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Marie Josephe Amiot-Carlin, Sophie Drogue, Nicole Darmon, Marlène Perignon, Carole Sinfort, - Medina Study Group

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HOW TO ORIENTATE PRODUCTION AND FOOD SUPPLY IN A SUSTAINABLE NUTRITIONAL PERSPECTIVE? RESULTS FROM THE MEDINA PROJECT



Marie-Josephe Amiot, Sophie Drogué, Nicole Darmon, Marlène Pérignon, Carole Sinfort & Medina-Study Group



- ❑ According to the 2015 report of the FAO on the *State of Food Insecurity in the World*, most Mediterranean countries are considered to have eradicated severe food insecurity.
- ❑ Nevertheless, the traditional Mediterranean dietary pattern has been progressively abandoned and evolved toward westernized dietary patterns with more consumption of animal-based products and processed foods, and less plant-based products.
- ❑ Populations exposed to this dietary shift are less likely to achieve adequate intakes of nutrients compared to those with greater adherence to the Mediterranean diet pattern and as a consequence are at high risk of obesity and other diet-related non-communicable diseases like type-2 diabetes.



- ❑ Coinciding with the dietary and nutritional shift, the Mediterranean region is facing a massive alteration of its environment: land degradation, water scarcity, environment pollution, biodiversity loss, and climate change.
- ❑ Furthermore, recent analyses showed that the current Western-style diet in this region has a high environmental impact
- ❑ While the Mediterranean region has been a major food producing area for millennia, characterized by a large agro-biodiversity, environmental alterations may threaten the local food system capacities to ensure food security and nutritional adequacy



- ❑ **Parameters affecting the sustainability of food systems in the Mediterranean region**
 - *Health pillar: adherence to the Mediterranean diet pyramid, , under-use of the nutritional potential of local agro-ecosystems*
 - *Environment pillar: land degradation, water deficit, environment pollution, biodiversity loss, and climate change*
 - *Economic pillar: food trade and dependence on food imports and subsidies for basic products (sugar, plant oils...)*
- ❑ **The MEDINA “fork-to-farm” and multi-scale approach**
- ❑ **Recommendations of further research and development actions**



□ Parameters affecting the sustainability of food systems in the Mediterranean region

- ***Adherence to the Mediterranean diet pyramid***

In the Mediterranean context, targeting the adherence to the Mediterranean diet pyramid seems to be relevant for ensuring good health and nutrition.

- ***Nutritional potential of local agro-ecosystems and biodiversity***

In addition to the nutritional value and nutrient profile of local products and recipes, it is also relevant to understand the nutritional potential of local agro-ecosystems, including the wild, neglected, and underutilized edible plants and animals.



❑ Parameters affecting the sustainability of food systems in the Mediterranean region

- ***Environmental impacts of the food systems***

A better adherence to Mediterranean diet is recognized to less impair the eco-environmental impact due to the consumption of more plant-derived products and less animal products whereas a western-style diet is associated with high environmental impacts.

- ***Food trade and dependence on food imports***

Since 1965, food trade has become more important worldwide and an increasingly large population has become dependent on food imports to ensure food availability. In such context, it might be a major issue to consider a food system assuming no import and export of feed and food when studying the sustainability of food systems



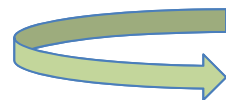
□ The MEDINA “fork-to-farm” and multi-scale approach

- In contrast to the “farm-to-fork” approach (from production to consumption) that is commonly used to improve the food systems in terms of food safety or nutrition, a “fork-to-farm” conceptual framework was conceived in the MEDINA research project “Promoting sustainable food systems in the Mediterranean for good nutrition and health”.

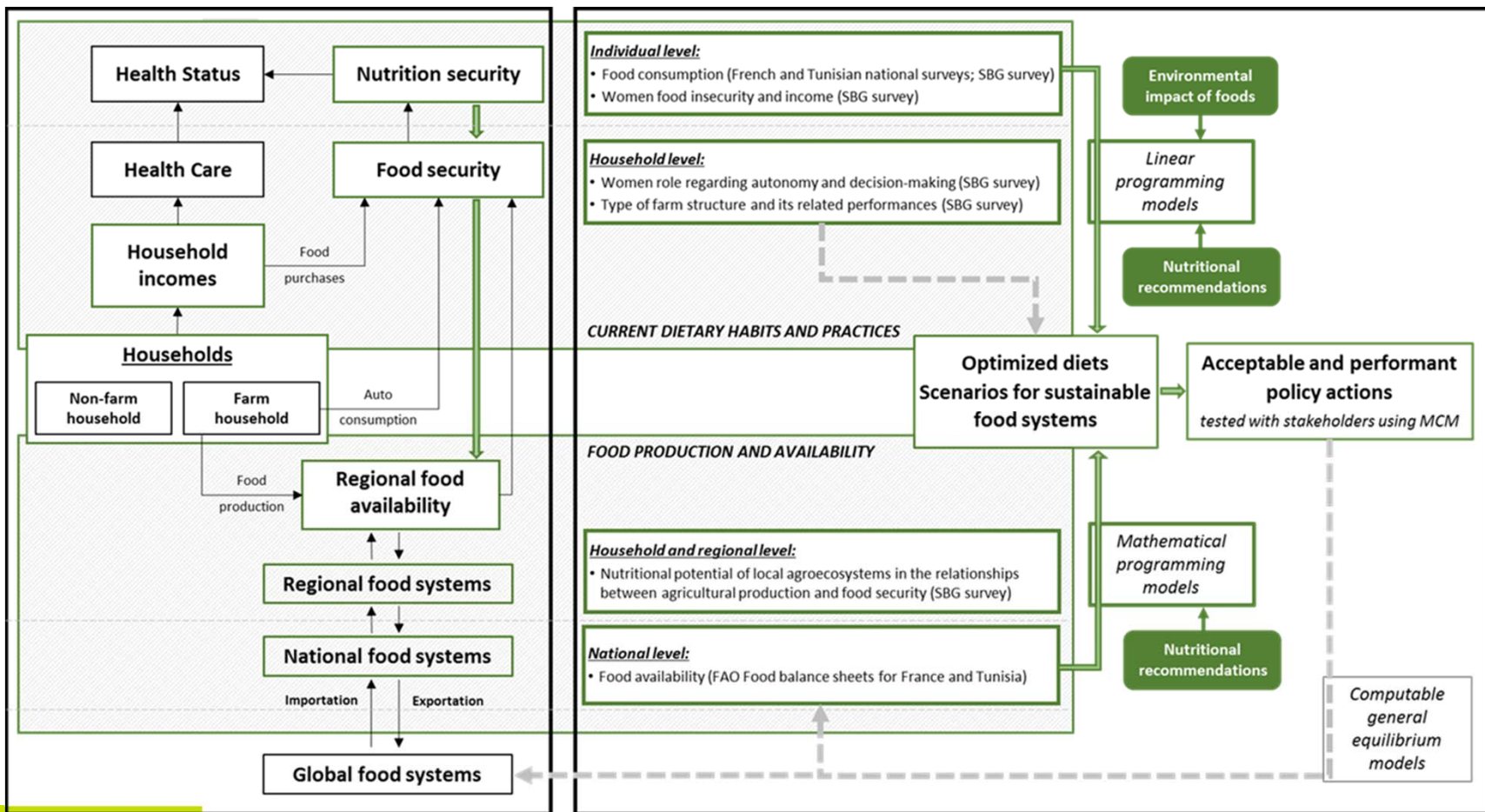


□ The MEDINA “fork-to-farm” and multi-scale approach

The “fork-to-farm” and multi-scale approach developed by the MEDINA Study group starts from the current dietary habits and practices at individual and household scales to identify the dietary changes needed to ensure food and nutrition security by mathematical modeling of diets under constraints (covering all the nutrients, not increasing the environmental impact, fitting with dietary habits) while examining the way it affects the food production and availability at three scales: household, regional and national. Changes are tested by participatory tools (Multicriteria Mapping) to finalize plan actions.



Conceptual framework





❑ Recommendations of further research and development actions

- **Bioavailability:** defined as the proportion of an ingested nutrient that is absorbed and utilized through normal metabolic pathways. In a context of promotion of more sustainable diets, the variations of nutrient bioavailability that strongly depends on the food source (animal vs. plant) and diet composition (e.g. iron, zinc, protein and vitamin A) should be assessed and integrated in future design of optimized diets.
- **Pesticides exposure:** future framework should address this point, with holistic methodology for at least controlling the observed exposures to dietary contaminants when respecting nutrient recommendations but also ensuring efficiency and yield during production
- **Affordability:** optimized diets should not increase its cost



❑ Recommendations of further research and development actions

- **Globalization:** behind the “fork-to-farm” approach there is also the idea that in a globalized economy. Models must be able to reproduce the relationships between domestic demand and supply in the agricultural sector and the relationships between agriculture and the rest of the economy. But these models must also summarize the linkages between a country and the rest of the world through trade.
- **Rescaling:** while the specific optimization models used in the MEDINA project concern the individual and national levels, future work should concern the regional (territory) level, which is important to sustain food and nutritional security.



□ Impact

MEDINA GROUP is “Labpilot”

- to better orientate food supply in a sustainable perspective
- to test an interdisciplinary approach to connect nutrition and production
- to propose scenarios and test a participatory methodology to co-build plan actions