



This project has received funding from the Horizon 2020 research and innovation programme under Grant Agreement No 101060014

HACK YOUR SCHOOL FOOD

Possible Subjects: Home economics, SDGs focused activities, and STEM subjects such as Science, Math, or Design; Project-Based Learning (out of subject teaching)

Themes included: Environment and climate impact, Social and Health impacts; Food hunger; Quality perception of food; Food values and belief; Food supply chain; Media trends; Peer group influence; Food waste calculation, Date labeling on food products.

Target group: Grades 6, 7 and 8 (age 11+)

Hours required (total): 1-2 hours for each 3 lessons. If you want to work on "Designing a school meal" from the food donations (from food bank), please add 2 hours.

Materials and facilities needed: Room for group work, paper & writing materials

BACKGROUND & INTRODUCTION - WHY IS THIS TOPIC IMPORTANT?

Food waste is one of the major challenges to the sustainability of today's food system. Food waste behaviours can have long-term nutritional effect since healthy foods maybe the ones that are thrown. This makes promotion of both healthy and sustainable eating habits a critical priority. Learning how food systems work, how food impact on sustainability, and the consequences of food waste are all essential topics that impact directly our everyday lives. Reducing food waste offer a powerful strategy for encouraging healthier and more sustainable eating habit, especially among young people.

Schools provide an ideal setting for this effort, as they are places where learning and food practices naturally intersect. Young people's food waste behavior is strongly shaped by personal preferences and perceptions of food quality, as well as influenced by peer group and social norm¹ within the school environment. These personal

preferences and perceptions of fruits and vegetables are often related to quality, based on taste and appearance of the food.

In the CHORIZO project², we explored various educational materials and strategies related to food and food waste, identifying food waste as a key topic for hands-on, project-based learning. Therefore we know that many schools have already put food waste on their teaching agenda with themes such as food sharing, use of surplus food, cooking workshops, demonstrations, planting, and Sustainable Development Goals



(SDG)³, especially the SDG 12.3. And food related learning activities can be used for many school subjects like Science, Mathematic, Home economics and Project Based learning.

The topic of food waste is multifacetted and contains a broad range of themes that are well-suited for school activities such as: Quality (Taste, texture, freshness) perceptions; current media trends; food culture; social norms; date marking of food products; responsible consumption; nutritional and health impact, economy; social equality and environmental impact. And the good news is that reduction of food waste is something that everybody can do something about – and that can have a direct and measurable impact. Actions to reduce food waste can be

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¹ Social norms are rules and expectations about behaviours that are socially enforced so are one of the key factors that influence behaviours.

² CHORIZO project newsletter on "Young peoples' behavior toward lunch-packs" - https://chorizoproject.eu/wp-content/uploads/2025/01/Newsletter7 CHORIZOv3.pdf

³ https://sdgs.un.org/goals

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quantified in terms of both saved CO2-equivalents and nutritional value. Open sourced databases are available to calculate the climate impact and nutritional value of specific food items that are at risk of being wasted. Furthermore since schools have close ties with families, food waste literacy created at school might easily extend into behavioral change in the home environment.

LEARNING GOALS - WHAT WILL WE LEARN?

The main goal of this learning activity is to increase students' knowledge about overall food systems and their knowledge and skills to reduce food waste. In other words, to provide students with actionable power to reduce unnecessary waste of food and at the same time learn about social, economic and climate impacts of wasting food. The objectives of the learning activities are to:



- 1. Explore various norms and important concepts around school food and food waste
- 2. Learn how our behaviour around food waste is formed.
- 3. Learn about the different causes and mitigation strategies on food waste.
- 4. Learn about climate and nutritional impact of wasting food.

LEARNING PROCESS - HOW DO WE ORGANISE ACTIVITIES?

The activity can be organized in the form of workshop. The activity is most suitable for students from 6th to 8th grade (11+ years old). It is recommended to divide the class into small groups of 3-5 students. To carry out this activity consider 1-2 hours for each theme (A, B & C) below. As a teacher you could supervise and guide students during the group work.



Tip: Invite external mentors—such as university researchers, tech entrepreneurs, or local food surplus advocates—to enrich each theme with real-world insights and inspiration.

As shown in *Figure 1*, the activity can be organized in three different workshops. Students can work in a groups and reflect on what are the causes of food waste, discuss on what possible solutions, and explore the various impacts related to climate, economics, social, and personal health. For the guidance of the student, you can make use of the inspirational themes and question provided as ATTACHMENTs.



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A-Exploring the Cause (make use of ATTACHMENT-1):

Understanding the root causes of a problem is essential for taking meaningful action. Therefore, focus on exploring and investigating the causes of - why food are not eaten or wasted.

B-Suggesting the Solutions (make use of ATTACHMENT-2)

Focus on identifying creatives solutions to reduce food waste based on your findings from first step (A-Exploring the causes). Therefore, suggest strategies to reduce food waste by evaluating various action formats.

C-Understanding the Consequences (make use of ATTACHMENT-3, 4 & 5)

Explore the consequences of food waste for example environmental, social, health and economic consequences. Therefore, it is recommended to pick one or more areas (e.g. environment), then calculate and estimate the possible consequences.

Figure 1: Three Step action for learning Process

RESOURCES & LINKS - WHERE CAN I LEARN MORE?

Link and title	Description of the resource					
Climate database	Food Climate database from Denmark and useful for whole Europe					
Seasonal Calendar	Platform to Explore Seasonal Fruit and Vegetables in Europe					
TasteGuide (Smaguiden)	Visual guidance of the taste and taste matching of the food ingredients					
Food Climate Database	Database of climate impact of food items					
Haver til Maver ("Gardens2Bellies")	School gardening and food waste learning activity center					
SAPERE – network for a promising educational approachhttps://www.sapereassociation.com/	Taste educational resources on preferences, likes and dislikes in relation to foods and how insights can be used in school teaching					
Food Educators	Learning resources for food literacy training in school settings					

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ATTACHMENT-1: THEMES AND INSPIRATIONAL QUESTIONS FOR EXPLORING THE CAUSES OF FOOD WASTE (WHY ARE FOOD WASTED?)

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To explore the cause of the food waste, following themes and questions can serve as inspiration.

Then	nes: Quality (Taste, texture, freshness) perceptions of fruits and vegetables
	What do you consider to be attractive school food or lunch?
	How would you like it to look and taste? And why?
	Does the texture and freshness of the food (e.g. how it looks), and taste (how it tastes) have impact on
	liking and disliking of the food?
	Do you reject any food based on their appearance (fx. Attractive or unattractive looks)?
Theme	es: Media trends (Tik-Tok influencer; Media news; Social Media) influence on what is cool to
bring	to school
	How do media news, advertisements or celebrity posts on social media influence your preferences of foods, e.g. on what is considered cool to eat at school?
	Which kind of news and trends have the biggest influence on your choices?
	Is it possible to have a critical stance toward how media portrays foods?
Theme	es: Food values and beliefs (Strong odor and the smell of food items)
	Which types of food have a smell that is perceived to be unpleasant?
	Can the smell of food affect your willingness to eat it?
	How does cultural background influence our perception of food odors?
Theme	es: Social norms and shared expectations
	What kind of beliefs about food can you think of that exist in your peer group?
	Do you think that these common beliefs are helpful when it comes to avoiding food waste?
	Or do you think that they contribute to creating food waste?
	Do you agree with these common beliefs?
	What kind of shared norms and expectations exist in your group, and how might they contribute to food waste?
Theme	es: Date marking of food products
	How it may confuse people on two types of dates on food product: BEST BEFORE and USE BY.
	Do you know what to do with the food that just passed the BEST BEFORE date?
	Do you know what to do with the food that just passed the USE BY date?
Theme	es: Portion size
	How might the buffet setting and plate size influence food waste?
	What about yourself? Are you following this general rule at buffets?
	Can you think of any ways in which we can avoid taking too much from the buffet?

ATTACHMENT-2: THEMES AND INSPIRATIONAL QUESTIONS FOR SUGGESTING POSSIBLE SOLUTIONS (WHAT CAN WE DO TO REDUCE OR PREVENT FOOD WASTE?)

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To come up with creative solutions for reducing food waste, the following themes and questions can serve inspiration.

Themes - SDG (Responsible consumption; Climate friendly food)

- □ Could you think of actions that could help to reduce food waste?
- □ What is climate-friendly food and is it related to whether it is meat and plant-based?
- ☐ Think about the actions we could take to either avoid or reduce the waste.

Themes - Food chain (Production, processing, distribution, retailing to consumption)

- □ Do you know in which part of the food value chain the most food waste happens?
- ☐ Have you noticed any food waste initiatives in your own favorite grocery?
- □ How our shopping behaviours contribute to food waste

Themes - Peer group interaction (Viewpoints on the quality of food)

- □ How do your friends and classmates talk about school lunch, e.g. what is nice to eat in lunch packs and what is not so nice?
- □ Why do you think that your peers think the way they think about food in lunch packs? And do you agree with them?
- □ How could student help each-other to reduce food waste?

Themes- Student-Parent interactions (Talking to parents about the food you like or dislike)

- □ Can you think of 5 good tips you can use to create dialogue about food with parents in the case where you have a lunch box?
- □ Discuss some of the good tips to consider in preparing your lunch pack.
- □ Idea on communicating and convincing your parents to prepare the food you like!

Themes- Re-use of surplus food

- □ Can you think of ways to make a meal such as salad, sandwich, or fresh fruits sticks, from the surplus food available.
- □ Can you regrow some of the leftover vegetables? And if so, how would you do that?
- □ Can you think of some creative ideas to reuse surplus food?

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ATTACHMENT-3: THEMES AND INSPIRATIONAL QUESTIONS FOR UNDERSTANDING THE CONSEQUENCES OF FOOD WASTE (WHAT ARE THE IMMEDIATE OR LONG-TERM EFFECTS?)

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To explore the various consequences of food waste, for example environmental, social, health and economic consequences, following themes can serve as inspiration.

Them	ies: Nutritional and long-term health effects of wasting food
	Discuss some of the good tips to consider in preparing your lunch pack.
	Give good examples to each other. Also, discuss the recommendations for eating more fruit and
	vegetables.
	Would you for instance like to try cucumber sticks, baked cauliflowers or other easy finger foods?
	Lunch provides important nutrients for our long-term personal health.
Theme	es: Economy (Wasting food means wasting money)
	How do you think it affects your economy if you waste a lot of food?
	How do you think it affects your economy if someone else waste food from the retail shop?
	How do you think it affects our economy if someone wastes food in the school canteen?
	Think in term of cost for production & resources is wasted when we waste food
Theme	es: Social inequalities (World hunger)
	Why do you think we should care about world hunger?
	Do you think there is a relation between food waste created in one place and hunger in other places?
	Food that we are ready to throw might be eaten by someone else
Theme	es: Environmental impact
	Discuss some of the signs and indicators of the environmental crisis we are facing?
	Discuss to what extent these signs of a crisis have a connection with the way our food system is working?
	Discuss some of the direct impacts of food waste?
	Consider food transportation and food miles
	Consider CO2 footprint of the food waste

ATTACHMENT - 4: CLIMATE IMPACTS DATA OF SELECTED FOOD ITEMS4

 $^{^4}$ The table of the dataset is prepared based on "The big CLIMATE DATABASE-Version 1.2" - https://denstoreklimadatabase.dk/en

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SN	Name of the food Item	Category	Agriculture	Indirect Land use (iLUC)	Processing	Packaging	Transport	Retail	Total CO2_equivalent /Kg food
1	<u>Artichoke</u>	Veg. & veg. products	0,68	0,04	0,00	0,06	0,19	0,01	0,98
2	Asparagus, green	Veg. & veg. products	0,82	0,08	0,00	0,06	0,11	0,01	1,08
3	<u>Aubergine</u>	Veg. & veg. products	0,51	0,03	0,00	0,14	0,30	0,01	0,99
4	Basil, fresh	Veg. & veg. products	0,25	0,03	0,00	0,06	0,03	0,01	0,38
5	Beet, red	Veg. & veg. products	0,19	0,02	0,00	0,06	0,06	0,01	0,33
6	Beet, red, canned	Veg. & veg. products	0,30	0,02	0,20	0,22	0,11	0,01	0,86
7	Broccoli	Veg. & veg.	0,42	0,04	0,00	0,06	0,11	0,01	0,63
8	Brussels sprouts	Veg. & veg. products	0,16	0,02	0,00	0,06	0,03	0,01	0,29
9	Cabbage, red	Veg. & veg. products	0,16	0,02	0,00	0,06	0,03	0,01	0,29
10	Carrot	Veg. & veg. products	0,15	0,02	0,00	0,06	0,04	0,01	0,27
11	<u>Cauliflower</u>	Veg. & veg. products	0,42	0,04	0,00	0,06	0,11	0,01	0,63
12	Celery	Veg. & veg. products	0,25	0,03	0,00	0,06	0,03	0,01	0,38
13	Cucumber	Veg. & veg. products	0,15	0,01	0,00	0,14	0,08	0,01	0,40
14	<u>Onion</u>	Veg. & veg. products	0,15	0,02	0,00	0,06	0,03	0,01	0,27
15	<u>Parsley</u>	Veg. & veg. products	0,25	0,03	0,00	0,14	0,03	0,01	0,45
16	<u>Potato</u>	Veg. & veg. products	0,26	0,02	0,00	0,06	0,06	0,01	0,41
17	Potato, canned	Veg. & veg. products	0,41	0,03	0,20	0,22	0,12	0,01	0,99
18	<u>Spinach</u>	Veg. & veg. products	0,31	0,03	0,00	0,06	0,08	0,01	0,48
19	<u>Tomato</u>	Veg. & veg. products	0,21	0,01	0,00	0,14	0,11	0,01	0,48
20	Tomato paste, concentrated	Veg. & veg. products	1,00	0,06	0,51	0,78	0,31	0,01	2,67
21	<u>Apple</u>	Fruits & fruit products	0,34	0,02	0,00	0,14	0,10	0,01	0,61
22	<u>Avocado</u>	Fruits & fruit products	0,77	0,05	0,00	0,14	0,25	0,01	1,22
23	<u>Banana</u>	Fruits & fruit products	0,43	0,03	0,00	0,14	0,25	0,01	0,85
24	<u>Blueberries</u>	Fruits & fruit products	0,82	0,07	0,00	0,14	0,18	0,01	1,22
25	<u>Grape</u>	Fruits & fruit products	0,54	0,04	0,00	0,14	0,16	0,01	0,88
26	Kiwi fruit	Fruits & fruit products	0,43	0,03	0,00	0,14	0,14	0,01	0,75

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27	<u>Lemon</u>	Fruits & fruit products	0,33	0,03	0,00	0,14	0,17	0,01	0,67
28	Mango	Fruits & fruit products	0,57	0,05	0,00	0,14	0,24	0,01	1,01
29	Orange	Fruits & fruit products	0,31	0,03	0,00	0,06	0,16	0,01	0,56
30	<u>Pineapple</u>	Fruits & fruit products	0,30	0,02	0,00	0,00	0,24	0,01	0,56
31	Pineapple, canned	Fruits & fruit	0,28	0,03	0,22	0,22	0,37	0,01	1,13
32	<u>Strawberry</u>	Fruits & fruit products	0,41	0,04	0,00	0,14	0,06	0,01	0,65
33	Watermelon	Fruits & fruit products	0,22	0,01	0,00	0,00	0,16	0,01	0,40
34	Biscuit, sweet	Bread & bakery	0,84	0,07	1,16	0,67	0,18	0,01	2,93
	Burger bun			· ·					
35		Bread & bakery	0,87	0,06	0,11	0,04	0,07	0,01	1,16
36	Rye bread, dark, whole grains, industrially produced	Bread & bakery	0,70	0,06	0,13	0,04	0,07	0,01	1,02
37	Tortilla bread, wheat	Bread & bakery	0,87	0,06	0,11	0,04	0,07	0,01	1,16
38	Wheat bread, for toasting, industrially produced	The state of the s		0,11	0,04	0,07	0,01	1,16	
39	Beef, meat, average	Meat & poultry	60,82	15,81	-2,97	0,14	1,05	0,00	74,84
40	Beef, mince, 5-10% fat	Meat & poultry	42,05	10,99	-3,23	0,14	0,67	0,00	50,61
41	Beef, sausage, salami	Meat & poultry	38,94	10,05	-0,54	0,02	0,68	0,01	49,16
42	Chicken, meat, average	Meat & poultry	2,71	0,18	-0,01	0,14	0,25	0,00	3,27
43	Chicken, minced	Meat & poultry	5,01	0,36	-0,09	0,14	0,28	0,00	5,71
44	Chicken, whole	Meat & poultry	2,71	0,18	-0,01	0,14	0,25	0,00	3,27
45	Lamb, meat, average values	Meat & poultry	36,94	4,22	-5,34	0,14	0,48	0,00	36,43
46	Lamb, minced	Meat & poultry	34,99	3,99	-4,82	0,14	0,43	0,00	34,73
47	Pork, meat, average	Meat & poultry	4,35	0,25	-0,23	0,14	0,19	0,00	4,69
48	Pork, mince, 5-10% fat	Meat & poultry	3,87	0,25	-0,71	0,14	0,13	0,00	3,67
49	Falafel mince	Plant products	0,96	0,17	0,18	0,64	0,11	0,00	2,06
50	Olive oil	Plant products	4,33	0,64	-0,03	0,56	0,38	0,01	5,89
51	Sunflower oil	Plant products	0,00	0,00	1,92	0,56	0,30	0,01	2,79
52	Vegan burger, soy based	Plant products	0,08	0,04	0,21	0,26	0,07	0,02	0,69
53	Chestnut	Nuts & seeds	1,73	0,11	0,00	0,14	0,33	0,01	2,31
54	Peanuts, oilroasted and salted	Nuts & seeds	1,91	0,22	0,72	0,26	0,35	0,01	3,47
55	Blue cheese	Milk, dairy & eggs	2,67	-1,33	-0,35	0,35	0,26	0,00	1,60
56	Cheese, hard, Parmesan, 32 % fidm.	Milk, dairy & eggs	4,46	-2,34	2,52	0,35	0,42	0,00	5,41
57	Eggs, free-range (indoor)	Milk, dairy & eggs	0,57	0,07	0,00	0,24	0,09	0,01	0,97
58	Milk, whole, 3.5 % fat	Milk, dairy & eggs	0,48	-0,24	0,12	0,08	0,07	0,00	0,50
59	Yogurt plain, whole milk	Milk, dairy & eggs	0,47	-0,24	0,17	0,26	0,07	0,00	0,73

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60	Breakfast cereal,	cereal products	1,35	0,15	0,15	0,58	0,07	0,01	2,31
	<u>müsli, average</u>								
	<u>values</u>								
61	Corn flakes, average	cereal products	1,22	0,14	0,31	0,58	0,13	0,01	2,39
	<u>values</u>								
62	<u>Pasta</u>	cereal products	1,18	0,09	0,18	0,23	0,36	0,01	2,05
63	Rice flour	cereal products	4,37	0,17	0,00	0,20	0,38	0,01	5,12
64	Rye flour, dark,	cereal products	0,78	0,09	0,03	0,20	0,07	0,01	1,17
	whole meal								
65	Wheat, flour,	cereal products	0,86	0,07	0,03	0,20	0,07	0,01	1,24
	wholemeal								
66									

As shown in figure 1 below, overview of the climate impact (CO2 emissions) associated with different food categories, highlighting the five main stages of CO2 contribution across food supply chain. The figure shows that meat and poultry category have highest Climate CO2 impact and mainly come from agriculture production. The climate impact in the Fruits and Vegetable category mainly contributed from transportation.

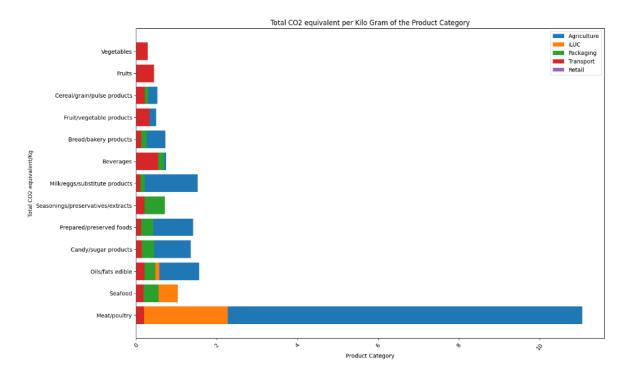


Figure 1- Overview of CO2 impact of the food product category. Source CONCITO food climate dataset.

ATTACHMENT 5: WORKING TABLE TO CALCULATE CLIMATE IMPACT IN YOUR OWN CASE.

By using a climate impact table (ATTACHMENT-4) any action and food behaviour, any change or intervention can be expressed in terms of carbon equivalents (kg. $CO_2/pr.kg$). In other words, anything you do with food - or choose not to do - can be expressed in terms of impact on the climate (CO_2 emissions).

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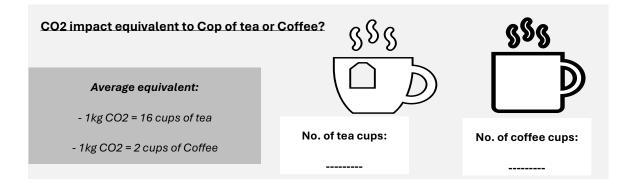
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Let's say for instance, you found that about *half a cucumber* which is approximately *150 gram* is wasted in the school canteen and that you decide that this should stop. That action - or intervention - can then be calculated in terms of – in this case a positive - impact on the climate.

So, in order to do the calculation for any other food, you will need to know **what types** of foods are wasted and in **what amounts**. Once you have this list of **types and amounts** you can start converting those to climate equivalence in table below.

Food item in focus - write the name of each food item to calculate CO2 impact (a)	Amount - edible amount of food items "convert to kg" (b)	CO2 Impact (in kg. CO ₂ / pr.kg food) - CO ₂ impact of food item in focus (See Attachment 4) (c)	Avoided CO2 impact Grams of food X kg CO2/pr.kg (d=b x c)	Where the most of CO2 come from? - what part of the supply chain have higher CO2 impact? (See Attachment 4) (e)
For example, Half cucumber	For example, 150 grams = 0,15 kg	For example, 0.5	For example, 0,075 kg CO ₂ /pr.kg (0,15 kg * 0,5)	For example, Transportation
(add the amou	Total nts from Avoide	ed CO2 impact)		

What can we do with CO2 impact avoided? Put them in the figures below.



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