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PREVENTING EARLY CHILDHOOD UNDERNUTRITION IN THE SAHEL REGION: RECOMMENDATIONS FOR SMALL-QUANTITY LIPID-BASED NUTRIENT SUPPLEMENT INTERVENTIONS

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KEY RECOMMENDATIONS

This policy note presents evidence-based guidance for the effective design, implementation, and utilization of small-quantity lipid-based nutrient supplements (SQ-LNS) interventions in the Sahel region. SQ-LNS are food supplements containing essential nutrients and are intended for daily consumption alongside standard age-appropriate diets. SQ-LNS effectively prevent child undernutrition and improve child growth and development. The key recommendations for modifying SQ-LNS interventions in Sahel country contexts to maximize their impact on child health are as follows :

- Provide SQ-LNS to children at age six-months or shortly after; and for a period of 12 months or longer.
- Ensure complementary messaging is provided alongside SQ-LNS products that emphasizes their importance as a supplement to a safe, nutritious, and age-appropriate diet.
- Provide SQ-LNS through community platforms to overcome barriers to accessing health care facilities.
- Identify SQ-LNS products being produced regionally, where feasible, to minimize program costs.
- Ensure adequate storage conditions to preserve the integrity of SQ-LNS products (i.e., 24-month shelf life and storage below 30° Celsius).
- Implement SQ-LNS interventions alongside key social protection programs to minimize unintended product over- or under-use in close collaboration with health sectors.

1 Introduction

Child undernutrition is a significant public health and development issue in Sub-Saharan Africa, with the Sahel region bearing a disproportionate burden of cases.¹ In the Sahel, only 13 percent of children between age 6 and 23 months have a diet that meets the World Health Organization (WHO) recommendation for minimum dietary diversity. Undernutrition in the first few years of

life can impair cognitive and physical development, and result in significant costs to human capital², including health, education, and productivity costs to individuals, households, and economies.³ It is estimated that childhood undernutrition costs Sahel countries between US\$451 million and US\$802 million annually.^{4,5,6}



2 Context for SQ–LNS Interventions in the Sahel

Small–quantity lipid–based nutrient supplement (SQ–LNS) interventions can effectively prevent undernutrition and improve child growth.⁷ SQ–LNS are food supplements that contain essential macronutrients and micronutrients and are intended for daily consumption alongside standard age–appropriate diets. SQ–LNS are for the prevention of undernutrition, while other nutritional supplements are for the treatment of acute malnutrition. Large–quantity lipid–based nutrient supplements (LQ–LNS) are an at–home treatment for severe acute malnutrition, and medium–quantity lipid–based nutrient supplements (MQ–LNS) are an at–home treatment for moderate acute malnutrition or are used to prevent malnutrition in emergency settings with severe levels of food insecurity. Importantly, both LQ–LNS and MQ–LNS are used in instances where children do not have additional medical complications.

In lower–middle–income countries (LMICs), the provision of SQ–LNS to children between age 6 and 23 months, for 3 months or longer, reduces undernutrition and mortality and improves child growth and development.⁸ Also among LMICs, SQ–LNS are more effective than conventional interventions such as fortified blended foods, nutrition education, and micronutrient supplementation.⁹ SQ–LNS can either be consumed alone or used to fortify meals. Most SQ–LNS include a base of peanuts, chickpeas or lentils, milk, oil, sugar, and a ready–made blend of micronutrients. However, the exact contents of SQ–LNS can vary in different settings to reduce production costs or accommodate for local tastes. In two Sahel countries — Burkina Faso and Niger, the use of a peanut base has proven acceptable in terms of local taste.¹⁰

3 Design of SQ–LNS Interventions in the Sahel

3.1 Timing of Supplementation

SQ–LNS are most effective when introduced at age 6–months and consumed for a minimum duration of 12 months. The optimal age to introduce SQ–LNS for children is age six–months or shortly after. WHO recommends exclusive breastfeeding until age six–months, at which point the risk of undernutrition increases significantly due to poor food safety or inadequate supplementary diets — specifically, inadequate dietary diversity or meal frequency. Providing SQ–LNS for a duration of at least 12 months or longer significantly increases the impact on child undernutrition and growth.¹¹

3.2 Complementary Services and Interventions

SQ–LNS must be implemented alongside complementary services and interventions that address context–specific causes and constraints of child undernutrition at the household level.^{12,13,14} SQ–LNS is not a standalone program, and in the Sahel, complementary services and interventions should include the provision of health education, information about how to prevent and manage child illness, and how to improve dietary diversity alongside the consumption of SQ–LNS. In different settings, complementary interventions can include nutrition education, or behavior change communication focused on improving WASH behavior and infant and young child feeding. At a macro level, complementary interventions may include improving WASH infrastructure, strengthening health systems, and improving household food security.





Box 1: Case Study — Madagascar¹⁵

In Madagascar, a SQ–LNS intervention was introduced to address a high prevalence of childhood undernutrition. Caregivers of children between age 6 and 18 months were given SQ–LNS products weekly over a 12-month period and were encouraged to use them to fortify 2 of the child’s meals daily.

The provision of SQ–LNS was integrated into the monthly provision of community–based growth monitoring and promotion clinics. During these clinics mothers were educated about infant and young child feeding and WASH behavior. Community health workers also regularly conducted cooking demonstrations using local and affordable food items.

Community health workers also regularly visited homes to educate mothers about infant and young child feeding, as well as subsistence farming of crops and livestock. The frequency of home visits was child age–dependent, with more frequent visits scheduled for households with younger children.

of primary caregivers (largely mothers) on safe WASH practices and clinically recommended child feeding and care practices. Primary caregivers were also given one month’s supply of SQ–LNS to prevent childhood undernutrition, and child body measurements were assessed. Within each community, leaders and elders were identified to encourage primary caregivers to attend monthly behavior change communication sessions and assist in the implementation of the program. This intervention improved coverage of acute malnutrition screening and aided the prevention of new acute malnutrition cases.

3.3

Delivery Mechanism

In the Sahel, providing SQ–LNS through communities instead of through healthcare facilities can lower costs and increase impact on child growth and nutrition outcomes.^{16,17}

Providing SQ–LNS through communities addresses key barriers to accessing healthcare services, including distance to healthcare facilities, and time and opportunity costs.¹⁸ Empowering community members with basic health knowledge alongside the provision of supplementary food can be an effective delivery mechanism, particularly in the Sahel where conflict has disrupted the functioning of healthcare facilities. Additionally, where feasible, more frequent visits or sessions increase impact, for example through weekly distribution of SQ–LNS instead of monthly.

Box 2: Case Study — Mali¹⁹

In Mali, community health volunteers scheduled monthly behavior change communication sessions in their communities. During these interactive sessions, the community health volunteers educated small groups



4 Implementation of SQ–LNS Interventions in the Sahel

4.1 Supply and Distribution Chain

Most LMICs currently procure lipid-based nutrient supplements (LNS) and other ready-to-use supplementary food through World Food Programme (WFP) or UNICEF. LNS products are largely manufactured outside of Africa, purchased by institutions such as WFP or UNICEF, and transported to regional warehouses.²⁰ They are also available through the PlumpyField network. Once at the regional warehouses, local NGOs or UN country offices purchase their desired amount of LNS products and use local distribution chains to deliver products.²¹ In many instances, to enable reliable access to supplementary foods, institutions like WFP and UNICEF have relied on the pre-positioning of supplements that are procured in advance and stored in national or regional warehouses.

Localizing the production of LNS products within African countries has been identified as a key opportunity, with projected viability having factored in establishment costs.²²

Initiatives that seek to locally produce internationally formulated SQ–LNS products must meet existing international standards and guidelines.²³ Initiatives that seek to formulate and manufacture new SQ–LNS products locally, must also consider ingredients, nutritional standards, food safety, quality standards, and packaging.²⁴ Meeting these requirements will enable countries to reduce production costs and ensure that products align with local taste. If LNS products are being formulated for both local use and export, products must also meet the requirements of large buyers such as UNICEF and WFP. WFP has developed guidelines and requirements for the manufacturing, safety, and quality of SQ–LNS products.²⁵

A short-term initiative to avoid or minimize fixed costs could be to introduce the formulation and/or manufacturing of SQ–LNS at West African facilities where larger quantities of other LNS products are already being produced. A

small number of African countries currently manufacture LQ–LNS and MQ–LNS. In Niger, LQ– and MQ–LNS are produced through Société de Transformation Alimentaire (STA), and in Burkina Faso through InnoFaso. In the late 2000s, STA, in partnership with Nutriset — a French firm which formulates and manufactures supplements, piloted the commercial production of a SQ–LNS product in Niger known as Grandibien.²⁶ Production of Grandibien has since been introduced in Burkina Faso through InnoFaso. InnoFaso is currently opening another plant in Northern Nigeria.

4.2 Storage Requirements

Due to the climatic conditions among Sahel countries, stringent storage conditions must be met to preserve the safety and nutritional value of SQ–LNS products. Most SQ–LNS products have a 24-month shelf life and must be stored below 30° Celsius. The quality of SQ–LNS products must be reassessed if they are kept above 30° Celsius for over six months or above 40° Celsius for over three months.²⁷ This is especially important in the Sahel where temperatures regularly reach above 30° Celsius and given the rise of pre-positioning of supplements. The quantity of pre-positioned supplements should meet the existing or anticipated demand to ensure that products are used before expiration. Appropriate storage conditions should exist both within warehouses and during distribution. These requirements may affect program costs.

4.3 Integrating SQ–LNS Interventions into Existing Policy

SQ–LNS interventions can either be integrated into existing policy or introduced cohesively alongside existing policy, depending on country-specific intervention aims. For example, in settings where the primary goal was to encourage attendance at growth monitoring and promotion clinics, SQ–LNS programs have partnered with the health sector. USAID has identified several sectors or existing programs for integration or cohesive implementation, including nutrition, health, food assistance, agriculture, WASH, social protection, and education.²⁸ For social protection or food assistance platforms, SQ–LNS can be supplied alongside the provision of cash transfers, vouchers, or food items. Beyond identifying relevant government platforms, it may be beneficial to partner with various implementing partners, such as NGOs, UNICEF, WFP, etc., which are well-versed in LNS program design and implementation. In Burkina Faso, for example, Hellen Keller International carried out the first SQ–LNS pilot.



5 Ensuring the Uptake and Appropriate Use of SQ-LNS at the Household Level

Ensuring the uptake and appropriate use of SQ-LNS within households will maximize the impact of interventions on child growth and undernutrition. In LMICs, LNS products are generally accepted although with varied levels of consumption. For example, consumption patterns in Malawi and Mozambique reveal both overuse and underuse of supplements²⁹. Underuse affects the potential impact of the product and is a serious concern. Overuse of SQ-LNS products is rarer and can be due to caregivers or children above age 23-months consuming the SQ-LNS products, and children between age 6 and 23 months being fed more

than the recommended daily amount. Overuse affects program efficiency more than having direct impacts on populations. In settings where overuse is driven by food insecurity, SQ-LNS programs should be implemented alongside relevant social protection interventions — i.e., cash transfers, vouchers, and food distribution schemes. In addition, and where feasible, SQ-LNS programs should cover entire communities instead of targeting individual households to address the tendency of households to depend on each other and share supplements.

6 CONCLUSION

SQ-LNS interventions can significantly improve child nutrition and health among Sahelian countries, which continue to experience high levels of child undernutrition. Initiatives that incorporate the Sahel-specific recommendations outlined in this policy note can better ensure the effective, design, implementation, and utilization of SQ-LNS interventions in this region. Furthermore, there are key opportunities to localize the formulation and/or production of SQ-LNS products within African countries, which may reduce costs even when factoring in the required short-term capital investments.





ENDNOTES

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- ² Victora, Adair, Fall, Hallal, Martorell, Richter, Sachdev, and Maternal and Child Undernutrition Study Group, “Maternal and Child Undernutrition,” 340–357.
- ³ AU and WFP, “The Cost of Hunger in Africa.”
- ⁴ AU, “Le coût de la faim au Burkina Faso.”
- ⁵ AU, “Le coût de la faim en Afrique: L’incidence sociale et économique de la malnutrition chez l’enfant au Mali.”
- ⁶ AU, “Le coût de la faim en Afrique: L’incidence sociale et économique de la malnutrition chez l’enfant au Niger.”
- ⁷ Keats, Das, Salam, Lassi, Imdad, Black, and Bhutta, “Effective Interventions to Address,” 367–384.
- ⁸ Dewey, Stewart, Wessells, Prado, and Arnold, “Small–Quantity Lipid–Based Nutrient,” 3S–14S.
- ⁹ Dewey, Stewart, Wessells, Prado, and Arnold, “Small–Quantity Lipid–Based Nutrient,” 3S–14S.
- ¹⁰ Arimond, Zeilani, Jungjohann, Brown, Ashorn, Allen, and Dewey, “Considerations in developing lipid–based,” 31–61.
- ¹¹ Das, Salam, Hadi, Sheikh, Bhutta, Prinzo, and Bhutta, “Preventive Lipid Based Nutrient.”
- ¹² Das, Salam, Hadi, Sheikh, Bhutta, Prinzo, and Bhutta, “Preventive Lipid Based Nutrient.”
- ¹³ Das, and Salam, “Addressing Childhood Undernutrition,” e1160-e1161.
- ¹⁴ USAID. 2021. “Lipid-Based Nutrient Supplements.”
- ¹⁵ Stewart, Fernald, Weber, Arnold, and Galasso, “Lipid-Based Nutrient Supplementation,” 958–966.
- ¹⁶ Huybregts, Le Port, Becquey, Zongrone, Barba, et al, “Impact on Child Acute Malnutrition,” e1002892.
- ¹⁷ Becquey, Huybregts, Zongrone, Le Port, Leroy, et al, “Impact on Child Acute Malnutrition,” e1002877.
- ¹⁸ Huybregts, Becquey, Leroy, Ruel, “Incorporating Prevention into Community–Based.”
- ¹⁹ International Food Policy Research Institute, “The Effect of Integrated Prevention.”
- ²⁰ WFP, “SNF Procurement Update.”
- ²¹ WFP, “SNF Procurement Update.”
- ²² Segrè, Liu, and Komrska “Local Versus Offshore,” e12376.
- ²³ Arimond, Zeilani, Jungjohann, Brown, Ashorn, Allen, and Dewey, “Considerations in Developing,” 31–61.
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- ²⁵ WFP, “Lipid-Based Nutrient Supplement.”
- ²⁶ Fernandez, Sauguet, Da Costa, Claeysens, Lescanne, Lescanne, “Social Marketing of a Nutritional.”
- ²⁷ WFP, “Managing the Supply Chain.”
- ²⁸ USAID, “Lipid-Based Nutrient Supplements.”
- ²⁹ Kodish, Aburto, Nseluke Hambayi, Dibari, and Gittelsohn, “Patterns and Determinants of Small–Quantity,” e12234.

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