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Aflatoxin contamination in industrial ruminant feed and milk: Assessing health risks in Dakar’s peri-urban dairy farms

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Abstract

This study investigates the quality of milk from cows on three peri-urban farms in Dakar, Senegal, focusing on contamination by Aflatoxin B1 (AFB1) in industrial ruminant feed. AFB1 is a mycotoxin that, when ingested by dairy cows, can be metabolised in the liver into Aflatoxin M1 (AFM1), a compound that further can be excreted in milk. AFM1 is classified as a Group 1 carcinogen by the International Agency for Research on Cancer and poses significant health risks. Particularly children, who are more vulnerable due to their dietary habits and lower body weight, are exposed to this risks.

Milk and feed samples were collected from the three farms and analysed at the Mycotoxin Laboratory of the Institute of Food Technology in Dakar. The analysis revealed that 58.33 % of the feed samples contained AFB1 concentrations above the maximum allowable limit of 20 $\mu\text{g}/\text{kg}$, as defined by French regulatory standards used as a reference. This level of contamination increases the likelihood of AFM1 residues appearing in milk. High-performance liquid chromatography, conducted in accordance with ISO 14501:2007, detected AFM1 in 86.95 % of the milk samples. Notably, these levels exceeded the European Union’s regulatory threshold of 0.05 ppm.

These findings underscore a pressing need for intervention in Senegal’s dairy sector. To ensure food safety, improve milk quality, and meet international standards, it is essential to address the sources of feed contamination and promote better farming practices. Strengthening regulatory oversight and increasing awareness among producers and stakeholders can help reduce health risks and support the production of safe, high-quality milk.

Keywords: Aflatoxin, dairy products, food security, milk, Senegal