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Review Article

A Comprehensive Review of Food-Safety Threats, Nutritional Inadequacies, and Pediatric Disease Outcomes in Cameroon (2000 – 2025)

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Abstract

Introduction: Children under five in Cameroon continue to face high burdens of malnutrition, infectious diseases, and exposure to unsafe foods. Nutritional inadequacies, including stunting, underweight, and micronutrient deficiencies, intersect with food contamination by mycotoxins, pathogens, pesticide residues, and heavy metals. Together, these factors aggravate disease susceptibility and impair growth and neurodevelopment.

Objective: To comprehensively review evidence from 2000–2025 on the convergence of food-safety threats, nutritional inadequacies, and pediatric disease outcomes in Cameroon, highlighting key risk factors, interaction pathways, and policy gaps.

Methods: A narrative comprehensive review approach was applied. Literature from Google Scholar, PubMed, ScienceDirect, AJOL, and institutional reports (WHO, UNICEF, Ministry of Public Health) were screened using predefined keywords. Studies were included if they presented data on Cameroonian children aged 0–59 months and addressed at least two themes: food safety hazards, nutritional status, and disease outcomes. Findings were synthesized thematically, covering national trends, contamination profiles, dietary patterns, and health risks.

Results: Data show persistent malnutrition, with stunting at 29%, underweight between 11–19%, and anemia exceeding 60% in some regions. Staple weaning foods—including maize, cassava, and groundnuts—commonly contain aflatoxins, fumonisins, and ochratoxin A at levels surpassing international limits. Poor dietary diversity, low maternal education, unsafe water, and early or delayed complementary feeding contribute to malnutrition and diarrheal disease. Evidence indicates strong links between contaminated diets, impaired immunity, child growth failure, and increased risk of neurodevelopmental disorders.

Conclusion: Food safety hazards and nutritional deficiencies jointly threaten child health in Cameroon. Addressing these interlinked issues requires integrated, multisectoral strategies that combine strengthened regulation, improved dietary diversity, mycotoxin mitigation, caregiver education, and adoption of a One Health food-safety framework.

Keywords: Food Safety; Nutrition; Child Disease; Cameroon; Aflatoxin; Stunting

Introduction

In Cameroon, child health remains a critical public health priority, with children under five facing high disease burdens including malnutrition, neurodevelopmental disorders, and preventable diseases. According to the 2018 Cameroon Demographic and Health Survey (CDHS), approximately 29% of children under five are stunted, 11% are underweight, and 63% suffer from anaemia, indicating widespread nutritional inadequacies [1]. At the same time, unsafe food, often contaminated with bacteria, mycotoxins, pesticide residues, and heavy metals, poses additional threats to child health, particularly as complementary feeding begins [2-4]. These food safety risks not only increase susceptibility to infections and exposures to chemical contaminations in foods but also contribute to nutrient malabsorption and long-term developmental impairments [5,6]. Despite interventions, the convergence of poor food safety and suboptimal nutrition continues to undermine progress toward child survival, growth, and development.

The interaction between food safety and nutrition is particularly important in contexts where children's diets are monotonous, largely plant-based, and prepared under inadequate hygienic conditions. Studies have shown that common weaning foods in Cameroon, including maize-based porridges and groundnuts, are frequently contaminated with aflatoxins [7-10] and pathogens like *Aspergillus* [11]. Aflatoxins, in particular, are associated with growth impairment and immune suppression in young children [12,13]. Meanwhile, poor dietary diversity contributes to persistent micronutrient deficiencies and weakens resistance to disease. However, most studies have addressed food safety and nutrition as separate issues, failing to explore their combined influence on child health outcomes. A comprehensive understanding of this intersection is urgently needed to inform multisectoral responses in health, agriculture, and food regulation.

This review aims to bridge that gap by synthesizing current knowledge on how food safety hazards and nutritional inadequacies collectively impact the disease burden and developmental health of children in Cameroon. By identifying key patterns, risk factors, and evidence gaps, the review supports a food system's approach to improving child health - one that recognizes the interdependence between what children eat, how it is prepared, and the environments in which they grow.

Methodology

This review adopts a narrative comprehensive review approach to explore and synthesize published literature on the convergence of food safety risks, nutritional deficiencies, and disease outcomes in children under five in Cameroon. The objective is to map existing knowledge, identify research gaps, and highlight intersections relevant to child health.

The literature search was conducted across key academic databases including Google Scholar, African Journals Online, PubMed, and ScienceDirect, supplemented with relevant institutional reports from WHO, UNICEF, and Cameroon's Ministry of Public Health. The search strategy combined broad and specific keywords using Boolean operators, including: "child health", "food safety in Cameroon", "malnutrition", "stunting", "aflatoxins", "diarrhoea in children", and "dietary exposure".

Studies were included if they met the following criteria: (1) conducted in Cameroon or provided relevant regional context, (2) involved children aged 0–59 months, (3) addressed at least two of the `appraisal tool was applied, in keeping with the flexible, exploratory nature of a comprehensive review. Key findings were extracted and organized under thematic headings: types of food safety hazards, nutritional profiles and deficiencies, disease patterns, and interactions among these variables. Data from diverse sources between 2000 and 2025 were summarized using tables and visualized through maps and figures where applicable.

This flexible approach allowed for the inclusion of multidisciplinary sources, public health, nutrition, food toxicology, and agricultural research, providing a broad understanding of how food safety and nutrition intersect in shaping child health outcomes in Cameroon.

This review does not involve primary data collection or ethical approval, as it is based entirely on secondary data from published and publicly accessible sources.

Results and Discussion

Nexus between food safety, nutrition and diseases

The proposed conceptual model of the food safety–nutrition–disease nexus (Figure 1) elucidates the intricate interconnections between food quality, dietary adequacy, and health outcomes. Contaminated or unsafe food compromises nutritional security by

diminishing nutrient bioavailability, triggering foodborne illnesses, and worsening micronutrient deficiencies [5]. Conversely, poor nutritional status heightens vulnerability to infections and toxin exposure, establishing a feedback loop among diet, immunity, and disease [14]. This model integrates environmental, behavioural, and biological pathways: unsafe agricultural and processing practices introduce hazards; inadequate food storage and preparation increase exposure risk; and limited dietary diversity weakens resilience to disease [15]. Nutrition-sensitive food safety interventions, including enhanced hygiene, mycotoxin mitigation, and diet diversification, are therefore vital to disrupting this cycle [16]. This systems-based framework emphasizes that food safety is not an isolated concern but a critical determinant of nutritional health and sustainable development. Strengthening regulatory frameworks, surveillance systems, and community education fosters improvements in both food safety and nutrition, ultimately reducing the global burden of diet-related diseases [17]. The model highlights the necessity for integrated policies that connect agriculture, health, and environmental sectors to promote optimal population well-being.

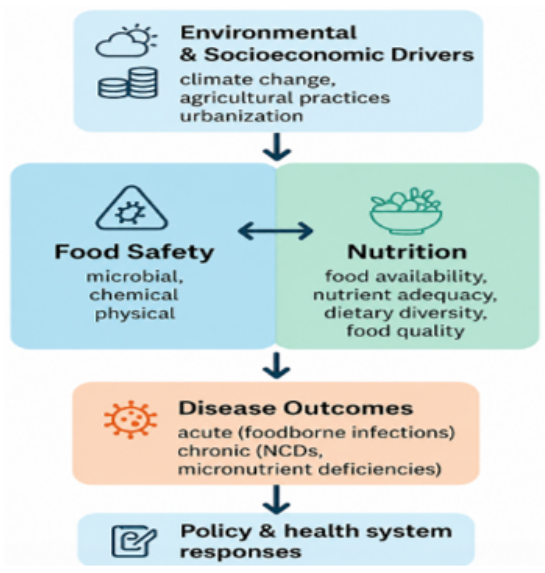

Figure 1: Proposed conceptual model of the food safety, nutrition and disease nexus.

National trends in under-five nutrition and disease indicators (2000–2025)

According to UNICEF 2025, the population of Cameroon was estimated at 29.9 million in 2025 with under 5 children representing 17% of the population with an average of 4.8 children per woman [18]. Table 1 shows national trends in nutritional status of under 5 children in Cameroon from the years 2004 to 2021. From the data collected, the highest prevalence of stunting was seen in the year 2008 with a percentage prevalence of 36% [19] and reduced to 29% in 2021 [20]. More children were stunted in rural areas (36%) and the northern region (41%) compared to urban areas [21]. The prevalence of underweight was highest in the year 2012 with a percentage prevalence of 19.3% [22] and decreased in 2018 to 11% [21] but there was an increase in the prevalence of underweight to 15% in the year 2021 [20]. The prevalence of wasting reduced from 7% in 2008 [19] to 4.3% in 2021 [20].

Generally, there has been an improvement in the prevalence of stunting and wasting from the years 2004 to 2021 where the prevalence of stunting was below the WHO serious (very high) threshold of 30% and the prevalence of wasting was at the low threshold in accordance with the WHO standard of 2.5-<5 [23]. The 15% prevalence of underweight in the year 2021 indicates a serious malnutrition problem according to the WHO threshold [24]. Several factors such as type of breastfeeding, age of introduction of complementary foods, mothers level of education, marital status and occupation [25], household income, maternal education and irregular meal patterns [26], inadequate healthcare infrastructure [27], age of mother [28], age of child [29], and sex of child [30] influences the nutritional status of a child. Most studies showed that more boys were stunted compared to girls [24,25,30,31] although other studies showed that females were more stunted compared to males [32,33]. It is generally assumed that male children eat more than female children and will tend to be more malnourished if not adequately fed [32]. Prevalence of malnutrition was higher in children aged 18-23 months (45%) compared to those aged 9-11 months (14%) [21]. This finding was consistent with the study by Tchapda., *et al*. [25] where children aged 12-24 months were more stunted (19.41%) compared to other ages. Similarly, Asoba., *et al*. [29] reported a high stunting prevalence in children aged ≤2 years old" compared to other ages. The high percentages of malnutrition at this age could be due to the fact that this age indicates nutrition transition and probably inappropriate breastfeeding and complementary feeding practices [34].

Year	Stunting (%)	Underweight (%)	Wasting (%)	Citation
2004	35	14	6	[35]
2008	36	16	7	[19]
2011	33	15	6	[36]
2012	30.4	19.3	6.1	[22]
2014	32	15	5	[37]
2018	29	11	4	[21]
2020	32	15	/	[38]
2021	29	15	4.3	[20]

Table 1: National trends in under-five nutrition and disease indicators (2000-2025).

Food safety hazards in children's diets

As shown in Table 2, all the staple foods were contaminated with multiple mycotoxins including AFT, FB1, DON, OTA and ZEN. Maize had the highest contamination of the *Fusarium* toxins; FB1 (the most abundant of the *Fumonisins*), DON and ZEN with mean concentrations of (508, 171 and 68) µg/kg respectively compared to other staples [39]. Groundnuts had higher levels of the *Aspergillus* toxin AFB1 (the most abundant of the aflatoxins) with concentration of 47µg/kg and the *Aspergillus* and *Penicillium* toxin OTA (7 µg/kg) compared to other staples [39]. Lower mycotoxin contamination was found in by products of maize and groundnut compared to the original samples [39-41]. Penicillic acid was found only in cassava samples ranging between 25 and 184 µg/kg [42].

Food Type	Food contaminant	Levels/Range (µg/kg)	Region (AEZ)	Citation
Maize	AFB1	4(<LOQ-12)	Central and North-west (AEZ3 and AEZ5)	[39]
	FB1	508(2-2313)		
	OTA	1(<LOQ-1)		
	DON	171(43-437)		
	ZEN	68(0.2-309)		
	AFT	9.46 (5.50 - 16.33)	AEZ1-5	[43]
Maize-based foods	AFT	0.8-20	Central (AEZ5)	[40]
Maize fufu	AFB1	0.9 (n.d-1.8)	Northwest (AEZ3)	[41]
Groundnut	AFB1	47 (<LOQ-210)	Central and North-west (AEZ3 and AEZ5)	[39]
	FB1	5(0.4-10)		
	OTA	7(<LOQ-23)		
	DON	Nd		
	ZEN	4(<LOQ-45)		
	AFT	5 - 10.6	AEZ1-5	[43]
Groundnut soup	AFB1	15 (<LOQ -37)	Central and North-west (AEZ3 and AEZ5)	[39]
	FB1	4(0.6-17)		
	OTA	1.7(<LOD-3)		
	DON	1(0.96-1.8)		
	ZEN	nd		

Rice	AFT	8.92 (5.06 - 17.26)	AEZ1-5	[43]
	OTA	(0.2-0.3)	North (AEZ1)	[44]
	ZEN	67	North West, Central and Litoral (AEZ3, AEZ5 and AEZ4)	[45]
Soybean	AFB1	2.6(1-3)	Central and North-west (AEZ3 and AEZ5)	[39]
	FB1	49(38-69)		
	OTA	nd		
	DON	67(56-75)		
	ZEN	15(12-18)		
	AFT	4.86 - 14.06	AEZ1-5	[43]
Cassava flakes (garri)	AFB1	6-194	AEZ3, AEZ4, AEZ5	[42]
	PA	25-184		

Table 2: Reported prevalence of microbial and chemical contaminants in common weaning foods.

AFT: Total Aflatoxin, AFB1: Aflatoxin B1, FB1: Fumonisin B1, DON: Deoxynivalenol, ZEN: Zearalenone, OTA: Ochratoxin A. PA: Penicillic acid; Nd: not determined; AEZ: Agroecological Zone; AEZ1-5: AEZ1, AEZ2, AEZ3, AEZ4, AEZ5.

From the study carried out by Abia., *et al.* [41], the AFB1 levels in maize fufu was 0.9 µg/kg. This was similar to the AFB1 levels (1.2 µg/kg) of maize fufu in a study by Nguegwouo., *et al.* [40] and lower than levels of AFB1 in groundnut "(6–125 µg/kg [42] and 47 µg/kg [39])" and groundnut soup (15 µg/kg) [39]. It was also lower than the AFT levels found in maize by (5.50–16.33 µg/kg [43] and 4 µg/kg [39]). The levels of aflatoxins reported in maize by Dongmo., *et al.* [43] exceeded the Codex Alimentarius Commission's (CAC) maximum limits (MLs) of 10 µg/kg [46] and the MLs of 2 µg/kg specified for ready-to-eat maize in the European Union (EC) [47].

Though the levels of AFB1 in maize fufu samples were below the standards stipulated by CODEX and EU, it is important to limit the consumption of these contaminated products since negative effects may be aggravated in cases of constant daily exposures to low doses over a long period of time considering the fact that maize is consumed almost daily in several forms as staple foods for many, if not all homes in Cameroon [39]. Long-term effects or fluctuations of Aflatoxins have been associated with stunted growth and kwashiorkor, malnutrition, and abnormalities in the metabolism of micronutrients in children [9].

In a study carried out by Njumbe., *et al.* [48], multiple mycotoxins were detected in the urine of infants with higher AFM1 in children who were wholly breastfed compared to those who were fully weaned. These results were consistent with those from a study. Those from Tchana., *et al.* [12] where AFB1 was detected in the urine of malnourished children and there was a link ($P < 0.05$) between AFB1 and malnourished children. Also, milk from breastfeeding mothers (4.8%) was contaminated with AFM1. It is possible that the presence of the toxin reflects food habits of the mothers whose knowledge, attitudes and practices with respect to food may vary considerably [12]. The high AFT contents of some maize-based food samples could be explained by poor conditions of drying and storage of maize which is the major ingredient [40]. Also, highest mycotoxin contamination was seen in Fumonisin (FB1) 508 µg/kg (range: 2-2313 µg/kg) in maize samples compared to other mycotoxin contaminations [39]. This was lower than the FB1 levels obtained from previous studies where maize was highly contaminated with Fumonisin (FB1) with a mean of 3,684 µg/kg (range: 37-24,225 µg/kg); 5412 µg/kg [42] compared to other mycotoxins. These FB1 levels were higher than the maximum tolerable levels of 1000 µg/kg in maize-based products for direct human consumption [46] thus indicating high risk. The higher OTA levels in groundnut 7(<LOQ-23) and its product compared to other staples [39] was in conformity to a study carried out by Njumbe., *et al.* [49], where it was observed that OTA was more of a contaminant in peanut products than in products derived from the other two

food matrices (maize and cassava flour) [49]. Higher levels of ZEN 68 µg/kg (range 0.2-309 µg/kg) were found in maize [39] whose higher limit was higher than the maximum tolerable limits of 100 µg/kg [47]. Similar levels of ZEN were found in maize (69 µg/kg) and rice (67 µg/kg) in a similar study carried out by Njobeh., *et al.* [45]. These levels were below the maximum tolerable limits of 100 µg/kg [47]. Although these levels were low, it is important to keep them lower. Higher levels of DON were found in maize 171(43-437) µg/kg compared to other samples [39]. These levels were lower than those gotten from a study by Njobeh., *et al.* [45] with DON levels ranging from 13-273 µg/kg and were well below EU acceptable levels of 1,750 µg/kg [47]. The presence of Penicillic acid, PA was not detected in any of the nonfermented products, suggesting that cassava flakes constitute a suitable substrate for growth of *Penicillium spp*. and hence mycotoxin production [42]. Lower mycotoxin levels in processed foods compared to the original food could be due some decrease caused by the multistep cooking procedure and include loss into the water [41].

Nutritional status and dietary patterns

As presented in Table 3, the east region (Ayos) recorded the highest rates of stunting 53.07% [25] while the Far North region had higher levels of underweight (30.1%) among children [24]. Notably, the prevalence of wasting in Douala reached 23.1%, exceeding the levels reported in other regions [33]. Most reports did not show prevalence of anemia but, from a study in Fouejio et al. [33], the prevalence of anemia was 35.10%. With regards to the minimum dietary diversity (MDD), higher levels were found in the Northwest region with a percentage prevalence of 80.75% [50] with lower levels of 16.80% found in Mayo-Danay in the Far North [31].

Region	Number of participants	% Stunting	% Wasting	% Underweight	% Anemia	Citation
Urban areas						
Littoral (Douala)	333	27.00	23.10	25.80	35.10	[33]
West Dschang	200	35.00	8.90	12.80	-	[28]
Adamaoua	674	37.80	4.00	16.30	-	[24]
North	825	33.80	10.10	20.40		
Far north	962	41.90	9.00	30.10		
East	623	35.80	7.80	21.10		
South West (Buea)	323	23.30	13.30	26.70	-	[26]
Rural areas						
South West (Batoke, Tole and Dibanda)	628	29.00	18.20	21.20	72.80	[51]
East (Ayos)	309	53.07	9.06	26.54	-	[25]

Table 3: Pooled prevalence of stunting, wasting, underweight and anemia by region.

As indicated in Table 3, the Far-North region exhibited high prevalence rates of both stunting and underweight among children, with figures reaching 41.9% and 30.1%, respectively. This pattern underscores the substantial burden of malnutrition faced by children in this region. Higher prevalences of stunting and comparable levels of underweight have been documented in studies conducted in Batouri, Ayos, and Foumban, with stunting rates of 45.8%, 53.07%, and 55.08%, and underweight prevalences of 30.2%, 26.54%, and 31.99%, respectively [25,30,32]. These rates exceed those reported in the 2018 Cameroon Demographic and Health Survey, which indicated national prevalences of 29% for stunting and 11% for underweight. The observed increases in these malnutrition indicators have been attributed to factors including socio-economic disparities, suboptimal feeding practices linked to low family income, limited access to healthcare services [26], cultural practices, and the prevalence of recurrent or chronic infectious diseases [25].

The prevalence of wasting in Douala was notably high at 23.1% [33], substantially exceeding both the wasting rates observed in other regions and the national estimate of 4% reported in the 2018 Cameroon Demographic and Health Survey [21]. This elevated wasting prevalence may be attributed to dietary intakes falling below minimum nutritional requirements, which can compromise immune function, increase susceptibility to childhood illnesses, and ultimately contribute to the development of acute malnutrition [33].

Fouejio., *et al.* [33] reported a 31.5% anemia prevalence in Douala, which is notably lower than the 57% prevalence documented in the 2018 Cameroon EDS-MICS report [21]. This discrepancy may be attributed to the widespread use of iron-fortified complementary foods in Douala, primarily manufactured porridges enriched with iron, which are likely to contribute to the reduced risk of anemia in this population [33]. Regional variations in malnutrition indicators may primarily result from differences in dietary habits, sociodemographic factors, political contexts, and environmental conditions [33]. Conversely, Teh., *et al.* [51] reported a higher anemia prevalence of 72.8% among children in three rural communities in the Southwest region (Batoke, Tole, and Dibanda). This rate exceeds the 66% prevalence previously reported for rural Cameroon [52] and aligns closely with the 77.3% prevalence observed in the same region (Muea, Ekona, and Dibanda) [29]. The elevated anemia rates in the Southwest region are likely linked to ongoing socio-economic instability, which has disproportionately affected farmers, leading to internal displacement and reduced agricultural productivity, thereby exacerbating food insecurity and compromising child nutrition [29].

The highest minimum dietary diversity (MDD) was reported in a study by Akob., *et al.* [50] among urban and rural communities in the North-West region, with an MDD score of 80.75%. Despite this relatively high dietary diversity, malnutrition remained prevalent, largely attributable to a diet dominated by grains, fats, and oils, while fruits, vegetables, and dairy products were among the least consumed food groups. Caregivers frequently cited limited time for purchasing, preparing, and cooking vegetables as a contributing factor [50]. Prevalence estimates from the same study indicated severe underweight affected 14.4% of children in rural areas, whereas overweight prevalence was 13.8% in urban settings. These disparities likely reflect differences in dietary patterns and levels of physical activity between rural and urban children [53]. Conversely, a study in the Southwest region by Ngwengeh., *et al.* [26] reported a markedly lower MDD of 20.0%, with low household income identified as the strongest predictor of malnutrition, restricting access to diverse diets and resulting in a 60% malnutrition prevalence. Maternal education also significantly influenced child nutritional status, with 70% of children whose mothers lacked formal education being malnourished; notably, 60% of mothers in this study were uneducated [26]. Similar low MDD scores (19.9%) have been documented in children from the Far North region [54], although higher scores (44.7%) were reported by Ndah., *et al.* [27] in the same geographical area. The generally low MDD across these regions can be explained by diets predominantly composed of staple foods and legumes, with limited inclusion of meat, dairy, fruits, and vegetables [33].

Pediatric disease burden linked to unsafe and poor-quality diets

Unsafe and poor-quality diets are major contributors to the global disease burden, driving malnutrition, foodborne illnesses, and non-communicable diseases, particularly among vulnerable populations such as children under five [55,56]. Dharod., *et al.* [57] observed that only 31% of children exhibited adequate dietary diversity, while the prevalence of anemia and diarrhea was notably high, at 75.5% and 32% respectively. These findings are

consistent with those reported by Teh., *et al.* [51], who found that malnourished children aged 24 months or younger demonstrated a higher prevalence of microcytic anemia (38.8%) and anisocytosis (68.8%), suggesting a possible underlying iron deficiency anemia. Furthermore, Teh., *et al.* [51] identified a pronounced association between malnutrition and the occurrence of anisocytosis in this population. Limited access to improved water sources, requiring roundtrips of 30 minutes or more, was correlated with increased risk of diarrhea and reduced dietary diversity [57]. In contrast, Tambe., *et al.* [58] reported a lower diarrhea prevalence of 23.8%, attributed to the use of safe water supplies and the adoption of narrow-mouth containers for storage by 74.4% of caregivers. In the study conducted by Ndah., *et al.* [27], 70% of the 51 children presenting with diarrhea were found to be severely acutely malnourished, underscoring the strong association between diarrheal illness and nutritional status. The quality of drinking water provided to children emerged as a critical determinant of nutritional outcomes; untreated water sources were significantly linked to an increased risk of stunting [59]. Furthermore, restricted access to improved water supplies constrained women's ability to maintain household gardens, resulting in reduced dietary diversity, a recognized risk factor for malnutrition [60]. Consistent with this, Sobze., *et al.* [31] reported that exposure to a non-diversified diet was significantly associated with acute malnutrition in children aged six to fifty-nine months (OR = 2.891, p = 0.039). In Cameroon specifically, the prevalence of stunting among children under five stands at 28.9%, with rural children disproportionately affected due to chronic undernutrition and limited dietary variety [38]. Timing of complementary feeding was also influential; Fouejio., *et al.* [33] observed that 34.8% of mothers introduced complementary foods before six months, whereas Mananga., *et al.* [34] reported a higher rate of 50.4%. Delayed introduction of complementary foods was similarly linked with increased rates of malnutrition among children, worst still if the food is contaminated (Figure 2).

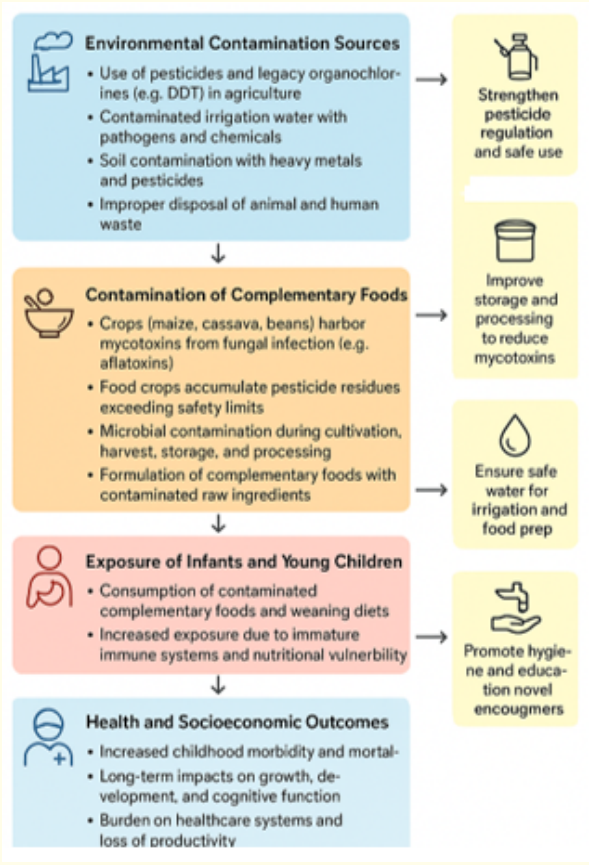

Figure 2: Disease risk associated with intake of contaminated complementary foods in Cameroon.

Knowledge gaps, policy landscape and future directions

Altogether, children are suffering from one or more forms of malnutrition (stunting, wasting and underweight). Coupled to this, most children are relying on staple foods due to their affordability compared to processed infant formular during the weaning period. Unfortunately, most of these staples are contaminated with mycotoxins. National trends in the nutritional status of children under five show little improvement in the levels of stunting, underweight, and wasting compared to previous years. Nonetheless, there is a need for proper follow-up, as the prevalence of stunting and underweight remains at high and serious levels, respectively.

Based on regional reports on the prevalence of malnutrition [24-26,28,31,50], limited research has been conducted on the prevalence of anemia, which is primarily caused by micronutrient deficiencies. There is a clear need for further research on anemia in Cameroon, as well as the implementation of appropriate nutritional interventions where necessary.

Limited knowledge of dietary diversity among parents and caregivers has significantly contributed to the high prevalence of malnutrition among children under the age of five in Cameroon. This situation is primarily attributed to low levels of education among

mothers and caregivers. To effectively address this challenge, it is essential to implement targeted nutritional programs that educate parents and caregivers, using accessible and context-appropriate communication, on the importance of balanced and diverse diets in promoting child health and improving nutritional outcomes. Furthermore, capacity-building initiatives should be established, particularly in rural areas, to train mothers in the cultivation and management of nutrient-dense crops, thereby reducing the incidence of nutrition-related illnesses.

Although mycotoxins have been detected in commonly consumed weaning foods in Cameroon, there is currently no established data on the maximum tolerable intake levels of these toxins for children aged 0–5 years. Alarmingly, high levels of mycotoxin contamination have been reported in staple foods, often exceeding the maximum tolerable limits set for children and adults [39,41]. Given that many of these staples are used as weaning foods, this poses a significant health risk to young children, who are physiologically more vulnerable than adults. Such health risk includes malnutrition [12,61], cancer, immunosuppression [62,63] and brain development-related and neurodevelopmental disorders due to neurotoxic mycotoxins [10,64]. This situation presents a serious public health concern, with potential implications for child growth and development. It is therefore imperative that regulatory frameworks be strengthened to ensure that all foods intended for weaning are routinely tested and certified safe for consumption. Additionally, community-based outreach programs, particularly in rural areas, should be implemented to educate parents and caregivers on appropriate child nutrition, including the safe and hygienic preparation of local dishes to promote both dietary adequacy and food safety. Furthermore, all stakeholders, including women, should be included for sustainable child health protection [61].

Furthermore, an integrated One Health food safety and nutrition policy for Cameroon may promote collaboration across human, animal, and environmental health sectors to enhance food security and prevent zoonotic and foodborne diseases. By harmonizing surveillance, regulation, and nutrition interventions, it supports sustainable food systems and public health resilience. Such an approach aligns with WHO and FAO recommendations for holistic food system governance [15,65,66]. Figure 3 is a proposed roadmap on for the integration of One Health into food safety for Cameroon.

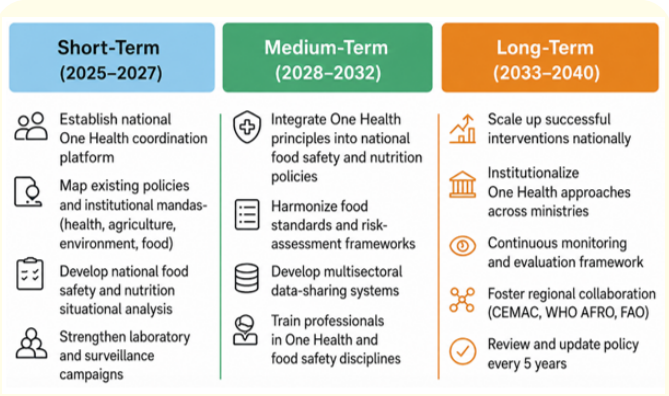

Figure 3: Roadmap for an integrated One Health food safety and nutrition policy for Cameroon.

Conclusion

Children in Cameroon continue to endure a substantial burden of malnutrition, infectious diseases, and exposure to unsafe foods, despite ongoing national and regional health interventions. The review demonstrates that nutritional inadequacies, particularly stunting, wasting, underweight, and anemia, remain widespread and are deeply intertwined with food-safety challenges. Staple foods consumed during the weaning period frequently contain hazardous levels of mycotoxins such as aflatoxins and fumonisins, as well as microbial contaminants that exacerbate nutrient malabsorption, diarrheal diseases, immune suppression, and impaired growth. These threats are intensified by structural determinants including poverty, limited dietary diversity, poor maternal education, inadequate water and sanitation, and weak food-monitoring systems. The reviewed evidence underscores that nutrition and food safety have historically been addressed as separate domains, despite their strong biological and environmental linkages. An integrated food-systems approach is essential. Strengthened national regulatory frameworks, routine monitoring of mycotoxins in staple foods, and improved agricultural and storage practices would reduce exposure. At the community level, empowering mothers and caregivers through nutrition education, dietary diversification strategies, and promotion of safe food handling would significantly improve child outcomes. Addressing regional disparities is also critical, particularly in conflict-affected and economically marginalized areas where malnutrition remains severe. The findings highlight the urgent need for a coordinated One Health policy that connects

human health, agriculture, environmental management, and food-safety regulation. Such an approach would support sustainable food systems, enhance early-life nutrition, and reduce preventable childhood illnesses. Ultimately, advancing child health in Cameroon requires long-term multisectoral collaboration to ensure that foods consumed by young children are not only nutritionally adequate but also consistently safe.

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