A European Public-Private Partnership

12th ATF Seminar
17 November 2022

Dairy industry: use of an additive to reduce enteric methane

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Bel Group

Bel: A UNIQUE GROWTH MODEL

RESPONSIBLE

PROFITABLE

Long-term vision
A positive impact on the planet and for all generations

Creating growth
Sustainable growth levers that mobilize a whole value chain

Decarbonation as a driver of our performance

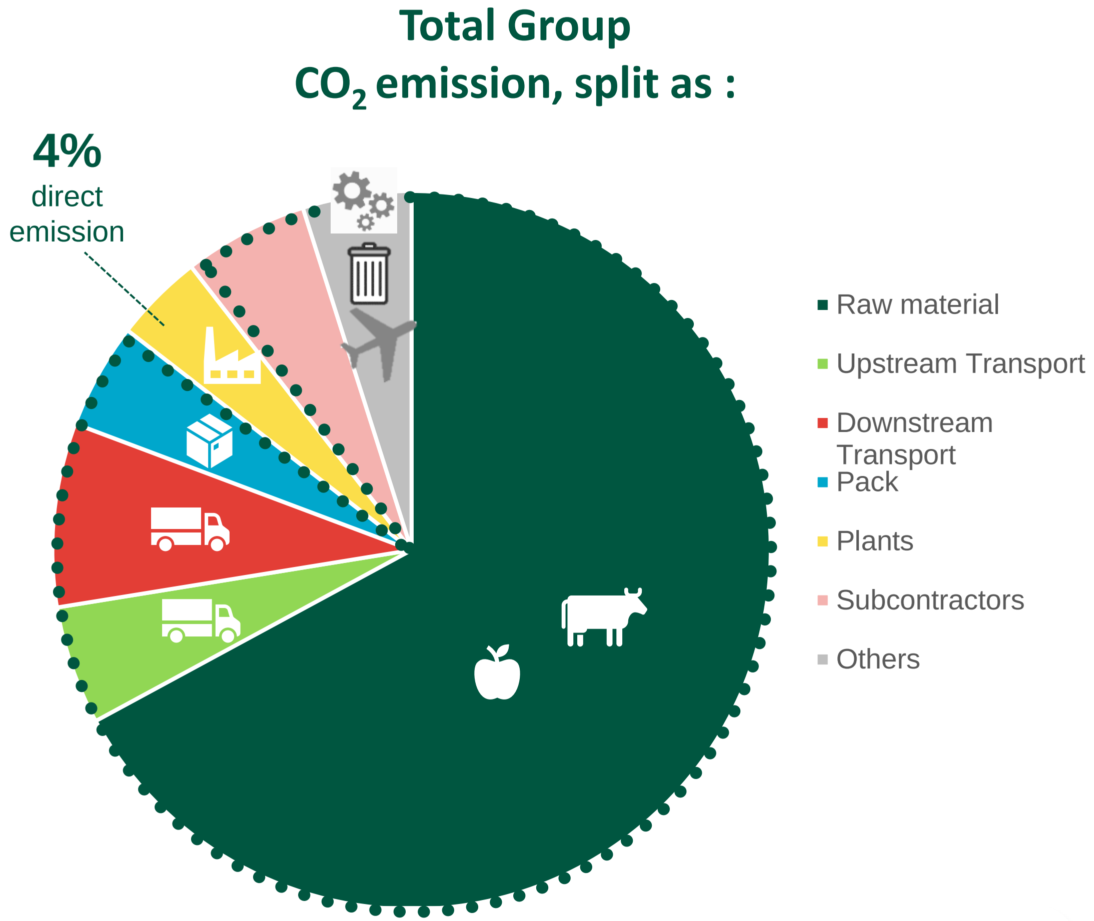
CONTRIBUTE TO LIMITING GLOBAL WARMING TO BELOW +1.5ºC:

- Reducing the impact of our sites
- Optimise logistics
- Designing responsible packaging
- Reduce food waste
- Protecting and restoring ecosystems

AN ACTION
Deployment in 2022 of the Bel Carbon Impact **steering platform**

A FIGURE
Target of 1/4 net reduction in GHG emissions across the value chain by 2035

What is our Bel Carbon Footprint?



Factories represent **4%** of Bel global carbon footprint → **96%** of Bel Carbon **footprint is not "directly" in our hands**
The biggest impact comes from raw materials and especially farms.

2020 Data

Milk is @ the heart of Bel decarbonation strategy

9 dairy basins

>1,200 ML of Milk

About 1400 farmers
or collection centers

About 1,4 Mio T CO_2eq
in 2021

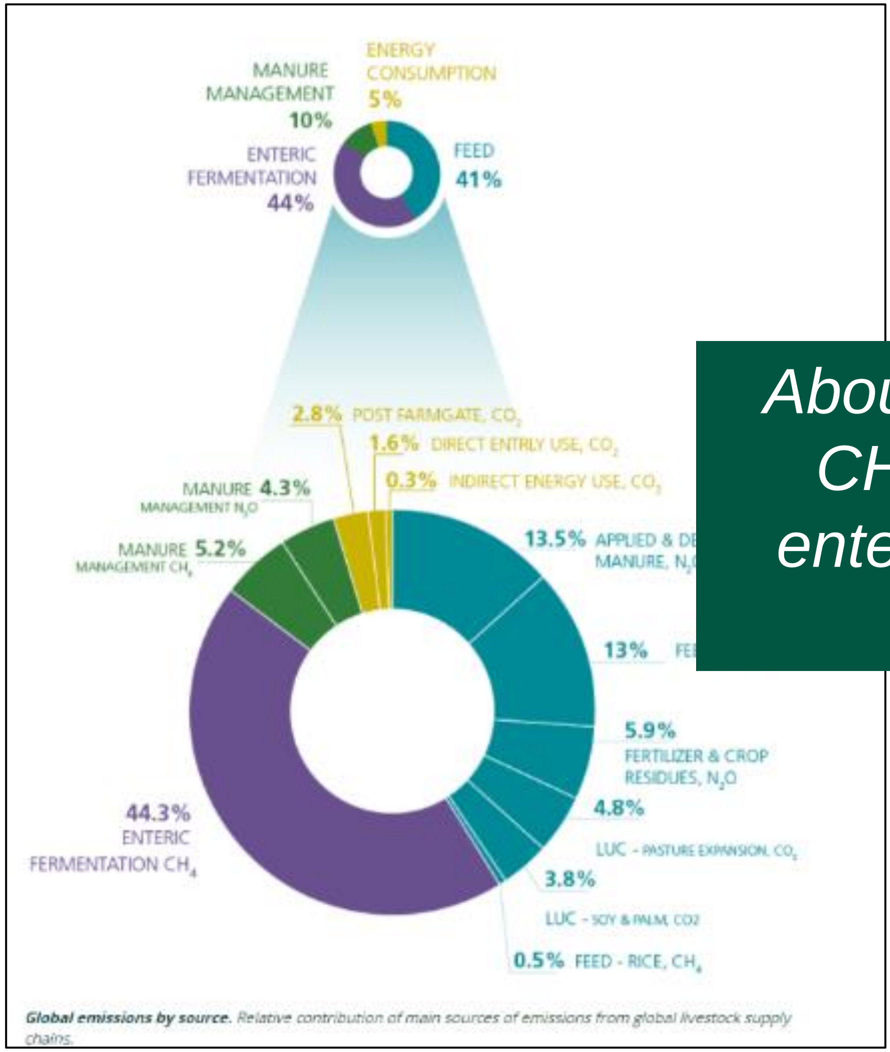
64% of the farms have
performed a carbon diagnostic

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION
BUSINESS AMBITION FOR 1.5°C

Reduce by 50% GHG coming from farm by 2035

2021 Data

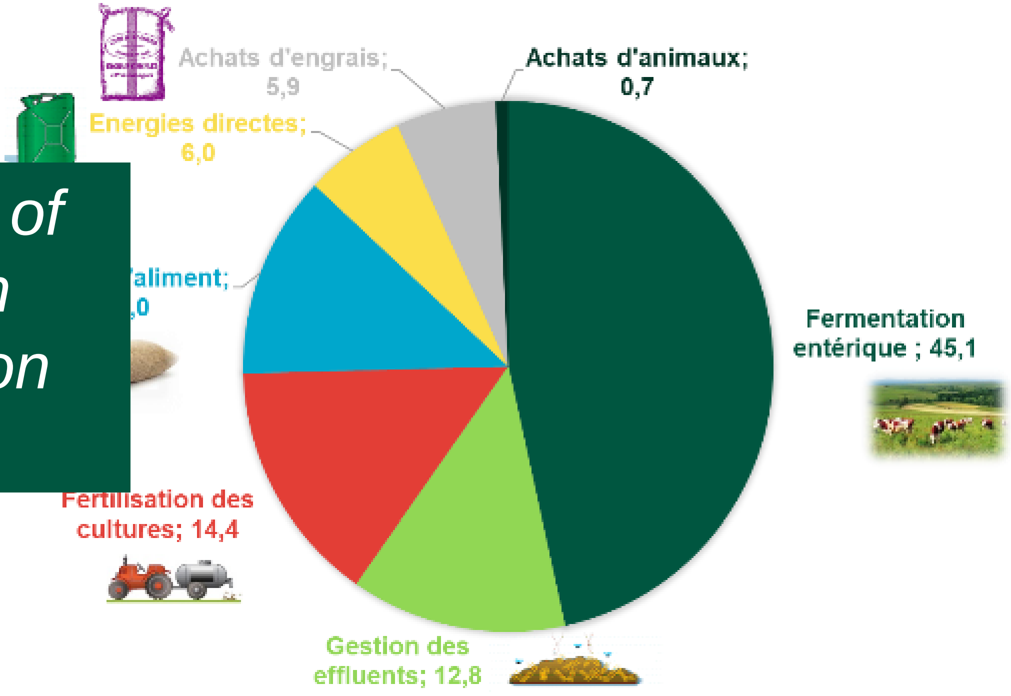
Emission factors are clearly identified @ farm level



Global emissions by source. *Relative contribution of main sources of emissions from global livestock supply chains.*

https://www.fao.org/gleam/results/en/

About 25,000 tons of CH_4 coming from enteric fermentation every year



Example of emission for an APBO farm - 2022

And first actions have started to reduce CO_2 emissions

	Levers	Frequency	Redu. M
Herd	Optimize first calving age	57%	-2,5%
Herd	Optimize milk production	54%	-6,0%
Herd	Reduce unproductive animals	41%	-4,9%
Energy	Install pre-cooling system	39%	-0,1%
Ration	Substitute soy by rapesedd	28%	-6,1%

Most levers activated in France

Cover crops in FR & USA

Local sustainable feeding & protein autonomy

Regenerative agriculture practices

And about enteric methane mitigation?

Grazing management in Azores

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Many solutions on the paper…


GLOBAL RESEARCH ALLIANCE ON AGRICULTURAL GREENHOUSE GASES

NEW ZEALAND AGRICULTURAL GREENHOUSE GAS Research Centre

CGIAR

RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security

CCAFS

An evaluation of evidence for efficacy and applicability of methane inhibiting feed additives for livestock

November 2021

Prepared for the Global Research Alliance (GRA) with the support of:

The New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC)

Climate Change, Agriculture and Food Security (CCAFS)

Agriculture and Agri-Food Canada (AAFC)

Climate and Clean Air Coalition (CCAC)

United States Agency for International Development (USAID)

CLIMATE & CLEAN AIR COALITION

Canada

New Zealand Government

USAID

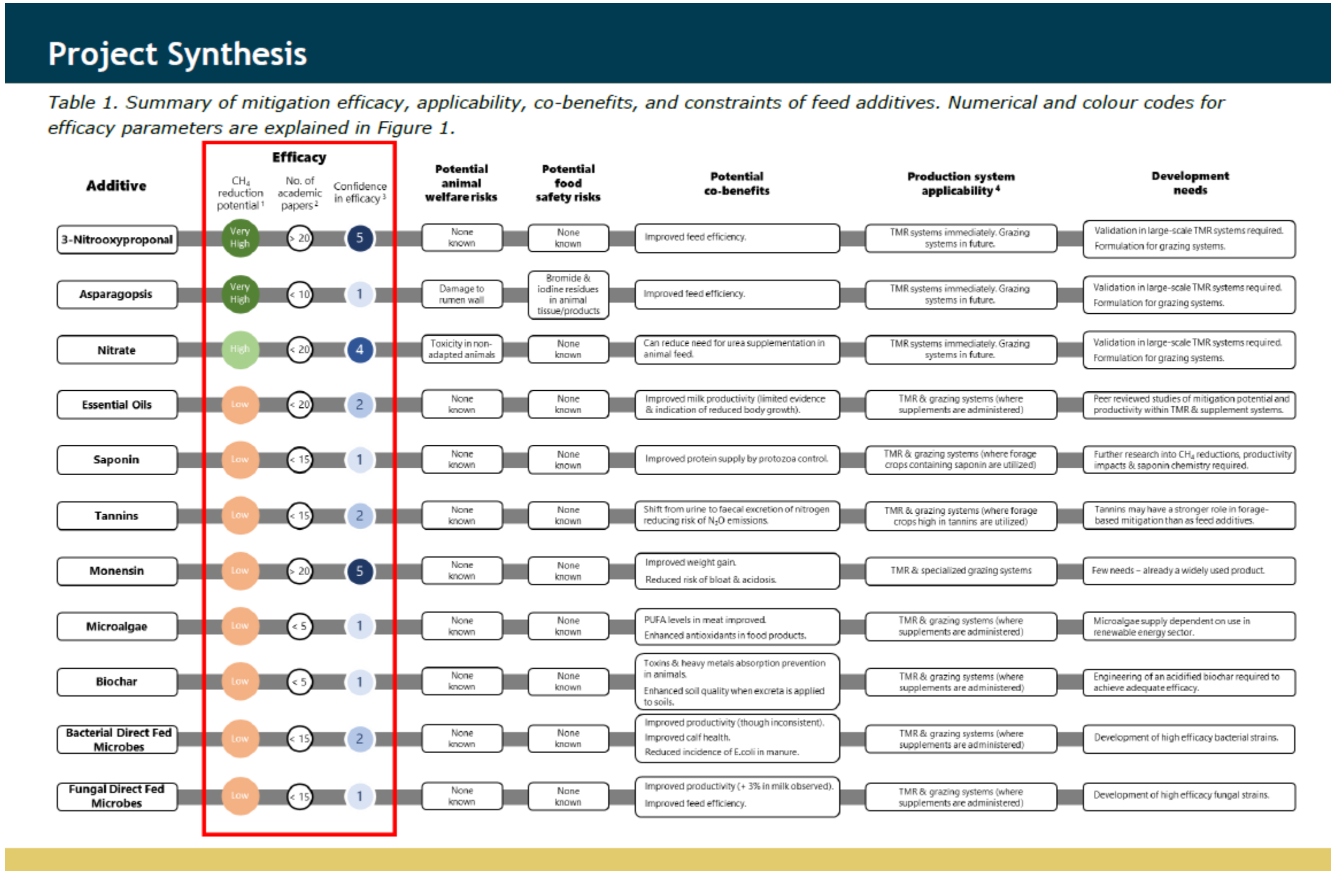
Project Synthesis

Table 1. Summary of mitigation efficacy, applicability, co-benefits, and constraints of feed additives. Numerical and colour codes for efficacy parameters are explained in Figure 1.

Additive	Efficacy: CH_4 reduction potential[1]	Efficacy: No. of academic papers[2]	Efficacy: Confidence in efficacy[3]	Potential animal welfare risks	Potential food safety risks	Potential co-benefits	Production system applicability[4]	Development needs
3-Nitrooxyproponal	Very High	> 20	5	None known	None known	Improved feed efficiency.	TMR systems immediately. Grazing systems in future.	Validation in large-scale TMR systems required. Formulation for grazing systems.
Asparagopsis	Very High	< 10	1	Damage to rumen wall	Bromide & iodine residues in animal tissue/products	Improved feed efficiency.	TMR systems immediately. Grazing systems in future.	Validation in large-scale TMR systems required. Formulation for grazing systems.
Nitrate	High	< 20	4	Toxicity in non-adapted animals	None known	Can reduce need for urea supplementation in animal feed.	TMR systems immediately. Grazing systems in future.	Validation in large-scale TMR systems required. Formulation for grazing systems.
Essential Oils	Low	< 20	2	None known	None known	Improved milk productivity (limited evidence & indication of reduced body growth).	TMR & grazing systems (where supplements are administered)	Peer reviewed studies of mitigation potential and productivity within TMR & supplement systems.
Saponin	Low	< 15	1	None known	None known	Improved protein supply by protozoa control.	TMR & grazing systems (where forage crops containing saponin are utilized)	Further research into CH_4 reductions, productivity impacts & saponin chemistry required.
Tannins	Low	< 15	2	None known	None known	Shift from urine to faecal excretion of nitrogen reducing risk of N_2O emissions.	TMR & grazing systems (where forage crops high in tannins are utilized)	Tannins may have a stronger role in forage-based mitigation than as feed additives.
Monensin	Low	> 20	5	None known	None known	Improved weight gain. Reduced risk of bloat & acidosis.	TMR & specialized grazing systems	Few needs – already a widely used product.
Microalgae	Low	< 5	1	None known	None known	PUFA levels in meat improved. Enhanced antioxidants in food products.	TMR & grazing systems (where supplements are administered)	Microalgae supply dependent on use in renewable energy sector.
Biochar	Low	< 5	1	None known	None known	Toxins & heavy metals absorption prevention in animals. Enhanced soil quality when excreta is applied to soils.	TMR & grazing systems (where supplements are administered)	Engineering of an acidified biochar required to achieve adequate efficacy.
Bacterial Direct Fed Microbes	Low	< 15	2	None known	None known	Improved productivity (though inconsistent). Improved calf health. Reduced incidence of E.coli in manure.	TMR & grazing systems (where supplements are administered)	Development of high efficacy bacterial strains.
Fungal Direct Fed Microbes	Low	< 15	1	None known	None known	Improved productivity (+ 3% in milk observed). Improved feed efficiency.	TMR & grazing systems (where supplements are administered)	Development of high efficacy fungal strains.

But very few ready-to-use for the industry…

Many solutions on the paper…


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CLIMATE & CLEAN AIR COALITION
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- No negative impacts on farm management and animals
- Scientifically proved
- Recognized by public authorities
- Monitoring
- Existing cost model

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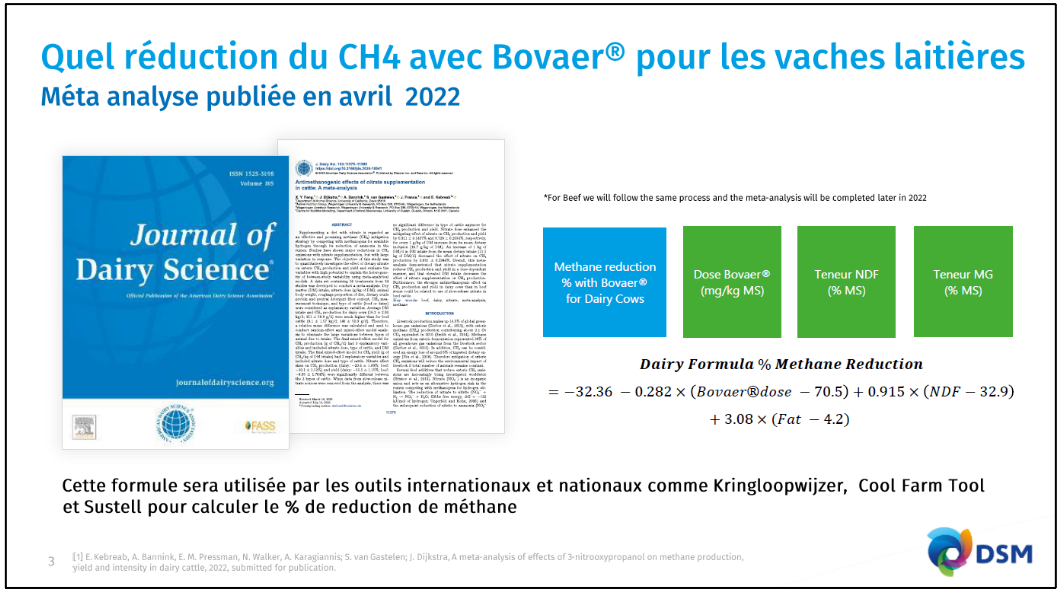
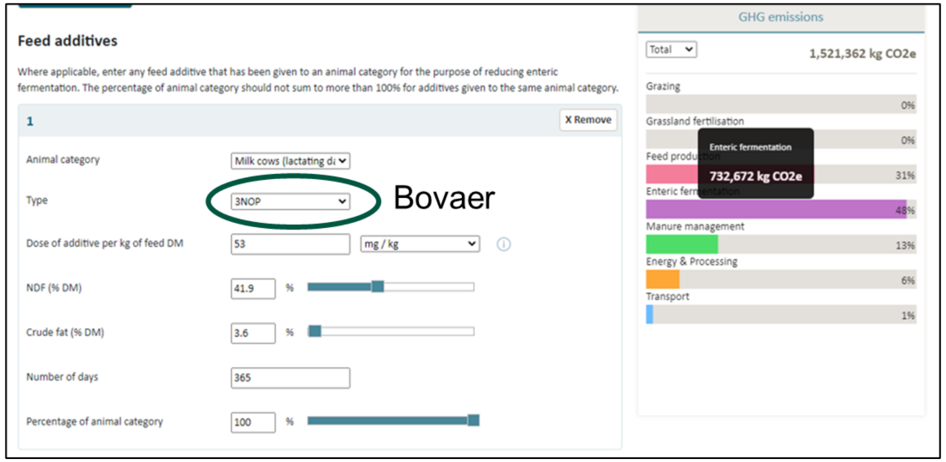
Bel and DSM partnership to test Bovaer®



A clear and scientifically validated formula to estimate methane reduction:

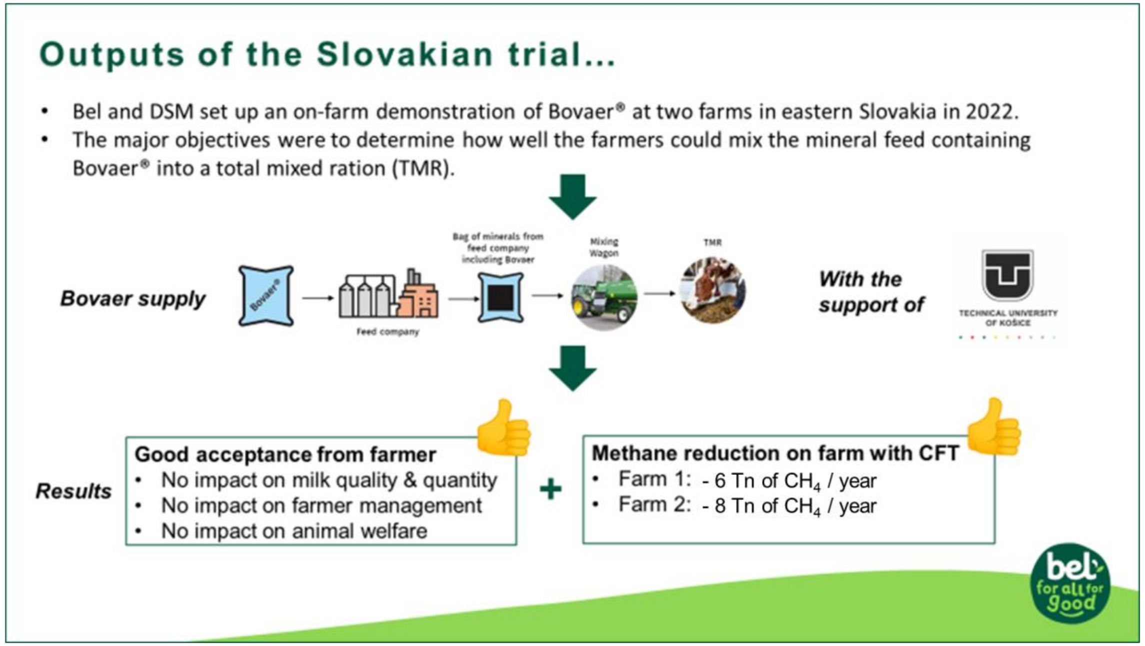
Its reduction depends on:

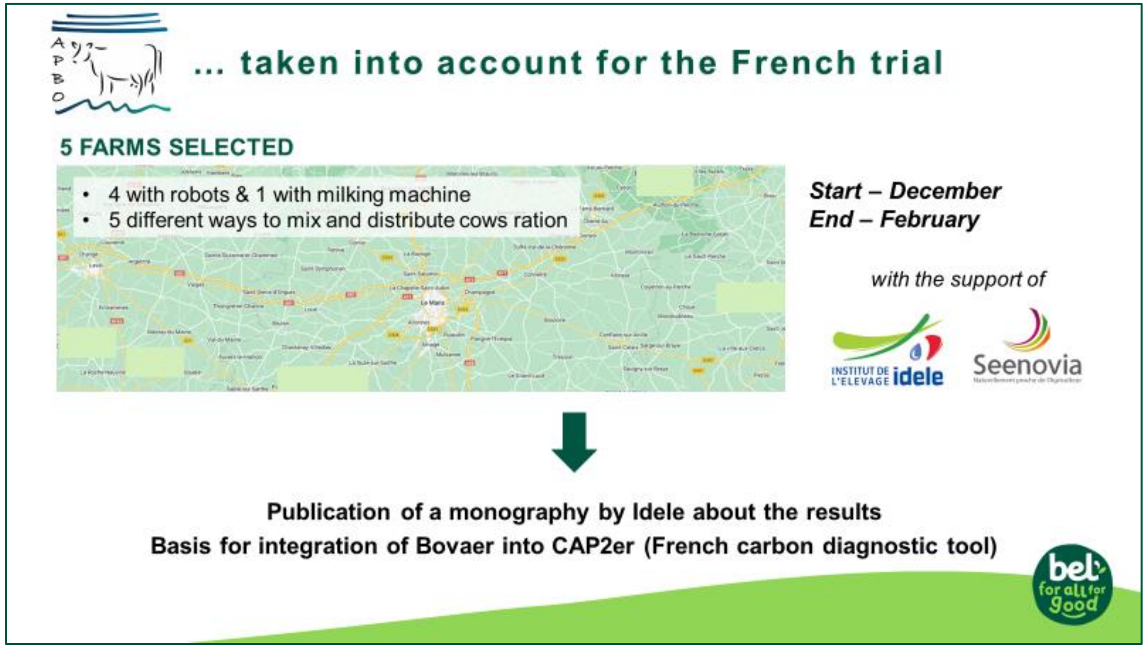
- *Bovaer® dosis*
- *NDF: neutral detergent fiber of the ration*
- *Lipids of the ration*



Since October 22, Bovaer® can be used in the CoolFarmTool and methane reduction can be measured in the carbon diagnostic

Leading to trials in Slovakia and France…





=> And a roll-out in Europe today would mean…

A reduction of **4.000 tons of CH_4**

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… so far, we need to keep in mind

Benefits

- Easy to add to the cows ration
- **Certainty of reduction**
- Instant reduction
- **No drawbacks** for the farmer from a production POV
- Push the farmer to better know its feeding system

Challenges

- Dose of Bovaer ® is based of feed quality/ration which can be variable each month/year
- Feed analyse are necessary
- **No benefit beyond methane reduction**
- **100% extra-cost** with no additional advantage

+€

Farmers
Dairy industry
Governments
Consumers

?

Multi-levers approach to reach 50% carbon footprint reduction!!!

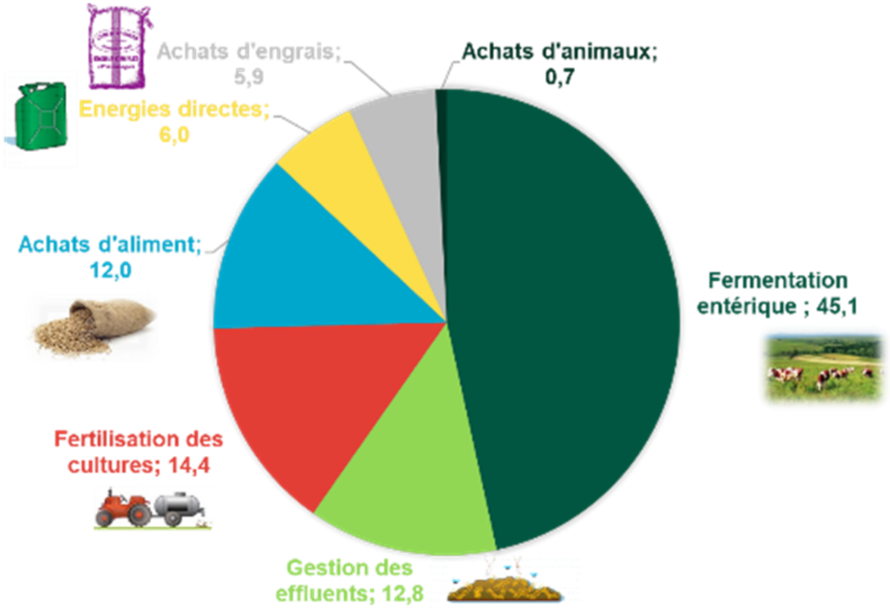
Herd management

Ration optimization

Protein autonomy

Regenerative agriculture practices

Etc.



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25,000 tons of CH_4 coming from enteric fermentation

↓

4,000 tons of CH_4 reduction with Bovaer®

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