



The influence of livestock-derived foods on nutrition during the first 1,000 days of life

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Global efforts to limit or reduce the consumption of meat, milk and eggs over environmental concerns should exclude pregnant and breastfeeding women and babies under the age of two, especially in low-income settings. An extensive review of research found ‘clear nutritional benefits’ of providing children with livestock-derived foods (LDF), particularly in countries in Africa and South Asia where undernutrition is highest and food choice limited. While consuming LDF—such as meat, milk and eggs—in the first 1,000 days of life can improve a child’s prospects of growth, cognition and development, the research found that consumption was typically very low among poor families in low- and middle-income countries (LMIC).

The influence of livestock-derived foods on nutrition during the first 1,000 days of life, published by the International Livestock Research Institute (ILRI) and the Centre on Global Health Security, Chatham House, concluded that it was possible to meet the nutritional needs of the most vulnerable through the provision of LDF, even if total global livestock production slowed down. This brief provides an overview of the report, synthesizing the best current evidence on the influence of LDF on the nutrition of mothers and infants in LMIC, especially in Africa and Asia. It focuses on the needs of pregnant and lactating mothers and infants during their first 1,000 days of life, from conception to around two years. The

report draws from an extensive review of scientific and grey literature, as well as up-to-date data from various sources, to derive main conclusions and recommendations on the role of livestock-derived products on nutrition in the first 1,000 days in LMIC.

Livestock product-based diets in low- and middle-income countries

While data are unavailable on LDF consumption in the first 1,000 days of a child’s life, information from multiple sources on per capita consumption in LMIC confirms—though it is still far lower than in high-income regions—it is rapidly rising. Moreover, significant regional variations in livestock systems and LDF consumption indicate that livestock and nutritional interventions must be tailored to local contexts, such as dairy-based interventions in southern Asia, where milk and milk products are central to people’s diets. Surveys reporting on levels of meat, milk and egg consumption in the first 1,000 days confirm that mothers and infants from low-income households typically only consume these products occasionally. The picture is further complicated as some infants under six months are routinely given cow or goat milk, despite an evidence-based global consensus recommending exclusive breastfeeding for children until this age.

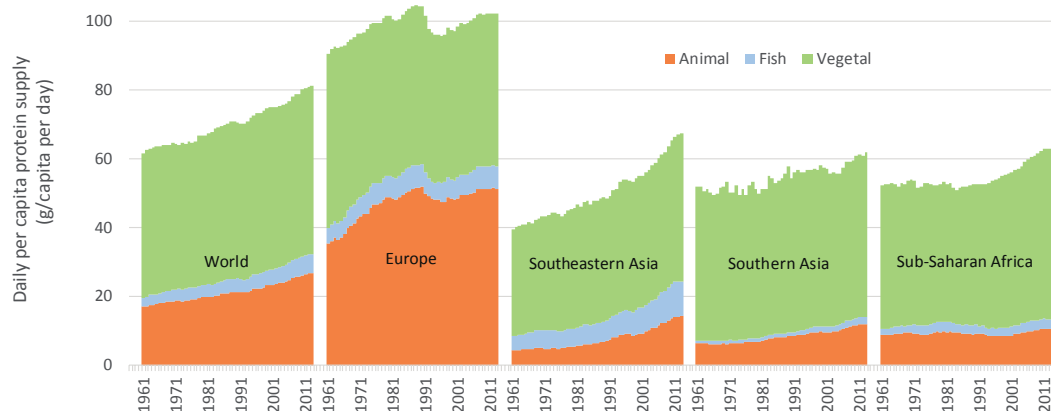


Figure 1: Total daily per capita food protein supply, shown for animal products, fish and aquatic products and vegetal products, 1961–2011, for the world and four regions (g/capita per day). Data: FAOSTAT (2016)

Impacts of livestock-derived foods on nutrition

The report found a scarcity of research documenting intervention studies that assessed the effects of LDF supplementation on nutritional outcomes. The 14 studies that met the inclusion and quality criteria of the review indicate that consumption of LDF can improve growth, cognition and other nutritional outcomes in children. Milk was particularly associated with better linear growth, meat with better cognition. Furthermore, malnourished children benefitted more from LDF consumption than healthy children. Given the clear nutritional benefits shown of providing LDF to malnourished children in the first 1,000 days of life, further rigorous studies are needed to understand the types and quantities of LDF suitable for different regions and circumstances, and the best means to enable access to them for poor communities and households.

Impact of livestock interventions on nutrition

The authors considered the evidence from major scientific reviews and other research papers that evaluated the impacts of livestock interventions on nutrition (for example, interventions providing poultry to women). These indicate that livestock interventions do improve small-scale food production and increase incomes and household expenditure. They can thus improve nutrient consumption and diets in poor households and may improve nutritional outcomes, particularly in poor children and women. These studies also indicate that some interventions can have a negative impact on nutrition by, for example, diverting food from households to markets. The literature is also consistent on two things: agricultural interventions, including livestock, are more successful at improving nutrition (1) when they target women and/or include a nutritional educational component and (2) when they are integrated into larger interventions that address various determinants of undernutrition. While the number of such studies is increasing rapidly, more research, and of higher quality, is needed to understand fully the potential of livestock interventions to reduce undernutrition among poor households.

Livestock-derived foods, associated diseases and implications for nutrition

Five foodborne diseases (FBD) most constrain the use of LDF to achieve better nutrition in the first 1,000 days. FBD have recently been shown to impose a human health burden comparable to malaria, HIV/AIDS and tuberculosis. Children under-5 bear a disproportionate amount of the FBD burden and pregnant women are particularly vulnerable to FBD. Other hazards associated with these foods include the presence of toxins, including aflatoxins, which can contaminate milk and are purportedly associated with stunting; allergens, especially eggs and milk; and faecal bacteria causing enteric dysfunction. Raising or processing livestock can increase exposure to ‘zoonotic’ diseases transmitted from animals to people, play major roles in the emergence of new human diseases, including pandemics such as avian influenza, and contribute to the rise of antibiotic-resistant pathogens. Approaches to increase and intensify the production of LDF should be accompanied by ways of enhancing livestock food safety, disease control and animal health.

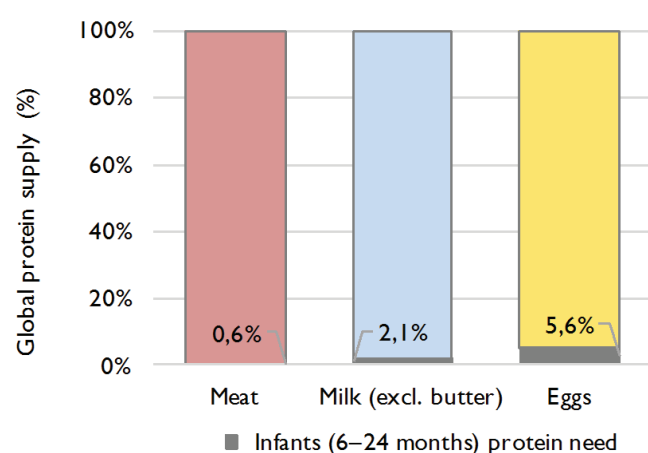
Sustainable diets

While high LDF diets are, on average, less environmentally sustainable than diets with low LDF levels, more typical ‘LMIC diets’ that incorporate some LDF, especially milk and eggs, can use less land for food production than their plant-based alternatives. Rather than competing with crops for land, much of this meat and milk is produced using non-human-edible feed resources and on marginal rangelands that would otherwise be unproductive. Medium levels of livestock grazing are better for the health, productivity and biodiversity of rangelands than having no livestock at all; and managed well, these lands can also sequester large amounts of carbon in their soils.

Moreover, diets considered environmentally sustainable in high-income countries in the global north often contain more meat, milk and eggs than are actually consumed by the poor in LMIC, demonstrating significant inequalities in LDF access between richer and poorer countries.

Arguments suited to high-income countries with widely available energy-rich foods and over-consumption problems should be adjusted to address LMIC needs. Typical diet sustainability assessments suffer from two main weaknesses: most are relevant only to specific contexts, and assess only the environmental aspect of sustainability, often ignoring the social, economic and health dimensions. The proportion of global LDF production needed to meet the nutritional needs of all the world's undernourished infants in their first 1,000 days and pregnant/lactating women is so small that this amount could easily be protected through equitable redistribution, even in the face of environmentally motivated reductions.

Figure 2: Global protein quantity required to meet infant needs, 6–24 months, shown in relation to the global protein supply from three major LDF categories, meat, milk and eggs in 2012.



Data: FAOSTAT (2018) and analysis in this study.

Recommendations

Equitably increase the availability and accessibility of safe LDF in LMIC populations with low levels of intake

Notwithstanding trends in high-income countries to question and reduce LDF intake, LMIC should extend interventions to improve the availability, accessibility and affordability of LDF to people whose intake of these high-quality protein and micronutrients sources is low. Such an 'equity first' approach should identify and prioritize people whose nutrition status would most greatly benefit from LDF – either because they have the greatest need, offer the strongest future potential for improving nutritional status, have little dietary choice or have the least access. This is particularly important for pregnant and lactating women and children whose physiology demands nutrient-dense foods. Such efforts to increase LDF availability and consumption in LMIC should be matched by interventions to improve food safety and reduce the risk of FBD. Strategies to increase LDF availability should be coupled with interventions to promote healthy diets, avoid over-consumption of LDF and monitor consumption levels in different segments of society.

Base global LDF strategies on full sustainability assessments and recognize the particular needs of mothers and infants

Balancing the perceived needs of the planet – for fewer livestock and lower LDF consumption – with the immediate nutrition needs – and the healthy futures – of women and infants in LMIC requires a fuller understanding and accurate figures about LDF production and sustainability in LMIC. Livestock production should follow all the sustainability dimensions – economic, environmental, health and social – and sustainability assessments should measure all the dimensions, capturing the multiple contributions of livestock to sustainable livelihoods as well as sustainable nutrition. Recognizing the equity arguments underpinning these issues and considering that global nutrient requirements in the first 1,000 days of life are a small proportion of total food production, production of LDF for young children and their mothers should be safeguarded and prioritized even as the world may seek to reduce overall LDF production and consumption as part of global environmental or sustainability commitments.

Better align nutrition, health, livestock and sustainability policies at national level

Nationally, the livestock, nutrition and health sectors need to come together and apply a 'One Health' approach to effectively align livestock and LDF strategies and interventions with wider dietary and nutrition policies that encourage healthy eating habits, ensure food security and safeguard the particular nutritional needs of vulnerable groups such as women and children. These evidence-based policies and guidance should also take into account sustainability considerations around the environment and natural resource use. Internationally, these same concerns should be brought into broader development discussions such as those in the 2030 Agenda for Sustainable Development and be taken up by development agencies as they support policy development and implementation in these areas.

Additionally, the conclusions and recommendations in this report require that livestock interventions be designed and implemented in a more 'nutrition-sensitive' way – for example, targeting mothers and infants, promoting healthy dietary practices, monitoring potential side-effects or assessing nutritional impacts. This would be a significant shift for a sector typically more focused on overcoming animal productivity yield gaps through, for example, improved animal health, genetics and feeds. It should prioritize outcomes that lead to safer and 'more nutritious' as well as 'more' milk, meat and eggs, in the hands and mouths of specific population groups who need them most.

Expand the evidence base through high-quality action research

Although LDF are known to be a rich source of high-quality protein and essential micronutrients, there is a worrying lack of scientific evidence on the effect of LDF intake on nutritional outcomes in the first 1,000 days of life.

While studies can be complicated, they need not be and the significant potential of LDF to improve nutrition during the first 1,000 days is a strong case for greater investment in such research. Emergency supplementation interventions could also be designed in a way that allows for rigorous impact assessment. Larger research studies with robust designs are needed to demonstrate if an effect exists for different LDF in children's growth and development and the dose-response relationship.

Beyond more rigorous studies of the nutritional effects of LDF, there is an urgent need to generate evidence on the most effective ways to deliver such interventions. For primary or secondary school children, school meal programs seem a suitable delivery platform to promote LDF consumption, with most studies considering milk as a food of choice. However, for younger children and women, the evidence identified was too limited to draw any recommendations and the delivery of interventions in these groups presents substantial challenges, according to the studies reviewed. Investments are needed to fill evidence gaps, strengthen evaluation rigour and extend promising and successful approaches. Eggs were particularly underrepresented in the research reviewed and their widespread availability and lower preservation requirements make them a product with great nutrition potential that requires more attention.

Scientific evidence on the more complex question of the impact of livestock interventions on nutritional outcomes in the first 1,000 days is also very scarce. Broader

scope studies that have assessed the effect of livestock interventions on nutrition seem to suggest that such interventions can improve nutrient consumption and diets and may improve nutritional outcomes in children and women, especially in farming households. However, the evidence is limited and weak, again mostly explained by the complexity of the pathways that link livestock interventions and nutrition. Development projects—often implemented at large scale and with long-term monitoring processes—with a focus on or including livestock interventions could be used as platforms to increase the evidence base around the impact of such interventions on nutrition.



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