

From Theory to Practice: Operational Considerations for Incorporating Small-Quantity Lipid-Based Nutrient Supplements into Programs to Prevent Undernutrition Among Children 6-23 Months of Age

Version 0
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Introduction

Background

The 2021 Lancet Series on Maternal and Child Undernutrition added small-quantity lipid-based nutrient supplements (SQ-LNS) for children 6-23 months to its list of proven interventions to address child undernutrition (1). In 2023, the WHO released guidelines on complementary feeding as well as the prevention and management of wasting and nutritional oedema, both of which recommended the use of SQ-LNS in populations at risk of food insecurity (Box 1) (2, 3). Several organizations have developed guidance for implementing SQ-LNS including [USAID](#) (4), [UNICEF](#) (5), and the [World Bank](#) (6). While these documents provide a strong foundation for designing programs that include SQ-LNS, a more comprehensive document that addresses additional operational aspects such as estimating SQ-LNS supply needs, training, and supervision of staff would be useful. Therefore, the SQ-LNS Task Force’s Operational Guidance Working Group has developed this document to provide operational guidance covering considerations related to the preconditions, design, logistics, implementation, and monitoring of programs providing SQ-LNS.

Box 1. Recommendations related to SQ-LNS in two recent WHO guidelines.

Source	Recommendation	Remark
WHO guideline for complementary feeding of infants and young children 6-23 months of age, 2023 (2)	#6. “In some contexts where nutrient requirements cannot be met with unfortified foods alone, children 6–23 months of age may benefit from nutrient supplements or fortified food products.” c. “Small-quantity lipid-based nutrient supplements (SQ-LNS) may be useful in food insecure populations facing significant nutritional deficiencies (context-specific, high-certainty evidence).”	“[Fortified products] should never be distributed as stand-alone interventions, rather they should always be accompanied by messaging and complementary support to reinforce optimal infant and young child feeding practices.” “None of the products are a substitute for a diverse diet consisting of healthy and minimally processed foods.”
WHO guideline on the prevention and management of wasting and nutritional oedema (acute malnutrition), 2023 (3)	<u>Prevention of wasting and nutritional oedema:</u> D3. a) “In areas of or during periods of high food insecurity, in addition to infant and young child feeding counselling, specially formulated foods (SFFs), including medium-quantity lipid-based nutrient supplements (MQ-LNS) or small-quantity lipid-based	“In contexts where wasting and nutritional oedema occur, implementation of these interventions should ideally be through a multisectoral and multisystem approach.” “SFFs should be delivered with behaviour change communication and with messaging on infant and young

	<p>nutrient supplements (SQ-LNS), may be considered for the prevention of wasting and nutritional oedema for a limited duration for all infants and children 6-23 months of age, while continuing to enable access to adequate home diets for the whole family.”</p> <p>b) “In areas of or during periods of high food insecurity, children living in the most vulnerable households should be prioritized for SFF interventions through a targeted approach. However, when targeting is not possible, these SFFs may need to be given to all households through a blanket approach for infants and children 6-23 months of age, while continuing to enable access to adequate home diets for the whole family and providing infant and young child feeding counselling.”</p>	<p>child feeding including breastfeeding and complementary feeding.”</p> <p>“Screening and referral for wasting and nutritional oedema should be done alongside delivery of preventive interventions as part of a continuum of care.”</p> <p>“Provision of SFFs (including SQ-LNS) for the prevention of wasting and nutritional oedema should be stopped when the food insecurity situation improves and/or when the most vulnerable households can meet energy and nutrient needs from locally available nutrient-dense foods”.</p>
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Purpose of the operational guidance

This document aims to build on and harmonize existing guidance by providing practical information to policymakers, program managers, and implementers. It addresses key considerations when deciding whether and how to integrate SQ-LNS into existing programs in countries with high levels of child undernutrition or household food insecurity. Additionally, it presents evidence-based best practices for designing, implementing, and monitoring effective programs aimed at preventing child undernutrition in resource-limited, vulnerable settings. The document also includes several case studies to highlight context-specific differences and program parameters.

Description of SQ-LNS

SQ-LNS were designed for the prevention of undernutrition in settings where vulnerable populations are likely to have nutrient gaps in their diet along with multiple micronutrient deficiencies. In these settings, SQ-LNS are intended for children during the complementary feeding period (6-23 months of age) and provide 22 vitamins and minerals embedded in a small amount of food (~20g/d; 100-120 kcal/d). This supplement also provides energy, protein, and essential fatty acids (see [WFP](#) & [UNICEF](#) product specification) (7, 8). SQ-LNS act as a form of

home fortification, which consists of adding specialized, nutrient-filled products to locally available foods prepared at home or other settings such as daycare centers or schools (9). The supplement's small volume prevents the displacement of breastmilk and locally available nutrient-rich food (10-15), enables all children in the target age range to consume the entire ration in one day (thereby receiving the intended dose of micronutrients) (16, 17), and minimizes cost of the intervention (18).

The rationale for the use of SQ-LNS is that between 6-23 months of age, poor nutritional quality of complementary foods contributes to undernutrition, increased susceptibility to disease and developmental delays. Growth faltering is common during the complementary feeding period, and this is exacerbated in situations where household resources are stretched. In low-income populations, many households cannot access or afford a nutritionally adequate diet for their young children. SQ-LNS are intended to assist children in these vulnerable settings to meet their nutrient needs during this critical period of growth and development, thereby protecting and promoting nutritional status and optimizing health.

Scientific evidence on SQ-LNS

A growing body of scientific evidence supports the use of SQ-LNS for prevention of child undernutrition (**Figure 1**). Meta-analyses of numerous randomized trials, involving over 37,000 children, indicate that SQ-LNS can reduce mortality by 27%, severe wasting by 31%, severe stunting by 17%, iron deficiency anemia by 64%, and developmental delay by 16-19% between 6-23 months of age (19-21).

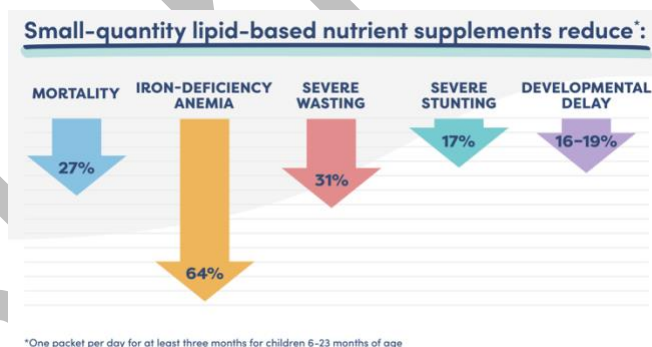


Figure 1. Benefits of SQ-LNS

A recent assessment of the most cost-effective maternal and child nutrition interventions for the Copenhagen Consensus estimated a benefit to cost ratio of 13.7 for SQ-LNS provided preventively to children 6-23 months of age, targeted to the poorest 60% of the population in the 40 low- and lower-middle-income countries with the highest rates of child stunting (22). A synthesis of available evidence on the cost and cost-effectiveness of SQ-LNS concluded that SQ-LNS can be a cost-effective intervention when implemented using the most appropriate delivery platform with adequate support and supervision (18).

SQ-LNS should not replace a diverse and nutritious diet, nor should provision of SQ-LNS serve as a stand-alone intervention. Instead, they are intended to be integrated into a core package of actions, including (at minimum) robust communication, quality interpersonal counseling and support for caregivers focused on infant and young child feeding (IYCF) practices, including continued on-demand breastfeeding through age 2 years or beyond and consumption of a diverse nutritious diet. In highly food insecure contexts this preventive intervention for young children should be part of a package that includes household food assistance and a nutrition

intervention for women during pregnancy and breastfeeding. Fundamentally, SQ-LNS are designed to be a supplement, complementing the regular suite of good nutritional practices for young children.

Structure of the operational guidance

To support policy makers, program managers, and implementers in designing and integrating the delivery of SQ-LNS into existing programs, this document presents considerations divided into four stages (**Figure 2**), with a separate section for special circumstances.

- **Stage 1:** *Verify that preconditions are met.* This stage guides the program manager or implementer on how to assess the nutrition situation as well as the policy and program environment to determine the suitability, appropriateness, and sustainability of SQ-LNS for their context.
- **Stage 2:** *Integrate SQ-LNS into the program.* Once the program manager or implementer has decided that the preconditions are met, this stage presents key design considerations such as targeting (including exit and entry criteria), supplementation duration, distribution frequency, and complementary services that should be considered and addressed when designing a program utilizing SQ-LNS.
- **Stage 3:** *Implement the program.* This stage covers operational issues such as communicating information about SQ-LNS with caregivers, staff training content and duration, and logistical considerations such as calculating SQ-LNS supply needs.
- **Stage 4:** *Supervise and monitor the program.* This stage includes considerations related to the monitoring systems including indicators and type and frequency of supervision for quality improvement.
- Finally, the section on **special circumstances** covers what to do if other fortified products are distributed in the selected program area, such as medium-quantity lipid-based nutrient supplements (MQ-LNS), multiple micronutrient powders (MNP), and fortified blended flours (FBF).

Figure 2. Stages of program design and implementation



Stage 1. Verify that preconditions are met

The first step in designing a program that will provide SQ-LNS involves evaluating whether the necessary preconditions for implementation are met. This process begins by assessing the nutrition situation, gaining a deeper understanding of the program context, identifying potential delivery platforms and integration opportunities, and determining existing capacities (e.g., human resources) and relevant needs. If the assessment indicates that provision of SQ-LNS may be an appropriate intervention, then a consensus-building workshop can be facilitated with stakeholders (e.g., government, UN agencies, NGOs, and other partners) to share and validate findings and to design a strategy for implementing SQ-LNS. Effective collaboration with

appropriate governmental agencies is essential at all steps in this process and political commitment is important.

Nutrition situation of the program area

UNICEF’s guidance states “SQ-LNS can be considered as part of a package of interventions for nutritionally at-risk populations (e.g., those with a high prevalence of stunting, wasting and anaemia, with an emphasis on contexts with high wasting and treatment relapse rates, mortality and micronutrient deficiencies)” (5).

Program managers and implementers should begin by reviewing the child nutrition situation, including levels of wasting, stunting, anemia, and mortality among children under 5 years of age. To do this, they can refer to recent [Demographic and Health Survey](#) reports (23), [Multiple Indicator Cluster Survey](#) reports (24), and micronutrient survey reports for data on child nutritional status and mortality. They should attempt to find data specific to the program area being considered for implementation, or as close to it as possible. Ministry of Health annual reports and [Standardized Monitoring Assessment for Relief and Transition \(SMART\)](#) survey reports (25) conducted by implementing organizations might also provide necessary data to assess the nutrition situation of the program area. Additionally, data entered into the national monitoring systems such as [district health information system 2](#) (DHIS2) may also be a good source (26). It is possible that some program areas have high levels of one but not another form of undernutrition or that they may have high levels of all forms of undernutrition. Each policy maker, manager, and implementer will need to evaluate their nutritional status data to determine whether there is a need for an intervention such as SQ-LNS. They may consider using widely accepted prevalence thresholds for child stunting, wasting, and anemia (**Box 1**) (27, 28).

Box 1. Prevalence thresholds of stunting, wasting, and anemia

Stunting

Low: <10%
Medium: 10-19%
High: 20-29%
Very high: >=30%

Wasting*

Low: <5%
Medium: 5-9%
High: 10-14%
Very high >=15%

Anemia**

Normal: <=4.9 %
Mild: 5-19.9%
Moderate: 20-39.9%
Severe: >=40%

Source: *de Onis et al. 2019 (27) and **WHO 2011 (28)

In addition to examining nutritional status data, it is also important to analyze data on IYCF practices, as well as on the affordability of the lowest cost healthy, nutritious diets (29-31). IYCF information is available from DHS, MICS, and other nutrition survey reports. When reviewing data on dietary practices, program managers and implementers should pay close attention to data on complementary feeding (e.g., minimum dietary diversity, minimum meal frequency,

and minimum acceptable diet) (32). Children not meeting minimum dietary diversity (defined as consuming at least 5 out of 8 food groups in the past 24 hours) may not be getting adequate nutrients through their regular diet. If a substantial proportion (e.g., $\geq 20\%$) of children fall into this category, it can be considered to be of public health concern and intervention may be warranted (33). If data are available, program managers and implementers might also consider reviewing age-specific minimum dietary diversity data (e.g., 6-11 months, 12-17 months, 18-23 months) because in some contexts the prevalence of minimum dietary diversity for 6-23 months might be acceptable, but it may be concerning for younger age groups. In such cases a product such as SQ-LNS can bridge the nutrient gap and serve as an appropriate intervention for the program area. To facilitate this assessment, tools such as the [Nutrition Program Design Assessment](#) (33) or [WFP's Food and Nutrition Handbook](#) (34) can be valuable.

Food security situation of the program area

In addition to assessing the nutrition situation of the program area, it is important to understand the food security situation. This is because SQ-LNS are designed to enhance the nutritional quality of existing diets and provision of SQ-LNS does not directly address household food insecurity issues. To gauge the severity and scope of food insecurity, the [Integrated Food Security Phase Classification](#) (IPC) is a globally recognized scale that includes five levels of acute food insecurity: no/minimal (phase 1), stressed (phase 2), crisis (phase 3), emergency (phase 4), and catastrophe/famine (phase 5) (35). Another resource, the [WFP's HungerMap LIVE](#) (36) can be consulted to check the prevalence of food insecurity, as well as crisis or above crisis coping strategies at the subnational level based on real-time monitoring and now-casting (36). In areas characterized by high levels of food insecurity, programs should aim to provide or ensure availability of household food assistance in addition to the provision of SQ-LNS and core interventions. [UNICEF's guidance](#) recommends that "SQ-LNS should be considered in contexts facing high levels of acute food insecurity (IPC severity phases 3-5 for acute food insecurity) and limited access to nutritious food" (5), and specifies that in these contexts, SQ-LNS provision should occur together with household assistance via food, cash or vouchers. For children in nutritionally at-risk populations in areas at IPC 1-2, the provision of SQ-LNS integrated into a core package of interventions (e.g., IYCF social and behavior change communication (SBCC)) may be sufficient. However, in all contexts, governments may opt to target vulnerable households via social assistance or other programs that aim to improve their food security, together with this nutrition-specific intervention for children aged 6-23 months.

Policy and enabling environment of the program area

Program managers and implementers should review relevant policies and strategies to understand how SQ-LNS might fit into a country's approach to addressing child undernutrition. These policies and strategies will typically be related to health and nutrition, but a review of strategies related to the food, WASH, and social protection systems may be helpful. [UNICEF's complementary feeding guidance](#) may be particularly useful, as it emphasizes the importance of having a situation analysis and provides a framework for improving diets (31, 37). A country might have a multi-sectoral strategy, which would be good to review as well. An additional resource that could be useful is the country's road map on the Global Action Plan (GAP) on child

wasting. It will be important to review which commodities are in the national essential medicines list (e.g., RUTF) and evaluate whether procuring SQ-LNS would require any further action. These steps will provide insights to the likely acceptability of SQ-LNS among policy makers. Next, program managers and implementers should hold consultative meetings with stakeholders to assess their perspectives on SQ-LNS and identify enablers and potential barriers. This might need to happen at the national level as well as the local level depending on whether a country is decentralized or centrally managed.

It is important to note that there may be variability in government acceptance of importation and use of LNS products, as well as community acceptability of those products. When considering SQ-LNS for potential use, importation requirements should be reviewed. Additionally, because of sustainability considerations, in development settings the feasibility, funding, and political appetite for long-term incorporation of SQ-LNS into standard nutrition protocols at-scale should be a major consideration. If there is no indication that the government in the implementing country is open to the long-term use of SQ-LNS as a primary product for protection and promotion of nutritional status in young children, piloting and scaling efforts may not be worthwhile investments, although it will be important to understand the barriers.

Once program managers and implementers have a good idea of the policy environment and have deemed it to be favorable for SQ-LNS implementation, then they can map the types of programs and services related to child nutrition operating in the program area. They should also note who is engaged to implement or deliver the services (e.g., community health workers) and what is the access, demand, and coverage in the program area. In addition, they might consider noting any strengths, weaknesses, and barriers related to implementation of the program. This step will help identify existing programs into which SQ-LNS might be integrated. This could include programs implemented through the health and non-health sectors. The [Nutrition Program Design Assessment](#) might also help with the analysis for this step (33).

Stage 2. Integrate SQ-LNS into the program

After determining that the preconditions to implementing SQ-LNS are met, program managers and implementers should ensure the availability of funding, make specific decisions about how the product will be used, and consider the logistical and personnel requirements. Decisions to be made in this stage include those regarding targeting (age, geographic location, potential socioeconomic considerations/enrollment in social assistance programs), supplementation duration (how long each child will consume the product), distribution frequency (how far and how frequently caregivers will have to travel to pick up the products or how frequently community health workers will deliver the product to participant homes), and complementary actions (services provided along with SQ-LNS), as well as the distribution platform. This stage will inform budgeting and logistical planning, which are further addressed in Stage 3.

Targeting

SQ-LNS are designed for children during the complementary feeding period of 6-23 months, when nutrient needs are high and diets may be deficient in multiple micronutrients and essential fatty acids. There is some evidence that benefits are greatest when a child begins consuming SQ-LNS at 6 months of age (38). Further, benefits of SQ-LNS on child development, anemia, iron deficiency, severe stunting, and severe wasting were found to be greater among populations with poor WASH conditions, a higher burden of undernutrition, and low socioeconomic status (19, 20). Blanket and geographical targeting for children is the most appropriate for preventive programs in high-risk populations. However, the decision to target the provision of SQ-LNS to subgroups most in need, or to implement blanket distribution within a geographical area, is to be informed by available resources, cost considerations, the way in which eligibility can be explained to the target population, and the key objectives of the program. In highly food insecure areas, SQ-LNS should be paired with household food assistance (see **Table 1** for program parameters).

Supplementation duration

The evidence thus far supports a duration of 12 months for SQ-LNS supplementation, ideally from 6 to 18 months of age (19). The recent meta-analysis did not find additional benefits in growth outcomes (e.g., stunting, wasting) when children were supplemented for more than 12 months (19). While data are limited, three studies that began supplementing children 6-11 months of age and for a duration of 6-9 months found positive impacts on growth (39-41), anemia and iron status (41, 42), although it isn't known how long those benefits on anemia and iron status would persist beyond the end of supplementation. Supplementation for longer than 12 months, if feasible, will continue to provide essential nutrients that may be limited in the child's diet. For example, a longer supplementation duration (>12 months) had greater effects on anemia and iron status (43).

Distribution frequency

Frequency of distribution will be dependent on the delivery platform and feasibility in the program context. After conferring with program staff and participants, programs should ideally aim for a distribution frequency every two to four weeks. There is evidence to show that more frequent contact between participants and program staff is associated with better program adherence (44). Some programs that provide SQ-LNS have implemented a three-month distribution frequency. However, these programs had a strong communication component and program staff continued to interact with participants on a monthly basis (45).

Table 1: Ideal Parameters of a Program Providing SQ-LNS

Design Considerations	Suitable
Population	<p>Areas where a high proportion of the population cannot afford healthy, nutritious diets and at least one of the following criteria are met: 1) low dietary diversity among children under 2 years, 2) a high burden of one or more forms of child undernutrition (wasting, stunting, micronutrient deficiencies), or 3) moderate to high child mortality*.</p> <p>Areas in IPC phase 1 or 2. Areas in IPC phase 3 to 5 where household food assistance programs are in place or can be implemented.</p>
Target Age Group	Children 6-23 months
Duration	12 months is recommended, with a minimum duration of 6 months**
Dosage	20 grams (110-120 kcal) per day
Frequency of Distribution	Every 2-4 weeks is recommended
Modality	Mixed with age-appropriate and adequate complementary food or eaten directly from the sachet
Special Circumstances	Children aged 6-23 months who have developed severe or moderate wasting* should be referred to the nearest wasting management program, as available.

Note: * Under five mortality rate of more than 25 per 1,000 live births, the Sustainable Development Goal target (46). Severe wasting is defined as a weight-for-length Z-score (WLZ) or weight-for-height Z-score (WHZ) <-3 or mid-upper arm circumference (MUAC) < 115 mm or bilateral edema; moderate wasting is defined as a WLZ or WHZ <-2 but ≥-3 or MUAC < 125 mm but ≥ 115 mm.

**Most of the evidence for benefits of SQ-LNS is based on randomized controlled trials that provided them for 12 or more months (19). Limited evidence suggests some benefits with a duration of 6-9 months (19).

Accompanying and complementary actions

The provision of SQ-LNS should not be considered as a stand-alone intervention. It is essential that the provision of SQ-LNS be integrated into a core package of actions (including at a minimum SBCC activities related to IYCF practices (47)) and accompanied by product-specific messages (e.g., ensuring caregivers know what the product is, who the product is intended for, how to use it appropriately, etc.). In addition, the provision of SQ-LNS should ideally be integrated and co-packaged with complementary interventions that address specific factors contributing to malnutrition and food insecurity in the program area. The selection of interventions to complement SQ-LNS should be tailored to the specific context and vulnerabilities of the target population. Evidence suggests that co-packaging interventions that address factors that constrain children’s response to SQ-LNS (or in other words, factors that prevent children from optimally benefiting from the product) might lead to a greater impact of

SQ-LNS (19). These co-interventions include prevention and control of prenatal and child infection and inflammation; improving access to health care, including mental health care for women; and promoting early childhood development (19).

In highly food insecure areas (IPC 3-5) most households are unable to meet their food and nutrient needs. There may be greater likelihood of intrahousehold sharing of SQ-LNS in such situations, which would dilute the potential for the index child to fully benefit from SQ-LNS. Therefore, in these settings, managers of programs providing SQ-LNS should liaise with local government and partners to ensure that assistance to mitigate household food insecurity is available (48). Food assistance should be provided for all vulnerable members in the household throughout the program duration. An example of such a package of products is shown in **Table 2**. For any given program, the specific elements of the package should be tailored to the program context.

Table 2: Example package of food and nutrition assistance programming in acute food insecurity settings (IPC 3-5), including SQ-LNS

Target group	Product	Daily ration	Other program elements
Children aged 6-23 months	SQ-LNS (7, 8)	1 sachet (20g)	<ul style="list-style-type: none"> • SBCC activities related to IYCF practices. • Routine screening and referral of wasted children to management services.
Children aged 24-59 months	MQ-LNS (49) Or Super Cereal Plus (e.g., Corn Soya Blend ++) (50)	1 sachet (50g) 100-200g (200g includes provision for sharing)	
Pregnant and lactating women and girls (PLW)	LNS-PLW (51)	1 sachet (75g)	<ul style="list-style-type: none"> • Referral of PLW to antenatal care (ANC) and basic primary health care services.
	Or Super Cereal (e.g., Corn Soya Blend +) (52)	Up to 200g (includes provision for sharing)	
Other household members	Household food assistance (cash or in-kind) based on SPHERE standards (53) and cluster assessments to determine household contribution.		

Delivery platforms

Potential delivery platforms for SQ-LNS through the health system might include primary health care services such as growth monitoring and promotion (GMP), general community nutrition/ IYCF activities, integrated management of childhood illness (IMCI) or integrated community case management (iCCM). Screening for community management of acute malnutrition (CMAM) will also help identify eligible children (**Box 2**) (45, 54). Registries for social assistance programs may also be used for identification and/or registration of households with children under 2 years of age; however, physical distribution of SQ-LNS would likely take place through

affiliated facilities (e.g., health post or pharmacies) where vouchers are redeemed, or shops where subsidized food is sold.

Box 2. Examples of SQ-LNS delivery platforms

In Honduras, SQ-LNS were integrated into the Ministry of Health's Atención Integral a la Niñez en la Comunidad (Comprehensive Care for Children in the Community [AIN-C]) program or a program modeled after AIN-C in districts of five departments of the Dry Corridor. The core components of AIN-C were counseling, child growth monitoring, monitoring of pregnant women, and conducting home visits.

In Somalia, SQ-LNS were delivered from health facilities where children were also eligible for other primary health care services including immunization and growth monitoring and promotion.

In Niger, SQ-LNS were integrated into the implementing organization's 1,000 days program, which included antenatal care, birth delivery, neonatal care, vaccination, and feeding and care from six months to 24 months of life.

In Mali, SQ-LNS were delivered as part of a prevention package inclusive of behavior change communication to screen for wasting in the community.

Source: USAID Advancing Nutrition 2022 (45); Huybregts et al. 2019 (54)

Stage 3. Implement the program

Integrating the distribution of SQ-LNS into existing platforms requires careful consideration of the logistics, training of health/community workers, communication with participants, and forging partnerships. Logistical considerations such as product quality and availability, cost, and storage and transport are essential for product supply and management. [WFP's Managing the Supply Chain of Specialized Nutritious Foods](#) is a helpful resource for this stage (55). Recruiting an adequate number of staff with the right skillset and training them on the technical and logistical aspects of SQ-LNS is also critical. Effective collaboration with partners (e.g., government, UN agencies, NGOs) is vital to the success of the program.

Logistics

Product quality and availability

Before integrating SQ-LNS into existing programs, the program manager should understand national regulatory policies, and procurement processes should be put in place to ensure the product meets quality standards and is readily and consistently available. It is important to note that packaging and labeling may need to be designed/adjusted to meet country-specific requirements. There are several organizations and manufacturers that are suppliers of SQ-LNS. Any SQ-LNS product used in programs should comply with Codex Alimentarius standards for ingredients used in preparing the product. See [WFP \(7\)](#) & [UNICEF SQ-LNS Product Specification Sheet \(8\)](#).

Cost of programs providing SQ-LNS

Integrating SQ-LNS into existing programs can have [cost implications](#) (18). It is important to consider the cost of procurement, storage, transportation, and distribution of the product, and the specialized logistics personnel needed to support those processes. Additionally, it may be necessary to provide training and education to program staff and caregivers to ensure effective use of the product, which will require additional staff time outside of distributions.

Volume: The amount of SQ-LNS needed for a program depends on several factors, including the target number of children, the duration of the program, and the frequency and amount of SQ-LNS to be distributed per child (see **Table 3** for general steps to compute the amount of SQ-LNS needed). It is important to note that these calculations are based on general assumptions and that the specific requirements for a particular program may differ based on factors such as the prevalence of malnutrition in the target population, the logistics of distribution, and the availability of resources. It is also important to work with a nutrition expert or program planner to ensure that the program is designed and implemented effectively.

Table 3. Illustrative steps to estimate the amount of SQ-LNS required on an annual basis for a hypothetical program that provides SQ-LNS to 6-18 month old children

Program parameter	Description	Example
Number of children targeted per month	Determine the total number of eligible children in the program area. This information can be obtained from census data, other programs that provide services to pregnant women and/or young children, or through a survey of households in the area.	10,000 children 6-18 months old
Duration of SQ-LNS distribution per year	Determine the duration of the distribution period. This could be a fixed period of time, such as six months or one year.	12 months
Amount of SQ-LNS required	Determine the amount of SQ-LNS to be distributed by the program. The recommended dosage is 20 g per day. Therefore, the total amount of SQ-LNS required per month will be approximately equal to the number of children x 20 g/day x 30 days/month. Assuming a 12-month distribution period, the amount of SQ-LNS required per year would be equal to the monthly amount x 12 months. A buffer stock, typically in the range of 10-20%, may be added.	10,000 children X 0.02 kg per day X 30 days per month X 12 months X 1.1 buffer = 79,200 kg

Note: Currently, in the UNICEF supply catalog (56), one carton includes 600 x 20 g sachets of SQ-LNS. To obtain the quantity of SQ-LNS required in number of cartons, the total amount needed in kg can be divided by the amount of SQ-LNS contained in one carton (600 x 20 g = 12 kg). Example: 79,200 kg/12 kg = 6,600 cartons.

Cost: In September 2023, the cost of one carton of SQ-LNS (600 x 20 g sachets) was USD 58.77, which is equivalent to 0.098 USD per daily ration (18). This cost does not include shipping, landing, storage, and clearance costs from the manufacturer to the final destination. For a 12-month supply, the cost at that price would be approximately USD 36 USD per child for the product alone. Please refer to the [UNICEF supply catalog](#) for up-to-date prices (56). Product transportation costs will be unique to each context.

The estimated weight of one carton of SQ-LNS (600 x 20 g sachets), is 12.5kg and the volume is 23.2 cubic decimeters. This information will help program managers and implementers to estimate shipping, storage, and in-country transport needs. It is also essential to consider the issue of shelf-life, which is typically 24 months from the manufacturing date, when planning issues around transport, storage, and distribution, and to ensure that the product will be consumed before the best before date.

Non-product costs can vary widely due to differences in program design and delivery platform, start-up costs, and buffer estimates (18). For program design and delivery platform related costs, factors such as mode (e.g., taken to households, distributed at group meetings) and frequency of SQ-LNS distribution, and whether personnel time and overhead are shared with other program components make a big difference. In the early stages of program implementation, cost per child may be higher, due to fixed start-up costs and time to reach acceptable levels of coverage (18).

Cost data in 2021 USD from programs providing SQ-LNS in Uganda, Madagascar, Mali, Burkina Faso, and Bangladesh show variation in cost elements (18):

- Product costs: USD 23-47 per child for 12 months
- Procurement cost: USD 35-50 per child for 12 months
- Non-product costs: USD 8-47 per child for 12 months
- Total costs: ~USD 50 per child for 12 months in most of the countries, with product cost averaging 60% of that total. The high end of this range was (USD 71) for Burkina Faso where distribution coverage was very low.

The recently formed [Child Nutrition Fund](#) is a new financing mechanism to scale-up government-led efforts to prevent and manage child wasting (57). This mechanism may be a potential funding source for government-led integration of SQ-LNS in existing platforms.

There are many different international and in-country suppliers of SQ-LNS. UNICEF procures and supplies SQ-LNS products through their Supply Division. They work with manufacturers to ensure the quality and safety of the products and provide technical support to programs implementing SQ-LNS interventions. More information on how to procure SQ-LNS products through UNICEF can be found on their [website](#) (56). WFP also provides support for the distribution of SQ-LNS products through their nutrition programs. They work with partners and manufacturers to ensure the availability of high-quality products and provide technical support

to programs implementing SQ-LNS interventions. More information on WFP's nutrition programs can be found on their [website](#) (58).

Shipping

If SQ-LNS need to be shipped, then programs need to account for production and shipping time. This will influence when the program can actually begin implementation. In certain instances, there may be production backlogs as well as competing production priorities (e.g., demand for RUTF). As noted above, the product's shelf-life is calculated from the time of production. This needs to be considered in relation to the timeline for transportation, storage, and distribution.

Storage and transport

SQ-LNS products require specific storage and distribution conditions to maintain quality and nutritional value. It is important to ensure that the existing supply chain can handle the storage and distribution of the product or consider establishing a separate supply chain if necessary.

Storage: SQ-LNS products need to be stored appropriately at home and in storage locations (e.g., warehouse, health facility). These products typically have a shelf life of 24 months when they are stored at up to 30°C in a cool, dry place, away from direct sunlight (56). If stored above 30°C for more than 6 months or above 40°C for more than 3 months then the quality of the products must be assessed periodically (6).

Additionally, there are certain considerations for storage of SQ-LNS at warehouses or health facility storerooms. It is recommended to implement a 'First In, First Out' inventory management and stock rotation system. This system ensures that products with the earliest arrival or production date are used first. Programs should also track the "best before" date on the carton and sachets of SQ-LNS as this will help determine when the products should be consumed. Documents such as [WFP's Managing the Supply Chain of Specialized Nutritious Foods](#) (55) and [Emergency Field Operations Pocketbook](#) (59) provide guidance on handling and storage of food commodities including assessing storage capacity, stacking commodities, accounting for commodities, inspection of the store and contents, stock records and stock control, store hygiene, how to dispatch commodities, labor management and security, and reporting.

Organizations implementing a program that provides SQ-LNS may have a well-managed warehouse at a central location, but they may need to make provisions for storage closer to the community. Some health facilities have large storage capacity, but a discussion with the health facility management team will be necessary to ensure SQ-LNS can be stored with other medical commodities. Additionally, in some contexts, program staff may need to bring SQ-LNS to households. In this case, the program will need to plan carefully for how SQ-LNS will be stored, at the community, prior to being delivered to participant homes.

Transport: SQ-LNS will need to be transported from the central warehouse to distribution sites and/or participant homes. The World Food Programme's Food Storage Manual (60) and

[Emergency Field Operations Pocketbook](#) (59) provide guidance on how to plan for transportation of food commodities. Additionally, while planning for transport, it will be critical to secure at least one month's supply of extra SQ-LNS stock at each delivery point to ensure there are no disruptions in the SQ-LNS regimen for children. Additionally, in an unstable area, security measures will be necessary while transporting products to different delivery points. This may also add to program costs.








Training

Multiple levels and types of staff will require training on different aspects of SQ-LNS (e.g., staff providing SQ-LNS, staff who provide associated counseling, staff who manage logistics, etc.). The training curriculum for staff providing SQ-LNS should include information about the product, methods for counseling caregivers on appropriate use, how to incorporate IYCF information, how to monitor and track adherence, and when to refer children to wasting management programs. The training curriculum should be designed to be interactive and participatory, with opportunities for group discussion, role-playing, and hands-on activities. The training should also be tailored to the specific needs and context of the program, with consideration given to cultural and linguistic differences.

Programs will also need to plan to hold refresher training (at least once per year) and implement a system to train new staff as they are recruited. Separate training materials may need to be developed for different levels/types of staff (e.g., health facility staff vs. community health workers vs. volunteers) involved in the program providing SQ-LNS. The number of days of training will depend on the platform into which SQ-LNS provision will be integrated and the resources available (see **Box 4** for the suggested training curricula). Opportunities to integrate training regarding SQ-LNS into existing capacity-building activities on IYCF should also be explored to maximize impact.

In addition to the technical aspects of SQ-LNS, staff will also need to be trained on program logistics and monitoring. These might include how to track stocks of SQ-LNS, count sachets on distribution day, record amounts given to participants, collect and dispose of used sachets, and other program related indicators (e.g., height, weight, MUAC, edema, number referred to malnutrition treatment programs, etc.).

Box 4. Suggested training curriculum for program staff

	Introduction and Background	<ul style="list-style-type: none"> • Overview of the program goals and objectives • Background information on malnutrition and the importance of nutrition interventions • Role of health workers (and volunteers) in the program
	Infant and Young Child Feeding Practices	<ul style="list-style-type: none"> • Appropriate infant and young child feeding practices, including exclusive breastfeeding, timely introduction of complementary foods, and responsive feeding • Common misconceptions and barriers to optimal feeding practices • Counseling and communication skills for promoting optimal feeding practices
	Nutritional Needs and SQ-LNS	<ul style="list-style-type: none"> • Nutritional needs of infants and young children and the role of SQ-LNS in meeting those needs • Composition and benefits of SQ-LNS • Recommended dosage, frequency, and duration of SQ-LNS supplementation
	Home Storage and Safe Use of SQ-LNS	<ul style="list-style-type: none"> • Proper storage and handling of SQ-LNS in the home setting, including temperature, humidity, and exposure to light • Hygiene and sanitation practices to prevent contamination of SQ-LNS • Not sharing SQ-LNS with other family members to ensure adequate supply for the targeted child • Proper disposal of empty SQ-LNS sachets
	Program Logistics	<ul style="list-style-type: none"> • Stock monitoring, calculation and request • Storage of SQ-LNS at distribution sites
	Adherence and Monitoring	<ul style="list-style-type: none"> • Strategies for promoting adherence to SQ-LNS supplementation • Monitoring and tracking of SQ-LNS supplementation and growth monitoring indicators • Identification and referral of children with acute malnutrition
	LNS Products for Malnourished Children	<ul style="list-style-type: none"> • The role of LNS supplements (e.g., ready-to-use therapeutic food [RUTF] for and ready-to-use supplementary food [RUSF]) in the treatment of malnutrition • When to refer malnourished children for treatment and when to provide SQ-LNS in the community setting • Identification and management of severe and moderate acute malnutrition

Counseling

It is important for caregivers of children 6-23 months to understand how to appropriately use SQ-LNS so that their children may benefit from consuming them. With these principles in mind, during every interaction, health workers should actively listen to caregivers and address any concerns they have or challenges they are facing. They should also plan to provide 3-5 key points about SQ-LNS to caregivers. These can be shared individually or in groups. At a minimum, the following four essential topics, as outlined in [UNHCR 2011 guidance](#) (61), should be covered:

- i. Whom SQ-LNS is intended for: Caregivers should understand that SQ-LNS are specifically designed to support the nutrition and growth of children aged 6-23 months, and not for children outside of that age range.
- ii. Why SQ-LNS should be used: Emphasize the vital role of SQ-LNS in addressing nutritional deficiencies and promoting healthy growth and development in young children, and that it should be given in addition to a variety of foods that are appropriate for the child’s age.
- iii. How and when to take SQ-LNS: Provide clear instructions on the proper administration of SQ-LNS, including dosage, frequency, and timing. Explain the importance of consistent use.
- iv. How to manage possible adverse reactions. Inform caregivers about symptoms (e.g., allergy) and how to manage them. Encourage open communication with health workers if adverse reactions occur.

Program staff may also provide additional information during the first interaction and prior to the child’s exit from the program (**Table 4**). A brief developed by USAID Advancing Nutrition, [SQ-LNS: What to Communicate to Program Participants](#) provides guidance on how to develop a communication plan for the SQ-LNS component of the program (62). It also includes sample job aids for program staff to use with caregivers, such as counseling cards and a FAQ document to answer questions raised by caregivers. The brief emphasizes the importance of program staff to interact with caregivers on a regular basis and actively listen to and address caregivers’ concerns, so they might help overcome challenges and problem solve as necessary. The frequency of interaction may vary from the frequency of distribution but is dependent on the distribution platform the program selects.

Table 4. Example of key information to share with caregivers

When	Example of key information
Every interaction	<ul style="list-style-type: none"> ● Practice responsive feeding (i.e., feed your child with love and care, be attentive to their hunger and satiety cues, be patient and make eye-to-eye contact while eating). ● Continue to offer your child a wide variety of nutritious, age-appropriate complementary foods, including fruits, vegetables, and animal-source foods (47). ● SQ-LNS are intended for children 6-23 months of age and should be used for a minimum of 6 months. Benefits are greatest when provision of SQ-LNS is started between 6-11 months of age. ● SQ-LNS can help improve your child's health and growth by providing essential nutrients that may be missing from their diet. ● SQ-LNS should be given once a day, every day, for at least 6 months. The recommended dosage is 20g. ● SQ-LNS can be eaten as-is or mixed with food that the child normally eats, such as porridge, mashed vegetables or fruits, or cooked cereal. ● If your child develops any adverse reactions, such as diarrhea or vomiting, stop giving them SQ-LNS and seek medical advice.

First interaction	<ul style="list-style-type: none"> ● SQ-LNS should not be given as a replacement for breastmilk. Continue to breastfeed your child as often as they want. ● SQ-LNS should be given in addition to a variety of foods that are appropriate for your child's age, including fruits, vegetables, and animal source foods (47). ● Wash your hands thoroughly before handling SQ-LNS and preparing your child's food. ● Store SQ-LNS sachets in a cool, dry place, away from direct sunlight, and out of the reach of children. ● Once opened, encourage your child to consume the sachet within 24 hours. ● If SQ-LNS are mixed with food then encourage your child to consume the food within 2 hours. ● Collect empty SQ-LNS sachets and bring them to the distribution point at the next visit. ● SQ-LNS are not a substitute for proper health care. Make sure to take your child for regular check-ups and follow-up with their health care provider as recommended. ● Remember that SQ-LNS are just one part of a comprehensive approach to ensuring your child's health and growth. Continue to provide a loving and supportive environment for your child, including proper care, hygiene, and stimulation.
Last interaction	<ul style="list-style-type: none"> ● Continue to feed your child a variety of family foods including fruits, vegetables, and animal-source foods. ● Continue to provide a loving and supportive environment for your child, including proper food, care, hygiene, and stimulation.

Distribution

After planning the technical and logistical aspects of the program, it is critical to plan how the different pieces will fit together during distributions. Efforts should be made in advance to raise awareness about the program amongst community members and various local stakeholders (e.g., community leaders, religious officials, health staff, etc.). Information regarding the program's eligibility criteria, start date, location of operation, etc., should be clearly communicated to potential program participants to prevent confusion and ease operations as the program is initiated. Program managers and implementers should refer to tools such as the [Emergency Field Operations Pocketbook](#) (59) to determine what needs to happen in order to organize a smooth distribution system including registration, ID cards, crowd control, sequencing of services, and documentation. To do this, they should work with the community and actors involved in the chosen delivery platform (e.g., health workers if the delivery platform is GMP) to determine the best way to identify and register eligible children. They should also keep in mind that enrollment will likely occur on a rolling basis.

1. Attendance Tracking with ID Cards:

Develop a system to create and manage ID cards to track the attendance of beneficiaries. Even if an existing program issues ID cards to each child, ensure a mechanism is in place to record the receipt of SQ-LNS on these cards, allowing caregivers to maintain a copy for their records.

2. Crowd Control:

Consider the implementation of crowd control measures to maintain order during distribution. This may involve:

- Designating separate areas for waiting and product distribution.
- Issuing tokens to ensure that the first arriving caregivers receive the product first.
- Clearly defining roles and responsibilities for staff members at the SQ-LNS distribution point. Assign tasks such as checking registration, distributing sachets, collecting returned sachets after use, and conveying key information about SQ-LNS to caregivers.
- Depending on the scope of services provided on distribution day, deciding whether to distribute SQ-LNS before or after other services, such as anthropometric measurements, IYCF counseling, and early childhood development activities.

3. Participant Comfort:

Ensure that adequate seating and shaded areas are available for participants as they await their supply, taking into consideration the comfort and well-being of participants.

4. Sachet Collection and Disposal:

Establish a systematic approach for collecting and appropriately disposing of empty sachets, adhering to local waste management practices and environmental considerations.

5. Documentation:

Equip staff with the necessary documentation tools to efficiently track participants and monitor SQ-LNS stock. These documentation tools can be in either paper-based or electronic format, depending on the program's resources and capacity.

6. Participant Feedback:

Ensure that a system is in place to receive feedback and complaints from participants and program staff. Ensure that trained staff are available to address any concerns in a constructive and timely fashion.

Collaboration

Integrating SQ-LNS into existing programs may require collaboration with multiple partners, including suppliers, local governments, health facilities, and community organizations. It is important to establish partnerships and collaborations for the design of the program to ensure effective procurement, supply chain management, and distribution of the product. This is especially true of wasting management programs being implemented in the same area. Program implementers should engage with the relevant stakeholders early and often. Such collaborations, including strong support and/or ownership from the local government, are essential to the long-term sustainability of the program.

Stage 4. Supervise and monitor the program

A well-designed monitoring and evaluation system will allow programs to collect necessary data for program improvement. It should also include a plan to provide supportive supervision to staff to identify challenges and test solutions, and support frontline workers. In order for monitoring and evaluation systems to be effective, data should be reviewed regularly and used to guide any necessary adjustments to program implementation.

Monitoring system

Programs should consider using documents such as the [UNHCR Operational Guidance](#) (61), [Sphere for Monitoring and Evaluation](#) (63), national [DHIS2](#) (26) documentation, or other donor standards to design the M&E system. The system should include how the data will be collected, who will collect the data, and how frequently. It may also be useful for the system to track other interventions or forms of assistance that the child and/or his/her household receives. Depending on resources available, programs may choose to use a paper-based or electronic data collection system. Staff at the distribution point will most likely be responsible for recording data related to distribution of SQ-LNS. But the system should have a plan in place for when, how and by whom data will be entered into an electronic system. The electronic system may just be Excel sheets or may include tablets and phones to enter data at the distribution site to ease the process of data collection. There will also need to be plans to review the data for accuracy. Programs may consider indicators on coverage, adherence, IYCF practices, and program implementation to assess the effectiveness and impact of the intervention and guide program adjustments, as needed. Some of this information may need to be gathered through qualitative methods (e.g., reasons for non-adherence). Illustrative monitoring indicators are provided in **Table 5**; however, these are not intended to serve as operational definitions.

Table 5. Illustrative monitoring indicators of a SQ-LNS program

Area	Indicator	Description
Reach and coverage	Proportion of children 6-23 months who received any SQ-LNS in the last 3 months.	This indicator can be collected in population surveys and aligns with the existing indicator on the provision of complementary food supplements for 6-23 month old children specified in the Compendium of Nutrition Intervention Coverage Indicators and Questions for Household Surveys (64).
	Proportion of eligible children within the program who received any SQ-LNS sachets in the last 3 months.	This indicator can be collected through population surveys and measures the extent to which the program target population is reached. It is a modification of

		the above indicator to align with program eligibility criteria.
	Proportion of eligible children within the program who received SQ-LNS in a given month.	This routine program monitoring indicator measures the distribution of SQ-LNS at each contact point with program participants.
	Proportion of eligible children within the program who received all recommended SQ-LNS rations.	This indicator reflects whether eligible children received complete coverage during their eligibility period. It is a more difficult indicator to collect because it requires tracking coverage at the individual child-level over time. For example, if children are eligible for 12 months of supplements, this indicator would reflect the proportion of children who received all 12 months of rations.
Adherence	Proportion of eligible children who consumed any SQ-LNS during the past month.	This indicator tracks consumption of SQ-LNS by the target population. It is collected by caregiver recall. It can be collected using population surveys or during routine distribution contact points.
	Proportion of eligible children who consumed SQ-LNS at least 5 out of the past 7 days ¹ .	This indicator reflects routine consumption of SQ-LNS by the target population. It is collected by caregiver recall. The shorter recall period is less susceptible to recall error and bias than longer periods (e.g., past month, past 3 months). High adherence is essential for the effectiveness of the program.
	Number of sachets available at the child's home at the time of the survey vs. the number of "expected" sachets ² .	This indicator compares the number of available sachets to the number of sachets that are expected to be in the home based on the number that were provided during the last distribution and the number that should have been consumed by the child. This will indicate whether the child is consuming fewer or more than the expected number of sachets (or if they are being shared with other members of the household).

	Reasons for non-adherence (e.g., dislike of taste, forgetfulness, household leakage)	Understanding the reasons behind non-adherence helps identify barriers and inform strategies to address them. This information can guide program improvements.
IYCF Practices	Proportion of children who received appropriate complementary feeding, including minimum acceptable diet, minimum dietary diversity, and minimum meal frequency in the past day.	This indicator evaluates the quality of complementary feeding practices among program participants, to assess whether children receive a diverse diet in addition to SQ-LNS. This set of indicators aligns with the WHO/UNICEF Indicators for Assessing Infant and Young Child Feeding Practices (32). The indicator is typically collected among all 6-23 month old children, but could be adapted to be collected among the target population of the program.
	Proportion of eligible children who received age-appropriate information about IYCF and SQ-LNS during the last 3 months.	This indicator is similar to the IYCF counseling indicator recommended in the Compendium of Nutrition Intervention Coverage Indicators and Questions for Household Surveys (64), but uses a 3 month recall period to align with the above SQ-LNS coverage indicators. The data for this indicator could be collected through population surveys or during routine distribution contacts with program participants. Programs may modify this indicator to collect data on the specific topics covered by frontline staff or to use a shorter recall period (e.g., past month) that aligns with the SQ-LNS distribution frequency. It can be used to track whether messages are being delivered consistently according to program protocols.
Program implementation	Number of trained health workers and community volunteers involved in the distribution and promotion of SQ-LNS.	This assesses the human resources dedicated to program implementation, to determine whether an adequate workforce is available to support beneficiaries.
	Proportion of the volume of SQ-LNS received that is distributed to program participants.	This indicator reflects the efficiency of SQ-LNS procurement and distribution. A low proportion distributed may reflect high wastage (e.g., due to product expiry) or leakage (e.g., due to theft or other types of loss).
	Sufficient SQ-LNS available at participant contact points.	The data for this indicator can be collected through routine monitoring or spot check

		surveys of distribution contact points. It can serve as an indicator of product stock-outs.
	Proportion of monitoring visits over the past year that complied with storage protocols (e.g., temperature and humidity).	This indicator provides insight into whether SQ-LNS are being properly stored. Data on storage conditions can be collected during regular (e.g., monthly) supervisory visits.

¹ 5 of the past 7 days reflects ~70% adherence. Programs may determine their own marker of “high adherence”. For example, one randomized controlled trial of SQ-LNS defined high adherence as ≥ 4 of the past 7 days (65), whereas a recent meta-analysis of SQ-LNS supplementation defined high adherence as $\geq 80\%$ of days (e.g., 5.6 of the past 7 days) (19).

²This indicator requires that the program document the date of distribution and the quantity of SQ-LNS provided at the individual level.

Supervision

For supervision, a variety of methods will need to be used such as onsite visits, discussions with program staff, review of program monitoring data, etc. The supervision plan should also indicate who will provide the supervision and how frequently (e.g., program manager to provide onsite visit every 3 months) and when learnings will be shared with staff. It can also be helpful to develop supervision checklists to ensure that supervisory activities are being implemented in a comprehensive and consistent manner. In addition to technical staff, monitoring and evaluation staff should also plan to visit distribution sites (see **Box 5** for points that may be included in a supervisory plan). These points can help program supervisors ensure that the program is being implemented effectively and efficiently, identify areas of improvement, and address any challenges that arise during program implementation. During supervision visits, staff should also plan to speak with caregivers of targeted children to understand their perspectives on how the program is meeting their needs and gather feedback to improve the program. In unstable settings, consider conducting market visits to ensure SQ-LNS are not being sold on the market.

Box 5. Elements of a supervisory plan

A comprehensive supervisory plan may encompass the following:

- **Adherence to protocols**
 - Ensure that program activities align with established protocols and guidelines.
- **Supply chain management**
 - Evaluate the efficiency of supply chain operations, including procurement, storage, and distribution of SQ-LNS.
- **Quality assurance**
 - Assess the quality of SQ-LNS and their handling to maintain efficacy.
- **Training and capacity building**
 - Review the training and capacity building efforts for program staff, volunteers, and community workers.
- **Participant feedback**
 - Regularly solicit participant feedback to gauge their satisfaction, needs, and suggestions for program improvement.
- **Market monitoring (in unstable settings)**
 - In areas prone to instability, conduct market visits to verify that SQ-LNS are not being sold illicitly.

Supervisors should also maintain an open channel for staff to report challenges, share observations, and seek guidance during supervision visits.

Special circumstances

When implementing a program that includes SQ-LNS provision, it is important to understand whether another preventive nutritional supplement is being delivered in the program area. Other types of preventive nutrition products for children, apart from SQ-LNS, include: MQ-LNS, MNP, and FBF. Consumption of more than one of these specialized nutritious foods per day is not recommended; however, if that happens occasionally, it does not present a safety risk, as each prescribed daily dosage contains 1-2 reference nutrient intakes (RNIs), depending on the nutritional status that it addresses. A program site may also have wasting management programs for children with severe and moderate wasting. Since the treatment foods for severe and moderate wasting are usually also LNS, but of larger quantity, programs will need to minimize confusion around the different LNS products among caregivers and the community. Below we provide considerations for these scenarios.

MQ-LNS

MQ-LNS is typically a 50g LNS product that is designed to prevent undernutrition among children 6-36 months of age. In areas where a program is implementing MQ-LNS, but would

also like to consider implementing SQ-LNS, the program might consider targeting SQ-LNS to younger children and MQ-LNS to older children and ensure there is strong messaging to help caregivers differentiate which product is intended for the index child. A recent systematic review concluded that MQ-LNS does not offer added benefits over SQ-LNS in children 6-23 months of age (66). The rationale is that 20g SQ-LNS is more concentrated with micronutrients than 50g MQ-LNS as both commodities have approximately the same amount of micronutrients irrespective of the quantity difference. The smaller amount of SQ-LNS makes it easier for younger children (particularly age 6-11 months) to consume the entire 20g daily ration thereby helping them to consume the intended doses of essential nutrients necessary for growth and development. This may not be the case for larger quantity LNS such as MQ-LNS where some operational studies reported that younger children consume only a proportion of the daily recommended ration. However, having a greater portion (50g) that provides the same amount of essential nutrients in a larger food base might be appropriate for older children (24 months and above), especially when households are highly food insecure.

MNPs

A child should not receive both MNPs and SQ-LNS as the combination may provide too much of certain micronutrients. [MNPs](#) are sachets of dry powder with 15 micronutrients that can be added to semi-solid or solid food ready to be eaten by children 6-59 months of age (67). MNPs with 15 micronutrients were developed to prevent micronutrient deficiencies in general. SQ-LNS provides the same 15 micronutrients as MNPs in approximately the same amounts; however, it also provides macronutrients, including essential fatty acids, macrominerals (e.g., calcium, phosphorous, potassium, and magnesium) and additional micronutrients (e.g., vitamin K). Evidence shows that MNPs reduce the prevalence of anemia and iron deficiency, but do not prevent other forms of undernutrition when used alone (68). In settings where a program providing SQ-LNS is to be implemented alongside an existing MNP program, targeting criteria should be considered carefully to ensure a child does not receive multiple products.

Other

Other types of fortified products that may be consumed in a given context should also be considered (e.g., [FBF](#) (69)). Depending on the age of the target child, and the frequency and quantity of FBF consumed, there may be the potential for excess consumption of particular micronutrients (e.g., vitamin A).

Wasting management

Provision of SQ-LNS should not replace appropriate wasting screening and management activities. Programs for the prevention and management of wasting should be well integrated with clear protocols for communication, screening, entry and exit criteria. Programs providing SQ-LNS have the potential to support community mobilization and wasting screening efforts.

On distribution day, many programs providing SQ-LNS screen children for wasting to ensure they are still eligible for a preventive product such as SQ-LNS and refer those who have wasting to management programs (45). However, this requires strengthening wasting management programs so that wasted children receive necessary interventions. It may be appropriate to integrate and facilitate both programs at the same location to promote service utilization. Programs will need to minimize confusion around the different LNS products among caregivers and the community by appropriately training program staff and volunteers, developing clear communication materials about the use of preventive, supplemental and therapeutic products, and describing the programs during community engagement efforts.

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References

1. Keats E.C., Das J.K., Salam R.A., Lassi Z.S., Imdad A., Black R.E., Bhutta Z.A. Effective interventions to address maternal and child malnutrition: An update of the evidence. *Lancet Child & Adolescent Health* 2021;5:367-84.
2. World Health Organization. WHO guideline for complementary feeding of infants and young children 6-23 months of age. Geneva: World Health Organization. 2023. Available at: <https://www.who.int/publications/i/item/9789240081864>. Accessed on 1 March 2024.
3. World Health Organization. WHO guideline on the prevention and management of wasting and nutritional oedema (acute malnutrition) in infants and children under 5 years. Geneva: World Health Organization. 2023. Available at: <https://app.magicapp.org/#/guideline/noPQkE>. Accessed on: 1 March 2024.
4. USAID. Lipid-based nutrient supplements: Evidence and program guidance. USAID Advancing Nutrition Technical Brief. 2021. Available at: <https://www.usaid.gov/document/lns-evidence-and-programming-brief>. Accessed on: 1 March 2024.
5. UNICEF. Small supplements for the prevention of malnutrition in early childhood (small quantity lipid nutrient supplement). Brief Guidance Note. Version 1.0 February 2023. UNICEF, New York. Available at: <https://www.unicef.org/documents/nutrition/SQLNS-Guidance>. Accessed on: 16 February 2023.
6. Lufumpa N., Hilger A., Ng O., de la Briere B. Preventing early childhood undernutrition in the Sahel region: Recommendations for small-quantity lipid-based nutrient supplement interventions. 2023. Available at: <https://openknowledge.worldbank.org/server/api/core/bitstreams/f1ca5060-56b9-4124-96cd-e29215940a0e/content>. Accessed on: 1 March 2024.
7. World Food Programme. Technical specifications for lipid-based nutrient supplement - small quantity (LNS-SQ). Version 4 (date of issue: November 24, 2023). Available at: <https://docs.wfp.org/api/documents/WFP-0000149100/download/>. Accessed on: 1 March 2024.
8. UNICEF. Product Specification Sheet. LNS-SQ Lipid Nut. Suppl. Sml 20g/CAR-600. Version 1.3. Date: 15.09.22. Available at: <https://www.unicef.org/supply/media/16646/file/S0000323-LNS-SQ-Specification.pdf>. Accessed on: 1 March 2024.
9. Home Fortification Technical Advisory Group (HF-TAG). What is home fortification? Available at: <https://hftag.org/about>. Accessed on: 1 March 2024.
10. Kumwenda C., Dewey K.G., Hemsworth J., Ashorn P., Maleta K., Haskell M.J. Lipid-based nutrient supplements do not decrease breast milk intake of Malawian infants. *Am J Clin Nutr* 2014;99:617-23.
11. Arimond M., Abbeddou S., Kumwenda C., Okronipa H., Hemsworth J., Jimenez E.Y., et al. Impact of small quantity lipid-based nutrient supplements on infant and young child feeding practices at 18 months of age: Eesults from four randomized controlled trials in Africa. *Matern Child Nutr* 2017;13:e12377.
12. Hemsworth J., Kumwenda C., Arimond M., Maleta K., Phuka J., Rehman A.M., et al. Lipid-based nutrient supplements increase energy and macronutrient intakes from complementary food among Malawian infants. *J Nutr* 2016;146:326-34.
13. Lesorogol C., Bond C., Dulience S.J.L., Iannotti L. Economic determinants of breastfeeding in Haiti: The effects of poverty, food insecurity, and employment on exclusive breastfeeding in an urban population. *Matern Child Nutr* 2018;14:e12524.

14. Byrd K., Dentz H.N., Williams A., Kiprotich M., Pickering A.J., Omondi R., et al. A behaviour change intervention with lipid-based nutrient supplements had little impact on young child feeding indicators in rural Kenya. *Matern Child Nutr* 2019;15:e12660.
15. Jannat K., Luby S.P., Unicomb L., Rahman M., Winch P.J., Parvez S.M., et al. Complementary feeding practices among rural Bangladeshi mothers: Results from WASH Benefits study. *Matern Child Nutr* 2019;15:e12654.
16. Arimond M., Zeilani M., Jungjohann S., Brown K.H., Ashorn P., Allen L.H., Dewey K.G. Considerations in developing lipid-based nutrient supplements for prevention of undernutrition: Experience from the International Lipid-Based Nutrient Supplements (iLiNS) Project. *Matern Child Nutr* 2015;11 31-61.
17. Small-quantity lipid-based nutrient supplements. FAQs. Available at: <https://sqlns.ucdavis.edu/>. Accessed on: 1 March 2024.
18. SQ-LNS Task Force Working Group on Cost and Cost-effectiveness. Costs and cost-effectiveness of small-quantity lipid-based nutrient supplements. SQ-LNS Technical Brief. Available at: <http://sqlns.ucdavis.edu/technical-brief/>. Accessed on: 1 March 2024.
19. Dewey K.G., Stewart C.P., Wessells K.R., Prado E.L., Arnold C.D. Small-quantity lipid-based nutrient supplements for the prevention of child malnutrition and promotion of healthy development: Overview of individual participant data meta-analysis and programmatic implications. *Amer J Clin Nutr* 2021;114:3S-14S.
20. Dewey K.G., Arnold C.D., Wessells K.R., Prado E.L., Abbeddou S., Adu-Afarwuah S., et al. Preventive small-quantity lipid-based nutrient supplements reduce severe wasting and severe stunting among young children: An individual participant data meta-analysis of randomized controlled trials. *Amer J Clin Nutr* 2022;116:1314-33.
21. Stewart C.P., Wessells K.R., Arnold C.D., Huybregts L., Ashorn P., Becquey E., et al. Lipid-based nutrient supplements and all-cause mortality in children 6-24 months of age: A meta-analysis of randomized controlled trials. *Amer J Clin Nutr* 2020;111:207-18.
22. Larsen B., Hoddinott J., Razvi S. Investing in nutrition - a global best investment case. Halftime for the Sustainable Development Goals. Copenhagen Consensus Center. 2023. Available at: <https://copenhagenconsensus.com/publication/halftime-sdgs-nutrition>. Accessed on: 14 April 2023.
23. ICF. The Demographic and Health Surveys (DHS) Program. Available at: <https://www.dhsprogram.com>. Accessed on: 1 March 2024.
24. UNICEF. Multiple Indicator Cluster Surveys (MICS). Available at: <https://mics.unicef.org/surveys>. Accessed on: 1 March 2024.
25. Standardized Monitoring and Assessment of Relief and Transitions (SMART). Available at: <https://smartmethodology.org/about-smart/>. Accessed on: 1 March 2024.
26. University of Oslo. District Health Information System 2 (DHIS2). Available at: <https://dhis2.org/>. Accessed on: 1 March 2024.
27. de Onis M., Borghi E., Arimond M., Webb P., Croft T., Saha K., et al. Prevalence thresholds for wasting, overweight and stunting in children under 5 years. *Public Health Nutr* 2019;22:175-9.
28. World Health Organization. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Vitamin and Mineral Nutrition Information System. Geneva, World Health Organization, 2011 (WHO/NMH/NHD/MNM/11.1) Available at: <http://www.who.int/vmnis/indicators/haemoglobin.pdf> Accessed on: 18 January 2019.
29. World Food Programme. Fill the nutrient gap. Available at: <https://www.wfp.org/publications/fill-nutrient-gap>. Accessed on: 1 March 2024.
30. Bai Y., Dewey K., Masters W. Feasibility and cost of nutritionally adequate complementary feeding: Role of breastmilk, family foods and supplementation in 114 low- and middle-income countries.

2023. Available at:
https://sites.tufts.edu/foodpricesfornutrition/files/2023/08/FeasibilityAndCostOfInfantFeedingPosterAbstractForMNF_Rev26Aug2023.pdf. Accessed on: 1 March 2024.
31. UNICEF. Understanding the status and drivers of young children's diets: Conducting a situation analysis. New York: UNICEF. 2021. Available at:
<https://www.unicef.org/media/131216/file/Understanding%20the%20Status%20and%20Drivers%20of%20Young%20Children%E2%80%99s%20Diets.pdf>. Accessed on: 1 March 2024.
 32. World Health Organization, UNICEF. Indicators for assessing infant and young child feeding practices: Definitions and measurement methods. 2021. Geneva: WHO and UNICEF. Available at:
<https://iris.who.int/bitstream/handle/10665/340706/9789240018389-eng.pdf?sequence=1>. Accessed on: 1 March 2024.
 33. CORE Group Nutrition Working Group, Food and Nutrition Technical Assistance III Project (FANTA), Save the Children. Nutrition program design assistant: A tool for program planners. Version 2. 2015. Washington, DC: FANTA/FHI 360. Available at:
<https://www.fantaproject.org/tools/nutrition-program-design-assistant-npda>. Accessed on: 1 March 2024.
 34. World Food Programme. Food and nutrition handbook. 2018. Available at:
<https://docs.wfp.org/api/documents/WFP-0000102101/download/>. Accessed on: 1 March 2024.
 35. Integrated Food Security Phase Classification. IPC overview and classification system. Available at:
<https://www.ipcinfo.org/ipcinfo-website/ipc-overview-and-classification-system/en/>. Accessed on: 1 March 2024.
 36. World Food Programme. Hunger Map LIVE. Available at: <https://hungermap.wfp.org/>. Accessed on: 1 March 2024.
 37. UNICEF. Improving young children's diets during the complementary feeding period. UNICEF Programming Guidance. New York: UNICEF. 2020. Available at:
<https://www.unicef.org/media/93981/file/Complementary-Feeding-Guidance-2020.pdf>. Accessed on: 11 August 2022.
 38. Galasso E., Weber A.M., Stewart C.P., Ratsifandrihamanana L., Fernald L.C.H. Effects of nutritional supplementation and home visiting on growth and development in young children in Madagascar: A cluster-randomized controlled trial. *Lancet Global Health* 2019;7:e1257-e68.
 39. Adu-Afarwuah S., Lartey A., Brown K.H., Zlotkin S., Briend A., Dewey K.G. Randomized comparison of 3 types of micronutrient supplements for home fortification of complementary foods in Ghana: Effects on growth and motor development. *Am J Clin Nutr* 2007;86:412-20.
 40. Iannotti L.L., Dulience S.J., Green J., Joseph S., Francois J., Antenor M.L., et al. Linear growth increased in young children in an urban slum of Haiti: a randomized controlled trial of a lipid-based nutrient supplement. *Am J Clin Nutr* 2014;99:198-208.
 41. Hess S.Y., Abbeddou S., Jimenez E.Y., Some J.W., Vosti S.A., Ouedraogo Z.P., et al. Small-quantity lipid-based nutrient supplements, regardless of their zinc content, increase growth and reduce the prevalence of stunting and wasting in young Burkinabe children: a cluster-randomized trial. *PLoS ONE* 2015;10:e0122242.
 42. Adu-Afarwuah S., Lartey A., Brown K.H., Zlotkin S., Briend A., Dewey K.G. Home fortification of complementary foods with micronutrient supplements is well accepted and has positive effects on infant iron status in Ghana. *Am J Clin Nutr* 2008;87:929-38.
 43. Wessells K.R., Arnold C.D., Stewart C.P., Prado E.L., Abbeddou S., Adu-Afarwuah S., et al. Characteristics that modify the effect of small-quantity lipid-based nutrient supplementation on child anemia and micronutrient status: an individual participant data meta-analysis of randomized controlled trials. *American Journal of Clinical Nutrition* 2021;114:68S-94S.

44. Kim S.S., Nguyen P.H., Tran L.M., Alayon S., Menon P., Frongillo E.A. Different combinations of behavior change interventions and frequencies of interpersonal contacts are associated with infant and young child feeding practices in Bangladesh, Ethiopia, and Vietnam. *Curr Dev Nutr* 2020;4:nzz140.
45. USAID Advancing Nutrition. Small-Quantity Lipid-Based Nutrient Supplement Program implementation learnings and considerations for scale-up from International Food Relief Partnership partners in Honduras, Niger, and Somalia. Arlington, VA: USAID Advancing Nutrition. 2022. Available at: <https://www.advancingnutrition.org/resources/small-quantity-lipid-based-nutrient-supplement-program-implementation>. Accessed on: 12 April 2023.
46. United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). Levels & trends in child mortality: Report 2022, Estimates developed by the United Nations Inter-agency Group for Child Mortality Estimation. Available at: <https://data.unicef.org/resources/levels-and-trends-in-child-mortality/>. Accessed on: 1 March 2024.
47. UNICEF. The community infant and young child feeding counselling package. 2012. Available at: <https://www.unicef.org/documents/community-iyfc-package>. Accessed on: 1 March 2024.
48. Fenn B., Myatt M., Mates E., Black R.E., Wilkinson C., Khara T. Effects on child growth of a reduction in the general food distribution ration and provision of small-quantity lipid-based nutrient supplements in refugee camps in eastern Chad. *BMJ Nutr Prev Health* 2021;4:235-42.
49. UNICEF. Product Specification Sheet. LNS-MQ Lipid Nut. Suppl. Med 50g/CAR-300. Version 3.1. Date: 23.09.22. Available at: <https://www.unicef.org/supply/media/16651/file/S0000324-LNS-MQ-Specification.pdf>. Accessed on: 1 March 2024.
50. UNICEF. Product Specification Sheet. Super Cereal plus (CSB++)/BAG-1,5 kg. Version 4. Date 07.04.2020. Available at: <https://www.unicef.org/supply/media/16621/file/S0000295-SuperCereal-Plus-BAG-1.5kg-Specification.pdf>. Accessed on: 1 March 2024.
51. UNICEF. Product Specification Sheet. Sup. Pre. Lac. LNS-PLW, 75g/CAR-168. Version 1.0. Date: 26.08.2022. Available at: <https://www.unicef.org/supply/media/16641/file/S0000266-LNS-PLW-75g-Specification.pdf>. Accessed on: 18 March 2024.
52. World Food Programme. Technical Specifications for: Super Cereal - Corn Soya Blend - 1.5 to 3 kg. Version 3. Date of issue: May 15, 2023. Available at: <https://docs.wfp.org/apli/documents/WFP-0000149106/download/>. Accessed on: 20 March 2024.
53. Sphere Association. The Sphere Handbook: Humanitarian charter and minimum standards in humanitarian response. Fourth Edition. 2018. Available at: <https://www.spherestandards.org/handbook>. Accessed on: 1 March 2024.
54. Huybregts L., Le Port A., Becquey E., Zongrone A., Barba F.M., Rawat R., et al. Impact on child acute malnutrition of integrating small-quantity lipid-based nutrient supplements into community-level screening for acute malnutrition: a cluster-randomized controlled trial in Mali. *PLoS Med* 2019;16:e1002892.
55. World Food Programme. Managing the supply chain of specialized nutritious foods. Rome: World Food Programme. 2019. Available at: <https://www.wfp.org/publications/managing-supply-chain-specialized-nutritious-foods>. Accessed on: 1 March 2024.
56. United Nations Children's Fund (UNICEF). UNICEF Supply Catalogue. LNS-SQ Lipid Nut. Suppl. Sml 20g/CAR-600. S0000323. Available at: <https://supply.unicef.org/s0000323.html>. Accessed on: 15 June 2023.
57. The Child Nutrition Fund. Available at: [https://www.unicef.org/media/144496/file/Child%20Nutrition%20Fund%20\(Full%20document\).pdf](https://www.unicef.org/media/144496/file/Child%20Nutrition%20Fund%20(Full%20document).pdf). Accessed on: 1 March 2024.
58. World Food Programme. Nutrition. Available at: <https://www.wfp.org/nutrition>. Accessed on: 1 March 2024.

59. World Food Programme. Emergency field operations pocketbook. 2002. Available at: <https://emergency.unhcr.org/sites/default/files/WFP%2C%20Emergency%20field%20operations%20pocketbook.pdf>. Accessed on: 1 March 2024.
60. Walker D.J., Farrell G., eds. World Food Programme. Food Storage Manual. London: University of Greenwich - Natural Resources Institute, 2003.
61. UNCHR. UNHCR operational guidance on the use of special nutritional products to reduce micronutrient deficiencies and malnutrition in refugee populations. 2011. Available at: <https://www.unhcr.org/us/media/unhcr-operational-guidance-use-special-nutritional-products-reduce-micronutrient-deficiencies>. Accessed on: 1 March 2024.
62. USAID Advancing Nutrition. Small-quantity lipid-based nutrient supplements: What to communicate to program participants. 2023. Available at: <https://www.advancingnutrition.org/resources/small-quantity-lipid-based-nutrient-supplements-what-communicate-program-participants>. Accessed on: 1 March 2024.
63. The Sphere Project. Sphere for monitoring and evaluation. Available at: <https://www.spherestandards.org/wp-content/uploads/sphere-for-monitoring-and-evaluation.pdf>. Accessed on: 1 March 2024.
64. Compendium of nutrition coverage indicators & questions for household surveys. Baltimore: Data for Decisions to Expand Nutrition Transformation (DataDENT). 2021. Available at: https://datadent.org/wp-content/uploads/2021/08/HH-Compendium_12-Aug_FINAL.pdf. Accessed on: 1 March 2024.
65. Dewey K.G., Mridha M.K., Matias S.L., Arnold C.D., Cummins J.R., Khan M.S., et al. Lipid-based nutrient supplementation in the first 1000 d improves child growth in Bangladesh: a cluster-randomized effectiveness trial. *Amer J Clin Nutr* 2017;105:944-57.
66. Dewey K.G., Arnold C.D., Wessells K.R., Stewart C.P. Lipid-based nutrient supplements for prevention of child undernutrition: when less may be more. *Am J Clin Nutr* 2023;118:1133-44.
67. Home Fortification Technical Advisory Group (HF-TAG). Programmatic guidance brief on use of micronutrient powders (MNP) for home fortification. Available at: https://hftag.org/content/user_files/2023/06/HF-TAG-Micronutrient-Powder-Program-Guidance-Brief1.pdf. Accessed on: 1 March 2024.
68. De-Regil L.M., Jefferds M.E.D., Pena-Rosas J.P. Point-of-use fortification of foods with micronutrient powders containing iron in children of preschool and school-age. *Cochrane Database Syst Rev* 2017;11:CD009666.
69. World Food Programme. Specialized nutritious food. Available at: [https://www.wfp.org/specialized-nutritious-food#:~:text=FBFs%20are%20blends%20of%20partially,WSB\)%20is%20also%20sometimes%20used](https://www.wfp.org/specialized-nutritious-food#:~:text=FBFs%20are%20blends%20of%20partially,WSB)%20is%20also%20sometimes%20used). Accessed on: 18 March 2024.