



Fueling growth and preventing stunting: the role of animal protein in achieving optimal nutrition - Indonesia's National Nutrition Day 2023 Theme

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Poor linear growth, currently defined as inadequate height to growth standards defined by the World Health Organization (WHO), is still a major problem in low-middle-income countries (LMICs) including Indonesia. The national survey results from 36.8% in 2007 to 30.8% in 2018 showed small differences in under-five years old children with height-for-age-Z-score less than -2 standard deviation (HAZ < -2 SD) from the growth reference or stunted.¹ Though the Indonesian Nutrition Status Survey results showed an improvement in the stunting rate to 21.6% in 2022, the data revealed large regional disparities, ranging from 8% in Bali to 35.3% in East Nusa Tenggara.²

It is known that for children with stunted growth in early life, the risk of impaired health, mortality, and delayed neurocognitive and motor development is heightened. Moreover, tend to have a long-term effect of decreased performance in education, lower productivity and socioeconomics, and a higher risk of chronic diseases in adulthood.^{1,3}

Stunting has many associated factors, including socioeconomic inequality, geographic differences, maternal factors, such as education, age, nutrition status, and infection; short birth intervals, low birth weight, and preterm birth, food insecurity, practices of feeding, nutrient deficiencies, such as protein, iron, zinc, calcium, and vitamins, childhood morbidity, and environmental. Low birth weight and length, unimproved sanitation, and low protein intake are the leading risk factors in developing countries, especially in the horticulture area.^{4,5}

The requirement for protein and amino acid is likely to be greater in environments where vulnerable populations such as children are commonly affected by ongoing or recurrent infections and impaired intestinal absorptive

ability, despite the lack of overt clinical signs. Protein plays a role in the growth and maintenance of body tissues and replaces damaged cells. Inadequacy of protein intake during the growth period could arise nutritional problems and delayed growth.⁶

Linear growth retardation mostly occurs during the complementary feeding period of 6–23 months of age, when breastfeeding is no longer adequate to

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meet the child's nutritional needs. Adequate intake of energy, protein, and micronutrients is associated with a more diverse diet. However, epidemiological data suggest that infant feeding diversification after a period of exclusive breastfeeding is a problem; and that the nutritional quality of the solid food introduced is insufficient to meet the infants' caloric and nutrient needs.^{3,7} A pooled analysis of Indonesia's Demographic and Health Surveys from 2007 to 2017 revealed that the percentage of children who consumed minimum dietary diversity was stagnant from 53.1% in 2007 to 53.7% in 2017, and less in rural areas.⁸

Protein adequacy among under-five Indonesian children was low. The Total Diet Study in 2014 found that 23.6% of children consumed less than 80% of the recommended dietary allowance for protein. Protein quality is crucial because of the main component of proteins, amino acids. Insufficient amino acids can disrupt protein synthesis and affect growth.^{9,10} In LMICs, where staple foods such as rice, wheat, maize (corn), millet, sorghum, roots and tubers dominate infant and young child diets, there is a high likelihood of insufficient intake of essential amino acids and usable dietary protein to support overall growth. Animal-source foods could improve child nutrition through their rich content of high-quality protein, essential fatty acids, and micronutrients such as zinc, calcium, and vitamins A and B12 which have high bioavailability.^{10,11}

A study by Limardi, et al³ found that although there was no significant difference in dietary diversity between children with and without stunting, stunted children consumed a significantly lower proportion of flesh food and received significantly less protein from their diet. The findings of another study by Amalia, et al.¹² in East Java Indonesia showed that toddlers with improper complementary feeding practices are 7.87 times more likely to be stunted, while toddlers with protein deficit had a 6.5 times higher risk of stunting.

Sholikhah and Dewi¹³ reviewed five studies from Indonesia to support arguments for the importance of animal protein source foods in

stunting prevention. Three studies found animal protein source food consumption of children with stunted growth was lower compared to children with normal linear growth. Oktaviani et al.¹⁴ found that children 2–4 years old who consumed an inadequate intake of animal protein have a higher risk of being stunted compared to children who consumed an adequate intake of animal protein by 6.059 ($p < 0.001$). Afiah et al.¹⁵ found that children under five years old who did not consume animal protein source food in the past week have a greater incidence of stunted compared to children who consumed animal protein source food in the past week ($p = 0.023$, $OR = 9.000$).

With a target to reduce the stunting prevalence to 14% in 2024, the Indonesian government has implemented various policies and programs through both 'nutrition-specific' (predominantly related to the health sector) and 'nutrition-sensitive' (related to non-health sectors) interventions.^{16,17} A study in East Java revealed that access to adequate latrines was the nutrition-sensitive intervention that had the greatest impact on the incidence of stunting among children 6-24 months of age.¹⁷

The latest nutrition-specific intervention by raising theme for Indonesia's National Nutrition Day's 63rd anniversary on January 25th, 2023 was "Animal Protein Prevents Stunting", with slogans including "Animal Protein Food in Every Meal" and "My Plate is Rich of Animal Protein Food".¹⁸ Indonesia still needs hard efforts to accelerate the reduction in the prevalence of stunting. In order to achieve adequacy of protein intake and proper complementary feeding for the children, women should be empowered to affect access to resources and allocations.^{4,12} Further longitudinal studies, monitoring, evaluation, and maintaining the continuity of the programs are still needed to ensure the sufficiency of animal protein intake, thus determining the effects of animal protein intake adequacy on linear growth in children to prevent stunting.

Conflict of Interest

Authors declared no conflict of interest regarding this article.

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