



FROM ITS ROOTS
organic inspires life.

 **Organic World
Congress 2021**

FRANCE

FORUM SCIENCE

Integrated farming systems



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How could livestock farming maximize organic production at a global scale?

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Services provided by livestock

Food



Soil fertility



Housing



Energy



Work



Gastronomy
Culture
Landscape



Feeding the world



Feed/Food competition



Agroecology - Diversification
Mix - livestock Crop - Livestock



Agroforestry



Implementing OF principles

What (multi) performances expected?

1- Many studies show that OF provides many benefits for society:

Environment, Global health including Human health, Biodiversity, employment etc.

(but the advantages are less clear on some aspects, as climate change)

Reganold et al 2016, Schader et al 2012, Bourguet et al 2016, Baranski et al 2014, Baudry et al 2017, 2018, 2019

2- However, OF's productivity is globally significantly lower compared to conventional's one

(Seufert et al 2012, Ponisio et al 2014) → **this is the « black point »**

Searchinger et al 2018, Kirschman 2019, ...

→ A dilemma: How to produce “clean” with the same agricultural area?

Producing « clean » (/synthetic inputs)

...while satisfying human feeding requirement ? (productivity)

HOW?

6 major levers

1/ Demographic management (Long term)

2/ Reducing losses and waste

3/ Limit other uses of agricultural land

Energy, Housing/building (land use), Mobility → Global issue - What policies?

4/ Increase cultivated areas (deforestation; northern latitudes)

5/ Ensure sufficient productivity of agricultural land

6/ Adapting human diets

1

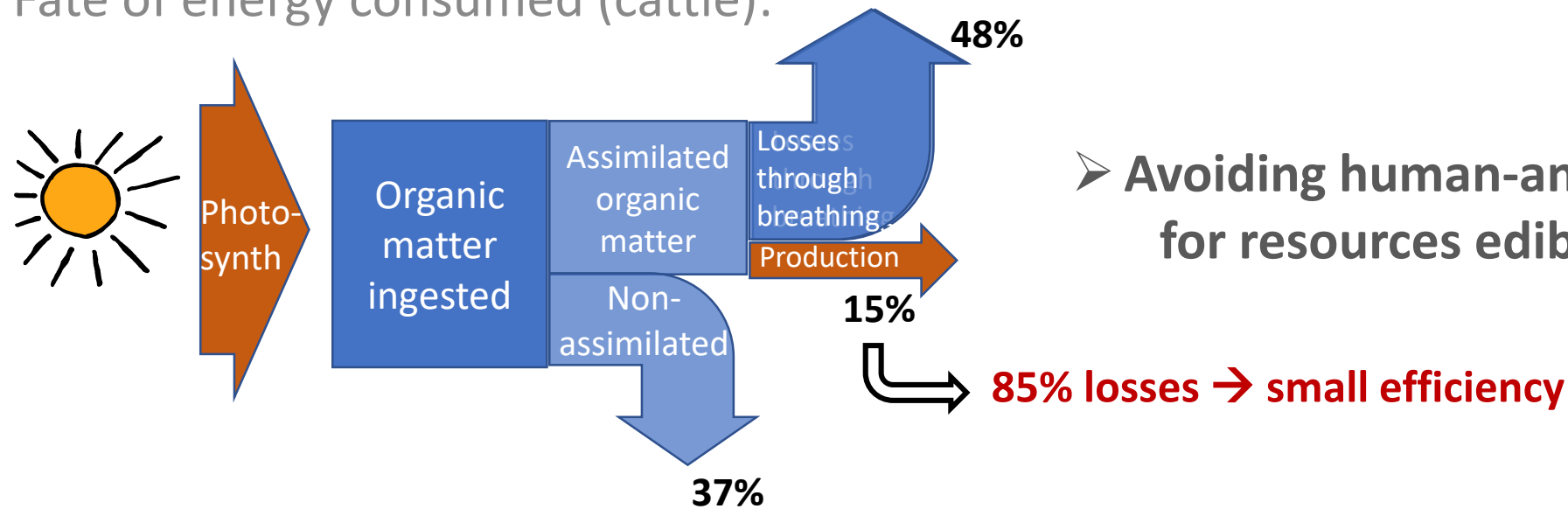
Diets:

Less animal products in order to feed more people

Why is the consumption of animal products "sub-optimal" compared to the human consumption of plant products?

Energy loss along the trophic chain:

Fate of energy consumed (cattle):



➤ **Avoiding human-animal competition for resources edible by humans**

World crops for livestock = 500 million ha = 1/3 of crops

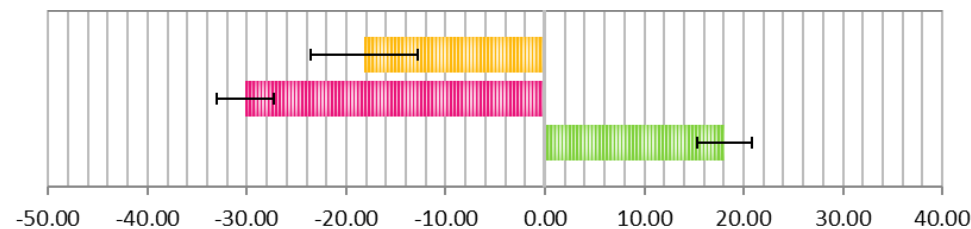
Consequence: Effects of diet (animal products share) on sustainability indicators Comparison OF / CA

Consumer Cohorts Q5 vs. Q1

Big vs small consumers of organic products: Q5 vs Q1

*Baudry et al 2019
(BioNutrinet)*

Land use



Global effect

Diet effect

OF vs CA effect

Despite 18-20% lower yields on OF, and thanks to a diet that relies less on animal proteins, the French organic consumer uses 18% less UAA than a conventional consumer

➤ ... Suppressing livestock to produce "sustainable" and feed the entire population?



2

Agronomic optimization:
« husbandry wisely »

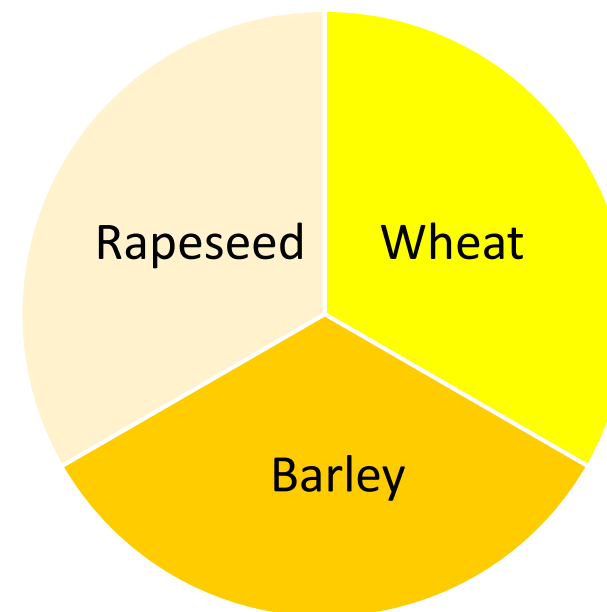
Simplified rotation in specialized agriculture:

Chemical nitrogen

→ **Climate change, fossil energy**

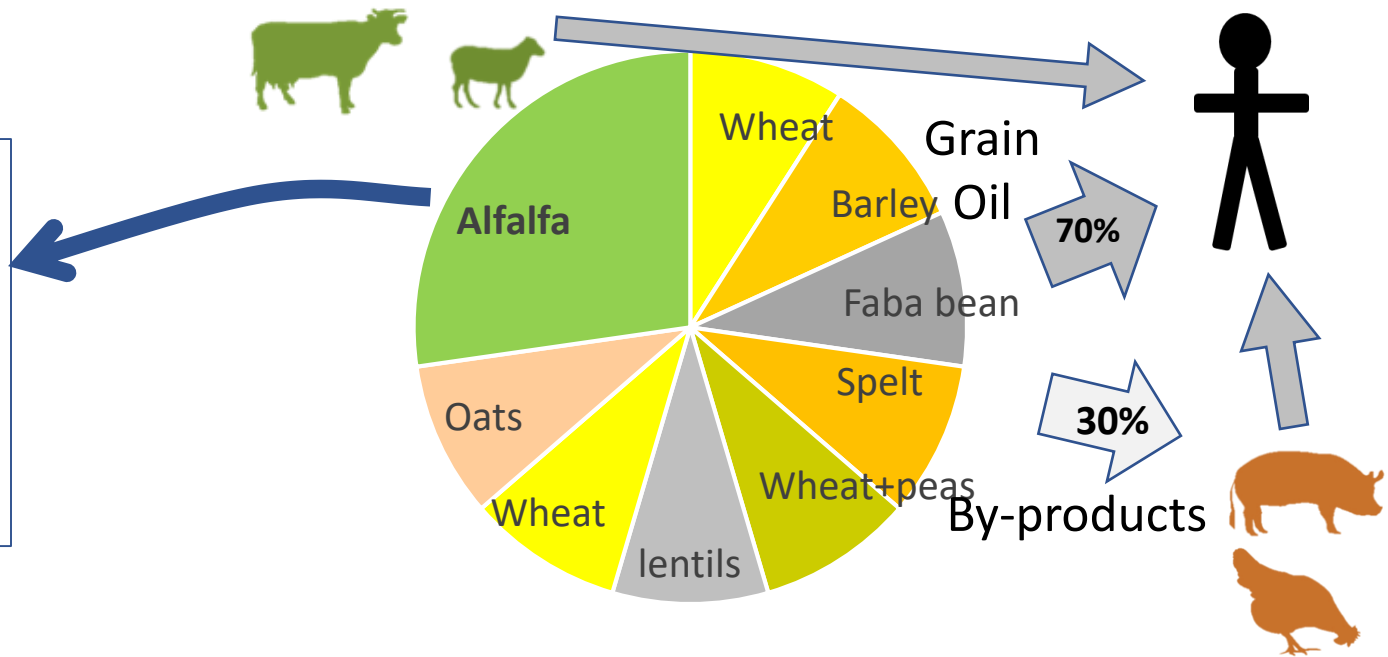
Pesticides (diseases, pests, weeds)

→ **Loss of biodiversity, water pollution, human health**

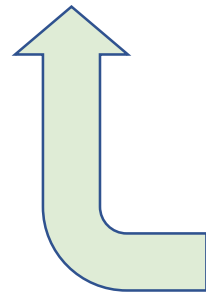
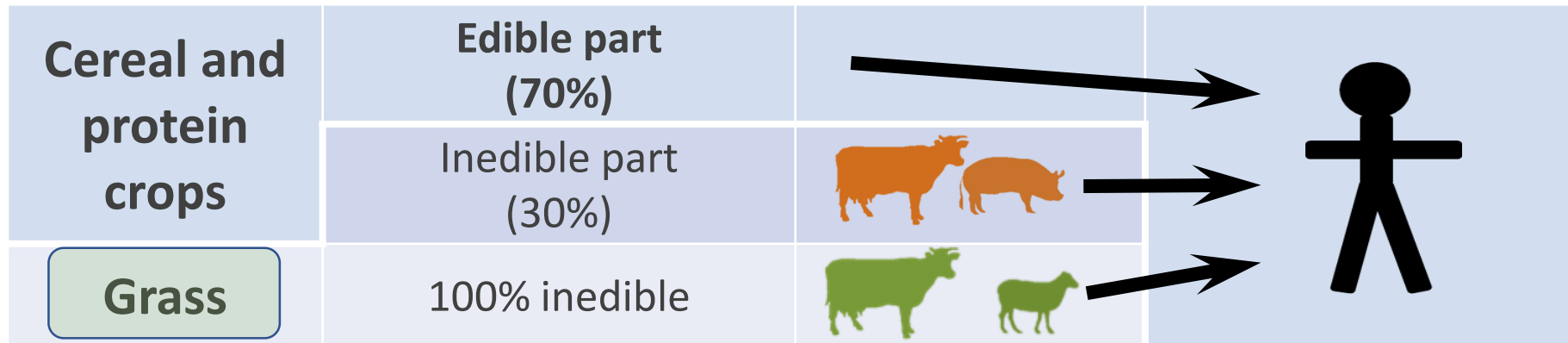


→ increase complexity and include forage
in the rotation to limit/remove synthetic inputs

Fixing atmospheric nitrogen
Break the cycles
Diseases - Pests - Weeds
Structure the soil and
explore deep horizons



Optimize (maximize) agricultural production for humans Avoiding feed-food competition



3

Overall:

What share of agriculture production should come from livestock
...to maximize the population fed?



Maximization of the population to be fed: an optimum of livestock in the UAA

Example: Netherlands *H. Van Kernebeek et al 2014*

Land and resources are optimally used if 12% of proteins
are of animal origin

No Human/Animal competition

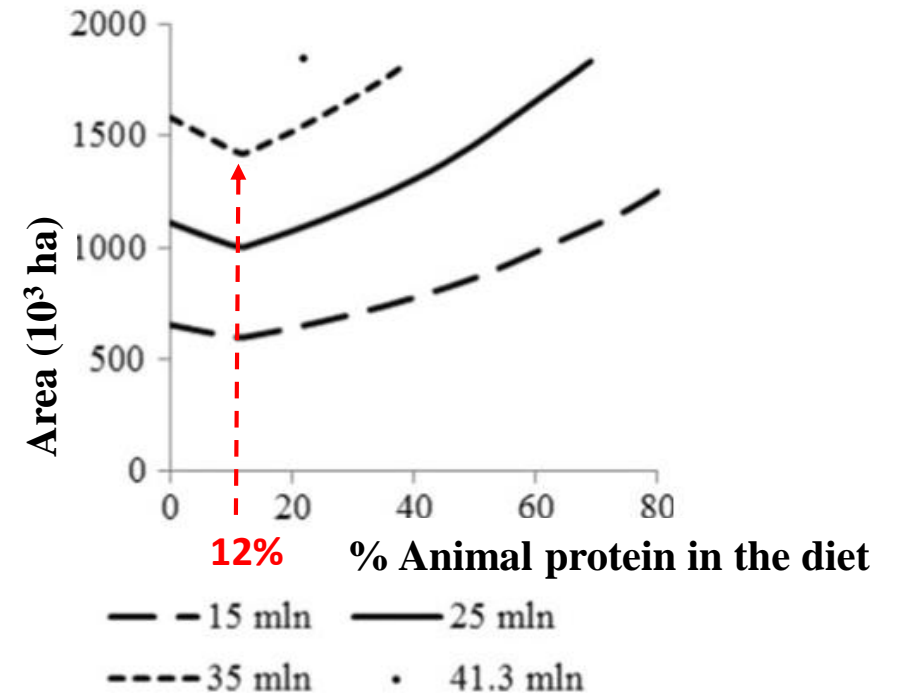
The level of this optimum fluctuates according to

The perimeter taken into account (country, territory...)

The pedoclimatic context

The technologies used

In France: around 25%



4

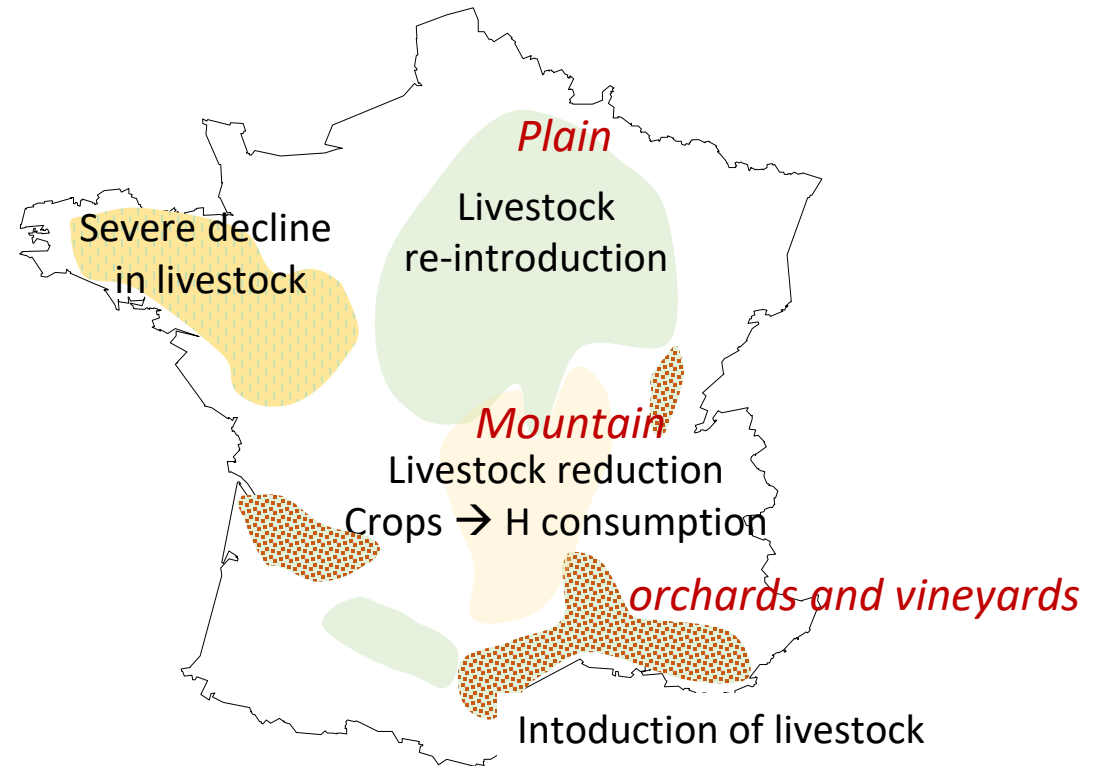
What futur? France as an example



An implementation of Agroecology or OF at a large scale: Towards a large-scale restructuring of French agriculture

Prospective studies to be undertaken

- Global agricultural production?
(crops, livestock etc.)
- Environmental and social impacts
(jobs, income, health)
- International trade
- Food sovereignty



Conclusion



- From **global** issues ... to **local** solutions
- Sustainable food system: \searrow livestock share **and** revisit its functions/types/locations.
- Many challenges:
 - Available skills? (new productions, new systems, new services ...)
 - The traditional industries: how to integrate them into this process?
 - How to manage diversification and heterogeneity of the products?
 - What future for territories that have relied on a concentration economy?
- **The territory:** crucial scale for understanding and implementing the transition lead by agriculture. A combination of stakes as food security, added-value, resilience, social issues



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SEPTEMBER 6TH TO 10TH 2021 IN RENNES

AT THE COUVENT DES JACOBINS • RENNES MÉTROPOLE CONFERENCE CENTRE

THE WORLD ORGANIC CONGRESS IN 2021, IT'S HERE!

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Thank you!

FOR MORE INFORMATION PLEASE CONTACT:

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