LIFETIME PERFORMACE IS KEY TO SUSTAINABLE DAIRY PRODUCTION

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GASL Manhatten Kansas, Sept, 9th, 2019

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9.7bn 2050
70%
more animal based food
within the planet's
boundaries
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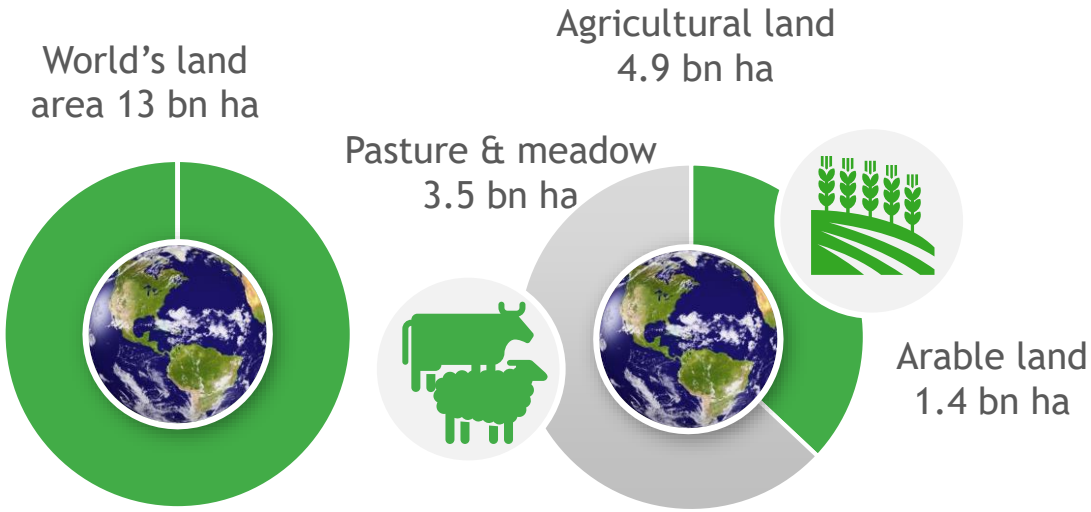
Ruminants play a key economic & ecological role to achieve this



56%

Required increase in food calories to feed 9.7bn people by 2050

- Ruminants turn non-edible products into high nutritious food
- Ruminants use marginal lands to produce high nutritious food
- Ruminants are a key component to socio-economic status

Sources FAO Stats, 2015; Tilman *et al.*, 2011. Global food demand and the sustainable intensification of agriculture, PNAS 108, 50; Mottet at al., 2017. Global Food Security 14, 1-8.

The dairy cow dilemma – increased feed & replacement costs

80%

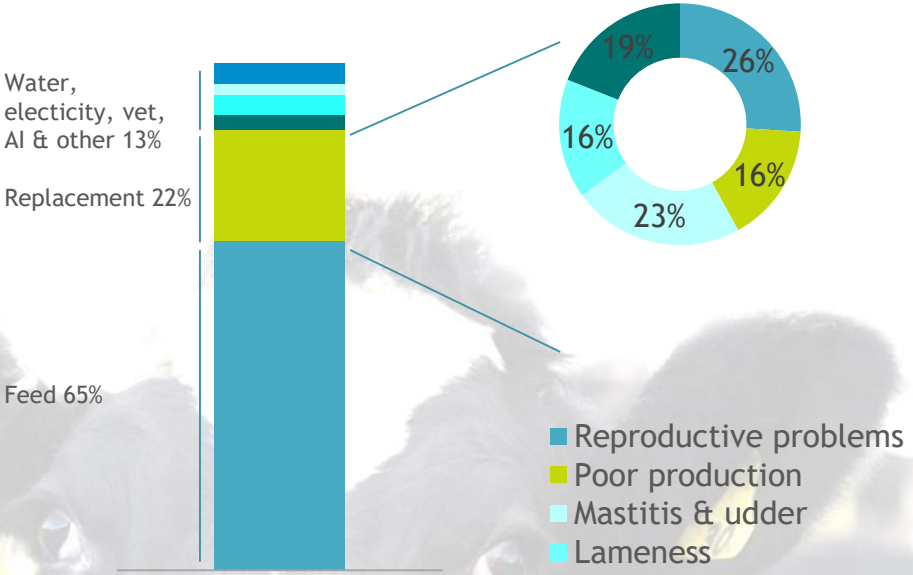
of the world`s population consume dairy products

100%

increases in milk production during the last 50 years

30%

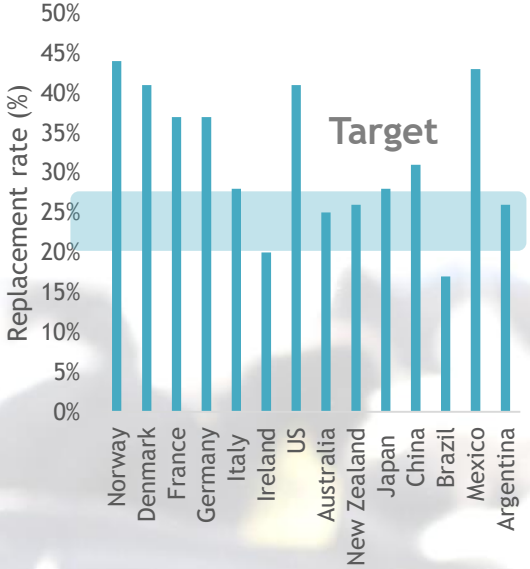
Increase in milk production between 2005 and 2015

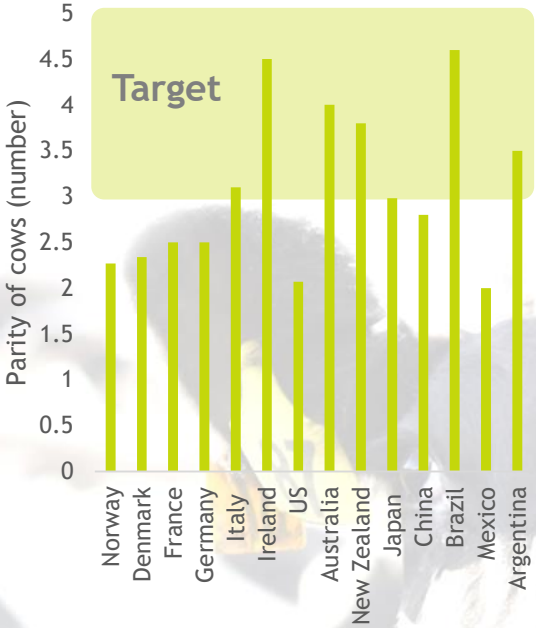


Cost of milk production

Source: IFCN, 2012

Replacement rates increase and cow longevity decreases globally - a major issue affecting sustainability





- Reproductive performance is declining about 1%/year
- Farm profitability depends on cow´s lifetime performance.
- Multiparous cows produce up to 20% more milk than heifers.

- This is critical to address for sustainable dairy farming

Source: IFCN, 2017

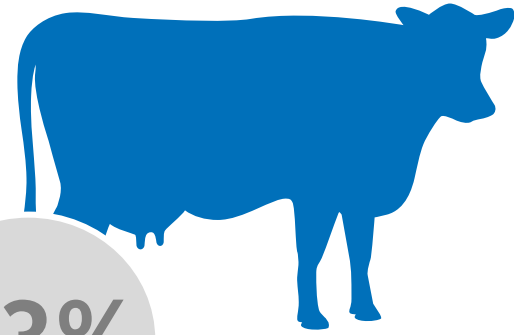
Lack of pasture and over-reliance on preserved feed

Intensive dairying moving cows more inside, lower access to pasture, more by-products and preserved forages (silage, hay) mean a lack of essential micro nutritients (ß-Carotene & E) – vital for reproductive success, udder health, immunity and stress resistance.

There is a need for non-medicated and preventative supplements.

Lack of vitamin E results in lower resistance to mastitis with substantial impact on farm economics & food waste

23% of cows are culled early in life due to mastitis & udder health



33% typical clinical mastitis incidence in high producing herds

$32billion estimated annual mastitis cost to the global dairy industry

31% is loss of milk production

18% is discarded milk (Food Loss & Waste)

Source: Santman-Berends et al., 2015

Nutrient utilization drives farm economics

Feed costs contribute to 65% to the total milk production costs.

Feed cost savings – key drivers for profitable dairy farming

Corn has a high nutritional value – is good fiber and energy source, but not all is digested.

Typical starch intake in early lactation @ 6.8 kg/cow/d	Starch losses via feces (%)			
	5	10	15	20
Starch losses (g DM/cow/d)	335	670	1 005	1 340
Extra corn grain required to substitute fecal starch loss (g/cow/d)	543	1 087	1 631	2 175
€/cow/day	0.09	0.18	0.27	0.36

[1] 70% starch in corn grain, 88% DM
[2] Costs of corn grain 164 €/t

The impact of improved corn utilization on land use and resources is significant

Nutrient Utilization

20 MIO EUROPEAN COWS OVER 100 DAYS

5% lower starch excretion

=

3 mio t corn silage

=

210 000 **ha** corn

=

1.5 mio **t** **wheat**

2.7 bln **loaves** of bread

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Get more out of corn based dairy diets

Amylase enzyme reduces nutrient excretion

Nutrient Utilization

Parameter	No Amylase	Amylase
Milk yield (kg/cow/d)	35.4	37.0
Fat (%)	3.34	3.59
Casein (%)	2.55	2.63
Preg Rate (%)	21.0	26.6
Feed efficiency (%)	1.49	1.55

Ration in kg FM/hd/d: Corn meal 6.5, corn flakes 2, protein blend 4.5, soybean full fat 0.8, alfalfa hay 7.0, grass hay 1st cut 5.5, molasses 1.0. Constituents in %: CP 16.74, NDF 29.19, Starch 24.04, by-pass starch 1.88 kg

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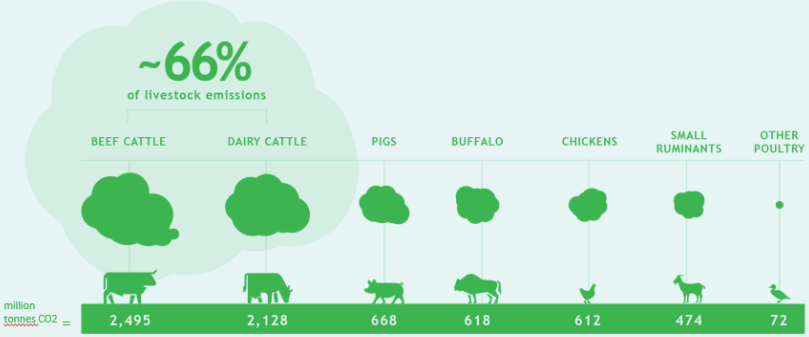
DAIRY COW DIRECT EMISSIONS

Environment

Human activities are a driver of climate change

14.5% of Green House Gasses originate from livestock sector

The cow's footprint presents a major challenge



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Productivity improvements are key to reductions in GHG emissions & nitrogen flows to the environment

Without productivity gains GHG emissions would have risen

38%

between 2005 and 2015 instead of 18%

The 18% increase in GHG emissions between 2005 and 2015 was attributable to

169

million tons CO_2 equiv. coming from methane from enteric fermentation & manure decomposition

52

million tons CO_2 equiv. coming from N_2O….

….of which a large contributor is excess dietary nitrogen excreted in manure & urine

Source: FAO, Global Dairy Platform, Rome 2019

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Addressing the methane issue

3-NOP is a radical innovative & disruptive technology that significantly reduces methane emissions from ruminants

It enables the consistent reduction of methane emissions

30%

minimum reduction in methane emissions

helping improve the sustainability of the dairy industry.

Environment

REDUCING ENTERIC METHANE

CONSISTENT, MEASURABLE REDUCTION OF DIRECT GHG EMISSIONS FROM DAIRY COWS

Our journey begins in 2008

Recognized the potential impact of reducing enteric methane from ruminants

Product development - strong collaboration

Intense collaboration among scientists, dairy and beef sector/value chain, external partners and experts in nutrition, biology, chemistry, engineering and analytics

~30% methane reduction

Peer-reviewed studies have shown that 3-NOP has the ability to consistently reduce enteric methane by ~30% for dairy, beef and sheep

Today in final stages of development

Launching in coming years globally

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Lifetime performance & welfare

Only healthy, productive animals lead to healthy business

We have developed full nutritional programs to address the species specific needs of sustainable production

We have cost effective, proven solutions

Replacement rate & longevity

- Fertility
- Udder & hoof health (welfare)
- Skeletal development
- Milk yield & feed efficiency

Feed

- Nutrient utilization
- Environment

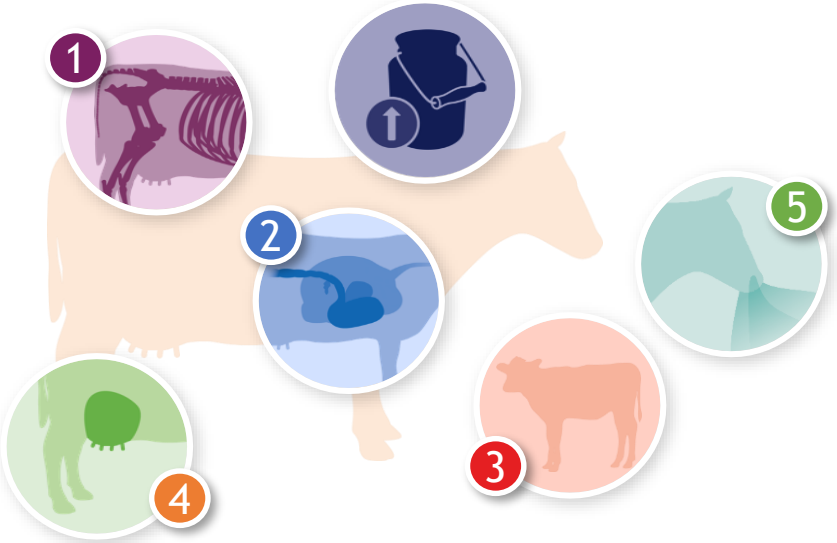
Lifetime performance program

Through a scientifically grounded and proven nutritional lifetime performance program from calf to cow. It is designed to improve dairy productivity, profitability & sustainability

McGrath et al., 2017: Research in Veterinary Science (2017)

Our approach to sustainable dairy production is non-medicated and preventive through nutritional means

1. **Optimum blood calcium levels:** 25-OH D3 for skeletal development & health
2. **Nutrient utilization:** Phytogenics x Biotin x amylase for high milk efficiency, and acidosis prevention
3. **Fertility:** ß-Carotene (fertility vitamin)
4. **Ketosis, mastitis, lameness:** Vitamin E, Biotin, Phytogenics
5. **Greenhouse gas emissions:** 3-NOP for direct emissions & all the above for indirect emissions



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IMPROVING DAIRY COW LIFETIME PERFORMANCE...

...IS THE KEY ENABLER FOR SUSTAINABLE DAIRY FARMING

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