LIFE CARBON DAIRY
Improving the dairy farm efficiency with the milk Carbon Footprint assessment

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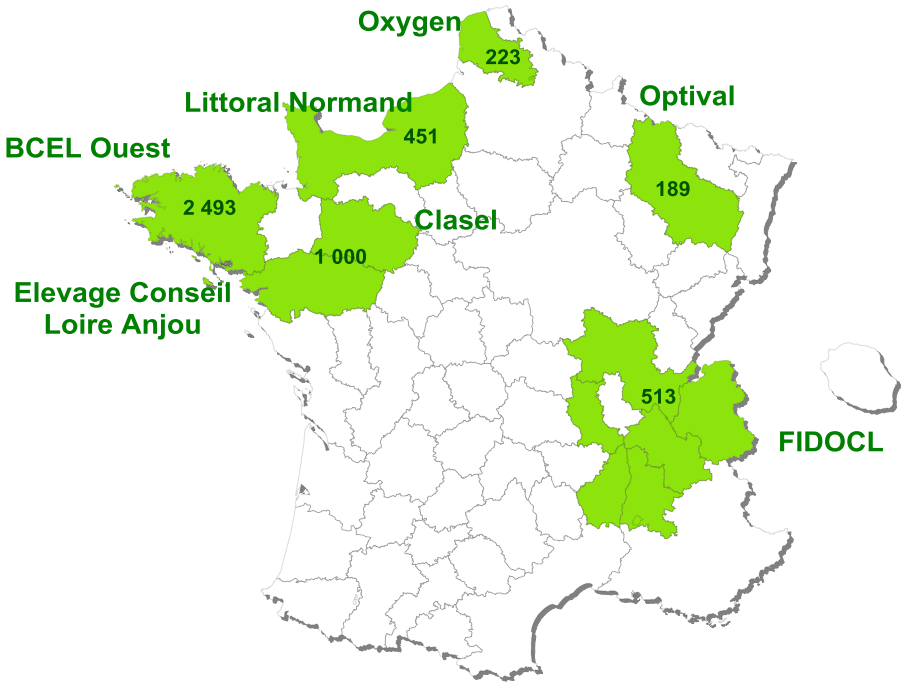
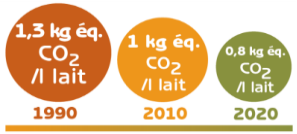
LIFE CARBON DAIRY initiative

To reduce by 20% the milk carbon footprint over 10 years
To raise awareness farmers





- ➔ 5 years : 2013 - 2018
- ➔ 14 partners
- ➔ 6 regions
- ➔ One national tool
- ➔ 210 advisers trained
- ➔ 4 869 farmers involved
- ➔ Two CF evaluation : year 2013 & 2016 for 2314 farmers

CAP'2ER®

GHG emissions and carbon sequestration

LCA analysis at farm scale

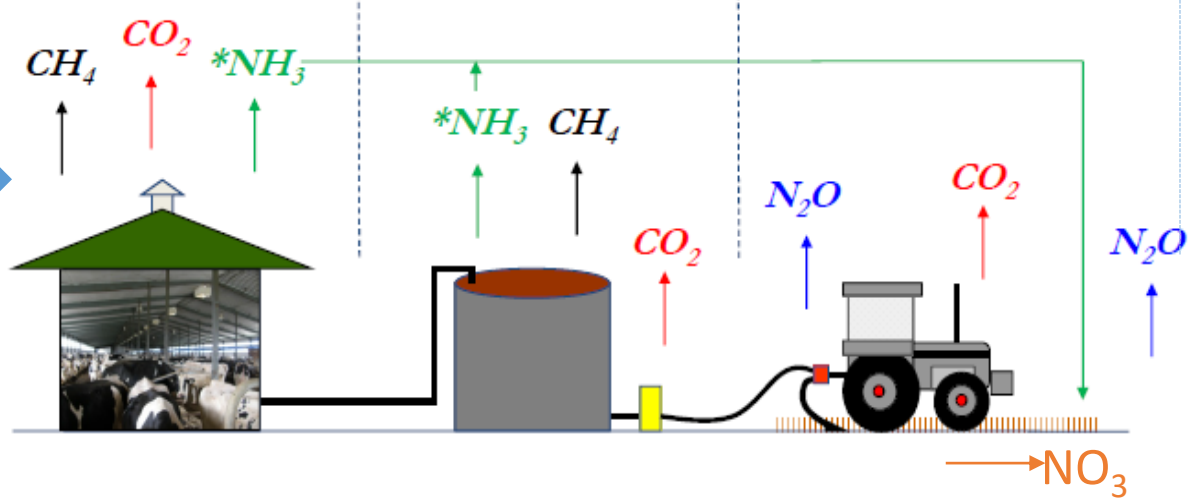
Barn & feeding management

Manure storage management

Crop management

Carbon sequestration

Inputs



CO_2

➔ **Development of the CAP'2ER tool to assess farms**

CAP'2ER

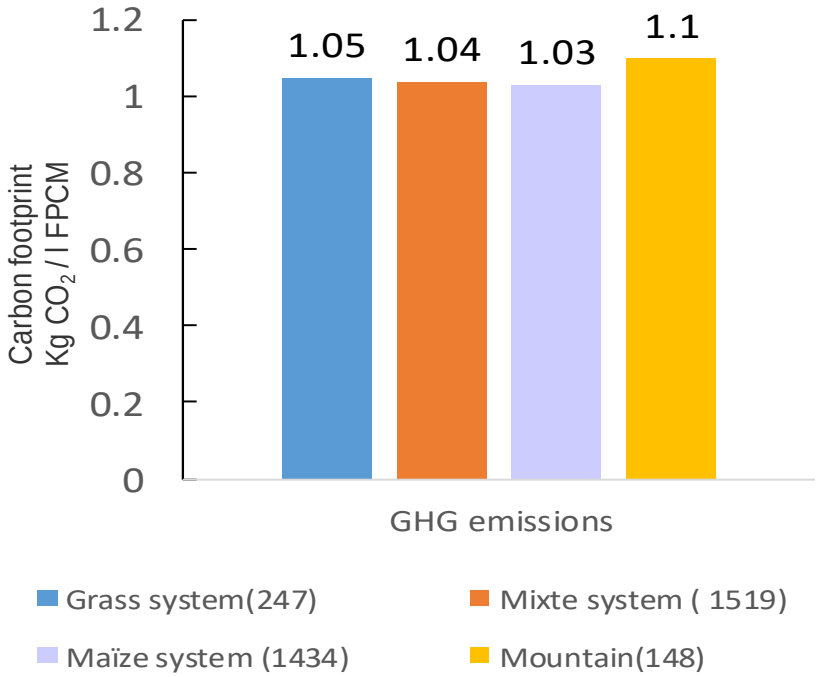
General Farms characteristics – Year 2013

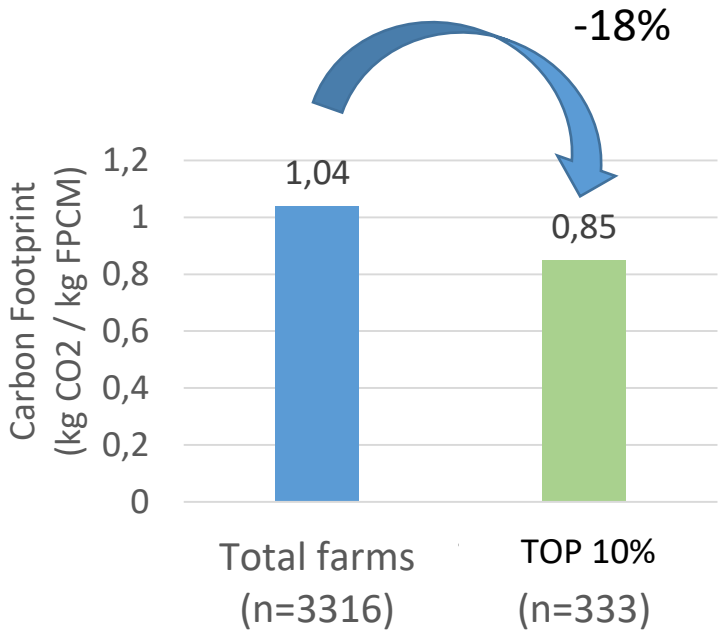
n=3 348	Mountains N=148	LOWLAND Grass N=247	LOWLAND Mixte N=1519	LOWLAND Maïze N=1434
Farm size- ha	112	127	98	87
Cash crop - ha	11	28	28	31
Forage area- ha	101	99	70	56
% Maize / forage area	8%	12%	32%	49%
Number of milking cows	55	64	61	62
Milk production per cow, liter FPCM/cow/year	6 320	6 590	7 460	7 800

➔ Farms classification according to localization and part of maïze in the forage area

GHG emissions and carbon footprint

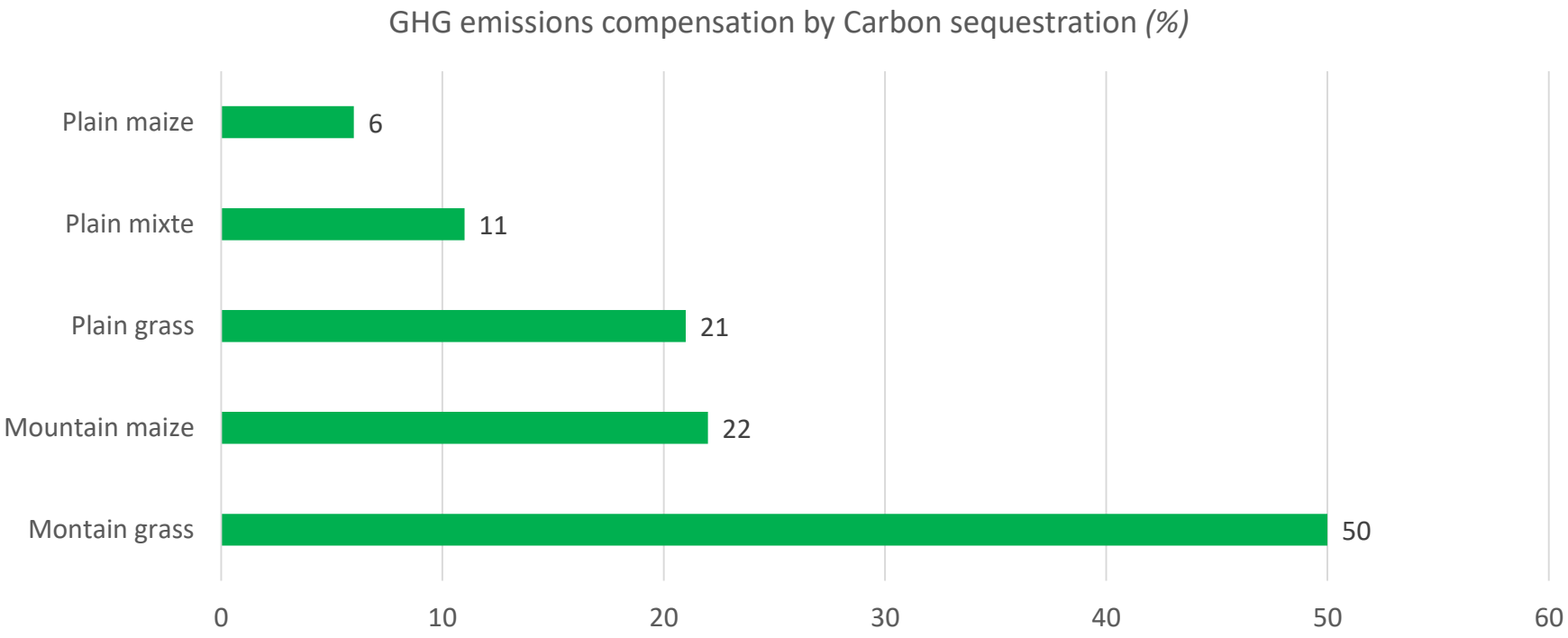
- No difference between production systems…
- but high difference between efficient and less efficient dairy farms





➔ **There is room for progress to be made in every production systems**

Carbon sequestration



➔ **There is a large variation between production system**
➔ **The carbon sequestration compensate GHG emissions by 11%.**

Correlation between farms' practices and carbon footprint

NO CORRELATION

Parameter	Correlation with GCF
Number of cows	0.002
% Maize / Total area	-0.027

CORRELATION

Milk production per cow, liter FPCM/cow/year	-0.436
Age at first calving, months	0.288
Replacement rate, %	0.079
Concentrate rate, g/l milk	0.271
N-fertilizer use, kg N/ha dairy herd	0.064

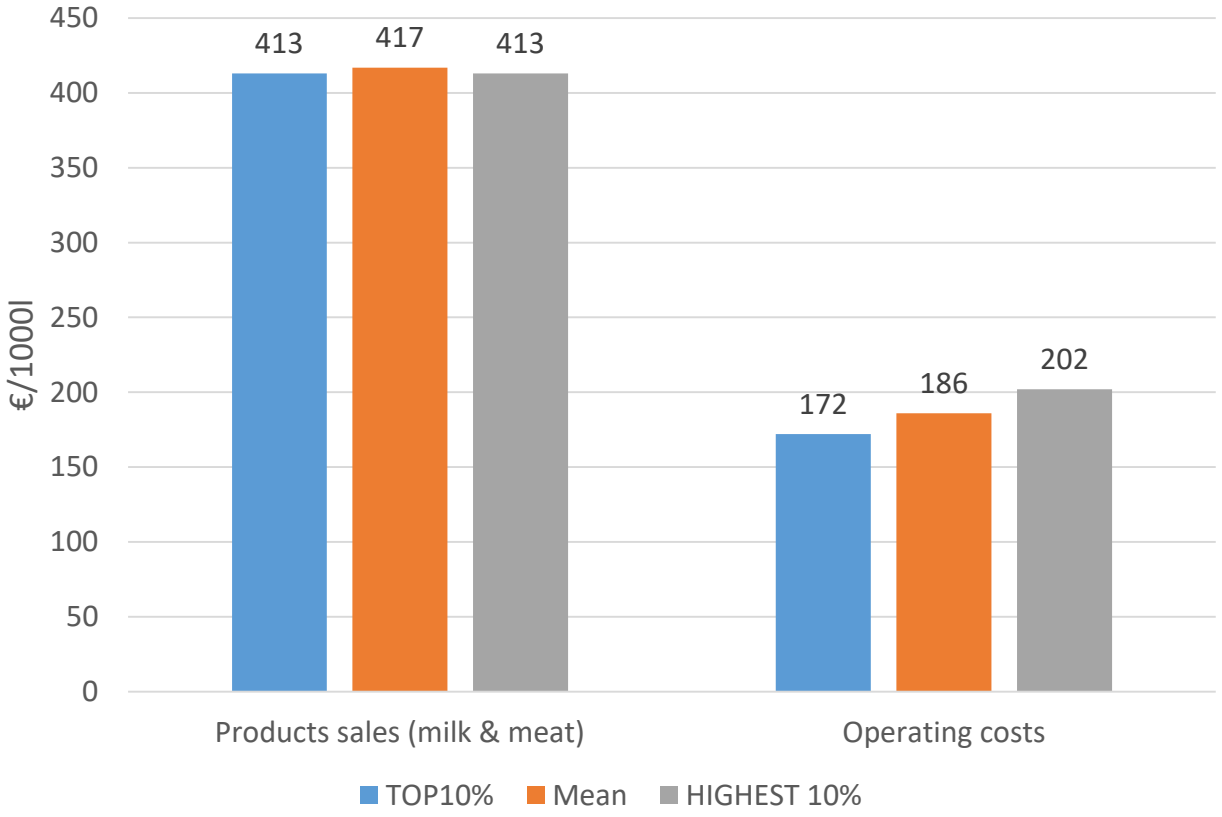
Farms practices and carbon footprint of the lowest 10%

	Mean	TOP 10%
Area dedicated to the dairy herd - ha	64	56
Total milk sold – l FPCM	432	440
Number of cows	61	57
Milk production per cow, liter FPCM/cow/year	7,490	8,220
Age at first calving, months	29	28
Concentrate rate, g/l milk	166	146
N-fertilizer use, kg N/ha dairy herd	145	122
Carbon footprint kg CO2/l FPCM	1.04	0.87

➔ More milk sold with less cows and farm size for the Lowest 10%

➔ Milk production, number of heifers and nitrogen crop managment are the main mitigation practices

Carbon footprint and economic efficiency



Year 2013
n = 1 143 Brittany farms

➔ **30 €/1000 l between the higher and lower classes of carbon footprint**
➔ **Operating costs are the main driver of the results**

Farms practices and economic results of the lowest 10% carbon footprint

	TOP 10%	Mean	Highest 10%
Carbon footprint kg CO2/ l FPCM	0.88	1.01	1.2
Variable costs - €/1000 l FPCM	172	186	202
Milk production per cow, liter FPCM/cow/year	8,266	7,586	6,545
Age at first calving, months	27	28.2	29.6
Concentrate rate, g/l milk	157	171	174
N-fertilizer use, kg N/ha dairy herd	136	156	162

➔The main driver : milk production.
➔They produce more milk with less!
➔ the global system efficiency is the key

The main mitigation practices and farmers choices

		Farmers' choice	Reduction potential
1	Herd management	27%	**3-16%**
2	Quantity of concentrate and N excretion	19%	**1-7%**
3	Mineral nitrogen fertilization	16%	**1-6%**
4	Protein autonomy	13%	**0,2-2%**
5	Fuel consumption	9%	**0-2%**
	Electricity consumption	9%	**<0,1%**
	TOTAL		**10% to 23%**

⇒ **Efficiency is the first farmers' objectives and permit to reduce carbon footprint**

Conclusions

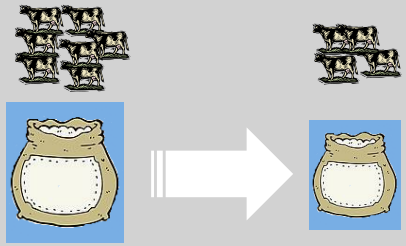
1.0
kg CO_2/l lait

GHG emissions

- 18%
TOP10%

Room for progress

Adapt action to local context



The key to success

Improving production efficiency and reducing the milk carbon footprint are highly complementary with positive impact on economy

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Thank you

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Conclusions of the pilot project LIFE Carbon Dairy

When farmers are engaged, reduction of the milk carbon footprint is possible

Improving production efficiency and reducing the carbon footprint of milk production are highly complementary with positive impact on economy.

The milk carbon footprint assessment is a good means to provide farmers with information about GHG emissions from dairy system and the link with farming practices.