

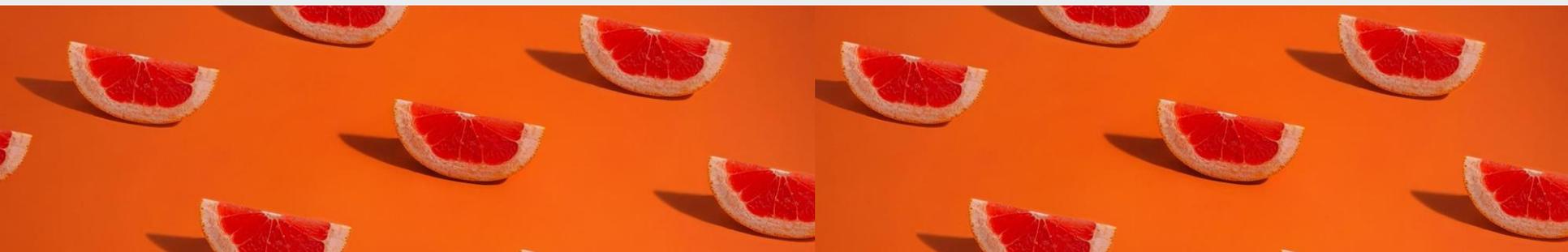


Changing habits for a healthier and more sustainable diet

Anna Bach-Faig (Msc, PhD)
Professor, Universitat Oberta de Catalunya

@Bach_Faig

Curso 'Alimentar la metr poli en tiempos de emergencias
Feeding the metropolis in times of emergencies



How big of a difference makes what food I



A syndemic global problem

Some figures

About 2 billion people in the world experience some level of food insecurity, including moderate¹

39% global population is overweight

13% global population is obese

Heavy impact on human health:

800 million people are undernourished

2 billion people have micronutrient deficiencies

20-33% GHGE can be attributed to food

The livestock itself produces **14% of the total gas (GHG emissions)**²

A **30%** reduction of GHG emissions would be possible, for example, if producers in a given system, region and climate adopted the *technologies and practice* currently used by the 10 percent of producers with the lowest emission intensity²

Planetary Health

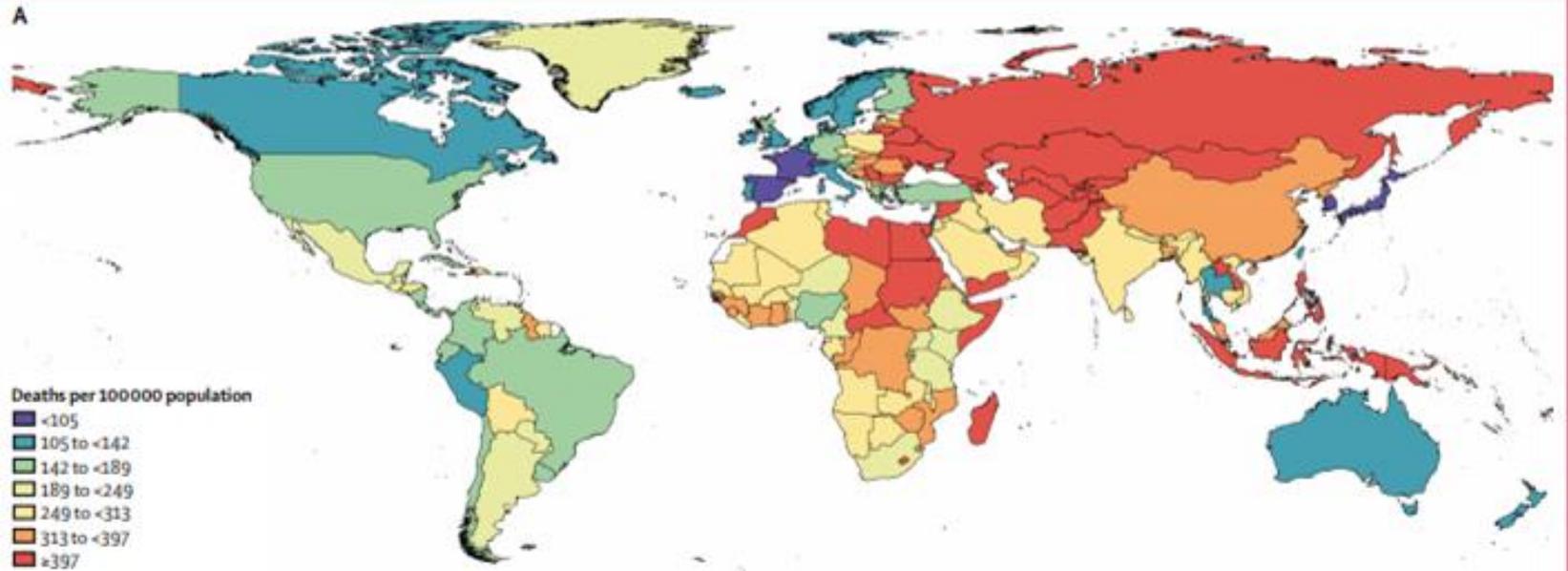
Focuses on the interdependence between human health, animal health and the environment around them [Whitmee 2015]



Sustainable diets aim to address the growing **health** and **environmental** concerns related to food production and consumption.

Springmann, M., Wiebe, K., Mason-D'Croz, D., Sulser, T.B., Rayner, M. & Scarborough, P. 2018. Lancet Planet Health, 2(10):e451–e461. doi:10.1016/S0140-6736(18)31788-4

Report: Global **health** effects of dietary risks, 2017



22% of all deaths are attributable to just 3 food factors:

- high intake of **sodium (salt)**
- low intake of **whole grains**
- low **fruit** intake

Conclusion: high consumption of vegetables, fruits and whole grains either in the form of "Mediterranean, vegetarian or vegan diet"..., reduces the risk of cancer, cardiovascular disease, adult diabetes and obesity.

Planetary Health last news



eldiario.es
@eldiarioes

Seguir

Los científicos de la ONU llaman a cambiar la dieta mundial con urgencia para frenar la crisis climática. Para ello, inciden en que utilicemos una dieta con más vegetales y carne obtenida con sistemas que demanden menos energía eldiario.es/sociedad/cient ...



Julio fue el mes más caluroso de la historia y advierten que las temperaturas seguirán subiendo

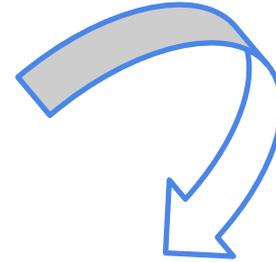
Publicado: 5 ago 2019 16:55 GMT



El pasado mes fue alrededor de 0,56°C más cálido que la temperatura promedio mundial entre 1981 y 2010.



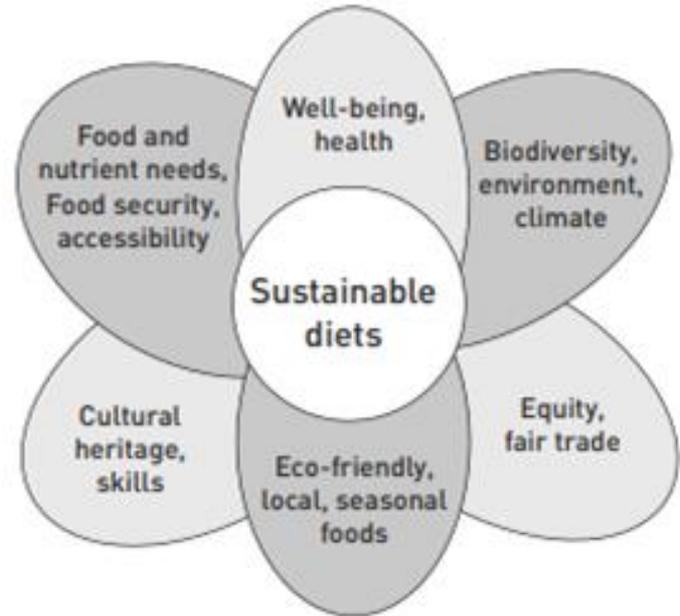
3:14 - 8 ago 2019



The citizens worldwide are mobilizing for climate:

-*School strike for climate- Fridays for Future (FFF)* after Swedish schoolgirl, Greta Thunberg, staged a protest in August 2018 outside the Swedish parliament
-*Global Climate strike (20-27 sept)* to demand an end to the age of fossil fuels.

Key elements of sustainable diets



Definition: Sustainable healthy diet

Sustainable diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of **biodiversity** and **ecosystems**, **culturally** acceptable, **accessible**, economically fair and **affordable**; **nutritionally** adequate, **safe and healthy**; while optimizing natural and human resources (FAO, 2010).

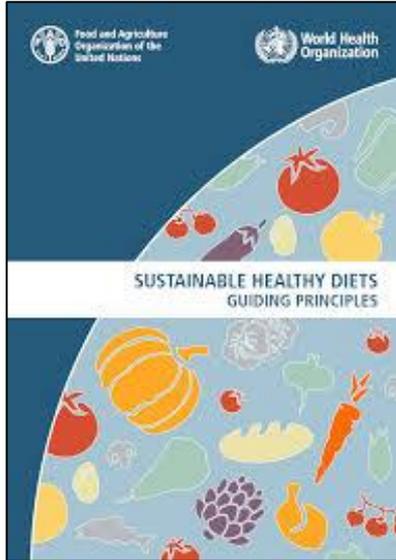
Sustainable Healthy Diets are dietary patterns that promote all dimensions of **individuals' health and wellbeing**; have **low environmental pressure and impact**; are **accessible, affordable, safe and equitable**; and are **culturally acceptable**. The aims of Sustainable Healthy Diets are to achieve optimal growth and development of all individuals and support functioning and physical, mental, and social wellbeing at all life stages for present and future generations; contribute to preventing all forms of malnutrition (i.e. undernutrition, micronutrient deficiency, overweight and obesity); reduce the risk of diet-related NCDs; and support the **preservation of biodiversity and planetary health**. Sustainable healthy diets must combine all the dimensions of sustainability to avoid unintended consequences. [FAO&WHO 2019]



4 dimensions

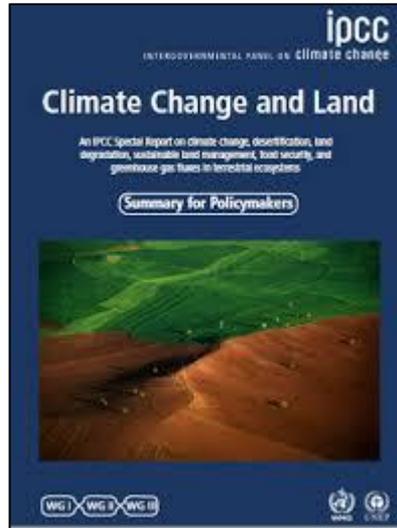
- **Health**
- Sustainability
 - **environmental**
 - **social/cultural**
 - **economic**

Latest reports of interest



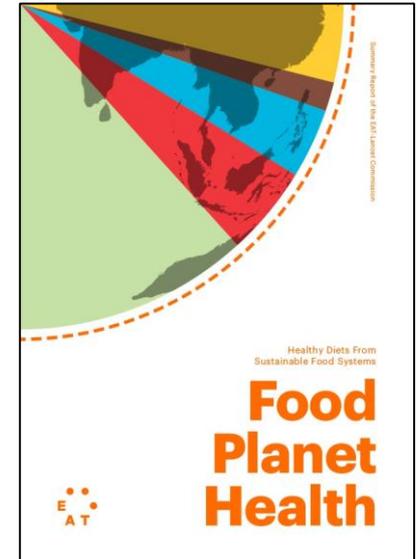
FAO, 2019

IPCC, 2019



European
Commission, 2018

EAT-Lancet
Commission, 2019



1. Reduce Food loss and Food waste

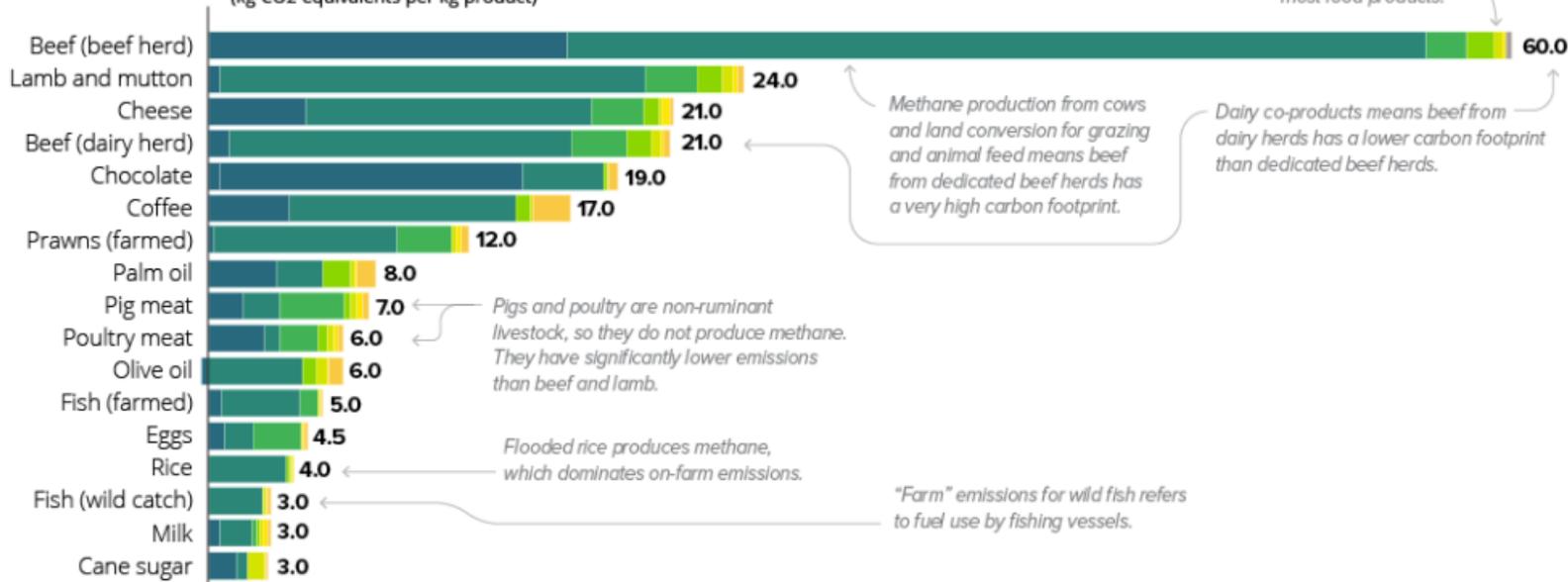


2. Meat!

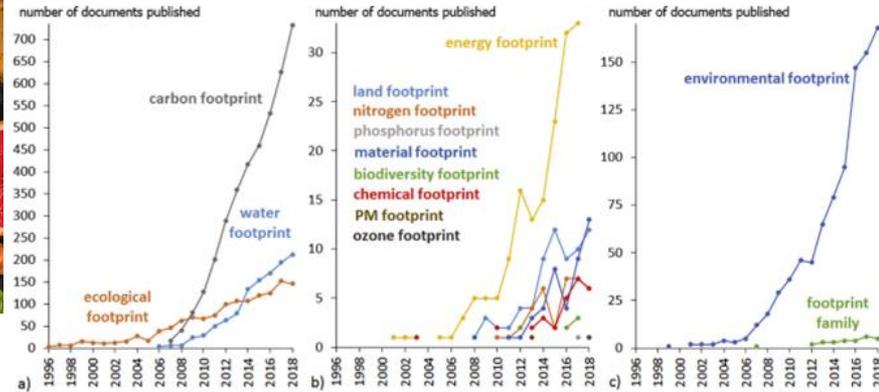
There is a vast difference in greenhouse gases (GHG) that are produced across various food types.



GHG emissions per kilogram of food product
(kg CO₂-equivalents per kg product)



Environmental footprints indicators (carbon, water, land, N, P) of food products similar observation:



Animal products high footprints Plant-based low footprints (especially red meat)

Davy Vanham et al. 2019

Nutrition, health and environment

Exceptions: nuts and olive oil: tradeoffs! Option for sustainable production

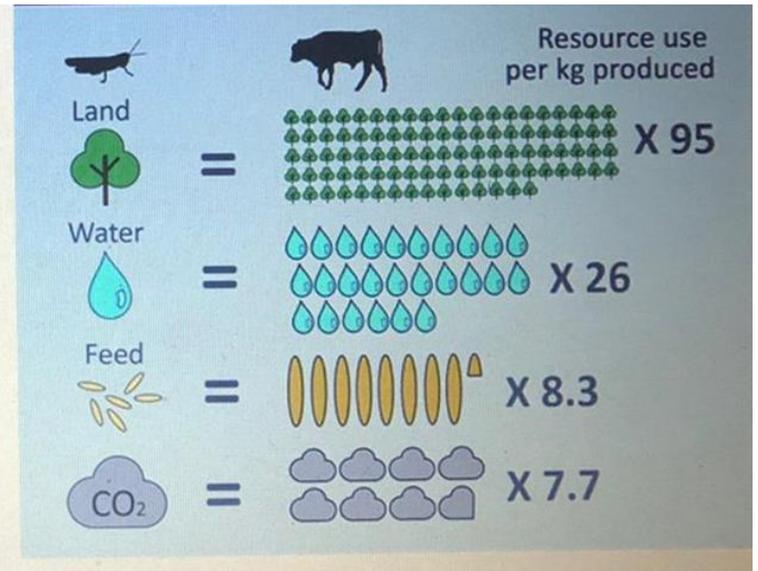
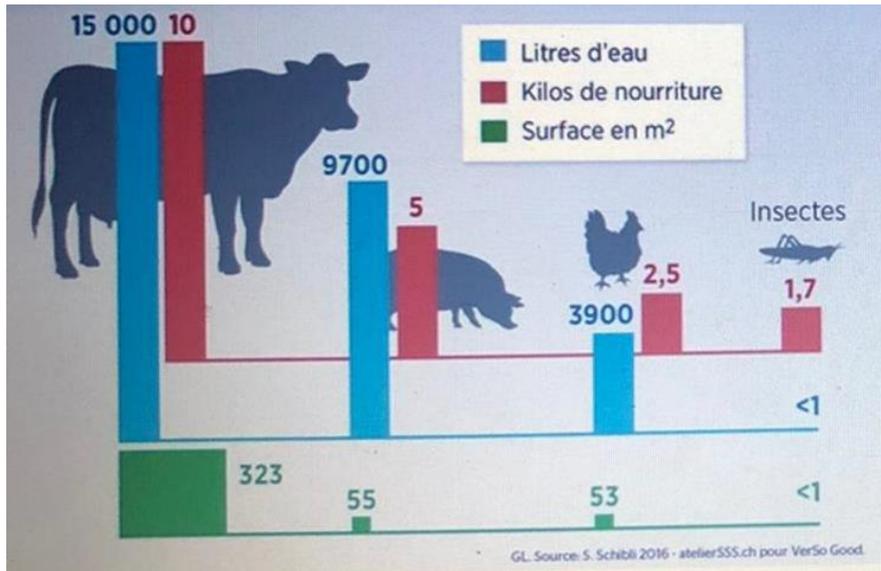
[4] Background paper on healthy diets. Authors: Shiriki Kumanyika, Ashkan Afshin, Mary Arimond, Mark Lawrence, Sarah McNaughton and Chizuru Nishida

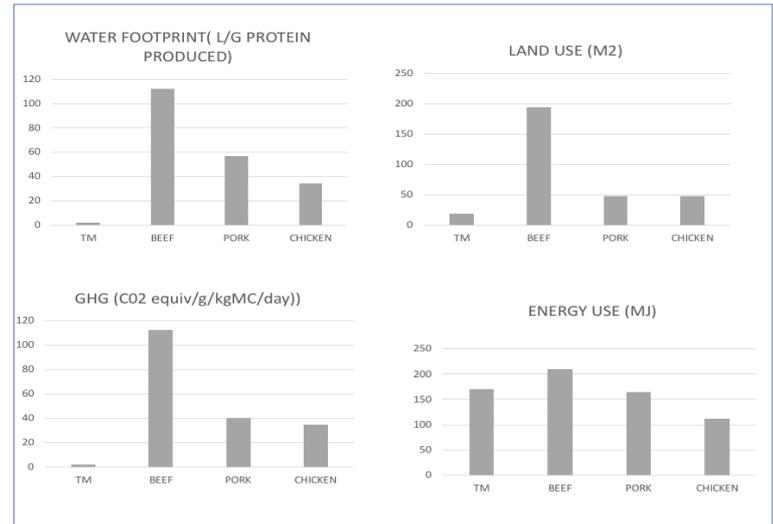
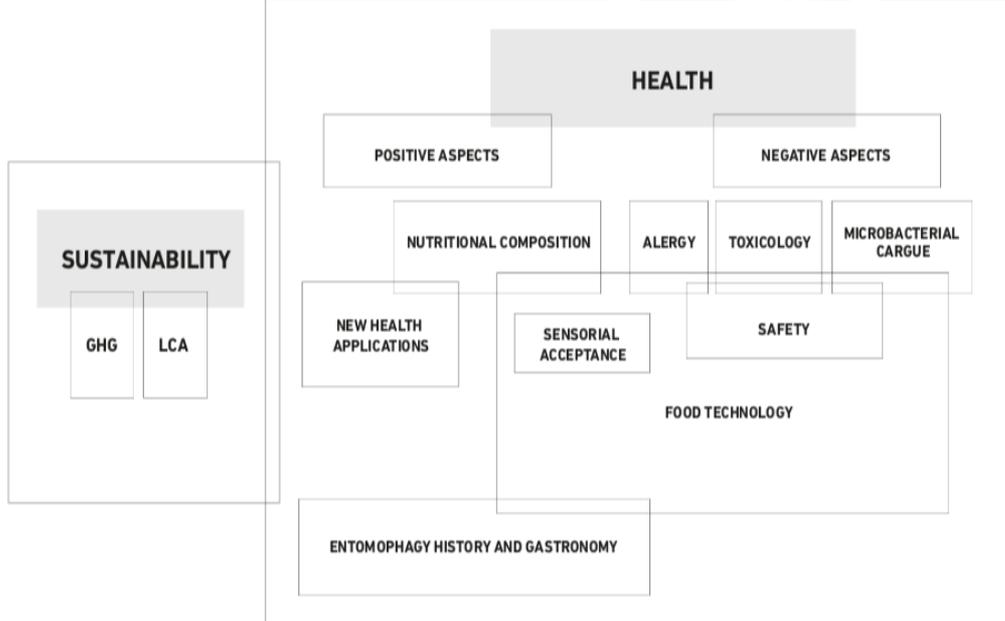
[5] Springmann, M., Wiebe, K., Mason-D'Croz, D., Sulser, T.B., Rayner, M. & Scarborough, P. 2018. Lancet Planet Health, 2(10):e451–e461.

[6] doi:10.1016/S0140-6736(18)31788-4

[7] Macdiarmid, J.I., Kyle, J., Horgan, G.W., Loe, J., Fyfe, C., Johnstone, A. & McNeill G. 2012. The American Journal of Clinical Nutrition, 96(2):632–639

Environmental impact for producing 1 kg of animal food







FL FW and PackageW, Technological improvements Dietary change

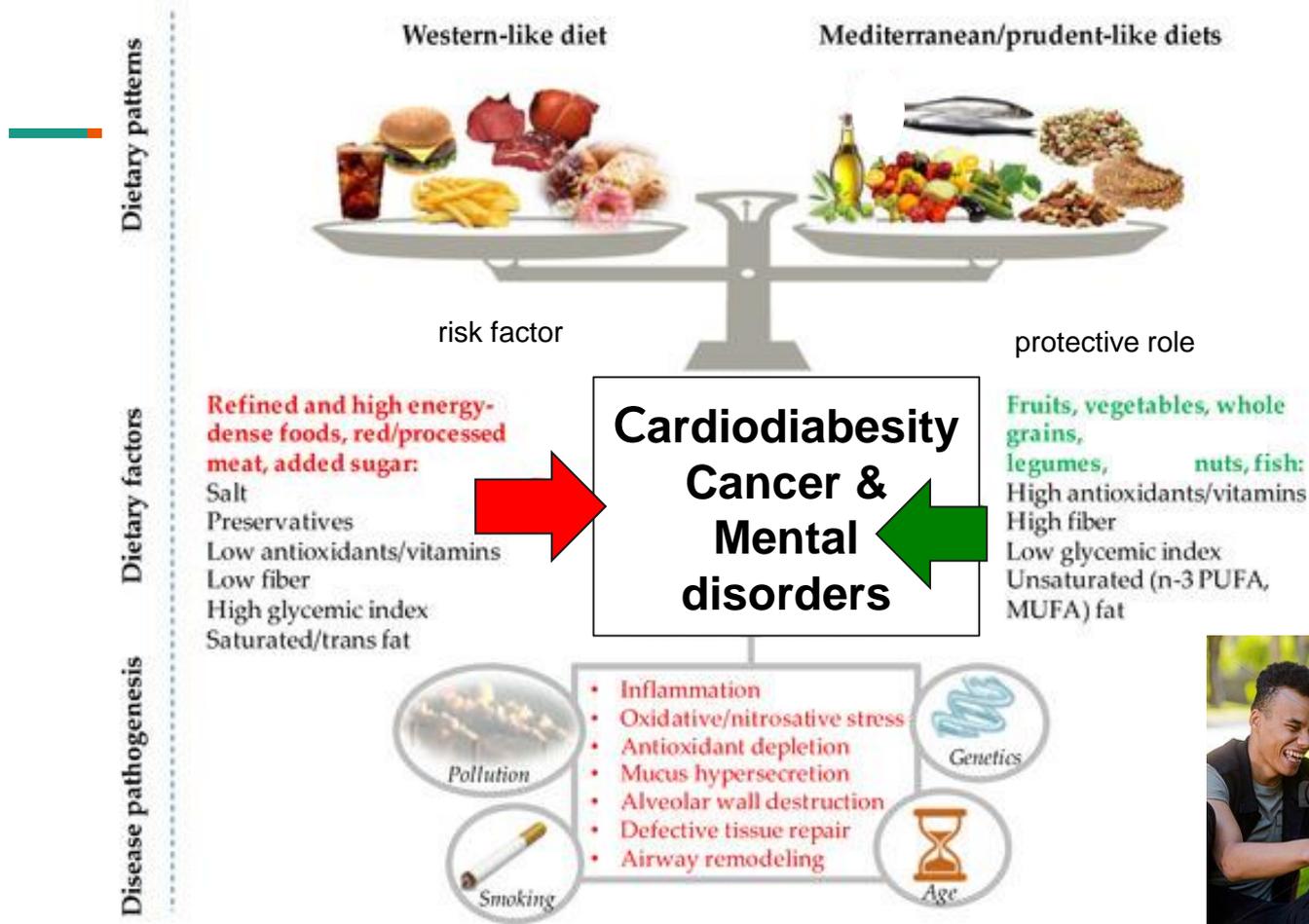
(plant-based and minimally including processed foods. Meat, processed meat, fatty dairy products and fish are what makes the difference taking into account the different dimensions:

- Accessibility (price),
- Environmental
- Nutritional

Source: *Fresán et al.*

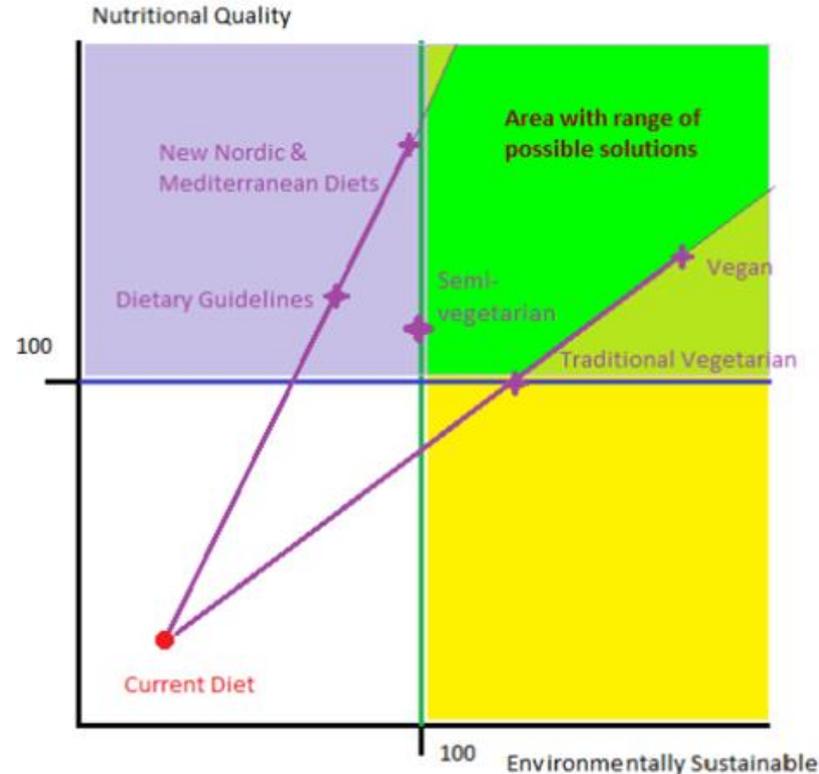
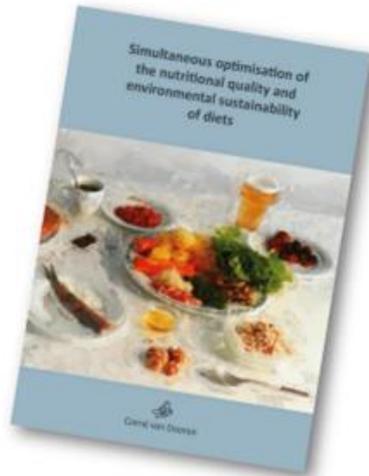


Food transition: animal proteins have increased markedly, along with empty calories from refined sugars, fats, alcohol, and sugary drinks.



The environmental footprints of different dietary patterns

Range of diets



Source: Corné van Dooren, 2019

Environmental footprints of Mediterranean versus Western dietary patterns: beyond the health benefits of the Mediterranean diet

Sara Sáez-Almendros¹, Biel Obrador², Anna Bach-Faig³ and Lluís Serra-Majem^{4,5*}

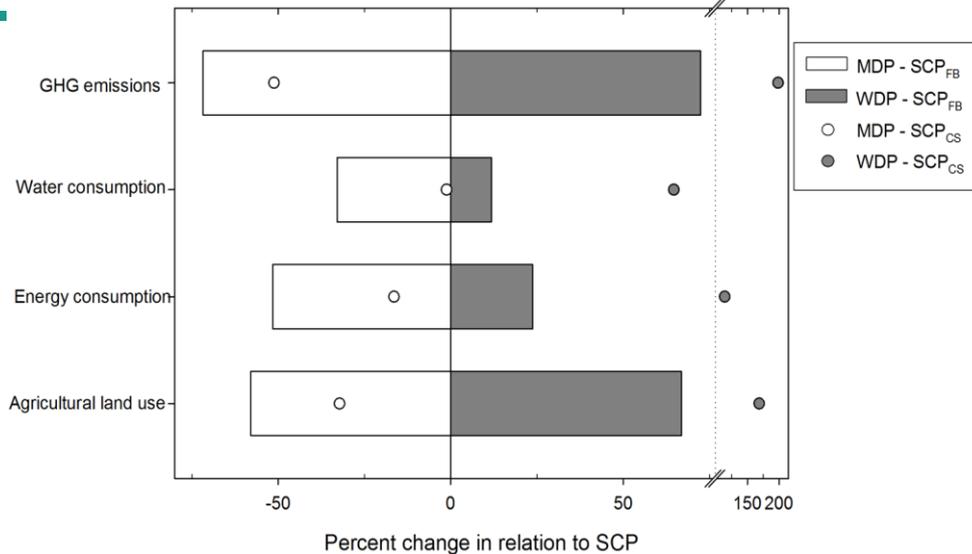


Figure 2 Changes in environmental footprints of the Mediterranean (white) and Western (grey) dietary patterns in relation to the Spanish current diet. The relative change of each dietary pattern in relation to the Spanish current diet is shown for data derived from food-balance sheets (boxes) and from household consumption surveys (dots).

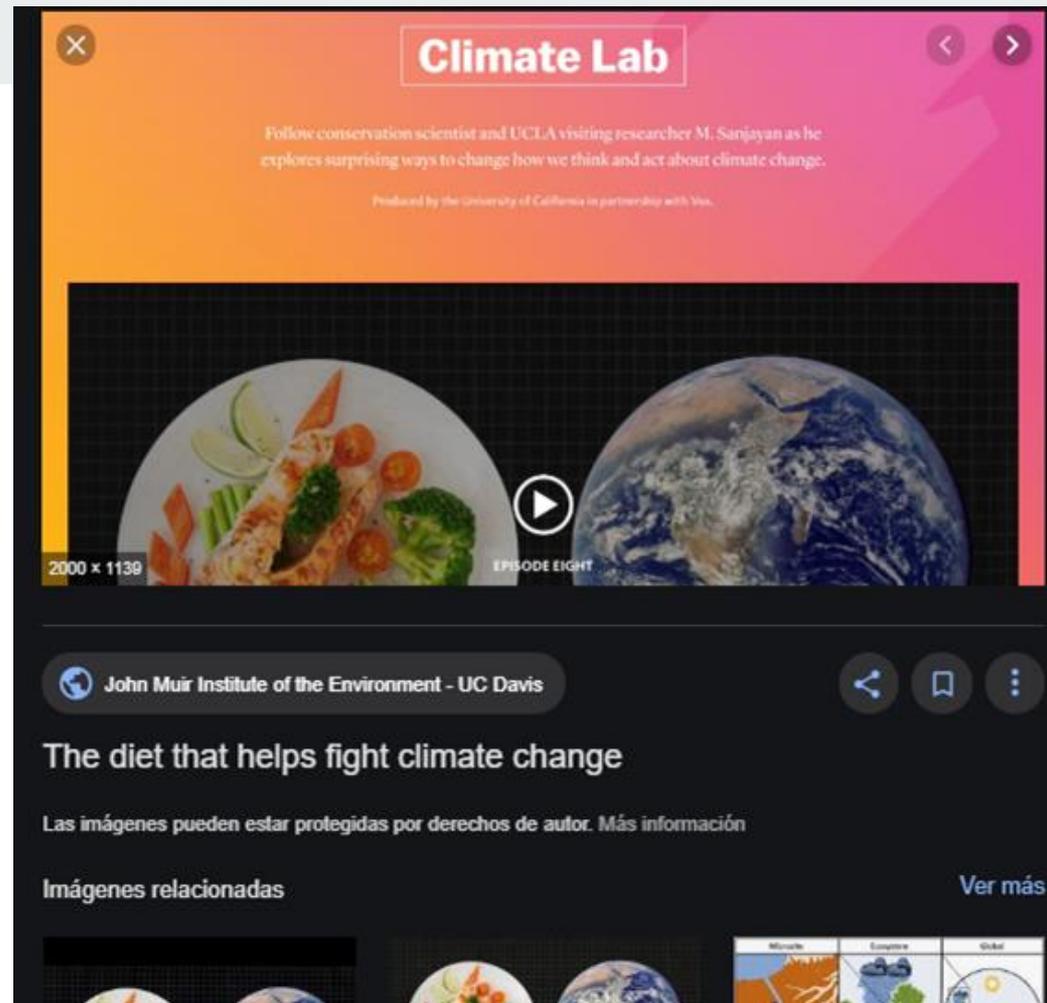
✓ Adherence to the MDP pattern in Spain would reduce greenhouse gas emissions (72%), land use (58%) and energy consumption (52%), and to a lower extent water consumption (33%).

✓ On the other hand, the adherence to a western dietary pattern would imply an increase in all these descriptors of between 12% and 72%.

(Sáez-Almendros et al. 2013)

✓*The fish food group was not counted in the LU footprint because was not applicable.

If we all adhere to a
MD we would
reduce 15% global
warming by 2050*



*Data of a paper ahead of print. The study was based on a model published in Science of the Total Environment (Wang et al. 2017). This model has been used to forecast the nitrogen requirements of business as usual diets, and estimated the CO₂eq for nitrogen based emissions, particularly fertilizer. This assessment has not been published separately. There is a publication in process that examines a food-system model through 2050, including technological interventions and dietary patterns.

ASSESSMENTS

ENVIRONMENT

WATER FOOTPRINT
(WF)

NUTRITIONAL WATER
PRODUCTIVITY
(NWP)

NUTRITIONAL ASSESSMENT
(NUT)

HEALTH

DIETS

CURRENT
HOUSEHOLD
CONSUMPTION

MEDITERRANEAN
DIET

RESULTS AND COMPARISON

Current Consumption

- **3 times more:**
Meats
Dairy products
Sweet products
- **Fewer:**
Fruits
Vegetables
Fish

Mediterranean diet

753 liters/capita day of
consumptive water
(28 are Blue National WF)

↑
NWP

More Kcal, Fiber, Nutrients
Per liter water used

↓ Kcal, Proteins, Fats

↑ Fiber, Vitamins, Minerals

Article

Updating the Mediterranean Diet Pyramid towards Sustainability: Focus on Environmental Concerns

Lluís Serra-Majem ^{1,2,3,*}, Laura Tomaino ^{1,4}, Sandro Dernini ^{2,5}, Elliot M. Berry ^{2,6}, Denis Lairon ⁷, Joy Ngo de la Cruz ², Anna Bach-Faig ^{8,9}, Lorenzo M. Donini ¹⁰, Francesc-Xavier Medina ⁸, Rekia Belahsen ¹¹, Suzanne Piscopo ¹², Roberto Capone ¹³, Javier Aranceta-Bartrina ^{1,3,14}, Carlo La Vecchia ⁴ and Antonia Trichopoulos ¹⁵

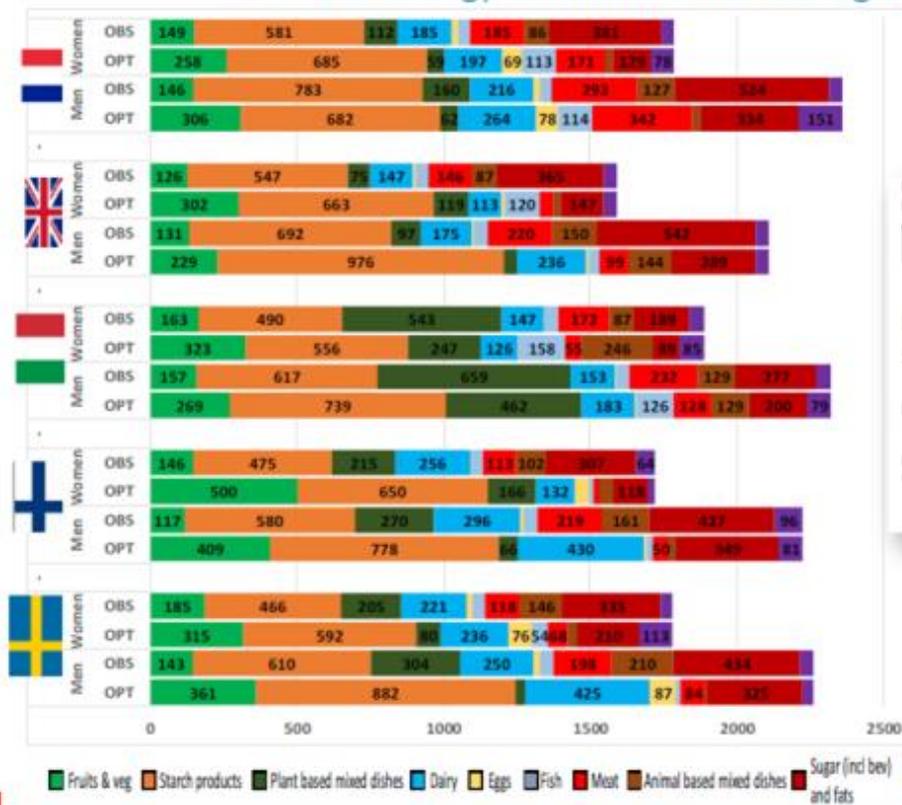


Figure 2. New Pyramid for a Sustainable Mediterranean Diet.



Dietary changes needed to improve diet sustainability in Europe

Share of energy contribution of food groups in observed and optimized diets



-30% Greenhouse Gas Emissions

European Journal of Clinical Nutrition
<https://doi.org/10.1038/s41430-017-0060-z>

ARTICLE

Dietary changes needed to improve diet sustainability: are they similar across Europe?

Florent Vieux¹ · Marlene Perignon² · Rozenn Gazan¹ · Nicole Darmon²

Received: 7 June 2017 / Revised: 16 October 2017 / Accepted: 4 December 2017
© Macmillan Publishers Limited, part of Springer Nature 2018

Source: Corné van Dooren, 2019

Plates, pyramids, planet

FAO and FCRN, 2016

Plates, pyramids, planet

Developments in national healthy and sustainable dietary guidelines: a state of play assessment



- Official Food Based Dietary Guidelines (FBDGs) → only 1/3 of the countries in the world (83 countries of a total of 215).
- Absence in **low income countries** → only 5 countries in Africa have guidelines.
- Not many countries include **sustainability criteria** in dietary guidelines.

National Dietary Guidelines that include sustainability recommendations



Qatar

Brazil

Sweden

Germany

Austria

Denmark

The Netherlands

Estonia

Spain



France

Italy

Portugal

Belgium



National Dietary Guidelines

common points

Diets rich in plant-sourced products

Low in animal-based products

Emphasis on the consumption of fish from sustainable sources

Reduction of red and processed meat

Reference for seasonal and local food

Reduction of food waste

Table 1. Description of the number of reviewed scenarios, by type of sustainable dietary pattern and environmental indicator.

Sustainable diet type	Environmental impact		
	GHG emissions	Land use	Water use
Vegan	14	6	1
Vegetarian	20	7	9
Ruminants replaced by monogastric meat	6	3	1
Ruminants replaced by monogastric + no dairy	1	-	-
Meat partially replaced by plant-based food	8	4	-
Meat partially replaced by dairy products	3	1	-
Meat partially replaced by mixed food	7	1	-
Meat + dairy partially replaced by plant-based food	5	3	3
Balanced energy intake	6	2	1
Healthy guidelines	21	10	9
Healthy guidelines + further optimisation	16	5	4
Mediterranean	8	5	4
New Nordic Diet	3	1	-
Pescatarian	6	4	2
Total	124	52	34

doi:10.1371/journal.pone.0165797.t001

FBDG (NL) 2016

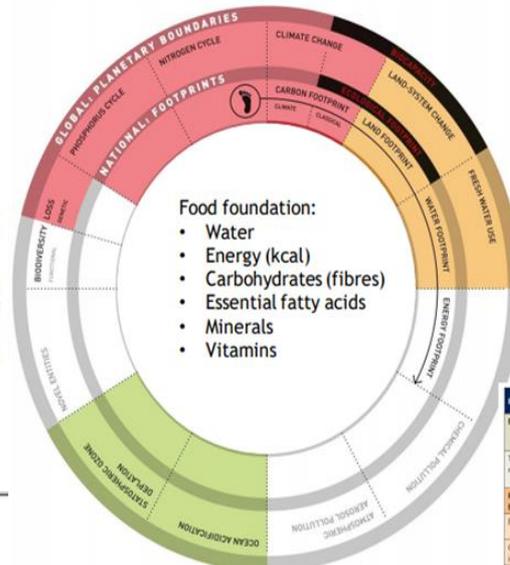
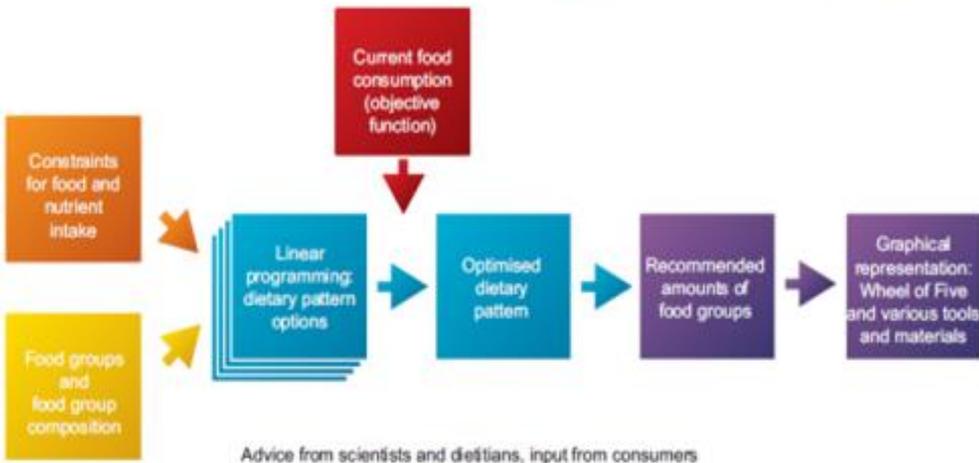
Development of healthy and sustainable food-based dietary guidelines for the Netherlands

Elizabeth Brink^{1,*}, Caroline van Rossum², Astrid Postma-Smeets¹, Annette Stafleu¹, Danielle Wolvers¹, Corné van Dooren¹, Ido Toxopeus², Elly Buurma-Rethans², Marjolein Geurts² and Marga Ocké²

¹The Netherlands Nutrition Centre (Voedingscentrum), PO Box 85700, 2508 CK The Hague, The Netherlands:

²National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands

Submitted 13 July 2018; Final revision received 4 March 2019; Accepted 27 March 2019



Apple slice model:

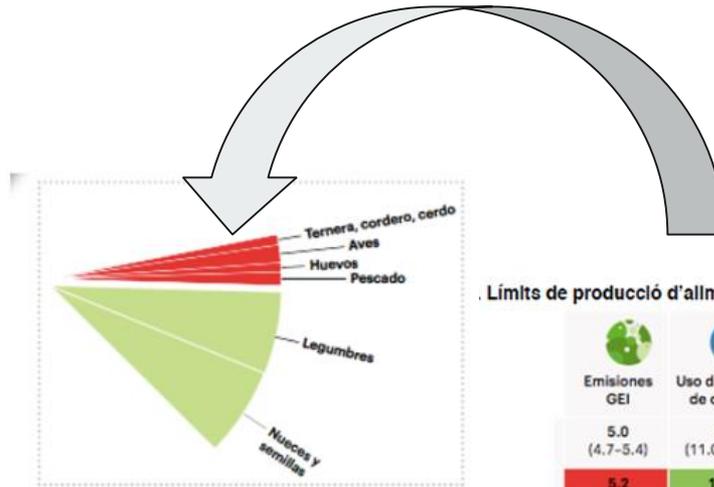
Linear programming makes it possible to calculate diets with the needed food foundation within the planetary boundaries.

(van Dooren, 2018; Woods et al. 2019)

Environmental indicator	GHG emissions	Land use	Water use	Nitrogen application	Phosphorus application	Biodiversity
EAT-Lancet global targets	(GtCO ₂ -eq per year)	(million km ²)	(km ³ per year)	(Tg N per year)	(Tg P per year)	(restrictions per million species-years)
Target (uncertainty range)	5 (4.7-5.4)	13 (11-15)	2500 (2000-4000)	90 (65-99, 10-130)	8 (6-12, 8-14)	10 (1-80)
Per capita boundaries	(tCO ₂ -eq/yr)	(hectares)	(m ³ /yr)	(kg N/yr)	(kg P/yr)	
Boundary	0.69 (2015) 0.54 (2050)	0.18 (2015) 0.14 (2050)	340 (2015) 270 (2050)	12 (2015) 10 (2050)	1.1 (2015) 0.9 (2050)	More work needed
Current environmental impact	1.8 (1.7 - 1.9)	0.3-0.4*	97-118**	Not known	Not known	Not known

Planetary health diets

Planetary Health Diet has been considered as the reference guideline for sustainable diets, gaining worldwide recognition. In fact, fourteen cities of the global network C40 have recently committed to achieve this diet by 2030 (C40 Cities, 2019). Hence, further improvement of Spanish dietary guidelines is needed by adding environmental metrics.



Font: EAT-Lancet Commission Summary Report.

Límits de producció d'aliments i punts de referència del 2010

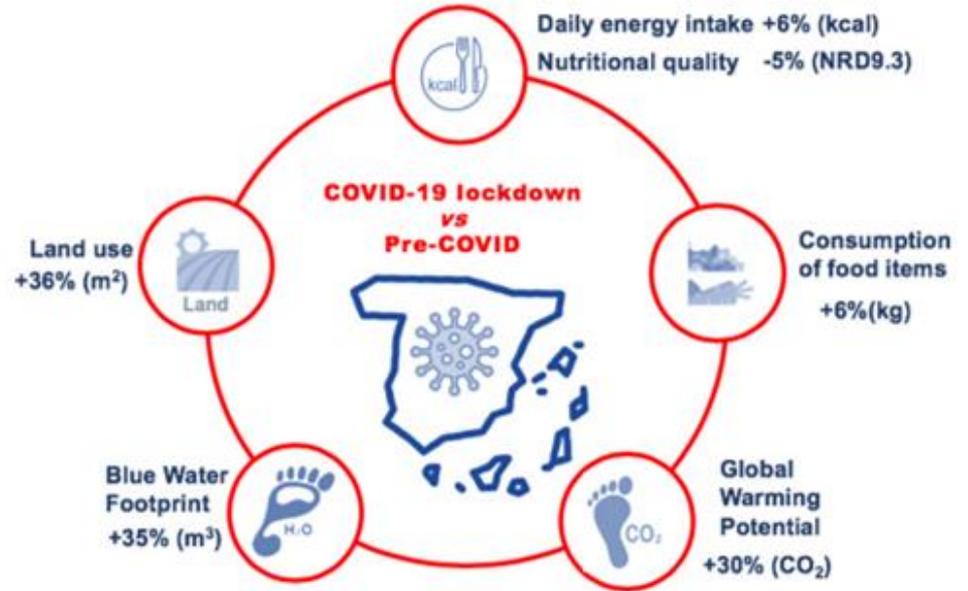
Emisiones GEI	Uso de tierras de cultivo	Uso de agua	Aplicación de Nitrógeno	Aplicación de Fósforo	Pérdida de biodiversidad
5.0 (4.7-5.4)	13 (11.0-15.0)	2.5 (1.0-4.0)	90 (65.0-140.0)	8 (6.0-16.0)	10 (1-80)
5.2	12.6	1.8	131.8	17.9	100-1000

Font: EAT-Lancet Commission Summary Report.

Potential of modeling to create scenarios and assess impact on health and the environment

COVID lockdown diet

During Covid lockdown in Spain, Batlle et al observed an increase in energy intake but a decrease in nutritional quality, as well as an increase in environmental impact (30-36%). Other countries found similar results.



Environmental and nutritional impacts of dietary changes in Spain during the COVID-19 lockdown

Laura Batlle-Bayer^a, Rubén Aldaco^{b,*}, Alba Bala^a, Rita Puig^c, Jara Laso^b, María Margallo^b, Ian Vázquez-Rowe^d, Josep Maria Antó^c, Pere Fullana-i-Palmer^a

Sustainable healthy diet: is it really possible?

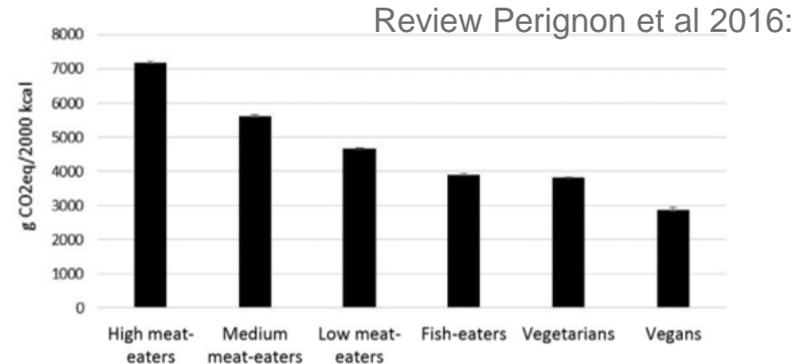
Literature describes some sustainable healthy dietary patterns that are shown to reduce environmental impact: vegan, vegetarian, pescatarian, mediterranean, some national guidelines, and some patterns of that exclude and/or replace some food groups. They have the following traits in common:

- Mostly **plant-based** with a reduction or exclusion of animal products, specially red and processed meat
- **Seasonal foods**
- **Local production**
- **Whole foods:** less processed foods
- Minimization of **food loss and food waste**

Sabate 2019. Environmental Nutrition

Review by Perignon et al 2016 states:

- **meat consumption** and **energy intake** -primary factors for reducing diet-related GHG
- Diet sustainability might be increased without requiring drastic food choices like excluding entire food categories
- Scarcity of standardized and nationally representative data for food price and environmental indicators (all the dimensions: nutritional, environmental, affordability, and acceptability dimensions of diet sustainability)

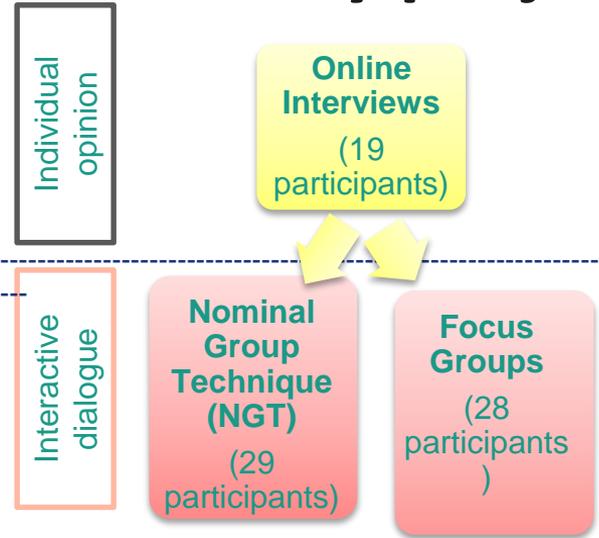


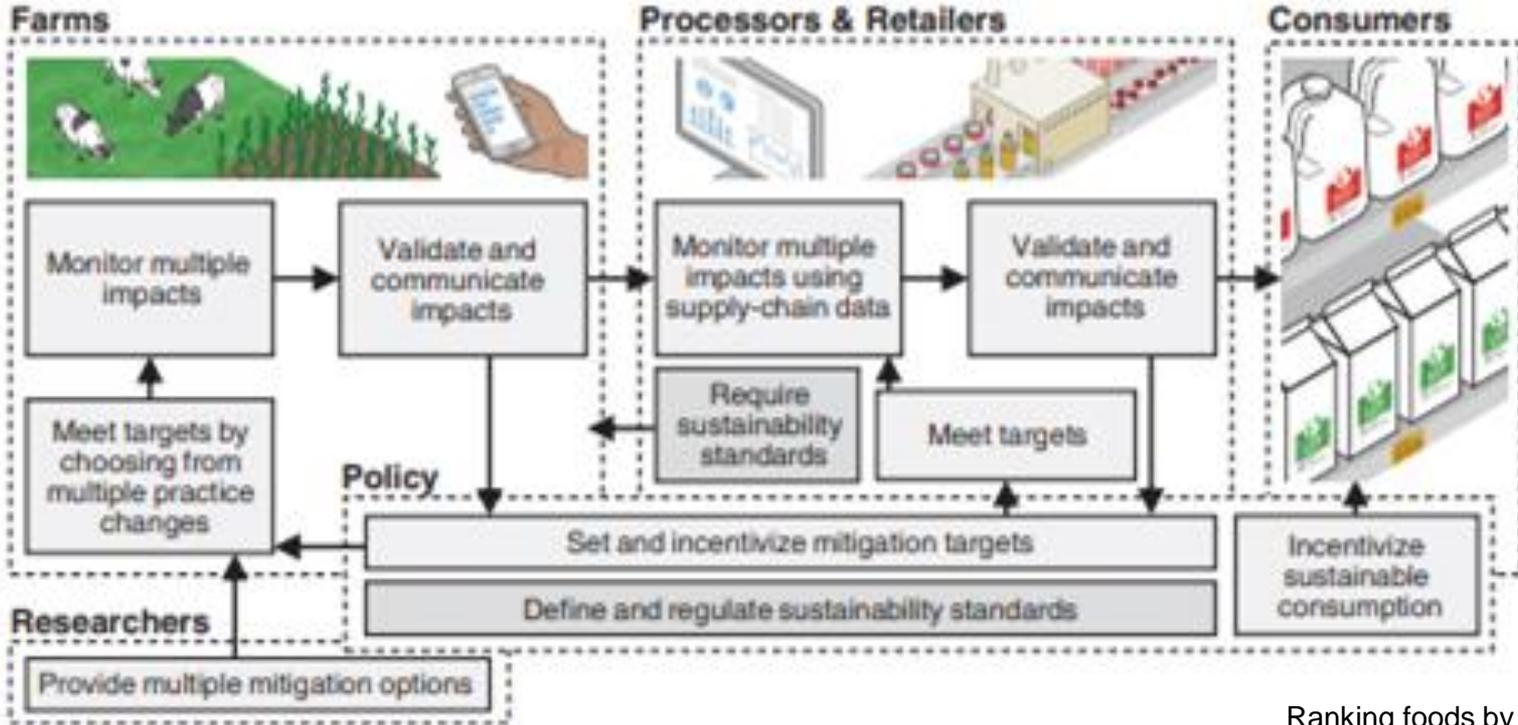
The Global Dietary Patterns for Health and Sustainability project

Research should focus on reaching a consensus on the actions and tools that Member States should include in their dietary guidelines and national health policies in order to increase the feasibility of adopting these new dietary patterns



This project aims at formulating **Europe-wide dietary guidelines, considering the overall concept of sustainability**





Ranking foods by footprint (e.g., front-of-pack labelling) was suggested as a tool to increase food literacy

The Governance of Food Systems in Cities: Assessing Risks and Gaps for a Sustainable Transition in the Decade of Action

Topic Editors

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Frontiers in Sustainable Food Systems

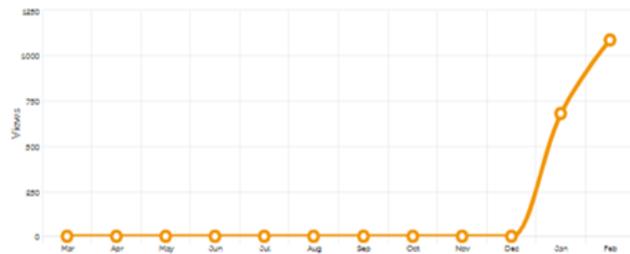


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**Thank you! Moltes gràcies!
¡Muchas Gracias!**



Working towards a sustainable healthy diet in Bcn for future

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