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➤ The livestock sectors and research in animal science in France

A need for disruptive research

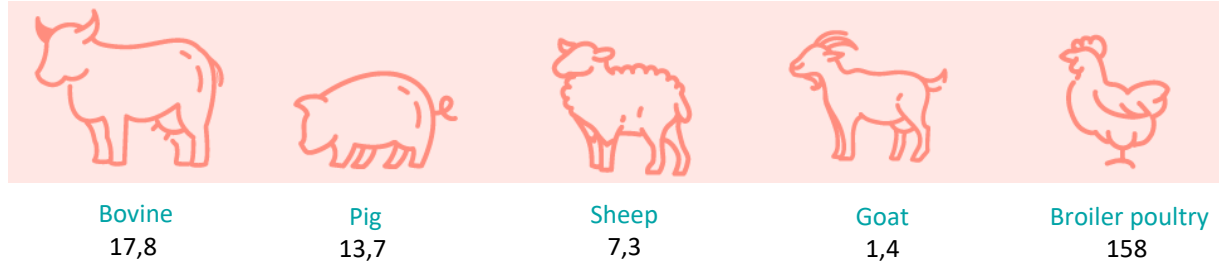
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➤ Some key figures about livestock farming in France

Million heads *(AGRESTE GRAPHAGRI, 2021)*



24 billion litres
of cow's milk
(2nd European
production)

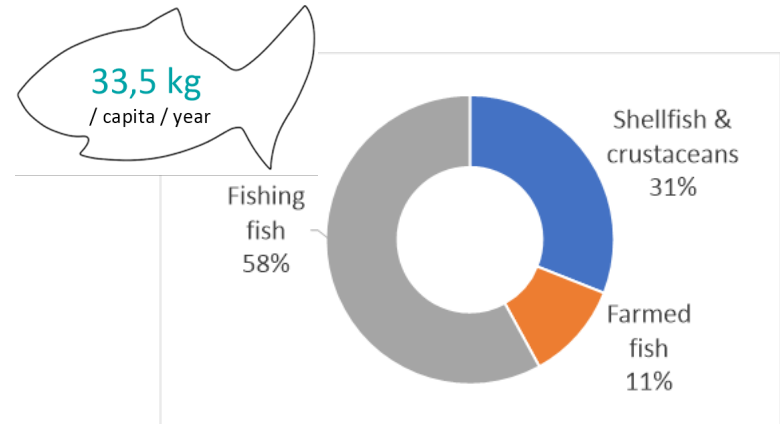
In 2020 :

145,000 farms were devoted to livestock and poultry farming, i.e. 37% of all farms...

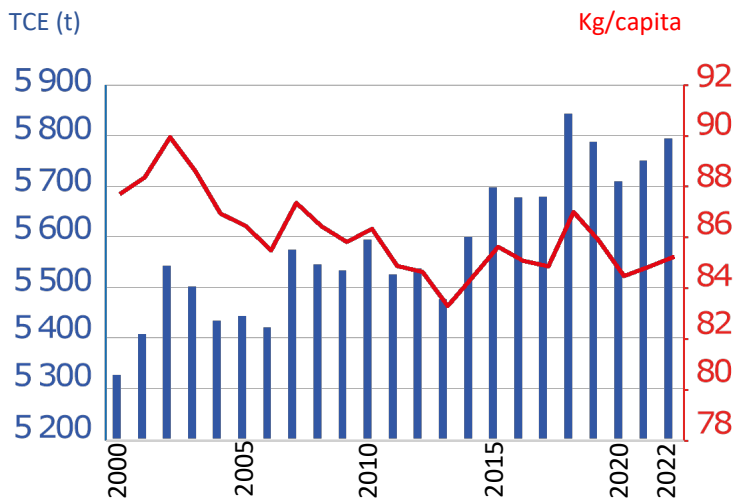
... positioning France **second in Europe** after Spain, in terms of livestock population

➤ Some key figures about the consumption of animal products

Consumption *(per capita / year)*



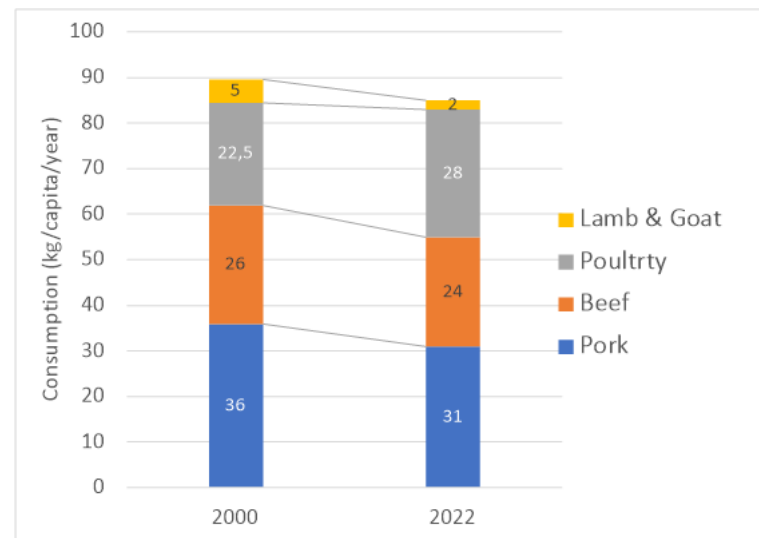
➤ Trends in meat consumption over time



A slow erosion of consumption over the past 20 years (-3.2%)



With substitution between meats



(Agreste, 2020 ; FranceAgriMer, Juillet 2023)



➤ A specific quality-based strategy



PDO

Production is done following **specifications** within the same **geographical area**, giving the product its **characteristics**

51 PDO for milk
(e.g. cheeses)



PGI

a product which qualities and characteristics are linked to its **geographical origin**

20 PGI for meat from herbivores
(lamb, beef)



Organic farming

Best **environmental practices**, and a high level of **animal welfare**

A specific INRAE multidisciplinary research program (METABIO) is dedicated to the scaling-up of organic farming
<https://metabio.hub.inrae.fr>



Label Rouge

A national sign, which refers to products with a **higher level of quality**

226 red-label in poultry broiler and egg sectors

➤ The interprofessions of the livestock sectors and their missions

Groups formed on the initiative of professional organizations recognized interprofessions by the administrative authority (ministry of agriculture)

- forecast production potential and help coordinate the marketing of products
- defend and promote French production sectors, in particular by communicating with the general public
- collect and share economic data on production and markets
- implement collective actions to anticipate and adapt to crises
- support research and participate in the discussions on its major orientations.....



➤ The different actors in research and development in France

INRAE: 85% of the French scientific articles in dairy and animal science



- Agronomy & Environment
- Plant Biology & Breeding
- Plant Health & Environment



- Animal Genetics
- Animal Physiology & Livestock System
- Animal Health



- Human Nutrition & Food Safety
- Food & Bioproducts Sciences
- Microbiology of Food Chain



- Ecology of Forests and Terrestrial Ecosystems
- Water Resources & Uses

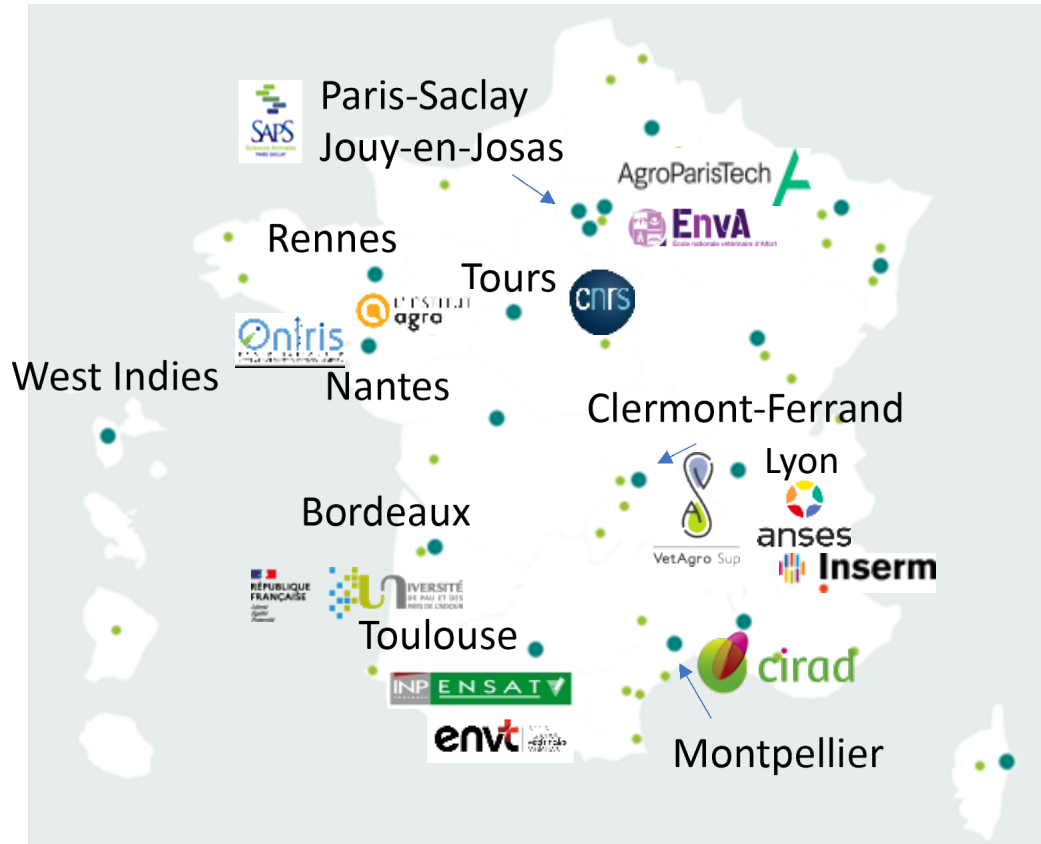


- Mathematics, Computer Sciences & AI
- Sciences for Action & Sustainable Development
- Economic & Social Sciences

3 scientific divisions dedicated specifically to animal science =

1600 INRAE permanent staff

➤ The different actors in research and development in France



... plus 1250 permanent staff from other major research (and teaching) actors in animal science:

other research organisms (CIRAD, CNRS, INSERM, ANSES, ...), universities, “grandes écoles” for engineers and veterinaries,

grouped in « shared research units » (‘UMR’)

➤ The different actors in research and development in France

The technical institutes: major actors of innovation in agriculture

19 technical institutes in France, among which 4 are specifically dedicated to livestock, horses and poultry

Their missions :

- Carry out applied research and development work to provide operational and sustainable solutions for farmers and value chains.
- Combine scientific skills and field expertise to inform the decisions of companies and public authorities
- Evaluate and facilitate access to innovation
- Transfer and disseminate reliable, objective references



National program for agricultural and rural development (PNDR)

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➤ The different actors in research and development in France

The **French Association for Animal Production**: a crossroads for all the players in the animal production sectors.



ASSOCIATION FRANÇAISE DE ZOOTECHNIE

French association for animal production

All AFZ members are EAAP members

The **GIS Avenir Élevages: a scientific interest group** bringing together 23 partners (research, higher education, development, industry, ...)



avenir élevages

Animaux - Territoires - Alimentation - Société

Visit their booth !



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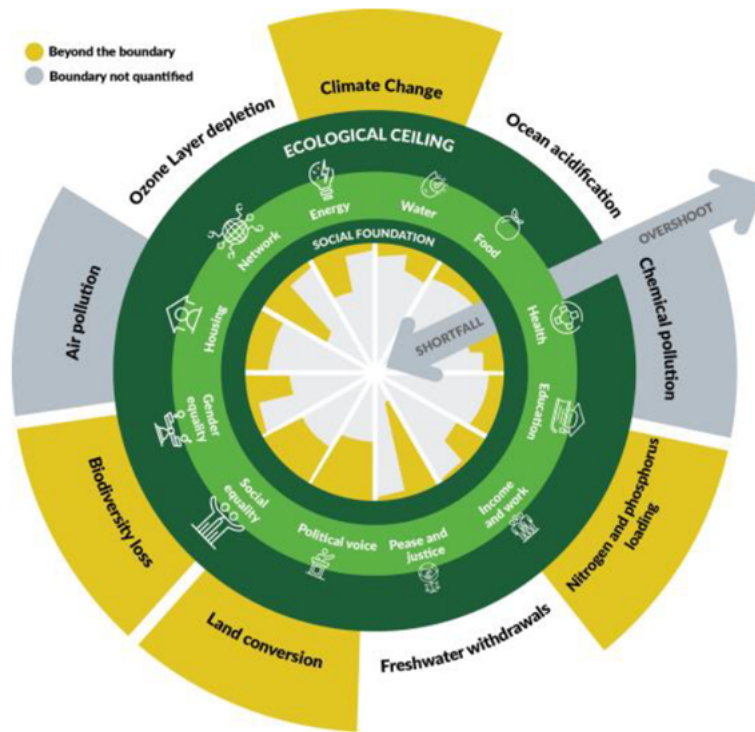
➤ The major challenges facing the (French) agriculture and the livestock sectors

Planetary boundaries

- climate, biodiversity, nutrients and overall food security

Different transitions occurring simultaneously

- Climate change:
 - a need to adapt and to mitigate
 - decarbonation of agriculture
- Dietary transitions that promotes a reduction of the consumption of animal products

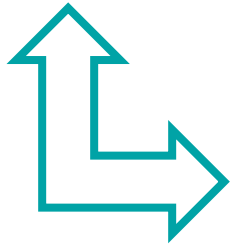


Safe and Just Operating Space
(from Raworth K., 2017)

➤ Between environmental urgency and food sovereignty / security

Among issues:

- Livestock: a need to reduce the numbers -> to what extent?
- Consumption of animal products in human diets: a need to better balance protein supply: **workshop on “Food & Feed for the Future” on Sept 1st in ISARA**
- Environmental services: a need of measures and metrics



Among ambitions:

- Reaching zero net emissions of livestock systems
- Improving practices and decisions for agroecology (diversification, links animal & plants, etc.)
- Reducing the work load

➤ Scientific objectives (SO) for livestock breeding: the INRAE perspective



SO 1 ← Meeting environmental challenges and managing associated risks

Climate change: mitigation & adaptation
Organisms adaptation

SO 2
Accelerate transitions to agro-ecological farming and food systems, taking into account economic and social issues

SO 3 ← A bioeconomy based on the sober and circular use of resources

CNP cycles in agro-ecosystems

SO 4 ← Promoting a global approach to health

Emerging infectious animal and zoonotic diseases

SO 5
Mobilizing data science and digital technologies to support transitions

➤ France's research priorities for livestock breeding: the INRAE perspective

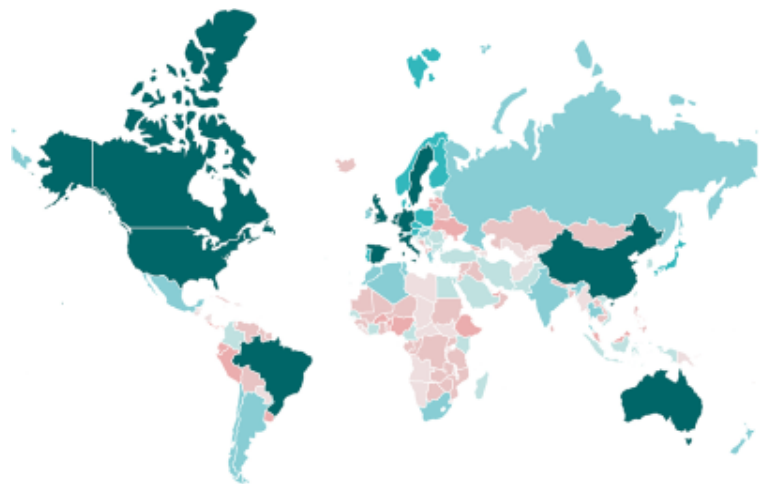
The (agroecological) transition of livestock farming (SO 2)

- Animal welfare and health
- Protein self-sufficiency
- Food, environmental and social services provided by livestock in a diversity of systems
- Strategies and public policies to maintain the economic value of livestock farming

➤ The INRAE perspectives declined within the scientific divisions for a disruptive research (some examples...)

- **Promoting animal welfare:** deciphering animal cognitive capacities, designing livestock systems that promote “positive-emotion”,...
- **Promoting positive environmental footprint** of livestock systems: « zero net emission » and enhanced ecosystem services
- **Preserving animal health within agroecological conditions:** individual robustness, including the role of the microbiotes and genetics
- **Promoting variability (including genetic diversity) instead of uniformity in key traits:** making value of individual complementarities and synergies,
- **Orienting genome expression in early stages (including epigenetics) :** promoting coadaptation between animals and their environment
- Understanding and modeling **genetic variability** in key traits for the agroecological transition of livestock farming

> An important international collaboration network



INRAE co-publications with others in more than 150 countries around the world

An important presence in European projects addressing INRAE's scientific priorities



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➤ International scientific cooperation

Examples of International Research Initiatives (IRIs)

- PREZODE (*Preventing Zoonotic Disease Emergence*)
- TSARA, *Transforming food system and agriculture through partnership research in Africa*

INRAE develops tools for international partnerships (all INRAE labs)

- International Associated Laboratories (LIAs)
- International Research Networks (2RI/IRN)
- Joint Linkage Calls (JLC)



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> Conclusion

International collaborations are one of our top priorities, and this congress is a great opportunity to stimulate them and forge new ones



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➤ Thank you for
your attention

