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The Rt Hon Daniel Zeichner MP
Minister of State for Food Security and Rural Affairs
Department for Environment, Food and Rural Affairs (DEFRA)
Seacole Building, 2 Marsham Street
London
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United Kingdom

Dear Minister Zeichner,

I am writing to express my concerns regarding the rollout of the feed additive 3-nitrooxypropanol (**3-NOP**), marketed as **Bovaer**, which is being adopted in UK dairy production to reduce methane emissions. While the supposed environmental benefits of methane reduction may be important to the Government and to institutions supporting atmospheric CO2 reduction, I believe that the potential health, environmental, and animal welfare risks associated with this novel additive necessitate immediate and thorough review by your department.

Evidence from animal studies raises critical questions about the potential risks of 3-NOP exposure to human health. The active ingredient, 3-nitrooxypropanol, has been linked to serious health concerns under experimental conditions:

Potential Human Harms

1. 3-NOP has been associated with benign tumour formation upon its preliminary testing with rats. Carcinogenic compounds have often displayed cumulative effects over prolonged periods of even minimal exposure, and given the ubiquitousness of dairy products in the UK diet, particularly among vulnerable populations such as children, pregnant women, and the elderly, there is a strong case for more extensive long-term human risk assessments before widespread adoption.

2. Studies have also shown that high doses of 3-NOP can adversely affect male reproductive health in animal models, with reductions in testicular weight, sperm count, and motility observed. I believe this raises serious concerns about the potential for low-level, chronic exposure to disrupt endocrine and reproductive systems in humans. This is particularly relevant in light of increasing concerns about environmental and dietary contributions to declining fertility rates globally.
3. The UK's dairy industry already employs multiple additives and processing aids. The introduction of 3-NOP adds another layer of complexity to understanding how such compounds may interact within the food chain. Even if each additive is believed to be "safe" individually, their combined or synergistic effects over time on human health remain largely unknown, particularly given the ephemeral nature of the studies and testing for 3-NOP.
4. While regulators claim that residue levels of 3-NOP in animal-derived products are negligible, real-world conditions (e.g., variations in feed protocols, farm management, or processing methods) could result in higher-than-expected residue levels. Consumers would have little means of knowing whether the dairy products they purchase contain traces of this compound, leading to potential long-term exposure without informed consent.

Additionally, I would like to address the potential harms of 3-NOP to livestock welfare and the environment, as I believe these warrant closer scrutiny before widespread adoption:

Potential Livestock Harms

1. 3-NOP functions by inhibiting the enzyme methyl-coenzyme M reductase (MCR) in the rumen, a key step in methane production. I believe this mechanism raises concerns about unintended consequences:
 - Methane production is part of a delicate microbial ecosystem in the rumen that supports digestion and nutrient absorption. Inhibiting this process could disrupt the balance of beneficial microbes, potentially affecting feed efficiency and digestion over the long term.
 - Altered digestion could lead to increased production of volatile fatty acids or other metabolites, potentially contributing to acidosis or other metabolic disorders.

2. Animal studies suggest that while 3-NOP may reduce methane emissions, there could be trade-offs in terms of energy efficiency. Methane production is an energy pathway for ruminants, and its inhibition might result in energy being redirected in ways that do not benefit the animal. Over time, this could impact growth rates, milk yields, and reproductive performance.
3. While short-term studies indicate no immediate adverse health impacts, there is a lack of data on the additive's effects on livestock over extended periods. Questions remain about potential impacts on:
 - Alterations to the gut microbiome may influence systemic immunity, making animals more susceptible to infections.
 - Any metabolic stress caused by prolonged 3-NOP use could indirectly affect fertility or calving outcomes.

Potential Environmental Harms

1. 3-NOP and its metabolites are excreted through animal manure, which is often used as fertilizer. This raises concerns about environmental contamination:
 - Just as 3-NOP affects microbial populations in the rumen, its metabolites could, with expansive national rollout, alter soil microbial ecosystems, potentially affecting nutrient cycling and soil health.
 - Runoff from fields fertilized with manure containing 3-NOP metabolites may introduce these compounds into waterways, impacting aquatic ecosystems and possibly entering the human water supply.
2. If 3-NOP metabolites persist in the environment, they may affect non-target organisms, including beneficial soil bacteria, fungi, and insects. These impacts could have cascading effects on biodiversity and agricultural sustainability.
3. Methane is one component of the agricultural greenhouse gas equation. The broader impacts of 3-NOP on other elements of the carbon and nitrogen cycles, such as ammonia production or nitrate leaching, are not fully understood. These could offset any alleged environmental benefits of methane reduction.

4. Repeated use of 3-NOP in livestock systems might inadvertently promote microbial adaptation or resistance. Although this is not directly analogous to antibiotic resistance, changes in microbial populations could reduce the additive's effectiveness over time and introduce unforeseen ecological dynamics.

Given Arla's partnerships with major retailers and its significant share (approx. 30%) of private-label milk and dairy products, the risk of widespread exposure to trace residues of 3-NOP through milk and meat is substantial. I'm sure you would agree the importance of robust assurances for consumers regarding the long-term safety of products derived from animals fed with 3-NOP.

I urge the Government to take a precautionary approach to the rollout of 3-NOP by commissioning comprehensive and independent research into its long-term impacts. Furthermore, I strongly advocate for a mandatory transparent labelling of the products derived from animals fed with 3-NOP, ensuring that consumers have the ability to make informed choices about their dietary intake.

I do not value the importance of reducing methane emissions or support a climate strategy when it risks the potential expense of public health, environmental stability and agricultural integrity. The adoption of 3-NOP as a feed additive reflects a concerning prioritization of a narrow environmental agenda over the wellbeing of the nation and the ecosystems it depends on.

I look forward to your response regarding the Government's plans to address these concerns.

Yours sincerely,

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