

Letters to the editor

Response to Dewey et al.'s Letter

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The response to our commentary on Small Quantity Lipid Nutrient Supplements (SQ-LNS) (Dewey, Stewart, McDonald, et al., in press) by 44 authors, of whom just 8 were from the global South, where the implementation of SQ-LNS is sought, reminds us of the inspiring Hindi song: “*Nirbal se ladai balwan ki, ye kahani hai diye ki aur toofan ki*” (Dogra and Dogra 2022). “This is in the form of a parable of an earthen lamp showing light to people but attacked by a fierce storm, which is bent on extinguishing the lamp. It symbolizes the struggles of the very weak against big aggressors. Despite many attacks by the storm, the lamp manages to protect its glow.” (Dogra and Dogra 2022)

There are many problems with the Dewey et al response (Dewey, Stewart, McDonald, et al., in press). First, they fail to answer our critical question about the lack of appropriately fed control groups to compare SQ-LNS effects, sidestepping the query by citing feasibility problems in implementing a control group. However, the lack of a proper control group is a critical problem that renders the evidence base that informs the whole debate on contextual diets *versus* industrially formulated nutrient products untenable. As we said in our commentary, Dewey *et al.* are simply stating a foregone conclusion: *any* intervention is likely to yield positive effects within this framework.

Second, it is stated that it is difficult to meet the requirements for nutrients with contextual diets; for example, ‘...it is very difficult to meet needs for nutrients such as iron (in the absence of fortification) without substantial intakes of animal-source foods (e.g., liver)’. This is hard to believe. An inspection of the modelling used in their quoted reference (Vitta and Dewey 2012), shows that the daily iron requirement was defined by the Recommended Dietary Allowances (RDA) or Recommended Nutrient Intakes (RNI), and not the Estimated Average Requirements (EAR), which is the suitable metric for use at population level. The estimated EAR for iron is much lower in 0.5-1 year old children, including in India (5.6 mg) (Ghosh et al. 2019), and linear programming using a locally developed tool, shows that this requirement of iron (and other micronutrients) can actually be met (<https://datatools.sjri.res.in>) through locally avail-

able and affordable foods for this age group. It is indeed a mystery, as to why none of these series of well-funded SQ-LNS trials had a positive control group of such diets. This would have enabled a head-to-head comparison for determining and quantifying the relative benefits, harms, and costs of these two interventions.

Third, if locally available diets are to be ignored in favour of using chemical fortification or supplements (which we emphatically disagree with – when diets work, they should be the primary choice), it is prudent to first evaluate nutrient gaps in the intake of the child population that is being targeted. The exercise should not just be based on linear programming of local foods to meet a high target intake (the RDA), but also on the prevalent risk of nutrient inadequacy, if any. Here too, the target intake to meet is the EAR, and the target risk of inadequacy is 50%; a recent publication details such modelling in a population (Ghosh et al. 2022). In the absence of good dietary records, using biomarkers to state that nutrient gaps exist may be misleading, as the context is important when defining the nutrient biomarker cut-offs to use to diagnose deficiency (Sachdev et al. 2023).

Fourth, Dewey *et al.* (Dewey, Stewart, McDonald, et al., in press) state: “*As a matter of equity, we believe that infants and young children in LMICs also deserve access to high-quality fortified products.*” We believe that equity first demands access to the “best foods that a normal population would eat”, which is diverse foods. Not processed pastes and powders, which might be needed rarely and transiently (not for one-year) in specific environmental shocks, disasters or conflicts. Such an intervention should not be forced on a population, invading their cultural diets, in the guise of prevention of malnutrition.

Equity also demands that the child is exposed to no additional risk. By using the micronutrient RDA as the requirement metric, and not explicitly defining the contextual gap in nutrients, the SQ-LNS falls into the trap of proposing that “one size fits all.” The ‘equity’ that this intervention claims to seek is transformed into ‘inequity’ by this evidently false principle. The risk of excess intake is real

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and amplified by the multitude of micronutrient supplementation in operation in such settings, including multiple micronutrient powders, pharmacological iron-folic acid supplementation, iodine-iron fortified salt, and mega-dose Vitamin A supplementation. There are further ethical dimensions: for example, what are the harms of abruptly stopping the increased intake of micronutrients and other nutrients after one year?

Fifth, the positioning of a complementary feeding intervention as a micronutrient supplement is perplexing. If a 'product' supplies about 33-50% of complementary food energy need at this age (<https://sqlns.ucdavis.edu/FAQs>), and similarly the need of other macronutrients like fat and protein apart from multiple micronutrients content to meet the requirement of 98% of population, then it must be classified as a food. We reiterate that SQ-LNS should be classified as Ultra Processed Foods (UPF), as per the original NOVA classification (Monteiro et al. 2018). This being the case, any labelling, packaging and marketing of SQ-LNS should meet, not only local regulatory guidelines (where these exist), but the very strictest recommendations to prevent commercial exploitation and unethical marketing; so there must be no promotional claims (such as 'growell'), no cross promotion, no 'greenwashing,' no e-commerce and data collection, nor any labelling, marketing or humanitarian appeals that promote the product, increase its salability and potential spill-over. The product should also carry precautionary warnings that highlight all potential risks of the product (including allergies) and an unambiguous prominent statement that the target content of certain nutrients may exceed the tolerable upper limit of intake, particularly where other interventions are already in place.

Sixth, the dangers of creeping overnutrition are dismissed, based on sparse and indirect evidence. Our concern is not simply about a child becoming obese, as per global references, within this time frame, as one cannot expect 2 to 3 SD weight-for-height change (depending on baseline) within an intervention period of 6 months to one year. The core issue pertains to embarking on the journey to becoming more ponderous relative to self, without crossing the threshold of overweight/obesity, which is well documented to be associated with overnutrition associated Non-Communicable Diseases in later life (Bhargava et al. 2004; Singhal 2017). No data analysis on this aspect is available, nor a comparison of weight-for-height above 1 SD between supplemented and control groups. Given the experience in India with "metabolic obesity" (Sachdev et al. 2021), it is worth comparing body adiposity, blood pressure, and the potential for dyslipidemia and dysglycemia too.

Seventh, the portrayed mortality reduction of 27% is not evident (RR: 0.82; 95% CI: 0.61, 1.10), if the appropriate comparison groups are used in this meta-analysis (Stewart et al. 2020). Further, if one focusses on the more relevant metric for anthropometric gains (absolute mean differences instead of Relative Risk based on dichotomous outcomes), these are quite modest (Dewey, Wessells, Arnold, et al. 2021) and unlikely to interest an informed policy maker.

Eighth, we clarify the Conflicts of Interest concerns. Our analysis included the 14 Individual Participant Data (IPD)

trials (Dewey et al. 2022), and the 13 additional trials referred to by Aguayo *et al.* (Aguayo et al. 2023), to support several benefits like growth (Dewey, Wessells, Arnold, et al. 2021), development (Prado, Arnold, Wessells, et al. 2021), anemia (Wessells, Arnold, Stewart, et al. 2021), and mortality (Stewart et al. 2020). Among the IPD trials, Mamane Zeilani, paid employee of Nutriset, is reported as the co-author in 3 trials, and is associated in 2 trials. Andre Briend, ex-consultant of Nutriset was a co-author in 1 trial (See [Table 1](#)). [Table 2](#) shows that Mamane Zeilani was associated with one trial, and Andre Briend in another. Nutriset provided free product support in three trials. DSM and Unilever were co-funders of one study. Another study shows association with 'Valid Nutrition'. It is also stated that "K.R. Wessells received a grant from Nutriset, SAS outside of the submitted work during the period of this IPD analysis project". Dewey *et al.* (Dewey, Stewart, McDonald, et al., in press), state that "...(*Nestle*) *Foundation is independent of the Nestle company*"; however, their website (<https://www.nestle-foundation.org>) states that it was founded by a donation from the Nestlé Company, which cannot be ignored. The researchers and advocates are obliged to transparently declare their interests, which in this particular instance would be relevant for 3-5 years prior to the publication of the earliest study included in IPD analyses. It is for the external stakeholders and the policy makers to judge whether the declared (and undeclared) interests should be factored for in the decision making, instead of relying on the advocates' or their critics' perceptions.

In conclusion, we reiterate that SQ-LNS should not be promoted as a component of *routine* complementary feeding, even in vulnerable settings. It is disturbing that external advocacy groups (in HICs), and those who designed and undertook these trials should be seeking to influence the decision-making and expertise of those in LMICs, suggesting that the operationalization of this product at scale is the best way forward. LMICs have sufficient expertise and maturity for their own decision making and implementation of appropriate child feeding, and are likely to better understand the need to protect and preserve dietary and socio-cultural practices.

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Table 1. Potential Conflicts of Interest detected among the 14 Individual Participant Data Trials.

S. No.	Trial Reference	Authorship/Association
1	Christian P, Shaikh S, Shamim AA, Mehra S, Wu L, Mitra M, et al. Effect of fortified complementary food supplementation on child growth in rural Bangladesh: a cluster-randomized trial. <i>Int J Epidemiol</i> 2015;44(6):1862–76.	In-kind support in the form of micronutrient premix for the food supplements was provided by DSM, Basel, Switzerland , and Plumpy'doz was provided by Nutriset (Maulany, France) . <i>Acknowledgement:</i> We acknowledge the support of Mamane Zeilani and his staff at Nutriset for providing Plumpy'doz.
2	Adu-Afarwuah S, Lartey A, Brown KH, Zlotkin S, Briend A, Dewey KG. Randomized comparison of 3 types of micronutrient supplements for home fortification of complementary foods in Ghana: effects on growth and motor development. <i>Am J Clin Nutr</i> 2007;86(2): 412–20	Until December 2003, AB[Andre Briend] was a paid consultant of Nutriset, the company that manufactured NB[Nutri Butter] . None of the other authors had any potential conflicts of interest. Supported by the Nestlé Foundation with additional support from USAID's MGL Research Program through ILSI.
3	Adu-Afarwuah S, Lartey A, Okronipa H, Ashorn P, Peerson JM, Arimond M, et al. Small-quantity, lipid-based nutrient supplements provided to women during pregnancy and 6 mo postpartum and to their infants from 6 mo of age increase the mean attained length of 18-month children in semi-urban Ghana: a randomized controlled trial. <i>Am J Clin Nutr</i> 2016;104(3):797–808	At the time of the study, MZ[Mamane Zeilani] was an employee of Nutriset S.A.S. , which is a commercial producer of LNS products.
4	Galasso E, Weber AM, Stewart CP, Ratsifandrihamanana L, Fernald LCH. Effects of nutritional supplementation and home visiting on growth and development in young children in Madagascar: a cluster-randomised controlled trial. <i>Lancet Glob Health</i> 2019;7(9): e1257–68. 52.	<i>Acknowledgement</i> We thank Christine Powell (University of the West Indies), Mamane Zeilani (LNS-Nutriset) , Jantina Clifford and Kimberly Murphy (University of Oregon), and Harold Alderman (IFPRI).
5	Ashorn P, Alho L, Ashorn U, Cheung YB, Dewey KG, Gondwe A, et al. Supplementation of maternal diets during pregnancy and for 6 months postpartum and infant diets thereafter with small-quantity lipid-based nutrient supplements does not promote child growth by 18 months of age in rural Malawi: a randomized controlled trial. <i>J Nutr</i> 2015;145(6):1345–53	<i>Author disclosures:</i> M Zeilani works as a director of research for Nutriset S.A.S. , a company that produces and sells lipid-based nutrient supplements (NLSs) and which also prepared the LNSs purchased for the present trial.
6	Maleta KM, Phuka J, Alho L, Cheung YB, Dewey KG, Ashorn U, et al. Provision of 10–40 g/d lipid-based nutrient supplements from 6 to 18 months of age does not prevent linear growth faltering in Malawi. <i>J Nutr</i> 2015;145(8):1909–15	<i>Author disclosures:</i> M Zeilani works as a director of research for Nutriset S.A.S. , a company that produces and sells lipid-based nutrient supplements and that also prepared the lipid-based nutrient supplements purchased for the current trial.

Table 2. Potential Conflict of Interest detected in other studies.

S. No.	Trial Name	Authorship/Association
1	Mangani C, Maleta K, Phuka J, Cheung YB, Thakwalakwa C, Dewey K, Manary M, Puumalainen T, Ashorn P. Effect of complementary feeding with lipid-based nutrient supplements and corn-soy blend on the incidence of stunting and linear growth among 6- to 18-month-old infants and children in rural Malawi. <i>Matern Child Nutr</i> 2015;11(Suppl 4):132-43.	The micronutrient mixture used in the production of LNS was provided free of charge by Nutriset Inc. (Malaunay, France). John Phuka and Chrissie Thakwalakwa received personal stipends from Nestle Foundation.
2	Phuka JC, Maleta K, Thakwalakwa C, Cheung YB, Briend A, Manary MJ, Ashorn P. Complementary feeding with fortified spread and incidence of severe stunting in 6- to 18-month-old rural Malawians. <i>Arch Pediatr Adolesc Med</i> 2008;162(7):619-26.	The micronutrient mixture used in the production of FS was provided free of charge by Nutriset Inc. (Malaunay, France). Briend was a consultant to Nutriset until December, 2003 and the company has also financially supported the planning of another research project by the same study team through Ashorn and the University of Tampere after the completion of this trial.
3	Smuts CM, Matsungu TM, Malan L, Kruger HS, Rothman M, Kvalsvig JD, Covic N, Joosten K, Osendarp SJM, Bruins MJ, et al. Effect of small-quantity lipid-based nutrient supplements on growth, psychomotor development, iron status, and morbidity among 6- to 12-mo-old infants in South Africa: a randomized controlled trial. <i>Am J Clin Nutr</i> 2019;109(1):55-68.	This study was funded by the Global Alliance for Improved Nutrition (GAIN), Geneva, Switzerland, with DSM and Unilever as cofunders . The SQ-LNS product was provided by Unilever R&D Vlaardingen BV, and the SQ-LNS-plus product was supplied by DSM Nutritional Products Ltd. MJB[Maaïke J Bruins] is employed by DSM Nutritional Products, a supplier of vitamins, carotenoids, and n-3 and n-6 nutritional lipids. LGJF is employed by Unilever R&D Vlaardingen. DSM and Unilever were cofunders of the study and provided the test products free of charge.



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