Dietary animal source food across the lifespan in LMIC

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Introduction

- Animal source foods (ASFs) are important sources of high-quality calories and nutrients.
- Despite historical increases in global food production and availability, low- and-middle income countries (LMIC) have not comparably benefited from such improvements.
- Inclusion of even small amounts of ASF in diets in LMIC provides much-needed high-quality protein and concentrated energy.
- Much research has focused on ASF consumption and health outcomes for children under 5 (CU5) with little research investigating ASF intake at older ages.

Methods

- We conducted a narrative review investigating peer-reviewed and grey literature.
- This review aimed to examine the contributions of dietary ASF to human health and well-being across the lifespan and barriers to their consumption.
- Results were mapped across and presented by life stage.

Discussion and Conclusions

- Narratives and realities from high-income countries (HIC) about the problems of ASF dominate, but many are not reflected at the global level and do not apply to LMIC.
- Constraints and barriers to ASF consumption in LMIC most intensively limit consumption among children and women.
- The nutritional value of ASF is not unique to children, and other life stages deserve attention.
- Standardization of outcomes and more comprehensive metrics (such as measuring quality, quantity, and type of ASF) are needed.
- More longitudinal studies that examine longer-term effects of ASF consumption in early life on longer-term outcomes are needed.

Infancy and Early Childhood

ASF intake in CU5 has been found to be **protective against mortality.**

Considerable research has found ASF consumption associated with **improved growth outcomes** (most often stunting).

The **timing** of ASF consumption in relation to **critical growth periods is important.**

Underlying nutritional status **may affect the benefits of ASF.**

Longitudinal studies suggest that **the frequency** of ASF consumption is important for child development, but there is not enough evidence to assess the impact of ASF on development outcomes.

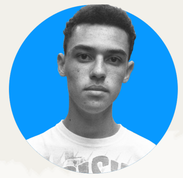
Adolescence

There is a chance for **catch-up growth** during adolescence.

Caloric intake and nutrient intake is generally suboptimal in LMIC **with disparities by country, income, rurality, and gender.**

Anemia: A Peruvian study implemented an intervention to promote iron intake. **Hemoglobin levels did not improve during observation period.**

Cognition: **No trials to assess the impact** of ASF on adolescent cognition have been reported.



Adults

Households in LMIC typically **consume low-diversity diets** based on foods of **plant-based origin (FPO).**

Relatively **little is known about health risks vs. benefits** of adult ASF consumption in LMIC.

Cost of ASF consumption is a major barrier to ASF consumption in LMIC.

Cultural norms, such as food taboos, often preclude or shape some ASF consumption in pregnant women.

Educational achievement is an important predictor of dietary diversity (DD) and ASF consumption.

Schoolchildren

School-aged children in LMIC **mainly consume monotonous plant-based diets.**

Growth: School feeding programs in LMIC have demonstrated that daily energy intake from ASF **positively predicted gains in growth outcomes.**

School performance: **Poverty** has been linked to **structural changes in the brains** of school-aged children. How much is nutritionally based is unknown.

Several school feeding trials have indicated **greater improvements in cognitive function in those receiving ASF snack.**

Pregnancy and Lactation

Poor maternal nutrition is associated with increased risk of poor health outcomes for mothers, many of which **can be mitigated through ASF consumption (iron, B12).**

Fetal outcomes: Pre-pregnancy **maternal underweight and poor gestational weight gain** are associated with miscarriage, preterm birth, and fetal growth restriction.

Lactation: **ASF may support lactation.** Milk concentrations of some vitamins and minerals relate to maternal stores/intake of these nutrients.

References: McKune, SL, Mechlowitz, K, Miller, LC. (submitted 1/2022). Dietary animal source food across the lifespan in LMIC. *Global Food Security.*
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