ANTICIPATING FUTURE GENETIC NEEDS FOR FRENCH DAIRY AND SUCKLER CATTLE SECTORS

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1/ Introduction

✓ Cattle industry is facing a number of challenges :

→ Will probably affect farming production systems

→ **Bovine genotypes** currently used may be **inadequate** for future farming production systems

✓ **Aim of the project :**

Define the bovine genotypes best suited to the evolution of farming production systems

✓ Scope of the study :

Dairy and suckler

France

20 years

Forecasting

2/ Materials and methods

Meetings with an interdisciplinary group of researchers with bovine expertise in various fields.
→ ***Results based on experts opinions***

Steps to build the scenario and define genetic needs :

1. Identify factors that will drive the evolution of production systems

2. Build a plausible evolution scenario for the cattle industry, broken down by French region

3. Determine the production systems associated with the scenario

4. Identify the characteristics of animals adapted to these systems

3/ Results – Driving factors of production systems and associated general genetic needs

Driving factors	Occurrence probability	Consequences
Reduction number of farmers	high	↘#farms, ↗#head/farm, ↗robotized milking, ↘grazing
New expectations regarding quality of life at work	high	↗robotized milking, ↘time dedicated for monitoring animals
Climate change	high	↘forage quantity and quality, ↗hyperthermia stress
Higher input costs	high	favour low-imput and efficient intensive systems
Development of beef from dairy	high	partial substitution of suckling beef for dairy beef
Disease emergence	high	depends on disease
Stricter standards for the transport of live animals	unknown	high consequences on the export of live animals
Carbon tax	unknown	weakens cattle production, especially suckler
Decrease in bovine products consumption	moderate	no major effect

Autonomous animals: absence of disorders, easy calving, …

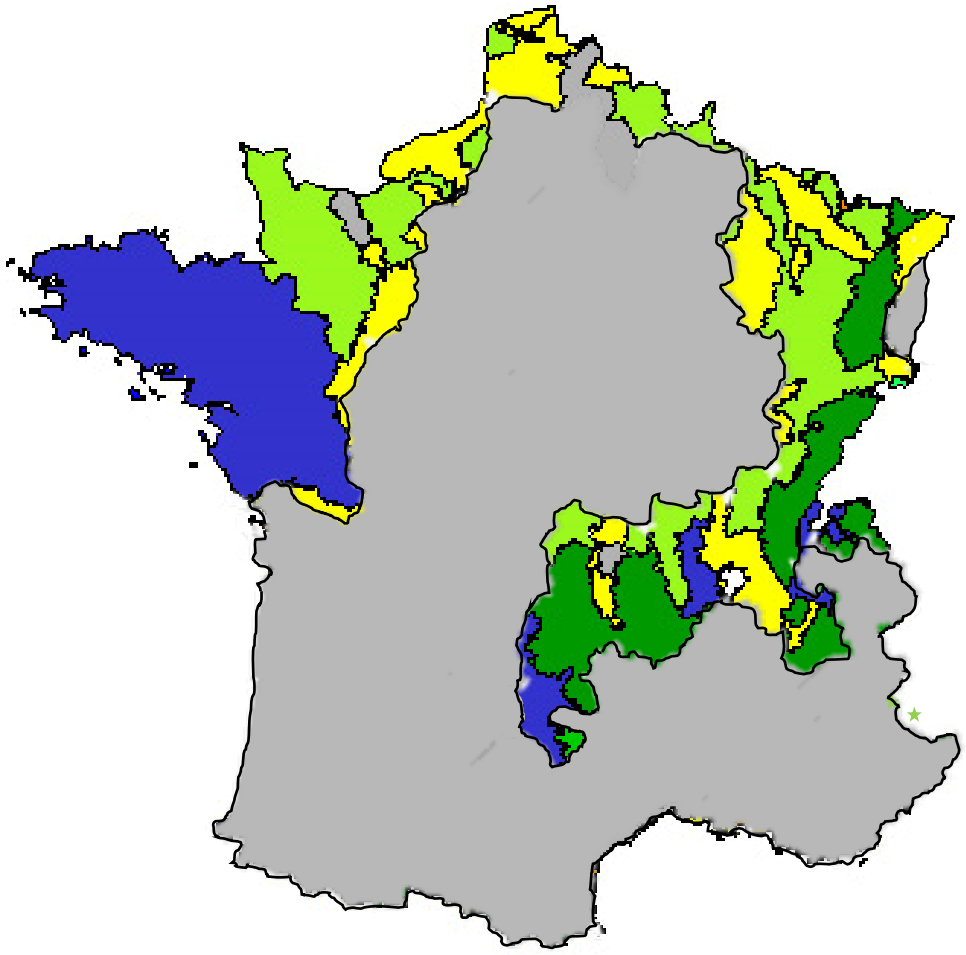
Feed efficiency

Hyperthermia tolerance: technical solutions (fan, fogging) might not be enough

Resistance to emerging diseases: too many uncertainties and genetic is too slow

Reducing methane emissions: increasing productive life, direct selection for methane reduction

5/ Results Dairy sector expected evolution



10% of milk production

Current situation:

Main areas	Topography	Tillables lands	Forage	Animal productivity	Area productivity
Rainy mountains	Mountain	*0-5%*	*100% grass*	*5000 L/cow*	*3000 L/ha*
Grassland / **Intensive forage** / **Mixed**	Plain and piedmont	*>50%*	*100% maize*	*10000 L/cow*	*12000 L/ha*

Evolution prognosis:

Rainy mountains :

PDO milk : production continuity, low evolution due to PDO specifications.
Non PDO milk : decline in favour of meat production.

Plain and piedmont :

Mix of systems + widening gap between extremes.

Extensive: self-sufficiency and sobriety to maximize margins. Maximum grasing, new seasonality in grass growth, decrease in stocking density, animals often outdoors, group calving, limited farm expansion.

Intensive: high-level production /animal. Mass production, robotized milking, methanization, farm expansion, animal housing, less grazing, more maize.

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Smaller size (grazing),
Robustness,
High ingestion capacity,
High fertility.

Long lactations,
Suitable for robotic milking.

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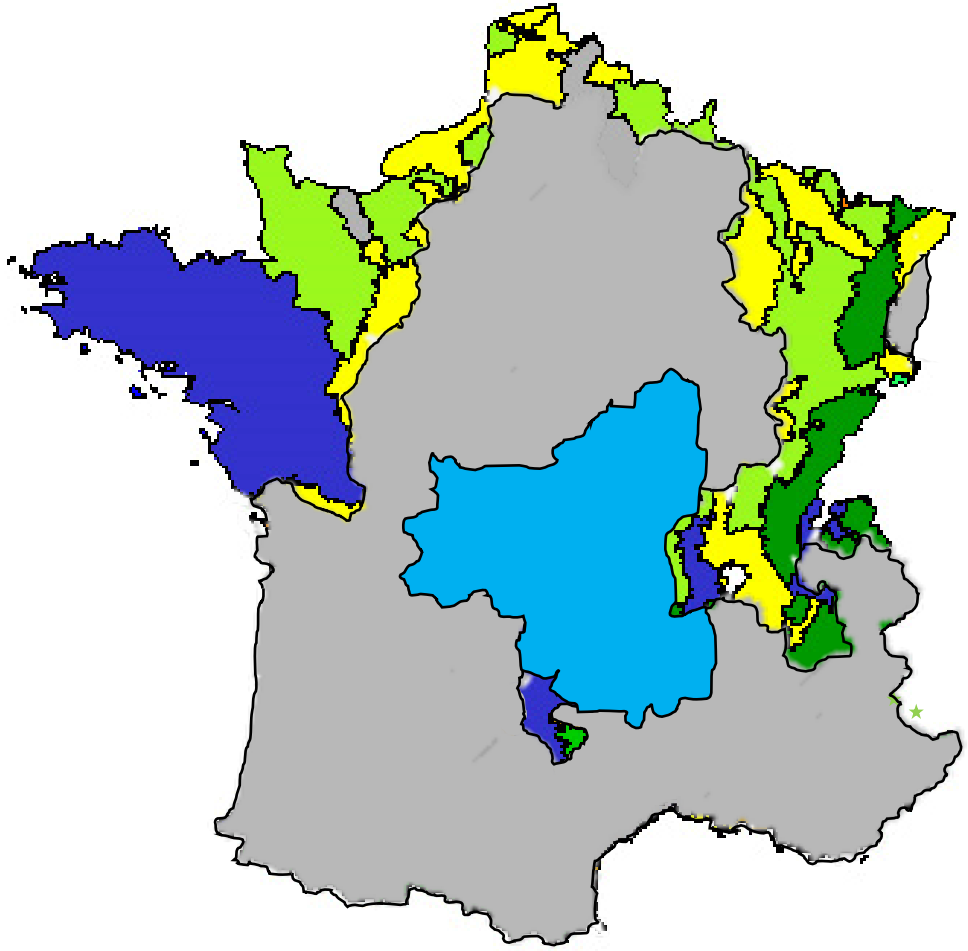

Separation calving and fattening phases

Cow-calf systems:

Extensive suckler cow-calf system: less-favored areas, grazed and conserved grass,

Beef from dairy: 25% of calves for meat, mostly slaughtered at calf age

Fattening systems:

Export for fattening in feedlots in Italy and Spain

Fattening in feedlots in France

Fattening with a grass-based ration in France

Evolution prognosis:

Cow-calf systems:

Lower stocking rates with climate change, fattening of beef from dairy, beef from dairy could represent 50% of bovine for meat.

Fattening systems:

Proportion of each system will depend on :

- Evolution of live animals transportation standards
- Climate change effect on forage production in Italy and Spain
- Input prices

5/ Results suckler sector expected evolution

Easy calving and good calf vitality
Milk production

Early fattening (fat deposit),
Size : smaller for butcher pieces, larger for the minced meat industry

Early fattening (fat deposit),
Smaller size (grazing, butcher pieces),
High ingestion capacity,
Grass-fattening capacity,
Robustness.

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7/ Conclusion

- Effects of certain driving factors on production systems are **difficult to predict** due to their nature (new diseases, regulation evolution, …) while others are easier to anticipate (reduction number of farmers, climate change, …)

- Still a **diversity** of production systems + **new systemic constraints** (climate change, increase inputs costs, emerging diseases)

- Genetics is one of the levers for adaptation, and some new characters will become potentially important (**thermotolerance, methane reduction, autonomous animals, dairy : long lactation, suckler : early fattening, grass fattening capacity, milk production**).

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