



**HAL**  
open science

## Developing local protein resources in monogastric feeds to promote the agroecological transition

Claire Escande, Myriam Grillot, Vincent Thenard

### ► To cite this version:

Claire Escande, Myriam Grillot, Vincent Thenard. Developing local protein resources in monogastric feeds to promote the agroecological transition. 73rd Annual Meeting of the European Federation of Animal Science, EAAP, Sep 2022, Porto, Portugal. p. 21. hal-03774991v2

**HAL Id: hal-03774991**

**<https://hal.inrae.fr/hal-03774991v2>**

Submitted on 13 Sep 2022

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# THE COEXISTENCE OF WILDLIFE AND LIVESTOCK

PORTO – PORTUGAL

4 SEPTEMBER – 9 SEPTEMBER 2022



EAAP 2022

## Developing local protein resources in monogastric feeds to promote the agroecological transition

Claire Escande, Myriam Grillot, Vincent Thénard

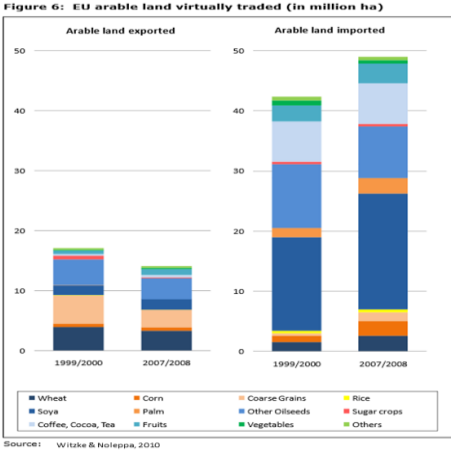
# Flow

- Context, aims
- Cases studies
- Approach
- Main results
- Some elements to discuss

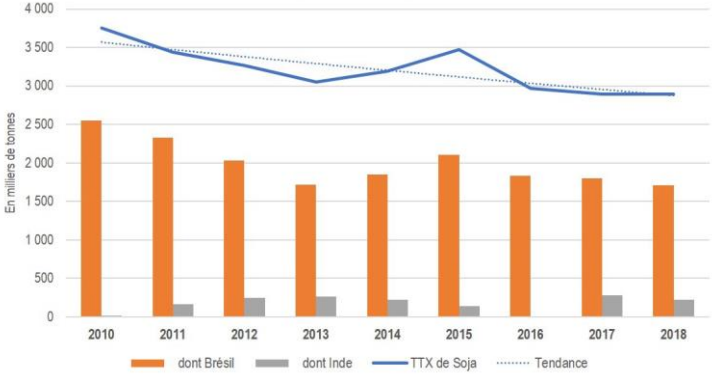


# Why local protein is a challenge?

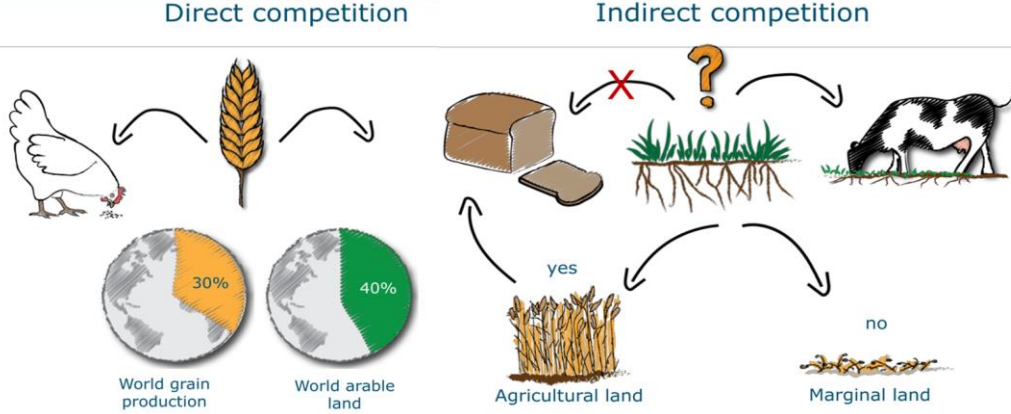
## Global Land use



## Economic dependency



## Feed/Food competition

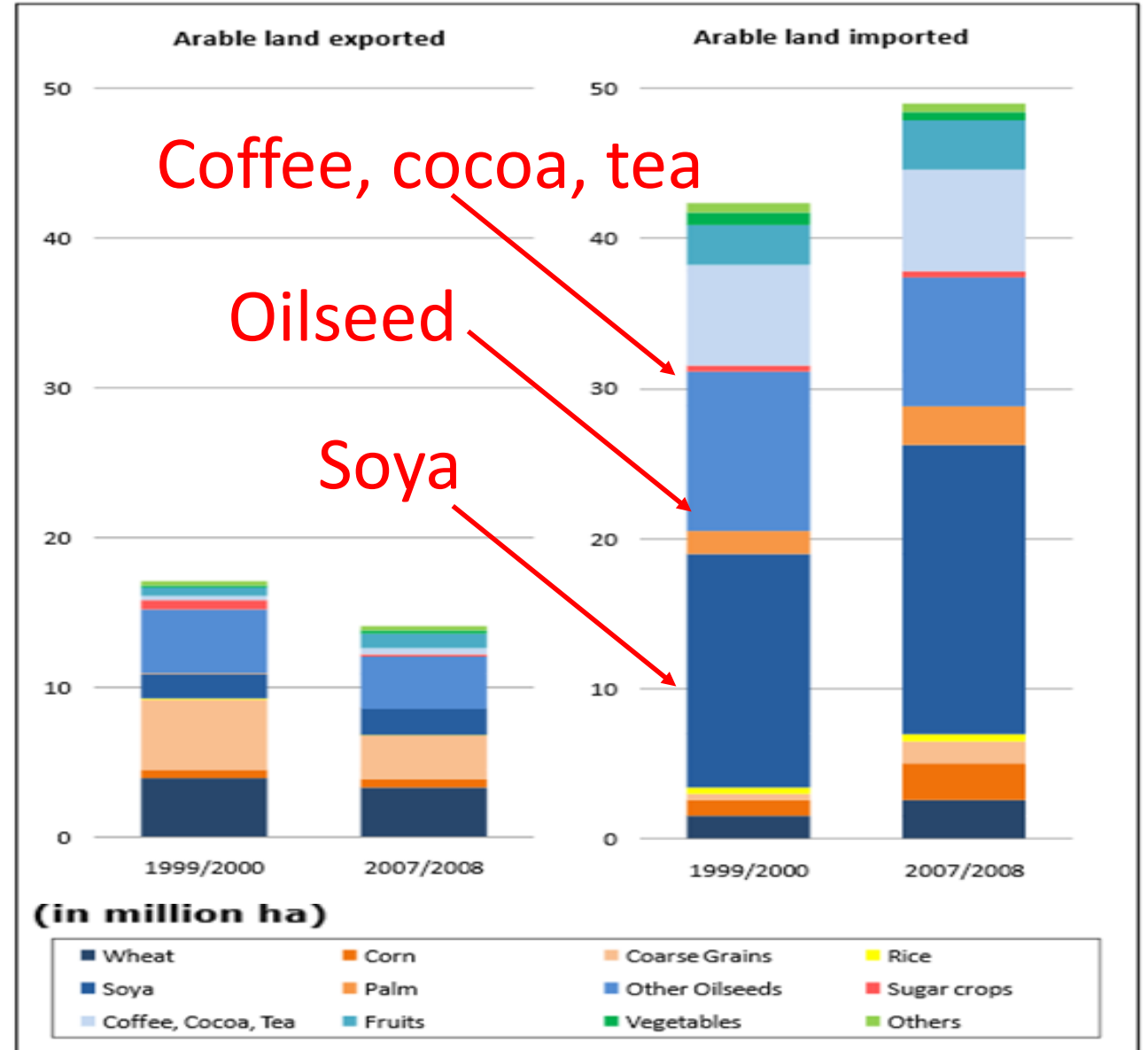


# Global land use

## EU arable land virtually traded :

European agriculture is dependent on the production of other land...

35 millions ha in 2008 !



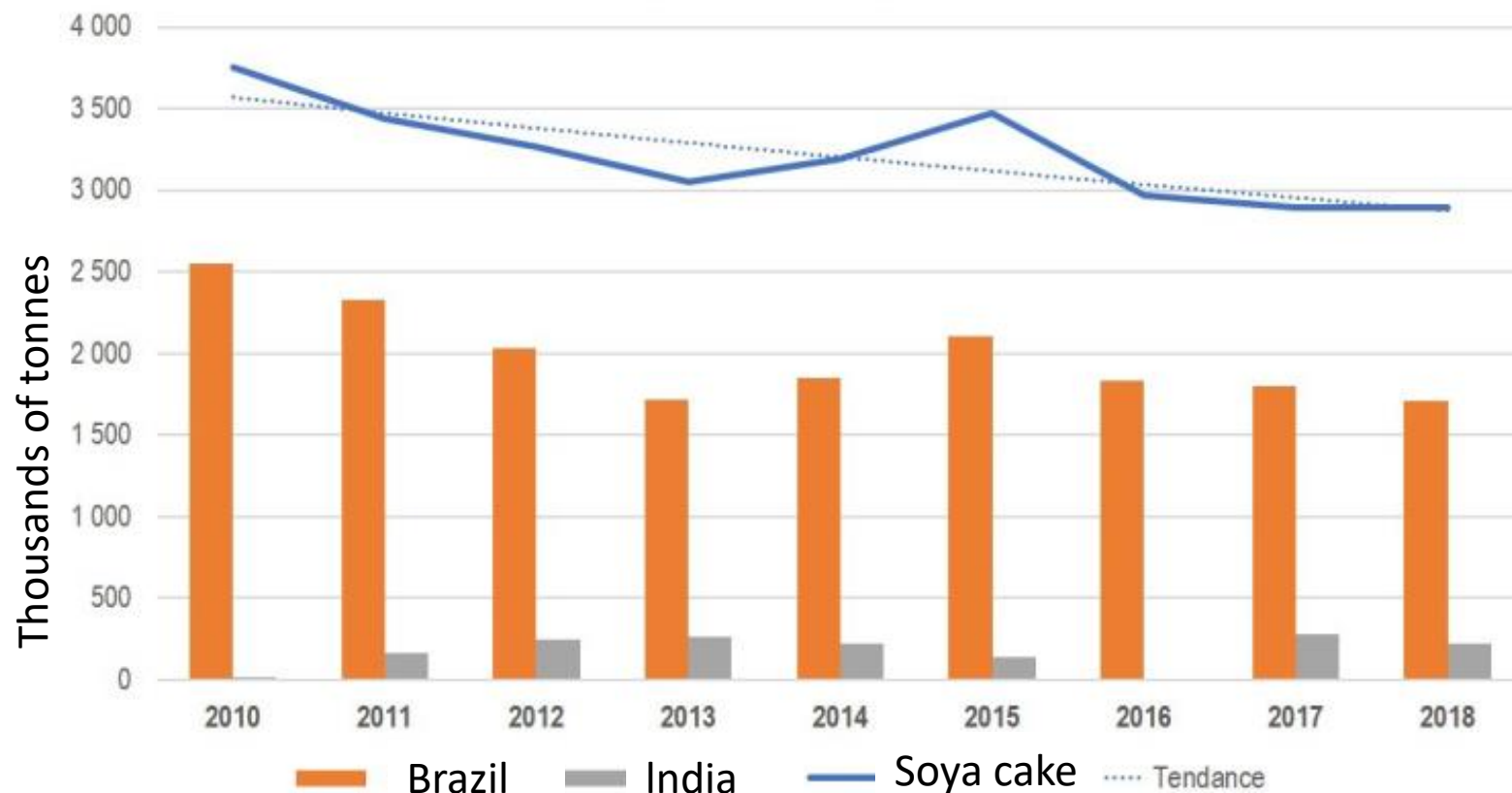
Source: Witzke & Noleppa, 2010



# Economic dependency

## High level of importation:

Soybeans and soy cake are an important protein-feed for animal production in Europe, in France

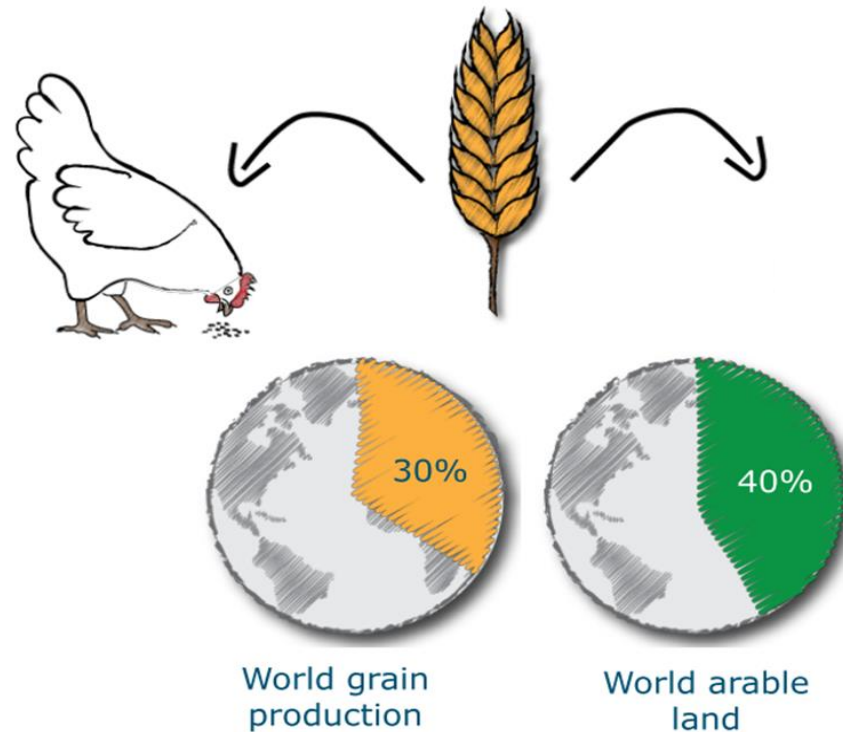


Soybean imports by France (Source : SNIA)

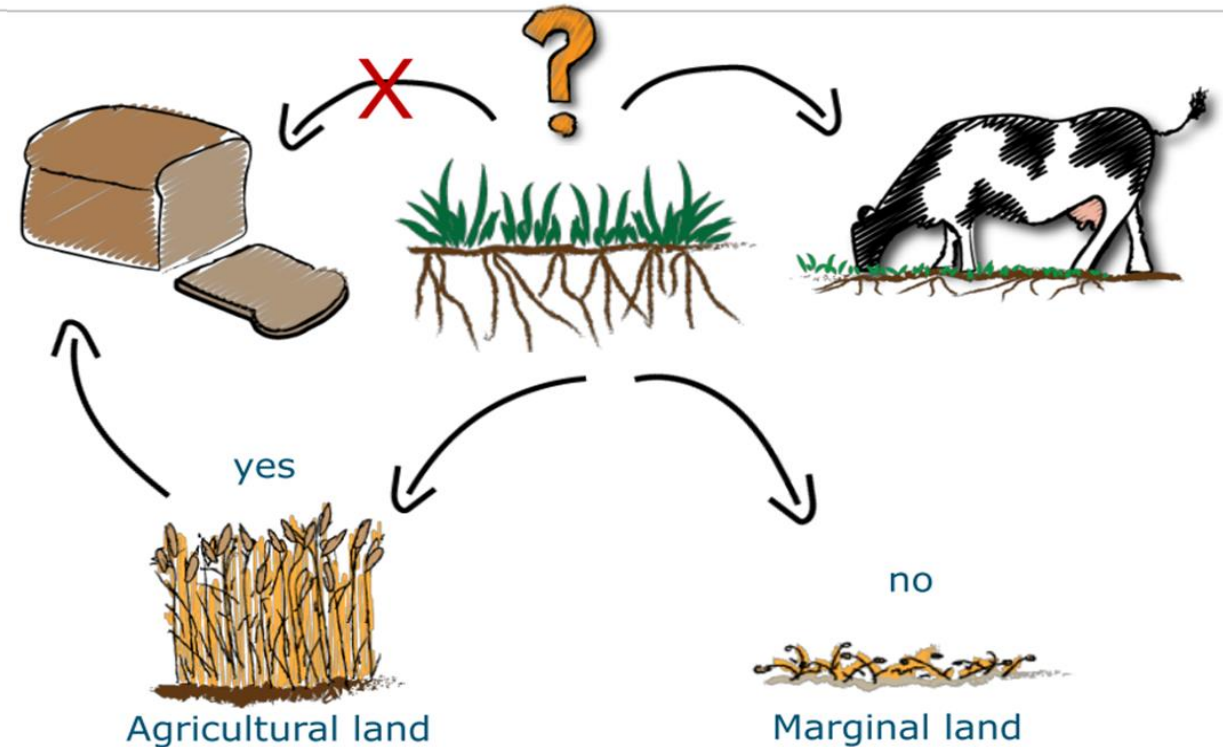


# Feed/Food competition

## Direct competition



## Indirect competition



From Hannah van Zanten, 2016

# Agroecological challenge

## Issue and highlights of Agroecology transition

- Agroecological transition is a way to improve sustainability of the LFS  
(*Altieri, 2002; Dumont et al., 2013; Bonaudo et al., 2014*)
- Feed Self-sufficiency (FSS) can be considered as a driver of agroecological transition (*Dumont et al., 2013*)
- Some farmers combine different resources included natural grassland to increase their farm's feed self-sufficiency (*Thénard et al. 2014, 2016, 2021*)

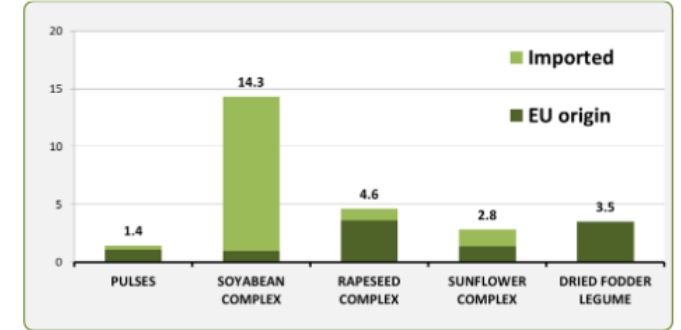




# Agroecological challenge

Protein self-sufficiency is on the agenda for the next few years in the EU, in France and in Occitania...

Graph 1 2016/17 EU use of proteins and their sources (in million tonnes of crude protein)



Source: EU Commission. "Complex" includes meals, seeds and beans

Graph 8 Agricultural European Innovation Partnership – linking H2020 to the CAP



Legumes have benefitted from research projects at different scales. Building on previous projects tackling breeding issues related to biotic/abiotic stresses, food/feed uses and environmental assets of legumes, the on-going H2020 projects are looking at transition paths to sustainable and competitive legume-based production systems and value chains in the EU, as well as breeding strategies and food characteristics.



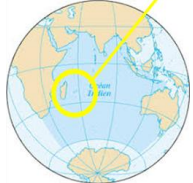
Brussels, 22.11.2018  
COM(2018) 757 final

REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

on the development of plant proteins in the European Union

# Agroecological challenge

Many opportunities to discuss works about self-sufficiency in herbivorous systems



And what about granivores ?



## Developing local protein resources in monogastric feeds



# Case study: mixed farming region



- Mainly arable crops
- + Residual livestock (granivores)
- + Local knowledge of mixed farming
- + Potential of protein crop production

**How to increase protein self-sufficiency?**



# Case study: A participatory approach

Current challenges



a drastic change of Livestock farming Systems

But



The agroecological transition

complex process

undefined paths

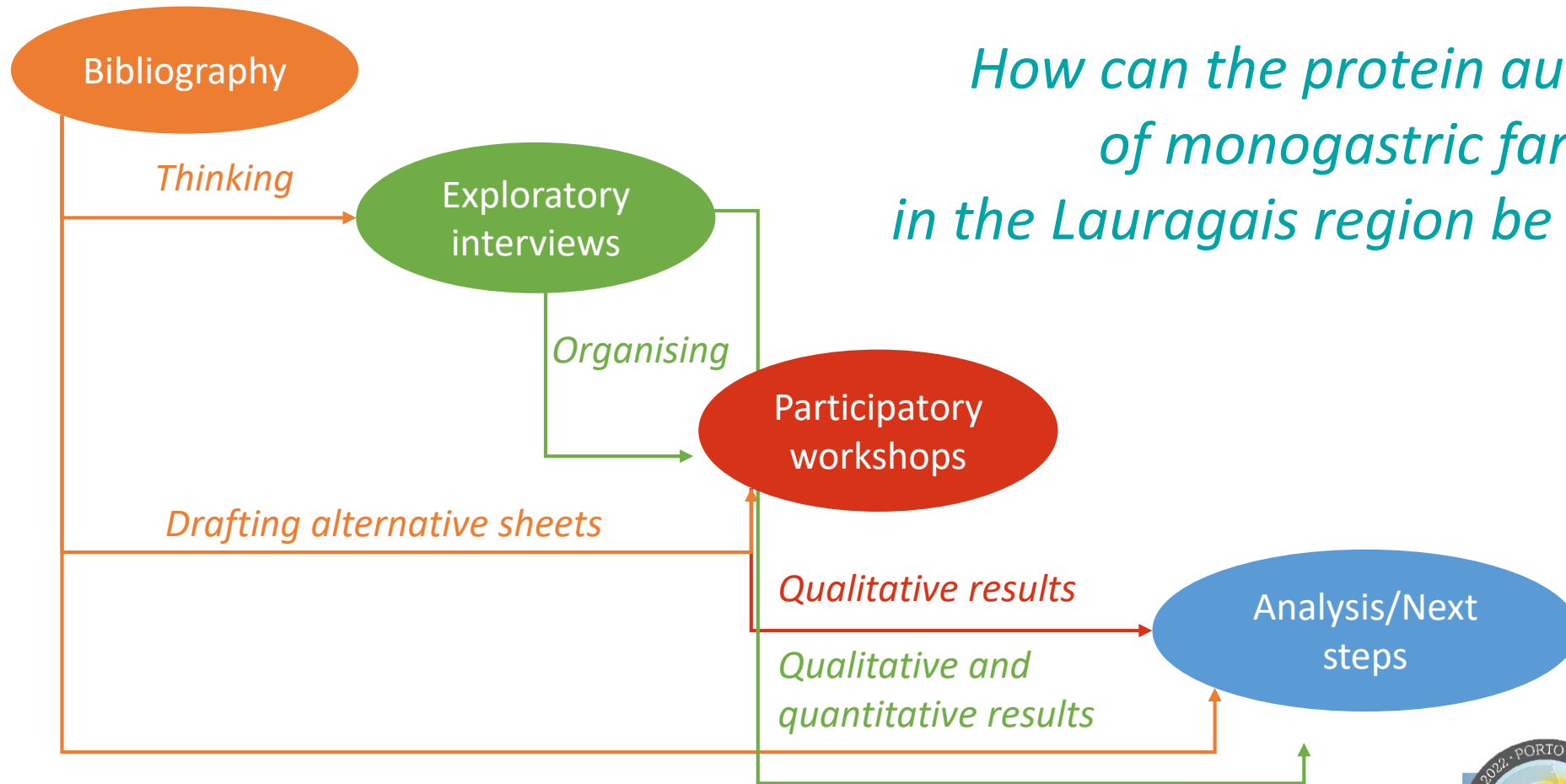
To achieve such changes, it is necessary to involve farmers in co-designing innovations and encouraging their adoption

→ Participatory approach relevant to analyze SES/ STS



Source : Darnhofer et al., 2015

# Case study: A participatory approach



*How can the protein autonomy of monogastric farms in the Lauragais region be improved?*

## Direct sales farms

- 8 « pigs » farmers
- 7 « Poultry » farmers
- 1 « Pigs&Poultry » farmer

## Farmers' practices:

- 10 farms make feed on the farm (FAF) including cereals produced on farm
- 6 farmers supplied protein feed by buying a nitrogen supplement
- 4 farms supplied protein feed by producing the protein-rich raw material themselves (soya or peas)

## *Some obstacles to protein autonomy expressed during the interviews :*

- ✓ Need for support or advice on farming techniques (new crops, new diet, etc.).
  - ✓ Difficulties in substituting soybean meal in rations:  
it is an ideal nutritional component.
- ✓ Few support from cooperatives to small farmers in direct sales

# Main results

Participatory  
workshops

5 farmers  
4 advisors



## Workshop 1

**Overview and presentation of alternatives to imported soybean meal**

- Sharing feeding alternatives
- Thinking collectively towards protein self-sufficiency
  - Identifying benefits & disadvantages

4 farmers  
1 advisor



## Workshop 2

















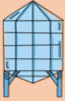







**Design of protein self-sufficient systems**

- Building farmer-specific perspectives



# Main results

Participatory workshops

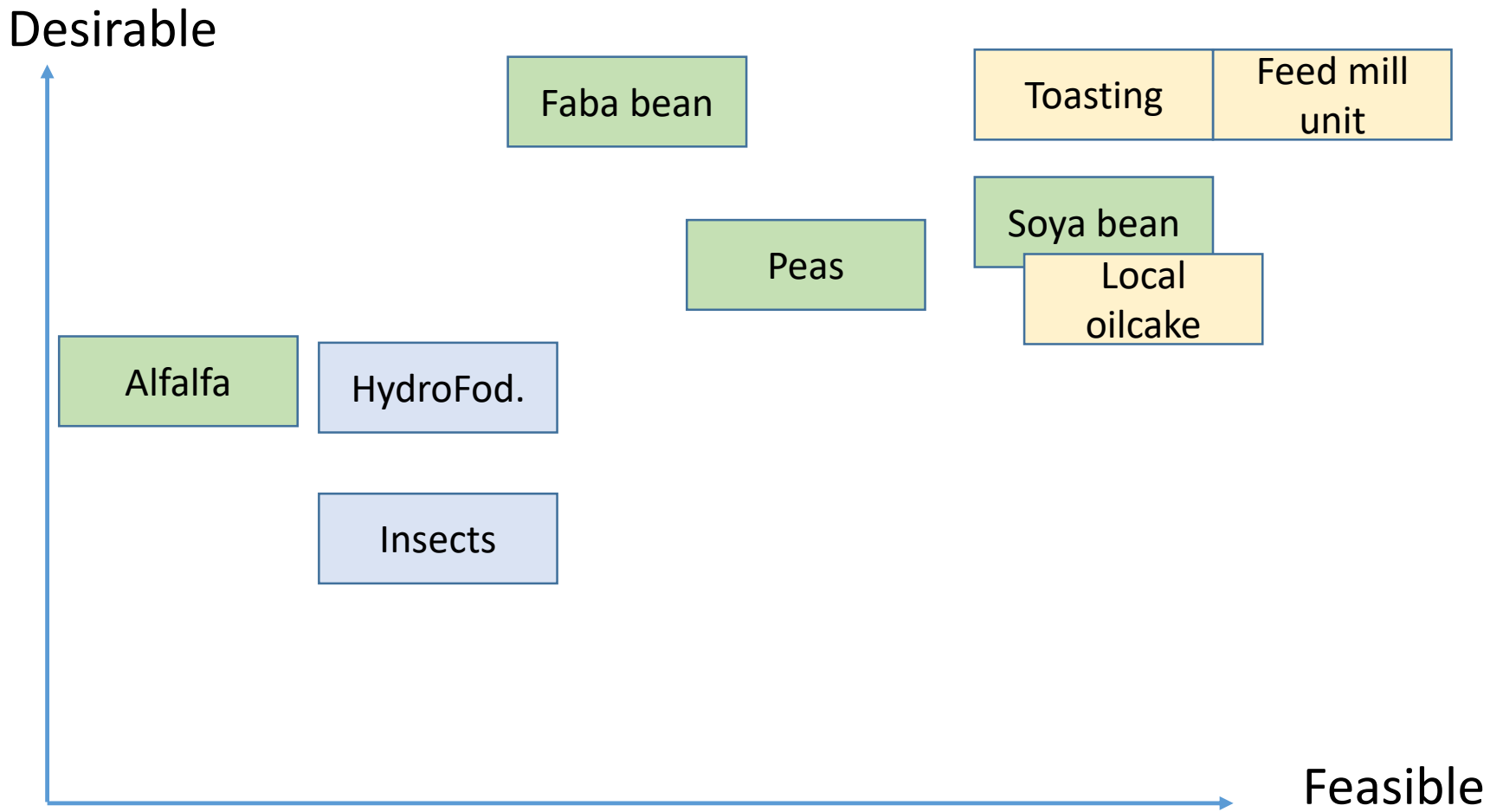
	Benefits	Disadvantages
Peas	 PROTEINES	
Faba bean	 PROTEINES	
Soya bean	 PROTEINES	
Alfalfa		 PROTEINES
Hydroponic fodder		 
Sprouted cereals		
Insects		 
Local oilcake by pressing		 
Feed mill units		  
Toasting	 PROTEINES 	





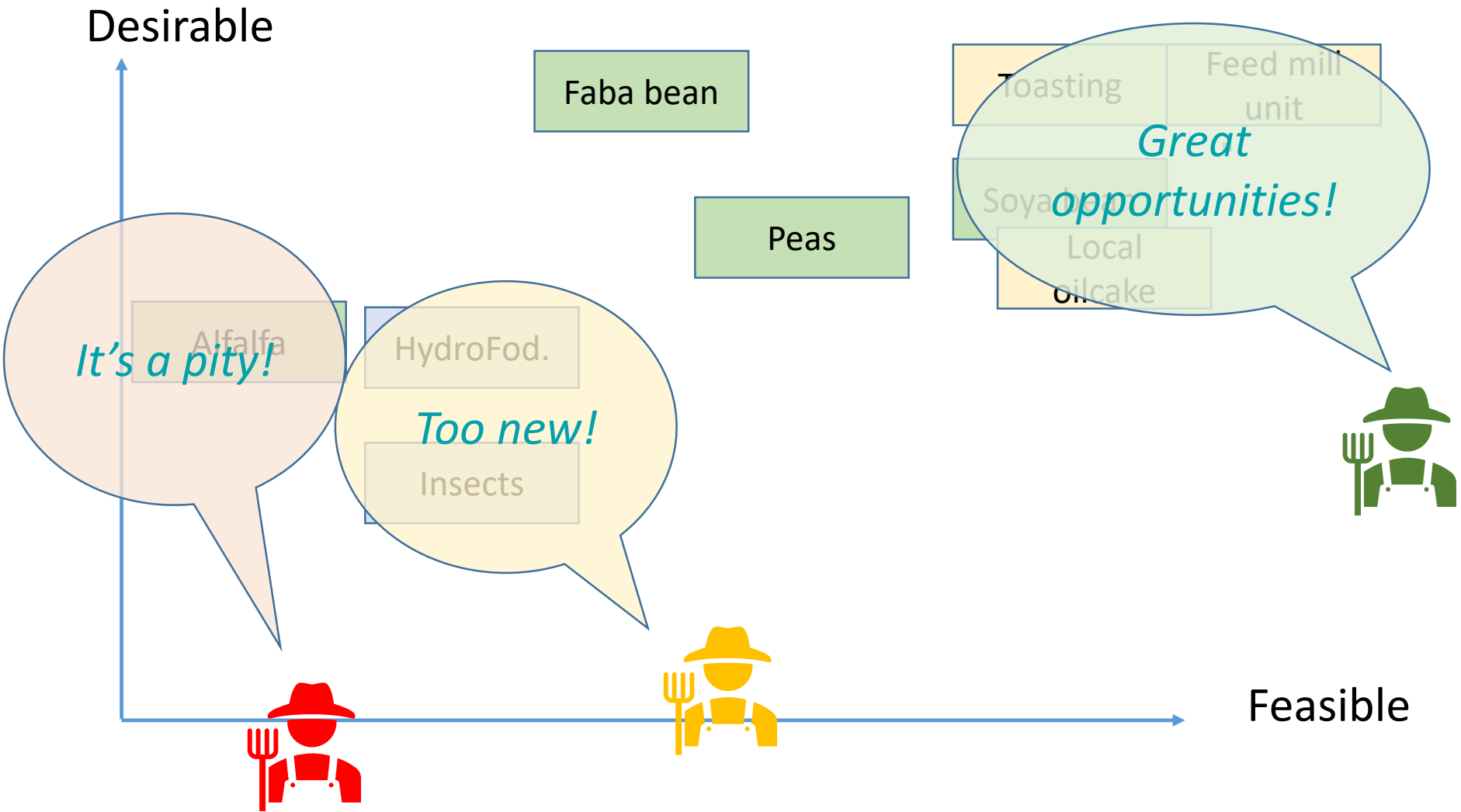
# Main results

Participatory workshops



# Main results

Participatory workshops



# Wrap-up

## *Identified avenues for action*

- Integrating the stakeholders in the sectors in the quest for protein autonomy
- TAP (Transformed Animal Proteins): calling on the French public authorities after the EU has allowed them
- Benefit from aid for protein autonomy (CAP, regional policy,...)
- Intensify and develop interactions between farmers



# Take-home messages

- Alternatives to soy cake exist, they be developed on the basis of technical research and territorial organizations.
- Direct sales farmers are motivated, the next step is to involve the pork and poultry sectors on a regional scale.
- New integrated crops need support and exchange between farmers.
- Protein self-sufficiency is a good thing for the transition to agro-ecology and a way to adapt LFS to climate change



# References

- AGENCE AD'OCC, 2020. Retour sur la 2e journée « Protéines végétales et animales en Occitanie ». [online].
- AGRESTE, 2016. Commercialisation en circuit court. [online].
- FAGES, Floriane, DE VILLOTREYS, Ra-phaël et MARTIN, Guillaume, 2016. Autonomie alimentaire en concentrés et fourragère : Définition. [online]. DOI 10.17180/KTRG-FX25.
- LE BOULCH, Mathilde, 2022. Prévisions des prix des matières premières et de l'aliment IFIP. [online]
- Bracher, A. (2019). Les légumineuses comme alternative aux protéines importées. *Recherche Agronomique Suisse*, 10, 180-189..
- Altieri, M. A., 2002. Agroecology: le Science of Natural Resource Management for Poor Farmers in Marginal Environments, *Agriculture Ecosystems & Environment*, 93, 1, 1– 24.
- Bonaudo, T., Bendahan, A. B., Sabatier, R., Ryschawy, J., Bellon, S., Leger, F., Magda, D., Tichit, M., 2014. Agroecological Principles for the Redesign of Integrated Crop– Livestock Systems, *European Journal of Agronomy*, 57, 43– 51.
- Dumont, B., Fortun-Lamothe, L., Jouven, M., Thomas, M., Tichit, M., 2013. Prospects from agroecology and industrial ecology for animal production in the 21st century. *Animal* 7(6): 1028–1043
- Espagnol, S., Delage, C., Royer, É., Dauguet, S., Jensen, S. K., & Garcia-Launay, F. (2020, February). Analyse environnementale de l'utilisation de sources de protéines européennes pour l'alimentation porcine. In 52. Journées de la Recherche Porcine (pp. 337-342). IFIP-Institut du Porc..
- Petit, M. S., Challan-Belval, C., Blosseville, N., Blancard, S., Castel, T., Lecomte, C., & Duc, G. (2012). Un exemple de gestion de systèmes de polyculture élevage à l'échelle de territoires: le cas des protéagineux et de l'élevage de monogastriques en Bourgogne. *Innovations Agronomiques*, 22, 135-157..
- Rouillé B., Devun J., Brunschwig P., 2014. L'autonomie alimentaire des élevages bovins français. OCL 21, D404. <https://doi.org/10.1051/ocl/2014017>
- Thénard, V., Jost, J., Choisis, J. P., Magne, M. A., 2014. Applying Agroecological Principles to Redesign and to Assess Dairy Sheep Farming Systems, *Options Méditerranéennes, Série A : Séminaires Méditerranéens*, 785– 789.
- Thénard, V., Choisis, J. P., Pages, Y., 2016. Towards Sustainable Dairy Sheep farms Based on Self- Sufficiency: Patterns and Environmental Issues, *Options Méditerranéennes, Série A : Séminaires Méditerranéens*, 81– 85.
- Vincent Thénard , Gilles Martel, Jean-Philippe Choisis, Timothée Petit, Sébastien Couvreur, Olivia Fontaine, Marc Moraine, 2021. How access and dynamics in the use of territorial resources shape agroecological transitions in crop- livestock systems: Learnings and perspectives. In, Claire Lamine, Danièle Magda, Marta Rivera-Ferre, Terry Marsden (eds.), *Agroecological transitions, between determinist and open-ended visions*. Peter Lang, Brussel - pp 199-224.
- Van Zanten, H.H.E., Mollenhorst, H., Klootwijk, C.W., Van Middelaar, C.E., De Boer, I.J.M., 2016 Global food supply: Land use efficiency of livestock systems. *Int. J. Life Cycle Assess*, 21 pp. 747-758
- Von Witzke, H., & Noleppa, S. (2010). EU agricultural production and trade: Can more efficiency prevent increasing 'land-grabbing' outside of Europe?. *Università Cattolica del Sacro Cuore, Piacenza: OPERA*.





**Obrigado, Thanks !**

