

# Big Business' Latest 'Solution' – Engineering Cow Digestion for Profit

Analysis by [Ashley Armstrong](#)

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## STORY AT-A-GLANCE

- › Chemical fixes take center stage – Big Ag pushes a new synthetic additive Bovaer to “fix” cow burp methane emissions while sidelining sustainable farming solutions
- › With Bovaer, cows are consuming a daily dose of silicon dioxide, petroleum-derived propylene glycol, and synthetic compounds – but at what cost?
- › The corporate-controlled research raises red flags, with alarming findings about cow health and potential long-term human impacts
- › Altering cow digestion disrupts an ancient, balanced carbon cycle, introducing risks we don't fully understand
- › Methane emissions from synthetic nitrogen production are vastly underestimated, yet Big Ag remains silent

DSM-Firmenich, a Dutch chemical giant, has developed Bovaer – their answer to cattle methane emissions and climate change.<sup>1</sup> The company claims that just a quarter teaspoon of this feed supplement per cow daily reduces methane by 30% in dairy cattle and 45% in beef cattle. But in today's article let's look deeper at what's really driving this "innovation."

## The Corporate Push

DSM-Firmenich is projected to rake in \$13.86 billion in 2024. The Bovaer would cost roughly \$0.30 per cow per day (plus labor costs for feed mixing). Targeting just 10% of the global dairy cow population would generate \$2.85 billion in revenue.

Despite the marketing hype, only about 100,000 cattle worldwide currently receive Bovaer, with a similar product, Agolin, used in 150,000 U.S. cattle – a fraction of the global 260 million dairy cows. However, Bovaer has secured approvals in the EU, Australia, Brazil, and New Zealand.

A recent FDA approval for U.S. dairy cattle in May 2024 reveals the expanding corporate agenda. Elanco Animal Health has partnered with DSM-Firmenich to distribute the additive, with plans to extend into the beef market after widespread dairy cow adoption.



28 May 2024

### **Elanco Announces FDA Has Completed Review of Bovaer®, First-in-Class Methane-Reducing Feed Ingredient, for U.S. Dairy Industry**

Rather than working with natural solutions, this approach attempts to artificially alter cow digestion through chemical intervention. Each cow must consume 10 to 22 grams of this synthetic compound daily – adding yet another industrial product to our food system.

As we will discuss, the long-term consequences of manipulating natural digestive processes remain to be seen. Questions worth asking:

- Why are we pursuing expensive technological fixes instead of supporting sustainable, natural farming methods like regenerative agriculture?
- What are the unknown long-term effects of chemically altering livestock digestion?
- Who really benefits from this "solution" – the environment, or corporate shareholders?

This isn't about solving climate change – it's about creating new profit streams by convincing farmers they need another expensive input. History shows us repeatedly: attempting to outsmart nature through chemical intervention often leads to unintended consequences that we only discover years later.

## **So How Does It Work?**

Strip away the slick marketing, and here's what we're really feeding our cows: a synthetic chemical cocktail consisting of 60% silicon dioxide, 30% propylene glycol (a petroleum derivative), and 10% of the active compound 3-Nitrooxypropanol (3-NOP). For a cow receiving a typical 20-gram daily dose, that means consuming 12 grams of silicon dioxide, 6 grams of propylene glycol, and 2 grams of 3-NOP – every single day.

3-NOP works by modifying a fundamental digestive process in ruminants, one that has developed over a very long period of time to support their unique biology.

It blocks an enzyme called methyl-coenzyme M reductase (MCR), which methane-producing bacteria in the cow's gut need to function. The company claims this process is harmless, with the compounds "safely breaking down" in the rumen. But let's follow the chemical trail.

When 3-NOP breaks down, it produces nitrites and propionic acid. The company presents this as beneficial, but here's what they're not emphasizing: We're fundamentally altering how cows process hydrogen byproducts. Instead of the natural methane pathway, we're forcing their digestive systems to find alternative routes – routes that nature didn't intend. Unanswered questions:

- What happens to accumulated hydrogen when its natural pathway is blocked?
- How do these daily doses of silicon dioxide and petroleum-derived propylene glycol affect long-term health?
- What are the long-term consequences of forcing bacterial communities to adapt to new metabolic pathways?

Even researchers studying methane inhibition admit to "substantial gaps" in understanding "the intricacies of hydrogen flow within the ruminal ecosystem."<sup>2</sup> Yet we're meant to trust that disrupting this complex system daily won't have consequences?

The synthesis of 3-NOP isn't a natural process — it's industrial chemistry at its core. The compound is created using industrial chemicals like silver nitrate and acetonitrile, with 3-bromo-1-propanol as the starting material. This synthetic molecule is then mixed with silicon dioxide and petroleum-derived propylene glycol to create the final product.

While short-term studies suggest safety, they can't account for the potential long-term accumulation of these compounds or the gradual adaptation of gut bacteria that might lead to unintended consequences. History has taught us repeatedly that intervening in complex biological systems often reveals its true impacts only after years or generations of use.

## **The "Safety Studies" — Looking Behind the Curtain**

When challenged about safety concerns, DSM-Firmenich and their partners like Arla quickly point to "15 years of trials" and "extensive testing." But dig into the actual research, and a different picture emerges — one of limited studies, concerning findings, and corporate-controlled data.

ADOPTED: 30 September 2021

doi: 10.2903/j.efsa.2021.6905

**Safety and efficacy of a feed additive consisting of 3-nitrooxypropanol (Bovaer<sup>®</sup> 10) for ruminants for milk production and reproduction (DSM Nutritional Products Ltd)**

**Assessment of 3-Nitrooxypropanol “3-NOP” as a feed additive for all ruminants for milk production and reproduction.**

Animal Feed and Feed Additives Joint Expert Group (AFFAJEG)

Advisory Committee on Animal Feedingstuffs (ACAF)

Regulated Product Dossier Assessment

ID: RP1059

Assessment finalised: 06/10/2022

The safety studies fall under European Union Regulation (EC) No 1831/2003 – a framework with a crucial flaw: the manufacturer provides their own safety data. While the European Food Safety Authority (EFSA) reviews this data, they rely heavily on company-provided summaries, with limited access to raw data. Independent verification? Nearly impossible due to prohibitive study costs. This creates an obvious conflict of interest where the fox guards the henhouse.

## 1. Introduction

The Science, Evidence and Research Directorate of the FSA received a request to provide a full risk assessment on the safety and efficacy of an additive (Bovaer<sup>®</sup> 10) containing a minimum 10% 3-nitrooxypropanol, under Regulation (EC) No 1831/2003<sup>1</sup> under the category of 'zootechnical' additives, functional group 'substances which favourably affect the environment'.

Looking at the actual studies reveals troubling limitations:

- Many tests were done in vitro (lab dishes) or on rats
- The studies on cows were short-term with small sample sizes
- Researchers couldn't even properly assess consumer exposure to NOPA (a breakdown product) due to "unexpectedly high differences" in concentrations
- The potential for DNA damage (genotoxicity) "cannot be ruled out"
- A 2-year rat study found an increase in rare intestinal tumors that researchers admitted "cannot be considered a chance finding"

Two studies that assessed dairy cow "tolerance:"

1. In a 16-cow study, feed intake dropped significantly. More alarming? "Two cows had to be euthanised prematurely due to reduced feed intake and lethargy"
2. An 80-cow study found changes in blood work and, notably, smaller ovaries in treated cows (again, what are the long-term implications of this?)

Although statistically significant differences were detected, some of these differences seem to be of no clinical relevance such as, for instance, the decreases observed in ALT, LDH, amylase, cholesterol or triglycerides. Albumin was decreased to a minor extent, and no clinical relevance is expected. The changes in serum Ca were rather small and seemed to be not dose related.

The researchers' own conclusion? "Some uncertainty remains on the tolerance of 3-NOP by dairy cows." They could not establish a safety margin and couldn't extrapolate safety to other animals. Yet somehow this translated to widespread adoption.

Perhaps most concerning is how they established "safe" consumption levels for humans eating products from treated animals. They took short-term lab animal studies, found a

level with no obvious effects (NOAEL), and divided by 100 as a "safety factor."

This ignores potential long-term accumulation, interactions, or subtle effects that might only appear after years of consumption.

Further, farm workers must handle this chemical daily (adding it to ruminant feed), with studies showing it's a skin and eye irritant that "may be harmful if inhaled." The report also mentioned that the product creates significant dust, making exposure and inhalation likely during feeding operations.

When a company claims something is "extensively tested" and "proven safe," we should ask: Tested by whom? Proven safe by what standard? In this case, the safety studies reveal a rushed approval process based on limited and short-term data, concerning findings that warrant more investigation, and studies designed and provided by the very company profiting from the product's sale.

## **Nature's Perfect Design – Understanding Cow Digestion**

Before we rush to 'solve' cow methane emissions with synthetic chemicals, let's take a moment to reflect on what we're tampering with – a digestive system intricately designed with care and perfected over time.

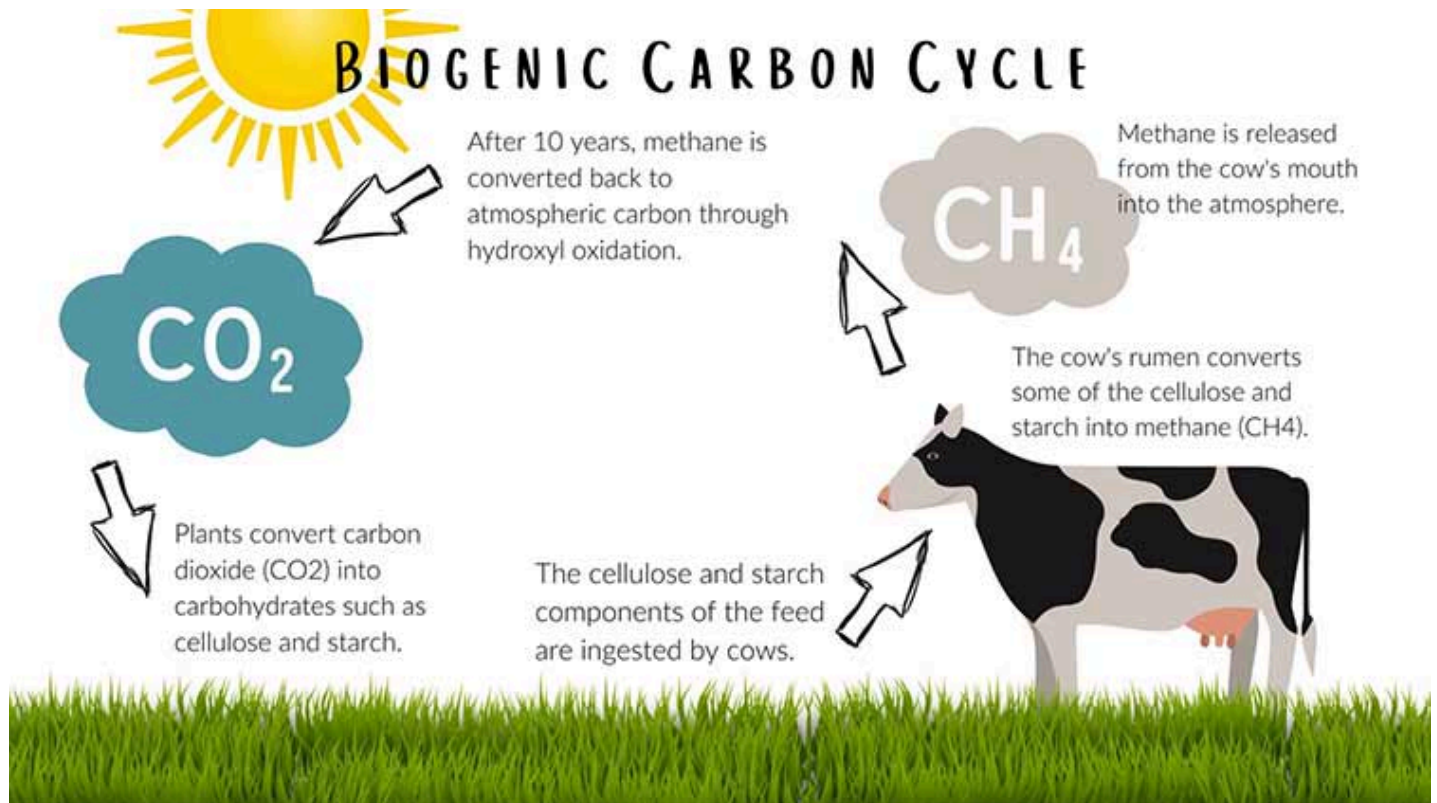
Cows are ruminants, equipped with a specialized four-chambered stomach that performs an essential ecological function: converting inedible plant fiber into nutrient-dense food for humans. When cows digest these tough plant materials, their gut microbes (specifically methanogens) produce methane as a natural byproduct, which the cows release through burping.

Here's the crucial point that Bovaer's marketers don't want you to understand: This methane is part of a natural carbon cycle:

- Plants absorb CO<sub>2</sub> from the air through photosynthesis
- These plants are eaten by cows

- Cows digest them and release methane
- Within about 10 to 12 years, this methane naturally breaks down back into CO<sub>2</sub>
- Plants reabsorb this CO<sub>2</sub>, starting the cycle again

There's no new carbon.



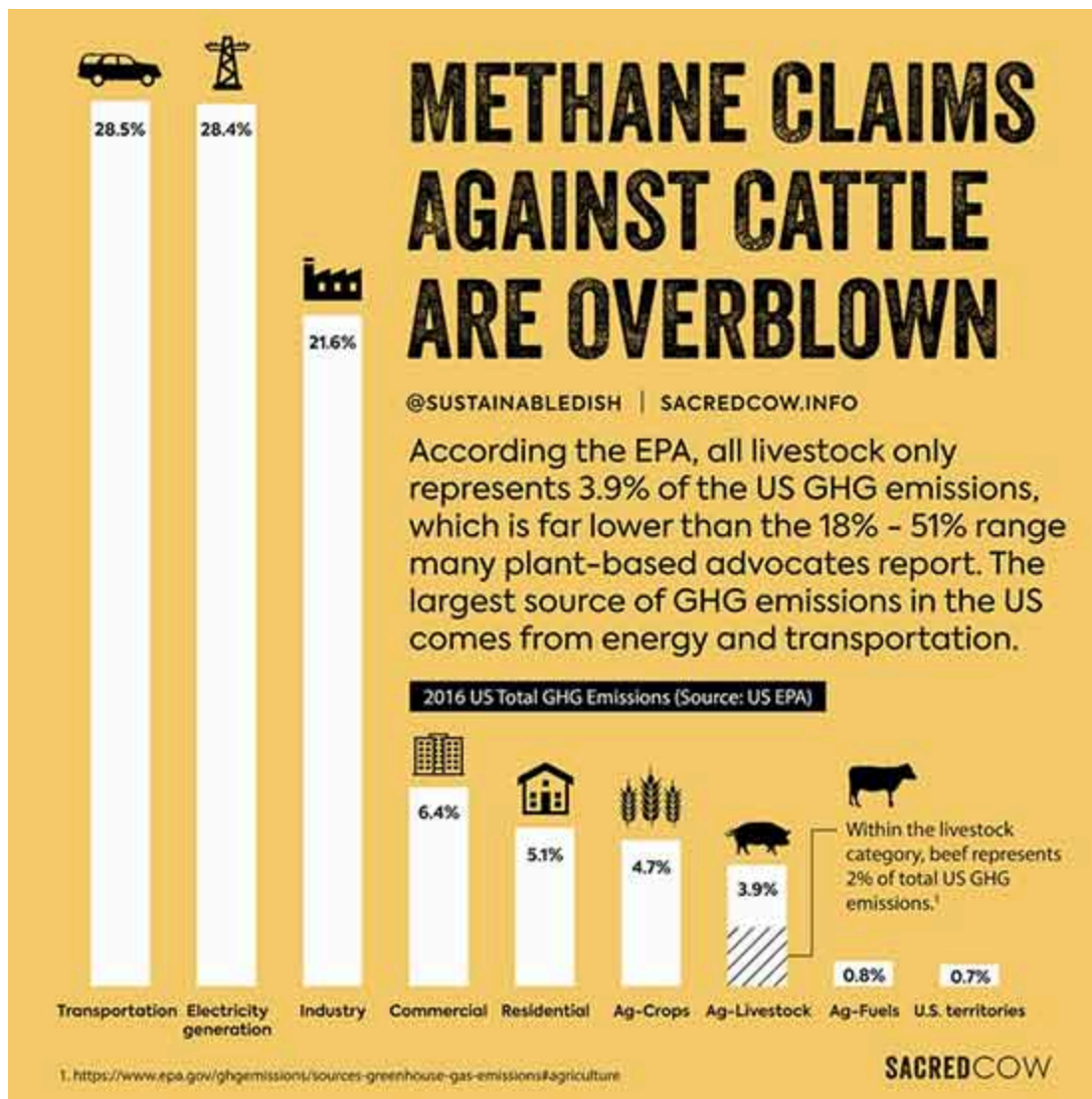
From: [National Agriculture in the Classroom](#)

Cow burps don't add new carbon to the atmosphere. They're simply part of a continuous, natural cycle that's been occurring for a very, very long time.

In fact, there are fewer methane-belching ruminants in North America today than in the 1600s, when 60 million bison roamed freely alongside millions of deer, antelope, and moose. Let's put cattle 'emissions' into perspective:

- U.S. livestock account for just 4.2% of greenhouse gas emissions (very far from the 18% to 51% range that advocates often cite)
- Transportation sector – 27%
- Energy sector – 31%





Instead of trying to "fix" a natural process with synthetic chemicals, we should focus on regenerative agriculture practices that work with nature's cycles rather than against them. But there's one problem with this approach: Big Ag can't patent and profit from it.

Big Ag can profit from "chemical solutions to climate change." But it is important to point out that carbon dioxide (CO<sub>2</sub>) is often misrepresented as a harmful pollutant, yet it is a critical component of life on Earth. While it plays a role in regulating the planet's climate, its influence on temperature is often exaggerated.<sup>3</sup>

For instance, doubling atmospheric CO<sub>2</sub> from 400 ppm to 800 ppm would reduce radiation to space by only 1.1%, causing a modest 0.7 degrees Celsius rise in global temperature. The real issue lies not in CO<sub>2</sub> itself but in the disruption of natural cycles like carbon and water, largely driven by industrial practices that prioritize profit over true sustainability.

Why are we rushing to chemically alter a natural digestive process that's been functioning perfectly for millions of years? The answer isn't in synthetic feed additives – it's in returning to agricultural practices that work in harmony with nature's cycles, not against them. Mother Nature already has this figured out. Perhaps instead of trying to outsmart her, we should try listening.

## Conventional Agriculture's Dirty Little Secret

While Big Ag pushes expensive feed additives to "solve" natural cow burps, they're conveniently ignoring an issue that is hypocritical to their stance on climate change: synthetic nitrogen fertilizers. Let's compare these two sources of methane:

Natural Cow Digestion	Synthetic Nitrogen Production
Part of a closed carbon cycle	Relies on fossil fuels through the Haber-Bosch process
Methane breaks down in 10 to 12 years	Creates new methane that wasn't in the natural cycle
No new carbon added to the system	Emissions are vastly underreported (by a factor of 100, according to Cornell University)
Been occurring naturally for ages	Continues adding new methane to the atmosphere indefinitely
	Produces nitrous oxide after application – a greenhouse gas 265 times more potent than CO <sub>2</sub>

Isn't it interesting that the same agricultural industry pushing Bovaer to "fix" cow burps is silent about their fertilizer emissions? One study out of Cornell University found that

industry-reported methane emissions from synthetic nitrogen production are understated by a factor of 100.<sup>4</sup>

Yet instead of addressing this toxic chemical problem, they're trying to chemically alter a natural biological process. The issue goes beyond just emissions. Conventional agriculture's reliance on synthetic inputs creates a vicious cycle:

- Chemical fertilizers and pesticides damage soil health
- Glyphosate disrupts beneficial fungal networks in the soil
- Weakened soils become dependent on more chemical inputs
- Each "solution" creates new problems requiring more chemicals

Why focus on cow burps instead of fertilizer emissions? Simple: There's no profit in admitting that synthetic fertilizers are the problem.

Big Ag can't patent natural soil processes or sell you a product to fix fertilizer emissions. But they can sell you Bovaer — a new chemical "solution" to a natural process that was never broken in the first place.

Instead of adding more chemicals to "fix" natural processes, we should be addressing the actual problem: the breakdown of natural nutrient cycles through industrial agriculture. But that would require admitting that the conventional agricultural model itself is the issue — something Big Ag isn't ready to do.

While they're pushing farmers to feed their cows synthetic chemicals to reduce methane, perhaps we should be asking: Who's going to fix the methane from making all those synthetic fertilizers?

## **The Bottom Line**

The push to "fix" cow methane with synthetic feed additives perfectly exemplifies modern agriculture's broken mindset: Instead of working with natural processes, the

industry keeps creating chemical "solutions" to problems that don't exist – all while ignoring the real environmental damage from conventional farming practices.

After a period of time, we often learn that these 'chemical solutions' cause more problems than they initially solved.

This isn't about climate change – it's about profits. Big Ag can't monetize natural processes, but they can sell you chemicals that disrupt them. Here's your choice: Support a system that views nature as something to be conquered with chemicals, or support farmers who work in harmony with natural cycles.

If you care about both environmental and human health, the answer is clear: Stop buying industrially produced meat and dairy from grocery stores. Instead, connect directly with farmers and cooperatives who respect natural processes through the use of regenerative agriculture practices rather than trying to outsmart them with synthetic chemicals.

Mother Nature already has this figured out – perhaps it's time we started listening to her instead of fighting against her.

## **About the Author**

Ashley Armstrong is passionate about helping educate and inspire others to improve their metabolic health. She and her sister run the "Strong Sistas" social media account, and have [free information and courses on their website centered around improving metabolism](#).

Ashley is also passionate about improving the food system and providing food products that support thyroid and metabolic health. Ashley is a regenerative farmer, and co-founder of [Angel Acres Egg Club](#), which specializes in low-PUFA (polyunsaturated fat) and low phytoestrogen eggs that are shipped to all 50 states, and [Nourish Cooperative](#) which ships low-PUFA chicken and pork, beef, cheese and traditional sourdough to all 50 states.

## Sources and References

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- <sup>1</sup> [Bovaer, How Cows Can Help Us Fight Climate Change PDF](#)
- <sup>2</sup> [Australian Journal of Experimental Agriculture 48\(2\) 7-13 doi: 10.1071/EA07218](#)
- <sup>3</sup> [Mercola, January 27, 2024](#)
- <sup>4</sup> [ScienceDaily, Fertilizer plants emit 100 times more methane than reported, June 6, 2019](#)