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Global Perspectives on PFAS Contamination in Animal-Source Foods: Implications for Food Safety in Sri Lanka

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Per- and polyfluoroalkyl substances (PFAS), particularly the four key compounds PFOA, PFNA, PFHxS, and PFOS (PFAS4), are highly persistent synthetic pollutants with strong bioaccumulative potential. These compounds have documented adverse health effects, including immunotoxicity, endocrine disruption, and developmental impacts. Global evidence indicates that PFAS contamination in animal-source foods—such as milk, eggs, and meat—is more prevalent near industrial or firefighting-related hotspots, driven by exposure through contaminated water, feed, and soil. Concentrations exceeding regulatory thresholds have been reported globally, with PFOS and PFOA frequently dominating contamination profiles. Currently, there are no guidelines for livestock feed, soil, or drinking water for livestock, which complicates exposure assessments in food production systems. To date, no published data exist on PFAS levels in Sri Lankan livestock or animal-source foods. This review synthesizes international findings to identify potential exposure pathways and risks relevant to Sri Lanka's smallholders and other vulnerable livestock production systems, where reliance on groundwater and imported feed may heighten vulnerability. The study emphasizes the urgent need for a national PFAS monitoring and management strategy, incorporating hotspot mapping, routine testing, regulatory limit setting, and farmer training to safeguard food safety and public health in Sri Lanka. In the absence of locally available or affordable analytical capabilities, insights from international experiences in similar contamination contexts can serve as a practical foundation for developing effective initial risk assessment and mitigation approaches. Looking ahead, investing in national analytical capacity, digital surveillance tools, and predictive modeling could enable Sri Lanka to move toward proactive, data-driven approaches to managing emerging contaminants like PFAS.

Keywords: Bioaccumulation, Food safety, Livestock, PFAS contamination, Sri Lanka