Hammed K.O., Eyinla T.E., Sanusi R.A. 2025. "24-hours or 7 days' recall in infant and young child feeding: implications for research in low and middle-income countries." *World Nutrition, 16*(2), June, 122–127. https://doi.org/10.26596/wn.2025162122-127

Commentary

24-hours or 7 days' recall in infant and young child feeding: implications for research in low and middle-income countries

Karimot O. Hammed[1], Toluwalope E. Eyinla[1,*], Rasaki A. Sanusi[1]

[1]Department of Human Nutrition and Dietetics, University of Ibadan, Nigeria

Keywords: IYCF, dietary diversity, 24-hour recall, 7-day recall, food groups

https://doi.org/10.26596/wn.2025162122-127

World Nutrition 2025;16(2):122-127

Abstract

This commentary highlights the need to consider contextual factors when selecting recall periods for assessing dietary diversity in children in low- and middle-income countries (LMICs). The 24-hour recall approach is standard but may be inadequate in LMICs, where food availability is seasonal. As a result, many infants and young children do not appear to meet minimum dietary diversity within the recommended 24 hours and the validity of this finding may be uncertain. Extending the recall to 7 days often reveals occasional and useful consumption of animal-source foods, fruits, vegetables, and legumes. Thus, longer recall periods may better reflect habitual intake and improve assessment accuracy in resource-limited settings.

INTRODUCTION

Various studies have shown that a varied diet is linked to a higher intake of essential micronutrients; their absence has adverse effects on children's growth in both physical and cognitive domains (Onyango et al. 2014; Prado and Dewey, 2014). Among the eight recognized food groups, it is advised that at least five be consumed on a daily basis to meet the minimum dietary diversity. These food groups include breast milk; cereals and grains, roots, tubers, and plantains; pulses, nuts and seeds; dairy products; flesh foods; eggs; vitamin-A rich fruits and vegetables; and other fruits and vegetables (WHO and UNICEF, 2021).

Dietary recall utilizes various time periods. Participants in a 24-hour dietary recall interview are less likely to suffer from recall bias, thus increasing the reliability of the data. However, a significant limitation of the 24-hour recall is its limited ability to account for day-to-day variability in dietary intake. At aggregate level for a large sample, this is dealt with by holding interviews on each day of the week. A single cross-sectional study also has a seasonal limitation, more pronounced in populations with diets that are subject to seasonal and economic variability, as is often the case in many low and middle income countries (LMICs), especially outside of cities.

In contrast, the 7-day dietary recall offers a more comprehensive approach by collecting information on all foods and beverages consumed over a week. This method is better suited for assessing habitual dietary patterns and capturing a more accurate picture of dietary diversity and nutrient intake but the likelihood of recall bias is higher. It also puts a larger burden on both researchers and respondents and requires more resources. In lieu of 3 days or 7 days' recall, a repeat 24 hour recalls might give similar results; however, this method is also resource intensive, is analytically complex, and requires repeat availability of respondents, potentially limiting its feasibility in large-scale studies.

All the mentioned time frames have their advantages and disadvantages, depending on the context where they are to be implemented. All time-frames are more likely to give better results when combined with other methods, for example, utilizing a food frequency questionnaire (FFQ). The food-frequency questionnaire captures habitual intakes over an extended period of time, usually weeks, months or years (FAO, 2018). This method is however limited in its ability to quantify the amount of food consumed. Combining a 24-hour dietary recall with a FFQ would resolve the problem of assessing habitual dietary intake while capturing information on both quantity and frequency of food. However, the problem that's likely to arise from this is the complex analytical procedure involved and introduction of recall bias. Similarly, a 7-day recall can integrate a food frequency approach thus capturing information on the number of times a particular food was consumed within the past 7 days with limited recall bias as the time frame is more restricted than in typical FFQs.

*Corresponding author: toluemma@ymail.com

These issues are particularly important when it comes to infant and young child feeding, especially complementary feeding. Complementary feeding is essential (after 6 months) to provide a child's energy and nutrients needs (WHO, 2007; Dewey, 2013). Children's development, growth, and overall health depend on timely, adequate, and safe complementary feeding (CF), which includes considerations for quantity, quality, variety, consistency, safety, and hygiene (Hollis et al. 2020). The indicators commonly used in determining the adequacy of complementary feeding include the *Minimum dietary diversity* (MDD), *Minimum meal frequency* (MMF) and the *Minimum acceptable diet* (MAD).

The WHO indicator for dietary diversity in infants and young children (IYC), MDD, utilizes a 24-hour recall. To do this, either a list-based method or the open recall method is recommended. When resources allow, recalls can be extended to longer time frames with the 3-day or 7-day time frame being the most commonly used (WFP, 2008; FAO, 2018).

The present commentary seeks to make a case for considering context prior to selecting a time frame for recall interviews during a dietary intake assessment of IYC, especially in LMICs.

FOOD CULTURE AND FOOD RELATED PECULIARITIES OF LMICS

In most LMICs, including Africa, agricultural production is rain-fed and thus food availability is highly seasonal, raising concerns about the steady supply of fresh nutrient dense foods (Wertheim-Heck and Raneri, 2019; Ekesa et al. 2020; Surendran et al. 2020; Schreinemachers et al. 2020). This is compounded by poor food processing and preservation techniques as such, fresh nutrient dense foods especially fruits and vegetables are only available and affordable at harvest seasons while they become expensive and unaffordable at other seasons. As such, staple foods that can be easily stored through traditional processing methods are those that are readily available across all seasons without significant change in price. Thus, the diet of most people in LMICs is limited to these staple foods with the consumption of other foods when they are affordable and in season. This argues for dietary assessment approaches that cover an entire year and thus include all seasons.

Cultural factors also affect dietary intake in LMIC. For instance, the consumption of animal-based foods is influenced by age, socioeconomic status, gender and residence (Kupka et al. 2020; White et al. 2017). Thus, older people, the wealthy, males and people living in urban areas are more likely to consume animal-based foods compared to their counterparts. Culturally, women and children are often targets of restrictions related to animal-based foods as the consumption of these foods by children may be surrounded by myths such as causing misbehavior in children and also negative pregnancy outcomes in women (Kariuki et al. 2017; Vasilevski and Carolan-Olah, 2016).

In most LMICs, complementary feeding starts with the introduction of thin gruels and porridges that are mostly sweetened with sugar and/ or milk. This feeding practice usually starts with “baby food” and begins to include family meals either directly served or spontaneously shared with the child while older household members are eating.

Due to the inherently unpredictable nature of complementary foods in LMICs, it is better to capture intake within 7-day time-frame within which it’s more likely for a child to have been fed more varieties of foods either during the normal feeding times or spontaneous feeding when joining older family members.

SUPPORTING EVIDENCE FROM OTHER STUDIES

Using the 24-hour time-frame, most children in LMICs in Africa do not meet the minimum dietary diversity and consequently fall short of the criteria for the minimum acceptable diet. A review of 49 LMICs (Baye and Kennedy, 2020) found that the percentage of children meeting the criterion for MMF, MDD and MAD varies greatly across regions of LMICs. Sub-Sahara Africa was reported to have the lowest number of children meeting these criteria at 41%, 15% and 9% for MMF, MDD and MAD respectively. In contrast, the Latin America and Caribbean region were reported to have the highest number of children that met these criteria at 72%, 54%, and 40% respectively. Country-wise, the number of children consuming the MDD ranged from 5% in Burkina Faso to 78% in Peru. Those who achieved Minimum Dietary Diversity were less than 30% in 38 of the countries reviewed and only 4 countries had MDD higher than 50%.

In contrast, most children from developed countries were able to meet the criteria. Even in China, Wu et al. (2015) reported that by 24 months between 90 to 98% of all available complementary foods in the food environment of the family have been introduced to the children and could possibly be consumed within the time-frame of 24 hours. By 6 months, the daily intake of at least 70% of the children contains fruits while between ages 6 to 8 months, 70% of the children consume various vegetables daily. Among the protein foods sources, eggs were first introduced and over 55% of infants 6 months old and 90% of children 12 months and above consume egg daily. Fish and meat were mostly introduced later and by 8 months over 50% of the children consume these daily. Bean and its products were mostly the last food introduced with only half of the children consuming it daily before 12 months. Grains mostly, rice flour was the first food introduced and by 5 months, over 50 % of the children were already being fed foods containing rice flour while other grains and porridges were introduced by 6 months of age and were being consumed on a daily basis by over 50% of the children.

Going by the current standard and considering the food culture in most LMICs especially with respect to infant and young child feeding and peculiarities surrounding feeding habits of children, a single 24-hour recall be sufficient to adequately capture the routine dietary habits of children? Or will it risk under-reporting the nutrient intakes of the children in these settings? To address these questions, we experimented with both recall time frames (Hammed, 2024) in selected local government areas in Oyo state, Nigeria. This study was conducted among 727 children aged 6 to 23 months in two urban and two peri-urban LGAs in Ibadan metropolis. The difference between the 24 hours and 7 days’ recall were assessed using a paired sample T-test at 95% level of significance. The results (Table 1) revealed

significant differences in the frequency of consumption of foods from the 8 food groups recommended by WHO for children 6 to 23 months within two reference times, 24 hours and 7 days. Comparing both time frames, statistically significant increase was seen in the frequency of consumption of foods from food groups that have lower consumption rates within 24 hours specifically food groups like other fruits and vegetables (40.9%), flesh foods (48.4%), vitamin A rich fruits and vegetables (59.7%), eggs (95.8%) and, pulses, nuts and seeds (97.7%). Likewise, the percentage of children meeting the requirements for the minimum dietary diversity and minimum acceptable diet increased significantly by 45.2% and 38.3% respectively when assessed within 7 days.

Kesinro et al. (2022) studying 197 children aged 6 to 24 months in Badagry Local Government Area of Lagos State, Nigeria, found even larger differences when 7-day recall was used, as shown in Table 2.

Studies from other LMICs have also provided evidence for a significant increase in the number of food groups consumed by IYC when the timeframe is extended to 7 days. These studies used both the 24-hour recall and the 7 days' recall or food frequency questionnaire. The sample size in these studies ranges from 127 children (Atim et al., 2024) to 591 children aged 6 to 23 months (Biks et al., 2018). Two studies from Senegal (Downs et al., 2019; Thiam et al., 2022) showed significant increase in the consumption of foods groups that have very low consumption within the 24-hour time frame particularly, fruits and vegetables; flesh foods and fish; legumes and nuts; and eggs. Similarly, studies from Uganda (Bwenge Malembaka et al., 2019; Atim et al., 2024), Ethiopia (Biks et al., 2018), Ghana (Bandoh and Kenu, 2017) and Thailand (Thaweekul et al., 2021) also reported increase in the consumption of these foods without significant change in the consumption of starchy staples (cereals, roots and tubers).

Table 1. Difference in frequency of consumption from the 8 food groups within 24 hours and 7 days (Hammed, 2024)

Food groups	24 hours (%)	7 days (%)	Difference (%)	Percent increase
Grains, root, tubers and plantain	93.4	94.5	1.10	1.18
Breast milk	75.3	77.0	1.70	2.26
Dairy products*	75.9	89.8	13.90	18.31
Flesh foods*	52.1	77.3	25.20	48.37
Other fruits and vegetables*	54.3	76.5	22.20	40.88
Vitamin A rich fruits and vegetables*	40.4	64.5	24.10	59.65
Eggs*	35.4	69.3	33.90	95.76
Pulses Nuts and Seeds*	39.2	77.6	38.40	97.96
Minimum dietary diversity*	58.0	84.2	26.20	45.17
Minimum acceptable diet*	37.1	51.3	14.20	38.27

* signifies a statistically significant difference between the 24 hours and 7 days' recall.

Table 2: Difference in frequency of consumption from the 8 food groups within 24 hours and 7 days (Kesinro et al., 2022)

Food groups	24 hours (%)	7 days (%)	Difference (%)	Percent increase
Eggs	86.3	86.3	0.00	0.00
Grains/Roots/Tubers	94.4	97.5	3.10	3.28
Vitamin A rich fruits and vegetables	73.1	93.4	20.30	27.77
Fish and sea foods	71.1	92.9	21.80	30.66
Milk and dairy products	55.3	92.4	37.10	67.09
Pulses, legumes and nuts	40.6	93.9	53.30	131.28
Other fruits and vegetables	22.8	96.4	73.60	322.81
Meat/poultry/organs	8.6	85.8	77.20	897.67

CONCLUSION

Diets in LMICs are often influenced by seasonal food availability, economic constraints and cultural factors and are thus subject to high variability if usual intake is considered within a 24-hour recall period. The 7-day recall's ability to capture a broader range of dietary intake makes it more suitable for studies aiming to understand habitual eating patterns particularly when it relates to IYC, as children within this age group have inherent peculiarities that might affect daily food intake and acceptance. A single 24-hour dietary recall appears to often result in under reporting of IYC's dietary intakes and practices.

AUTHOR CONTRIBUTIONS

KOH: Conceptualization, Methodology, writing first draft, Review and editing; TEE.: Methodology, Supervision; Review and editing; RAS: Conceptualization, Methodology, Supervision, Review and editing. All authors gave approval of the final version and consent for its publication.

CONFLICT OF INTEREST

The authors declare that they have no other potential conflicts of interest.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN SCIENTIFIC WRITING

Nothing to disclose.

ACKNOWLEDGEMENTS

None

FUNDING

The authors received no financial support for the research and publication of this article.

Received: April 19, 2025; **Revised:** March 26, 2025; **Accepted:** May 30, 2025; **Published:** June 30, 2025

REFERENCES

Atim, E., Atukwase, A. and Kabahenda, M. 2024. "Complementary feeding and food handling practices among caregivers in a semi-urban setting in Northern Uganda". *African Health Sciences* 24(3):322-332. https://dx.doi.org/10.4314/ahs.v24i3.36

Bandoh, D. A. and Kenu, E. 2017. "Dietary diversity and nutritional adequacy of under-fives in a fishing community in the central region of Ghana". *BMC Nutrition* 3(2):1-6. https://dx.doi.org/10.1186/s40795-016-0120-4

Baye, K. and Kennedy, G. 2020. "Estimates of dietary quality in infants and young children (6–23 mo): Evidence from demographic and health surveys of 49 low- and middle-income countries". *Nutrition* 78:110875. https://doi.org/10.1016/j.nut.2020.110875.

Biks, G. A., Tariku, A., Wassie, M. M., and Derso, T. 2018. "Mother's Infant and Young Child Feeding (IYCF) knowledge improved timely initiation of complementary feeding of children aged 6–24 months in the rural population of northwest Ethiopia". *BMC Research Note* 11(1). https://doi.org/10.1186/s13104-018-3703-0

Bwenge Malembaka, E., Tumwine, J. K., Ndeezi, G., Engebretsen, I. M. S., Tylleskär, T., Wamani, H., Sommerfelt, H., and Nankabirwa, V. 2019. "Effects of complementary feeding on attained height among lower primary school-aged children in Eastern Uganda: A nested prospective cohort study". *PLoS ONE* 14(2):e0211411. https://doi.org/10.1371/journal.pone.0211411

Dewey, K.G. 2013. "The challenge of meeting nutrient needs of infants and young children during the period of complementary feeding: An evolutionary perspective". *Journal of Nutrition* 143 (12):2050–2054. https://doi.org/10.3945/jn.113.182527

Downs, S.M., Kalaj, J., Smith, S., Sackey, J. and Fanzo, J. 2019. "An mHealth voice messaging intervention to improve infant and young child feeding practices in Senegal". *Maternal and Child Nutrition,* e12825. https://doi.org/10.1111/mcn.12825

Ekesa, B., Baganizi, M. and Dolan, I. 2020. "Diversifying agriculture in post-conflict areas: 7 things we can change" [Policy brief]. **Full text here**

Food and Agriculture Organization (FAO). 2018. "Dietary assessment: a resource guide to method selection and application in low resource settings". Rome: FAO. **Full text here**

Hammed, K. O. 2024. "Infants and young children feeding practices, and anthropometric indicators of children aged 0-23 months in selected Local Government Areas in Ibadan, Southwest Nigeria. Master's thesis, University of Ibadan". **Full text here**

Hollis, J. L., Collins, C. E., DeClerck, F., Chai, L. K., McColl, K. and Demaio, A. R. 2020. "Defining healthy and sustainable diets for infants, children and adolescents". *Global Food Security* 27:100401. https://doi.org/10.1016/j.gfs.2020.100401

Kariuki, L., Lambert, C., Purwestri, R., Maundu, P. and Biesalski, H. 2017. "Role of food taboos in energy, macro and micronutrient intake of pregnant women in western Kenya". *Nutrition and Food Science* 47:795–807. https://doi.org/10.1108/NFS-09-2016-0146

Kesinro, A. R., Oluwasegun, A. A., Ogunlaja, A. O. Babatunde, B. M., Bawa, J. A., Okuneye, F. and Oyewole, D. D. 2022. "Investigation into infant and young child feeding (IYCF) practices among mothers in fishing communities in Badagry Local Government Area, Lagos state". *European Journal of Modern Medicine and Practice* 2(8):42–69. http://www.inovatus.es/index.php/ejmmp/article/view/1157/1241

Kupka, R., Siekmans, K. and Beal, T. 2020. "The diets of children: Overview of available data for children and adolescents". *Global Food Security* 27. https://doi.org/https://doi.org/10.1016/j.gfs.2020.100442

Onyango, A. W., Borghi, E., de Onis, M., Casanovas, M. del C., and Garza. 2014. "Complementary feeding and attained linear growth among 6–23-month-old children". *Public Health Nutrition* 17(9):1975–1983. https://doi.org/10.1017/s1368980013002401

Prado, E. L., and Dewey, K. G. 2014. "Nutrition and brain development in early life". *Nutrition Reviews* 72(4):267–284. https://doi.org/10.1111/nure.12102

Schreinemachers, P., Baliki, G., Shrestha, R. M., Bhattarai, D. R., Gautam, I. P., Ghimire, P. L., Subedi, B. P., & Brück, T. 2020. "Nudging children toward healthier food choices: An experiment combining school and home gardens". *Global Food Security*, 26, 100454. https://doi.org/10.1016/j.gfs.2020.100454

Surendran, S., Selvaraj, K., Turner, C., Addanki, S., Kannuri, N. K., Debbarma, A., Kadiyala, S., Kinra, S., and Walls, H. 2020. "Characterising the fruit and vegetable environment of peri-urban Hyderabad, India". *Global Food Security* 24:100343. https://doi.org/10.1016/j.gfs.2019.100343.

Thaweekul, P., Sinlapamongkolkul, P., Tonglim, J., and Sritipsukho, P. 2021. "Associations between the infant and young child feeding index and nutritional status". *Pediatrics International* 63(8):958–964. https://doi.org/10.1111/ped.14570

Thiam, M., Diouf, A., Coly, O. B., Kébé, S. D., Diongue, O., Badiane, A., Faye, M. H., Sylla, P. M. D. D., Idohou-Dossou, N., and Medoc, J. M. 2022. "Dietary intakes and nutritional status of mother-child (6-23 months old) pair targeted through the "organic residual products for biofortified foods for Africa project" in rural area in Senegal". *International Journal of Child Health and Nutrition* 11:119-130. https://doi.org/10.6000/1929-4247.2022.11.03.1

Vasilevski, V. and Carolan-Olah, M. 2016. "Food taboos and nutrition-related pregnancy concerns among Ethiopian women". *Journal of Clinical Nursing*. 25:3069–3075. https://doi.org/https://doi.org/10.1111/jocn.13319

Wertheim-Heck, S.C.O. and Raneri, J.E. 2019. "A cross-disciplinary mixed-method approach to understand how food retail environment transformations influence food choice and intake among the urban poor: experiences from Vietnam". *Appetite* 142:104370. https://doi.org/10.1016/j.appet.2019.104370.

White, J.M., Bégin, F., Kumapley, R., Murray, C. and Krasevec, J. 2017. "Complementary feeding practices: Current global and regional estimates". *Maternal and Child*

Nutrition. 13:e12505. **Full text here**

WFP. 2008. "Food consumption analysis: Calculation and use of the food consumption score in food security analysis. Vulnerability Analysis and Mapping. Rome: World Food Programme. **Full text here**

WHO. 2007. "Indicators for Assessing Infant and Young Child Feeding Practices PART 1". Geneva: World Health Organization, pp. 1–19, **Full text here**

WHO and UNICEF. 2021. "Indicators for assessing infant and young child feeding practices: definitions and measurement methods". Geneva. **Full text here**.

Wu, H., Li, H., Zhang, Y., Zong, X., Zhu, Z., and Yu, Y. 2018. "National survey showed that Chinese city children under two years of age had similar feeding patterns to developed countries". *Acta Paediatrica* 107(9):1555–1561. https://doi.org/10.1111/apa.14302.