# Evidence and Programmatic Considerations for the Use of Small Quantity Lipid-Based Nutrient Supplements for the Prevention of Malnutrition

October 14-16, 2015 | Washington, DC

## Meeting Highlights

The U.S. Agency for International Development through the Food and Nutrition Technical Assistance III Project (FANTA), in collaboration with the Bill & Melinda Gates Foundation's International Lipid-Based Nutrient Supplements (iLiNS) Project, convened a technical meeting in Washington, DC from October 14–16, 2015 to take stock of the varied research and programmatic experiences using small quantity lipid-based nutrient supplements (SQ-LNS) for the prevention of malnutrition.

The objectives of the meeting were to:

- Share the evidence to date on the efficacy and effectiveness of SQ-LNS for the prevention of malnutrition
- Discuss and summarize experiences on key operational topics related to the use of SQ-LNS for the prevention of malnutrition including challenges and lessons learned
- Outline the key operational conditions needed to roll-out programs using SQ-LNS
- Identify an implementation research agenda

The meeting was attended by 44 participants, comprised of researchers, programmers, producers, and donors involved with projects that have used SQ-LNS for the prevention of malnutrition (see Annex 1 for participant list).

The agenda was organized around four main topic areas: social and behavior change communication (SBCC) related to SQ-LNS; use of SQ-LNS; economics of SQ-LNS; and logistics of SQ-LNS; and was designed to allow for formal presentation of scientific information and programmatic experiences, and to foster significant dialogue and exchange among participants (see Annex 2 for the agenda).

This brief report is intended to provide an interim summary of the key highlights from the meeting while the formal meeting report is being prepared. The report is structured to provide an overview of the meeting highlights by each of the four meeting objectives.

## Evidence on the Use of SQ-LNS for the Prevention of Malnutrition

Given that there is a growing body of research related to the efficacy of SQ-LNS for the prevention of malnutrition, the meeting provided an opportunity for results across studies to be shared with meeting participants. Although much of the SQ-LNS research has been carried out in controlled settings (i.e., randomized clinical efficacy trials), a few recent studies have been carried out to evaluate the effectiveness of SQ-LNS in a programmatic context. In terms of the impact of SQ-LNS, the results have been somewhat mixed across studies (refer to Table A). Differences in study design and the varied context in which the studies have been carried out make it difficult to summarize the extent of the impact demonstrated by SQ-LNS. For example, across studies, there is variability in the composition of

SQ-LNS, the package of interventions, the demographic group(s) targeted for SQ-LNS, and the length of time SQ-LNS was provided. In addition, when reviewing the results across the various studies, it may be necessary to consider the potential of a specific population to benefit from SQ-LNS (e.g., the extent of nutrient gaps in the diet, the extent of wasting) and the potential of a specific population to respond to SQ-LNS (e.g., the extent of inflammation, infection) as these characteristics are likely to differ across the various contexts where the studies were implemented and could be important factors influencing the potential for SQ-LNS to demonstrate impact in a given context.[1]

[1] This was a consideration raised by Kay Dewey in a presentation entitled "Synthesis of what has been learned to date from the iLiNS Project and implications for programs and policy."

## Table A. Summary of Studies Reviewed[2]

| Country, author, year | Study arms | Age at start of intervention | Intervention duration | Key results for birth, growth, and child development outcomes |
|---|---|---|---|---|
| *Efficacy studies* | | | | |
| Ghana<br>Adu-Afarwuah et al. 2015 | • SQ-LNS to PLW and children<br>• MMN tablet to PLW, no supplements to children<br>• Control: IFA to pregnant women, placebo to lactating women, no supplements to children | • As early as possible in pregnancy<br>• 6 months in children | • Varied in pregnancy, through 6 months postpartum<br>• 12 months in children | • Significantly greater birth weight and newborn weight-for-age and BMI-for-age z-scores, and among infants of primiparous women, greater newborn length-for-age and head circumference-for-age z-scores (in addition to weight-for-age and BMI-for-age z-scores) in SQ-LNS vs. control arm<br>• Significantly lower prevalence of stunting at 18 months in SQ-LNS vs. control arm |
| Malawi<br>Ashorn et al. 2015 | • SQ-LNS to PLW and children<br>• MMN tablet to PLW, no supplements to children<br>• Control: IFA to pregnant women, placebo to lactating women, no supplements to children | • As early as possible in pregnancy<br>• 6 months in children | • Varied in pregnancy, through 6 months postpartum<br>• 12 months in children | • No difference in birth outcomes between study arms<br>• No difference in length-for-age z-score at 18 months between study arms |
| Ghana<br>Adu-Afarwuah et al. 2007 | • SQ-LNS to children<br>• MNP to children<br>• Crushable MMN tablet to children<br>• Control: no intervention | 6 months | 6 months | • Significantly greater length-for-age z-score at 12 months in SQ-LNS compared to MNP and crushable MN tablet arms |
| Malawi<br>Phuka et al. 2008 | • MQ-LNS to children<br>• SQ-LNS to children<br>• Fortified CSB to children | 6 months | 12 months | • Significantly lower prevalence of severe stunting at 18 months in the MQ-LNS arm compared to the CSB arm |
| Haiti<br>Ianotti et al. 2014 | • SQ-LNS for 3 months to children<br>• SQ-LNS for 6 months to children<br>• Control: no intervention | 6–11 months | 3 or 6 months | • Significantly greater length-for-age z-score among children 12–17 months when SQ-LNS given for 6 months compared to control |

[2] Adapted from Kay Dewey's presentation entitled the "Rationale and efficacy of home-fortification with SQ-LNS during the first 1000 days." Additional results were presented at the meeting, but are not included in Table A given that they have not yet been published.

| Country, author, year | Study arms | Age at start of intervention | Intervention duration | Key results for birth, growth, and child development outcomes |
|---|---|---|---|---|
| Malawi<br>Maleta et al. 2015 | • 40 g no-milk SQ-LNS to children<br>• 40 g milk SQ-LNS to children<br>• 20 g no-milk SQ-LNS to children<br>• 20 g milk SQ-LNS to children<br>• 10 g milk SQ-LNS to children<br>• Control: delayed intervention, CSB to children from 18 months of age | 6 months | 12 months | • No difference in length-for-age z-score (or stunting) at 18 months between any of the SQ-LNS arms and the control arm |
| Burkina Faso<br>Hess et al. 2015 | • SQ-LNS containing no zinc to children<br>• SQ-LNS containing 5 mg zinc to children<br>• SQ-LNS containing 10 mg zinc to children<br>• SQ-LNS containing no zinc + 5 mg zinc tablet to children<br>• Control: no intervention<br>*All arms except the control arm received weekly morbidity surveillance and treatment for diarrhea and malaria | 9 months | 9 months | • Significantly lower prevalence of stunting and wasting at 18 months in all SQ-LNS arms combined, compared to the control arm<br>• Significantly higher performance on motor, language, and personal-social development measures at 18 months in all SQ-LNS arms compared to the control arm |
| *Effectiveness studies* | | | | |
| Bangladesh<br>Mridha et al. 2014 | • SQ-LNS to PLW and children<br>• IFA to PLW, SQ-LNS to children<br>• IFA to PLW, MNP to children<br>• IFA to PLW, no supplements to children | • As early as possible in pregnancy<br>• 6 months in children | • Varied in pregnancy, through 3 months postpartum if in IFA arm,* 6 months postpartum in SQ-LNS arm<br>• 18 months in children<br>*IFA was given daily during pregnancy but every other day postpartum | • Significantly greater birth weight, weight-for-age z-score, head circumference-for-age z-score, BMI-for-age z-score; and a lower prevalence of stunting, small head circumference, wasting, and small-for-gestational-age at birth in the SQ-LNS arm (compared with IFA arms) |
| Guatemala<br>Leroy et al. ongoing | • CSB to PLW and children + family ration (rice, beans, and oil)<br>• CSB to PLW and children + ½ family ration<br>• CSB to PLW and children + no family ration<br>• SQ-LNS to PLW and children + family ration<br>• MNP to PLW and children + family ration<br>• Control: no intervention | • As early as possible in pregnancy<br>• 6 months in children | • Varied in pregnancy, through 6 months postpartum<br>• 18 months in children | • Not available/unpublished |

CSB: corn-soy blend; IFA: iron-folic acid; MMN: multiple micronutrient; MNP: micronutrient powder; MQ-LNS: medium-quantity lipid-based nutrient supplement; PLW: pregnant and lactating women; SQ-LNS: small-quantity lipid-based nutrient supplement

## Challenges and Lessons Learned From the Use of SQ-LNS for the Prevention of Malnutrition

Throughout the meeting, participants shared their experiences, challenges, and lessons learned from using SQ-LNS for the prevention of malnutrition. The programs represented at the meeting included: the PROCOMIDA Food for Peace Development Food Assistance Program in Guatemala; the Rang-Din Nutrition Study (RDNS) in Bangladesh; the World Food Programme's Right Foods at the Right Time program in Malawi and Mozambique; Médecins Sans Frontières' integrated pediatric prevention program in Mali; the Millennium Villages project in Uganda; the World Bank's pilot project integrating SQ-LNS in Madagascar's community nutrition program; and the Inter-American Development Bank's SPOON project in Latin America.

Key challenges that were discussed included:

- Measurement challenges associated with monitoring beneficiary adherence to consuming SQ-LNS as recommended
- Preventing the intended beneficiary from sharing the SQ-LNS, which is contrary to cultural norms in many populations
- Confusion among beneficiaries, community health workers, and sometimes even among policy-makers between the purpose and role of SQ-LNS vs. that of RUTF
- The length of time required for government approval and shipping and customs clearance, and the consequences of this for the shelf life of SQ-LNS once it arrives at its destination
- Logistics difficulties associated with the "last mile" of transportation to deliver SQ-LNS to the beneficiary, especially in large-scale programs
- The need to generate demand for SQ-LNS, address barriers to accessing SQ-LNS, and engage the private sector in order to foster the sustainability of SQ-LNS

Lessons learned and shared included:

- SQ-LNS is generally highly accepted and well-liked by infants and young children; SQ-LNS is also generally accepted by pregnant and lactating women
- The consumption of SQ-LNS directly from the sachet is very common despite instructions to consume the SQ-LNS mixed with food; it may not be necessary to instruct beneficiaries to mix SQ-LNS with food
- Some caregivers may feel that dividing a 20 g sachet for children into two servings per day is unhygienic; two 10 g sachets may be more acceptable, but this would add cost
- Some evidence suggests that even when offered, the 20 g dose is not fully consumed by children, especially by infants less than 12 months
- The importance of ensuring that the packaging of SQ-LNS is language- and culturally-appropriate to avoid conflicts or rejection by national or local governments

## Programmatic Considerations for the Use of SQ-LNS for the Prevention of Malnutrition

Given that there is a current lack of international guidelines for the use of SQ-LNS, and that programs are nevertheless adopting SQ-LNS as an intervention for the prevention of malnutrition, it was deemed

important to consolidate experiences related to the provision of SQ-LNS and translate these into programmatic considerations and operational conditions necessary for programs adopting SQ-LNS.

Some of the programmatic considerations and operational conditions identified during the meeting included the need to:

- Conduct a situational assessment before committing to using SQ-LNS as part of an intervention strategy or package to understand the population's potential to benefit from SQ-LNS, as well as the population's potential to respond to SQ-LNS
- Coordinate with the host country government to ensure an enabling environment exists for distributing SQ-LNS before committing to using SQ-LNS in programming
- Conduct formative research to inform development of high-quality SBCC to optimize adherence and appropriate use of SQ-LNS, even though it can be costly, especially when scaling up SQ-LNS across diverse cultural groups and geographic/agro-ecological areas
- Monitor the adherence of beneficiaries, at least in the early stages of the intervention, to allow for proper attribution of benefit as well as reinforcing messages as needed to maximize the benefit of SQ-LNS
- Consider the legal and policy framework for the importation of SQ-LNS; approval of packaging and labeling prior to importation; and allowing time for pre-export verification, shipping, clearance, and in-country transportation

## Areas for Potential Research Related to the Use of SQ-LNS for the Prevention of Malnutrition

Gaps in the evidence base concerning the use of SQ-LNS were highlighted throughout the meeting and resulted in the outlines of a potential research agenda to advance scientific knowledge and programmatic practice concerning the use of SQ-LNS for the prevention of malnutrition. Topics identified for further research ran the spectrum from basic research to implementation research, including cost-effectiveness research. Some of the research questions that generated the most interest among meeting participants included the following:

- What nutrients are most specifically related to growth and development and need to be included in the formulation of SQ-LNS to optimize effectiveness, and which nutrients could potentially be dropped (i.e., what is the best formulation of SQ-LNS for the lowest price)?
- What is the relative effectiveness and cost effectiveness of SQ-LNS and micronutrient powders for growth and development outcomes?
- What minimum SQ-LNS dose adherence is necessary for a response, and over what length of time?
- What minimum package of interventions would be recommended to combine with SQ-LNS in programmatic efforts to address stunting?
- Does SQ-LNS delivered through health centers or community-based platforms improve the demand for health services, supplies at health centers, and quality of health services?
- What market-based or other combination of delivery approaches are most cost effective and reach the most vulnerable?

## Annex 1. Meeting Participants

| First Name | Last Name | Affiliation |
|---|---|---|
| Nancy | Aburto | WFP |
| Paul | Alberghine | USDA |
| Mary | Arimond | UC Davis |
| Deborah | Ash | FANTA/FHI 360 |
| Emmanuel | Atuhairwe | MVP |
| Elizabeth | Bontrager | USAID |
| Judy | Canahuati | USAID |
| Joyce | Chen | MVP/Columbia University |
| Parul | Christian | John Hopkins University |
| Deborah Kortso | Collison | FANTA/FHI 360 |
| Omar | Dary | USAID |
| Diane | De Bernardo | USAID |
| Megan | Deitchler | FANTA/FHI 360 |
| Kay | Dewey | UC Davis |
| Concetta C. | DiRusso | University of Nebraska |
| Emanuela | Galasso | World Bank |
| Wendy | Gonzalez | GAIN |
| Kerstin | Hanson | MSF |
| Nicole | Henretty Ilic | Edesia |
| Sheila | Isanaka | Epicentre/Harvard School of Public Health |
| Marcel | Janssen | Mercy Corps |
| Alima Amini | Jimu | Project Peanut Butter |
| Elizabeth | Jordan-Bell | USAID |
| Stephen | Kodish | Consultant |
| Jef | Leroy | IFPRI |
| Zeina | Maalouf-Manasseh | FANTA/FHI 360 |
| Mark | Manary | Project Peanut Butter |
| Shelley | Marcus | Tufts University |
| Timothy | Mastro | FHI 360 |
| Thais | Mosquet | Nutriset |
| Traci | Mouw | USDA |
| Malay | Mridha | ICDDR, B/UC Davis |
| Sorrel | Namaste | JSI |

| | | |
|---|---|---|
| Andre | Ntamack | USDA |
| Deanna | Olney | IFPRI |
| Lesley | Oot | FANTA/FHI 360 |
| Rafael | Perez-Escamilla | Yale School of Public Health |
| Ellen | Piwoz | BMGF |
| Jumana | Qamruddin | World Bank |
| Timothy | Quick | USAID |
| Sandra | Remancus | FANTA/FHI 360 |
| Michelle | Schaan | USAID |
| Melanie | Thurber | USAID |
| Stephen | Vosti | UC Davis |

## Annex 2. Meeting Agenda

| Day 1 - Wednesday, October 14 | | |
|---|---|---|
| 8:30–8:45 | Opening | Tim Mastro<br>Kay Dewey<br>Omar Dary |
| 8:45–9:15 | Introductions | Deborah Ash |
| 9:15–9:45 | Presentation to summarize the evidence on the efficacy of SQ-LNS | Kay Dewey |
| 9:45–10:05 | Presentation on the role of EFAs in SQ-LNS | Concetta DiRusso |
| 10:05–10:20 | Q&A | |
| 10:20–10:30 | Break | |
| 10:30–11:00 | Presentation on the effectiveness of SQ-LNS: Results from PROCOMIDA, Guatemala | Jef Leroy<br>Deanna Olney |
| 11:00–11:30 | Presentation on the effectiveness of SQ-LNS: Results from RDNS, Bangladesh | Malay Mridha |
| 11:30–11:45 | Q&A | |
| 11:45–12:45 | Lunch | |
| **Topic area 1: SBCC related to SQ-LNS** | | |
| 12:45–1:45 | Panel on SBCC related to SQ-LNS | Marcel Janssen<br>Steve Kodish |
| 1:45–3:00 | Facilitated discussion | |
| 3:00–3:15 | Break | |
| 3:15–3:45 | Presentation on programming and integration of SQ-LNS at scale | Nancy Aburto |
| 3:45–4:45 | Facilitated discussion | |
| 4:45–5:00 | Day 1 wrap-up | |

| Day 2 - Thursday, October 15 | | |
|---|---|---|
| 8:30–8:45 | Day 1 debrief | |
| **Topic area 2: Use of SQ-LNS** | | |
| 8:45–9:15 | Presentation on published literature on the use of SQ-LNS: Acceptability, adherence | Mary Arimond |
| 9:15–9:30 | The PROCOMIDA Guatemala Experience: A case study on the use of SQ-LNS | Marcel Janssen |
| 9:30–9:45 | The RDNS Bangladesh Experience: A case study on the use of SQ-LNS | Kay Dewey |
| 9:45–10:45 | Facilitated discussion | |
| 10:45–11:00 | Break | |

| Day 2 - Thursday, October 15 | | |
|---|---|---|
| **Topic areas 3 & 4: Economics and logistics related to SQ-LNS** | | |
| 11:00–12:00 | Presentation on the economics of SQ-LNS | Steve Vosti |
| 12:00–1:00 | Lunch | |
| 1:00–1:30 | Presentation on the local production of SQ-LNS | Alima Jimu |
| 1:30–1:45 | Presentation on the logistics of LNS | Nancy Aburto |
| 1:45–2:00 | Q&A | |
| 2:00–3:00 | Break-out groups by topic area | |
| 3:00–3:15 | Break | |
| 3:15–4:00 | Plenary report-back and facilitated discussion: Economics related to SQ-LNS | |
| 4:00–4:45 | Plenary report-back and facilitated discussion: Logistics related to SQ-LNS | |
| 4:45–5:00 | Day 2 wrap-up | |

| Day 3 - Friday, October 16 | | |
|---|---|---|
| 8:30–8:45 | Day 2 debrief | |
| 8:45–10:45 | Outlining of key operational conditions needed to roll out programs using SQ-LNS | |
| 10:45–11:00 | Break | |
| 11:00–12:00 | Identification of an implementation research agenda | |
| 12:00–12:15 | Wrap-up | |
| 12:15-12:30 | Closing | Elizabeth Jordan-Bell<br>Ellen Piwoz<br>Sandra Remancus |
| 12:30 | Boxed lunch | |

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