FoSSNet
CONFERENCE 2025

Food Systems Science: Establishing a Common Framework and Network

First European Food Systems Science Conference

The need for a European Food Systems Science Network

25th March / 14:10 GMT

Niels Halberg
Aarhus University

Funded by the European Union

UK Research and Innovation

'The need for a European Food Systems Science Network'.

Food Systems Science Network

1st Conference – Oxford, 25-27 March 2025

Theme: Food Systems Conceptual Issues

Niels Halberg, Aarhus University
SCAR SWG FS

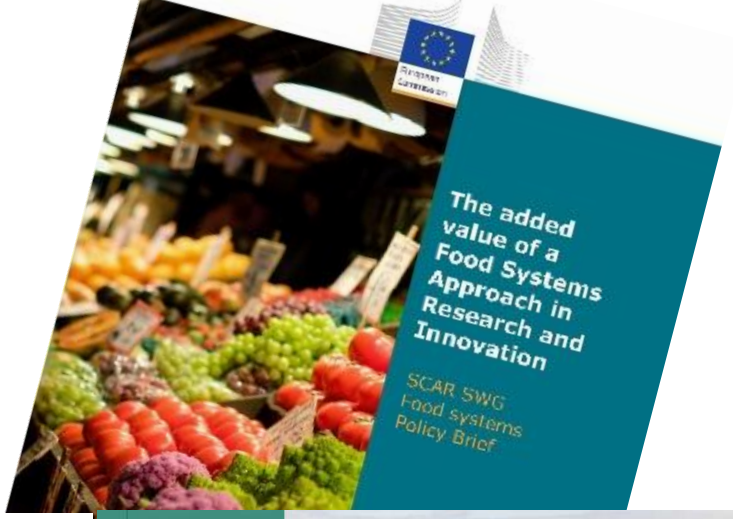
SCAR Food Systems

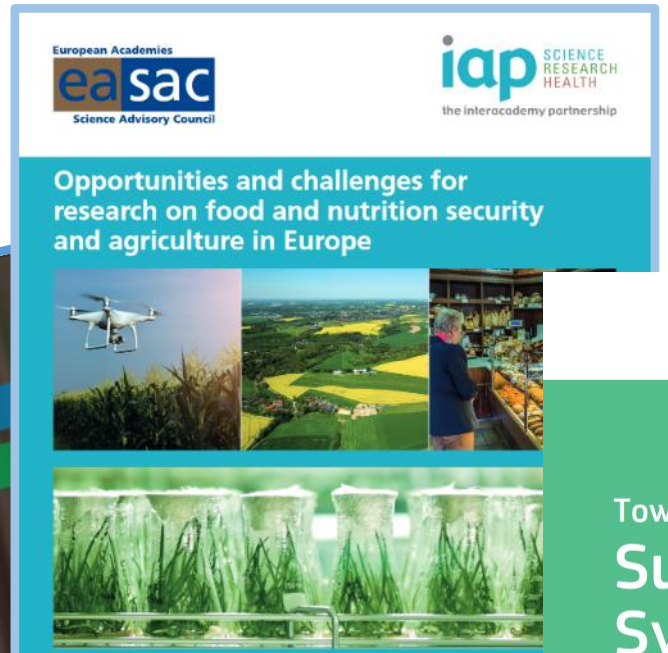
SCAR Food Systems Strategic Working Group

Chair – Monique Axelos, INRAE, FR
Co-chair – Minna Huttunen, Ministry of Agriculture and Forestry, FI
Co-chair of SCAR FS SWG –Niels Halberg, Aarhus University, DK (Food&Ag Ministry)

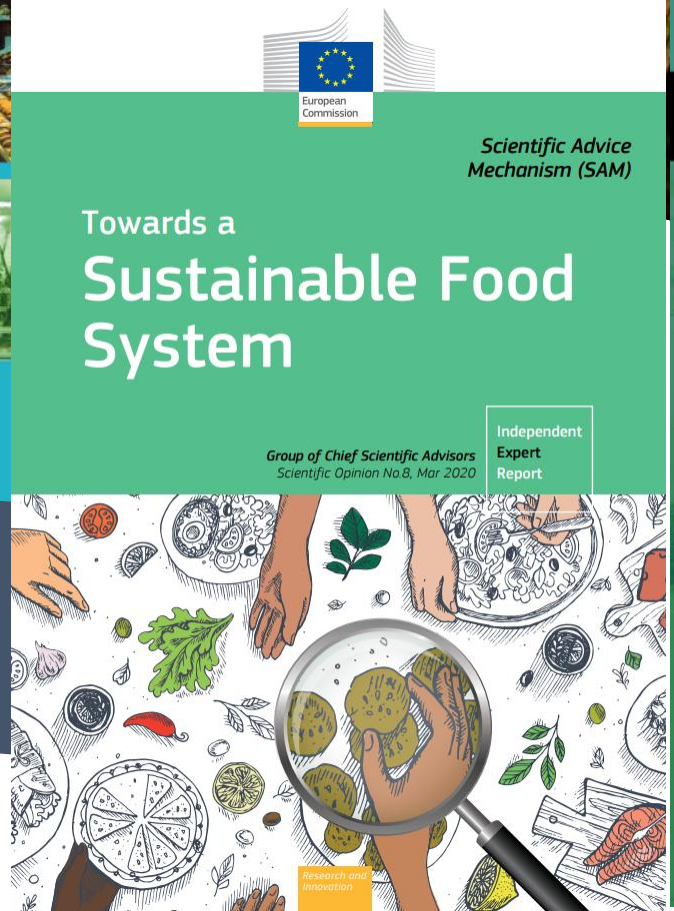
- 3rd Mandate (3years) – from December 2023 to December 2026
- **Type and Numbers**: **of partners**:
  - Representatives of MS Ministries and Research Org and Universities
  - Observers: FACCE-JPI, JPI OCEANS, HDHL, CIHEAM-Bari, Copa-Cogeca
  - representatives from 21 EU Member States and Associated countries
- Aim:
  - Provide **strategic advice** and **support** to the **EU R&I** policy framework FOOD 2030, Horizon Europe (Cluster 6).
  - Align research and **Strengthen the EU R&I** area in Food Systems
  - Contribute to the FutureFoodS partnership
- 3 main priority actions:
  - Monitoring and Accelerate the **Food Systems transition**
  - How to improve **resilience** of the Food Systems
  - **International dimension** of the Food Systems

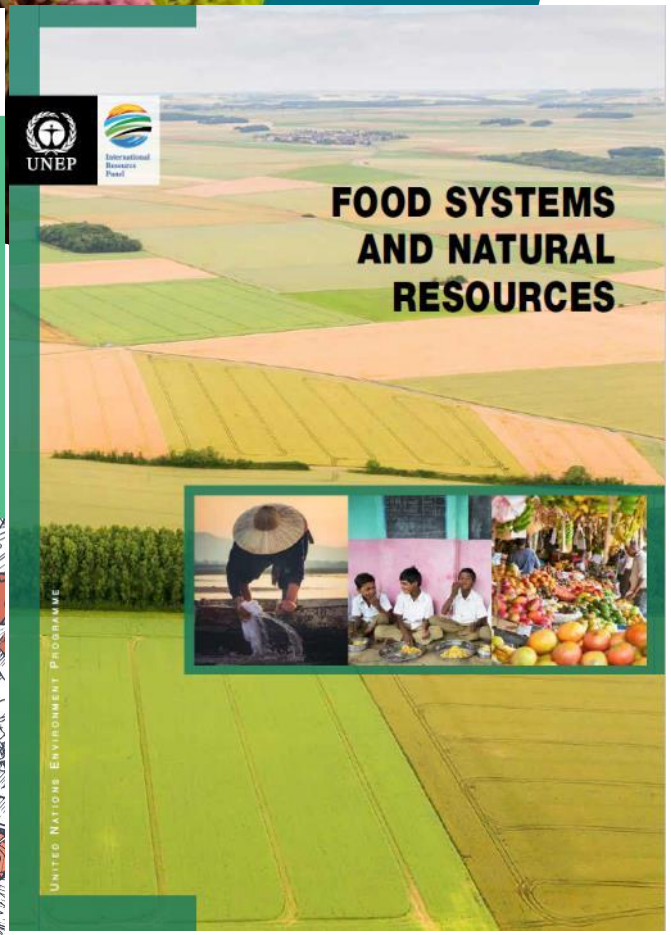
Food system thinking is ‘en vogue’





“In our report we take an integrative food systems Approach..”





'Synthesis of existing food systems studies and research projects in Europe'

Review of +50 papers and projects from a larger pool

The objective

- to provide a state-or-art synthesis of existing studies and research projects using a Food Systems approach
- to study Europe's food system (as a whole) and …
  - geographical parts (countries, regions, cities)
  - certain aspects (for example nutrition, or environmental issues)
  - comparable countries
- input to formulation of knowledge needs for EC research programs.

Thom J. Achterbosch (Wageningen University & Research (WUR), NL), Arthur Getz Escudero (Urban PlanEat, UK), Just D. Dengerink (WUR, NL), Siemen van Berkum (WUR, NL), EC, SCAR SWG FS, 2019.

'Synthesis of existing food systems studies and research projects in Europe'

Wider implications: Is the food systems approach a useful approach for R&I?

Main experiences from literature: Yes!

- understanding and acting with a food systems view is a useful and necessary approach
- in the light of the multi-faceted challenges of governments, farmers, fishermen, food companies, retailers and consumers/citizens.
- A food system approach is helpful in identifying relationships and interdependencies and
- can help to grasp the complexities between these elements.

Thom J. Achterbosch (Wageningen University & Research (WUR), NL), Arthur Getz Escudero (Urban PlanEat, UK), Just D. Dengerink (WUR, NL), Siemen van Berkum (WUR, NL), EC, SCAR SWG FS, 2019.

Room for further development of FS approach

Methodologies

- A credible (standard) **methodology for an effective and feasible analysis of food systems** is lacking including defining borders etc;
- How to operationalize, in methodology and practice, **the distinction and interdependencies between different scales**, from local to national to European to global food systems.
- Methodology for **identification of lock-ins** and barriers for change;
- How to speed-up learning and create a community of practise, involving all relevant stakeholders,
- provide an experimental space for practitioners from research, the food systems actors (including farmers and fishermen), NGOs and policymakers

Focus

- There is a need to better understand different European food-systems and **to develop a typology**, to defining more specific challenges, opportunities and knowledge needs for different types of FS
- to develop and support FS R&I with a **consumer/citizen centered** focus
  - engaging actor representatives not usually included in agriculture and food science.
  - the potential of new forms of consumer engagement by industry in food innovation,
  - the changing roles of actors due to individualisation and digitalisation of retail and consumer relations
- how **to identify the important leverage points** as tools for change agents and policy makers

FOOD SYSTEM CONCEPTUAL MODEL

Yellow boxes: **Main food systems outcomes** → link to indicators

Grey boxes: **Actors** → link to leverage points

Regulatory, institutional and social environment

Government | Finance | NGOs

Input, manufacturers: Machines, feed, fertilizers, pesticides, medicine, ingredients

Food companies: food processing, biorefining, other processing

Retail / food service

Food environment

Farmers income /competiviness / rural livelihoods

Farmers and fishermen: primary food & biomass production

Local food – direct sales

Interactions

Consumers: final consumption and evaluation

Food availability / affordability, satisfaction

Natural resource use / environmental impacts

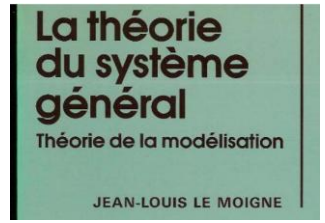
Interdependencies

Nutrition / Health impacts

Legend

Products

Money, influence, or demand



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DEPARTMENT OF AGROECO

***Les systèmes ne sont pas dans la nature*, le Moigne, 1977**

Four types of food systems analysis

Litterature review: FS research mostly descriptive so far

1. Supply oriented, focusing on food availability
2. Value chain oriented, focusing on links between production and consumption, markets and institutions,
3. Demand oriented, focusing on food demand, appropriate diets and access to food
4. System oriented, focusing on governance for responsive and adaptive food environment for synergies

- Little focus on interactions between stakeholders, thus no id of policy incentives to align different interests
- Little focus on trade-off across FS outcomes and political dilemmas

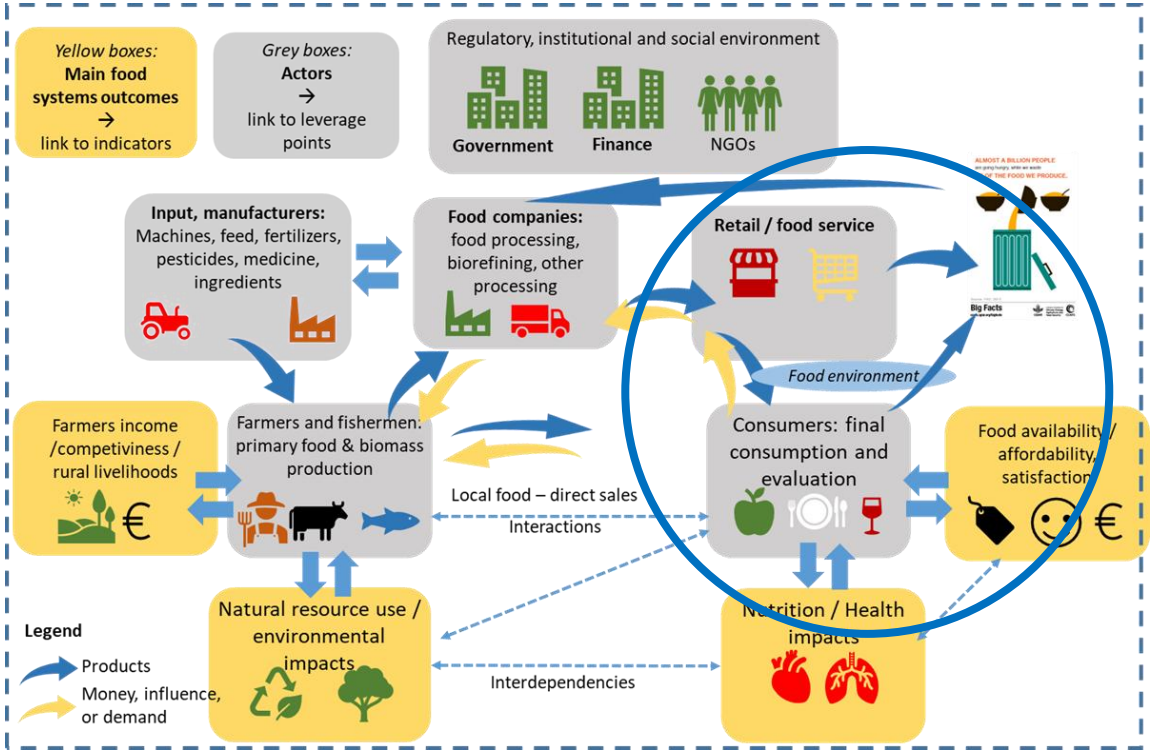
Need more focus on (how to change FS):

- consumer choice and diets (instead of single products)
- insights in FS governance mechanisms… and FS dynamics…
- the usefullness of FS approaches for
  - id innovative solutions to better outcomes
  - Id operational opportunities for engaging stakeholders in policy and practices..
- id of FS transformative pathways, leverage points
- backward linkages from healthier diets to adjustments in farm and food production…
- Insights into the exchange conditions between niche (alternative) and dominant FS – to support adaptive change and overcome lock-in effects blocking social change.

Brouwer et al., Global food security, 2020

Understanding food system characteristics: Drivers, components, outcomes..

- **Interactions** between actors with specific objectives, roles and interests
- ID of Key decision makers?
- Resulting feed-back loops => **level of complexity**!
- The resulting **interdependencies** of outcomes – including consequences for different stakeholders?
- Drivers for change
  - Pressure from stakeholders, policies Innovations in technologies, self-governance, niche development, …
- Identifying barriers to change:
  - negative feed-back loops
  - Lock-ins ..
  - Unaccepted trade-offs….



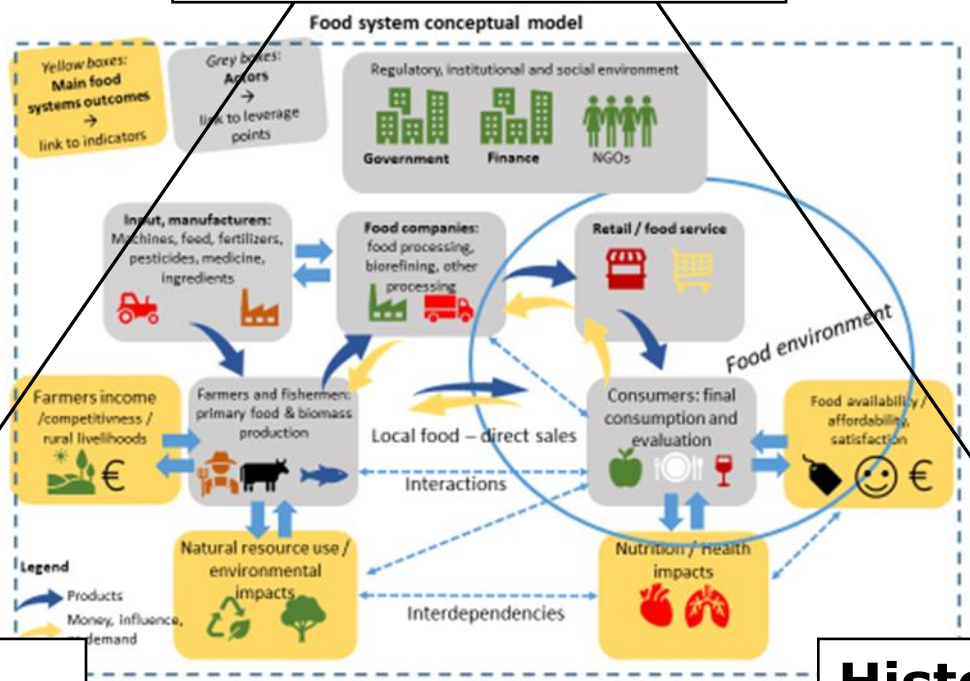
Complex systems, like the food system, are by definition non-linear, interconnected, multivariable, self-evolving, and dynamic, making it difficult to predict and control. Intervening requires continous reassessements, readjustments, adaptations and iterations to counter biases, unexpected consequences, unforseen reinforcing feed-back loops and other perverse effects *(SAPEA 2020, shortened)*

Three perspectives on Food System models

Ontological
(what constitutes the system? What is it/how do we define it?)

Bio-physical, agronomic/food science
Economic, social/humanities

à réfléchir pour mieux agir:
Descriptive vs proactive approaches: which type of understanding is needed?



Purpose and Outcomes,
Trade-offs, synergies?
Nutritional;
Environmental,
economic,, ...

Niche vs dominant regimes, transformative change, social & technological innovation, Culture, policies,

Functional
(what does the system perform vis-à-vis it´s environment?)

Reproduction,
Resilience
Power/influence

Determinants of food choices…?

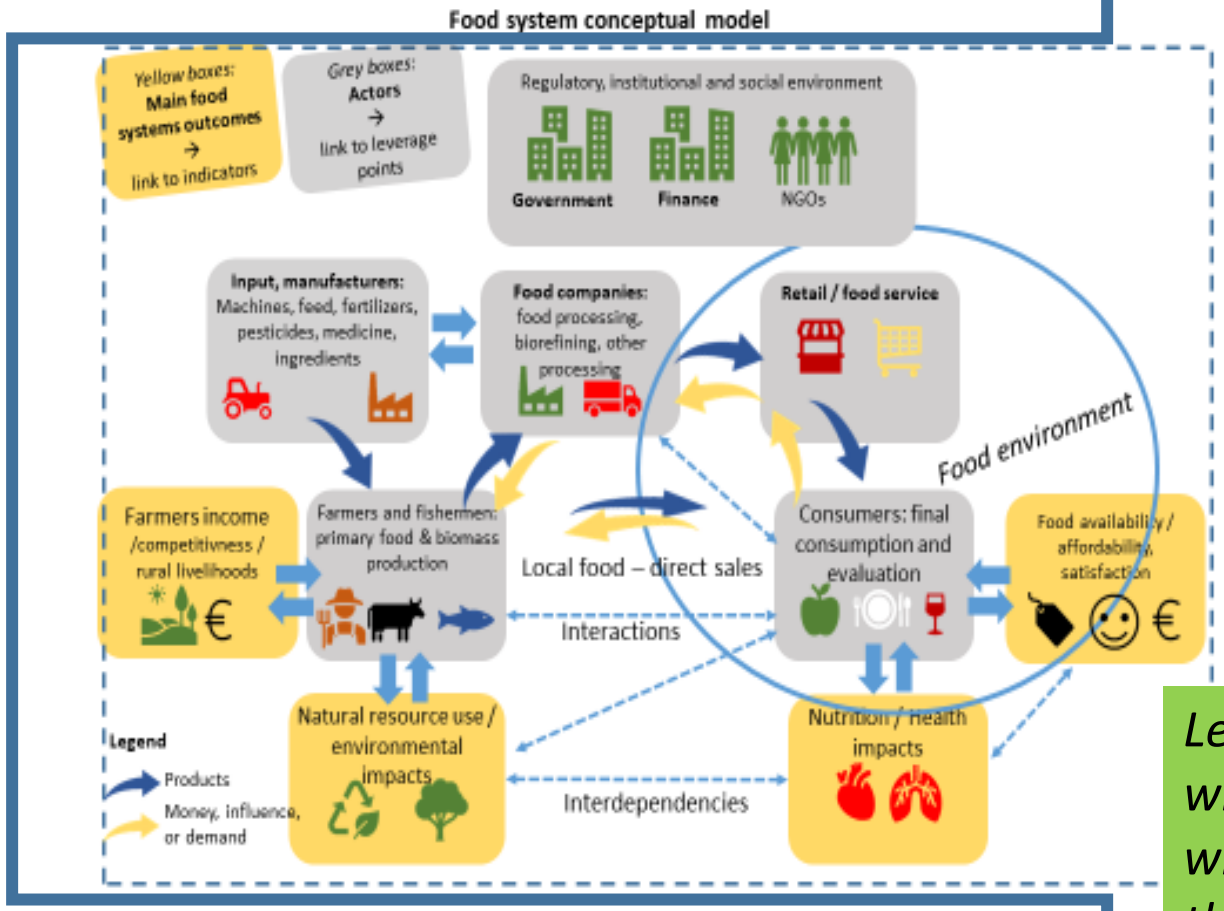
Historical/genetic
(how did the system evolve and in which direction(s) may it develop?)

Le Moigne: La théorie du système général, 1977, 1994

Brouwer et al. 2020

How do society change – a part of - a food system and its outcomes ?

- ID of Key decision makers?
- **Interactions** between actors
- Resulting feed-back loops
- The resulting **interdependencies** of outcomes for different stakeholders?
- Identifying barriers to change:
  - negative feed-back loops
  - Lock-ins ..
  - Lack of ideas and motivation…?



Looking for :

- **Drivers of change**
- **Adaptive behaviour**
- **leverage points**
- **Synergistic interventions**
- **Important interactions**
- **Reflexive learning?**
- **Changing rules and/or information flows**

- **So, - Who will change the system – consciously or by acting in ”self-interest”/ ethical standpoint?**

Leverage points are places within a complex system where a small shift in on thing can produce big changes in everything
D. Meadows, 1999

USES OF AN IMPROVED FOOD SYSTEMS METHODOLOGY:

- Research calls and projects
- Innovation programs
- Science advice
- Food Systems observatory
- Teaching and education
- .....

FutureFoodS

Sustainable Food Systems Partnership for People, Planet and Climate

STRATEGIC RESEARCH AND INNOVATION AGENDA (SRIA)

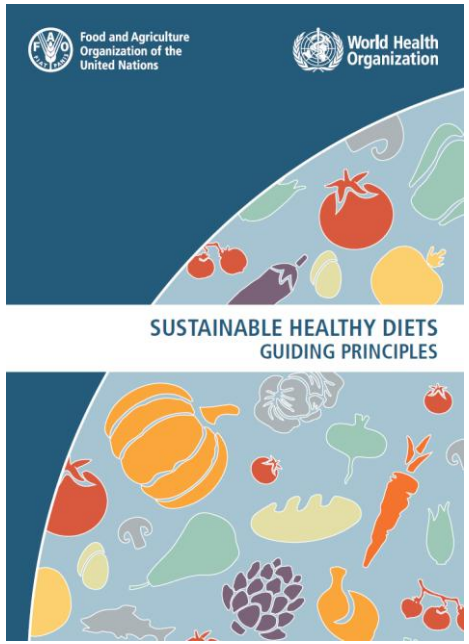
JANUARY 2023

=> Improved understanding of how to achieve the wide objectives of sustainable healthy food systems e.g.

*"a food system that ensures **food security and nutrition for all** in such a way that the **economic, social and environmental bases** to generate food security and nutrition of **future generations are not compromised**". HLPE, 2017*

HLPE. 2017. Nutrition and food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.

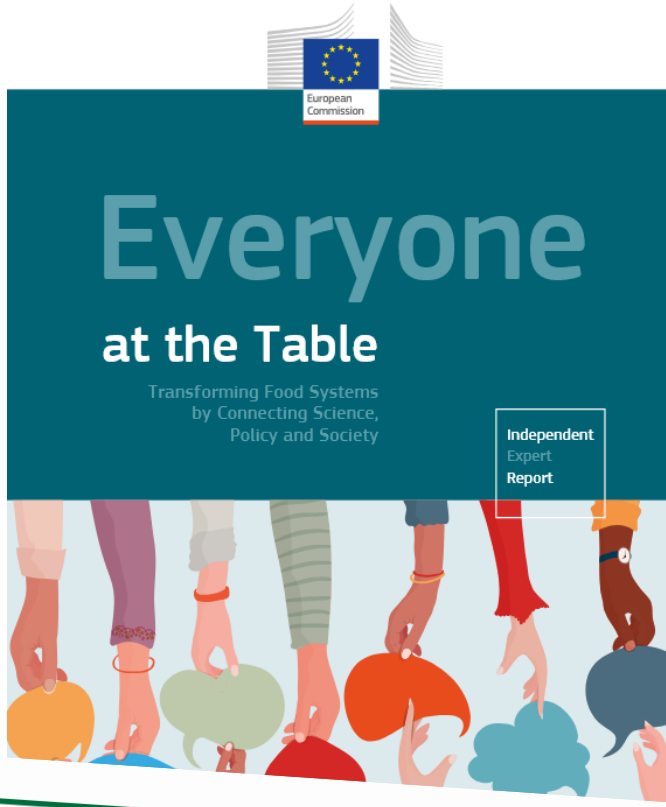
REQUEST FOR HOLISTIC SCIENCE ADVICE IN SUPPORT OF FOOD SYSTEMS TRANSITION TO SUSTAINABLE HEALTHY DIETS



*"Sustainable Healthy Diets (SHD) 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**; etc. ..*

FAO and WHO (2019)



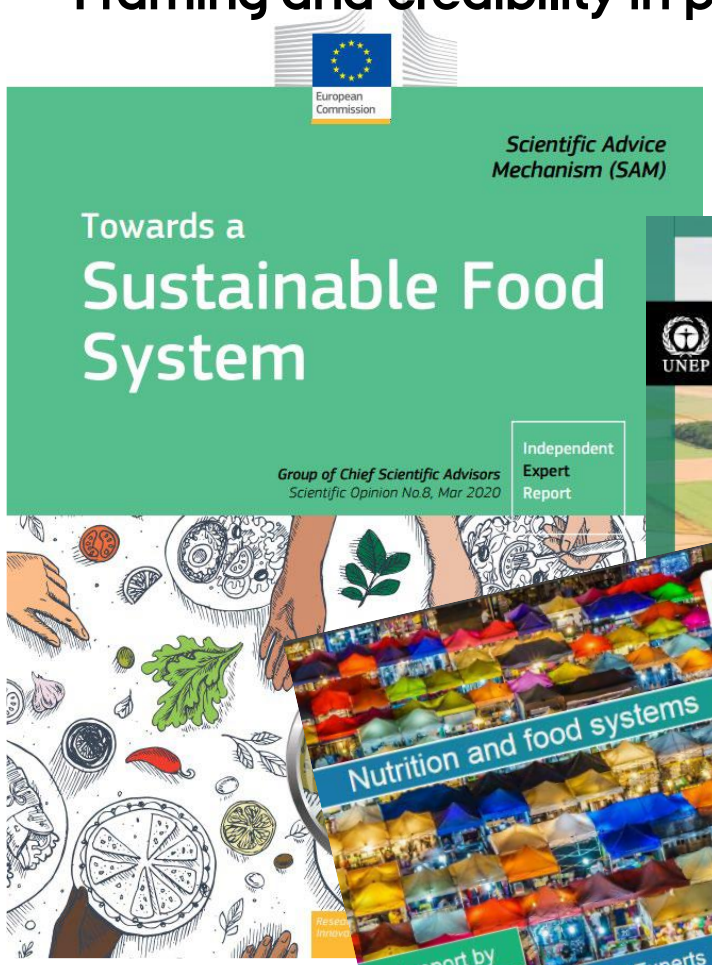

Environmental sustainability in national food-based dietary guidelines: a global review

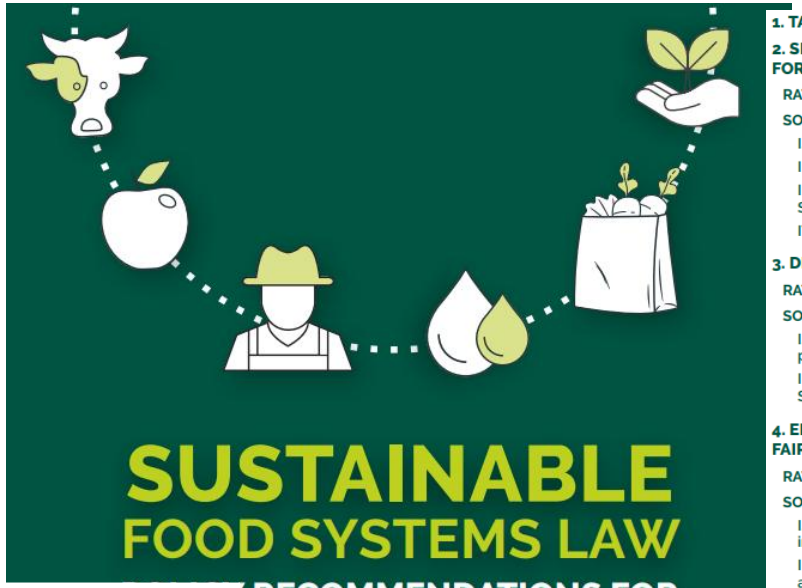
Genevieve James-Martin, Danielle L Baird, Gilly A Hendrie, Jessica Bogard, Kim Anastasiou, Paige G Brooker, Bonnie Wiggins, Gemma Williams, Mario Herrero, Mark Lawrence, Amanda J Lee, Malcolm D Riley

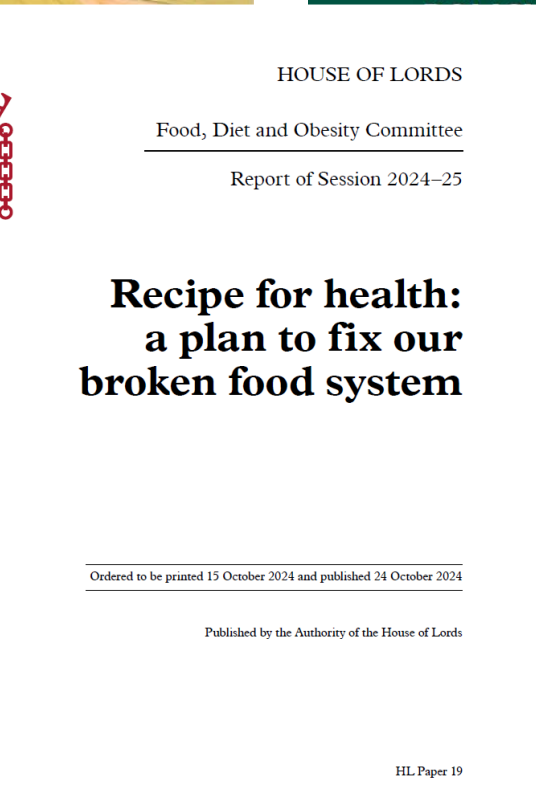
Food-based dietary guidelines (FBDGs) provide country-specific guidance on what constitutes a healthy diet. With increasing evidence for the synergy between human and planetary health, FBDGs have started to consider the

Lancet Planet Hea
6: e977–86

Framing and credibility in policy recommendations: can we clearly distinguish science based advice?







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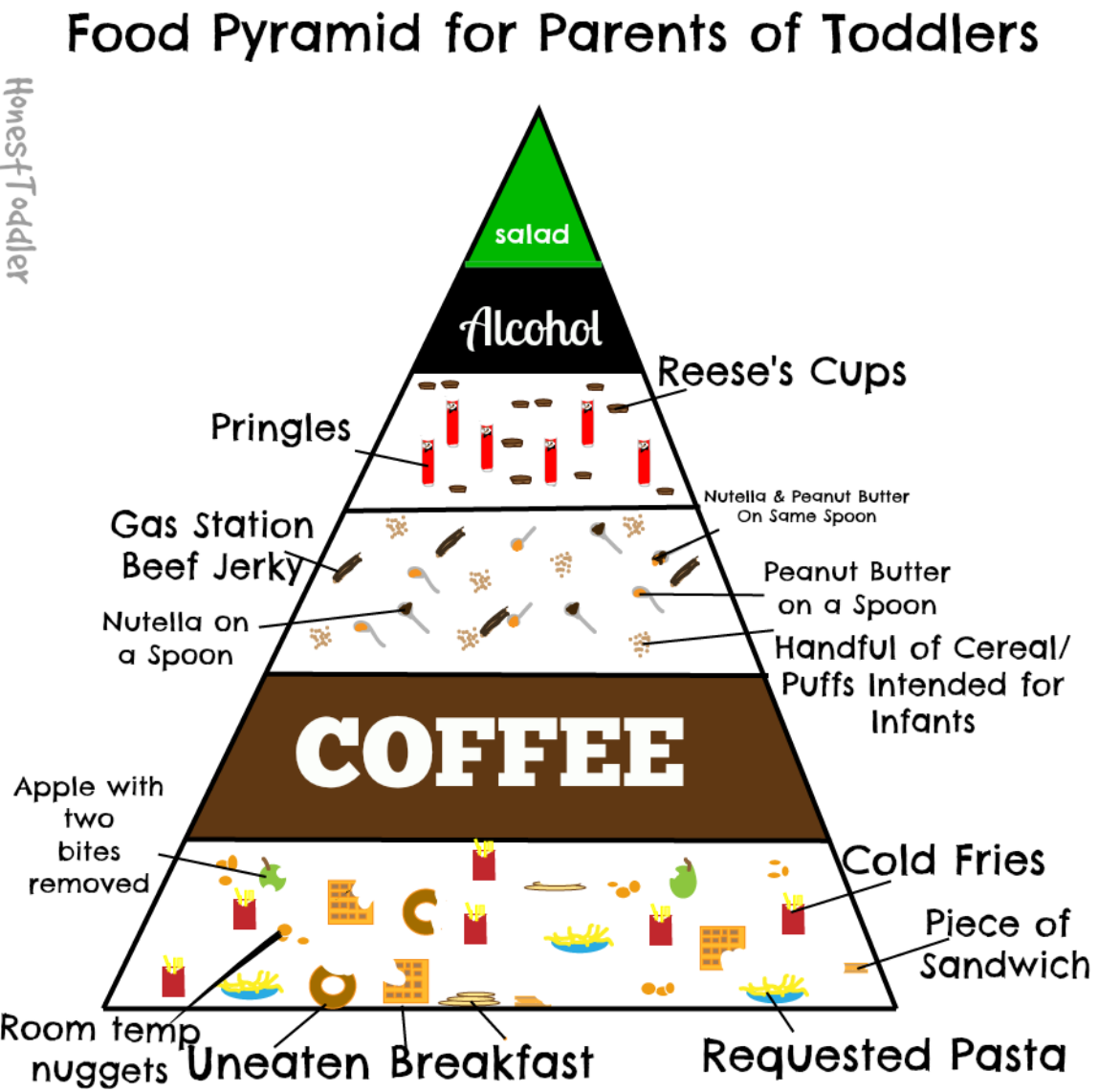
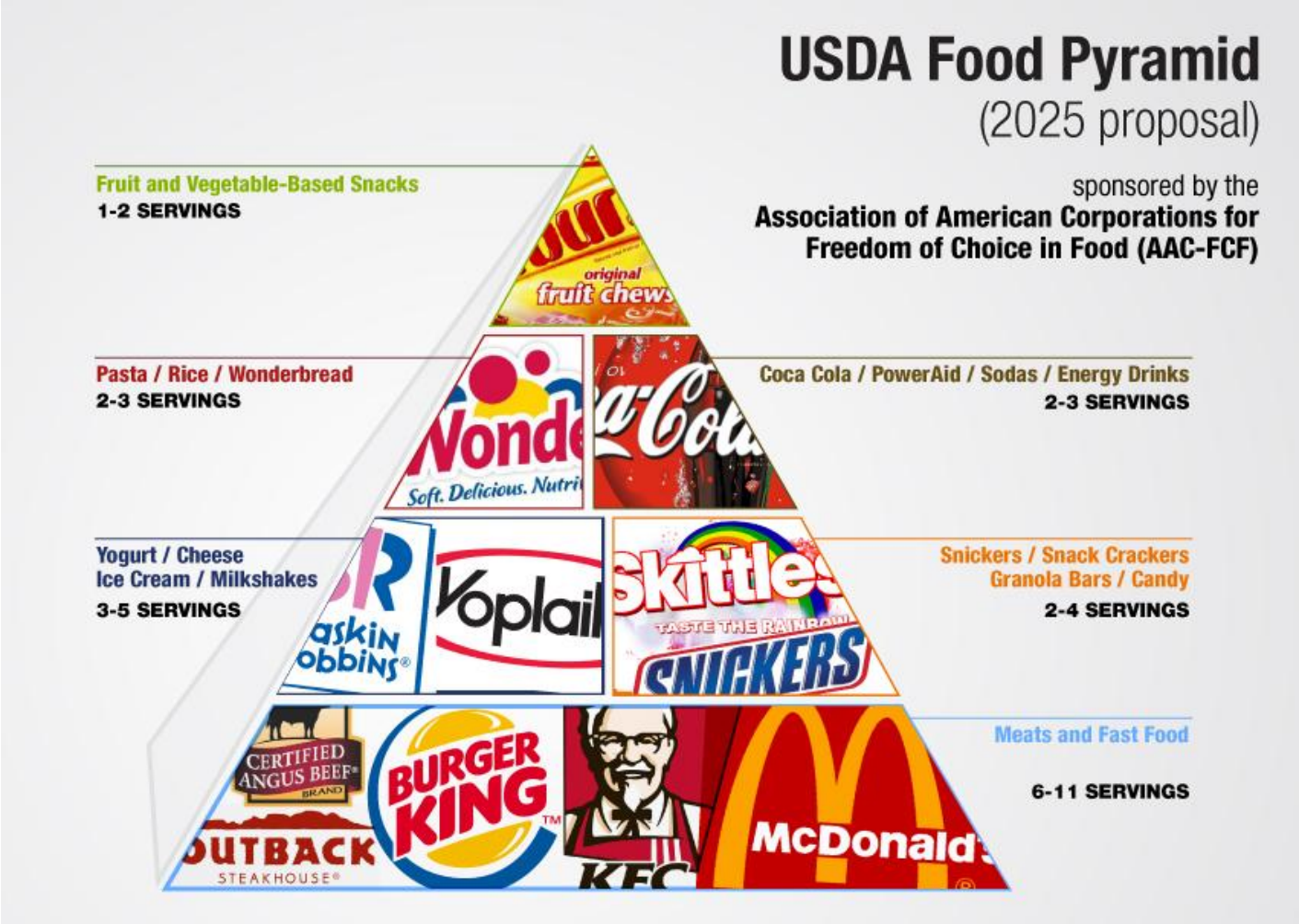
Thanks, - and have a healthy future & food system





https://sustainabledish.com/should-sustainability-be-part-of-the-food-pyramid

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