



A world without livestock farming makes no sense

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Part 1:

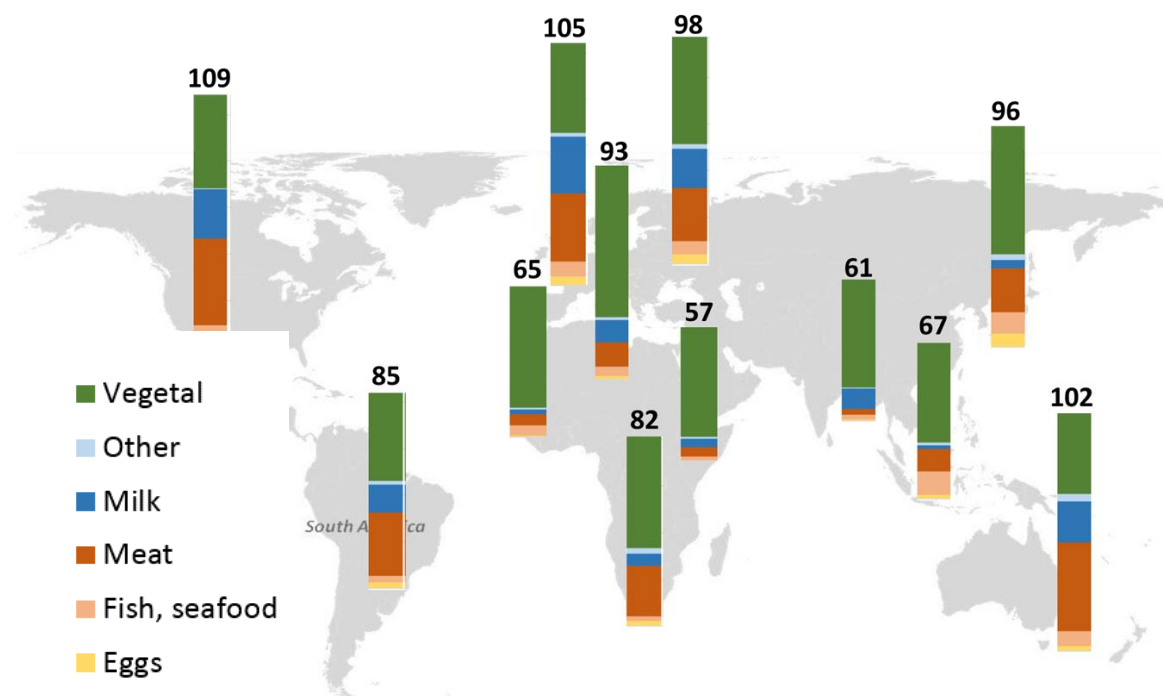
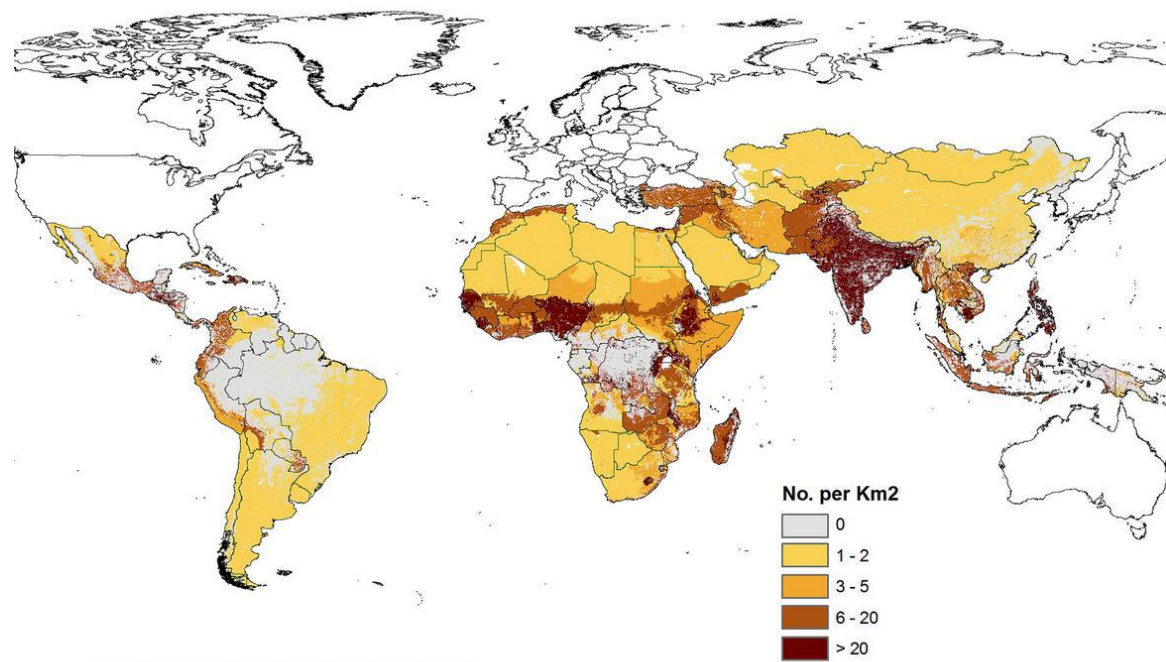
A world without livestock is a nonsense

A humanitarian nonsense

- Livestock is the livelihood for more than 800 million poor people

- Anemia in children in many parts of the world due to lack of meat

Density of Poor Livestock Keepers
Year 2010*



A humanitarian, economic and agronomic nonsense

- **In small family farming systems livestock boost food security**
 - **Provides fertilizer**
 - **maintains soil fertility**
 - **provides workload**
 - **is the mean of transport (no road)**

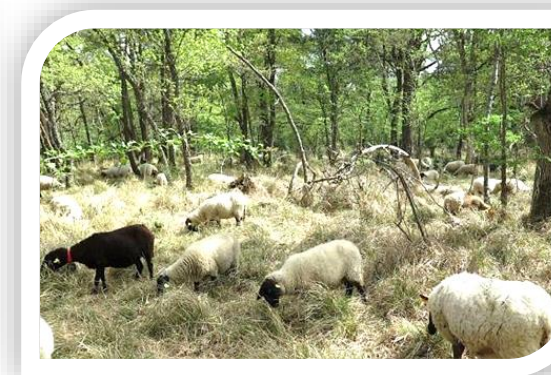


Livestock contribute to food security

Food from marginal Land? Ruminants can do!!!

- In Europe, permanent Grasslands and rangelands cover 73 M ha (40% Eu AA)
- At world level, 360 million cattle and 600 million small ruminants provide 25% of world animal products from marginal land

Sere and Steinfeld, 1996

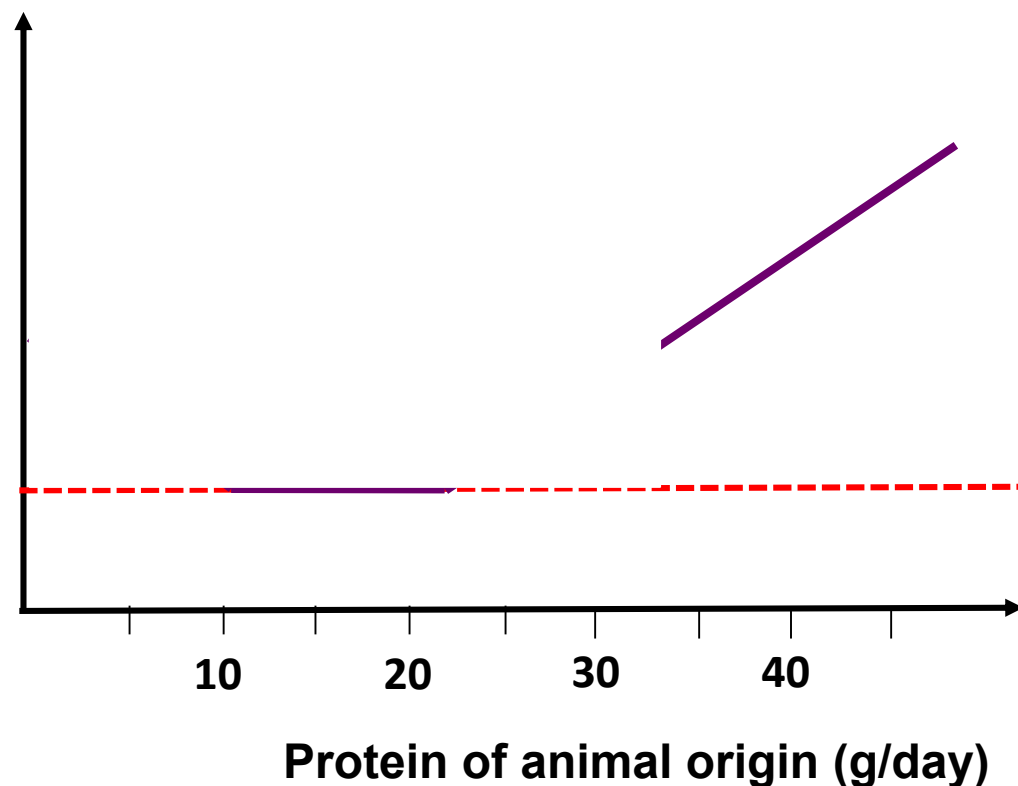


Livestock for a more efficient agriculture

We would feed more people without livestock: no!

- **Complementarity between livestock and crops to maximize food production**
 - Valorisation of co-products
 - Valorisation of non-usable land for crop production
- **Nutritional recommendations (PNNS)**
 - 60 g protein /day including 30 g of protein of animal origin

Relative area required to feed the population

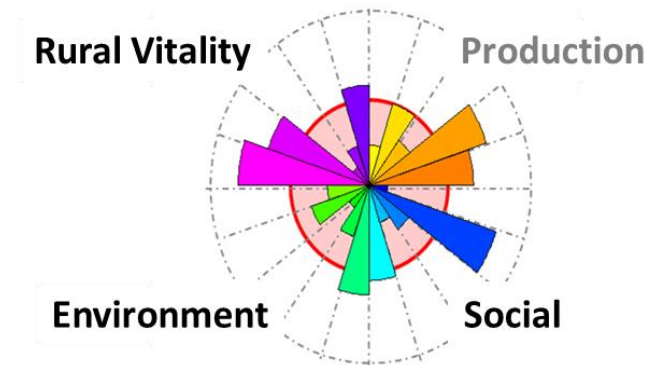


(Adapted from Van Kernebeck et al., 2014 et De Boer et al., 2018)

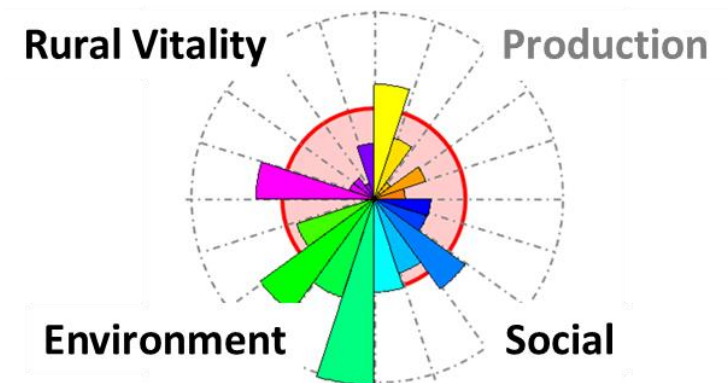
Livestock provides ecosystem and social services

- Various benefits of a sustainable EU livestock sector for rural area
- The bundle of services varies according to local contexts
- Comprehensive framework and method to assess the sustainability

- Intensive regions



- Extensive regions



Ruminants can produce Biodiversity

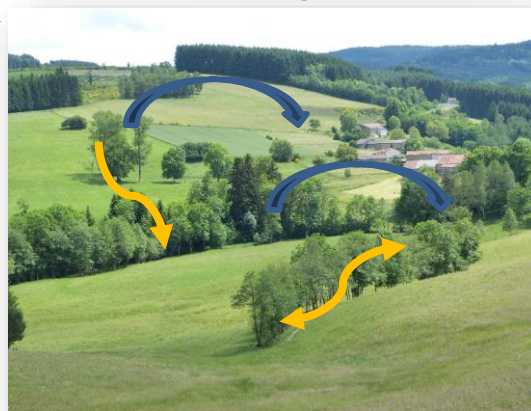
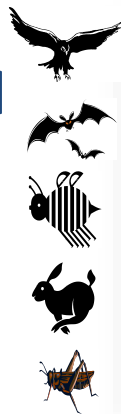
- Diversity of forage species (including honey plants) and grassland types



Bocage (hedges, groves, selvedges...)

Open fields

- Diversification of land uses, landscapes and maintenance of open habitats (with grasslands)



1 LU maintains 90 m of hedge



Part 2: The shadows of livestock



Livestock between Food and Feed!

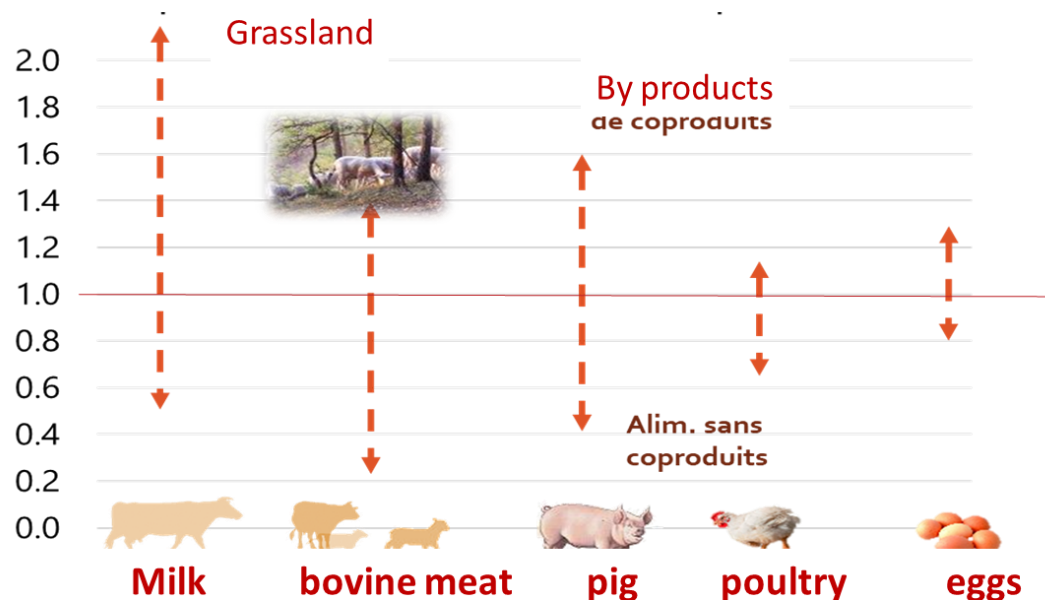
10 kg of plant protein to produce 1 kg of animal protein!

- Livestock consume 6 Billion tons DM, of which 86% are non edible as human food

Mottet et al., 2018

- Competition between feed and food does in fact concern those proteins of plant origin that are consumable by human but are actually consumed by animals.

Kg of protein of animal origin per kg of edible plant protein used as feed



Laisse et al., 2018

Water consumption by livestock

15 000 L of water per one kg of meat!

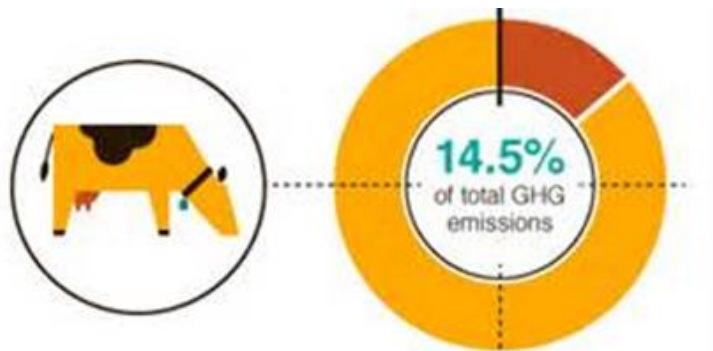
- What are we talking about?
 - Green water (soil water consumed for crops): more than 95% is recycled
 - Blue water (surface water and groundwater)
- Livestock consume 8 to 15% of water resource worldwide (FAO, 2014)
- Comparison of farming systems



1 kg beef meat	22 – 520 L
1 kg pig/poultry meat	100-190 L
1 kg milk	< 1 - 100 L
<i>1 shower</i>	<i>50 – 70 L</i>

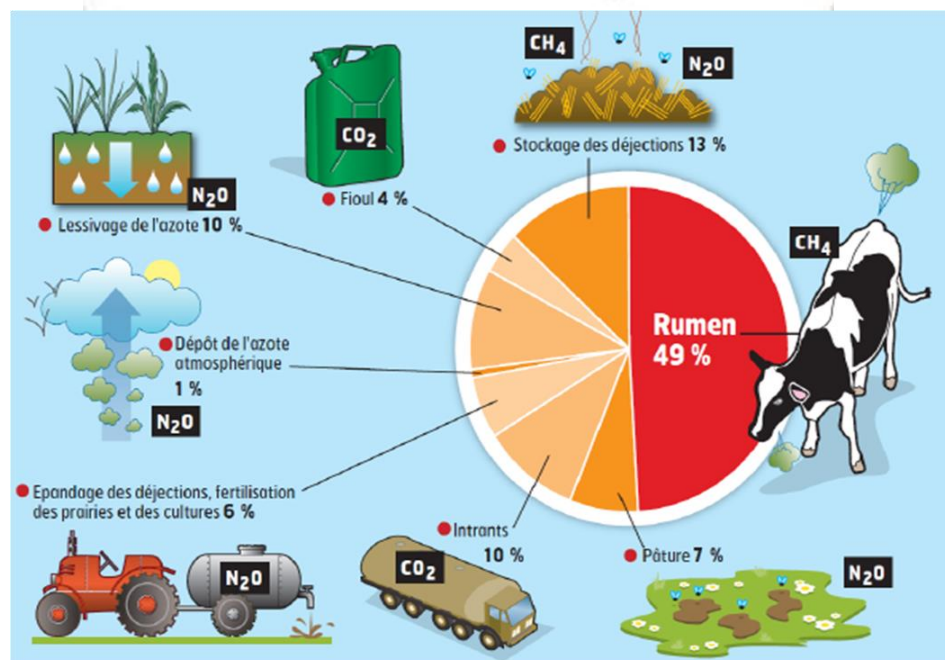
Doreau et al. (2014)

Real Carbon footprint of ruminant



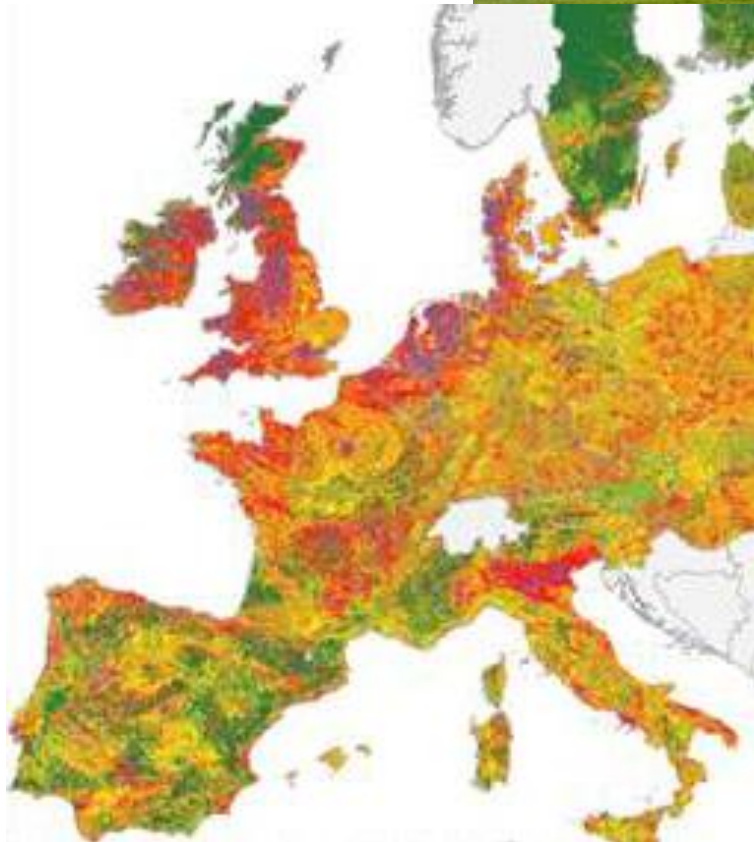
> 40% reduction

- Genotyping low methane production for selection
- Rumen microbes
- Improving animal health and husbandry conditions
- Smart use of manure
- More C sequestration (agroforestry)
- Precision Livestock Farming
- Feed production
 - More efficient production (legumes)
 - Better agricultural land use
 - No specific feed production



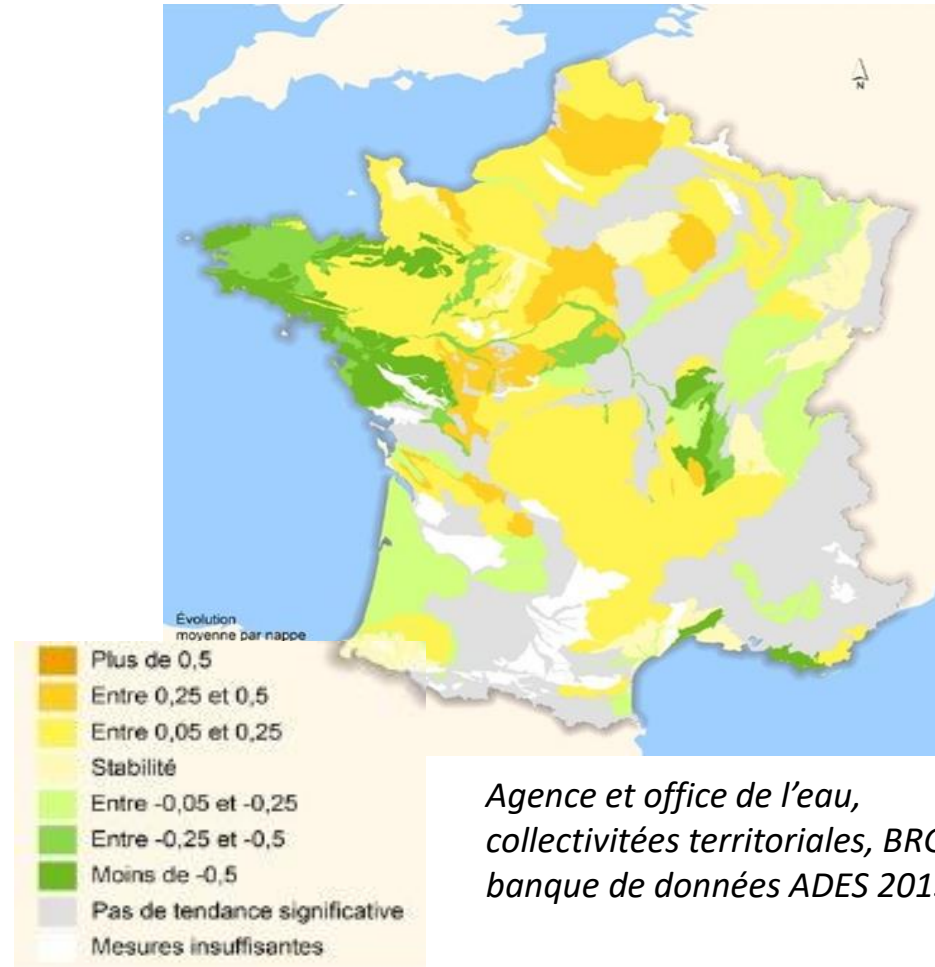
Local pollutions

NO₃ Emissions



Nitro Europe (2011)

Evolution of nitrate levels (mg / year) in groundwater (1998 – 2014)

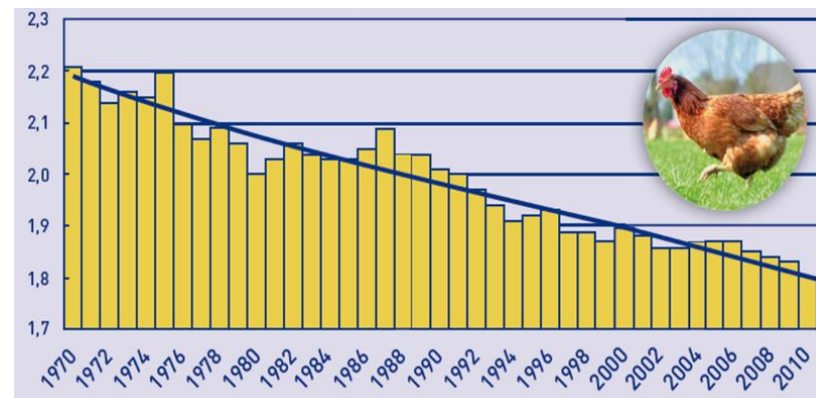
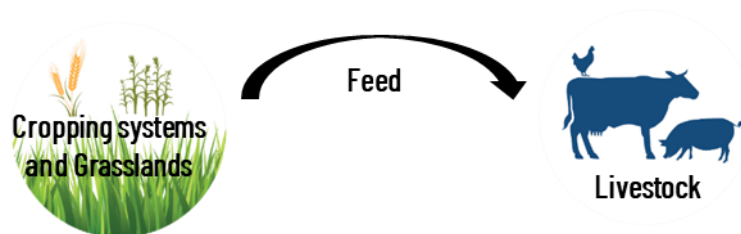


Agence et office de l'eau,
collectivités territoriales, BRGM,
banque de données ADES 2013

Part 4: Changing paradigms to rethink the place and roles of livestock farming in the agri-food sector



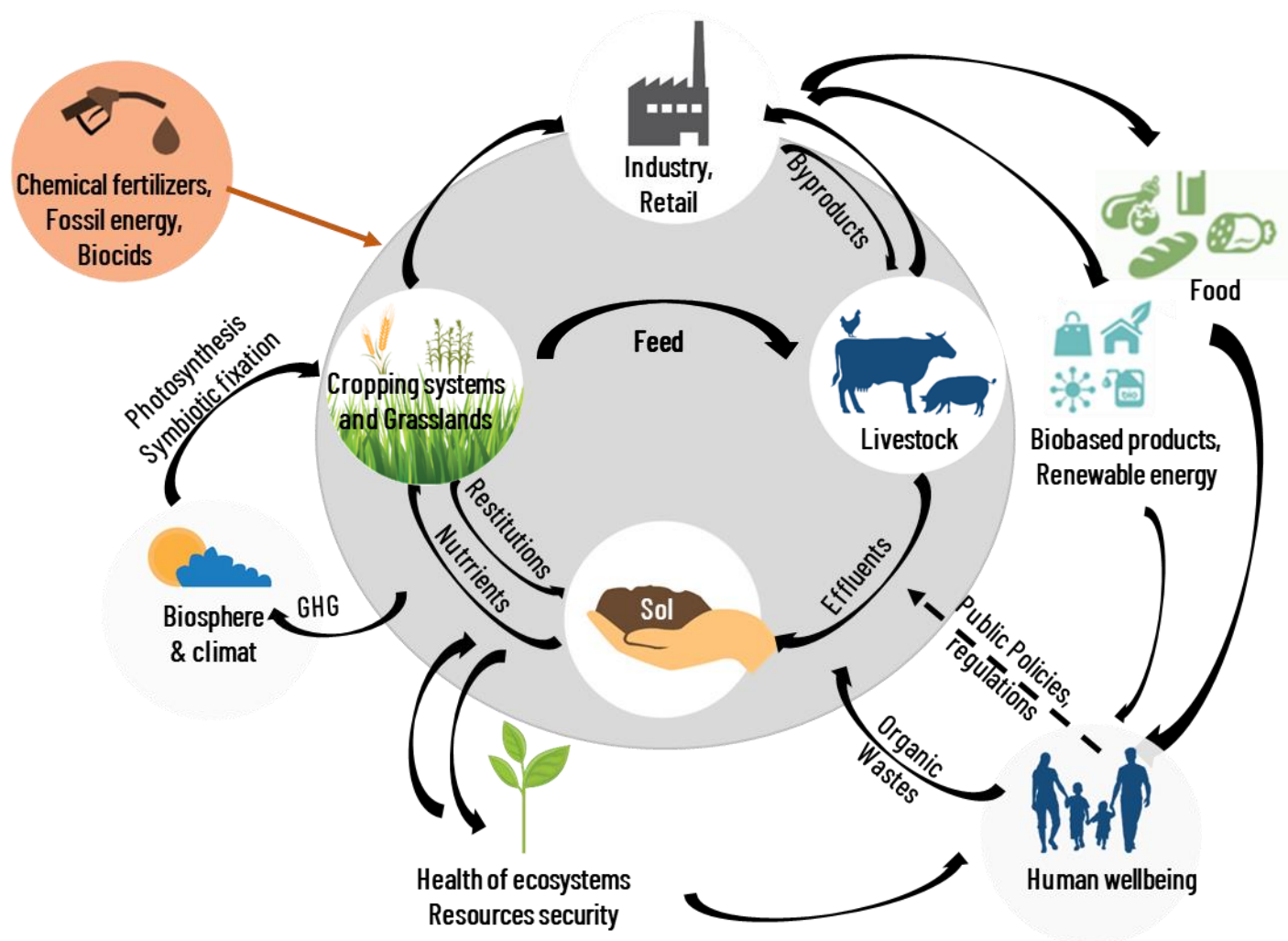
The “linear” vision



- This has led to significant productivity gains but
 - In a linear way of thinking (resource – production – product – waste)
 - Without considering the amount and origin of mobilized resources
 - Without preventing the degradation of ecosystems

A new paradigm

Livestock is a key issue for sustainable circular agri-food systems



- Rethinking the place, roles and performances of livestock
- Rethinking the links between livestock, crop production, soil fertility and environment
- Rethinking the links between livestock, livestock products and consumption of animal-based products
- Balances are to be found according to the political choices and the territorial contexts. There is no « one size fits all » optimal solution

Part 5: Take home message

- **Think twice: do not step into a simple and narrow vision of livestock farming systems**
- **Reducing impacts of livestock farming is essential: the shadow of livestock can be mitigated**
- **Livestock is not only a problem, it is also part of the solution**
- **Livestock farming system should change to regain legitimacy**
- **Europe need an ambition for livestock farming systems : articulate local and global, transformation or improvement, food production and/or immaterial functions (multifunctional livestock) ?**

