



Consortium
2023–2024



Coordinators

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Keywords

Food system, legumes,
holobiont, microbial
transfer, consumers,
health

Participating INRAE units

AGIR
Agroecology
CRESS
CSGA
PNCA
PSAE
SAYFOOD
UMRF
UNH

Partners

Terres Univia (France)
Terres Inovia (France)

What impact would eating more legumes have on food systems and microbial transfers?

Getting people to eat more plants is one lever that can be pulled to achieve carbon neutrality by 2050. The latest IPCC reports set a target of global carbon neutrality by 2050 or 2070 at the latest. To achieve this goal, our food systems will need to begin producing more protein crops, as doing so is considered to be one of the most important ways to achieve carbon neutrality and reducing the overall environmental impact of agriculture.

These transitional diets must meet specific human nutritional requirements and promote good health through the right nutrient profiles (rich in protein, starch, fibre, vitamins and minerals) and long-term health benefits, as recent studies have highlighted.

Several groups of experts have explored various scenarios that are compatible with these goals. These groups include the international EAT-Lancet Commission and the French Institute for Sustainable Development and International Relations (IDDRI), which drew up the "Ten Years For Agroecology" (TYFA) scenario. These scenarios are based on the share of plant-based foods increasing significantly in people's diets between now and 2050, with consumption of legumes in particular rising to 11 kg/year/person in the TYFA scenario for Europe and 18 kg/year/person in the worldwide EAT-Lancet scenario.

However, legumes are still consumed in modest quantities in France (2 kg/year/person) for a variety of reasons that have led to a lock-in situation that will require major investment in research to overcome.

Objectives

This consortium aims to determine the extent to which more (and which types of) legumes can be incorporated into French diets as well as the impact this will have on the entire legume production chain (from the land and soil to plants, processing and consumers).

Once stable and realistic scenarios have been created, we will assess the effects of this increase in legume consumption on soil-plant microbial transfers of *Rhizobium* during the processing of these products (especially through fermentation) through to the human gut microbiota and the subsequent health consequences.

The first goal of the project is to explore the following issue: if we assume that the proportion of legumes in our diets increases by a factor of 5 by 2050, for example, and if, by the same token, the production and processing of these legumes is prioritized in France, the implications for the whole sector will be significant.

The project's second goal is to address one of the major consequences of increasing the proportion of legumes in our diets, which to our knowledge has not yet been tackled in the various scenarios studied: the repercussions of these dietary changes from a microbiological point of view, from legume production to consumers and their own microbiota.

Partners

INRAE unit	Expertise	INRAE division
AGIR	Economics; analysis of product innovations and legume sectors; agronomy; resilience of legume-based agricultural systems	ACT, AGROECOSYSTEM
Agroecology	Legume ecophysiology; symbiotic nitrogen fixation; nitrogen-sulfur remobilization; end-of-cycle abiotic stress; variety selection tools	BAP, AGROECOSYSTEM
CRESS	Epidemiology; nutrition; public health; sustainable diet	AlimH
CSGA	Cognitive psychology; consumers; legumes	AlimH
PNCA	Nutrition; food quality; public health; plant-based protein	AlimH
PSAE	Experimental economics and public economics	ECOSOCIO
SAYFOOD	Microbiology; microbial biochemistry; functions/metabolism of microbial consortia; microbial diversity and transfer from the pea seeds to the food ingredient during processing; sensory analysis/engineering; food formulation	MICA, TRANSFORM
UMRF	Microbial transfers; food systems	MICA
UNH	Nutrition; health; microbiota; plant-based protein	AlimH
Partner	Expertise	
Terres Univia (France)	Interbranch organization that represents the French oilseed and protein crops	
Terres Inovia (France)	French technical institute for oilseed and protein crops	