High output farming systems in Europe:

the French case

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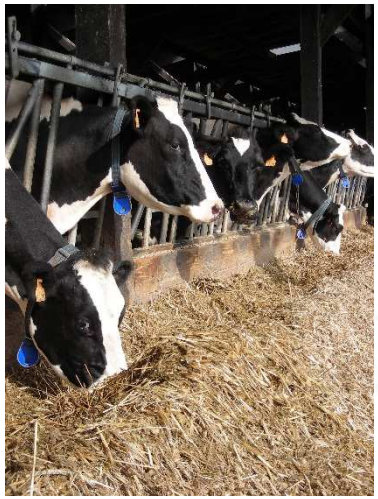
High output dairy farming systems: France ?

- Introduction
- Source of the data
- The huge diversity of bovine dairy production systems in France
- French dairy systems aim for self sufficiency, not productivity per hectare
- Avoiding negative outputs (environmental effects) by limiting inputs
- Discussion and Conclusion

Today's topic = bovine dairy farming systems in France



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Introduction

- **What is a high output dairy farming system?**
  - Not an issue in France : should we accept this presentation ?
- **Diversity over the territory: climate, soils, altitude, combinaisons of productions**
  - Variations in productivity, average far below our neighbours
- **Environmental regulations in major dairy areas:**
  - Limiting milk produced per hectare

Added value
Self sufficiency
Ecological services

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Origin of the data used to describe current situation

- General Agricultural Census RGA 2010
- National Farm Network and IFCN
- FranceAgriMer (quota management till 31/3/2015)
- FNSAFER for land prices
- European projects such as Dairyman…

See references
Contact the authors

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Dairy sector in France

- 2013/14: 23.29 Millions l milk
- 68,224 farms (341,000 l per farm)
- 70% plains / 30 % mountains and piedmonts

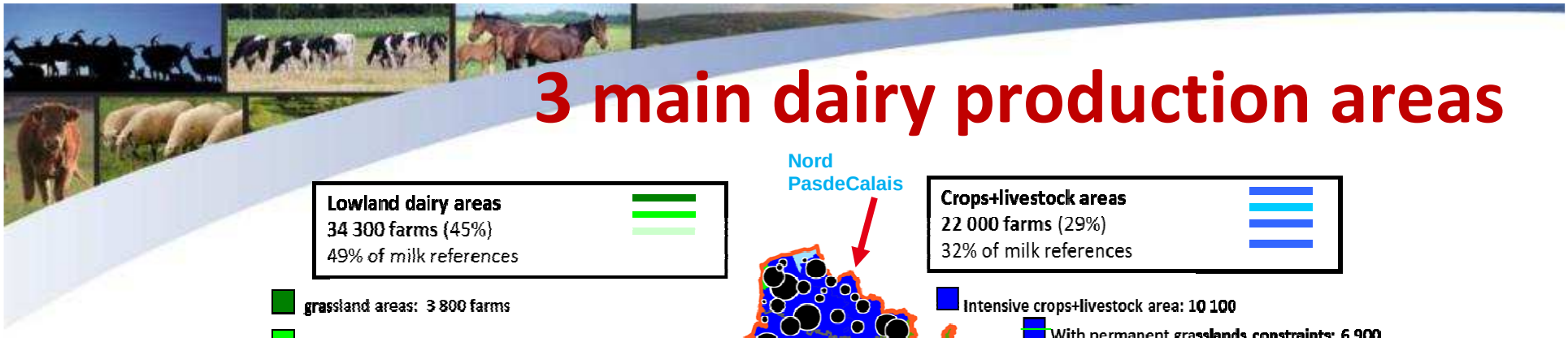
geography

history

sociology

Huge diversity in production systems

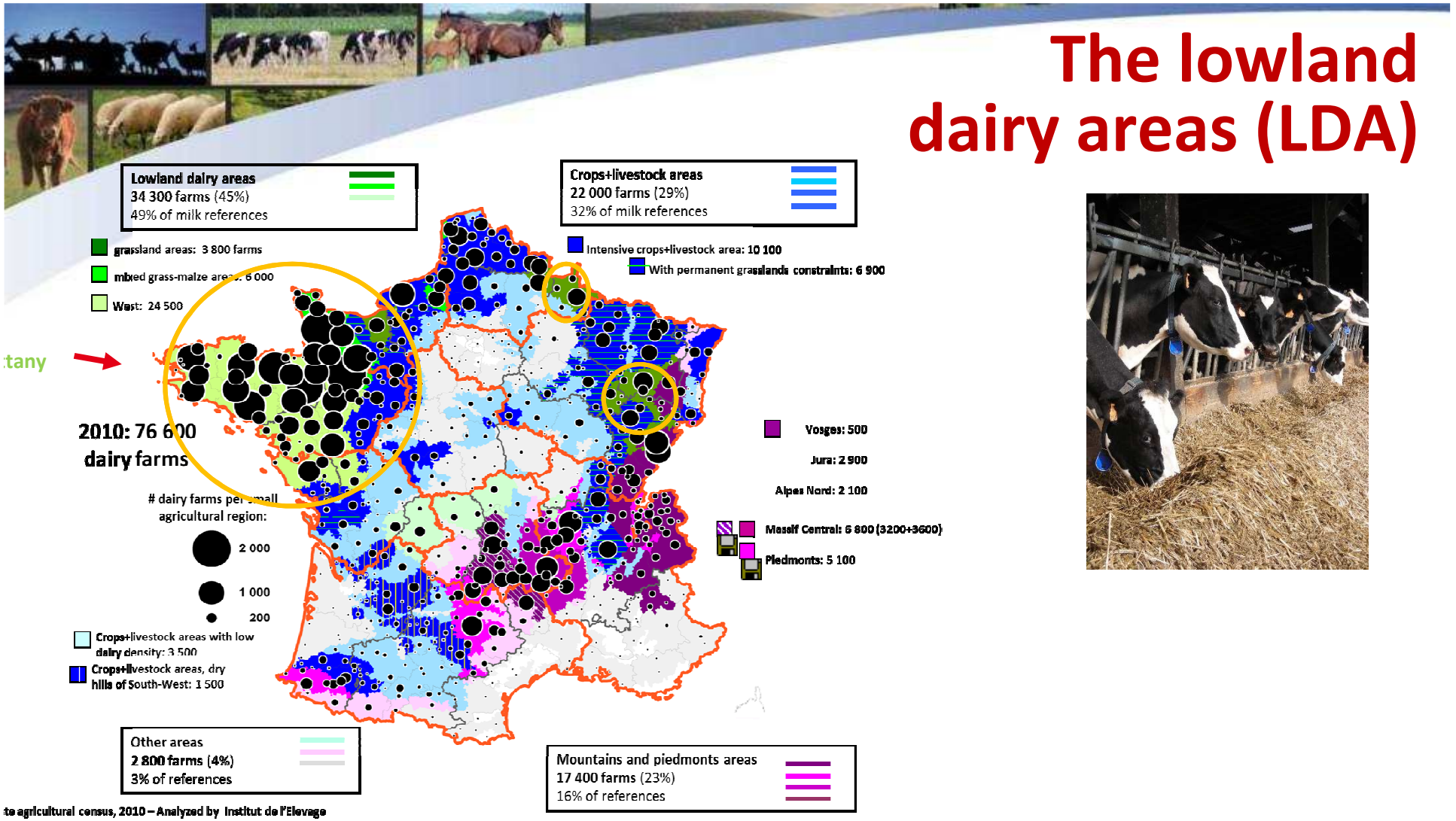
classification



3 main dairy production areas

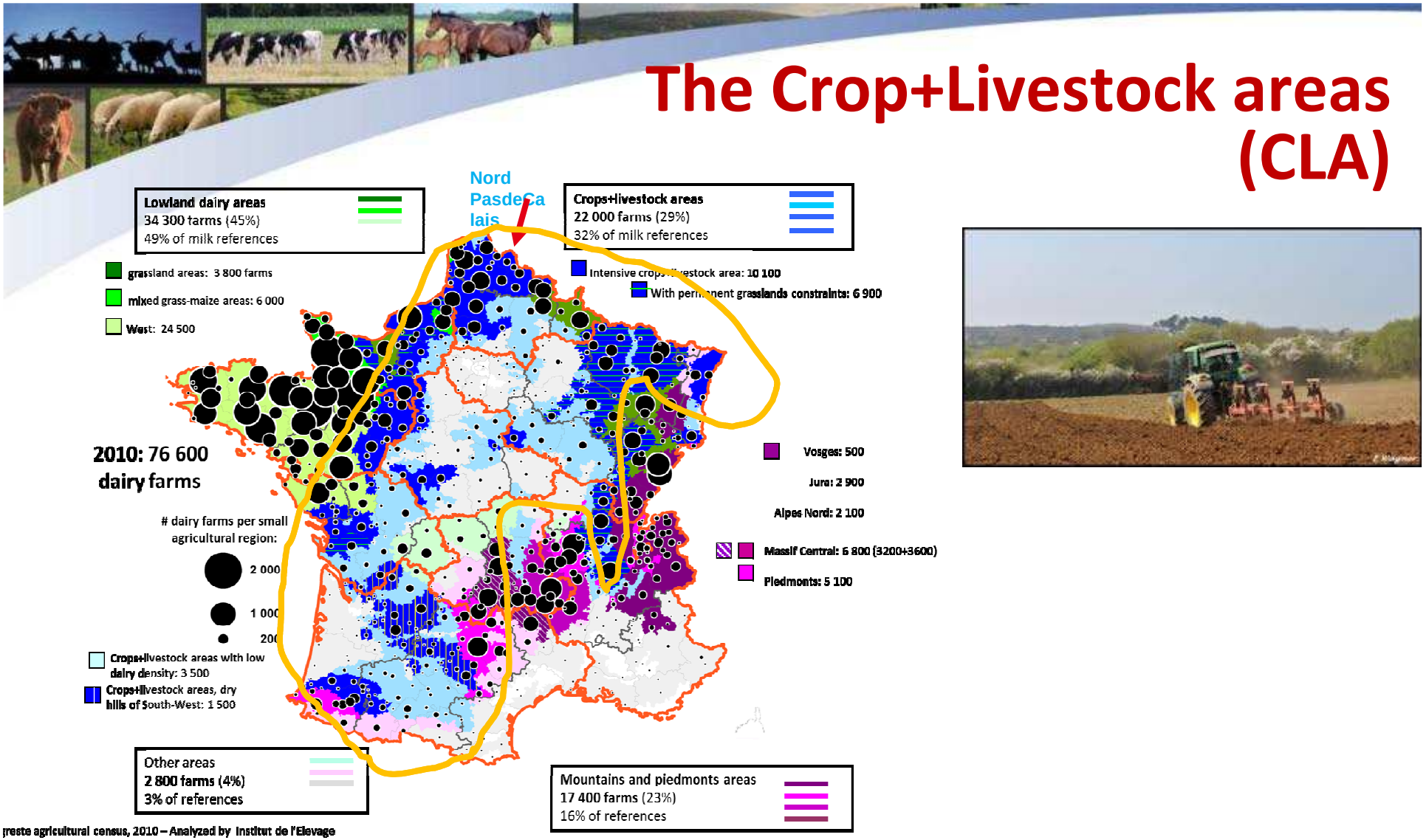
Source: Agreste agricultural census, 2010 – Analyzed by Institut de l'Elevage

The lowland dairy areas (LDA)



zone	# farms	Agr.area (ha)	Forage area (FA, %)	Maize silage % FA	Stocking rate (LU per ha)	# cows	Quota per farm (*1,000 l)	Quota per cow (l)	Quota per ha AA (l)	Quota per ha FA (l)
Lowlands dairy areas	34,369	89	74	30	**1.6**	54	351	6,500	**3,900**	6,600

The Crop+Livestock areas (CLA)



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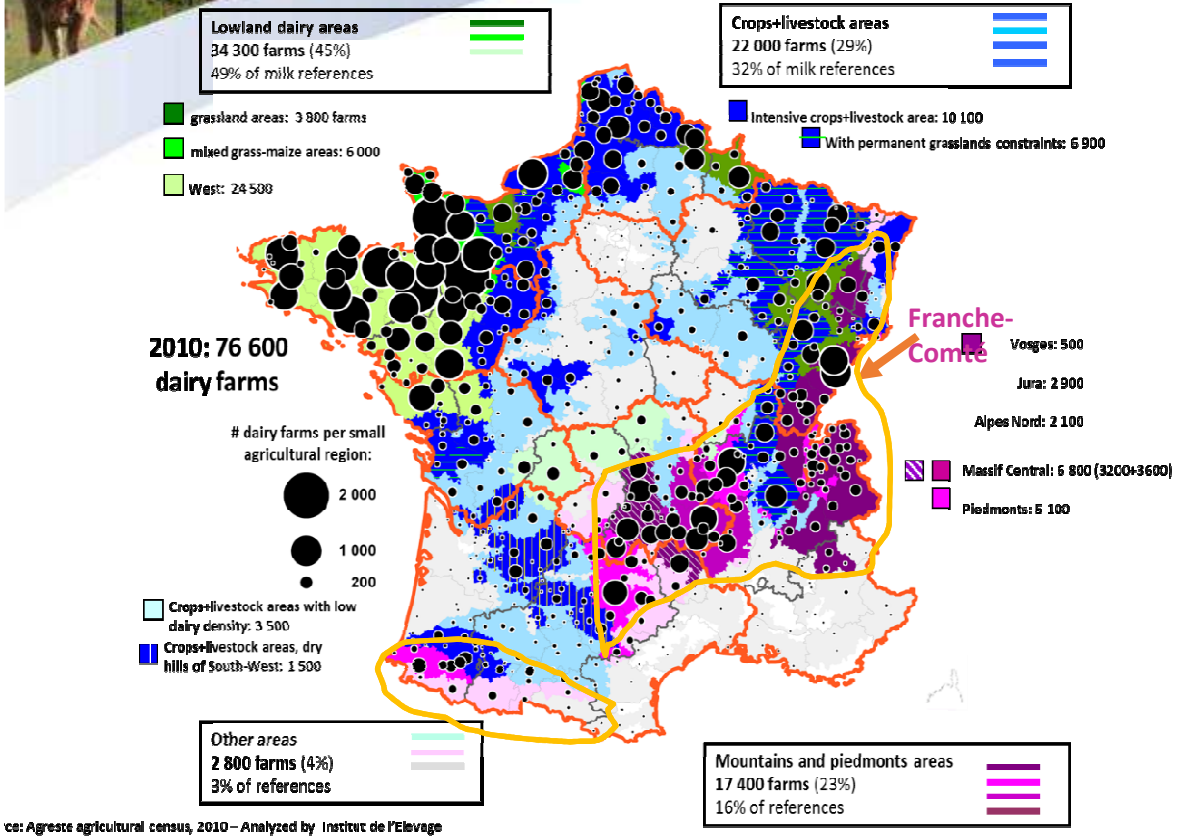
Crops+livestock areas	22,044	119	51	28	**1.6**	51	361	7,100	**3,000**	7,400

The mountain+piedmonts areas (MPA)



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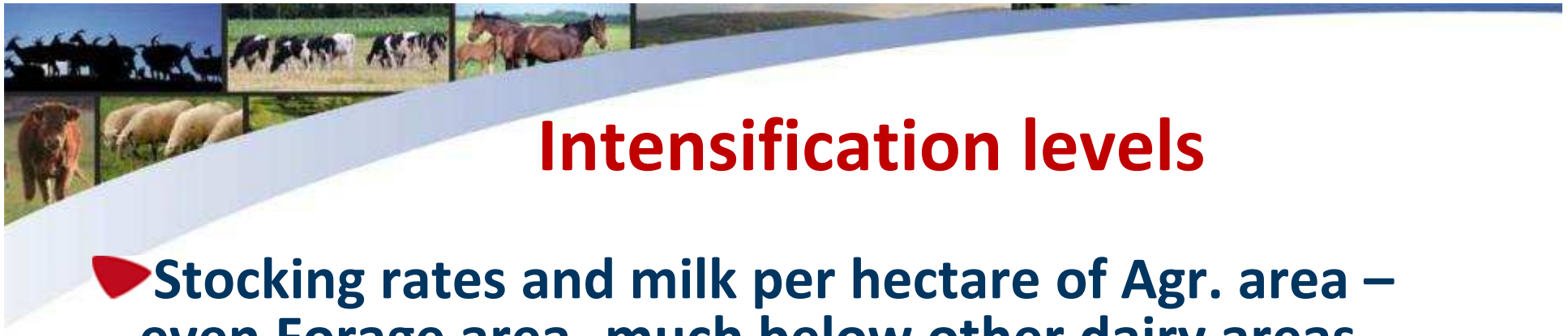
Mountains +piedmonts	17,444	75	91	5	**1,0**	38	221	5,800	**2,900**	3,700

Main characteristics of the 3 dairy "Frances"

LDA	CLA	MPA
Small farms: pig+poultry as complement	High quality of soils CROPS	Lower deliveries per farm
High farm density	Low farm density	Moderate farm density
Grass+ maize N surpluses, nitrates in water, strong regulations	Maize silage, high productivy of animals	High added value cheese (PDOs) Grass based (hay)

- In average: 3,400 l milk produced per ha Agric. Area, 5,800 l per ha Forage Area



Intensification levels

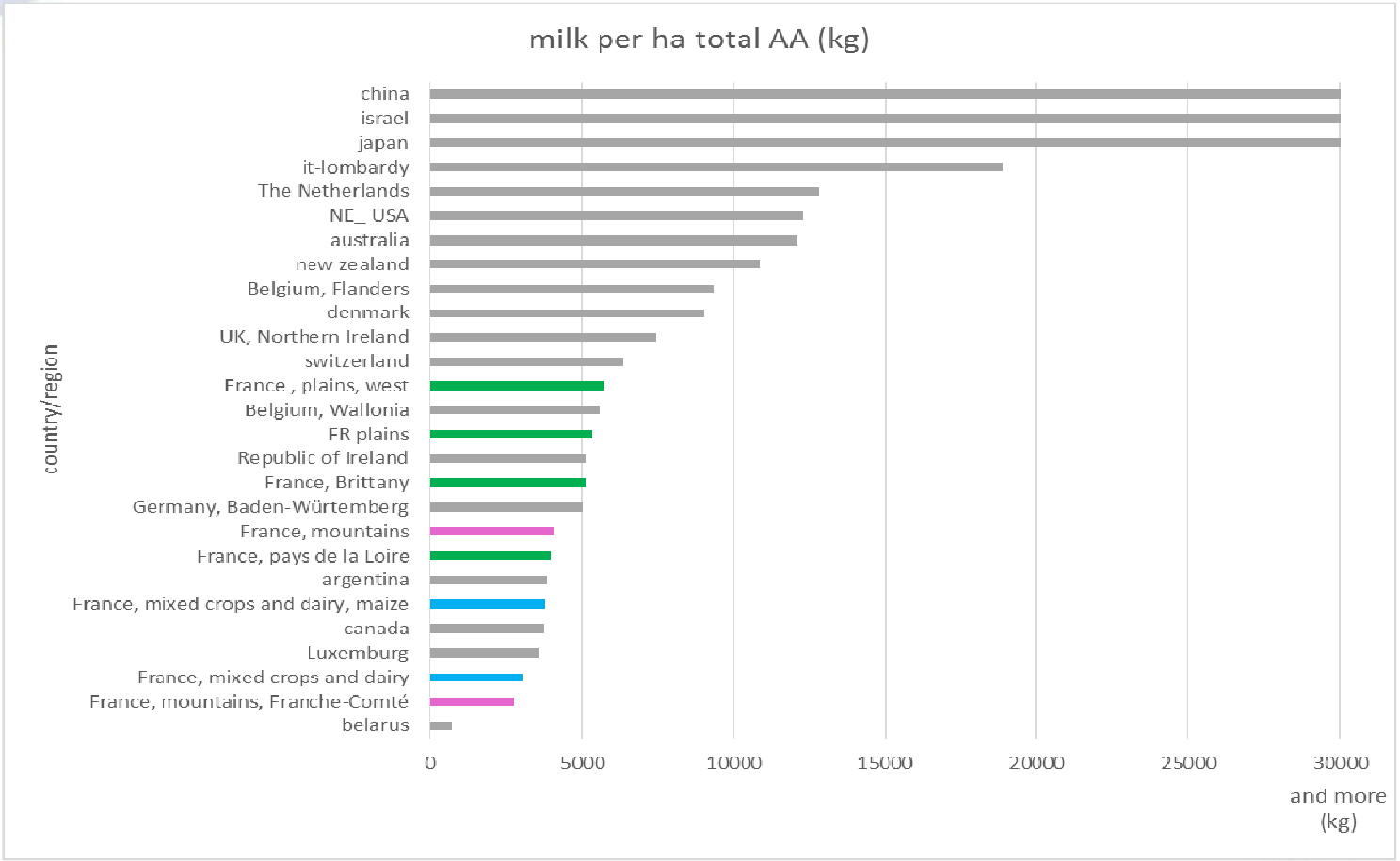
- **Stocking rates and milk per hectare of Agr. area – even Forage area- much below other dairy areas**

Intensification levels of some EU regions

Region Dairyman	Belgium, Flanders	Belgium, Wallonia	France, Brittany	France, Nord Pas de Calais	Germany, Baden-Würtemberg	UK, Northern Ireland	Republic of Ireland	Luxemburg	The Netherlands
Stocking rate (LU per ha)	2.6	1.9	1.4	2.0	1.7	2.1	2.3	1.3	3.0
Milk per ha forage area (kg)	15803	9,948	7,224	10,736	10,061	11,958	8,480	6,519	19,735
Milk per ha agricultural area (kg)	13979	5,870	5,884	5,291	7,078	10,743	7,501	3,821	19,733
N min input per ha AA (kg)	120	95	41	121	79	145	183	86	105

Intensification level per hectare of specialized dairy farms in some European dairy basins, data for the 128 pilot farms of Dairyman project

Intensification levels



Source: IFCN data, 2013

Relatively "low" land prices

- **Average cost: 5,750 € per ha in 2013.**
  - 2,350 € in mountains, up to 12,340 in Nord-Picardie (CLA)
  - Farming has always been a tool for land management and jobs in France: the state has a real agricultural policy
  - Strong link between quota and land till 31/3/2015. No quota market, no leasing, no renting possible.

From milk per hectare to self sufficiency

- **Thus the target is NOT**

to maximise milk produced per hectare

but

. maximise milk produced from home grown forages+crops,

. increase self sufficiency and the link between territories and dairy products.

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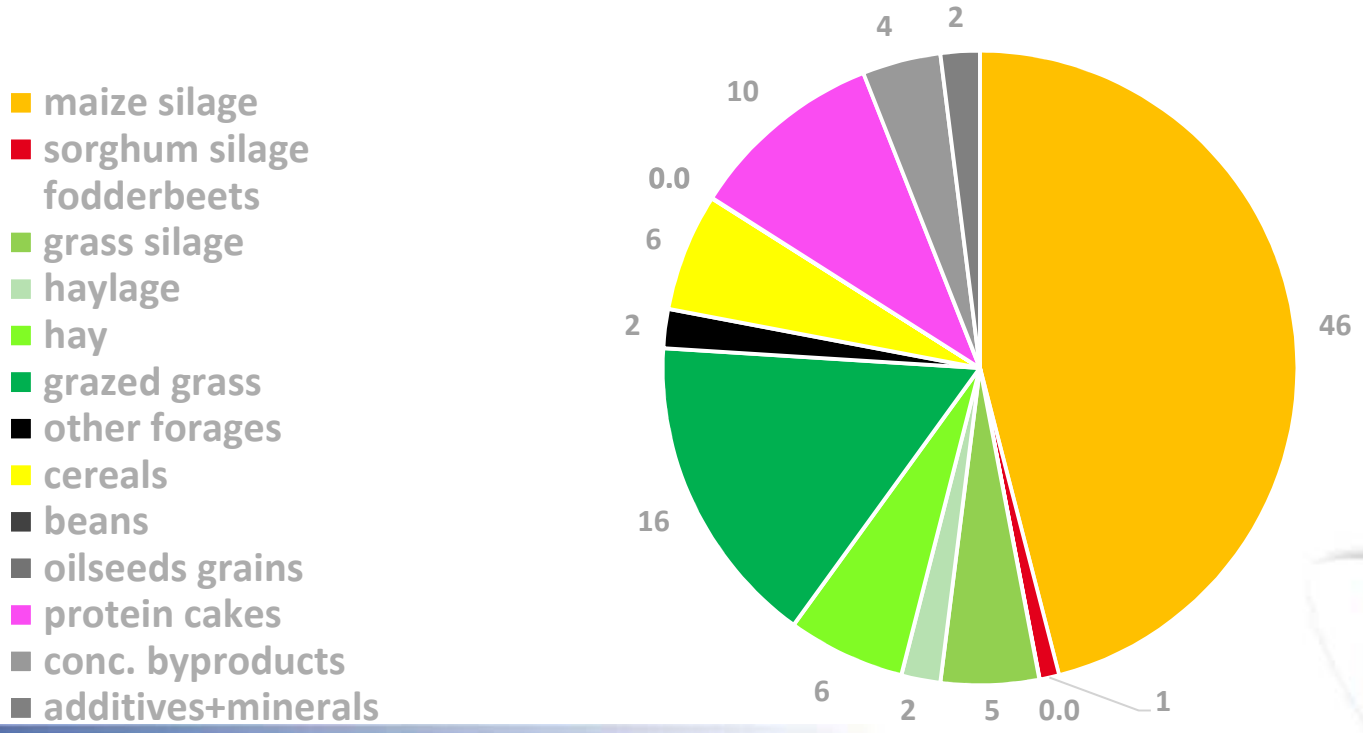
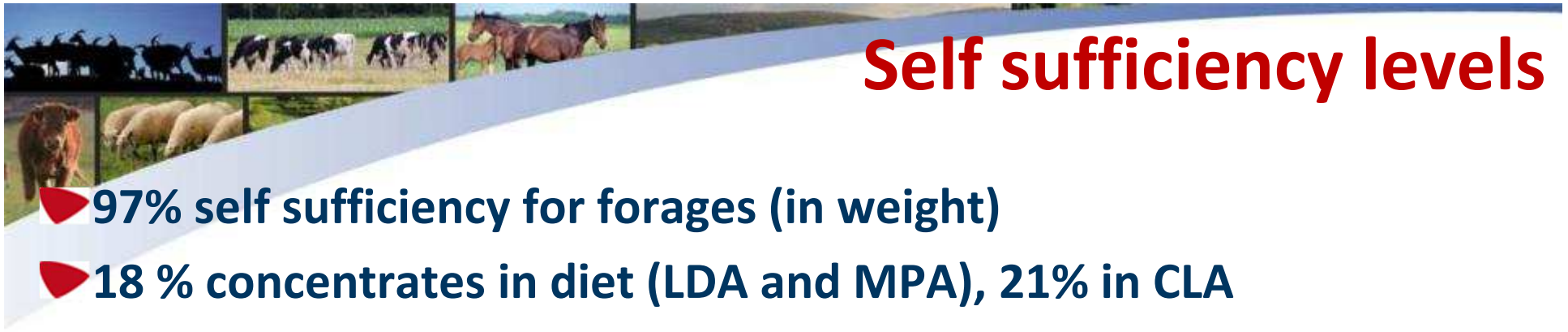
A strong link to the ground

High self sufficiency in forages; high quality

- Large resort to **maize silage** (except in mountains) **46%**
- …..and grass (all forms) **29%** of the diet of a dairy cow.
- Forages = 78% DM intake of French dairy cows (6,9 t DM per yr)
- ~90% of dairy cows "grazing"





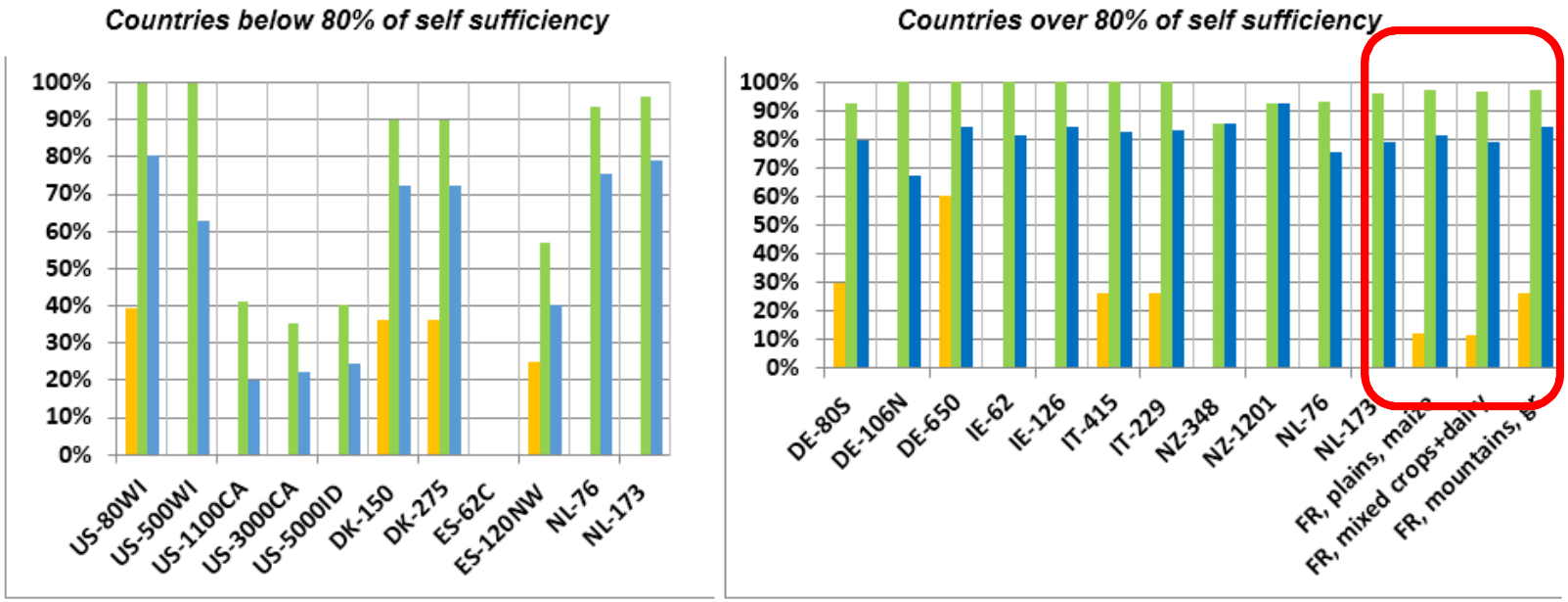
Self sufficiency levels

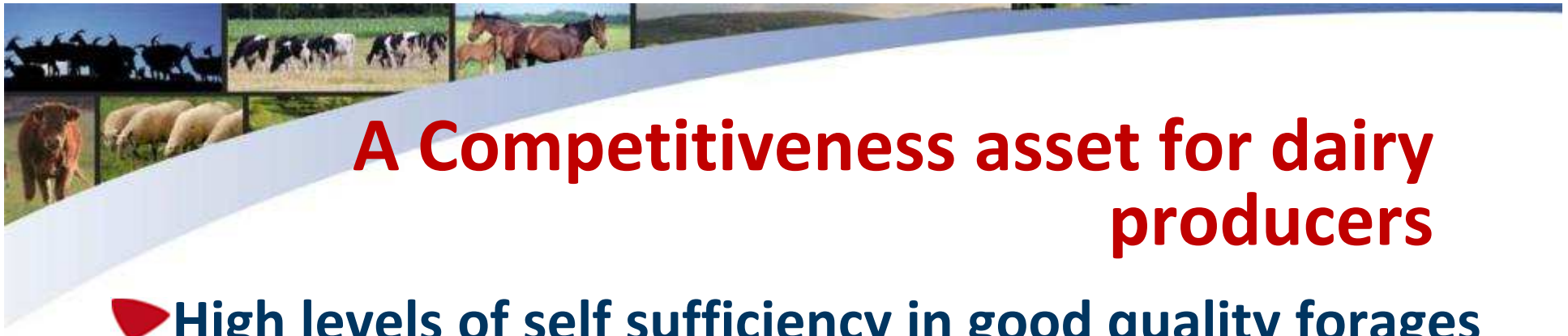
- 97% self sufficiency for forages (in weight)
- 18 % concentrates in diet (LDA and MPA), 21% in CLA
- Weak point: self sufficiency in protein concentrate at farm level (but at national level: rapeseed limiting resort to soya)

	dry matter self sufficiency (%) for:		energy self sufficiency (%) for:		protein self sufficiency (%)	
system	total diet	Concentr.	total diet	Concentr.	total diet	Concentr.
lowlands, maize	81.6	12.0	79.8	13.8	57.7	4.8
mixed crops+dairy, maize	79.0	11.9	77.4	13.6	53.2	5.1
mountains, grasslands	84.4	26.3	82.0	29.3	74.1	15.9

High feeding self sufficiency levels compared to neighbours

IFCN-IDF comparisons: France in group of high sufficiency countries for feeding of dairy cows





A Competitiveness asset for dairy producers

- High levels of self sufficiency in good quality forages (maize, grass)
- Possibility in plains to grow energy concentrates (cereals)
- Relatively high availability of land at low price
- The best way to limit feeding cost – production cost

➢ Milk produced from forages per hectare or autonomous milk per hectare
rather than "milk per hectare"

Which factors are correlated to low levels of self sufficiency?

- High share of maize silage: requires high levels of protein concentrates (French rapeseed, oversea soya)
  - Keep the right balance between grass and maize in system
- Negative correlation between self sufficiency in DM and proteins and:
  - stocking rate, production per cow and concentrate per cow

> - But also N inputs, N mineral balance, impacts on environment

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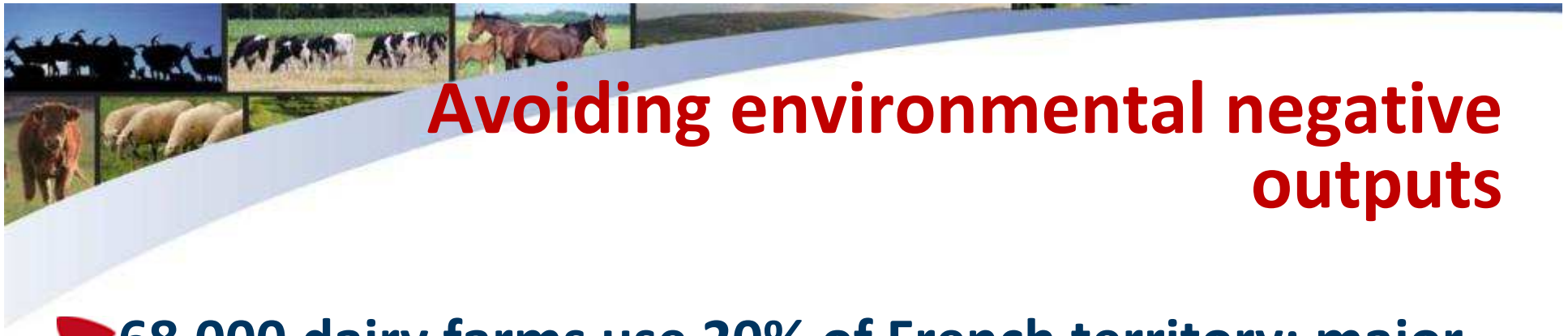


Avoiding environmental negative outputs

- **68,000 dairy farms use 20% of French territory: major role towards environment**
  - Limit pollution risks to air and water
  - Preservation of biodiversity
- **Eutrophication potential due to N leaching and P run-off (inputs of organic and mineral fertiliser)**
  - French state: 44% of territory in vulnerable zones in EU Nitrate Directive (1991)
  - In many LPA: **max of 170 kg organic N per ha, 210 kg tot N per ha**
  - More restriction in green algaes basins (Brittany): 140 to 160 kg tot N per ha
  - No derogation to apply more N on grasslands

Environmental regulation limiting stocking rates *de facto*

In lowlands

- Before 2013 average cow officially producing 85 kg N per year (now: from 95 to 110)
- Followed by 0,3 replacement LU
- Stocking rates automatically limited to

  170 / (85*1,3) = 1,54 LU per ha

In mountains

- Stocking rates limited by potential and grants system (<1.3 LU per ha)

Limiting N inputs and stocking rates to limit negative outputs

First mitigation targeted in 1990's: N leaching.

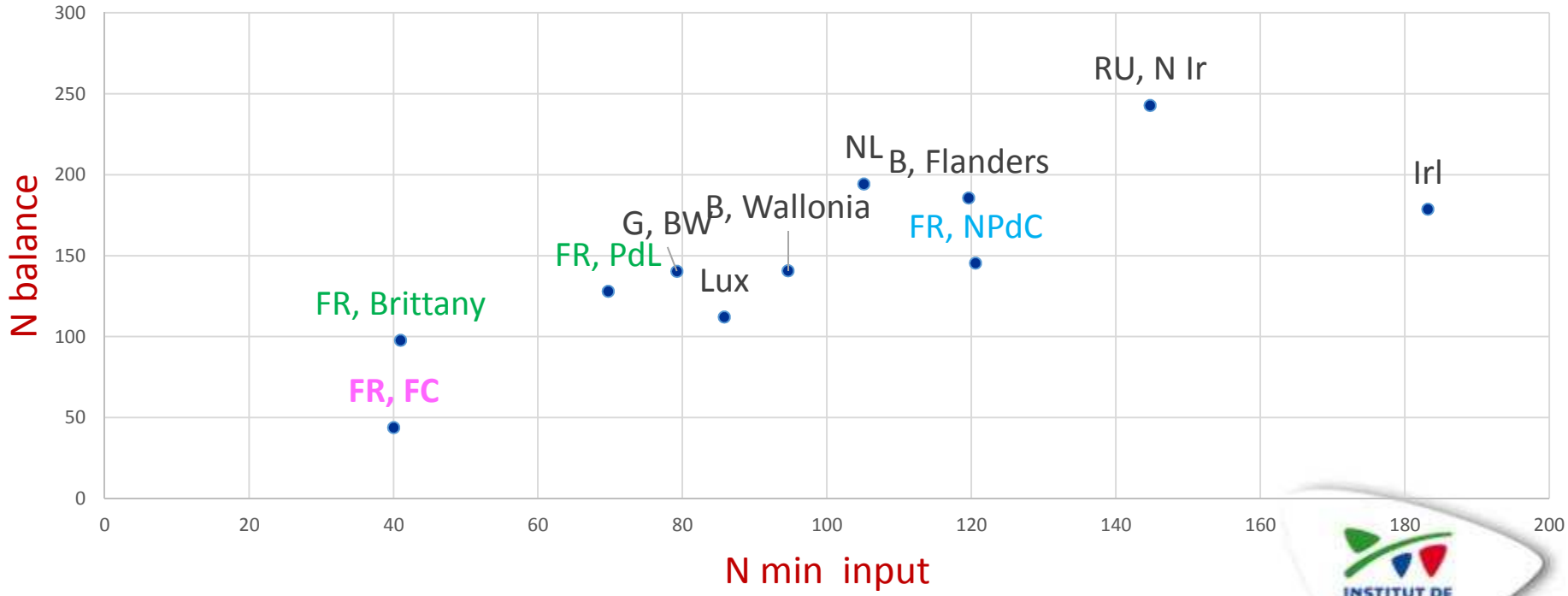
- Low levels of N inputs per hectare in French farms
- Low N balances and limited risks of leaching

Region Dairyman	Belgium, Flanders	Belgium, Wallonia	France, Brittany	France, Nord Pas de Calais	Germany, Baden-Würtemb	UK, Northern Ireland	Republic of Ireland	Luxemburg	The Nether lands
Concent. per kg milk (g)	170	247	121	216	245	302	155	216	232
N min input per ha AA (kg)	120	95	41	121	79	145	183	86	105
N Balance per ha (kg)	186	141	98	145	140	243	179	112	194

Less N inputs means a lower N balance

Aim: a low mineral balance

- French authorities limit N inputs to reduce N balance and thus impacts on water



Less N input and balance mean less milk per hectare

- **Aim: a low mineral balance**
  - Moderate level of milk per ha and stocking rate
  - But also low level of grass valorization (average: 4 to 6 t DM per ha)
  - **A limit to development of "high output production" systems**

Production per hectare or global added value per hectare ?

- **Agricultural practices impact biodiversity and landscape**
  - Dairy farming monitoring areas with agro ecological services
  - French state support through low stocking rates
  - Other services provided: landscape, limitation of snow avalanche risks, maintenance of ski slopes and tracks…
- **Production services per hectare limited (milk) but more jobs created in less intensive areas**
  - Franche Comté: 1 farm job creates 7 other jobs in dairy chain through PDO cheese chain
  - Highest farms replacement rate in France (1/2 compared to 1/4 or 1/7)

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Keyword = feeding *self sufficiency*

French production systems keep a strong link between land and dairy production

- Low levels of inputs and outputs per hectare: land widely available, moderate price, environmental regulations

Production systems based on home grown forages and crops SELF SUFFICIENCY

- Maintenance of high added value products in piedmonts and mountains.
- Resilience of forage based production systems to face economic hazards
- Economic and environmental efficiencies in lowlands (low feeding cost)

French weaknesses

- No proper land management (one county diseappearing every 10 years)
- Quota system with link quota-land has kept milk in 92% of French communities but created land fragmentation at farm level: problem for grazing
- Under use of production potential of grass
- No N derogation in western France limits milk increase after quota

Does France have "high output dairy systems" ?






Moderate levels of milk per hectare due to:

- Environmental regulations where high soils potentials (Western France)
- Limited production potentials in mountains (Franche Comté)
- High share of non forage area in mixed crops+livestock areas

Conclusion

- France has a high potential to increase outputs of dairy production
- Not only milk production per hectare but also other services
- Main risk: lack of dairy farmers




Thank you for your attention

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