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EARTH AND ITS RESOURCES
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YOU CAN HELP FIGHT CLIMATE CHANGE WITH YOUR FOOD CHOICES

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YOUNG REVIEWERS:

ALISSAR
AGE: 14

DAVID
AGE: 12

Human activities are affecting the Earth in ways never seen before, with multiple negative consequences for us. Our daily behaviors can still make a big difference in the fight against climate change. Among different behaviors and daily activities, we discuss here the necessity of adopting healthy diets with low environmental impact, and the characteristics of such a planet-friendly diet. We also emphasize the role of food waste and explain you why and how to become a food waste fighter.

WE CAUSE CLIMATE CHANGE, BUT WE CAN ALSO BE PART OF THE SOLUTION!

The scientific evidence is clear: human activities have been putting too much pressure on natural systems. Many of us are driving cars, flying to places in planes, wearing new fashionable clothes, eating too much meat, and buying the latest technology as routine. These actions are depleting our planet's limited resources, such as land and water, polluting the environment, and warming the climate through

emission of **greenhouse gases**. The consequences of **climate change** are already apparent in all countries around the world: heat waves, droughts, floods, and hurricanes. If we continue living as usual the situation will only get worse [1].

Many people think that opting for renewable energy is the only measure to fight climate change. This solution seems to indicate that this is just a matter that only adults can solve. But actually, anyone can and should make a difference. Anything we buy, eat or do result in emission of greenhouse gases that warm the planet -this is called **carbon footprint**. But not every activity or food or object have the same footprint. Thus, we can all contribute by becoming aware of the things and actions that have high carbon footprint (emit a lot of greenhouse gases) and choose the ones that do not, when possible. Some things are quite obvious, such as transport-related options: favoring biking, walking or taking the public transport rather than cars. On the other hand, others can be less obvious, such as food-related choices.

Producing food is vital, but also emits a huge quantity of greenhouse gases. Till arriving to your plate, your food has to be produced, packaged, transported, cooked... and, of course, greenhouse gases are being released in each of these phases. Altogether, one third of all the greenhouse gases that humans release is related to the food system! We eat every day, and if lucky more than once per day. Thus, every time we eat is an opportunity to contribute to the fight against climate change. Of course, the solution does not come from stopping eating nor skipping meals, but from choosing foods with the least impact on climate change.

WHICH FOODS CONTRIBUTE THE LEAST TO CLIMATE CHANGE?

Not all foods have the same impact on climate change. The carbon footprint of a product will depend on many aspects: the type of product (if it is a fruit or a piece of meat), the agricultural techniques used for growing it (if growing a fruit out of season in a heated greenhouse that requires energy or during the right growing season in an open field), the level of processing (the more processing, the more energy used and the more greenhouse gases emitted), the mode and distance transported (if it comes by plane from faraway or in a van from a farm nearby), etc. Among these, the type of food that we eat is much more relevant than any other aspect; indeed, 70% of your dietary carbon footprint will depend on the type of food you decide to eat [2, 3]! Thus, if you wish to reduce your dietary carbon footprint, be specially focused on what you eat.

GREENHOUSE GASES

Gases that allow the energy emitted by the Sun to pass to the Earth, but prevent the energy emitted by the Earth from going into space, increasing Earth's temperature.

CLIMATE CHANGE

Change in the typical weather for a region—such as high and low temperatures and amount of rainfall—over a long period of time.

CARBON FOOTPRINT

The amount of greenhouse gases released to the atmosphere due to any human activities, including growing food, producing clothes or gadgets, or traveling.

RUMINANTS

Animals with four-part stomachs, that bring back food from its stomach and chews it again, such as cows, sheep or goats.

As shown in Figure 1, the foods that generate larger emissions are animal-sourced, especially the ones that originate from the **ruminant** animals, such as beef, lamb or cheese. That makes sense when we recall that, in order to eat animal-based foods, food had to be previously grown to feed those animals, and growing food for animals obviously generate greenhouse gases. To get 1 kilo (kg) of chicken meat or pork, animals had to be fed with more than 3 and 6 kg of other foods (mainly grains and legumes), respectively. Thus, chicken and pork have at least three- and six-times higher carbon footprint than those grains and legumes the animals were fed with [3]. Additionally, manure (the animals' poo) is a substantial source of greenhouse gases. The degradation of manure releases methane and nitrous oxide, which are two greenhouse gasses whose warming potential is even higher than that of carbon dioxide (CO_2). And there is more! In the case of ruminants, such as cows and sheep, the large amount of greenhouse gases emitted also due to the special digestion mechanism that characterizes these animals. During digestion, basically when they burp and fart, ruminants emit large amounts of methane. Scientific evidence is clear on this: giving preference to plant-based foods over those animal-sourced, such as meat and cheese, in our diet is the most effective action to reduce the dietary carbon footprint, and, therefore, help fighting climate change.

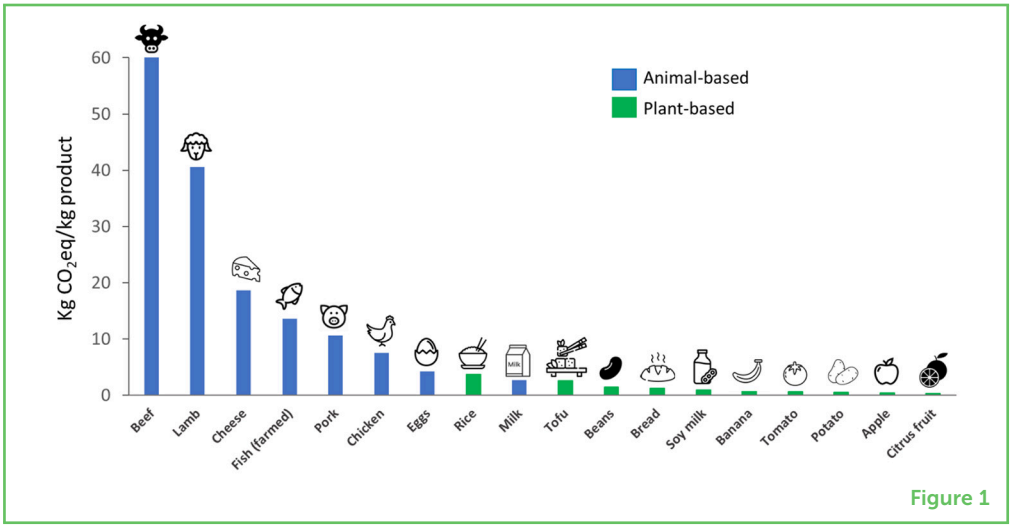

Figure 1

Greenhouse gas emissions from the production of various foods. The bars represent the median values of greenhouse gases emitted per kg of food product [Data sourced from [3]].

However, there is an exception: flown foods! Transporting food (or anything else) by plane increases their transport-related carbon footprint by even 100-fold. It is impossible for something flown to have a small carbon footprint! Fortunately, just <1% of food is transported by plane. Unfortunately, consumers are not aware about how our food has been transported unless it is mentioned in the label. So, how to identify flown foods? Here you have one tip: those foods with the highest chance to have been flown are those that have been produced far away and are rapidly perishable. For instance, perishable and fragile fruits, such as berries, asparagus or green beans, or fresh fish from far away regions need to be transported quickly; otherwise, they will go

bad. Get informed about where your food came from, and when you think that it has been transported by plane, try to avoid it!

If you are already committed to follow a plant-based diet with no flown food, you have covered the most relevant aspects of adopting a low carbon footprint diet. But if you want to go one step further, here are some extra tips to reduce your dietary carbon footprint: give preference to those in-season fresh produces (to avoid those foods grown in greenhouses), avoid buying foods with unnecessary packaging (e.g., buy in bulk if possible), and recycle those packages that you use (to decrease the waste that goes to landfills).

PLANT-BASED... AND HEALTHY DIETS

If you want to reduce the consumption of animal-based foods in your diet, you need to replace them with nutritionally interesting foods, not only with candies and pastries. Current diets -rich in calories, meat, sugary, salty and fatty foods- are seriously affecting not only the health of the planet, but also our own health. More and more people are suffering from diet-related diseases, like diabetes or heart issues. And even more alarming: this is also happening in children and adolescents! Altogether, changing current dietary patterns into healthy diets with low environmental impact is imperative for both human and planetary health. Ideally:

- Eat a diet rich in in-season vegetables and fruits, whole grains, legumes, and nuts;
- Limit animal-sourced foods, especially those with the highest environmental impact;
- Limit highly processed foods that contain excess sugar, salt, and unhealthy fats, such as pastries, snacks, sodas, and fast food;
- Prioritize **unsaturated and non-refined oils** (such as virgin olive oil or canola oil) over other dietary fats (like coconut oil or butter); and
- Drink water instead of other beverages, such as soft drinks.

If you follow a diet like this, your health and the health of the planet will appreciate it [4].

UNSATURATED OILS

Those plant-based oils that are liquid at room temperature, like olive, canola and sunflower oil, among others, in opposite to those plant-based oils that are solid are room temperature, such as coconut oil, which are saturated.

CONSIDER THE FOOD YOU EAT...AND THE FOOD YOU DO NOT EAT

If you are really determined to combat climate change with your diet, the adoption of a healthy plant-based diet should be combined with a reduction in food waste. Every year one third of the food produced is finally not consumed, and it is estimated that around 8–10% of all global greenhouse gas emissions are due to food losses and waste solely. Think about it: why producing foods—and releasing

the corresponding greenhouse gases—and then waste it? It makes no sense.

You can avoid food spoilage in your home by making sure to eat what you already have on hand before buying new products. You can also keep any leftovers and eat them for another meal. Additionally, be sure to store foods at the proper temperatures and conditions. Take it also into account when eating at your school canteen, at restaurants, or at your friends' house. If you have leftovers, do not be shy, and ask for a container for keeping them for later. Do not miss any opportunity to be a food waste fighter!

CONCLUSIONS

Through your everyday choices, you can contribute to improving the health of our planet. Understanding the impact that your everyday-life actives have on the climate is the first step toward becoming a climate-change fighter! This article has provided some useful, food-related tips. In general, animal-based foods, such as meats and cheese, have a higher carbon footprint than plant-based foods do—so try to eat as few animal-based foods as possible. Limiting food waste matters a lot, too. Try to discuss this topic with your family, friends, schoolmates, and with the people who are with you wherever you eat. Together, we can all contribute to the fight against climate change.

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YOUNG REVIEWERS

ALISSAR, AGE: 14

I spend summertime's swimming, riding around town, and playing in the park. My childhood was idyllic and I have many fond memories of those carefree days. I was involved in a lot of extracurricular activities, including the school band and the drama club. I am a member of some green sorority and involved in a lot of campus activities. I hope to land some small roles in independent films and commercials and do also some modeling work and being appeared in some TV shows and movies.

DAVID, AGE: 12
I am in the 7th grade. I like fishing, mountain biking, and camping.

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