

Peer Review

Review of: "Effect of Bromide on Livestock Development: A Review"

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This review addresses an important and potentially underrecognized issue in livestock production: the impact of environmental bromide (Br^-) exposure on thyroid physiology and developmental outcomes. The manuscript integrates environmental chemistry, halide biology, endocrine regulation, and production performance, presenting a mechanistically plausible framework linking bromide exposure to thyroid hormone (TH) disruption.

The topic is relevant, particularly for livestock systems dependent on groundwater in arid or coastal regions. The review is scientifically ambitious and brings attention to a water quality parameter that is rarely discussed in animal production contexts.

However, while the biological plausibility is strong, some conclusions extend beyond the available field-level evidence. Greater distinction between mechanistic evidence, experimental animal data, and production-scale implications would improve scientific balance.

Major Concerns

1. Generalization of NOAEL (0.01 mg/L)

The repeated reference to a NOAEL of 0.01 mg/L (derived from the chicken embryo model) risks overgeneralization. This threshold:

Is species-specific.

Has not been validated in ruminants.

Is not supported by large-scale livestock field data.

The manuscript should clearly state that this value is provisional and model-dependent.

2. Experimental vs Field Evidence

Much of the evidence presented derives from:

In ovo injection studies

Rodent toxicology models

Controlled exposure trials

Direct epidemiological or production-system field data linking groundwater bromide to hypothyroidism in livestock are limited.

A clearer distinction between laboratory findings and real-world exposure scenarios is needed.

3. Human Food Chain Implications

The suggestion that bromide accumulation in milk or offal may pose a hypothyroid risk to humans is speculative. Without exposure modeling or human dietary risk assessment, this claim should be framed cautiously.

4. Limited Discussion of Mitigation

The manuscript calls for mitigation but does not elaborate on practical strategies such as:

Water blending

Reverse osmosis

Iodine supplementation protocols

Monitoring guidelines

Declarations

Potential competing interests: No potential competing interests to declare.