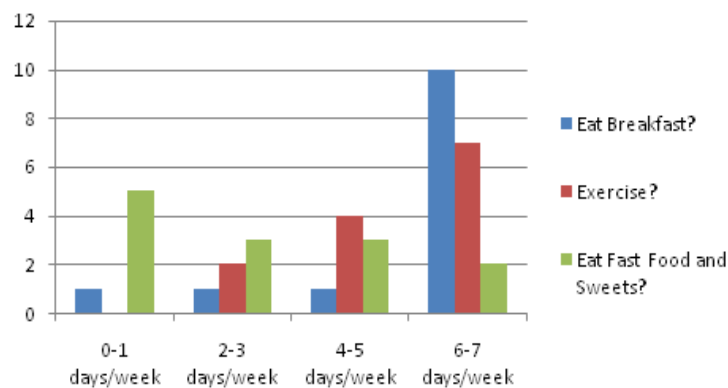
2. What is usually your main meal? How is it prepared?



3. What time do you eat dinner?



4. How often do you...

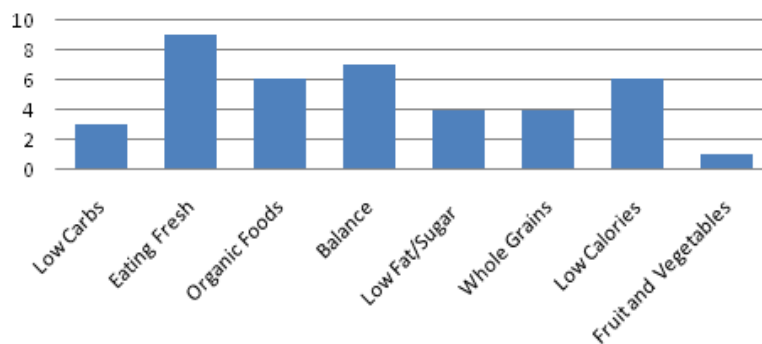


5. What does your school/work lunch consist of?

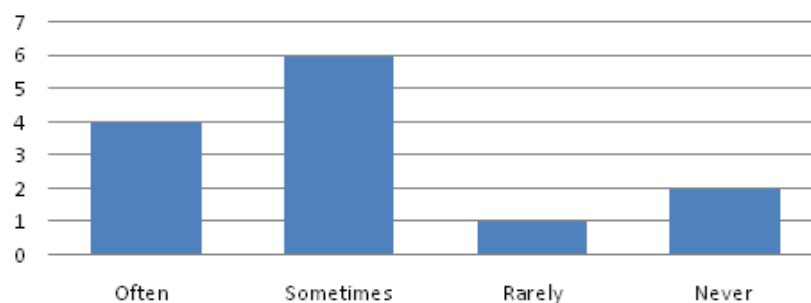
Answers:

- Homemade sandwich (6)
- A sandwich and a fruit (2)
- Fruit (2)
- Fruit and vegetables (2)
- Granola bar (1)

6. What are the main healthy diet characteristics for you?



7. How often do you do any research on your own on the nutritional value of foods?



8. What do you think we can do to reduce the high levels of obesity?

Answers:

- Exercise (3)
- Ban Fast Food restaurants (1)
- More hours of PE in the school program (1)
- Inform people (7)
- Promote a healthier lifestyle/ diet (2)
- Cheaper and more accessible healthy food (1)

Conclusion

In a nutshell, the project we have been working on revolves around the context of obesity and how it affects the environment. It is important to note that nutrition is an essential and integral part of our lives and we need to take it more seriously. The fact that people are very busy nowadays makes them not to pay attention to their diet, since they do not consider that it is as important as their job, for example. That is why we need to be more careful with this issue as it also affects the environment. Also, in a more personal level, we must note that as students we have benefited to the fullest from this experience, acquired knowledge, skills and broadened our horizons. We are grateful that we were given this opportunity despite the difficulties we are facing (covid-19).



Reference List

- [1] Barness, L. A., Opitz, J. M., & Gilbert-Barness, E. (2007, Dec 15). Obesity: genetic, molecular, and environmental aspects. *Am J Med Genet A*. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/18000969>
- [2] Basic Information About Food Waste. (n.d.). *United States Environmental Protection Agency*. Available at: <https://www.epa.gov/sustainable-management-food/sustainable-management-food-basics>
- [3] Behrens, P., Kiefte-de Jong, J. C., Bosker, T., Rodrigues, J. F., de Koning, A., & Tukker, A. (2017, Dec 4). Evaluating the environmental impacts of dietary recommendations. *PNAS*. Available at: <https://www.pnas.org/content/114/51/13412>
- [4] Bessesen, D. H., & Kushner, R. F. (2007). *Treatment of the Obese Patient*. Humana Press. Available at: <http://books.google.com/?id=vWjK5etS7PMC&pg=PA121&lpg=PA121&dq=measurement+of+m etabolism+in+obese+Bessesen>
- [5] Broussalian, K. (2011, May 4). Eating Local. *The EPA Blog*. Available at: <https://blog.epa.gov/2011/05/04/eating-local/>
- [6] Haslam, D. W., & James, W. P. (2005, Oct 1). Obesity. *Lancet*. Available at: <https://dx.doi.org/10.1016%2FS0140-6736%2805%2967483-1>
- [7] Imaz, I., Martínez-Cervell, C., García-Álvarez, E. E., Sendra-Gutiérrez, J. M., & González-Enríquez, J. (2008, May 6). Safety and Effectiveness of the Intra-gastric Balloon for Obesity. A Meta-Analysis. *Obesity Surgery*. Available at: <https://dx.doi.org/10.1007%2Fs11695-007-9331-8>
- [8] Is Meat Sustainable? (n.d.). *World Watch*. Available at: <http://www.worldwatch.org>
- [9] Murphy, P. G., & Adams, J. P. (2000, July 1). Obesity in anaesthesia and intensive care. *British Journal of Anaesthesia*. Available at: <http://bjaoxfordjournals.org/cgi/content/full/85/1/91>
- [10] Obesity prevention. (2006, December 13). *NICE*.
- [11] Polluted Runoff: Nonpoint Source (NPS) Pollution. (n.d.). *United States Environmental Protection Agency*.



[12] Will Farmed Fish Feed the World? (n.d.).
World Watch. Available at: <http://www.worldwatch.org>

[13] Woodhouse, R. (2008). *Obesity and Metabolism*. London: Karger. Available at:
<http://books.google.com/?id=nXRU4Ea1aMkC&pg=PA271&lpg=PA271&dq=Obesity+in+art:+a+brief+overview>

[14] World Health Statistics. (2014-15). *WHO*.

