

Bovaer®

From science to impact at scale

Bovaer® the proven solution to immediately
reduce enteric methane from dairy and beef cattle

NZ Agricultural Climate Change Conference, Wellington, Feb 28-Mar 1

Mark van Nieuwland – mark.nieuwland-van@dsm.com



DSM

BRIGHT SCIENCE. BRIGHTER LIVING.

The planet has already warmed up 1.2 degrees, we need to urgently reduce GHG emissions to keep our planet livable

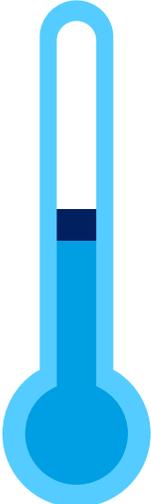


Steep and near-term reduction in methane identified as one of the key levers to fight warming

150 countries signed Global Methane Pledge

GLOBAL METHANE PLEDGE

COP26: World leaders pledge to cut methane emission levels by 30% By 2030 in “game-changing commitment”



0.2°C warming

Avoided by 2050

Reducing methane emissions by 30% also means preventing...

- 205,000 deaths**
From respiratory and cardiovascular diseases
 - 21 million tons**
Of staple crop losses
 - 624,000**
Asthma-related hospital visits
 - 60 billion**
Lost work hours to heat exposure by 2040
- every year



Pressure against offsets increasing Need to lower in own value chain

Does the SBTi accept all approaches to reducing emissions?

The SBTi requires that companies set targets based on emission reductions through direct action within their own boundaries or their value chains.

Offsets are only considered to be an option for companies wanting to finance additional emission reductions beyond their science-based target (SBT) or net-zero target.



Milk brand in hot water

Using offsets to claim carbon neutrality or 'climate positivity' (the term preferred by Unilever) has already landed some brands in hot water. The consumer ombudsman in Sweden is taking dairy giant Arla Foods (total emissions 19MtCO₂e) to court over claims its milk is carbon neutral, arguing the assertions give "consumers the wrong picture of a product's impact."

Bloomberg

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- Industries
- Technology
- Politics
- Wealth
- Pursuits
- Opinion
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Green

Dutch Watchdog Rules KLM's 'Carbon Zero' Ad Is Misleading

By [Diederik Baazil](#)

April 9, 2022 at 3:11 AM GMT+10

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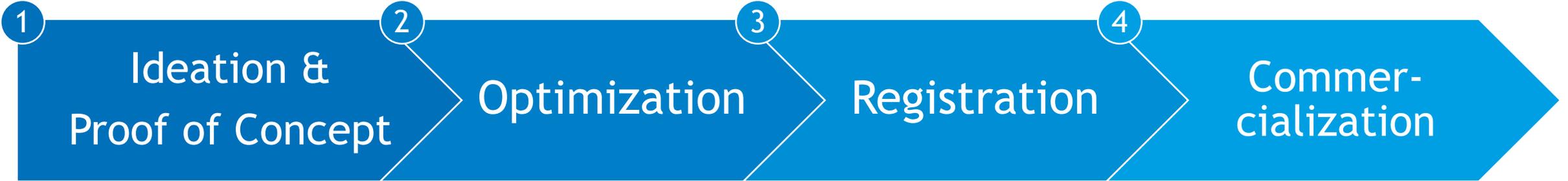
The Dutch advertising watchdog ruled that a KLM promotion telling customers they could fly carbon-emission free is misleading.

The ad's tag line, "Be a hero, fly CO₂ zero," is an absolute claim, the Dutch Advertising Code Committee said in a verdict seen Friday by Bloomberg. As such, the company has the burden of proving the statement and didn't meet that test, the committee said.

Airlines are now buying carbon offsets, or offering customers the option pay extra for them, to convince travelers that, on a net basis, their trips won't contribute to global warming. These programs, which include tree planting and forest protection, have been criticized as insufficient, misleading or impossible to validate. A similar debate swirls around so-called sustainable aviation fuel, an element in airlines' CO₂-reduction plans.

From Science to Scale – a decade long journey

- Completed
- Well advanced



- Scientific concept development
- in-vitro screening
- Early safety assessment
- in-vivo trials
- clarification mode of action
- Selection of final development candidate

- Dose range finding for different ruminant species
- Confirmation trials in-vivo for various geographies
- Initial application & form development
- Process development and pilot production
- Additional application & form development

- 3 efficacy studies
- 2 tolerance studies
- ~100 safety studies (animal, human)
- ~10 environmental studies
- ~40 supportive studies (stability, analytical method, physico chemical properties etc.)
- 1 local efficacy study (depending on country)
- New forms & applications

- Meta-analysis or on-field measurement
- Carbon reduction protocol
- Inclusion in LCA tools and national inventory
- Scale-up production
- Local application pilots
- Value chain onboarding & education
- Customer pilots and scaling
- First repeat orders



2 Slow-release form prototypes produced at industrial scale for in-vivo trials

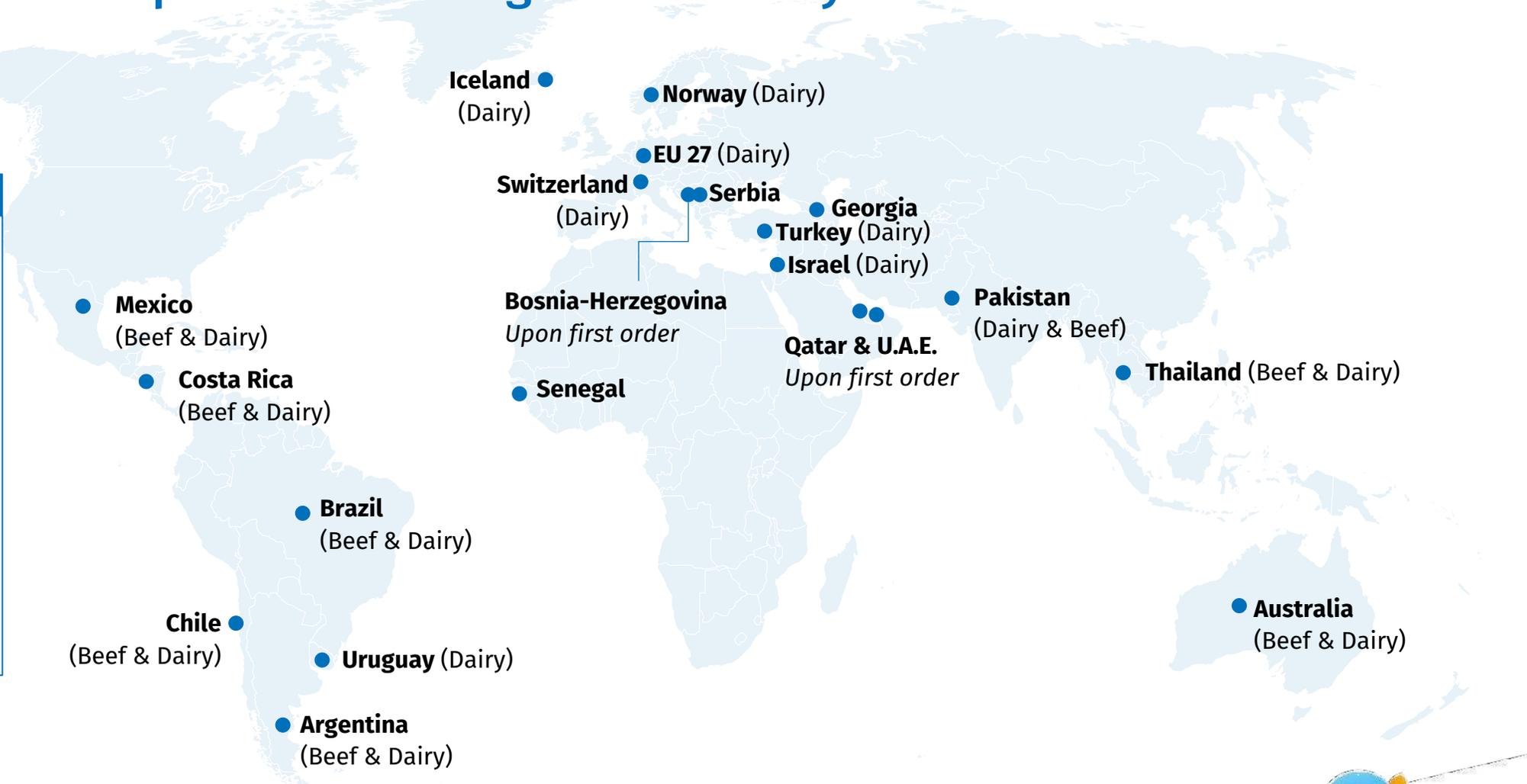


3 Bovaer® is available in 45+ countries today

More approvals expected in coming months and years

Market Approvals In progress

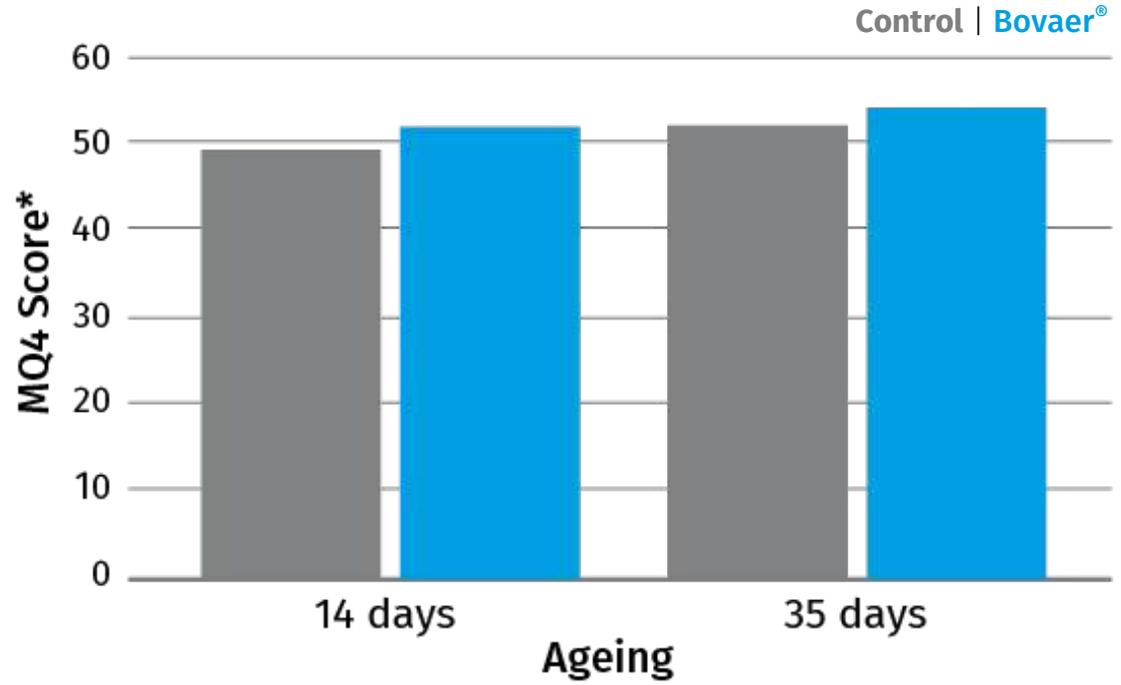
- Paraguay (2023)
- United Kingdom (2023)
- South Africa (2023)
- India (2023)
- New Zealand (2024)
- Korea (2024)
- Canada (2024/2025)
- USA (2024/2025)
- EU/CH – Beef (2025)
- China (2025/2026)
- Japan (2025/2026)



4 Meat and milk tasting and testing frequently part of initial pilots or local trials

No sensory differences observed by consumers

Australian tasting panel – rump steak n = 480



Source: UNE (2022) Taste and Sensory Panel – manuscript in preparation
* MQ4 Score (University of New England) = Tenderness (0.3) + Juiciness (0.1) + Flavor (0.3) + Overall (0.3). Higher score is better.



4 Efficacy of Bovaer[®] extensively demonstrated in dairy & beef

Overview of scientific trials and key commercial partnerships

15
North America

8 beef and 7 dairy trials with up to 82% methane reduction

Strategic partnership with:



27
Europe

22 dairy, 2 beef and 3 calf trials with up to 50% methane reduction

Collaboration with:










60+ trials conducted or ongoing across 18 countries



7
Latin America

5 beef and 2 dairy trials with up to 55% methane reduction

Collaboration with:





16
Oceania

7 beef, 5 dairy and 4 calf trials with up to 90% methane reduction

Collaboration with:






Bovaer[®] has already saved **30,000 tons CO2e**





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