Supplementary material

Table S1: **Cereals, cereals products, and substitutes**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Barley[1]	0.71			100												
Bread[1]	1			100												
Breadcrumbs[1]	1			100												
Corn[1]	0.45			100												
Corn flour[1]	0.45			100												
Croutons[1]	1.46			100												
Gnocchi alla romana[2, A]	1.6			18			2	70	6						4	
Lasagna pasta[1]	1.1			80											20	
Meat ravioli[1]	1.1		30	55											15	
Meat tortellini[1]	1.1		30	55											15	
Potato gnocchi[1]	0.375			27										73		
Pasta for broth[1]	1.07			100												
Pizza margherita[1]	1.3			59					20				20			1
Puff pastry[1, B]	1.53			46			36									
Rice[1]	2.76			100												
Rusks[1]	1.46			100												
Semolina pasta[1]	1.07			100												
Spelt[1]	0.57			100												
Vegetarian ravioli[1]	1.1			31					21				23		25	
Wheat flour[1]	0.71			100												
Wheat semolina[1]	0.71			100												

Table S2: **Legumes**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Borlotti beans[1]	0.5									100						
Cannellini beans[1]	0.5									100						
Chickpeas[1]	0.5									100						
Chickpeas flour[1]	0.5									100						
Frozen peas[3]	0.61									100						
Lentils[1]	0.5									100						
Peas[1]	0.5									100						

Table S3: **Vegetables**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Asparagus[1]	0.7												100			
Cabbage[1]	0.6												100			
Canned tomatoes[1]	1.23												100			
Capers[1]	0.91												100			
Carrots[1]	0.14												100			
Cauliflower[1]	0.6												100			
Celery[1]	0.11												100			
Chard or swiss chard[1]	0.1												100			
Condiriso[1]	1.23												100			
Eggplant[1]	1.35												100			
Fennel[1]	0.14												100			
Fresh basil[1]	0.91												100			
Frozen broccoli[3]	0.814												100			
Frozen carrots[2]	0.342												100			
Frozen cauliflower[3]	0.773												100			
Frozen fennel[3]	0.354												100			
Frozen potatoes[2]	0.225													100		
Frozen spinach[2]	0.277												100			
Frozen pumpkin[3]	1.314												100			
Frozen zucchini[2]	0.263												100			
Garlic[1]	0.11												100			
Green beans[1]	0.78												100			
Green salad[1]	0.45												100			
Leaf vegetables[1]	0.1												100			
Leeks[1]	0.11												100			
Mushrooms[1]	0.1												100			
Onions[1]	0.11												100			
Origan[1]	0.91												100			
Parsley[1]	0.91												100			
Peppers[1]	0.91												100			
Potatoes[1]	0.13													100		
Pumpkin[1]	1.1												100			
Red beets[1]	0.11												100			
Rosemary[1]	0.91												100			
Saffron[4]	3205.13												100			
Sage[1]	0.91												100			
Spinach[1]	0.1												100			
Tomatoes[1]	0.77												100			
Zucchini[1]	1												100			

Table S4: **Fruits**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Apple[1, C]	0.14					100										
Apricot[1, C]	0.24					100										
Banana[1, C]	1.35					100										
Black olives[1, C]	0.52					100										
Grape[1, C]	0.9					100										
Green olives[1, C]	0.52					100										
Mandarin[1, C]	0.36					100										
Orange[1, C]	0.25					100										
Peach[1, C]	0.24					100										
Pear[1, C]	0.31					100										
Prune[1, C]	0.24					100										

Table S5: **Meat, meat products, and substitutes**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Beef chuck[1]	15.45		100													
Beef meatballs[1]	15.45		100													
Chicken[1]	1.88	100														
Chicken breast[1]	1.88	100														
Chicken chops[1]	1.88	100														
Chicken thigh[1]	1.88	100														
Frozen chicken[5]	3.65	100														
Cotechino[1]	15.03		100													
Ground beef[1]	15.45		100													
Ground chicken[1]	1.88	100														
Ground turkey[1]	1.88	100														
Ground veal[1]	15.45		100													
Ham[1]	15.03		100													
Lamb roll[1]	13.85		100													
Mortadella[1]	15.03		100													
Pork loin[1]	3.65		100													
Pork sausage[1]	15.03		100													
Roast gravy[4]	4.41		100													
Salami[1]	15.03		100													
Smoked beef[1]	15.03		100													
Turkey[1]	1.88	100														
Turkey breast[1]	1.88	100														
Processed turkey meat[1]	15.03	100														
Veal chuck[1]	15.45		100													
Veal sirloin[1]	15.45		100													

Table S6: **Eggs and eggs products**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Egg[1]	2.7														100	
Hard-boiled eggs[1]	2.7														100	
Pasteurized eggs[1]	2.7														100	

Table S7: **Fish and seafood**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Blue shark fillet[1]	2.27											100				
Cod cutlet[1]	3.1											100				
Cod fillet[1]	3.1											100				
Fish sticks[2]	2.883											100				
Octopus[1]	6.7											100				
Seafoods[1]	6.7											100				
Tuna fish[1]	2.27											100				

Table S8: **Milk, milk products, and their substitutes**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Cream[1]	6						100									
Crescenza cheese[1]	1.68								100							
Diced mozzarella cheese[1]	10.14								100							
Edamer cheese[1]	14								100							
Emmental cheese[1]	14								100							
Fontal cheese[1]	14								100							
Grated cheese[1]	5.87								100							
Gorgonzola cheese[1]	1.68								100							
Grana Padano cheese[1]	4.6								100							
Mascarpone cheese[1]	1.68								100							
Milk[1]	1.31							100								
Mozzarella cheese[1]	10.14								100							
Parmesan cheese[1]	4.6								100							
Primosale cheese[1]	1.68								100							
Ricotta cheese[1]	2.52								100							
Robiola cheese[1]	1.68								100							
Seasoned Tometta[1]	4.6								100							
Spreadable fresh cheese[1]	1.68								100							
Taleggio cheese[1]	4.6								100							
Tomino[1]	4.6								100							
Yogurt[1]	1.5							100								

Table S9: **Oil, fats spices, and sauces**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Butter[1]	3.36						100									
Herbs[1]	0.91												100			
Mayonnaise[1]	6														20	80
Olive oil[1]	5.12										100					
Pepper[1]	0.91															
Pesto[3]	2.72									33			34			33
Sunflower oil[1]	1.93															100
Vegetable broth[2]	0.591												100			

Table S10: **Sweet products and substitutes**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Biscuits[1]	1.4				100											
Chocolate[1]	4.2				100											
Ice-cream[1]	4.14				100											
Jam[1]	1.63				100											
Pudding[1]	2.08				100											
Sugar[1]	1.63				100											
Sweets[1]	2.08				100											
Tarts[1]	2.08				100											

Table S11: **Non-alcoholic beverages**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Decaffeinated coffee[1]	1.43															
Lemon juice[1]	0.67															
Tea[1]	3.1															
White vinegar[6]	2.54															

Table S12: **Alcoholic beverages**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Red wine[1]	1.39															
White wine[1]	1.39															

Table S13: **Miscellaneous**

Food item	CF (g CO_2/g)	White meat (%)	Red meat (%)	Cereals (%)	Sweets (%)	Fruit (%)	Fats (%)	Milk (%)	Cheese (%)	Legumes (%)	Olive oil (%)	Fish (%)	Vegetables (%)	Potatoes (%)	Eggs (%)	Sunflower oil (%)
Fresh fruit[1, C]	0.234					100										
Fruit mousse[1, D]	0.754					100										
Grain and legume soup[1, E]	0.59			66						34						
Mixed cereals[1, F]	0.57			100												
Mixed legumes[1, G]	0.5									100						
Vegetables tris[1, H]	0.45												100			

1: Ferrari M, Benvenuti L, Rossi L, et al. Could Dietary Goals and Climate Change Mitigation Be Achieved Through Optimized Diet? The Experience of Modeling the National Food Consumption Data in Italy. Front Nutr. 2020;7. doi:10.3389/fnut.2020.00048.
2: European Commission. Directorate General for Research and Innovation. Urban Food System Transformation in the Context of Food 2030: Current Practice & Outlook towards 2030. Publications Office; 2023. doi:10.2777/507125.
3: Wrobel-Jedrzejewska M, Polak E. Determination of carbon footprint in the processing of frozen vegetables using an online energy measurement system. Journal of Food Engineering. 2022;322:110974. doi:10.1016/j.jfoodeng.2022.110974.
4: Volanti M, Arfelli F, Neri E, et al. Environmental Impact of Meals: How Big Is the Carbon Footprint in the School Canteens? Foods. 2022;11(2):193. doi:10.3390/foods11020193.
5: Frederiksen R, Dalgaard R, Halberg N. LCA Food Database. Accessed December 14, 2023. https://www.lcafood.dk/.
6: Bartocci P, Fantozzi P, Fantozzi F. Environmental impact of Sagrantino and Grechetto grapes cultivation for wine and vinegar production in central Italy. Journal of Cleaner Production. 2017;140:569-580. doi:10.1016/j.jclepro.2016.04.090.

A: 18% of semolina, 4% of eggs, 2% of butter, 70% of milk and 6% of Parmesan cheese.
B: 36% of butter, 46% of flour and 18% of water.
C: The CF of fresh fruit was calculated as the mean value of the seasonal fruits indicated in the fruit section.
D: 50% of apple and 50% of banana.
E: 33% of lentils, 33% of spelt and 33% of barley.
F: 33% of spelt, 33% of barley and 33% of rice.
G: Mixed legumes: 50% of lentils, 50% of beans.
H: 33% of cauliflower, 33% of carrots and 33% of broccoli.