



Global  
**NUTRITION**  
CLUSTER

REVIEW OF THE USE OF  
BALANCED ENERGY PROTEIN  
(BEP) SUPPLEMENTATION  
FOR PREGNANT AND  
BREASTFEEDING WOMEN  
AND GIRLS (PBW/G)

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## ABBREVIATIONS

ANC	Antenatal care
BEP	Balanced energy and protein
BSFP	Blanket supplementary feeding programme
CBT	Cash based transfers
CH	Cadre Harmonise
COs	Country offices
CSB	Corn soya blend
FBF	Fortified blended food
GAP	Global Action Plan
GFA	General food assistance
GTWG	Global Technical Working Group
IPC	Integrated Phase Classification
KII	Key informant interviews
LBW	Low birthweight
LNS	Lipid-based nutrient supplements
LQ	Large quantity
MIYCN	Maternal, infant and young child nutrition
MUAC	Mid-upper arm circumference
MQ	Medium quantity
PPPD	Per person per day
PBW/G	Pregnant and breastfeeding women and girls
SBCC	Social behaviour change communication
SGA	Small for gestational age
SNF	Specialised nutritious foods
SQ	Small quantity
SVN	Small and vulnerable newborn
TSFP	Targeted supplementary feeding programme
WFP	World Food Programme
WHO	World Health Organisation
WSB	Wheat soya blend

## EXECUTIVE SUMMARY

The provision of balanced energy protein (BEP) supplements to women during pregnancy is recommended by WHO in 'undernourished settings' and is included in the UN Global Action Plan (GAP) framework on child wasting. However, questions remain regarding certain aspects including the optimal dose and duration of supplementation, appropriate targeting and graduation criteria, and modes/platforms of delivery.

In view of these gaps, **a review of BEP supplementation targeting pregnant and breastfeeding women and girls (PBW/G)<sup>1</sup> was conducted.** The aim of the review was to map the implementation of BEP programming for PBWG, documenting how programmes were targeted and delivered including eligibility and admission criteria as well as products and rations provided. The review also sought to understand delivery platforms and integration, indicators used as well as success and challenges experienced by these programmes.

**Mixed methods were used drawing from both primary and secondary data sources including a review of peer-reviewed and grey literature as well as key informant interviews with a sample of partners. A desk review of trials and documented programmes was conducted.** Products and doses used in trials and programmes since 2013 in the published literature were mapped to gain a wider understanding of what was being used in different contexts. Following the desk review, key informant interviews were conducted and data were gathered on recent and ongoing programmes (2019-present) which use BEP supplementation for PBWG to prevent and manage undernutrition. The focus of the interviews was on humanitarian programmes.

The mapping identified four types of programming providing BEP food supplements to PBW/G across 46 countries. These were: **BEP trials/research; government-led programmes; Targeted Supplementary Feeding Programmes (TSFP) to manage undernutrition (underweight/ thinness); UN/NGO-led programmes to prevent undernutrition (underweight/ thinness).** This review focused on the provision of food supplements which provided less than 25% of energy from protein, were fortified with micronutrients and were provided to PBW/G during the 1,000 days from conception up to two years postpartum.

**There were limitations in terms of the timeframe and the number of countries included as well as the online relevant literature which were in English and not in any local language. Additionally, few partners were identified by the Wasting Global Thematic Working Group (GTWG), and therefore KIIs were conducted with World Food Programme (WFP) staff, two implementing partners recommended by WFP COs and one academic researcher. Support for government-led programmes was also discussed in four interviews.** As a result, the findings and recommendations are based on a non-exhaustive mapping.

The review identified a variety of programmes and approaches to BEP programming for PBWG.

Key findings of the review were as follows:

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<sup>1</sup> The term PBWG encompasses adolescents. Although those involved in the review believe that child pregnancies are not appropriate and should be prevented where possible, in reality many experience pregnancy and breastfeeding before they reached adulthood and therefore require support.

**Data on undernutrition among PBWG or birth outcomes are not used routinely as part of geographic prioritisation exercises at country-level.** Robust criteria were used for geographical selection of locations for humanitarian programming in all contexts. However, data on undernutrition in PBWG were not usually part of the process due to unavailability of data. Lack of data collection on PBWG undernutrition rates and birth outcome may prevent the prioritisation of locations where supplementation may be most needed - where there is a high prevalence of undernutrition in women and/or high prevalence of small and vulnerable newborns (SVN). Existing data on maternal anaemia and Minimum Dietary Diversity in Women (MDD-W) may also be useful in prioritising locations for BEP supplementation of PBWG. The Managing At Risk Mothers and Infants (MAMI) Care Pathway also provides guidance on SVN which may be used.

**In the absence of a clear anthropometric definition of 'wasting' (underweight/ thinness) in PBWG, different enrolment and discharge criteria were being used in programmes to manage this.** In Targeted Supplementary Feeding Programmes (TSFP), different enrolment and discharge criteria were used with some countries admitting women with a Mid-Upper Arm Circumference (MUAC) <23cm and others using a lower threshold of <21cm. No countries were considering the measurement in between (22cm) in case of resource constraints. Research supports using a threshold of MUAC < 23 cm to identify women at high risk of poor birth outcomes<sup>2</sup> although its sensitivity and specificity have been found to be poor and a different cut-off might have to be identified for different contexts<sup>3</sup>. However, funding constraints and high caseload were the primary reasons provided for a lower threshold being used with some countries also citing SPHERE 2018 and national guidelines which suggest admitting PBW/G under 21cm. Some countries felt that 23cm is too high in their location and the caseload is/would be unmanageable if 23cm were applied. Although 23cm is increasingly being recommended, where resources are constrained, using a lower threshold of 22cm or 21cm could prioritise PBW/G with more severe undernutrition.

**Currently PBWG are treated as a homogeneous group across most interventions. However, the nutrient requirements of women change across the stages of pregnancy and lactation. Furthermore, pregnant adolescents who are still growing themselves may have different support needs to those of non-adolescent pregnant women.** However, the support provided in most government and all humanitarian programmes was the same regardless of the age of the woman/girl throughout pregnancy and lactation. Although it may be challenging to implement tailored programmes or protocols to reflect the different stages of pregnancy and breastfeeding, greater understanding of varying needs and gaps could contribute to more tailored support and possibly some programme efficiencies through development of criteria for greater prioritisation where needed.

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<sup>2</sup> Ververs et al. 2013. Which anthropometric indicators identify a pregnant woman as acutely malnourished and predict adverse birth outcomes in the humanitarian context? PLoS Currents 5, <https://doi.org/10.1371/currents.dis.54a8b618c1bc031ea140e3f2934599c8>

<sup>3</sup> Fanta, June 2016. [Determining a Global Mid-Upper Arm Circumference Cutoff to Assess Malnutrition in Pregnant Women](#). Retrievable [here](#).

**Supplementation aimed specifically at PBWG typically ends at 6 months postpartum even though continued breastfeeding is recommended up to 24 months and beyond.** Women who breastfeed beyond 6 months postpartum will continue to have additional nutrient requirements. The target of the support provided in most interventions transitions from the mother to the child from 6 months and a similar ration that was given to the mother is often provided for the child. However, in the 6-12 months period, the child only needs small amounts of nutrient-dense solid food with the majority of the nutrients the child receives expected to still be from breastmilk (but for some, such as iron, adequate provision from the complementary feeding diet is essential; the quantity of breastmilk provided should also not decrease from the amount given in the 0-6 month period) and the mother still requires additional food.

**Blanket targeting of prevention supplementation programmes for PBWG is not always possible and there are some examples of applying additional household vulnerability or individual risk criteria.** Many humanitarian programmes focused on targeting GFA-receiving households as they had been identified as the least food secure. In the government-led programmes in The Philippines, additional criteria based on the trimester of pregnancy, anthropometry and age of the woman/girls were also applied. There was blanket enrolment of all pregnant women in the third trimester due to their high nutrient requirements at this stage of pregnancy. However, more evidence is needed on the use of these prioritisation criteria for PBWG.

**Currently there is a broad definition of BEP supplements and a variety of products provided to PBWG fit this broad category.** As different formulations are being used across trials, government and humanitarian programmes, this limits the certainty of the evidence that could be used in developing guidelines on BEP supplementation.

**Different ration amounts were provided with the largest difference in humanitarian prevention programmes.** Differences were found in the support provided ranging from 100g FBFs pppd to more than double at 250g pppd. Many countries decided the amount to provide based on whether there was additional support provided to the household and the likelihood of sharing in the household. However, in many cases the ration amount was based on funding constraints and the prioritisation of reaching as many vulnerable PBWG as possible, often leading to the reduction in ration sizes so that resources could be stretched.

**A number of delivery platforms were used for BEP supplementation programmes bringing opportunities for integration of service.** In terms of delivery platform, TSFP delivery for the management of undernutrition (underweight/ thinness) in PBWG was similar in most countries - usually integrated with management of SAM and MAM in children through health services. Ethiopia, Mauritania and Myanmar were exceptions due to different approaches to working with these governments (in terms of departments responsible and overall engagement). Where prevention programming was most closely linked to the GFA, there were advantages in terms of low cost and ability to scale up quickly. However,



prevention programming linked to other services such as other health services had reported benefits in increasing the uptake of these services but were viewed as more challenging to establish and to scale.

**Many of the government programmes that supplement PBWG have been in place for many decades and have tested local formulations but there is a lack of strong documentation about their successes and challenges.** If large-scale delivery of BEP is intended, then closer assessment of these programmes is suggested to understand how they perform compared to programmes providing cash-based support or a combination of cash and BEP. These programmes could also offer insight into local solutions and their potential role in shock response during crises.

**A number of indicators were being used as standard for humanitarian BEP programmes with some countries using additional indicators.** Most countries implementing TSFP for PBWG were using the same indicators as for child wasting programmes, but length of stay and average weight gain were used by some countries. In the case of prevention programming, indicators used most commonly were numbers reached with many programmes also using minimum dietary diversity for Women (MDD-W). Important to note that WFP has developed a variation to the commonly used MDD-W indicator, known as MDD-W\*, where SNFs (i.e. LNS-PBWG and SC/SC+) are coded in the animal-source food group, based on comparability of the nutrient density. Therefore, an increased proportion of women meeting MDD-W\* indicates that the proportion at-risk of inadequate micronutrient intake has decreased. Currently, there are no global guidelines on the management of undernutrition (underweight) in PBWG and further assessment of both the usefulness of these indicators and the process to collect these indicators may be useful for future work. Assessment of the appropriateness and sensitivity of MDD-W and MDD-W\* for BEP supplementation programmes and in tracking progress in dietary diversity may also be useful as it can be challenging in some contexts to meet the minimum dietary diversity threshold even if diets have significantly improved. In these cases, reporting of changes in average diversity scores may also be appropriate.

**Overall there are gaps in evidence on the provision of BEP to PBWG.** There are particular gaps in terms of when to supplement with what dose and how to prioritise support when needed. Trials of BEP have been conducted or are underway, but these studies will not address all the evidence requirements of the humanitarian sector, particularly in terms of evidence on the impact of the maternal supplement as well as on preventing child wasting. Much of the research focuses on the use of LNS when FBFs are used in the majority of government and humanitarian programming. There is little documentation of programmes using locally produced and prepared BEP. There is also little documentation of the usage of these products and considerations such as the workload required for preparation as well as equipment and supplies needed (such as adequate fuel and water). Given the scale of needs and the level of production possible for LNS, it is unlikely that programmes will fully shift away from FBFs and local products so these are key gaps.

**In addition to further research being needed on what works best to supplement women from a nutritional needs perspective in food insecure contexts** (enhancing diets to meet nutritional

requirements using products, local foods and other solutions such as cash transfers), **further research is also needed on what works best from a contextual and socio cultural perspective** (convenience, preference). **Funding is needed for research to fill these gaps.**

**To date, there has been a lack of prioritisation of PBWG for support.** Data on PBWG are rarely collected or included in prioritisation exercises and when there were funding constraints children were typically prioritised over PBW/G for preventative supplementation. Given the potential of BEP supplementation in preventing newborn deaths and SVN, this may not be the appropriate prioritisation. However, given the gaps in operational evidence it can be challenging to make the case for funding these interventions when there are unmet funding needs across sectors.

### Recommendations

1. **Improve surveillance and targeting** by exploring ways to incorporate the MUAC measurements of PBW/G in periodic household surveys and emergency assessments and use the data to track progress.
2. **Work with the health sector to understand the availability of data on birth outcomes and children under 6 months at risk** so that could be used to support the prioritisation of locations for intervention.
3. **Consider using data on dietary diversity in women to feed into the prioritisation processes.**
4. **Further study into a) different MUAC admission and discharge thresholds (including 22cm) and their impact on caseloads b) the use of different MUAC thresholds for prioritisation as well as other considerations such as age and stage of pregnancy/lactation.**
5. **Consider piloting a phased transition of support from mother to child** in line with recommendations on continued breastfeeding and introduction of solid foods (gradual reduction in food for mother and increase for the child) with SBC/messages adapted accordingly.
6. **Conduct research to identify means of further prioritisation for prevention programmes** (such as stage of pregnancy, age etc) when resources are scarce.
7. **Assess whether/ how the recommendations on nutrient content of BEP supplements from the Bill and Melinda Gates Foundation (BMGF)-convened technical expert group can be applied.** State in research and programme reports whether the product complies with this guidance and any variation.
8. **Include guidance with criteria on how to decide the ration amounts in prevention programmes for PBW/G.**
9. **Provide guidance on how and when to leverage and use aspects of the different types of prevention programming and delivery platforms** to maximise linkage to complementary services, efficiencies and scale.
10. **Conduct more in-depth analysis/evaluation of the different government-led programmes to better understand successes and challenges and their potential for shock response.**

11. **Further focus on understanding the indicators used, their usefulness and the practicality of the associated data collection** with the aim of developing a standard set of indicators for BEP programmes.
12. **Conduct a research prioritisation exercise for BEP supplementation in PBWG** and use this to develop a multi-agency research agenda and to advocate for funding to address key evidence gaps.
13. **Use current evidence and future research to build a case for increased investment in BEP supplementation** through nutrition funding channels, but also by other sectors such as health and food security.
14. **Build cost efficiency and effectiveness (where possible) into programme plans and into research.**

## PART ONE | INTRODUCTION

### 1.1 Why is this period important?

The 1000 days from conception to a child's second birthday is a critical period for child development and the health and survival of the mother and child. Adequate maternal nutrition is crucial during this time to meet increased nutrient requirements and can have a significant impact on birth outcomes as well as the infant's growth and development, future health outcomes, and the woman/girl's health during pregnancy and beyond.<sup>4</sup>

During pregnancy, energy, protein and micronutrient requirements increase with energy requirements at their highest between 10 and 30 weeks gestation, when relatively large quantities of maternal fat normally are deposited.<sup>5</sup> Nutritional deficiencies or imbalances can lead to developmental abnormalities and adverse birth outcomes. In 2020, a quarter of babies born alive were Small Vulnerable Newborns (SVN); born with one or more of three vulnerabilities: born too soon (preterm), born too small (small for gestational age, SGA), or born with low birthweight (LBW). In the same year, more than half of all deaths of children within the first 28 days of life (55.3%) were attributable to forms of SVN.<sup>6</sup>

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<sup>4</sup>Black, R.E. *et al.* (2008) 'Maternal and child undernutrition: global and regional exposures and health consequences', *The Lancet*, 371(9608), pp. 243–260. Available at: [https://doi.org/10.1016/S0140-6736\(07\)61690-0](https://doi.org/10.1016/S0140-6736(07)61690-0).

<sup>5</sup>Institute of Medicine (US) Committee on Nutritional Status During Pregnancy and Lactation. Nutrition During Pregnancy: Part I Weight Gain: Part II Nutrient Supplements. Washington (DC): National Academies Press (US); 1990. 7, Energy Requirements, Energy Intake, and Associated Weight Gain during Pregnancy. <https://www.ncbi.nlm.nih.gov/books/NBK235247/>

<sup>6</sup>Lawn, J.E. *et al.* (2023) 'Small babies, big risks: global estimates of prevalence and mortality for vulnerable newborns to accelerate change and improve counting', *The Lancet*, 401(10389), pp. 1707–1719. Available at: [https://doi.org/10.1016/S0140-6736\(23\)00522-6](https://doi.org/10.1016/S0140-6736(23)00522-6).

There are strong links between SVN, wasting and other forms of malnutrition. An estimated 30 percent of all wasting and 20 percent of stunting in children under five years originates in utero.<sup>7</sup> Therefore, preventing children from being born SVN is a crucial step in reducing the prevalence of undernutrition.

Progress on reducing maternal deaths during pregnancy or childbirth is below the annual rate needed to achieve the Sustainable Development Goal of 70 maternal deaths per 100,000 live births by 2030.<sup>8</sup> A key component in achieving this goal with maternal undernutrition is linked to increased risks such as miscarriage, preeclampsia, eclampsia, abnormal blood pressure and other conditions which may lead to birth complications and even death.<sup>9</sup> Poor nutrition during breastfeeding can also exacerbate the challenges that mothers face in replenishing their nutrient stores and meeting their increased dietary needs.

## 1.2 What are the challenges?

Women in numerous countries have limited access to nutritious food such as fruit, vegetables, dairy, fish, and meat. Multiple factors impact women's diets globally, including poverty, food availability and affordability, gender inequality, as well as social and cultural norms that may limit women's decision-making regarding their nutrition and care.<sup>10</sup>

More than 20 million newborns suffer from low birth weight annually.<sup>11</sup> A significant number of women, particularly adolescents and those who are nutritionally vulnerable, are not receiving the necessary nutrition services to maintain good health and provide their children with the best chance of survival, growth, and development.<sup>12</sup>

Humanitarian crises exacerbate these challenges due to displacement, disrupted routines, increased workload of women, breakdown of services, insecurity and accessibility of markets as well as social support structures and stretched household resources. This can result in a lack of availability and affordability of familiar and nutritious foods.

## 1.3 What can be done?

### Evidence

Adequate maternal nutrition can support the woman/girls's health during pregnancy and after childbirth, reducing the risk of complications and improving maternal and infant outcomes.<sup>13</sup> A review found that scaling up proven interventions could decrease 475 million neonatal deaths and the largest relative effect were: delayed cord clamping for preterm births (30%); balanced protein and energy supplementation

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<sup>7</sup> Christian, P., et al. 2013. Risk of childhood undernutrition related to small-for-gestational age and preterm birth in low- and middle-income countries. *Int. J. Epidemiol.* 42:1340–1355. doi:10.1093/ije/dyt109.

<sup>8</sup> World Health Organization, UNICEF, United Nations Population Fund and The World Bank, *Trends in Maternal Mortality: 2000 to 2020* WHO, Geneva, 2023.

<sup>9</sup> Black, R.E. et al. (2008) 'Maternal and child undernutrition: global and regional exposures and health consequences', *The Lancet*, 371(9608), pp. 243–260. Available at: [https://doi.org/10.1016/S0140-6736\(07\)61690-0](https://doi.org/10.1016/S0140-6736(07)61690-0).

<sup>10</sup> <https://www.unicef.org/nutrition/maternal>

<sup>11</sup> Estimates of burden and consequences of infants born small for gestational age in low and middle income countries with INTERGROWTH-21st standard: analysis of CHERG datasets | *The BMJ* (no date). Available at: <https://www.bmj.com/content/358/bmj.j3677>

<sup>12</sup> <https://www.unicef.org/nutrition/maternal>

<sup>13</sup> Black, R.E. et al. (2008) 'Maternal and child undernutrition: global and regional exposures and health consequences', *The Lancet*, 371(9608), pp. 243–260. Available at: [https://doi.org/10.1016/S0140-6736\(07\)61690-0](https://doi.org/10.1016/S0140-6736(07)61690-0).

(17%); antenatal corticosteroids for preterm labour (17%), and multiple micronutrient supplementation (15%). The nutrition interventions alone were estimated to be able to prevent 32% of neonatal deaths.<sup>14</sup>

### What is recommended in terms of BEP?

The Lancet Maternal Nutrition series (2021) recommends the use of balanced energy protein (BEP) supplements during pregnancy to support maternal and child health and nutrition especially in low-income settings where undernutrition is prevalent.<sup>15</sup> The definition of BEP is outlined in Box 1.

BEP supplementation for pregnant women in undernourished populations is also recommended by WHO to reduce small for gestational age risk through antenatal (ANC) visits<sup>16,17</sup>; and is included in the UN Global Action Plan (GAP) framework on child wasting<sup>18</sup> as one of the priority actions to reduce low birth weight and child wasting. Additionally, LANCET 2021 recommends BEP supplementation as one of the proven preventive interventions which should be fully implemented in low and middle-income countries.<sup>19</sup>

Nutrient content targets for nutritious food supplements for use by pregnant and breastfeeding women/girls in food insecure and low-income contexts have also recently been developed following a consultation led by the Bill and Melinda Gates Foundation (BMGF).<sup>20</sup> The framework recommends one portion from the supplements should provide between 250 to 500 kcals, micronutrients as per the United Nations International Multiple Micronutrient Antenatal Preparation (UNIMAP) formulation<sup>21</sup>, and 50% of additional protein requirements in the third trimester (14-18g) but this dosage is dependent on the context and risk of malnutrition.<sup>22</sup>

#### BOX 1: DEFINITION OF BALANCED ENERGY-PROTEIN SUPPLEMENTS (BEP)

Balanced energy-protein supplements (BEP) are defined by WHO as supplements where “protein provides less than 25% of total energy content”.<sup>23</sup>

This review focused on the provision of food supplements which provided less than 25% of energy from protein, were fortified with micronutrients and provided to PBW/G during the 1,000 days from conception to two years postpartum. Examples are given in section 3.1.1.

<sup>14</sup> Hofmeyr, G.J. et al. (2023) 'Evidence-based antenatal interventions to reduce the incidence of small vulnerable newborns and their associated poor outcomes', *The Lancet*, 401(10389), pp. 1733–1744. Available at: [https://doi.org/10.1016/S0140-6736\(23\)00355-0](https://doi.org/10.1016/S0140-6736(23)00355-0).

<sup>15</sup> Keats et al. 2021 "Effective Interventions to Address Maternal and Child Malnutrition: An Update of the Evidence." *The Lancet Child & Adolescent Health* 5, no. 5 (May 1, 2021): 367–84.

<sup>16</sup> WHO. (2016) WHO recommendations on antenatal care for a positive pregnancy experience. <https://www.who.int/publications/i/item/9789241549912>

<sup>17</sup> Ota E, Hori H, Mori R, Tobe-Gai R, Farrar D. Antenatal dietary education and supplementation to increase energy and protein intake. *Cochrane Database Syst Rev*. 2015;(6):CD000032.

<sup>18</sup> <https://www.childwasting.org/>

<sup>19</sup> Hofmeyr, G et al. (2023). Evidence-based antenatal interventions to reduce the incidence of small vulnerable newborns and their associated poor outcomes. [https://doi.org/10.1016/S0140-6736\(23\)00355-0](https://doi.org/10.1016/S0140-6736(23)00355-0)

<sup>20</sup> BMGF. (2017). Framework and specifications for the nutritional composition of a food supplement for pregnant and lactating women (PLW) in undernourished and low-income settings. <https://dqq52087pnd5x.cloudfront.net/posters/docs/gatesopenres-187946.pdf>

<sup>21</sup> Annals of the New York Academy of Science. (2020) Expert consensus on an open-access United Nations International Multiple Micronutrient Antenatal Preparation—multiple micronutrient supplement product specification. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7384100/>

<sup>22</sup> BMGF. (2017.) Framework and specifications for the nutritional composition of a food supplement for pregnant and lactating women (PLW) in undernourished and low-income settings. <https://dqq52087pnd5x.cloudfront.net/posters/docs/gatesopenres-187946.pdf>

<sup>23</sup> <https://www.unicef.org/media/115361/file/Maternal>

## 1.4 Why are we doing this review?

Questions remain regarding BEP supplementation of PBWG including the optimal dose and duration of supplementation, appropriate targeting and graduation criteria, and modes/platforms of delivery. As a result, there are gaps in terms of BEP implementation guidance, alignment with recommendations on the use of other Specialised Nutritious Foods (SNF); standardised criteria for the targeting, enrolment, and discharge of pregnant and breastfeeding women and girls (PBW/G) in undernutrition (underweight/thinness) prevention and management programmes, and programme monitoring and evaluation.

In view of these gaps, we conducted a review of BEP supplementation in nutrition programmes targeting PBW/G. While much research is underway, little is documented about ongoing programmes, what is being implemented, successes, challenges and lessons learned. WHO is developing guidance on BEP supplementation, and it is hoped that findings from this review can support the process.

### 1.5 Objectives

The objective of this review and mapping is to support the Global Technical Working Group (GTWG) for Wasting sub-working group (SWG) on wasting prevention to document use of BEP supplementation for PBW/G, good practices, challenges, and lessons learned. Findings can inform future guidance on programmes to support maternal nutrition. Specific objectives included:

- Review and map BEP programming among PBW/G (i.e., targeting, enrolment and discharge criteria; product type, quantity, duration; delivery platforms)
- Document and describe if other nutrition interventions accompany BEP supplementation among PBW/G (e.g., maternal, infant and young child nutrition, counselling, micronutrient supplementation,)
- Review indicators used for performance monitoring and accountability and document information available on programme coverage.
- Understand bottlenecks and challenges to programme implementation, monitoring and scale up.
- Identify actions and enablers for strengthening maternal nutrition interventions.

## PART 2 | METHODS

The process for this review is described in Figure 1. The review focused on current and recent programmes (2019-present) using BEP supplementation to target PBWG to prevent undernutrition (underweight/thinness) among PBWG and/or poor birth outcomes (e.g. SGA, LBW, maternal and neonatal mortality) and child wasting. Products and doses used in trials since 1997 in the published literature were also mapped to gain a wider understanding of doses used in different contexts.

### 2.1 Methods of Data Collected

Mixed methods were used drawing from both primary and secondary data sources. The following methods were used for data collection and documentation:

#### a) Review of documents and data related to maternal BEP supplementation

Relevant case studies, programme reports, articles, and reviews were compiled by:

- A request to the GTWG, WFP and partners for relevant documentation

- Online searches for peer-reviewed publications and other reports on Google, Google Scholar, and relevant organisations<sup>24</sup> website using the following search terms “TSFP,” “supplemental feeding programme”, “BSFP,” “balanced energy protein,” “BEP,” “fortified food,” “malnutrition,” “wasting,” “maternal nutrition.” The snowball technique was used to identify additional resources.
- Provision of documents from key informants.
- A data extraction from the WFP database to understand where humanitarian programmes for PBW/G were taking place.

## b) Mapping BEP from the desk review

Based on the literature on trials using BEP as well as the data extraction from WFP, the countries with BEP supplementation programmes for PBW/G were mapped. Background interviews with one academic institution managing trials of BEP supplementation, and three countries providing technical support to government programmes were also conducted to help to identify resources. Following these interviews, a desk review of government programmes was also conducted.

- Request to 17 countries** managing humanitarian programmes who responded to the request to provide information about the programmes and to take part in a key informant interview (KII).
- An information matrix** was sent to those who responded to the request for interview to capture programme information such as programme type, targeting, product and dose. (see [annex 1](#))
- Key Informant Interviews (KIIs)** with 17 countries implementing humanitarian BEP programmes and two implementing partners managing humanitarian programmes. Background interviews with one academic institution managing trials of BEP supplementation, and three countries providing technical support to government programmes were also conducted to help to identify resources.

A total of 52 resources from peer reviewed publications and grey literature were identified by screening the title, abstract, and/or executive summary. Articles which included BEP supplementation (defined in box 1) for PBW/G were then included and categorised as government programmes, trials, undernutrition (underweight/ thinness) management programmes, or prevention programmes. Protocols were excluded. A total of 19 articles documenting the trials were included in the review.

Most papers identified in the literature review focused on BEP in trials and BEP in government social protection programmes. These programmes were included in the mapping, but as the focus of the review was on humanitarian programmes, the more in-depth review focused on programmes to prevent and manage undernutrition (underweight/ thinness) in PBW/G in humanitarian and resilience programming.

KIIs were conducted with those partners engaged in the planning and implementation of BEP supplementation for PBW/G. Key informants were recommended by the GTWG and by WFP regional bureaux and conducted using an interview guide ([Annex 2](#)). Interviews were conducted in English, recorded (with consent), transcribed, and organised into a matrix by theme. A total of 21 interviews were conducted.

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<sup>24</sup> World Health Organisation, Emergency Nutrition Network, UNICEF, Save the Children, Relief Web, IFPRI, Lancet

## **2.2 Analysis**

The data collected through different means were documented in an analytic framework and thematic analysis was then performed. Analysis involved a review of excerpts, discussion and synthesis of selected data. Countries with programmes were mapped using google maps software.

## **2.3 Ethics and Confidentiality**

Verbal informed consent was obtained from each key informant and personal details were not shared outside of the study team.

## **2.4 Limitations**

This review recognises the following limitations:

- Given the timeframe and number of countries included in the review, it was not possible to travel to the countries and the interviews were conducted remotely.
- Searches online for relevant literature were in English and not in any local language.
- There was low response from organisations outside WFP with few referrals from the GTWG. Therefore, the majority of the KIIs were with WFP staff. Two implementing partners recommended by WFP COs were interviewed.
- This review is not an exhaustive mapping and KIIs were conducted with a sample of countries. The small sample creates potential for selection bias.

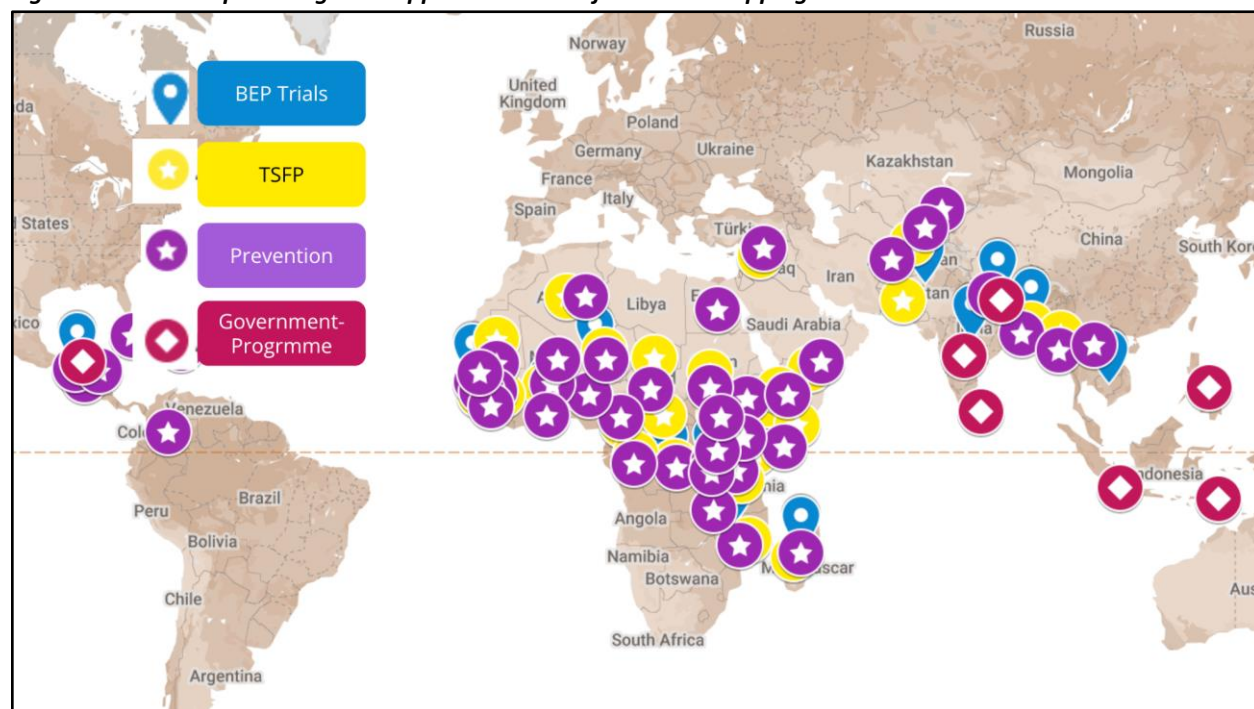


## PART 3 | FINDINGS OF THE DESK REVIEW

### 3.1 Overall Findings: Where was BEP supplementation taking place and in what type of programme?

As shown in Figure 2, the mapping identified four types of programming providing BEP food supplements to PBW/G across 46 countries. These were: BEP trials/research; government-led programmes which supplement PBWG; UN/NGO-led Targeted Supplementary Feeding Programmes (TSFP) to manage undernutrition (underweight/ thinness); UN/NGO-led programmes to prevent malnutrition.

**Figure 2: Locations providing BEP supplements identified in the mapping**



#### 3.1.1 Which products were being used?

A variety of BEP products were being used across the different types of programmes. BEP products which were used in trials and government programmes came in many forms including: fortified cereals; biscuits; buns paste in sachets. Some were commercially produced and others made locally with available foods. All provided 10-20% energy from protein and were fortified with multiple micronutrients.

Humanitarian and resilience programming to manage and prevent undernutrition (underweight/ thinness) used fortified blended flours (FBFs) such as Super Cereal and Super Cereal Plus as well as lipid-based nutrient supplements (LNS). More information about the products used and their composition can be found in Annex 2.

### 3.2 BEP supplementation in Trials/Research

We reviewed 19 studies in 14 countries (shown in Figure 3) assessing the impact of providing BEP to PBW/G. The summary of these studies can be found in [Annex 4](#).

**Figure 3: Location of BEP Trails**



#### 3.2.1 What were the enrolment and discharge criteria used?

**The studies included in the review had variations in enrolment criteria.** The majority of studies (17 out of 19) admitted women based on the stage of pregnancy and did not enrol based on nutrition status.

Stage of enrolment.

- One study had preconception enrolment<sup>25</sup>

<sup>25</sup>Krebs, N.F. *et al.* (2021) 'Growth from Birth Through Six Months for Infants of Mothers in the "Women First" Preconception Maternal Nutrition Trial', *The Journal of pediatrics*, 229, pp. 199-206.e4.

- Nine studies enrolled pregnant women in the first trimester<sup>26, 27, 28, 29, 30, 31, 32, 33, 34, 35</sup>
- 14 studies enrolled pregnant women in the second<sup>36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48</sup>

- <sup>26</sup>Argaw, A. *et al.* (2023) 'Fortified balanced energy–protein supplementation during pregnancy and lactation and infant growth in rural Burkina Faso: A 2 × 2 factorial individually randomized controlled trial', *PLOS Medicine*, 20(2), p. e1004186.
- <sup>27</sup>Ashorn, P. *et al.* (2015) 'Supplementation of Maternal Diets during Pregnancy and for 6 Months Postpartum and Infant Diets Thereafter with Small-Quantity Lipid-Based Nutrient Supplements Does Not Promote Child Growth by 18 Months of Age in Rural Malawi: A Randomized Controlled Trial', 2, 3, 4', *The Journal of Nutrition*, 145(6), pp. 1345–1353. Available at: <https://doi.org/10.3945/jn.114.207225>.
- <sup>28</sup>Adu-Afarwuah, S. *et al.* (2016) 'Small-quantity, lipid-based nutrient supplements provided to women during pregnancy and 6 mo postpartum and to their infants from 6 mo of age increase the mean attained length of 18-mo-old children in semi-urban Ghana: a randomized controlled trial', 2', *The American Journal of Clinical Nutrition*, 104(3), pp. 797–808. Available at: <https://doi.org/10.3945/ajcn.116.134692>.
- <sup>29</sup>Ullah, M.B. *et al.* (2019) 'Provision of Pre- and Postnatal Nutritional Supplements Generally Did Not Increase or Decrease Common Childhood Illnesses in Bangladesh: A Cluster-Randomized Effectiveness Trial', *The Journal of Nutrition*, 149(7), pp. 1271–1281. Available at: <https://doi.org/10.1093/jn/nxz059>.
- <sup>30</sup>Persson, L.Å. *et al.* (2012) 'Effects of Prenatal Micronutrient and Early Food Supplementation on Maternal Hemoglobin, Birth Weight, and Infant Mortality Among Children in Bangladesh: The MINIMat Randomized Trial', *JAMA*, 307(19), pp. 2050–2059. Available at: <https://doi.org/10.1001/jama.2012.4061>.
- <sup>31</sup>Ceesay, S.M. *et al.* (1997) 'Effects on birth weight and perinatal mortality of maternal dietary supplements in rural Gambia: 5 year randomised controlled trial', *BMJ (Clinical research ed.)*, 315(7111), pp. 786–790. Available at: <https://doi.org/10.1136/bmj.315.7111.786>.
- <sup>32</sup>Bliznashka, L. *et al.* (2022) 'Prenatal supplementation with multiple micronutrient supplements or medium-quantity lipid-based nutrient supplements has limited effects on child growth up to 24 months in rural Niger: a secondary analysis of a cluster randomized trial', *The American Journal of Clinical Nutrition*, 115(3), pp. 738–748. Available at: <https://doi.org/10.1093/ajcn/nqab404>.
- <sup>33</sup>Janmohamed, A. *et al.* (2016) 'Prenatal supplementation with Corn Soya Blend Plus reduces the risk of maternal anemia in late gestation and lowers the rate of preterm birth but does not significantly improve maternal weight gain and birth anthropometric measurements in rural Cambodian women: a randomized trial', *The American Journal of Clinical Nutrition*, 103(2), pp. 559–566. Available at: <https://doi.org/10.3945/ajcn.114.104034>.
- <sup>34</sup>Krebs, N.F. *et al.* (2021) 'Growth from Birth Through Six Months for Infants of Mothers in the “Women First” Preconception Maternal Nutrition Trial', *The Journal of pediatrics*, 229, pp. 199–206.e4. Available at: <https://doi.org/10.1016/j.jpeds.2020.09.032>.
- <sup>35</sup>Ceesay, S.M. *et al.* (1997) 'Effects on birth weight and perinatal mortality of maternal dietary supplements in rural Gambia: 5 year randomised controlled trial', *BMJ (Clinical research ed.)*, 315(7111), pp. 786–790. Available at: <https://doi.org/10.1136/bmj.315.7111.786>.
- <sup>36</sup>Argaw, A. *et al.* (2023) 'Fortified balanced energy–protein supplementation during pregnancy and lactation and infant growth in rural Burkina Faso: A 2 × 2 factorial individually randomized controlled trial', *PLOS Medicine*, 20(2), p. e1004186.
- <sup>37</sup>Sher, N. *et al.* (2022) 'Effect of Lipid-Based Multiple Micronutrients Supplementation in Underweight Primigravida Pre-Eclamptic Women on Maternal and Pregnancy Outcomes: Randomized Clinical Trial', *Medicina*, 58(12), p. 1772. Available at: <https://doi.org/10.3390/medicina58121772>.
- <sup>38</sup>de Kok, B. *et al.* (2021) 'Home consumption of two fortified balanced energy protein supplements by pregnant women in Burkina Faso', *Maternal & Child Nutrition*, 17(3), p. e13134.
- <sup>39</sup>Callaghan-Gillespie, N. *et al.* (2017). Trial of ready-to-use supplemental food and corn-soy blend in pregnant Malawian women with moderate malnutrition: A randomized controlled clinical trial. *The American Journal of Clinical Nutrition*, 106(4), 1062–1069.
- <sup>40</sup>Ashorn, P. *et al.* (2015) 'Supplementation of Maternal Diets during Pregnancy and for 6 Months Postpartum and Infant Diets Thereafter with Small-Quantity Lipid-Based Nutrient Supplements Does Not Promote Child Growth by 18 Months of Age in Rural Malawi: A Randomized Controlled Trial', 2, 3, 4', *The Journal of Nutrition*, 145(6), pp. 1345–1353.
- <sup>41</sup>Adu-Afarwuah, S. *et al.* (2016) 'Small-quantity, lipid-based nutrient supplements provided to women during pregnancy and 6 mo postpartum and to their infants from 6 mo of age increase the mean attained length of 18-mo-old children in semi-urban Ghana: a randomized controlled trial', 2', *The American Journal of Clinical Nutrition*, 104(3), pp. 797–808. Available at: <https://doi.org/10.3945/ajcn.116.134692>.
- <sup>42</sup>Ullah, Z., Khan, S.U. and Wijewickrama, E. (2021) 'Covid-19: implications for localisation. A case study of Afghanistan and Pakistan. HPG Working Paper'. ODI.
- <sup>43</sup>Persson, L.Å. *et al.* (2012) 'Effects of Prenatal Micronutrient and Early Food Supplementation on Maternal Hemoglobin, Birth Weight, and Infant Mortality Among Children in Bangladesh: The MINIMat Randomized Trial', *JAMA*, 307(19), pp. 2050–2059.
- <sup>44</sup>Ali, E. *et al.* (2013) 'Peanut-based ready-to-use therapeutic food: how acceptable and tolerated is it among malnourished pregnant and lactating women in Bangladesh?', *Maternal & Child Nutrition*, 11(4), pp. 1028–1035.
- <sup>45</sup>Bliznashka, L. *et al.* (2022) 'Prenatal supplementation with multiple micronutrient supplements or medium-quantity lipid-based nutrient supplements has limited effects on child growth up to 24 months in rural Niger: a secondary analysis of a cluster randomized trial', *The American Journal of Clinical Nutrition*, 115(3), pp. 738–748. Available at: <https://doi.org/10.1093/ajcn/nqab404>.
- <sup>46</sup>Leroy, J.L., Olney, D. and Ruel, M. (2016) 'Tubaramure, a Food-Assisted Integrated Health and Nutrition Program in Burundi, Increases Maternal and Child Hemoglobin Concentrations and Reduces Anemia: A Theory-Based Cluster-Randomized Controlled Intervention Trial', 123', *The Journal of Nutrition*, 146(8), pp. 1601–1608.
- <sup>47</sup>Galasso, E. *et al.* (2019) 'Effects of nutritional supplementation and home visiting on growth and development in young children in Madagascar: a cluster-randomised controlled trial', *The Lancet Global Health*, 7(9), pp. e1257–e1268. Available at: [https://doi.org/10.1016/S2214-109X\(19\)30317-1](https://doi.org/10.1016/S2214-109X(19)30317-1).
- <sup>48</sup>Lama, T.P. *et al.* (2022) 'Compliance with and acceptability of two fortified balanced energy protein supplements among pregnant women in rural Nepal', *Maternal & Child Nutrition*, 18(2), p. e13306. Available at: <https://doi.org/10.1111/mcn.13306>.

- 7 studies enrolled pregnant women in the third trimester<sup>49, 50, 51, 52, 53, 54, 55</sup>
- 2 studies enrolled breastfeeding women only<sup>56,57</sup>

**Only two studies specifically focused on women who were undernourished** and used the following enrolment criteria:

- MUAC  $\geq 20.6$  and  $\leq 23.0$  cm (Malawi)<sup>58</sup>
- Severe undernutrition (underweight/ thinness) was considered as  $< 17$  cm or oedema  $\geq$  grade three; at risk of malnutrition was considered to be MUAC  $< 21$  cm (Bangladesh)<sup>59</sup>

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<sup>49</sup> de Kok, B. *et al.* (2021) 'Home consumption of two fortified balanced energy protein supplements by pregnant women in Burkina Faso', *Maternal & Child Nutrition*, 17(3), p. e13134..

<sup>50</sup> Sher, N. *et al.* (2022) 'Effect of Lipid-Based Multiple Micronutrients Supplementation in Underweight Primigravida Pre-Eclamptic Women on Maternal and Pregnancy Outcomes: Randomized Clinical Trial', *Medicina*, 58(12), p. 1772.

<sup>51</sup> Callaghan-Gillespie, M. *et al.* (2017) 'Trial of ready-to-use supplemental food and corn-soy blend in pregnant Malawian women with moderate malnutrition: a randomized controlled clinical trial 12', *The American Journal of Clinical Nutrition*, 106(4), pp. 1062–1069.

<sup>52</sup> Ali, E. *et al.* (2013) 'Peanut-based ready-to-use therapeutic food: how acceptable and tolerated is it among malnourished pregnant and lactating women in Bangladesh?', *Maternal & Child Nutrition*, 11(4), pp. 1028–1035.

<sup>53</sup> Bliznashka, L. *et al.* (2022) 'Prenatal supplementation with multiple micronutrient supplements or medium-quantity lipid-based nutrient supplements has limited effects on child growth up to 24 months in rural Niger: a secondary analysis of a cluster randomized trial', *The American Journal of Clinical Nutrition*, 115(3), pp. 738–748. Available at: <https://doi.org/10.1093/ajcn/nqab404>.

<sup>54</sup> Leroy, J.L., Olney, D. and Ruel, M. (2016) 'Tubaramure, a Food-Assisted Integrated Health and Nutrition Program in Burundi, Increases Maternal and Child Hemoglobin Concentrations and Reduces Anemia: A Theory-Based Cluster-Randomized Controlled Intervention Trial 123', *The Journal of Nutrition*, 146(8), pp. 1601–1608. Available at: <https://doi.org/10.3945/jn.115.227462>.

<sup>55</sup> Galasso, E. *et al.* (2019) 'Effects of nutritional supplementation and home visiting on growth and development in young children in Madagascar: a cluster-randomised controlled trial', *The Lancet Global Health*, 7(9), pp. e1257–e1268. Available at: [https://doi.org/10.1016/S2214-109X\(19\)30317-1](https://doi.org/10.1016/S2214-109X(19)30317-1).

<sup>56</sup> Flax, V.L. *et al.* (2012) 'Use of Lipid-Based Nutrient Supplements by HIV-Infected Malawian Women during Lactation Has No Effect on Infant Growth from 0 to 24 Weeks', *The Journal of Nutrition*, 142(7), pp. 1350–1356.

<sup>57</sup> Ali, E. *et al.* (2013) 'Peanut-based ready-to-use therapeutic food: how acceptable and tolerated is it among malnourished pregnant and lactating women in Bangladesh?', *Maternal & Child Nutrition*, 11(4), pp. 1028–1035.

<sup>58</sup> Callaghan-Gillespie, N. *et al.* (2017). Trial of ready-to-use supplemental food and corn-soy blend in pregnant Malawian women with moderate malnutrition: A randomized controlled clinical trial 12. *The American Journal of Clinical Nutrition*, 106(4), 1062–1069.

<sup>59</sup> Ali, E. *et al.* (2013) 'Peanut-based ready-to-use therapeutic food: how acceptable and tolerated is it among malnourished pregnant and lactating women in Bangladesh?', *Maternal & Child Nutrition*, 11(4), pp. 1028–1035.

### 3.2.2 Discharge criteria varied depending on the study objectives

- 13 studies discharged women 10 weeks to 6 months postpartum<sup>60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72</sup>
- Five studies discharged once the woman had delivered<sup>73, 74, 75, 76, 77</sup>
- One study discharged women based on MUAC and good clinical status for at least two clinic visits<sup>78</sup>

Other discharge criteria included cessation of breastfeeding up to 28 weeks post partum<sup>79</sup>

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<sup>60</sup> Argaw, A. et al. (2023) 'Fortified balanced energy–protein supplementation during pregnancy and lactation and infant growth in rural Burkina Faso: A 2 × 2 factorial individually randomized controlled trial', *PLOS Medicine*, 20(2), p. e1004186. Available at: <https://doi.org/10.1371/journal.pmed.1004186>.

<sup>61</sup> de Kok, B. et al. (2021) 'Home consumption of two fortified balanced energy protein supplements by pregnant women in Burkina Faso', *Maternal & Child Nutrition*, 17(3), p. e13134. Available at: <https://doi.org/10.1111/mcn.13134>.

<sup>62</sup> Khan, G.N. et al. (2021) 'Effectiveness of wheat soya blend supplementation during pregnancy and lactation on pregnancy outcomes and nutritional status of their infants at 6 months of age in Thatta and Sujawal districts of Sindh, Pakistan: a cluster randomized-controlled trial', *European Journal of Nutrition*, 60(2), pp. 781–789.

<sup>63</sup> Callaghan-Gillespie, M. et al. (2017) 'Trial of ready-to-use supplemental food and corn-soy blend in pregnant Malawian women with moderate malnutrition: a randomized controlled clinical trial 12', *The American Journal of Clinical Nutrition*, 106(4), pp. 1062–1069.

<sup>64</sup> Ashorn, P. et al. (2015) 'Supplementation of Maternal Diets during Pregnancy and for 6 Months Postpartum and Infant Diets Thereafter with Small-Quantity Lipid-Based Nutrient Supplements Does Not Promote Child Growth by 18 Months of Age in Rural Malawi: A Randomized Controlled Trial 1, 2, 3, 4', *The Journal of Nutrition*, 145(6), pp. 1345–1353. Available at: <https://doi.org/10.3945/jn.114.207225>.

<sup>65</sup> Flax, V.L. et al. (2012) 'Use of Lipid-Based Nutrient Supplements by HIV-Infected Malawian Women during Lactation Has No Effect on Infant Growth from 0 to 24 Weeks', *The Journal of Nutrition*, 142(7), pp. 1350–1356.

<sup>66</sup> Adu-Afarwuah, S. et al. (2016) 'Small-quantity, lipid-based nutrient supplements provided to women during pregnancy and 6 mo postpartum and to their infants from 6 mo of age increase the mean attained length of 18-mo-old children in semi-urban Ghana: a randomized controlled trial 1,2', *The American Journal of Clinical Nutrition*, 104(3), pp. 797–808. Available at: <https://doi.org/10.3945/ajcn.116.134692>

<sup>67</sup> Ullah, Z., Khan, S.U. and Wijewickrama, E. (2021) 'Covid-19: implications for localisation. A case study of Afghanistan and Pakistan. HPG Working Paper'. ODI.

<sup>68</sup> Persson, L.Å. et al. (2012) 'Effects of Prenatal Micronutrient and Early Food Supplementation on Maternal Hemoglobin, Birth Weight, and Infant Mortality Among Children in Bangladesh: The MINIMat Randomized Trial', *JAMA*, 307(19), pp. 2050–2059. Available at: <https://doi.org/10.1001/jama.2012.4061>.

<sup>69</sup> Ceesay, S.M. et al. (1997) 'Effects on birth weight and perinatal mortality of maternal dietary supplements in rural Gambia: 5 year randomised controlled trial', *BMJ (Clinical research ed.)*, 315(7111), pp. 786–790. Available at: <https://doi.org/10.1136/bmj.315.7111.786>.

<sup>70</sup> Galasso, E. et al. (2019) 'Effects of nutritional supplementation and home visiting on growth and development in young children in Madagascar: a cluster-randomised controlled trial', *The Lancet Global Health*, 7(9), pp. e1257–e1268. Available at: [https://doi.org/10.1016/S2214-109X\(19\)30317-1](https://doi.org/10.1016/S2214-109X(19)30317-1).

<sup>71</sup> Taneja, S. et al. (2021) 'Impact of nutritional interventions among lactating mothers on the growth of their infants in the first 6 months of life: a randomized controlled trial in Delhi, India', *The American Journal of Clinical Nutrition*, 113(4), pp. 884–894. Available at: <https://doi.org/10.1093/ajcn/nqaa383>.

<sup>72</sup> Lama, T.P. et al. (2022) 'Compliance with and acceptability of two fortified balanced energy protein supplements among pregnant women in rural Nepal', *Maternal & Child Nutrition*, 18(2), p. e13306.

<sup>73</sup> Argaw, A. et al. (2023) 'Fortified balanced energy–protein supplementation during pregnancy and lactation and infant growth in rural Burkina Faso: A 2 × 2 factorial individually randomized controlled trial', *PLOS Medicine*, 20(2), p. e1004186. Available at: <https://doi.org/10.1371/journal.pmed.1004186>.

<sup>74</sup> Sher, N. et al. (2022) 'Effect of Lipid-Based Multiple Micronutrients Supplementation in Underweight Primigravida Pre-Eclamptic Women on Maternal and Pregnancy Outcomes: Randomized Clinical Trial', *Medicina*, 58(12), p. 1772. Available at: <https://doi.org/10.3390/medicina58121772>.

<sup>75</sup> Bliznashka, L. et al. (2022) 'Prenatal supplementation with multiple micronutrient supplements or medium-quantity lipid-based nutrient supplements has limited effects on child growth up to 24 months in rural Niger: a secondary analysis of a cluster randomized trial', *The American Journal of Clinical Nutrition*, 115(3), pp. 738–748. Available at: <https://doi.org/10.1093/ajcn/nqab404>.

<sup>76</sup> Janmohamed, A. et al. (2016) 'Prenatal supplementation with Corn Soya Blend Plus reduces the risk of maternal anemia in late gestation and lowers the rate of preterm birth but does not significantly improve maternal weight gain and birth anthropometric measurements in rural Cambodian women: a randomized trial 1', *The American Journal of Clinical Nutrition*, 103(2), pp. 559–566. Available at: <https://doi.org/10.3945/ajcn.114.104034>.

<sup>77</sup> Krebs, N.F. et al. (2021) 'Growth from Birth Through Six Months for Infants of Mothers in the “Women First” Preconception Maternal Nutrition Trial', *The Journal of pediatrics*, 229, pp. 199–206.e4.

<sup>78</sup> Ali, E. et al. (2013) 'Peanut-based ready-to-use therapeutic food: how acceptable and tolerated is it among malnourished pregnant and lactating women in Bangladesh?', *Maternal & Child Nutrition*, 11(4), pp. 1028–1035.

<sup>79</sup> Flax, V.L. et al. (2012) 'Use of Lipid-Based Nutrient Supplements by HIV-Infected Malawian Women during Lactation Has No Effect on Infant Growth from 0 to 24 Weeks', *The Journal of Nutrition*, 142(7), pp. 1350–1356. Available at: <https://doi.org/10.3945/jn.111.155598>.

### 3.2.3 What products were used in trials?

As shown in Table 1, a number of different products were used in trials with some testing different doses. The majority of the studies used LNS, three studies used fortified biscuits, and four studies used FBF (two studies used while the other two used WSB+ and CSB with oil). Three studies assessed locally produced products including fortified biscuits and LNS (Annex 4).

**Table 1: BEP products used in trials**

Product Used	Number of studies	Doses (kcal/day)
LNS	4	LQ 500-920
	4	MQ approximately 400
	6	SQ 118-237
FBF	4	677-920 (165g-200g dry ration per day) <i>*Based on 2 studies with available data</i>
Fortified biscuits	3	375-1015

### 3.2.4 What was studied in the trials

- *Acceptability of BEP*: Three studies assessed the acceptability of BEP products namely LNS and biscuits. Two out of the three studies showed both peanut-based LNS and biscuits were well accepted in Nepal<sup>80</sup> and in Burkina Faso<sup>81</sup>, but in Bangladesh<sup>82</sup>, 83% of women found RUTF either unacceptable or completely rejected after 4 weeks. In Nepal<sup>83</sup> and Burkina Faso<sup>84</sup>, 11 and 12 products, respectively, were screened prior to conducting the efficacy trial.
- The majority of studies (16) examined the *impact of BEP supplementation* in pregnancy with some in addition to breastfeeding on infants including length-for-age (stunting), linear growth, SGA,

<sup>80</sup> Lama, T.P. et al. (2022) 'Compliance with and acceptability of two fortified balanced energy protein supplements among pregnant women in rural Nepal', *Maternal & Child Nutrition*, 18(2), p. e13306. Available at: <https://doi.org/10.1111/mcn.13306>.

<sup>81</sup> de Kok, B. et al. (2021) 'Home consumption of two fortified balanced energy protein supplements by pregnant women in Burkina Faso', *Maternal & Child Nutrition*, 17(3), p. e13134.

<sup>82</sup> Ali, E. et al. (2013) 'Peanut-based ready-to-use therapeutic food: how acceptable and tolerated is it among malnourished pregnant and lactating women in Bangladesh?', *Maternal & Child Nutrition*, 11(4), pp. 1028–1035.

<sup>83</sup> Lama, T.P. et al. (2022) 'Acceptability of 11 fortified balanced energy-protein supplements for pregnant women in Nepal', *Maternal & Child Nutrition*, 18(3), p. e13336.

<sup>84</sup> Jones, L. et al. (2021) 'Acceptability of 12 fortified balanced energy protein supplements - Insights from Burkina Faso', *Maternal & Child Nutrition*, 17(1), p. e13067. Available at: <https://doi.org/10.1111/mcn.13067>.

childhood morbidity, birth weight. Four also assessed the impact on maternal outcomes such as maternal weight gain, anaemia, haemoglobin levels, and systolic blood pressure.<sup>85,86,87,88</sup> The majority of the studies using LNS in PBW/G showed a positive impact on birth weight, stunting, and wasting at 6 months and gestational weight gain. In the four studies which provided FBF for PBW/G, three studies showed positive impacts on wasting, stunting, and anaemia of infants at 6 months, but there were mixed impacts on maternal nutrition. Three studies<sup>89, 90, 91</sup> showed no or limited difference in gestational weight gain compared to the control group while one study showed an improvement in anaemia. In these studies, LQ FBF (CSB+ and WSB+) and SQ LNS were used.

- *Timing of maternal supplementation:* Two studies assessed the timing of starting BEP supplementation pre-conception and in the first trimester of gestation. This showed potential improvements infant growth with early supplementation.
- *LNS vs FBF:* One study which compared the impact on maternal and infants between the use of LNS (RUSF) and FBF (CSB+) showed mothers receiving LNS (RUSF) had the highest weight gain and a lower incidence of low birth weight compared to CSB+.<sup>92</sup> Potential improvement in infant growth with early supplementation (two studies) showed the provision of BEPs preconception and early pregnancy resulted in lower stunting prevalence at 6 months. One study showed improved length and ponderal growth from birth to 6 months.
- Two studies compared the impact of providing BEP versus micronutrient supplementation alone.<sup>93, 94</sup>

<sup>85</sup> Janmohamed, A. et al. (2016) 'Prenatal supplementation with Corn Soya Blend Plus reduces the risk of maternal anemia in late gestation and lowers the rate of preterm birth but does not significantly improve maternal weight gain and birth anthropometric measurements in rural Cambodian women: a randomized trial I', *The American Journal of Clinical Nutrition*, 103(2), pp. 559–566. Available at: <https://doi.org/10.3945/ajcn.114.104034>.

<sup>86</sup> Persson, L.Å. et al. (2012) 'Effects of Prenatal Micronutrient and Early Food Supplementation on Maternal Hemoglobin, Birth Weight, and Infant Mortality Among Children in Bangladesh: The MINIMat Randomized Trial', *JAMA*, 307(19), pp. 2050–2059. Available at: <https://doi.org/10.1001/jama.2012.4061>.

<sup>87</sup> Callaghan-Gillespie, M. et al. (2017) 'Trial of ready-to-use supplemental food and corn-soy blend in pregnant Malawian women with moderate malnutrition: a randomized controlled clinical trial II', *The American Journal of Clinical Nutrition*, 106(4), pp. 1062–1069.

<sup>88</sup> Sher, N. et al. (2022) 'Effect of Lipid-Based Multiple Micronutrients Supplementation in Underweight Primigravida Pre-Eclamptic Women on Maternal and Pregnancy Outcomes: Randomized Clinical Trial', *Medicina*, 58(12), p. 1772. Available at: <https://doi.org/10.3390/medicina58121772>.

<sup>89</sup> Galasso, E. et al. (2019) 'Effects of nutritional supplementation and home visiting on growth and development in young children in Madagascar: a cluster-randomised controlled trial', *The Lancet Global Health*, 7(9), pp. e1257–e1268. Available at: [https://doi.org/10.1016/S2214-109X\(19\)30317-1](https://doi.org/10.1016/S2214-109X(19)30317-1).

<sup>90</sup> Janmohamed, A. et al. (2016) 'Prenatal supplementation with Corn Soya Blend Plus reduces the risk of maternal anemia in late gestation and lowers the rate of preterm birth but does not significantly improve maternal weight gain and birth anthropometric measurements in rural Cambodian women: a randomized trial I', *The American Journal of Clinical Nutrition*, 103(2), pp. 559–566. Available at: <https://doi.org/10.3945/ajcn.114.104034>.

<sup>91</sup> Khan, G.N. et al. (2021) 'Effectiveness of wheat soya blend supplementation during pregnancy and lactation on pregnancy outcomes and nutritional status of their infants at 6 months of age in Thatta and Sujawal districts of Sindh, Pakistan: a cluster randomized-controlled trial', *European Journal of Nutrition*, 60(2), pp. 781–789. Available at: <https://doi.org/10.1007/s00394-020-02276-3>.

<sup>92</sup> Callaghan-Gillespie, M. et al. (2017) 'Trial of ready-to-use supplemental food and corn-soy blend in pregnant Malawian women with moderate malnutrition: a randomized controlled clinical trial II', *The American Journal of Clinical Nutrition*, 106(4), pp. 1062–1069. Available at: <https://doi.org/10.3945/ajcn.117.157198>.

<sup>93</sup> Bliznashka, L. et al. (2022) 'Prenatal supplementation with multiple micronutrient supplements or medium-quantity lipid-based nutrient supplements has limited effects on child growth up to 24 months in rural Niger: a secondary analysis of a cluster randomized trial', *The American Journal of Clinical Nutrition*, 115(3), pp. 738–748. Available at: <https://doi.org/10.1093/ajcn/nqab404>.

<sup>94</sup> Persson, L.Å. et al. (2012) 'Effects of Prenatal Micronutrient and Early Food Supplementation on Maternal Hemoglobin, Birth Weight, and Infant Mortality Among Children in Bangladesh: The MINIMat Randomized Trial', *JAMA*, 307(19), pp. 2050–2059. Available at: <https://doi.org/10.1001/jama.2012.4061>.

#### **BEP in trials summary**

- 19 studies included in the review
- Most studies used an LNS (14 out of 19 studies reviewed)
- Four studies looked at FBF
- Only two studies looked at the impact on the infant when supplementing breastfeeding mothers
- No study compared different doses of supplementation
- No study compared different durations of supplementation

### **3.3 Government-led programmes**

The review found examples of government-led development programmes providing food-based BEP supplements in five countries (Figure 4) through online searches and requests for information through working groups but may not be an exhaustive list of programmes. Those countries included in the review had information on products, targeting and doses. Four of the countries were receiving technical support from WFP and one was also supported in procurement of supplements. In many cases, these programmes had been in place for decades and operated at large scale. A summary of the eligibility criteria, integration and products used in the government-led programme examples can be found in Table 2.

*Figure 4: Location of government-led programme examples*





**Table 2: Eligibility, integration and products used in government-led programmes**

Country and programme	Products Used	Eligibility	Integration
<p><b>India</b></p> <p>Supplementary Nutrition Programme (SNP) is under the Integrated Child Development Services (ICDS) scheme</p>	<p><b>Take Home Rations (THR):</b> 600 kcal and 18-20 g protein + 50% RDA for micronutrients/ day different types of products in different states.</p> <p>THR is <b>fortified in some states:</b>            Madhya Pradesh: 50% RDA (iron, zinc, folate, b6, b12, vit D)            Kerala: 11 micronutrients, V&amp;M            Gujarat: Premix enriched with essential micronutrients (Iron, Vitamin A, Calcium, Thiamine, Riboflavin, Niacin, Vitamin C and Folic Acid at 50% RDA)</p>	All PBW/G from registration of pregnancy and up to 6 months postpartum	Education and counselling to pregnant women; Gestational weight gain monitoring; Child care and early child development
<p><b>Sri Lanka</b></p> <p>National</p>	<p><b>THR cereal-based food</b></p> <p>1500 g/month (50g/day)</p>	All pregnant women, all breast feeding mothers	Nutrition education and counselling. ANC/PNC in

supplementary feeding programme Thripasha, which means “triple-nutrients”	<i>Nutrients composition of Thripasha (100gm):</i> Energy 398 kcal, Protein 20g (20% of energy) Fortified with Micronutrients	(up to 6 months of age of the infant)	some locations; growth monitoring and child health services; immunisation.
<b>Timor-Leste</b> Programa Nasional Saúde Materno Infantil (PNSMI)	<b>Timor Vita. Cereal- based food</b> similar to the formulation of Super Cereal 787 kcal, 33g protein (17% of energy), 20g fat Fortified with Micronutrients	All pregnant women/girls, all breastfeeding mothers (up to 6 months of age of the infant)	Nutrition education and counselling healthy eating practices and appropriate nutrition during pregnancy.
<b>Pakistan</b> Ehsaas Nashonuma	<b>Locally produced chick-pea based LNS</b> WawaMum (50g MQ for prevention) - 260 kcal, 7g protein (11% of energy) Acha Mum for management (LNS) - 520 kcal, 13g protein (10% of energy) Maamta (1 sachet for prevention/ 2 sachet for management) each sachet provides 390 kcal, 10 g protein (10% of energy)	PBWG from Benazair Income support Programme (BISP) beneficiary households. All pregnant women/girls, all breastfeeding mothers (up to 6 months of age of the infant)	Unconditional cash transfer, SBCC including health, nutrition, and hygiene messages provided by lady health workers to women/girls during home visits and community sessions
<b>Philippines</b> National Dietary Supplementation Programme Totok Kainan	Enhanced <b>Nutribun</b> (1st tmr), fortified <b>rice meal</b> (2nd tmr), <b>SQ-LNS + Nutribun</b> (3rd tmr)  400 to 700 kcal 15-20 grams protein daily (11-15% of energy) SQLNS provides 20g pppd (100-120 kcal/d)	All 3rd trimester PW Nutritionally-at-risk: (BMI<18.5 in first trimester; low gestational weight gain at any time during pregnancy, MUAC<23cm, Pregnant adolescent)	Delivery of early childhood care and development. SMS “Nutriblast” messages and nutrition education classes.

### 3.5.1 Eligibility

The majority of countries enrolled all pregnant women and all breastfeeding mothers with infants up to 6 months of age (India, Pakistan, Sri Lanka, Timor-Leste) with some countries applying additional selection criteria. In Pakistan, PBWG are eligible if they are enrolled in the social protection programme and therefore from the poorest two wealth quintiles. In the Philippines, all third trimester pregnant women were eligible. However, in the earlier stages of pregnancy only a subset of women deemed to be “nutritionally at risk” were eligible. Therefore, during the first and second trimester of pregnancy only those with one or more of the following factors were eligible:

- BMI<18.5 in the first trimester

- Low gestational weight gain at any point during the pregnancy
- MUAC<23cm
- Pregnant adolescent.

### 3.5.2 Products used

Products used in the government-led programmes varied with several types implemented including cereal-based food, LNS, and take-home rations. These varied in energy (395-700 kcal) and protein (9-20% of energy).

### 3.5.3 Platforms used and integration for government-based programmes

Government programmes to supplement PBW/G were all integrated with other services.

In India, take home rations are a component of the Integrated Child Development services (ICDS) which is managed by the Ministry of Women and Child Development (MWCD). Rations are provided through a network of “Anganwadi” childcare centres established at the community level. The ICDS program aims to provide a package of essential services to children under the age of six and their mothers. The key services include supplementary nutrition, preschool education, health check-ups, immunisation, and referral services. THR has taken many forms and have been produced using many different mechanisms over the course of this programme. Currently, a mix of large-scale commercial production, local private sector manufacture and production by women’s groups is used with variation in the type used decided at sub-national level.

The Philippines has a programme “Totok Kainan” which is delivered in selected provinces to pregnant women and integrated into existing health services, such as antenatal care clinics. Eligible beneficiaries receive dietary supplements during routine visits to these facilities.

The supplements vary depending on the stage of pregnancy (see table 2). Health workers provide education and counselling to beneficiaries and their families about the importance of good nutrition, the benefits of dietary supplementation, and best practices for maintaining a balanced diet.

In Pakistan, the Ehsaas Nashonuma was launched in 2019 as part of a national multisectoral plan for poverty alleviation and social protection programme. The nutrition component is implemented through provincial health services who currently contract WFP to support BEP supplementation of PBWG.

Women with visible or verified pregnancy up to 6 months postpartum are given an LNS (75g pppd). This is delivered at the health facilities and integrated with other services such as a conditional cash transfer (conditional upon attendance at the health centre for preventive nutrition services, ANC, immunisation). From 6 months postpartum, children receive an SNF.

In Sri Lanka an FBF supplement called “Thriposha ” and made by private manufacturers contracted by the Ministry of Health. The distribution of the Thriposha supplement is typically carried out by health workers through health and nutrition facilities. Distribution of Thriposha is often through antenatal and postnatal services. As part of the programme, education and awareness campaigns are conducted about the

importance of good nutrition, the benefits of Triposha, and how to access the supplement and how to use it effectively.

Timor-Leste provides a supplement called Timor Vita, a local formulation of Super Cereal for the 1,000 days from conception to 24 months. This is provided by the Ministry of Health with support from WFP and UNICEF. The product is distributed at health facilities and alongside nutrition and gender awareness education sessions as well as lessons on how to cook Timor Vita and incorporate it into diets.

### 3.5.4 Successes and Challenges with government-led programmes

The desk review and interviews found the following successes and challenges:

#### Successes

- Large scale delivery of food supplements to PBWG
- The integrated programmes with SBC are reported to have helped to raise awareness about the importance of a balanced diet during pregnancy
- Variety of mechanisms used to produce supplements from commercial production to production by local women's groups
- Regular growth and weight monitoring of pregnant women helps identify women at risk of maternal malnutrition
- The programme in Pakistan conducted research into different modalities of support and found the SNF plus cash arm and the SNF plus cash plus SBC arm to have a significant impact on stunting reduction compared to the control group.

#### Challenges

- Concerns regarding the quality of implementation and adequacy of services which may limit impact.
- Funding constraints: challenges related to inadequate funding and resource allocation hamper service coverage and continuity
- Coverage of centres: limited access to centres in some countries, particularly in remote and marginalised communities.
- Many programmes were intended to be short term solutions or suffered from funding cuts and had stop, start implementation. As a result, many have not had comprehensive monitoring and impact evaluation included in the design. Therefore there is lack of documentation on their impact on maternal malnutrition and poor birth outcomes.

#### **Government-led programmes summary**

- Four countries were identified which were providing BEP food supplements to PBW/G which met the definition of BEP used for the review
- The countries were providing a variety of products. There was also subnational variation in India with states using a variety of products
- A variety of mechanisms were used to produce supplements from commercial production to production by local women's groups
- Successes in terms of scale and reach
- Challenges with quality of delivery, coverage and funding
- Lack of documentation on operational issues as well as impact

## PART 4 | HUMANITARIAN PROGRAMMES - FINDINGS OF THE KEY INFORMANT INTERVIEWS WITH WFP AND IMPLEMENTING PARTNERS

### 4.1 Programmes to manage undernutrition (underweight/ thinness) in PBW/G (TSFP)

As shown in Figure 5, TSFP to manage undernutrition (underweight/ thinness) in PBW/G were being implemented in 29 countries by WFP and partners. 12 of these countries were included in the review.

**Figure 5: BEP supplementation in TSFP programmes**



#### 4.1.1 Targeting - How were locations and beneficiaries selected?

##### a) Geographic targeting

All countries included in the review were using some form of geographic prioritisation as the first step to select areas of operation for TSFP. The process to select locations criteria was typically led by the government and involved multiple agencies and sectors.

Three countries (Afghanistan, South Sudan and Yemen) were implementing plans to scale up TSFP for PBWG across the whole of these countries. In these countries, selection of locations was not based on a regular prioritisation process but followed the cluster scale up plan and co-location with services to manage severe undernutrition (underweight/ thinness). In Bangladesh, a regular prioritisation process was also not followed as in this context TSFP was only provided in the refugee camps and host communities in Cox's Bazar. These services were not provided in the rest of the country.

The remaining nine countries providing TSFP services for PBW/G followed a geographic prioritisation process.

Most countries used Integrated Phase Classification (IPC) Acute Food Insecurity Classification (provides differentiation between different levels of severity of acute food insecurity) / Cadre Harmonise process or equivalent and any available nutrition data for their geographic targeting. Two countries, Chad and Ethiopia, also overlaid the data of additional sectors such as WASH and Health as part of the prioritisation process.

Based on the resources available, countries selected the most severely affected locations for intervention. Most countries using the IPC classification targeted locations in IPC phase 3,4 and 5. In the case of Somalia, just districts with populations in IPC 4 and 5 were targeted. Where malnutrition data were used to select locations for intervention, in most cases this was data on child wasting. However, Kenya and Madagascar used PBW/G undernutrition (underweight/ thinness) rates as part of their selection criteria. A breakdown of the data used by country can be found in [Annex 5](#).

#### **b) Household Level Targeting**

No household criteria were used in any TSFP included in the review.

#### **c) Individual Targeting**

In all countries, the eligibility period for women was from pregnancy up until 6 months postpartum. Those who met the enrolment criteria (Table 3) during this period would be enrolled in the programme. In all contexts, programmes required that the pregnancy was verified by a health centre or was visible. As a result, countries reported that PBW/G were typically enrolled in the second trimester or later.

In some countries (South Sudan, Myanmar) obtaining a pregnancy test was challenging so programmes relied on the visibility of a pregnancy making early entry (before the second trimester) into the programme unlikely.

In 3 locations (Madagascar, Kenya, Syria), verification of pregnancy from a health facility was a prerequisite for entry to the programme. In these cases, TSFP was usually delivered in locations with strong links to reproductive health services.

#### **4.1.2 TSFP enrolment and discharge criteria**

Although the individual eligibility was similar across locations, there were variations in the enrolment and discharge criteria applied across different countries (Table 3). All countries were using Middle Upper Arm Circumference (MUAC) to screen for undernutrition (underweight/ thinness) in PBW/G, but in some countries a threshold of MUAC <21cm was used meaning that a greater severity of undernutrition (underweight/ thinness) was required for enrolment. Those using a lower threshold are highlighted in purple in Table 3.

**Table 3: TSFP MUAC enrolment and Discharge by Country**

Country	Enrolment criteria (MUAC)	Discharge criteria (MUAC)
Afghanistan	<23 cm	≥ 23 cm
Bangladesh	<21cm	≥21 cm
Chad	<23cm. (21cm if resource issues)	≥23 (21cm if resource issues)
Ethiopia	<23cm	≥23 cm
Kenya	< 21cm	≥23 cm
Mauritania	< 21 cm	≥23 cm
Myanmar	< 21 cm	≥21 cm
Pakistan	< 21 cm	≥21 cm
Somalia	< 21cm	≥21 cm
South Sudan	<23 cm	≥23 cm
Syria	<23 cm	≥23 cm
Yemen	<23 cm	≥23 cm

As shown in Table 3 half of the countries implementing TSFP for PBW/G who were included in the review (6 out of 12 providing TSFP services to PBW/G) were using a lower enrolment threshold of less than 21 cm with the remaining countries using a MUAC of less than 23 cm. Four countries (Bangladesh, Myanmar, Pakistan and Somalia) were also using a lower discharge MUAC. Two countries (Kenya and Mauritania) were using a lower enrolment threshold of 21cm but were discharging at a 23cm.

Chad was using the higher enrolment and discharge threshold, but reported using the lower criteria during supply shortage to ensure that they used scarce resources for the more severely malnourished women.

*Feedback from KIIs on reasons for difference in enrolment and discharge criteria*

The main reason provided by those interviewed for using lower enrolment and discharge thresholds was resource constraints. Lowering the threshold would increase the caseload and countries preferred to prioritise managing more severe undernutrition (underweight/ thinness).

Sphere 2018 guidelines were also cited by key informants as these which recommend a threshold of 21cm. Kenya and Myanmar were following their national guidelines.

### 4.1.3 Product and ration given in TSFP

Most countries operating TSFP were providing an improved FBF (Super Cereal and Super Cereal Plus) to PBWG. Two countries (Pakistan and Syria) were using only LNS and one (Afghanistan) was piloting an LNS while using FBF across the rest of its programme sites.

Across all locations, the ration given remained the same amount for the entire period (pregnancy and postpartum). The ration size was the same size regardless of age and whether or not the woman or girl was still in adolescence.

There was a small variation between the countries in the dose/ration amount with four countries providing 200g per person per day (PPPD) (780-800 kcal with 15-16% energy from protein) and the remaining eight providing 250g pppd (950-1,000 kcal with 15-16% energy from protein). In the three countries here LNS was being used in humanitarian programmes, doses were different in each country and ranged from 75g pppd (383 kcal with 15% energy from protein), 100g pppd (510 kcal with 15% energy from protein) and 150g pppd (765 kcal with 15% energy from protein), but total calories provided was lower in all cases compared to the FBF due to the expectation of family sharing of FBFs. [Annex 6](#) has a detailed breakdown of the product and ration provided by country.

#### *Feedback from KIIs on reasons for the difference in ration sizes in TSFP*

WFP guidance states that 200-250g of FBF should be given so this amount was within the guidance. The main reason given for differences in amounts of FBF given was that some countries chose to provide the 50g extra to account for household sharing. The extra amount was not provided when there were resource constraints, or the household food assistance provided was expected to be sufficient to prevent sharing.

### 4.1.4 Platforms used and integration for TSFP

TSFP in most countries is delivered through health services. These include providing services at government health facilities (Mauritania, Ethiopia, Kenya, Somalia, South Sudan, Syria) community spaces, and for some countries, mobile teams are also used (Ethiopia, Somalia, Syria, Ethiopia). Where health system coverage and capacity were low, delivery was often managed by NGO partners.

TSFP for PBW/G was typically integrated with the management of child wasting, MIYCN, SBCC, micronutrient supplementation and health services.

In Mauritania, Myanmar and some regions of Ethiopia, delivery of TSFP for PBW/G was outside of the health system. In Ethiopia the Disaster Management authority has historically been responsible for TSFP with support for PBW/G delivered alongside food assistance. There is now a transition process with several regions already delivering TSFP through the health system and others continuing the old model of delivery.

In Mauritania, the Ministry of Agriculture is responsible for TSFP, and this is delivered alongside food security interventions and distributions.

In Myanmar, due to the policy of non-cooperation with the de-facto government, following the coup d'état in 2021, alternatives to the health system are being sought and programmes are implemented using available spaces and non-government staff for the management of undernutrition (underweight/thinness).



#### 4.1.5 Indicators and monitoring

The countries operating through the health system report using monitoring indicators based on the SPHERE standard for the management of child wasting such as: recovery rate; mortality rate; default rate; non-response rate, programme reach (Afghanistan, Chad, Ethiopia, Myanmar, South Sudan, Syria, Yemen). Some countries also included length of stay (Afghanistan, Bangladesh), average weight gain (Afghanistan), and rate of relapse (Kenya).

Programme coverage has also been used in Mauritania and South Sudan and is planned to be used in Somalia.

#### **TSPF summary**

- 29 countries with TSPF for PBWG were identified
- Geographical targeting was based on available data - usually IPC or equivalent (only 2 countries used data on PBWG)
- Some variations in enrolment and discharge criteria (4 countries using 21cm cut off, 6 using 23 cm, two using 21cm enrolment with 23cm discharge)
  - Reasons were resource constraints and current guidelines.
- Mainly use FBFs for PBWG two countries using LNS and one piloting)
  - Some variation in product and dose given, especially LNS
  - In all cases the total calories provided through LNS was lower than for FBFs
- Similar delivery across countries - usually integrated with management of SAM and MAM in children through health services (Ethiopia, Mauritania and Myanmar exceptions)
- Most countries were using the same indicators as for child wasting but LOS and average weight gain used by some countries.

## 4.2 Programmes to prevent malnutrition in PBWG and poor birth outcomes

The mapping identified 46 countries with UN/NGO-led humanitarian programming providing BEP supplements in programmes to prevent undernutrition in PBWG and poor birth outcomes (Figure 6). 13 countries were interviewed for the review.

*Figure 6: Locations of BEP use in prevention programmes*



#### 4.2.1 Targeting criteria- How were locations and beneficiaries selected?

##### a) Geographic

The process for prioritising locations for prevention programmes providing BEP supplement was similar (often the same) to that used for TSFP. Countries included in the review used geographic prioritisation as a first step through a multi-agency and multi-sector process to select areas of operation. Annex 7 summarises the programme type and geographic targeting.

##### b) Household targeting

In some locations no household targeting was applied and all PBWG were eligible. In other locations, the vulnerability criteria used for general food assistance (GFA) were applied and only PBWG from GFA receiving households were eligible.

##### c) Individual targeting

In all countries, the eligibility period for women was from pregnancy up until 6 months postpartum. Those who met the enrolment criteria during this period would be enrolled in the programme. As a result, countries reported that PBW/G were typically enrolled in the second trimester or later.

#### 4.2.2 Product and ration used in prevention programmes

The prevention programmes included in the review all used a FBF for PBWG.

Programmes used Super Cereal (CSB+/WSB+) or Super Cereal Plus (CSB++/WSB++). Across all locations, the ration given remained the same amount for the entire period (pregnancy and postpartum). The ration size was the same size regardless of age and whether the woman or girl was still in adolescence.

The countries offered different ration sizes varying between 100g to 250g (Table 4). Out of the 13 countries interviewed, seven countries provided 100g pppd, one provided 150g. Four countries supplied 200g while Nigeria supplied the largest portion at 250g. Kenya provided 100g but increased the amount during emergencies.

**Table 4: Summary of products and ration sizes (per person per day) used in prevention programmes**

Country	Product*	Ration FBF (pppd)
Afghanistan	WSB+	150g
Bangladesh	WSB+	200g
Cameroon	CSB+ or CSB++	100g
Chad	CSB++	200g
Ethiopia Nationals	CSB+	100g
Ethiopia Refugees	CSB++	200g
Kenya	CSB+ or CSB++	100g (emergency 150g)
Mauritania	CSB+	200g
Myanmar	WSB++	100g
Nigeria	CSB+	250g
Somalia	CSB++	100g
South Sudan	CSB++	100g
Yemen	WSB+	100g

Feedback from KIIs on the reasons for differences in product and ration

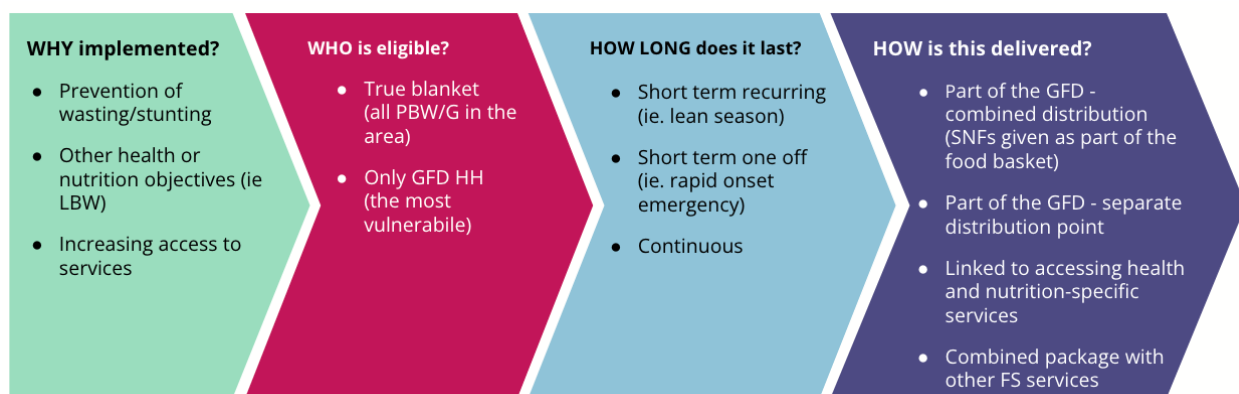
WFP internal guidance advises 100-200g pppd of FBF based on the additional nutrient requirements of PBW/G. Feedback from interviews indicated that larger ration sizes were often given to account for sharing within the family. Countries with a strong funding pipeline, such as Bangladesh were able to use a higher ration size to account for household sharing due to continued funding for prevention programming. The choice of product was also determined by supply and resulted in this use of CSB++/WSB++ (which while suitable for PBW/G, is more expensive than CSB+/WSB+ and usually recommended for children, but one product is easier from a logistics point of view) in some locations due to global supply shortages leading to pipeline breaks.

Some countries stated that they provide a smaller ration where the GFA is expected to cover some of the additional nutrient requirements of PBWG. The ration size is often determined by funding and a smaller ration may be used to prioritise reaching more PBWG (Afghanistan, Kenya, Myanmar, Somalia, Yemen). Somalia initially provided a ration of 200g pppd but reduced this 100g pppd in 2022 due to high numbers of enrolments and low funding.

#### 4.2.3 Types of prevention supplementation programmes

There was much flexibility and variation in prevention programmes providing BEP supplementation to PBW/G in terms of objectives, eligibility, duration and delivery platform (Figure 7).

**Figure 7: Variations in prevention BEP supplementation programmes**



All prevention programmes had an objective of preventing undernutrition, but some prevention programmes had additional objectives such as addressing other health and nutrition issues for example preventing poor birth outcomes (Madagascar, Somalia) or increasing access to services such as antenatal care (ANC) (Bangladesh, Madagascar, Somalia).

As mentioned above, some programmes used “true blanket” targeting, while others provided supplements to PBW/G in GFA-receiving households only. Programmes differed in terms of duration with some providing short term recurring support at certain times of the year such as the lean season, some as a one off such as in response to a rapid onset emergency. In other locations, support was provided on a continuous basis such as in protracted emergencies or in refugee camps.

#### 4.2.4 Integration and delivery platforms

There were a number of different mechanisms used for BEP supplementation in prevention programmes with programmes linked to the GFA or to health services. In many programmes there were elements of both models in the prevention programme.

Many BEP prevention programmes were linked to GFA. Where this type of programme was implemented, delivery is often by a food security partner – the same partner who was responsible for general food assistance. Delivery of BEP supplementation is integrated with the GFA- either by adding supplements into an in-kind food basket or by setting up a separate distribution point just for PBWG managed by the food security partner. This model was often used in the first phases of an emergency response as well as

in hard-to-reach locations.

In some instances, prevention programmes providing BEP supplementation were linked to health and nutrition service delivery. In these programmes, delivery of BEP supplements was in the same location as or close to health and nutrition services (these may be delivered at facilities, community locations or by mobile teams) and were usually delivered by the partner who was also responsible for TSFP for PBWG.

With this model, screening, referral and SBCC took place at the site of the BEP supplement distribution. In some programmes, there was a conditionality attached to receiving the ration of the PBW/G which was accessing preventative health care services such as ANC/PNC. Under this model, partners often engaged community health workers or nutrition volunteers to support the distribution. These programmes were often linked to longer term and resilience programming.

There were also some examples of prevention BEP supplementation linked to food security resilience programming and delivered alongside interventions such as homestead gardening, farmer training.

#### Feedback from the KIIs - perceived advantages and disadvantages of the different delivery platforms for prevention.

Perceived advantages of GFA linked programmes were that this model could allow quick start up and is suited to early response and supporting higher reach. There were also believed to be significant cost savings with this model. Targeting GFA-receiving households also supported prioritisation of the most vulnerable.

Potential disadvantages were lower integration with other services and loss of opportunity of using the distribution of BEP as a “pull factor” to these services. When delivered by the partner providing the GFA, if they were not experienced in nutrition then integration with screening, referral and SBCC could be challenging. It was also felt that when BEP was provided as part of the in kind GFA food basket it may increase sharing and the risk that it would not be consumed by the PBW/G. In some cases, health facilities were sometimes used as a distribution point under this model and therefore were still able to generate a pull factor.

Perceived advantages of health and resilience services linked BEP provision in prevention programmes were the “pull factor” of provision of these food supplements at the centres increasing uptake of other services such as ANC and PNC. With this delivery model, it was easier to link prevention programming with screening for undernutrition (underweight/ thinness), referral to management services and SBCC and/or long term resilience activities. Delivery of BEP supplementation using this platform could allow PBW/G and children to receive a package of preventative support.

Potential disadvantages of this model were that it was more difficult and time consuming to set up and more difficult to achieve high reach. This type of delivery could result in a more complicated registration process and could exclude those further away from services or where caregivers have less time, thereby reinforcing existing vulnerabilities. It was felt that this model was only appropriate for populations where functioning services within a reasonable travel distance could be ensured.

The delivery platform used, depended on the timing of the emergency and whether rapid scale up and low cost needed to be prioritised or if the programme was expected to be a longer term programme with more time to establish integration mechanisms and partnerships. Many countries were delivering a mix of different types of BEP supplementation prevention programmes in terms of objectives, targeting, duration and delivery depending on the location, programme objectives and the type of emergency.

#### 4.2.4 Indicators, monitoring and results

All countries collected data on the numbers of people reached. Short-term prevention programmes which were linked to GFA often only measured this indicator (numbers reached).

Where it was possible for BEP supplementation programmes for prevention to monitor additional indicators, the most commonly measured was Minimum Dietary Diversity for Women (MDD-W) (Afghanistan, Bangladesh, Cameroon, Chad, Ethiopia, Kenya, Madagascar, Mauritania, Myanmar, and Syria). In the case of WFP's programmes, this indicator scores BEP in the category of animal source foods based on the nutrient density of products.

Additional indicators varied among countries. Bangladesh also uses individual dietary diversity score (IDDS) and food consumption score (FCS) across its integrated programme. In Cameroon's resilience programme, the service utilisation is monitored with the percentage of PBW/G attending prenatal visits based on estimated target beneficiaries.

#### Prevention summary

- 46 countries with prevention programming: 13 who responded to requests were interviewed in the consultations.
- Geographic targeting based on available data, usually IPC or equivalent sometimes with other data overlaid.
- Prevention was either true blanket or targeted at PBWG from GFA HH
- All those included in the review use FBFs and provided 100-250g pppd
- Indicators uses were numbers reached, minimum dietary diversity for Women (MDD-W).
- Much flexibility and variation in prevention in terms of objectives, delivery platform
- There were perceived advantages and disadvantages to the different types of delivery

### 4.3 Overall feedback from KIIs on BEP supplementation in Humanitarian Programmes

#### 4.3.1 Feedback on acceptability, utilisation and sharing of products

The key informants in most countries reported a high acceptability of FBF and LNS products in terms of the taste and appropriate preparation. This was attributed to effective community mobilisation and messaging. However, in some locations there were reports of some PBW/G becoming tired of the same products (Madagascar, Kenya). In one country, there were complaints about the taste of products from a

new manufacturer (Myanmar) and about the chick-pea based LNS (Syria). In Syria the product has already been switched from an FBF to an LNS due to dislike of the FBF.

Sharing within the household was a challenge with 8 countries reporting it a problem despite sensitisation (Afghanistan, Bangladesh, Chad, Ethiopia, Kenya, Madagascar South Sudan, Syria). This was likely due to food insecurity and cultural practice of shared meals in the household. Sharing was reportedly higher for FBFs compared to LNS (Afghanistan, Chad). Selling of products on markets was also reported by one country (Cameroon).

Overall, there was limited research/evidence generation on the different types of products use in programmes or comparison of LNS, FBFs and using locally produced and prepared BEP in terms of the level of sharing as well as other considerations around the use of these products such as the workload required for preparation as well as equipment and supplies needed (such as adequate fuel and water).

#### **4.3.2 Successes and challenges**

##### Successes

Several of the key informants stated that they had had success with rapid scale up of programmes in response to crises. Increased government ownership was also cited as a success in a number of locations where delivery was through government systems.

Where prevention programmes were linked to other health services, those interviewed felt that there has been an improvement in health-seeking behaviours and use of /demand for other health services such as ANC and PNC. In one location, where a combined package of services had been provided over several years, including BEP supplementations, and it was possible to monitor impact, there was a reduction in the undernutrition rates (Bangladesh). However, where prevention supplementation had been combined with GFA, countries reported reductions in cost and increases in programme reach.

Most locations reported a high level of acceptability of the BEP products with PBW/G. Increases in local production of LNS and FBF products was also cited as a success.

Factors that key informants perceived to be enabling factors to these success were, continued and consistent funding, clear operational guidance at country level as well as strong partnerships with other agencies and with the government.

##### Challenges

Despite the successes mentioned above, those interviewed cited a number of challenges. Funding constraints were mentioned by many countries interviewed, with this resulting in the provision of lower rations or programmes achieving lower reach than was felt needed for the scale of the crisis.

Multi-year funding was especially challenging to secure for BEP supplementation for PBW/G leading to start-stop programming in many locations.

Short term funding cycles also created challenges in terms of impact assessment as operational research and impact assessments were not usually included in humanitarian prevention programmes.

Lack of prioritisation of PBW/G for support was viewed as a major challenge in terms of their inclusion as a vulnerable group for assessments and their inclusion in supplementation programmes. Children were usually prioritised over PBW/G for preventative supplementation when resources were constrained. Some of those interviewed also highlighted how pregnant and breastfeeding adolescents are currently grouped together with pregnant and breastfeeding women but felt that they required special attention and given their increased risk of poor pregnancy outcomes.

Where programmes were not integrated with health services, there were often challenges in integrating screening and SBCC, especially where distribution was through GFA due to the logistics of managing large scale distributions and also the lack of experience of the partner managing the distribution.

Global supply chain challenges were also cited by many countries as affecting programming. Various supply chain management challenges were discussed including global supply shortages and these affected timely delivery of commodities to the nutrition sites.



## PART 5 | DISCUSSION AND RECOMMENDATIONS

This study aimed to review and map the implementation of BEP programming for PBWG, documenting how programmes were targeted and delivered including eligibility and admission criteria as well as products and rations provided. The review also sought to understand delivery platforms and integration, indicators used and well as programme successes and challenges.

There were limitations to the review in terms of timeframe and number of countries included as well as the online relevant literature which were in English and not in any local language.

Additionally, no partners were referred by the GTWG, so KIIs were conducted with WFP staff, two implementing partners recommended by WFP COs and one academic researcher. As a result, the finding and recommendations are based on a non-exhaustive mapping.

The review identified a variety of programmes and approaches to BEP programming for PBWG. Key findings of the review and associated recommendations are as follows:

**Data on undernutrition among PBWG or birth outcomes are not used routinely as part of geographic prioritisation exercises at country-level.** Robust criteria were used for geographical selection of locations for humanitarian programming in all contexts. However data on undernutrition (underweight/thinness) in PBWG were not usually part of the process due to unavailability of data. Lack of data collection on PBWG undernutrition rates and birth outcome may prevent the prioritisation of locations where supplementation may be most needed - where there is a high prevalence of undernutrition in women and/or high prevalence of SNV. Existing data on maternal anaemia and MDDW may also be useful in prioritising locations for BEP supplementation of PBWG. The Managing At Risk Mothers and Infants (MAMI) Care Pathway also provides guidance on SVN which could be used.

*Recommendation: Improve surveillance and targeting by exploring ways to incorporate the MUAC measurements of PBW/G in periodic household surveys and emergency assessments and use the data to track progress. Inclusion of PBWG in mass screening campaigns could be considered for surveillance as well as the use of mother-to-mother MUAC screening. Indicators on PBWG should be included in the monitoring frameworks of policies and strategies.*

*Work with the health sector to understand the availability of data on birth outcomes and children under 6 months at risk of that could be used to support for the prioritisation of locations for intervention.*

*Consider using data on dietary diversity in women MDDW and maternal anaemia to feed into the prioritisation processes.*

**In the absence of a clear anthropometric definition of 'wasting'/ undernutrition (underweight/thinness) in PBWG, different enrolment and discharge criteria were being used in programmes to manage this.**

In TSFP, different enrolment and discharge criteria were used with some countries admitting women with a MUAC <23cm and others using a lower threshold of <21cm. No countries were considering the measurement in between (22cm) in case of resource constraints.

Current research supports using a threshold of MUAC < 23 cm to prevent adverse birth outcomes.<sup>95</sup> However, Funding constraints and high caseload were the primary reasons provided for a lower threshold being used with some countries also citing SPHERE 2018 and national guidelines which suggest admitting PBW/G under 21cm. Some countries felt that 23cm is too high in their location and the caseload is/would be unmanageable if 23cm were applied. Although 23cm is increasingly being recommended, where resources are constrained, using a lower threshold of 22cm or 21cm could prioritise the more severely wasted PBW/G.

*Recommendation: Further study into a) different MUAC admission and discharge thresholds (including 22cm) and their impact on caseloads b) the use of different MUAC thresholds for prioritisation as well as other considerations such as age and stage of pregnancy/lactation.*

**Currently PBWG are treated as a homogeneous group across most interventions.** The nutrient requirements of women change across the stages of pregnancy and in lactation. Furthermore, pregnant adolescents who are still growing themselves may have different support needs to those of non-adolescent pregnant women. However, the support provided in most government and all humanitarian programmes was the same regardless of the age of the woman/girl throughout pregnancy and lactation. Although it may be challenging to implement tailored programmes or protocols to reflect the different stages of pregnancy and breastfeeding, greater understanding of different needs and gaps in relation to support given could support adaptations, greater efficiency for programmes and the development of criteria for greater prioritisation where needed.

*Recommendations:*

*More research into the doses given versus the differences in the nutrient requirements of pregnant and lactating adolescents as well as the impact of supplementation on lactation and the recovery of mother from pregnancy and childbirth. In practice though, this could be challenging to implement (sharing could also affect this, one cannot be very precise in terms of how intake is improved etc).*

**Supplementation aimed specifically at PBWG typically ends at 6 months postpartum.** Support ends at 6 months even though continued breastfeeding is recommended up to 24 months and beyond. Women following this recommendation continue to have the same or more additional nutrient requirements as during the exclusive breastfeeding period. In the case of prevention programming, support transitions to the infant from 6 months and the same ration that was given to the mother is often provided for the child. However, in the 6-12 months period, the child only needs small amounts of solid food with the majority of the nutrients the child receives expected to still be from breastmilk (the quantity of

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<sup>95</sup> Ververs et al. 2013. Which anthropometric indicators identify a pregnant woman as acutely malnourished and predict adverse birth outcomes in the humanitarian context? *PLoS Currents* 5, <https://doi.org/10.1371/currents.dis.54a8b618c1bc031ea140e3f2934599c8>

breastmilk provided should also not decrease from the amount given in the 0-6 month period) and the mother still requires additional food

*Recommendation: Consider piloting a phased transition of support from mother to child in line with recommendations on continued breastfeeding and introduction of solid foods (gradual reduction in food for mother and increase for the child) with SBC/messages adapted accordingly. This would take into account the daily food requirements for children in this age group to ensure that their needs were still met while mothers continue to be supplemented.*

**Blanket targeting of prevention supplementation programmes for PBWG is not always possible and there are a number of examples of applying additional household vulnerability or individual risk criteria.**

Many humanitarian programmes focused on targeting GFA-receiving households as they had been identified as the least food secure. In the government-led programmes in The Philippines, additional criteria based on the trimester of pregnancy, anthropometry and age of the woman/girl were also applied. There was blanket enrolment of all third trimester women/girls mothers due to their high nutrient requirements. However, more evidence is needed on the use of these prioritisation criteria for PBWG.

*Recommendation: Identify means of further prioritisation (such as stage of pregnancy, age etc) when resources are scarce. Where there are gaps in evidence, conduct operational research to support further prioritisation.*

**Currently there is a broad definition of BEP supplements and a variety of products provided to PBWG fit this broad category.** As different formulations are being used across trials, government and humanitarian programmes, this limits the certainty of the evidence that could be used in developing guidelines on BEP supplementation.

*Recommendation: Assess whether/how the recommendations on nutrient content of BEP supplements from the Bill and Melinda Gates Foundation (BMFG)-led technical expert group can be applied. State in research and programme reports whether the product complies with this specification and any variation.*

**Different ration amounts were provided with the largest difference in humanitarian prevention programmes.** Differences were found in the support provided ranging from 100g pppd of an FBF to more than double at 250g pppd. Many countries decided the amount to provide based on the support provided to the household and the likelihood of sharing in the household. However, in many cases the ration amount was based on funding constraints and the prioritisation of reaching as many vulnerable PBWG as possible and cutting rations so resources could be stretched.

*Recommendation: Include guidance with criteria on how to decide the ration amounts in prevention programmes for PBW/G based on the BMGF technical group recommendations.*

**A number of delivery platforms were used for BEP supplementation programmes bringing opportunities for integration of service.** In terms of delivery platform, TSFP delivery for the management of undernutrition (underweight/thinness) in PBWG was similar in most countries - usually integrated with the management of SAM and MAM in children through health services. Ethiopia, Mauritania and Myanmar were exceptions due to different approaches to working with these governments (in terms of departments responsible and overall engagement).

Where prevention programming was most closely linked to the GFA, there were advantages in terms of low cost and ability to scale up quickly. However, prevention programming linked to other services such as other health services had reported benefits in increasing the uptake of these services but were viewed as more challenging to establish and to scale.

*Recommendation: Provide guidance on how and when to leverage and use aspects of the different types of prevention programming to maximise linkage to complementary services, efficiencies and scale. For example, look at how approaches such as mobile teams and community health worker led health and nutrition service delivery may be used to increase coverage of these services when BEP supplementation is linked to the GFA.*

**Many of the government programmes that supplement PBWG have been in place for many decades and have tested local formulations but there is a lack of strong documentation** about their successes and challenges. If large-scale delivery of BEP is intended, then closer assessment of these programmes is suggested to understand how they perform compared to programmes providing cash-based support or a combination of cash and BEP. These programmes could also offer insight into local solutions and their potential role in shock response during crises.

*Recommendation. Conduct more in-depth analysis/evaluation of the different government-led programmes to better understand successes and challenges and their potential for shock response.*

**A number of indicators were being used as standard for humanitarian BEP programmes with some countries using additional indicators.** Most countries implementing TSFP for PBWG were using the same indicators as for child wasting programmes, but length of stay and average weight gain were used by some countries. In the case of prevention programming, indicators used most commonly were numbers reached with many programmes also using minimum dietary diversity for Women (MDD-W). Currently, there are no global guidelines on the management of undernutrition (underweight/ thinness) in PBWG and further assessment of both the usefulness of these indicators and the process to collect these indicators may be useful for future work. Assessment of the appropriateness and sensitivity of MDD-W for BEP supplementation programmes and in tracking progress in dietary diversity may also be useful as it can be challenging in some contexts to meet the minimum dietary diversity threshold even if diets have significantly improved. In these cases, reporting of changes in average diversity scores may also be appropriate.

*Recommendation: Further focus on understanding the indicators used, their usefulness and the practicality of the associated data collection with the aim of developing a standard set of indicators for BEP programmes.*

**Overall there are many gaps in evidence on the provision of BEP to PBWG.**

There are particular gaps in terms of when to supplement with what dose and how to prioritise support when needed. Trials of BEP have been conducted or are underway, but these studies will not address all the evidence requirements of the humanitarian sector, particularly in terms of evidence on the impact of maternal supplement on the mother as well on preventing child wasting. Much of the research focuses on the use of LNS when FBFs are used in the majority of government and humanitarian programming. There is little documentation of programmes using locally produced and prepared BEP. There is also little documentation of the usage of these products and considerations such as the workload required for preparation as well as equipment and supplies needed (such as adequate fuel and water). Given the scale of needs and the level of production possible for LNS, it is unlikely that programmes will fully shift away from FBFs and local products so these are key gaps.

In addition to further research being needed on what works best to supplement women from a nutritional needs perspective in food insecure contexts (enhancing diets to meet nutritional requirements using products, local foods and other solutions such as cash transfers), further research is also needed on what works best from a contextual and socio cultural perspective (convenience, preference).

Funding is needed for research to fill these gaps.

*Recommendation: Conduct a research prioritisation exercise and use this to develop a multiagency research agenda and to advocate for funding to address key evidence gaps.*

**Overall, to date, there has been a lack of prioritisation of PBWG for support.**

Data on PBWG are rarely collected or included in prioritisation exercises and when there were funding constraints children were typically prioritised over PBW/G for preventative supplementation. Given the potential of BEP supplementation in preventing newborn deaths and SVN, this may not be the appropriate prioritisation. However, given the gaps in operational evidence it can be challenging to make the case for funding these interventions when there are unmet funding needs across sectors.

*Recommendations: Use current evidence and future operational research showing how BEP programmes can be effective and achieve outcome to build a case for increased investments in BEP supplementation. Increased investment can be through nutrition funding channels, but also by other sectors such as health and food security.*

*Build cost efficiency and effectiveness (where possible) into programme plans and into research.*

## PART 6 | CONCLUSION

This review has mapped different types of BEP programmes, how they are being implemented in terms of targeting, type of product and ration provided, monitoring, and delivery platforms. The review has also documented key success and challenges. A number of approaches have been identified and various mechanisms have been used to implement BEP supplementation. However, there continues to be a gap in evidence for the effectiveness and cost-effectiveness of many approaches which in turn contributes to guidance gaps and impacts the prioritisation of these activities.

Defining a research agenda may help fill these evidence gaps and development of operational guidance may further strengthen maternal nutrition programming to help PBW/G in humanitarian settings receive the nutrition support that they require. The guidance should allow for adaptation to the local context and the specific issues faced in different locations.

## PART 7 | CASE STUDIES

### Bangladesh - Cox's Bazar refugee camp

#### Context

Cox's Bazar in Bangladesh hosts close to 1 million refugees making it one of the largest protracted refugee responses in the world.<sup>96</sup>[1] In 2017, following the intensification of violence in Rakhine State in Myanmar, Rohingya Muslims fled to neighbouring Bangladesh. The majority of the refugees in Bangladesh reside in overcrowded refugee camps and are not permitted to live or work outside the camps making them largely dependent on external support. A nutrition survey in late 2017 found a GAM rate of 18.1% among children 6-59 months.<sup>97</sup>[2] There were heightened risks of mortality among malnourished children from frequent disease outbreaks, and as a result, a comprehensive nutrition response was initiated. While acute malnutrition rates have declined over the years with GAM rates currently at 12.3%; levels of stunting and anaemia remain high among children under five years of age at 41% and 50.5% respectively.

#### Programmes

The response in Cox's Bazar has two components to supplement PBW/G:

- TSFP for the refugees in the camps and in the host communities
- Prevention/BSFP in the camps

#### Targeting and enrolment process

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<sup>96</sup>[1] <https://data.unhcr.org/en/country/bgd>

<sup>97</sup>[2] <https://reliefweb.int/report/bangladesh/emergency-nutrition-assessment-final-report-coxs-bazar-bangladesh-october-22-november-27-2017>

- Geographic targeting: BEP supplementation using specialised nutritious products is only taking place in camps hosting refugees (prevention and management) and host communities (management only).
- Household targeting: none applied.
- Individual targeting: all pregnant women are eligible (the pregnancy must be verified by test at a clinic or visible). Breastfeeding women and girls are eligible up until 6 months postpartum.
- TSFP enrolment criteria is <21cm MUAC with discharge is  $\geq 21$  cm for 2 consecutive visits or when 6 months postpartum is reached.

#### Products used and doses/rations

- Supercereal (WSB+) was being used for both programmes for PBW/G.
- For the BSFP prevention programme, 200g pppd was given. along with 500g oil per person per month.
- For the TSFP 250g pppd was given along with 500g oil per person per month.

These amounts were provided to account for the high rates of acute malnutrition at the start of the emergency response and also to account for household sharing.

#### Delivery Platform and integration

In host communities TSFP services and SBCC are integrated into health facilities at the community level known as family health and welfare clinics and community clinics.

In the camps, BSFP and TSFP are delivered in integrated nutrition centres which provide multiple services and are delivered alongside community-based activities and interventions aimed at ensuring access to nutritious food. These include: Management of child wasting (SAM and MAM), health and nutrition education sessions; IYCF and CMAMI sessions; Growth monitoring and promotion interventions, cooking demonstrations, mother-to-mother support groups, community “courtyard” awareness-raising sessions.

In addition, the household general food assistance provided is nutrition sensitive. E- Vouchers are used for the GFA and can be used in ‘fresh food corners’ established in the camps which have a wide variety of food including fresh fruit and vegetable and animal source food.

Vulnerable households receive a \$3 top-up (to the base amount which was initially \$12, but as result of funding reduction was reduced to \$10 and now is at \$8 per person per month) which they use to purchase fresh fruits, vegetables and animal source protein from the fresh food corner. The WFP Retail team negotiates with suppliers in terms of price and the items on the list on a monthly basis. There is also a nutrition-sensitive homestead gardening programme which is linked to support groups and SBC work.

#### Indicators used

- The TSFP programme uses the standard TSFP indicators also used in child wasting programmes (number admitted, % discharge cured, % defaulted, % died, non-response) as well as length of stay in the programme.
- The BSFP programme currently tracks numbers reached as well as product utilisation and plans to begin tracking MDDW.

### Successes and enablers

The last survey findings from 2023 show low undernutrition (underweight/ thinness) rates in PBWG at under 2% with MUAC less than 21cm. This is compared to a survey in 2017 where close to 8% had a MUAV under 21cm.

The programme has been well-funded and the nutrition budget ringfenced as it is seen by donors and other stakeholders as a successful and essential programme. Introduction of ‘fresh food corners’ in the camp which supported a nutritious home diet is viewed to have had a large impact on dietary diversity.

### Challenges and barriers

Sharing occurs within the household, but GFA is a fairly large food basket and other simultaneous multiple interventions for all ages have helped reduced sharing overall.

## **Somalia**

### Context

Persistent food insecurity, conflict, and protracted population displacement, as well as recurrent droughts and floods, have adversely affected Somalia for many decades. The current humanitarian situation is dire with severe drought, hunger, disease and ongoing conflict and instability severely affecting food security, health and nutrition of the most vulnerable population, in particular women and children.

### Programmes

The undernutrition (underweight/ thinness) prevention and management programme is primarily an emergency response. Different models of prevention programmes are being implemented with a large-scale programme linked to GFA (with MUAC screening incorporated) as well as a prevention programme implemented where possible through the Maternal and Child Health Nutrition (MCHN) centres. In the absence of such MCHN, prevention support is provided through a Blanket Supplementary Feeding Programme during the lean season.

### Targeting and enrolment process

#### MCHN/ BSFP

- Geographic targeting is usually done through the selection of hot spot districts with IPC 3, 4 and 5 populations and GAM prevalence of above 15%. In case of limited resource availability, further prioritization is based on levels of food insecurity (IPC 4+) and GAM prevalence of 20% and above. The data used are from food security and nutrition assessments (FSNAU) conducted twice per year.



- Household targeting: Food insecure, HH with PBW/G, IDPs, marginalised/minority clan; based on vulnerability criteria.
- Individual targeting: children under 2 years and for PLWs visible or verified pregnancy up to 6 months postpartum. For the MCHN programme the pregnancy must be verified at the centre.

For enrolment into the TSFP, admission is based on MUAC measurements for PBW/G with a MUAC less than 21 cm. Discharge is >21cm for 2 consecutive weeks. The use of a lower MUAC threshold is due to usually limited resources.

#### Product and dose

Supercereal and Supercereal plus (CSB+/++) are provided as part of the prevention programme. The products are chosen based on donor funding and availability. During pipeline breaks, cereals/pulses/oil are distributed instead. Daily ration 100 g of CSB++ or cereals, oil and pulses. To manage undernutrition (underweight/ thinness) in very exceptional cases, rations might be substituted with LNS-MQ or LNS-LQ if no CSB+/++ or dry food rations available.

In two IDP areas, cash top ups are being piloted. Monthly cash-based transfers are 35 USD per household with a PBW/G and a CU2 for 6 months, on top of a regular GFD cash transfer. The transfer value for GFD is area specific and determined by the cash working group.

#### Delivery Platform and integration

TSFP / BSFP/MCHN are mainly delivered through implementing partners including local and international partners, using existing health facilities where possible.

TSFP are provided at health facilities or by CHWs as part of the mobile teams

Prevention resilience programmes are integrated with MCHN services and provided as part of a package including ANC/PNC

#### Indicators used

SPHERE standards are used for TSFP (numbers admitted, recovery rate, default rate, mortality rate)

For BSFP programmes, post distribution monitoring assesses coping strategies and on some occasions uses IYCF indicators.

A coverage survey is being conducted in Q4 2023. No coverage survey was done in the last two years due to COVID, famine prevention scale up response in 2022/2023 and security issues.

#### Successes and enablers

Scale up of TSFP last year as well as the integration with food security and health scale up led to an improvement of the malnutrition prevalence by mid-2023.

Good collaboration between UNICEF and WFP: commitment to improve co-location of nutrition services and increase use of the same implementing partners for management of undernutrition (underweight/ thinness) as well as harmonized tools and reporting.

#### Challenges and barriers

- Lack of funding for prevention - short term cycles and lack of predictability of funding, affecting ability to plan as well as ensuring continuity of prevention programming
- TSFP can be viewed as a food distribution programme

- Challenges with supply chain due to security and access constraints can create difficulties in delivering commodities in time and lower trust from beneficiaries due to lack of continued quality service provision
- PBW/G are not included as standard in food security and nutrition assessments. Inclusion requires repeated advocacy and additional funding support by WFP
- Household selection is based on vulnerability criteria but monitoring is a challenge due to access constraints. Targeting criteria and approach for GFD is under revision
- BSFP and GFD should ideally be provided together, in practice this is not always the case due to rotation of GFD beneficiaries in/out of the programme and changes in GFD funding prompting reprioritization of districts and caseload.

## **Afghanistan - Large-scale programmes to address maternal undernutrition (underweight/ thinness)**

- Scale up programme across the country
- BSFP through general food distribution quickly at scale

### Context

Afghanistan has experienced decades of conflict and severe drought followed by the takeover of Afghanistan by the Taliban in 2021. The political changes resulted in collapse of economic structures, leading to heightened economic and food insecurity. Increased restrictions on women’s employment and participation in public life make the context even more challenging.

### Programmes

In Afghanistan, undernutrition management and prevention programmes are implemented in all 34 provinces.

### Targeting and enrolment process

- Preventive supplementary feeding programmes are implemented alongside general food assistance (GFA) to GFA receiving households
- Undernutrition (underweight/ thinness) management programmes are based on national protocols using MUAC of <23cm for enrolment criteria and discharge at >23cm for 2 consecutive visits.

	Prevention:	Management:
Geographic targeting:	Areas with high food insecurity as per IPC, high prevalence of acute malnutrition/ undernutrition	All provinces
Household targeting:	Households eligible for general food assistance	No Household targeting

Individual targeting:	Women/girls with visible and/or verified pregnancy and breastfeeding mothers up to 6 months postpartum	As per national iMAM protocol for moderate acute malnutrition (6-59 mo) and undernutrition (underweight/thinness) (PBW)
Product and Dosage:	Children under 5: LNS-MQ (Wawamum) 50g/p/d PBW: Supercereal (WSB+) 100g/p/d	Children 6-59 mo: RUSF (Achamum) 100g/p/d  PBW: Supercereal (WSB+) 250g/p/d, or LNS-PLW (Maamta) 75g/p/d

### Product and dose

The product is selected based on availability and affordability of products

### Delivery Platform and integration

Prevention: Provided through GFA receiving households with PBWG receiving BSFP. There are arrangements for GFA and BSFP at the same distribution site. Beneficiaries also receive SBC at the distribution sites.

TSFP: Delivered at health facilities or through Mobile Health Nutrition Teams (MHNTs). It is integrated with the national Basic Primary Healthcare system (BPHS), MIYCN/ SBC and is implemented in close coordination with UNIC EF through the same cooperating partners.

### Indicators used:

- Prevention: Number of beneficiaries reached. This is tracked by monthly partner reports and commodity tracking reports.
- Management: Output and Performance indicators: Recovery rate, mortality rate, defaulter rate, non-response rate, program coverage, average length of stay and average weight gain.
- Data are captured in patient cards, registers, national nutrition database, nutrition cluster database, monthly partner reports

### Successes and enablers

- Quick scale up of both TSFP and prevention programmes with the aim to cover all UNICEF sites for TSFP. Next step is to enhance quality in these locations with ambition to target 100% of cluster target.
- Able to reach large numbers with BSFP when this is linked to GFA.

### Challenges and barriers

- Ban on female workers for the NGOs although the health sector is exempt and female staff are allowed to come to clinics. However, implementation of Nutrition surveys will prove challenging in the absence of female enumerators.

- Funding constraints mean that both prevention and management programmes will be scaled back while the needs are increasing.

## India- Integrated Child Development Scheme (IDS)

### Context

India is the largest contributor of undernourished people in the world with an estimated one third of all malnourished children globally. The National Family Health Survey 5 (NFHS 5) conducted in 2019/20 found that 36 percent of children under age five years were stunted, 19 percent are wasted and 32 percent underweight.

### Programme

To address malnutrition, India introduced the Integrated Child Development Services (ICDS) programme in 1975, which is one amongst many programmes. The ICDS is a comprehensive programme for early childhood care and development and is also covered under the National Food Security Act, 2013 making the supplementary nutrition available as an entitlement for its beneficiaries. Its main objectives are to improve the nutritional and health status of children under six years of age, to lay the foundation for proper psychological, physical and social development of the child and to reduce the incidence of mortality, morbidity, malnutrition and school dropout.

This is managed through the Ministry of Women and Child Development which is separate to the Ministry of Health.

The Supplementary Nutrition Programme (SNP) is a component of the Integrated Child Development Services (ICDS) and aims to provide nutritious meals and snacks to children and PBWG to address malnutrition and promote healthy growth. Children between 3-6 years of age receive a hot cooked meal at the anganwadi centres while children between 6-36 months, PBW/G and out of school adolescents girls receive a take home ration (THR).

No.	Categories	Nutrition Norms
1.	Children (6-36 months)	Energy – 500 Kcal Protein – 12 to 15 g
2.	Children (3-6 years)	Energy – 500 Kcal Protein – 12 to 15 g
3.	Severely malnourished children (3-6 years)	Energy – 800 Kcal Protein – 20 to 25 g
4.	Pregnant women & Nursing mothers	Energy – 600 Kcal Protein – 18 to 20 g

### Targeting and enrolment process

All PBWG from registration of pregnancy (based on visibility of clinical verification and up to 6 months postpartum).

#### Product and dose

PBWG receive take home rations (THR) with varying types of foods depending on the location each containing around 600 kcal and 18-20 g protein.

THR is fortified in some states:

- Madhya Pradesh: 50% RDA (iron, zinc, folate, b6, b12, vit D)
- Gujarat: Premix enriched with essential micronutrients (iron, vitamin A, calcium, thiamine, riboflavin, niacin, vitamin C and folic acid at 50% RDA)
- Uttar Pradesh: Calcium, iron, zinc, vitamin A, B1, B2,B3,B6,B9,B12, vitamin C are added to the THR

#### Delivery Platform and integration

This programme is delivered through a network of “Anganwadi” centres. These are community-based centres staffed by female Anganwadi Workers.

The production and type of THR varies by location. In some cases they are commercially produced, in others they are produced by NGOs and in some locations the THR are made through women’s groups.

Other services offered at the centres include: nutrition and health education - program aims to raise awareness about good nutrition and health practices among caregivers, especially mothers.

Early Childhood Education: ICDS centres provide early childhood education to promote cognitive and social development in children.

Other services are provided such as immunization, health check-ups including growth monitoring and gestational weight gain monitoring and referral services.

#### Successes and enablers (programmes)

- Large scale delivery of food supplements to PBWG
- The programme has helped to raise awareness about the importance of a balanced diet during pregnancy
- Variety of mechanisms used to produce supplements from commercial production to production by local women’s groups
- Regular growth and weight monitoring of pregnant women helps identify women at risk of maternal malnutrition

#### Challenges and barriers

- Quality of implementation and adequacy of services which may limit impact
- Funding Constraints: challenges related to inadequate funding and resource allocation hamper service coverage and continuity

- Coverage of centres: limited access to centres in some countries (cost norms insufficient for products for PBW/G), particularly in remote and marginalised communities
- Lack of documentation on impact on maternal malnutrition and poor birth outcomes.

## ANNEXES

### Annex 1: Matrix sent to country offices

Number	Question	Example	Prevention of malnutrition/poor birth outcomes programme (1 column for each)	Management of undernutrition in PBW/G
<b>Location and Setting</b>				
1	Country	Ethiopia		
2	Sub-national region/area	Gambala		
3	Context (acute/protracted emergency/refugee etc, natural disaster, conflict and type of location urban/rural/camp etc. Please include multiple answers/settings as applicable)	Refugee camp		
<b>Programme Design</b>				
4	Type of programme (BSFP, TSFP or ANC/PNC, etc.)	TSFP	BSFP	
5	What are the targeting criteria used for the programme?			
	Geographic criteria	High food insecurity levels, high prevalence of undernutrition (underweight/ thinness) among women of reproductive age, government priorities, WFP capacity and access in the region		
	Household (HH) criteria (if any)	Food insecure, with PBW/G, headed by female, elderly or child		

	Individual criteria (if any)	PBW/G belonging to vulnerable HH, marginalised groups		
6	What delivery platform are being used (including both nutrition specific and nutrition sensitive)? (Health facilities, GFD, community groups, etc.)	Health facilities, community groups for screening and outreach		
7	Transfer modality used (SNF/cash/voucher) If SNF, specify type of product (FBF, LNS, etc.)? If cash/voucher, specify the amount	SNF FBF (WSB+)		
8	Why was this/these intervention(s) chosen? (this intervention instead of a different one ie. BEP and not CBT) (rationale)	Cash support not permitted. Available product		
9	Amount given/time (ie. 20g sachet per day ; xx kg of super cereal plus per month etc). If cash/voucher, specify the amount	Daily ration 200 g of WSB dry flour, 10 mL daily ration of oil		
<b>Programme Implementation</b>				
10	Implementation modality (I/NGO partners, through government, etc.)	direct through partners with support of the government (Administration for Refugee & Returnee Affairs)		
11	Inclusion/enrolment criteria	Pregnant (verified or visible) women/girls or up to 6 months postpartum with MUAC <21cm		
12	Duration/discharge criteria	MUAC >22cm		



13	Responsibility for screening (e.g. by health workers, community volunteers, NGO partners, etc.)	health workers and community volunteers		
14	Delivery modality (e.g. take-home, on-site feeding, etc.)	take home rations		
15	Delivery frequency (e.g. daily, weekly, biweekly, monthly, etc.)	monthly	weekly	
16	Other accompanying interventions (e.g. food/cash assistance, SBC, MIYCN sensitisation and counselling, micronutrient supplementation, ANC,PNC, etc.)	food assistance (in kind), BSFP, mother to mother support groups for MIYCN, ANC/PNC, radio messaging for nutrition	GFD, SBCC	
<b>Monitoring &amp; Evaluation</b>				
17	Performance indicators	% discharge cured, % defaulted, % died		
18	How indicators are tracked/monitored?	Patient card and programme database		
19	Available disaggregations of data (e.g. by ethnicity, with HIV/AIDS, TB, and other marginalised groups.)	no		
<b>Additional Information and Recommendations</b>				
20	Available/ used tools and guidance	Ethiopia National Guidance for IMAM (2019)		
21	Successes and enablers	to be discussed in KII	to be discussed in KII	to be discussed in KII
22	Challenges and bottlenecks	to be discussed in KII	to be discussed in KII	to be discussed in KII

23	Perceptions on the effectiveness and appropriateness (including inclusivity and reach) of the existing targeting and delivery mechanisms	to be discussed in KII	to be discussed in KII	to be discussed in KII
24	Suggestions and recommendations for the maternal nutrition decision tool (if any)	to be discussed in KII	to be discussed in KII	to be discussed in KII
25	Suggested partners to consult (if any)	names and contact details of partners		
<b>Available Documentations</b>				
26	Reviews			
27	Evaluations	2017 CSP		
28	Case studies			
29	Country-specific research/studies (both published & unpublished)			

## Annex 2: Interview Guide

Date of Interview:			
Location:			
Team members present:			
Notes by:		Date completed:	
Interviewees			
Name	m/f	Designation (position/unit/organisation):	Contact (email/phone)

**Introduce the review and obtain verbal consent for interviewing and recording.** We are Sophiya Uprety, Joseph Njau and Alison Donnelly. We are conducting a review of pregnant and breastfeeding women and girls with the aim of mapping interventions and ultimately to create a maternal decision tool to inform global work maternal and adolescent nutrition. The interview will take about one hour to complete. Your participation is entirely voluntary.

Any personal information that you give us, such as your name, will be kept confidential and will be shared only within the study team. We will remove your name before sharing the information you give us outside of the study team

Do you have any questions about participating?

- If yes, answer any questions.
- If no, move to the next question.

Do you agree to participate?

- If yes, thank them for agreeing to participate and move to the next question.
- If no, thank them for their time and politely leave.

Can we audio record the conversation?

- If yes, proceed with audio recording.
- If no, say that it is no problem and proceed without audio recording.

### Questions

1. As an introduction, can you tell us briefly about your role and your involvement in programmes for PBW/G?

2. What is the current situation in your location for PBW/G?(acute/protracted emergency etc, natural disaster, conflict and type of location urban/rural/camp etc.)

3. Are you implementing any BEP/SNF/CBT programmes that target PBW/G with the aim of managing undernutrition (underweight/ thinness)? What product is used (if applicable) and how much is given? If cash is used, what amount is provided and how often?

4. Are you implementing any BEP/SNF/CBT programmes targeting PBW/G with the aim of preventing undernutrition (underweight/ thinness)? PBW/G and/or poor birth outcomes (e.g. SGA, LBW, wasting, maternal and neonatal mortality). What product is used (if applicable) and how much is given? If cash is used, what amount is provided and how often?

5. Why was this intervention chosen? (this intervention instead of a different one ie. BEP and not CBT) (rationale)

6. For each of the programmes mentioned:

- a) What approach/criteria do you use for targeting (geographic, household, individual)
- b) What are the enrolment and discharge criteria for each of these programmes (if applicable).
- c) Is there a specified duration?
- d) What is the modality (home, onsite etc) and frequency
- e) what is the expected outcome of the intervention (prevention of undernutrition (underweight/ thinness), gestational weight gain, improved birth weight etc)
- f) Inclusion of PBW/G suffering from HIV/AIDS, TB and/or from marginalised groups

7. How are these programmes- BEP/SNF/CBT- implemented (direct, through government etc)? What delivery platforms are used?

8. Was the modality (BEP/SNF/CBT) well accepted and utilised by beneficiaries?

9. Are other services provided with this intervention? Which ones? How does the integration work?

10. Which indicators are monitored and how? (including coverage)

11. Are the data available and can they be shared?

12. What would you say have been some successes from this programme and what has enabled these successes?

13. What have been some challenges or bottlenecks?(prompt on perceptions on the effectiveness and appropriateness (including inclusivity and reach) of the existing targeting and delivery mechanisms)

14. Do you have any other thoughts or suggestions that you would like to share for this review and the maternal tool?

## **Annex 3: Composition of products based on the minimum specification**

### **Definition of balanced energy-protein supplement (BEP)**

Balanced energy-protein supplements (BEP) are supplements where protein provides less than 25% of total energy content.<sup>98</sup> In pregnant women in undernourished populations, BEPs are provided to reduce the risk of SGA and stillbirths. BEPs are also provided to breastfeeding women and children under five to prevent and manage malnutrition. There are many types of BEPs, but the following products are used in WFP's supported programmes supplementing PBW/G:

#### **a) Supercereal**

Supercereals can be corn based (CSB) or wheat -based (WSB). These are further divided into supercereal (CSB+/ WSB+), suitable for women and child aged five and above, and Supercereal Plus (CSB++/WSB++) for children under five. The latter contains skimmed milk powder and refined oils which are more digestible levels of protein and fat for younger children while WSB+/CSB+ do not. These products are consumed as a porridge and are prepared by cooking with water.

#### **b) Lipid-based nutrient supplements (LNS)**

Lipid-based nutrient supplements (LNS) are another type of BEP supplement. A specific LNS formulation for PBWG has now been formulated to adhere to the formulation in the BMGF technical group recommendation. Studies have shown that provision of LNS in and pregnant and breastfeeding girls and women can improve birthweight, birth length, newborn stunting and wasting.<sup>99, 100, 101, 102</sup> These products, unlike the Supercereals, can be eaten immediately from the packet.

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<sup>98</sup> <https://www.unicef.org/media/115361/file/Maternal>

<sup>99</sup> Ota, E., Hori, H., Mori, R. et al. (2015). Antenatal dietary education and supplementation to increase energy and protein intake. *Cochrane Database of Systematic Reviews*, 2015 (6).

<sup>100</sup> Hambidge, K.M., Westcott, J.E., Garcés, A. et al. (2019). A multicountry randomized controlled trial of comprehensive maternal nutrition supplementation initiated before conception: the Women First trial. *American Journal of Clinical Nutrition*, 109(2): p. 457-469

<sup>101</sup> Das, J. K., Hoodbhoy, Z., Salam, R.A., et al. (2018). Lipid-based nutrient supplements for maternal, birth, and infant developmental outcomes. *The Cochrane database of systema*

<sup>102</sup> Adu-Afarwuah, S. (2020). Impact of nutrient supplementation on maternal nutrition and child growth and development in Sub-Saharan Africa: the case of small-quantity lipid-based nutrient supplements. *Maternal & Child Nutrition*, 16(S3): p. e12960.

	Unit	Supercereal (100g of finished product)	Supercereal+ (100g of finished product)	Small-quantity lipid- based nutritious supplement (100g)	LNS for women and girls (100g)	
Energy	Kcal	380	400	550	510	
% Energy from protein	%	15	16	9	15	
Protein	g	14	16	12	18.8	
Fat	g	6	9	40-53g	26-39.3 g	
Retinol (Vit A)	IU	800	800	2000	733	
Thiamine (Vit B1)	mg	4	0.4	1.5	1.6	
Riboflavin (Vit B2)	mg	1.6	1.6	2	1.73	
Niacin (Vit B3)	mg	10	10	20	19	
Pantothenic acid (Vit B5)	mg	2	2	-	-	
Vitamin B6	mg	0.8	0.8	1.5	2.3	
Biotin (Vit B7)	mg	8	8	-	-	
Folate (Vit B9)	µG DFE	160	160	667	533	
Cobalamin (Vit B12)	µG	2	2	2.5	3.2	
Vitamin C	mg	60	60	75	133	
Vitamin D	µG	8	8	25	29.3	
Vitamin E	mg aTE	8	8	20	96	
Vitamin K	µG	20	20	150	96	
Calcium (Ca)	mg	340	420	1400	667	
Iodine (I)	µG	40	60	450	279	
Copper	mg	-	-	1.7	1.3	
Iron (Fe)	mg	9	9	30	29	
Phosphorus (P)	mg	400	400	982	400	
Potassium (K)	mg	580	650	1000	-	
Zinc (Zn)	mg	8	8	40	20	

Source: <https://foodqualityandsafety.wfp.org/en/specifications>

## Annex 4: Summary of BEP Trials

Study	Country	Inclusion/enrolment criteria	Discharge criteria	Sample Size (includes controls)	Product	Dose	Outcomes
Argaw et al (2023)	Burkina Faso	Age 15-40 with gestational age <21 completed weeks	Arm 1 - antenatal: birth Arm 2 - postnatal: 6 months post partum	1897	LNS	MQ 393 kcal daily (20% from protein)	Prenatal BEP supplementation resulted in a significantly higher LAZ and lower stunting prevalence at 6 months of age, No significant effects from the postnatal BEP supplementation on LAZ or stunting at 6 months.
De Kok et al (2021)	Burkina Faso	Pregnant women aged between 15 and 40 years (average gestational age was 5.4 months)	10 weeks after enrolment	80	LNS, Biscuit	MQ LNS: 72 g (389 kcal daily; 14.5-g protein) Biscuit: 75 g (375 kcal; 16.5-g protein).	Both BEP supplements were positively evaluated. There was no difference in appreciation, convenience or intended daily use between the lipid-based peanut paste and vanilla biscuit after a consumption period of 4 weeks
Khan, G. et al (2021)	Pakistan	Pregnant women need access to full article to for gestational age	6 months postpartum	2030	FBF (WSB+)	LQ 633 kcal per day. Monthly ration of 5 kg (i.e., 165 g/day)	Significant reductions in risk of wasting and underweight were observed in infants at 6 months of age in the intervention as compared to the control group (after adjustment). A significant reduction in anemia was noted in infants at 6 months of age in the intervention as compared to the control group in adjusted analysis. There was no difference in weight gain during pregnancy between the intervention and control groups The reduction in the prevalence of LBW was not different between intervention and control groups
Sher, N. et al (2020)	Pakistan	Pregnant women, primigravida pre-eclamptic whose BMI was less than the requirement for their gestational age	delivery	60	LNS (LNS PLW)	MQ 400 kcal daily 75g sachet	Significant positive effect on gestational age at delivery significantly improved with LNS-PLW supplementation Significant positive effect on birth weight of the babies improved with maternal supplementation with LNS-PLW There was no significant difference in systolic blood pressure, while diastolic blood pressure with LNS-PLW supplementation. The hemoglobin concentration increased with the LNS-PLW supplement Conclusions: The pregnancy and maternal outcomes of underweight pre-eclamptic women can be improved by the prenatal daily supplementation of LNS-PLW during pregnancy, along with IFA and regular antenatal care and follow-up
Callaghan-Gillespie, N. et al. (2017)	Malawi	Moderately malnourished pregnant women >18 y of age. Moderate malnutrition was defined as a midupper arm circumference (MUAC) $\geq 20.6$ and $\leq 23.0$ cm. 0 cm) a fundal height (FH) <35 cm	3 month postpartum	1800	LNS or FBF 1) RUSF, CSB+ with UNIMMAP, 2) CSB+ with IFA	LQ The RUSF provided 920 kcal/d, 36 g of protein/d, The CSB+ with UNIMMAP ration had amounts of energy, protein, and micronutrients similar to the RUSF	PBWG receiving RUSF had the highest weight gain during supplementation. Newborn birth weights and lengths were similar across intervention groups, but the incidence of newborns with a birth weight under ,2.4 kg was higher in the CSB+ with UNIMMAP group than the other groups At birth, HIV-exposed newborns had a similar length and weight as newborns without HIV exposure, but their head circumference was Smaller. Conclusion RUSF improved maternal weight gain compared with CSB+ with UNIMMAP. The large amount of food given and the modest effect on linear growth in newborns suggests that stunting in utero is unlikely to be reduced by supplemental food alone.



Ashorn et al. (2015)	Malawi	Pregnant women $\geq 15$ years of age who came for antenatal care confirmed pregnancy of $\leq 20$ completed gestation weeks	6 months postpartum	869	LNS	SQ 118 kcal/day	LNS reduced the risk of preterm birth and increased birth weight and length. No significant difference in the primary outcome of small-for-gestational-age (SGA) infants
Flax, V et al (2012)	Malawi	HIV infected breastfeeding women. Mother and infant interventions began within 36 h of delivery	28 wk postpartum or until breastfeeding cessation, if earlier.	3572	LNS	LQ 745 kcal per day 20.8g protein	Maternal supplementation did not reduce the odds of infant weight or length faltering from 0 to 24 wk in any arm. These results indicate that blanket supplementation of HIV-infected lactating women may have little impact on infant growth.
Adu-Afarwuah, S et al. (2016)	Ghana	Pregnant women $\leq 20$ weeks gestation	6 months postpartum	1320	LNS	SQ 118 kcal per day	Significant impact on improving LAZ and WAZ of infants. No impact on MUAC.
Ullu et al (2019)	Bangladesh	Pregnant women with gestational age $\leq 20$ wk	6 months postpartum	4011	LNS	SQ 20g daily 118 kcal 2.6g protein	Providing LNSs to women or LNSs or MNP to children generally did not increase or decrease childhood illnesses.
Persson, L et al (2012)	Bangladesh	Pregnant women with gestational age $\leq 14$ wk (arm 1 early invitation) Pregnant women around 20 wk gestation (arm 2 - joining the study at a time of their choosing)	3 months postpartum	4436	LNS (locally made probably without CMV)	LQ 608 kcal of energy and 18 g of vegetable protein. 6 days per week	Among pregnant women in poor communities in Bangladesh, treatment with multiple micronutrients, including iron and folic acid combined with early food supplementation, vs a standard program that included treatment with iron and folic acid and usual food supplementation, resulted in decreased childhood mortality.
Ali, E et al (2015)	Bangladesh	PLW were admitted to the nutrition programme if they were found with (MUAC) $< 170$ mm or the presence of severe nutritional oedema $\geq$ grade three] or were at risk of malnutrition (MUAC $< 210$ mm).	MUAC $> 220$ mm, oedema $<$ grade two and were assessed as being of good clinical status for at least two consecutive visits.	248	LNS (RUTF)	500-1500 kcal per day. 1-3 packs of 92g. Based on the measured MUAC threshold, PPN daily dose was prescribed (one to three packs per day) for 2-5 months. Along with the nutritional support, PLW were offered antenatal and postnatal care.	193 (78%) women found RUTF unacceptable, of whom 12 (5%) completely rejected it after 4 weeks of intake.  Overall, 39% attributed side effects to PPN intake including nausea, vomiting, diarrhoea, abdominal distension and pain. Despite a perceived beneficial therapeutic effect, only two in 10 women found RUTF acceptable for nutritional rehabilitation.

Ceesay, S et al (1997)	Gambia	Chronically undernourished pregnant women (can't see from the paper that enrolment was based on height though) as possible to 20 weeks' gestation as judged by clinical examination.	The villages were randomised to intervention (supplement provided from around 20 weeks' gestation to term) or control (supplement provided for 20 weeks after delivery)	1460	Locally made biscuit	LQ 2 biscuits Maximum of 1015 kcal 22 g protein, 1.8 mg iron.	Supplementation increased weight gain in pregnancy and significantly increased birth weight, particularly during the nutritionally debilitating hungry season (June to October).  Birth length and duration of gestation were not affected. Supplementation significantly reduced perinatal mortality. Mortality after 7 days was unaffected.  Conclusion: Prenatal dietary supplementation reduced retardation in intrauterine growth when effectively targeted at genuinely at-risk PBWG. This was associated with a substantial reduction in the prevalence of stillbirths and in early neonatal mortality. The intervention can be successfully delivered through a primary healthcare system.
Bliznashka, L (2022)	Niger	Pregnant women <30 weeks' gestation at the time of enrolment	Delivery	3332	LNS	SQ 237 kcal and 5.2g protein. Women in the LNS arm received a daily 40-g sachet of fortified, ready-to-use food	Compared with IFA, MMS and MQ-LNS had no effect on child LAZ, WAZ, or WLZ at 24 mo of age (P > 0.05). Children in the prenatal MQ-LNS arm had significantly higher mid-upper arm circumference at 24 mo than children in the MMS arm: Conclusions Prenatal MMS and MQ-LNS had limited effect on anthropometric measures of child growth up to 24 mo of age as compared with IFA in rural Niger.
Leroy, J et al	Burundi	All pregnant women (at or after the fourth month of gestation) and mothers of children aged <6 mo	Not clear (likely up until child was 6m)	2566	FBF (CSB and oil)	Not clear. The program provided a monthly ration of Corn Soya Blend (CSB), vegetable oil, and sugar to pregnant and lactating women, as well as children under the age of two.	Haemoglobin decreased and anaemia increased markedly from baseline to follow-up for both children and mothers who had given birth in the previous 3 months
Galasso, E et al (2019)	Madagascar	Pregnant women (second or third trimester) and infants younger than 12 months were enrolled in the trial.	6 months postpartum	3738	LNS	SQ 235 kcal and 5.2g protein for PLW. 40g sachet	Supplementing PBWG conferred no additional benefit.

Taneja, S et al (2021)	India	Mother–infant dyads (infants ≤7 d of age) initiated into breastfeeding and enrolled within 7 d of birth.	6 months postpartum	816	Locally produced snack (5 types)	LQ 600 kcal with 25–30% of energy (150–180 kcal) from fats and 13% of energy from proteins (80 kcal). The snack contained 20 g of protein from a mix of plant- and animal-source proteins, with ~30% (5.4–6 g) of the protein coming from a dairy source. Micronutrient supplementation was provided for a period of 180 d as daily tablets that provided 80–100% of the RDA of vitamins A, D, E, C, B-6, B-12, and C; thiamin; riboflavin; niacin; folate; iron; zinc; iodine; selenium; and copper	The intervention did not achieve a significant effect on LAZ at 6 mo (adjusted mean difference: 0.09; 95% CI: –0.03, 0.20). Exclusive breastfeeding at 5 mo was higher (45.1% vs. 34.5%; RR: 1.31; 95% CI: 1.04, 1.64) in the intervention group compared with the controls. There were no significant effects on mean haemoglobin concentration or the proportion of anaemic infants at 6 mo of age compared with the control group. We noted significant effects on maternal nutritional status (BMI, MUAC, haemoglobin concentration, and proportion anaemic).
Lama, T et al (2021)	Nepal	The efficacy trial will supplement pregnant women starting from their second trimester at 14 weeks	8 week trial (discharge after 8 weeks)	80	LNS or vanilla biscuits	MQ LNS 72 g (389 kcal; 14.5-g protein Biscuits: of 75 g 375 kcal; 16.5-g protein).	Overall self-reported compliance was high: medians of 91.1% in the lipid-based peanut paste group and 96.4% in the biscuit group.
Janmohamed, A et al (2016)	Cambodia	Pregnant women, at least 18 y old, in the first trimester of pregnancy	delivery	547	CSB plus And vitA and D fortified oil	LQ The daily CSB Plus ration (200 g of dry flour) provided ~760 kcal, 27 g protein (14% of total kcal), and 5 g fat (6% of total kcal). The 10-mL daily ration of oil provided ~90 kcal of additional energy.	In Cambodian women, CSB Plus consumed during pregnancy did not significantly increase maternal weight gain or improve birth size but did reduce maternal anaemia in late gestation and preterm birth in comparison with women consuming a normal diet (control).
Krebs, N et al (2020)	DRC, Guatemala, India, and Pakistan	Nonpregnant women and pregnant women (depending on study arm)	Delivery	2408	LNS	SQ 2.6 g protein and 118 kcal and 22 micronutrients in quantities appropriate for pregnancy. Women in Arm 1 and Arm 2 (once on the primary supplement) who were underweight or had inadequate gestational weight gain were provided an extra protein-energy supplement of 300 kcal and 11 g protein (~15% of energy) without additional supplemental micronutrients.w	Linear growth for the LNS interventions was statistically greater.  Conclusions Improved linear growth in early infancy observed for the 2 intervention arms supports the critical importance of maternal nutrition before conception and in the early phase of gestation.

## Annex 5: Geographic targeting criteria for TSFP by country

Country	Whole country coverage plans?	Geographic targeting data used					Other criteria for are selection
		Food security Data	Child wasting data	PBW/G under nutrition (underweight/thinness) Data	Other sector data	Use of IPC	
Afghanistan	Yes						Co-location with UNICEF/health system scale up plan
Bangladesh	Refugees and host only						
Cameroon	Yes	x					
Chad	No	x	x		x	x	Presence of IDPs, refugees
Ethiopia	No	x	x		x		Presence of IDPs, refugees
Kenya	No	x	x	x		x	Priority 15 counties agreed with BHA
Madagascar	No	x		x		x	
Mauritania	No	x	x			x	
Myanmar	No	x	x				Conflict affected population, townships under martial law
Nigeria	No						
Pakistan	No						
Somalia	Yes	x	x				
South Sudan	No					x	
Syria	No						
Yemen	Yes						Co-location with SAM treatment

## Annex 6 Product provided and ration amount for TSFP

Country	Supercereal	Ration (pppd)*	LNS	Ration (ppd)
Afghanistan	WSB+	250g	LNS-PLW (Pilot)	75g
Bangladesh	WSB+	250g		
Chad	CSB+ and CSB++	200g		
Ethiopia	CSB+	250g		
Kenya	CSB+ and CSB++	250g		
Mauritania	CSB+	250g		
Myanmar	WSB+	200g		
Pakistan			LNS (Mamta, local)	75g
Somalia	CSB++	250g		
South Sudan	CSB++	200g		
Syria			LNS-LQ	100g
Yemen	WSB+	200g		

## Annex 7: Geographic targeting of prevention programmes

Country	Programme type	Geographic targeting
Afghanistan	Emergency BSFP	
Bangladesh	Emergency BSFP	Rohingya Refugee Camps only
Cameroon	Emergency BSFP	North areas using Cadre Harmonise
Chad	Emergency BSFP	IPC, Cadre Harmonise
	Resilience	Longer term food insecure

Ethiopia	Emergency BSFP	IDP camps in Tigray, Afar, AMhara (now closed)
	Refugee programme	refugee camps
Kenya	Emergency	For areas of high GAM levels >30%
Madagascar	Emergency (prevention of undernutrition (underweight/thinness))	Food insecurity assessment - mainly IPC done twice a year - WFP and other actors decide on the priority communes based on resources they have.
	Resilience (prevention of stunting)	Geographical targeting - ICA - Integrated context Analysis Multiple indicators, chronic, wasting and FS data. Communes are categorised and they prioritise based on this. 5 year commitment. Started with 4, now 11 (want to do 33)
Maurtania		1. Refugee camp (Malian refugees) 2. Agro-pastoral crisis marked by drought - IPC-like 3, 4 and 5; SMART surveys;
Myanmar	Resilience	based on past surveys
	Emergency	
Somalia	Emergency	IPC 4 and 5 populations and GAM prevalence of above 15% (currently targeting about 20%).
	MCHN	IPC 4 and 5 populations and GAM prevalence of above 15% (currently above 20% GAM prevalence due to resource availability)
South Sudan	Emergency	IPC phase 4 with pockets of populations in IPC 5 (Targeting used to be in locations in IPC phase 3 and above but reduced due to funding cuts;Refugees in camps
	Resilience	N/A -
Yemen		<ul style="list-style-type: none"> <li>• Districts with GAM <math>\geq</math> 15%</li> <li>• Districts with GAM <math>\geq</math> 10% and IPC AFI in Phase 4</li> <li>• Districts that are Pocket for IPC AFI``</li> </ul>

*Summary of available TSFP and BSFP programmes in 15 countries*

Country	Management (TSFP)	Prevention (BSFP)
Afghanistan	yes	yes
Bangladesh	yes	yes
Cameroon	no	yes
Chad	yes	yes
Ethiopia	yes	yes
Kenya	yes	yes
Madagascar	no	yes
Mauritania	yes	yes
Myanmar	yes	yes
Nigeria	no	yes
Pakistan	yes	yes
Somalia	yes	yes
South Sudan	yes	yes
Syria	yes	no (cash)
Yemen	yes	yes

The geographic targeting for BSFP in most countries used the same data and process as that to selecting locations for TSFP (Table 6). Annex 2 lists the specific geographic targeting.

*Targeting criteria for prevention programmes*

Country	Whole country coverage plans?	Geographic targeting data used					Other criteria for are selection
		Food Security Data	Child wasting data	PBW/G undernutrition (underweight/	Other sector data	Use of IPC and/or CH	

				thinness) Data			
Afghanistan	Yes						
Bangladesh	Refugees and host only						
Cameroon	Yes	x	x			x	
Chad	No						
Ethiopia	No						Emergency response, IDPs/host community and refugees
Kenya	No	x	x	x		x	
Madagascar	No					x	
Mauritania	No	x	x				refugees
Myanmar	No						
Nigeria	No						
Pakistan	No						
Somalia	Yes	x	x			x	IDPs
South Sudan	No						Refugees and IDPs
Syria	No						
Yemen	Yes		x			x	

In Bangladesh, the BSFP was only being implemented in the refugee camps so no other geographic targeting criteria were applied.

The remaining nine countries providing TSFP services for PBW/G followed a geographic prioritisation process.

Most countries used Integrated Phase Classification (IPC) Acute Food Insecurity Classification (provides differentiation between different levels of severity of acute food insecurity) / Cadre Harmonise process or equivalent and any available nutrition data for their geographic targeting. Two countries, Chad and Ethiopia, also overlaid the data of additional sectors such as WASH and Health as part of the prioritisation process.

Based on the resources available, countries selected the most severely affected locations for intervention. Most countries using the IPC classification targeted locations in IPC phase 3,4 and 5. In the case of Somalia, just districts with populations in IPC 4 and 5 were targeted. Where malnutrition data were used to select locations for intervention, in most cases this was data on child wasting. However, Kenya and Madagascar used PBW/G undernutrition (underweight/ thinness) rates as part of their selection criteria.



Table 5: Summary of prevention programme objectives, eligibility, duration, and programme implementation

Country	Programme type*	Why implemented			Who is eligible?		Duration			How delivered			
		Prevention of wasting/stunting	Other health or nutrition objectives	Increasing access to services	True blanket	GFA HH only	Short term recurring (ie. lean season)	Short term one off (ie. rapid onset emergency)	Continuous	Part of the GFA - in same basket	Part of the GFA - separate distribution point	Linked to health service access	Linked to nutrition service access
Afghanistan	E												
Bangladesh	E												
Cameroon	E												
Chad (emergency)	E												
Ethiopia	E (nationals)												
	E (refugee)												
Kenya	E												
Madagascar	E												
	R												
Mauritania	E												
Myanmar	E												
	E												
Nigeria -- why is this	empty												
Somalia	E												

	R												
South Sudan	E (relief)												
	E (protracted)												
	R												
Yemen	E												

*\*E-emergency; R-Resilience*