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ANIMAL-SOURCED FOODS IN LOW- AND MIDDLE-INCOME COUNTRIES

Position Paper

Animal-sourced foods in low- and middle-income countries:

Navigating the trade-offs between healthy diets and climate impact

This is an publication of the NWGN and Clim-Eat.

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NWGN - December 2024

Citation: NWGN & Clim-Eat. 2024. *Animal-sourced foods in low- and middle-income countries: Navigating the trade-offs between healthy diets and climate impact*. Position paper, Netherlands Working Group on international Nutrition and Clim-Eat.

Ministry of Foreign Affairs

NWGN is funded by the Dutch Ministry of Foreign Affairs. The findings, ideas, and conclusions contained within are those of the authors and do not necessarily reflect positions or policies of the Dutch Ministry of Foreign Affairs.

Foreword

The Netherlands Working Group on international Nutrition (NWGN) is a platform of civil society organizations, knowledge institutes, the private sector and the government, based in the Netherlands and working in the field of international nutrition. Its mission is to increase the nutrition impact of the Dutch government and stakeholders targeting the SDGs in low- and middle-income countries (LMICs) by exchanging knowledge and influencing and supporting stakeholders to better include nutrition in their policies and work.

In 2023 and 2024, one of the focus areas of discussions within the NWGN platform was the nexus between climate change and sustainable healthy diets with a focus on animal-sourced foods (ASFs), reflecting the protein transition discussion in the Netherlands, while realising that this transition to a more plant-based protein diet might not be appropriate for the contexts in LMICs. In March 2024, the NWGN and the Netherlands Food Partnership (NFP) organised a climate and nutrition event "Operationalizing sustainable healthy diets in the context of climate change" which looked at ASFs as part of sustainable healthy diets in LMICs. It allowed experts, NWGN members and stakeholders to discuss the topic and NWGN to develop a position paper providing NWGN members and related stakeholders with guidance on the production and consumption of ASFs. The final version of this position paper was presented during the World Food Day event in October 2024, co-hosted by NFP, and discussed with a diverse group of experts and stakeholders.

With this position paper the NWGN, and Clim-Eat (a think-and-do tank that aims to accelerate food systems transformation under climate change) aim to stimulate dialogue on the consumption of ASFs in LMICs within the Dutch government at large, within the ministries and embassies as well as among our members and partners. The aim is that these dialogues will translate into policies and programmes, diplomacy and facilitation and will enable partners in the Netherlands and LMICs to take a stand that addresses the nutritional needs of vulnerable people while also considering climate change.

This position paper is being published with endorsement or no objection of eligible NWGN members and Clim-Eat.

Key messages

- Strong evidence indicates that food production is among the largest drivers of global environmental change by contributing to climate change and biodiversity loss.
- Animal food production systems particularly need to become more sustainable to reduce adverse impacts on the climate and biodiversity.
- ASFs can play a role in reducing the risk of undernutrition and micronutrient deficiencies among vulnerable groups in LMICs as long as access and affordability issues are addressed.
- The protein transition towards the consumption of plant-based protein diets for the Dutch context as well for other HIC countries and high-income groups in LMICs, in a context of already adequate protein intake, is not appropriate for vulnerable LIMCs groups (low income consumers, women of reproductive age and young children), where consumption of animal-source protein is often low.
- Moderate consumption of ASFs can positively increase the intake of critical (micro)nutrients and therefore contribute to a reduced risk of impaired growth and cognitive development of children and contribute to healthy families and communities, and ultimately to thriving economies.
- ASF consumption with the lowest risk of adverse impact on planetary and human health (such as chicken, eggs) is preferred over ASF with the highest impact (such as red meat) and needs to be guided by country-specific food-based dietary guidelines with integrated sustainability and food system considerations.

1. Introduction

In December 2022, the Dutch government presented a letter to the Dutch Parliament concerning a step-by-step plan for global food security which focuses, among other things, on producing food within the carrying capacity of the earth. Agricultural and food systems are responsible for one third of total global greenhouse gas (GHG) emissions. Consumption and production of animal-sourced foods exert significant pressure on the environment, and the transition to a more plant-based diet in rich and emerging economies is mentioned in this letter as one of the required steps in the wealthier and upcoming economies to secure global food and nutrition security for future generations (Kamerbrief 2022).

A more recent letter, from March 2024, to the Dutch Parliament concerning sustainable food policy repeats this objective and gives specific targets for the Dutch context: the aim should be 60% plant-based and 40% animal-based proteins in the diet. The shift to this diet is called the protein transition. The Health Council of the Netherlands estimates that such a shift could lead to a 25% decrease in environmental impact compared to the current diet, both in terms of GHG emissions and land use. In addition, such a diet reduces the risk of chronic diseases (Kamerbrief 2024a).

However, the above-mentioned protein transition recommended for the Dutch context as well as for other high-income countries (HICs) and high-income groups in LMICs is ***not appropriate*** for low income consumers in LMICs, where consumption of animal-source protein is often very low.

2. The position

The NWGN recommends moderate consumption of animal-sourced foods in low- and middle-income countries as part of equitable and sustainable healthy diets as defined in the country-specific food-based dietary guidelines.

In the context of the protein transition, the NWGN recommends that a balance of production and consumption of animal- and plant-based foods be pursued within the Sustainable Food System framework for healthy diets (HLPE 2020). Issues of sustainable and climate-neutral (ideally climate-positive) food production systems, cost and affordability, vulnerable consumers, equity, empowerment of women and building upon indigenous knowledge should be carefully addressed.

These issues are explored in more detail below, but first some relevant terms can be defined around aspects of production and consumption:

- **Sustainable food systems** are productive and prosperous (to ensure the availability of sufficient food); equitable and inclusive (to ensure access for all people to food and to livelihoods within that system); empowering and respectful (to ensure agency for all people and groups, including those who are most vulnerable and marginalized to make choices and exercise voice in shaping that system); resilient (to ensure stability in the face of shocks and crises); regenerative (to ensure sustainability in all its dimensions); and healthy and nutritious (to ensure nutrient uptake and utilization) (HPLE 2020).
- **Climate-neutral food production systems** offset all GHG emitted for food production through climate protection measures, therefore not contributing to climate change.
- A **healthy diet** will vary depending on individual needs (e.g. age, gender, lifestyle, degree of physical activity), cultural context, local availability of foods and access, and dietary customs (WHO 2020). But generally agreed-upon principles of what constitutes a healthy diet are:
  - adequate amounts of fruits and vegetables, whole grains, legumes, nuts and [seeds] (Key principle adequate);
  - sufficient but not excessive intake of kilocalories, starchy staples and animal-sourced foods (preferring milk, egg, poultry, fish) (Key principle balanced);
  - [little] or no intake of foods with health risks such as free [added] sugars , saturated or trans-fat, salt, red meat and processed meat (Key principle moderate).
  - Have a wide variety of foods, between and within food groups (Key principles diversity)

  In addition, ***diets can only be healthy if foods and beverages are safe***. (FAO and WHO 2024).
- **Sustainable healthy diets** promote all dimensions of an individual's health and well-being (healthy diet) and have low environmental pressure and impact. These diets protect and respect biodiversity and ecosystems; are culturally acceptable; are accessible, economically fair, affordable and equitable; are nutritionally adequate; are safe and healthy; and optimize natural and human resources (FAO 2010, 2019).

- **Food-based dietary guidelines (FBDGs)** establish a basis for public food and nutrition, health and agricultural policies and nutrition education programmes to foster urban and rural healthy eating habits and lifestyles. They provide evidence-based recommendations on foods, food groups and dietary patterns to ensure the general public obtains essential nutrients, thereby promoting overall health and preventing chronic diseases (FAO 2024). Additional provisions can be made for specific groups like young children, adolescents, pregnant and lactating women, people with chronic diseases and / or contexts such as humanitarian situations. In countries where FBDGs exist, they should be assessed for whether and how sustainability aspects are considered; if they are not, then special provisions could be added to address sustainability. Where FBDGs do not exist, FBDGs from countries with similar diets can be considered, or regional or global guidelines such as the EAT-Lancet diet – where sustainability is strongly incorporated – can be used.

3. About animal-sourced food production and consumption

3.1 Animal-sourced food production

Strong evidence indicates that food production is among the largest drivers of global environmental change by contributing to climate change, biodiversity loss, freshwater use, interference with the global nitrogen and phosphorus cycles, and land-system change (Willett et al. 2019). ASF production particularly can have a major impact on the environment (UNEP 2024), with the impact being highest for red meat (beef and lamb), lower for eggs, dairy products, fish and pork and lowest for plant-based foods (Poore & Nemecek 2018).

Current global ASF production predominantly involves industrial agriculture, which it was believed would reduce hunger, accommodate a growing global population and support economic growth at (very) low production costs (UNEP 2020). However, its high output levels depends on the use of synthetic fertilizers, chemical pesticides and high-yielding varieties, all of which bring negative externalities that are not been considered, such as the impacts on natural resources and public health. The hidden cost of food production on the environment is estimated at US$ 3 trillion annually (UNEP 2020).

Its impact on the environment contributes to biodiversity loss and climate change challenges globally. While agricultural biodiversity (i.e. crop and livestock diversity) is essential to resilient food (production) systems, only a handful of species are used today. Intensive animal production is also associated with human health risks via the incidence of zoonosis and antimicrobial resistance (Murray et al. 2019).

Indeed, the millions of currently undernourished people (Global Hunger Index 2023) indicates that our food system is facing systemic issues on a global scale. In addition, the agro-industrial model is vulnerable to disruptions, such as the COVID-19 pandemic and the Russia-Ukraine war.

In contrast to food production in HICs, in most LMICs food (including ASFs) is mainly produced in small-scale agricultural systems that use (relatively) small amounts of inputs, labour and capital. While such extensive farming systems – especially in the livestock sector – results in lower productivity per animal and for a given surface area (Mpofu 2020), it does result in less land and soil degradation, making it more sustainable than intensive practices and offering an opportunity for longer term food production without the need for external inputs.

Additionally, these small-scale farming systems often build on:

- indigenous knowledge which is linked to agrobiodiversity, by using rare breeds and farm animals different from the big 5 (cow, goat, sheep, poultry and pigs) typically used in industrial agriculture.
- indigenous practices of the production and consumption of the traditional (neglected and underutilized crop species) crops and vegetables.

Indigenous knowledge and practices contribute to agrobiodiversity and to sustainable healthy diets (Mabhaudhi et al. 2018).

3.2 Animal-sourced food production and climate change

While the industrial agricultural systems are intensive, degrade the environment and contribute to climate change, there are opportunities. The changing weather conditions provide options for farmers to change their approach to food production. Farmers may be able to move from pure pastoralism or crop farming to mixed farming systems, bringing advantages of complementarity: crop residues feed animals, and their manure feeds crops. These systems have less food-feed competition, and the diversity of production is more resilient to climate change. Mixed farming systems are usually smaller in scale, which is a disadvantage when linking these farmers to (higher value product) markets.

Climate-adapted local (animal-sourced) food production systems do not, or to a very limited extent, contribute to GHGs, do not degrade non-renewable energy and natural resources, are economically efficient for all stakeholders involved, and do not compromise food production opportunities of future generations. These production systems can reduce the costs of externalities of production and should be promoted to increase availability and affordability of those ASFs with the lowest environmental impact (Foresight, 2011).

Furthermore, sustainable (animal-sourced) food production systems are linked to sustainable food value chains, offering pathways out of poverty and inequality through local value addition efforts and better (higher value product) market linkages (UNEP 2024).

3.3 Animal-sourced food consumption

ASFs include meat, dairy, eggs and seafood. The origin of these foods includes farm animals and animals in nature. Depending on food culture and context, it may also include insects, frogs, birds and snails.

There is great variation in the consumption of ASFs between countries and individuals. In HICs, consumers are being advised to reduce their intake of meat, especially red and processed meat for human and planetary health. These recommendations would also apply to many high-

income populations in LMICs, particularly in the urban settings. Among resource-poor populations in LMICs, however, ASFs are unaffordable and hardly consumed. Though legumes, nuts and seeds can provide high-quality fats, proteins and other nutrients, and may be more affordable than livestock-derived foods, plant-based foods may not be a suitable replacement for all ASFs as dietary requirements change over the course of a person's lifetime, in line with their physiological needs (UN Nutrition 2021).

ASFs can play a key role in reducing the risk of undernutrition and micronutrient deficiencies among vulnerable groups in resource-poor settings, especially for young children and pregnant and lactating women. They supply high-quality protein and highly bioavailable micronutrients like iron, zinc and calcium, vitamins, essential fatty acids and other less well-known bioactive factors (Ballard & Morrow 2013), which is especially relevant for nutritionally vulnerable population groups in LMICs. Currently, domestic production of ASFs in many LMICs is not meeting market demand nor the volumes needed to meet daily nutrient recommendations (IFPRI 2024).

Despite the benefits of ASFs, consumption of some type of animal-based sources of protein has been shown to increase the risk of chronic diseases (Health Council 2023). Excess consumption of red meat and processed meat are associated with increased risk of noncommunicable diseases (NCDs) (WHO 2023). Although excess consumption of ASFs is generally associated with HICs, it is growing in other regions of the world, especially among middle-class urban consumers (WWF 2020). Unhealthy diets (diets low in fruit, vegetables, legumes, nuts, and whole grains and high in salt, sugar and (saturated) fats) are the leading risk factor for NCDs, which are responsible for more than 73% of deaths globally (IFPRI 2024).

WHO recommends the consumption of moderate amounts of ASFs, with a focus on reduced-fat dairy foods and lean meat, or trimming visible fat from meat (WHO 2020). The EAT-Lancet healthy diet advises the consumption of moderate amounts of either beef, lamb and pork, poultry, eggs and fish, with a preference for poultry and fish (Willett et al. 2019).

These global recommendations need to be adjusted to the local context. FBDGs make these recommendations culturally appropriate by using nationally recommended food items. They include dietary requirements for different population groups in line with their physiological needs, including different recommendations for the consumption of ASFs (UN Nutrition 2021).

3.3.1 Women's empowerment

Women, adolescent girls and young children are often the most vulnerable in households, and they have specific dietary requirements in line with their physiological needs, such as during adolescence and pregnancy (UN Nutrition 2021). The Gender Nutrition Gap (GNG) is the way that harmful social norms and women's and girls' unique biological needs and disparities in access to food and services affect their health and economic outcomes. GNG is currently significantly worsening, jeopardizing the lives of women and adolescent girls, and our collective future (The Gender Nutrition Gap 2023).

Improving access to and awareness of balanced diets, which include ASFs, empowers women to make better dietary choices, breaking cycles of malnutrition and promoting overall health. Supportive gender-sensitive policies and programs can recognize the unique nutritional needs and rights of women and adolescent girls, ensuring that interventions and participation in the

food system promote equity and economic empowerment and do not reinforce gender disparities and inequitable workloads (Ewerling et al. 2017).

3.4 Animal-sourced foods, climate and nutrition

Ensuring climate-neutral or climate-positive food production systems is essential as current systems are significantly contributing to climate change, predominantly through methane emissions from the livestock sector, fertiliser production to increase crop yields and deforestation to create more farmland (UNEP 2024). Yet moderate amounts of ASFs are critical for improving nutrition outcomes for people in LMICs, especially vulnerable people.

One way to manage these competing interests is to include food production and nutrition (specifically through consumption for example of moderate amounts of sustainably produced ASFs that can positively impact nutrition outcomes with lower impacts on climate outcomes) in the commitments countries make to reduce GHGs through their Nationally Determined Contributions (NDCs). This offers an opportunity to consider and emphasize the role of nutrition in climate change. The importance of increasing the uptake of nutrition in NDCs is shown by a recent study by the I-CAN working group, led by the Global Alliance for Improved Nutrition (GAIN) in which 166 NDCs were analysed. Ninety-nine (60%) of the analysed NDCs did not show any connectedness between climate and nutrition, and only 26 (16%) show some intention to mobilise resources to further connect climate and nutrition. Three of these 26, or 2% of the total analysed NDCs, show actual commitment to mobilize resources and distinct plans to take action to connect climate and nutrition (Xin et al. 2023).

4. Conclusion

The NWGN recommends moderate consumption of animal-sourced foods in low- and middle-income countries as part of equitable and sustainable healthy diets as defined in the country-specific food-based dietary guidelines.

Moderate ASF consumption can positively increase the intake of (micro)nutrients and therefore contribute to a reduced risk of impaired growth and cognitive development of children, and thus contribute to healthy individuals, families, communities and ultimately thriving economies. ASFs can play a role in reducing the risk of undernutrition and micronutrient deficiencies among vulnerable groups in LMICs, especially for young children, adolescent girls and pregnant and lactating women as long as access and affordability issues can be addressed. Empowerment of women and girls through improved nutrition literacy for all is critical so they and their families can provide and consume healthy diets.

ASF consumption with the lowest risk of adverse impact on human and planetary health is preferred and needs to be guided by country-specific FBDGs with integrated sustainability and food system considerations. Sustainable ASF production is crucial and is necessary to reduce adverse impacts on the climate and biodiversity and is building on indigenous knowledge and traditional production systems.

Please note that for sustainable healthy diets, including moderate ASF consumption, to translate into optimal nutrition and health, food systems will need to coordinate with other systems that address the underlying determinants of malnutrition — such as health, social protection, education, and women's empowerment — and will require greater coordination among food systems actors (IFPRI 2024).

This position paper aims to encourage the government and other stakeholders towards a thorough consideration of all sustainability aspects in their support to food systems in LMICs. While Dutch domestic policies are unlikely to change consumption patterns worldwide (Kamerbrief 2022), they will contribute to change as Dutch policies do influence the world food systems. The Netherlands can contribute to making animal food production systems more sustainable, especially in LMICs which will contribute to their ambition to halve the Dutch ecological footprint by 2050 (Kamerbrief 2024b). In doing so, the Netherlands could take up a leading role globally by (further) including nutrition (and specifically ASFs) in its NDCs and thus becoming an example for other countries (including LMICs) to increase their focus on nutrition in relation to climate change.

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