Why SBCC with Market Based Approach Creates Synergy

Sustainable Nutrition Improvement Cycle

"Ghana PPP Model" by Market Base Approach with SBCC

"TEAM BEHAVIOUR CHANGE"

MINISTRY OF HEALTH · KOKO Plus Foundation · ESM Foundation

2 UNDERSTAND

SBCC of 4-Star diets including proteins and micronutrient powder

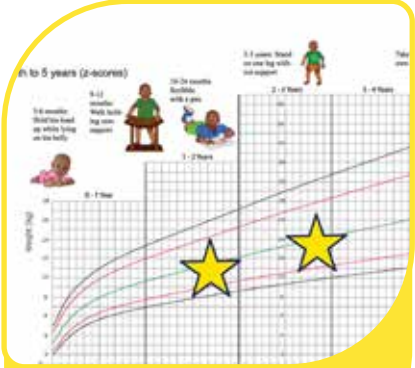
SBCC continues through other media forms

TV

ACTION (PURCHASE) 3

Mothers go and buy 4-Star diets including proteins and micronutrient powder

1 ASSESSMENT



Baby grows well and mothers come back smiling & confident

5 DESIRED RESULTS

Feed appropriate complementary food every time

ACTION (FEED) 4

6TH EDITION
JUNE, 2024

MINISTRY OF HEALTH · KOKO Plus Foundation · ESM Foundation · From the People of Japan · WFP World Food Programme

Sustainable Nutrition Improvement Cycle

"Ghana PPP Model" by Market Base Approach with SBCC

"TEAM BEHAVIOUR CHANGE"

TRAINING REVIEW

NAME

POSITION

REGION

DISTRICT

HEALTH CENTER

EXPECTATIONS

NEW KNOWLEDGE & SKILLS ACQUIRED

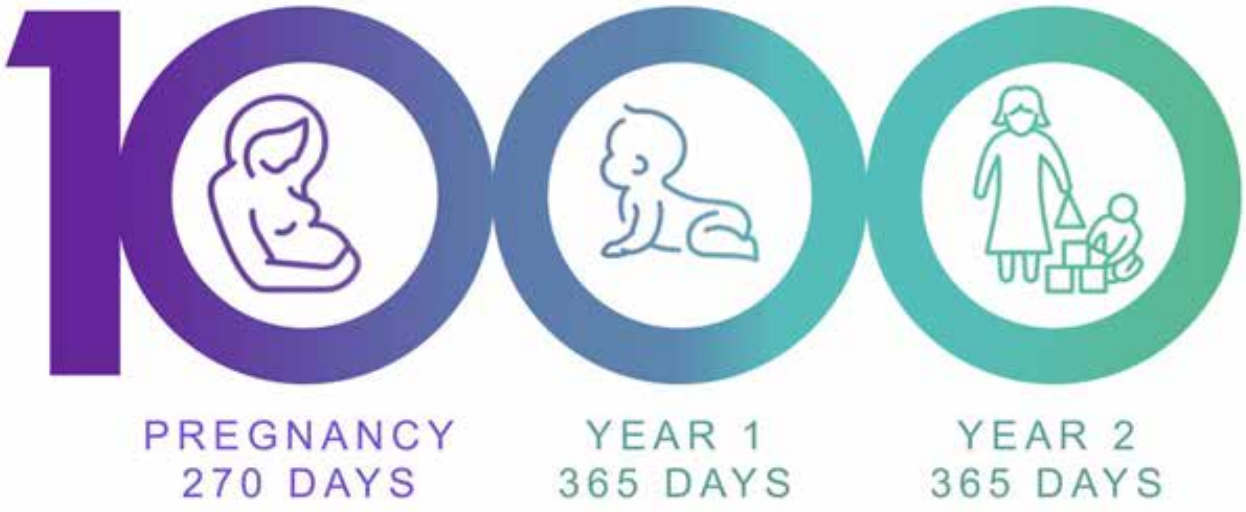
WHICH KEY SECTION(S) OF THE WORKSHOP DO YOU NEED FURTHER CLARIFICATION ON?

From the People of Japan

HOW TO FILL THE NUTRIENT GAP?

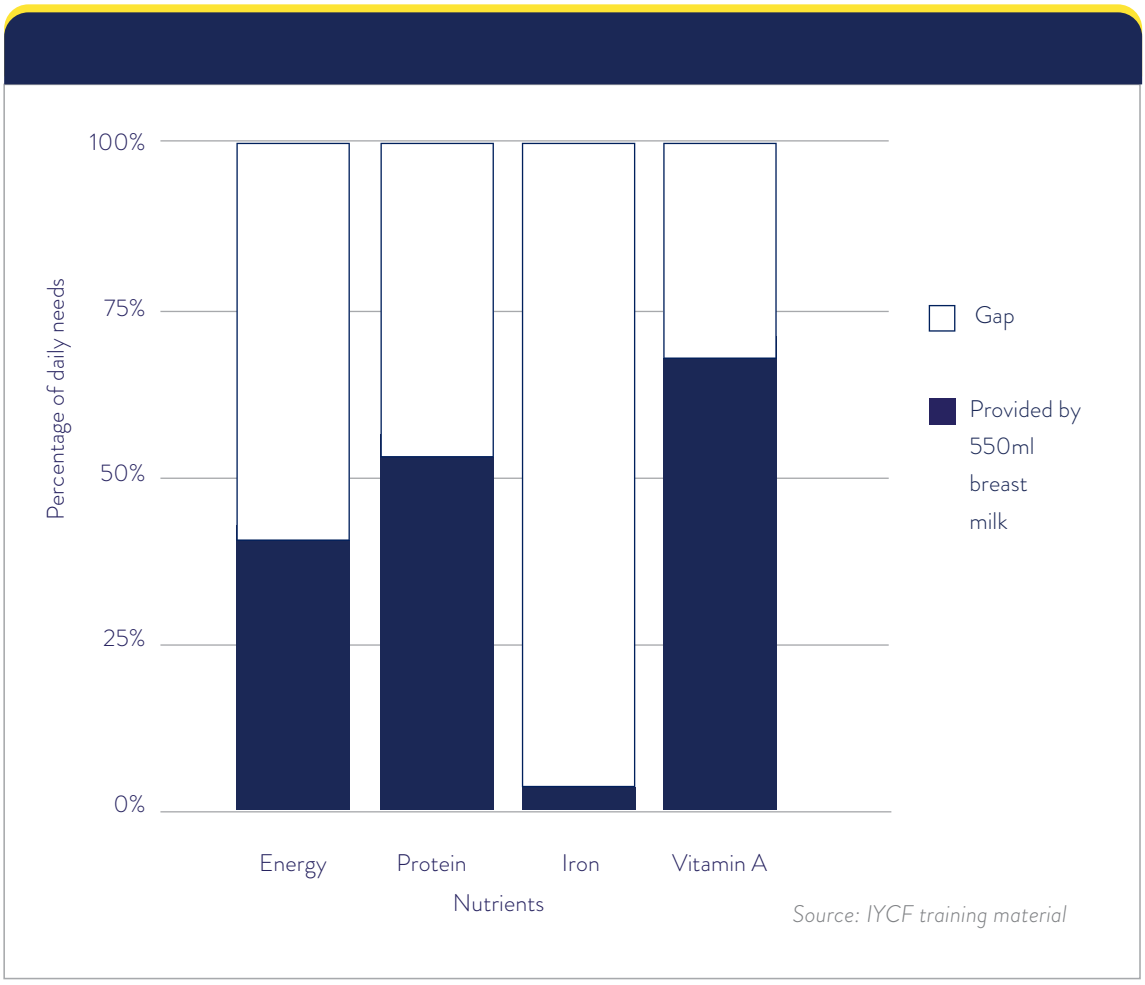
Through SBCC with Market Based Approach!

The first 1,000 days refers to a child's life from the moment they are conceived until they reach 2 years of age (24 months). It is described as a unique period of opportunity because it is when the foundations of optimum health, growth, and neurodevelopment across the lifespan are established. Scientific evidence shows that during the first 1,000 days, the brain grows more quickly than at any other time in a person's life and a child needs the right nutrients at the right time to feed her brain's rapid development In particular, protein, iron, zinc and iodine are essential to the rapidly developing brain.



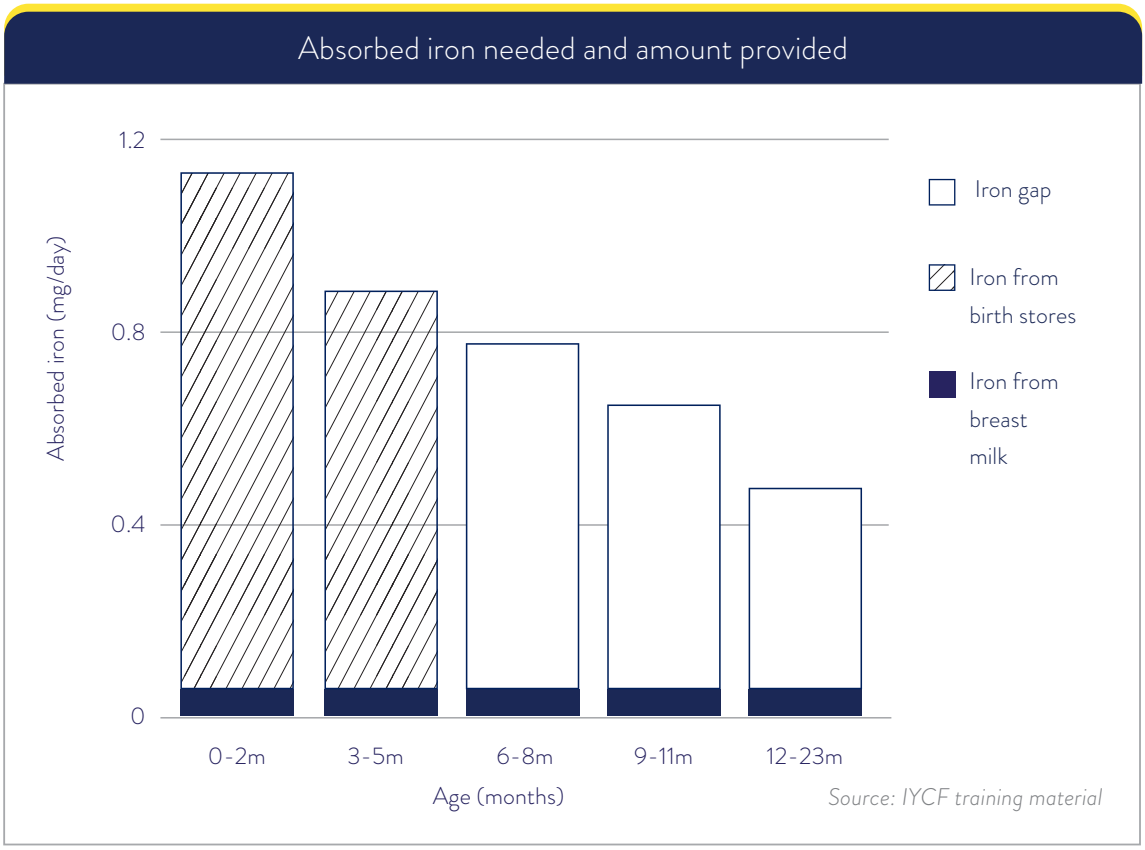
Exclusive breastfeeding is recommended for children 0 up to 6 months as breastmilk alone satisfies the daily nutrient requirement of these children. From 6-12 months, breastfeeding provide half or more of the child's nutritional needs, and from 12-24 months, at least one-third of their nutritional needs. This shows that from 6 months, breastmilk alone cannot help the child to meet his/her daily nutrient requirement creating gaps. A child must therefore receive appropriate complementary foods in addition to breastmilk to meet his or her daily nutrient requirement. The graphs below show the gaps in some key nutrients that child requires for optimal growth.

Gaps to be filled by complementary foods for a 12-23 months old child



The graph shows the energy, protein, iron, and vitamin A gaps that need to be filled by complementary foods for a breastfed child 12–23 months of age. The dark part of each bar shows the percentage of the child's daily needs that can be provided by an average intake of 550 ml of breast milk. The light part of the bar shows the gap that needs to be filled by complementary foods. The largest gap is for iron, so it is especially important that complementary foods contain iron, if possible from animal-source foods such as meat, organs, poultry, or fish. Pulses (peas, beans, lentils, nuts) fed with vitamin C-rich foods to aid absorption provide an alternative, but they cannot replace animal-source foods completely. Adding protein and micronutrient powders when recommended can also improve the iron intake in children.

Gap for iron



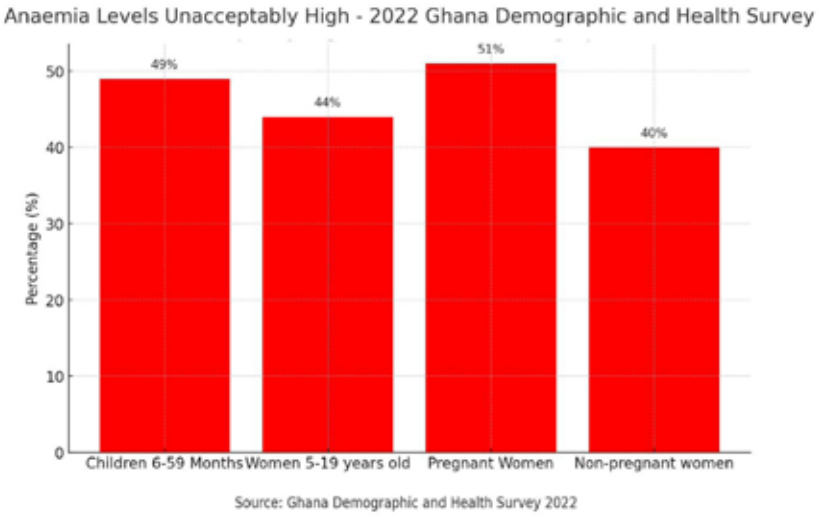
Gaps to be filled by complementary foods for a 12-23 months old child

Another nutrient gap to be filled is for iron. The young child needs iron to make new blood, to assist in growth and development and to help the body to fight infections. In this graph, the top of each column represents the amount of absorbed iron that is needed per day by the child. A full-term baby is born with good stores of iron to cover his needs for the first six months (This is the striped area). The black area along the bottom of the columns shows us that there is some iron provided by breast milk which contributes to the child's daily requirement. The young child grows faster in the first year than in the second year. This is why the need for iron is higher when the child is younger. However, these iron stores are used up over this first six months, so after that time we see a gap between the child's needs and what they receive from breast milk. This gap needs to be filled by nutritionally adequate complementary foods known as the four star-diet (The white area – this is the gap).

Effect of malnutrition: Missing "First 1,000 days" are irreversible

Anemia and the Potential of Protein and Micronutrient Powder as an intervention.

Anemia is an urgent public health problem that affects children and women throughout the life course and results in a high burden of morbidity and mortality. Though the recently released 2022 Ghana Demographic and Health Survey reported some significant decline in **the rates of Anaemia in children aged 6-59 months, close to half of these children still have Anemia (49%).**



Anaemia is a condition characterized by a decrease in the normal number of red blood cells or by low hemoglobin. Hemoglobin is the protein in red blood cells that transports oxygen to tissues. Anaemia is caused by multiple factors.Key among them are the prevalence of helminthic infections, malaria, and micronutrient deficiencies with the most common being iron and Vitamin A deficiency.

Anemia is diagnosed by hemoglobin levels below 110 g/L, with severity categorized as mild (100-109 g/L), moderate (70-99 g/L), or severe (below 70 g/L). Iron deficiency anemia, particularly prevalent in children aged 6 to 59 months, is a type of anemia that develops if you do not have enough iron in your body. It is the most common type of anemia. To help diagnose iron-deficiency anemia, a blood test is necessary to check your complete blood count (CBC), hemoglobin levels, blood iron levels, and ferritin levels. Iron is vital for brain function, especially during rapid growth periods like infancy. Iron deficiency can disrupt neurotransmitter production, hinder brain cell formation, and impair cognitive functions. Studies suggest a positive correlation between iron levels and IQ scores in children. This association translates to long-term benefits like increased productivity and higher wages in adulthood.

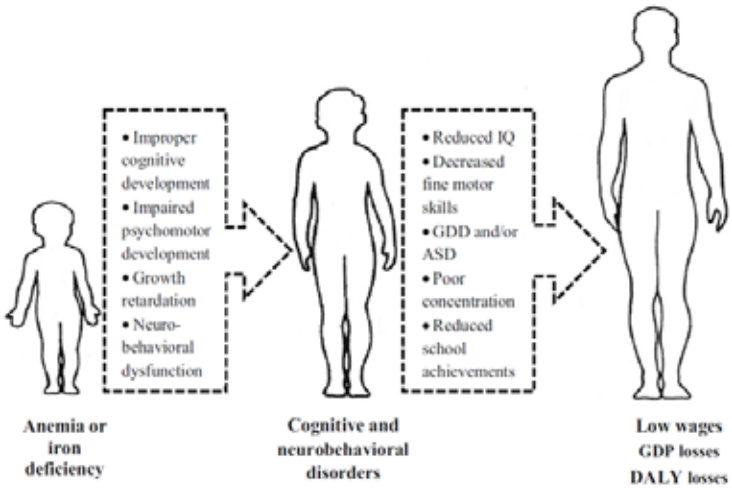


Figure outlines how iron deficiency affects lifetime earnings and the rationale for implementing iron fortification and iron supplementation programs;

Vallée L. Iron and neurodevelopment. Archives de Pédiatrie. 2017;24(5, Supplement). Adapted from 5S18-5S22.

Addressing anemia requires a comprehensive package of interventions, including malaria prevention, diagnosis, and treatment; helminth prevention and control; and nutrition-related strategies such as supplementation and fortification. In Ghana, anemia-related interventions targeting children encompass malaria prevention measures, deworming, and Vitamin A supplementation. However, coverage of these interventions remains a challenge, with some not reaching all children.

Efforts to improve micronutrient intake also include fortification and infant and young child feeding programs aimed at promoting dietary diversity. Mass fortification of vegetable oils with vitamin A is widespread, with over 95 percent of oil adequately fortified. However, there is a need for improvements in the production process for wheat flour fortification with multiple micronutrients, as well as the promotion of fortified food use and its coverage.

WHO's guideline on the use of multiple micronutrient powders for point-of-use fortification of foods has been suggested as an alternative to mitigate or overcome the constraints associated with supplementation and mass fortification. **They are intended to increase the vitamin and mineral intake of infants and young children aged 6 to 23 months as well as preschool and school-age children aged 2–12 years.**

These Micronutrients Powder are easy to administer, affordable, and can significantly improve iron status and reduce anemia. Expanding the age coverage of protein and micronutrient powder interventions is therefore essential to address the multifaceted challenges posed by anemia.

The Evidence

By ensuring access to fortified complementary foods across a broader age range, public health initiatives can mitigate the long-term consequences of anemia on cognitive functions, physical development, and productivity.

A review, encompassing thirteen trials with 5,810 participants across Latin America, Africa, and Asia, evaluated the efficacy of MNPs for point-of-use fortification in comparison to no intervention or placebo. The trials focused on children under 5 years of age, with some including participants aged 60 months or older.

Among Key Findings are children receiving iron-containing MNPs demonstrated significantly reduced risk of anemia and iron deficiency, coupled with higher hemoglobin concentrations.

Refer to appendix no. 4 "Percentage of Recommended Nutrition Intakes (RNI) supplemented

Please refer p. 23 for sources in the text.

> Anemia in children is unacceptably high

PROGRAM OVERVIEW

1

Previous Program Outcome

The Ghana Health Service (GHS) with support from the World Food Programme and KOKO Plus Foundation/The Ajinomoto Foundation made significant progress in the implementation of sustainable nutrition interventions using Nutrition Education and Counseling, Food Assistance, Recommendation and Access to Affordable Protein and Micronutrient Powder (Market Based Approach with SBCC) in selected districts within the Ashanti and Northern Regions from 2019 to 2021.

Key amongst the significant progress recorded were;

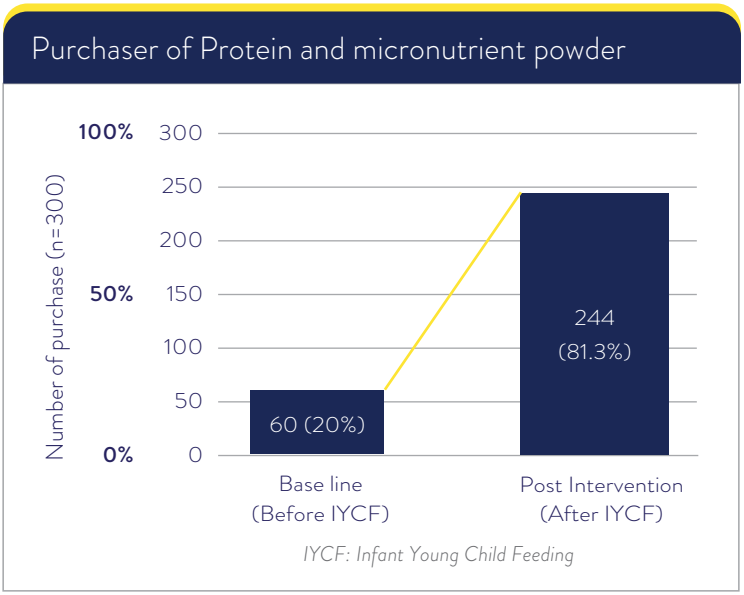
The improvement in Hb levels inchildren by 0.49g/dl averagely. This may be attributed to the fact that children of caregivers who received the nutrition education were 15% less likely to have anaemia at follow up.

Caregivers are willing to buy Protein and Micronutrient powder (even though it is NOT free) and practice appropriate feeding practice when they understand the benefits of feeding on a 4 Star Diet with Protein and Micronutrient Powder.

After the implementation of **Infant Young Child Feeding (IYCF)** interventions in the selected districts, care givers recorded a higher level of knowledge of IYCF practices. Additionally, the amount of Protein and Micronutrient Powder purchased also increased (graph below).

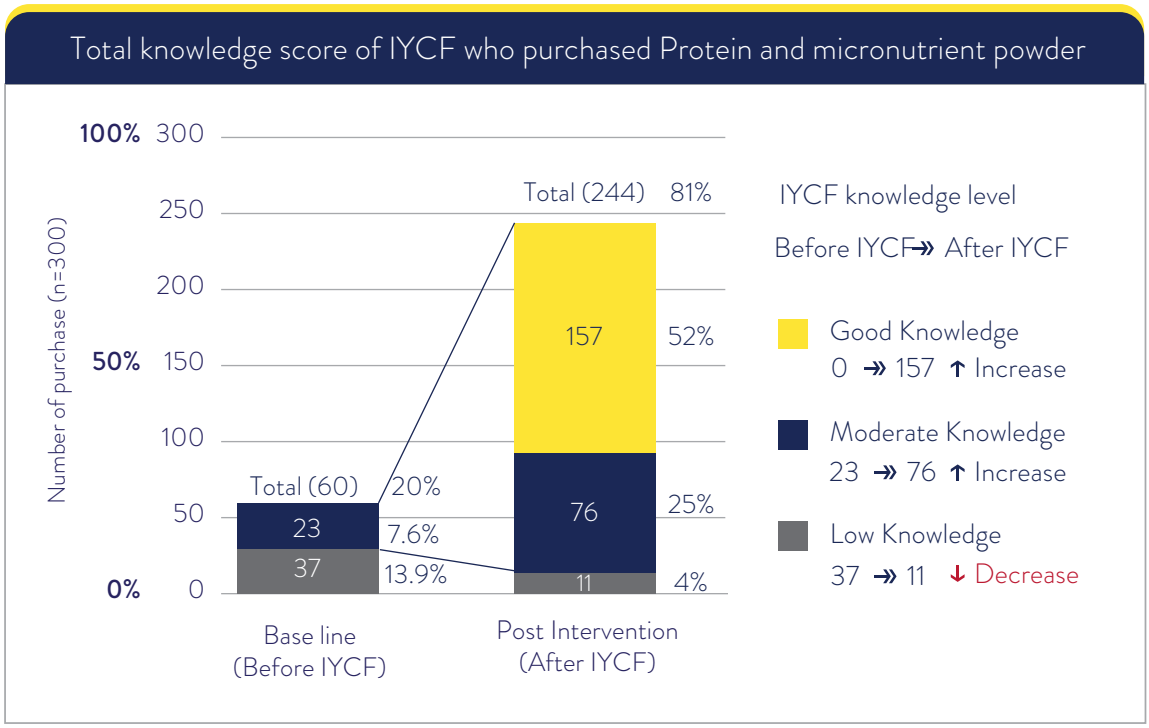
Similar improvements were found in other Infant and Young Child Nutrition (IYCN) indicators.

After IYCF, Purchasers of Protein and Micronutrient Powder increased



Effect of malnutrition: Missing "First 1,000 days" are irreversible

Purchase of Micronutrient Powder is an indication of IYCF knowledge



> **World Food Programme (WFP) officially registers Protein and Micronutrient Powder as "Nutritious Powder" in its food basket in February 2018.**

WFP World Food Programme

New program:

2

The significant progress recorded in the previous program as mentioned above, makes it important to scale up the use of Nutrition Education and Counseling, Recommendation and Access to affordable Protein and Micronutrient Powder (Market Based Approach together with SBCC) for sustainable social impact in this new program dubbed; **"The Program for Universal Nutrition and Health Coverage through Sustainable Systems for Nutrition Improvement"** to be implemented in 90 districts from October 2021 to March 2024. This project targets a population of 252,000 caregivers to be reached through SBCC and market based approaches.

> **Effect of malnutrition: Missing "First 1,000 days" are irreversible**

SBCC TOGETHER WITH MARKET BASED APPROACH

3 The goal of this program

To promote behavior change among caregivers in urban/peri-urban areas (90 districts) with comparably adequate purchasing power through training of frontline health staff on SBCC approaches, with special emphasis on dietary diversity (4-star diet) and recommendation of Protein and Micronutrients Powder through a market-based approach in collaboration with the Ghana Health Service.

Why Market-based Approach with Social and Behaviour Change Communication (SBCC)? 4

Market-based approaches are initiatives that generate viable livelihood opportunities by supporting the most marginalized to engage in markets, on better terms, and strengthening demand for the goods or services they produce. In light of the Sustainable Development Goals' pledge that 'no one will be left behind' market-based approach helps to engage low-income communities as customers, and supply them with products and services they can afford; or, as business associates (suppliers, agents, or distributors), to provide them with improved incomes. Social and Behavior Change Communication (SBCC) on the other hand uses the strategies of advocacy, behaviour change communication (BCC) and community mobilization to influence both individual and societal change.

The opportunities that SBCC and market-based initiatives present in promoting high impact SUSTAINABLE Nutrition Improvement for addressing malnutrition in Ghana is the reason this program will scale up the implementation of SBCC with Market Based Approach.

The program will use **the first 1000 days of life approach as the window of opportunity** to prevent malnutrition especially stunting and micronutrient deficiencies in children.

1000 Days Brain scans of normal / malnourished (Two 3-year old Children)

'UNICEF, WHO and World Bank 2018

Normal | Malnourished

Effect of malnutrition: Missing "First 1,000 days" are irreversible

SBCC TOGETHER WITH MARKET BASED APPROACH

A number of countries in Africa still have high stunting rate of around 40%

Source: World Health Organization, Child Growth Standards, 2014

Frontline health staff will be trained to promote SBCC approaches which encourages appropriate complementary feeding practices by caregivers.

Educating caregivers on appropriate and timely complementary feeding through the promotion of a four star diet is an essential response to fighting malnutrition, as a four star diet provides adequate nutrition for optimum growth.

However, the poor access to some of the locally available food products under the four star diet as a result of household food insecurity and high cost due to the seasonality limits the opportunities nutrition education and counselling present.

Health workers introducing and encouraging the use of four star diet alongside the Protein and Micronutrients Powders fill in the gaps where Four Star Diet cannot be obtained or there are gaps in the nutrient adequacy of the diet due to unavailability or poor access, seasonality, local preferences, cost and even traditional and religious norms including food taboos.

The health workers promoting SBCC will foster market-based approach that enables mothers to contribute to SUSTAINABLE systems for long-term nutritional improvement.

In ensuring availability and access to nutritious foods, Protein and Micronutrients Powder is delivered in close proximity (the last one mile) of beneficiaries around health facilities through local distributors and retailers.

Combining SBCC and delivery of nutritious foods, such as Protein and Micronutrients Powder, therefore ensures that beneficiaries are reminded to buy and use nutritious foods thereby sustaining behavior change leading to the prevention of malnutrition.

Effect of malnutrition: Missing "First 1,000 days" are irreversible

5 Creating a Cycle for Child's Optimal Growth

Caregivers visit health facilities routinely (e.g. CWC every month) based on maternal and child health care system.

Frontline Health Staff get information from caregivers (mothers) about children's nutrition situation and record it into the Maternal and Child Health Record Book (MCHRB)

Frontline health staff assess the growth and development of the child and help caregivers (mothers) to understand their children's nutrition status. The frontline health staff then, counsel mothers on appropriate IYCF practices in order for the mother or caregiver to understand the importance of nutrition and nutritious foods.

Frontline Health Staff introduce Protein and Micronutrients Powder to caregivers (mothers) as they encourage mothers to feed their children, a 4-Star diet.

Caregivers (mothers) act on nutrition information gained from frontline health staff's nutrition education and counseling by feeding their children 4-star diet with Protein and Micronutrient Powders where it is recommended.

Caregivers can realize the positive change in their children's nutrition and health status (from frontline health staff's feedback at next visit to health facilities).

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MINISTRY OF HEALTH

GHANA HEALTH SERVICE

KOKO Plus Foundation

ESM Foundation

2 UNDERSTAND

SBCC of 4-Star diets including proteins and micronutrient powder

SBCC continues through other media forms

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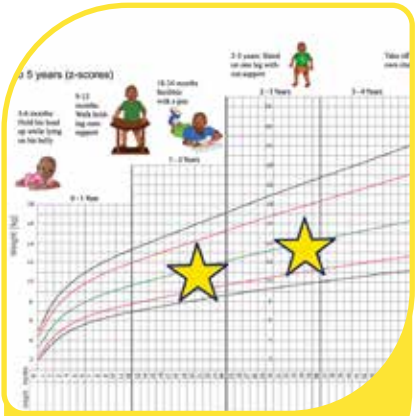
ACTION (PURCHASE) 3

Mothers go and buy 4-Star diets including proteins and micronutrient powder

1 ASSESSMENT



Baby grows well and mothers come back smiling & confident

5 DESIRED RESULTS

Feed appropriate complementary food every time

ACTION (FEED) 4

Program Partners and Their Roles

6

Ghana Health Service & KOKO Plus Foundation/ESM

By designing a SUSTAINABLE mechanism to encourage households to voluntarily purchase nutritious products (4-star diets) including Protein and Micronutrient Powders, the program funds will be focused on the nutrition education and counseling. Social and Behavior Change Communication (SBCC) will be promoted instead of food vouchers.

SBCC will be scaled up while ensuring nutritious products (4-star diets) including Protein and Micronutrient Powders are available in proximity to consumers.

Ghana Health Service

- The Ghana Health Service staff at the Family Health Division at the national level will lead and coordinate all implementation activities in line with the program activity plan and timelines.

- Additionally, national level staff at the Family Health Division will be responsible for strengthening the capacity of regional level staff through training, mentoring and coaching visits. Trainers who will in turn train district and frontline health staff in the SBCC approaches.

Regional and district level staff will play similar roles at their various administrative levels to ensure smooth implementation of all activities.

Health staff will be empowered to provide effective maternal, infant, and young child nutrition counselling including recommending the use of Protein and Micronutrients Powders where necessary.

KOKO Plus Foundation and ESM

- The KOKO Plus Foundation and ESM will work to strengthen the capacity of frontline health staff on how to recommend the use of Protein and Micronutrients Powders together with Ghana Health Service.

- Additionally, KPF and ESM will use community radios, radios, televisions to disseminate key Infant and Young Child Nutrition (IYCN) messages and introduction of Protein and Micronutrient Powder.

- KPF and ESM will lead the market based strategy by building the supply chain of locally produced Protein and Micronutrient Powder to the retailers around health facilities in the 90 districts and conduct on the job skill training for retailers including how to handle the sale of Protein and Micronutrients Powder, and monitoring and supervision for the selected retailers around health facilities in the target districts.

- ESM will monitor and report the number of Protein and Micronutrient Powder sold as a number of behavior change.

7

Program Indicator

	No.	Indicator	Year 1	Year 2
SBCC	1	Number of health staff trained by SBCC	2,400	3,000
	2	Number of health staff trained by orientation of Protein and Micronutrient Powder	2,400	3,000
	3	Number of whatsapp groups for health staff	40	50
		Number of articles, distribution information of Protein and Micronutrient Powder, and best practices by KOKO Plus Foundation and health staff	400	500
MARKET BASED APPROACH	4	Retail shops near-by CWC facilities in the target districts that handle Protein and Micronutrient Powder	80% of sellers around CWCs	80% of sellers around CWCs
	5	Retail shops near-by CWC in target districts are oriented on job skills including the benefit of CWC and Protein and Micronutrient Powder.	80% of sellers around CWCs	80% of sellers around CWCs
RESULTS OF SYNERGY	6	Number of sachets of Protein and Micronutrient Powder purchased in shops as the number of mothers who changed their behaviour	720,000	900,000

Protein & Micronutrient Powder

8

How can we monitor the effectiveness of Protein and Micronutrient Powder

Attains developmental milestones

As a result,

Key Messages on Protein & Micronutrient Powder

1. Protein and Micronutrient Powder is for children aged 6 months to 24 months

2. Add Protein and Micronutrient Powder to ready-to-eat family foods

3. Before feeding your child, wash your hands with soap and safe running water. Wash the child's hands and face as well

4. Always keep food clean and covered

5. Add Protein and Micronutrient Powder to your child's food; Do not feed your child only Protein and Micronutrient Powder

6. Give your child one sachet of Protein and Micronutrient Powder per day

7. Mix a portion of your child's food with one sachet of Protein and Micronutrient Powder and serve. Do not keep any remaining portion of the meal

8. Sick children (e.g., children with malaria, infection, fever, diarrhoea, etc.) should not be given Protein and Micronutrient Powder until they fully recover

9. Do not add Protein and Micronutrient Powder to food on fire

10. Do not add Protein and Micronutrient Powder to very hot food

11. Do not add Protein and Micronutrient Powder to beverages

12. Do not give Protein and Micronutrient Powder to children who are allergic to soy and soy products

13. Continue to breastfeed your child regularly in addition to the consumption of Protein and Micronutrient Powder

14. Continue to breastfeed your child for 2 years and beyond

15. Do not add sugar to baby's food when using Protein and Micronutrients powder

From the People of Japan

WFP World Food Programme

FREQUENT QUESTIONS & ANSWERS

- **Can it be given to babies below 6 months who have already started eating?**

- **Answer: No**, The Ghana Health Service (GHS) recommends exclusive breastfeeding for the first six months of a child's life. So, mothers should be counseled and supported to practice exclusive breastfeeding.

- **Can it be given to children above 2 years?**

- **Answer: Yes**, Protein and Micronutrient Powder can be given to children above 2 years however, the current dosage and formulation is recommended for babies six months to 2 years.

- **Why is the product not sold at the Health facilities?**

- **Answer:** To avoid issues on conflict of interest, GHS prohibits the sale of protein and micronutrient powder.

- **Why can't the nurses sell the products?**

- Answer: **GHS staff are prohibited from selling the products as per the regulations under conflict of interest.** The products are however sold in retail shops/outlets close to health facilities for easy accessibility. Health staff are to direct mothers and other consumers to these shops or outlets where the products are sold.

- **How many sachets of the product should be taken in a day?**

- **Answer: One sachet a day** is required.

- **How is the product stored?**

- Answer: Should **be stored in a cool dry area**. If you are unable to finish using it, fold it nicely, put it in a clean small plain plastic bag and tie it or container with a lid.

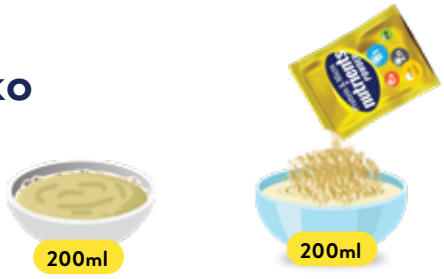
- **Can Protein and Micronutrient Powder be taken raw?**

- **Answer:** Though possible, **it is not recommended**. Protein and Micronutrient Powder is a food Supplement which must be added to already prepared food for the child to get the full benefits.

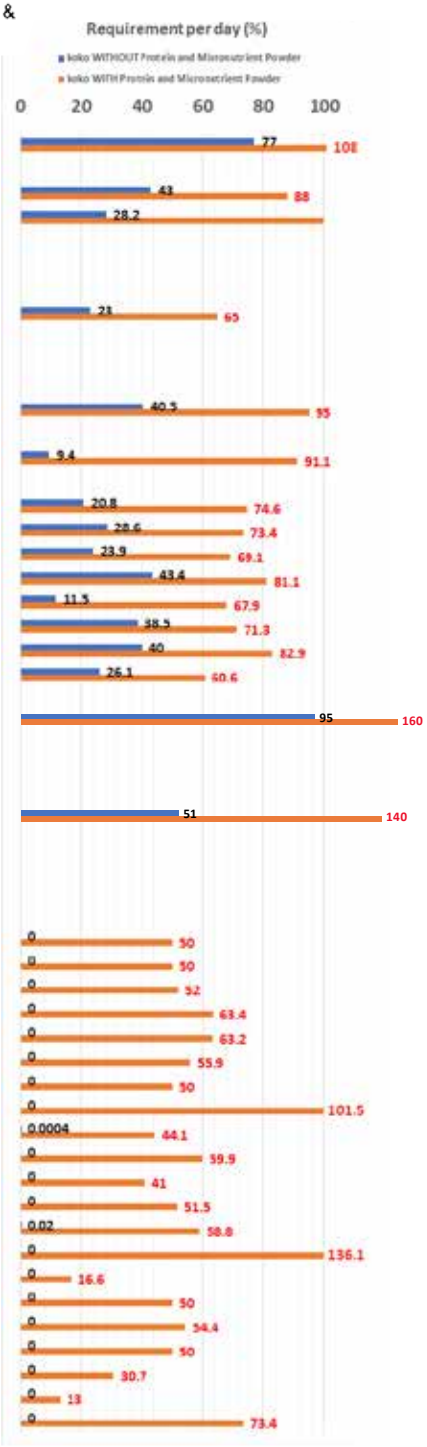
- **What foods can Protein and Micronutrient Powder be added to?**

- **Answer:** It has been made in such a way, that it **can be added to any food** so that no child will miss out on good nutrients in Protein and Micronutrient Powder. Examples of these foods include tom brown, porridge, rice porridge, different kinds of soups (Okro soup or stew, groundnut soup, light soup). However, adding it to certain foods **such as tea is not recommended**

Appendix 1:
Nutritional profile of Koko with and without Protein and Micronutrient Powder"



		Koko Without Protein & Micronutrient Powder		*Koko* With 15g of Protein & Micronutrient Powder	
	Requirement	Composition	% Met	Composition	% Met
Macronutrients					
Total energy, kcal	220	170	77	239	108
Protein, g		2.78		5.71	
PDCAAS		0.43		0.88	
Utilizable protein, g	4.25	1.20	28.2	5.00	118
PE ratio (% of total energy)		2.83		11.23	
Carbohydrate, g		36.78		29.73	
Carbohydrate (% of total energy)		86.72		66.80	
Fat, g	6.4	1.49	23	4.13	65
Fat (% of total energy)		7.90		20.87	
Poly unsaturated fatty acid composition					
Omega-6 (18:2 undifferentiated)		0.629		1.55	
Omega-6 (percent of total energy)	8.25	3.337	40.5	7.83	95
Omega-3 (18:3 undifferentiated)		0.020		0.13	
Omega 3 (percent of total energy)	1.1	0.103	9.4	0.67	61.1
Amino acid composition					
Tryptophan (g)	0.0795	0.017	20.8	0.059	74.6
Threonine (g)	0.285	0.082	28.6	0.209	73.4
Isoluecine (g)	0.315	0.075	23.9	0.218	69.1
Leucine (g)	0.635	0.275	43.4	0.515	81.1
Lysine (g)	0.545	0.062	11.5	0.370	67.9
SAA (Meth +Cys)	0.265	0.102	38.5	0.189	71.3
Histidine (g)	0.185	0.074	40.0	0.153	82.9
Valine (g)	0.425	0.111	26.1	0.258	60.6
Amino acid, mg/g protein					
Tryptophan	7.4	7.03	95	11.9	160
Threonine	27	34.59	128	41.9	160
Isoluecine	31	31.89	103	43.6	140
Leucine	63	116.76	185	103.0	160
Lysine	52	26.49	51	74.1	140
SAA (Meth +Cys)	26	43.24	160	37.8	150
Histidine	18	31.35	174	30.7	170
Valine	42	47.03	112	51.6	120
Micronutrient composition					
Vitamin A, µg RE	400	0.000	0	200.07	50.0
Folic acid, µg	90	0.000	0	45.00	50.0
Niacin, mg	6	0.000	0	3.12	52.0
Riboflavin, mg	0.5	0.000	0	0.32	63.4
Thiamine, mg	0.5	0.000	0	0.32	63.2
Vitamin B6, mg	0.5	0.000	0	0.28	55.9
Vitamin B12, µg	0.9	0.000	0	0.45	50.0
Vitamin C, mg	30	0.000	0	30.44	101.5
Calcium, mg	500	0.002	0.0004	220.32	44.1
Iron, mg	11.6	0.000	0	6.95	59.9
Magnesium, mg	50	0.000	0	20.48	41.0
Phosphorus, mg	100	0.000	0	51.48	51.5
Zinc, mg	4.1	0.001	0.02	2.41	58.8
Choline, mg	45.9	0.000	0	62.48	136.1
Panthothenic acid mg	0.35	0.000	0	0.06	16.6
Vitamin D, µg	5	0.000	0	2.50	50.0
Vitamin E, mg	5	0.000	0	2.72	54.4
Iodide, mg	0.09		0	0.05	50.0
Manganese, mg	0.6	0.000	0	0.18	30.7
Selenium, µg	10	0.000	0	1.30	13.0
Vitamin K, µg	15	0.000	0	11.02	73.4



Abbreviations: PDCAAS, Protein Digestibility Corrected Amino Acid Score; PE, Protein energy; SAA, Sulfur amino acids; RE, Retinol equivalent.

https://www.researchgate.net/publication/334056410_Development_and_Sensory_Shelf-Life_Testing_of_KOKO_Plus_A_Food_Supplement_for_Improving_the_Nutritional_Profiles_of_Traditional_Complementary_Foods

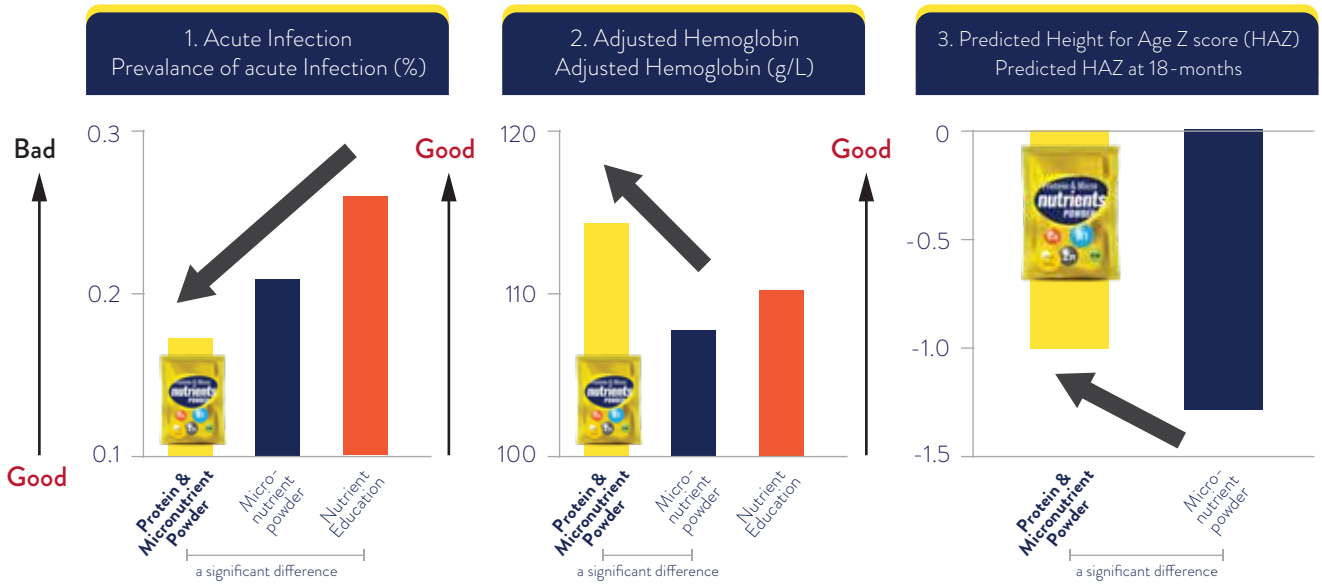
Appendix 2:

Nutritional Effect of Protein and Micronutrient Powder

A macro- and micronutrient-fortified complementary food supplement reduced acute infection, improved haemoglobin and showed a dose–response effect in improving linear growth: a 12-month cluster randomised trial

Journal of Nutritional Science (2019), vol. 8, e22, page 1 of 14

Shibani A. Ghosh, Nicholas R. Strutt, Gloria E. Otoo, Devika J. Suri, Judith Ankrah, Thomas Johnson, Paul Nsiah, Chie Furuta, Hitoshi Murakami, Gillian Perera, Kenneth Chui, Kennedy Bomfeh, Harold Amonoo-Kuofi, Kwaku Tano-Debrah and Ricardo Uauy



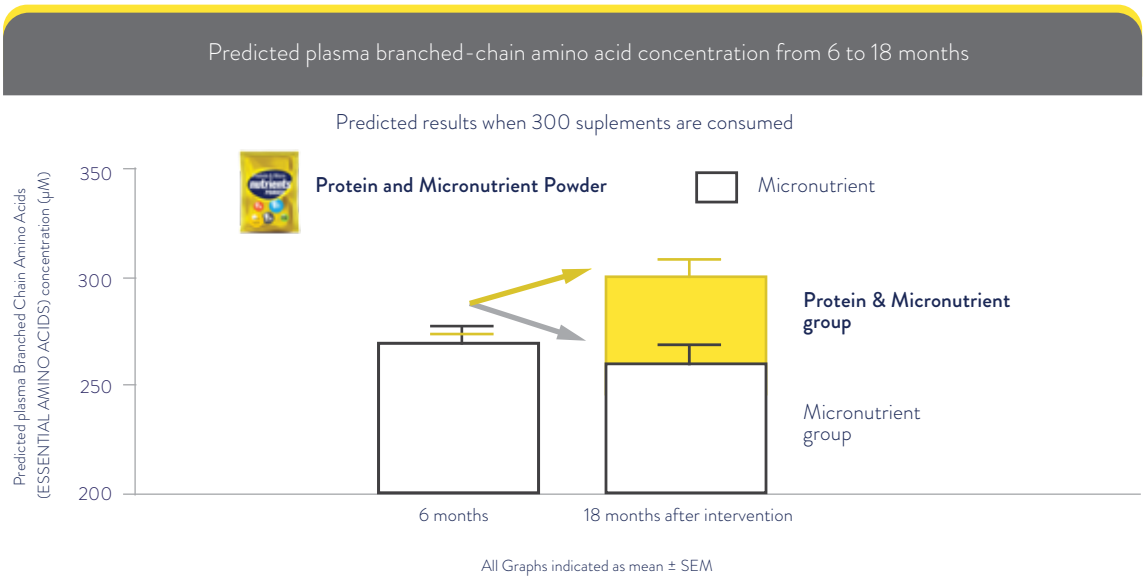
> World Food Programme (WFP) officially registers Protein and Micronutrient Powder as "Nutritious Powder" in its food basket in February 2018.

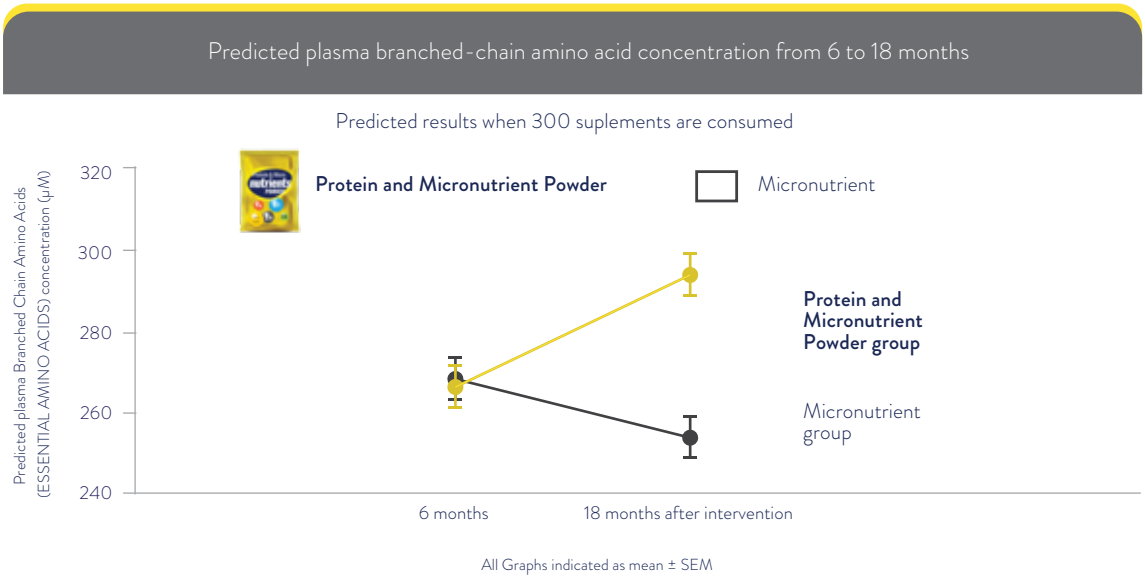
https://www.cambridge.org/core/services/aop-cambridge-core/content/view/51FB3309427E807879765937CDACBC75/S2048679019000181a.pdf/macro_and_micronutrientfortified_complementary_food_supplement_reduced_acute_infection_improved_haemoglobin_and_showed_a_doseresponse_effect_in_improving_linear_growth_a_12month_cluster_randomised_trial.pdf

Appendix 3:
Nutritional Effect of Protein and Micronutrient Powder

Changes of Plasma Amino Acid Profiles in Infants With a Nutrient-Fortified Complementary Food Supplement: Evidence From a12-Month Single-Blind Cluster-Randomized Controlled Trial

Chie Furuta, Wataru Sato, Hitoshi Murakami , Devika J. Suri , Gloria E. Otoo, Kwaku Tano-Debrah and Shibani A. Ghosh*





Results published in Frontiers in Nutrition, 2021

Appendix 4:
Percentage of Recommended Nutrition Intakes (RNI) supplemented

Percentage of Recommended Nutrition Intakes (RNI) supplemented by 1 sachet of Protein and Micronutrient Powder

Source Vitamin and mineral requirements in human nutrition
https://apps.who.int/iris/bitstream/handle/10665/42716/9241546123.pdf?ua=1

	Composition per 1 sachet of Protein and Micronutrients Powder	6month-3yrs % RNI met	4-6yrs % RNI met	7-9yrs % RNI met
Vitamin A mcg	200.07	50%	44%	40%
Iron mg	7.63	60%	55%	39%
Zinc mg	2.96	59%	50%	43%
Iodine mg	0.05	50%	50%	38%

Appendix 5

Supplementation Trial of Protein and Micronutrient Powder Among HIV Exposed Children in Accra

Latest research yet to be published

COLLABORATING INSTITUTIONS

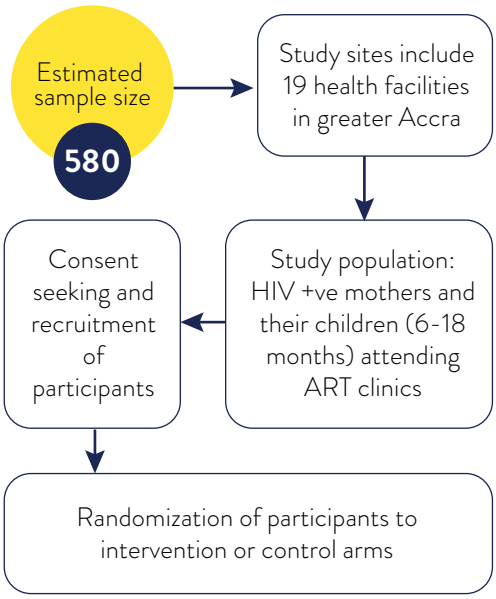
- UG Medical School
- Korle-Bu Teaching Hospital

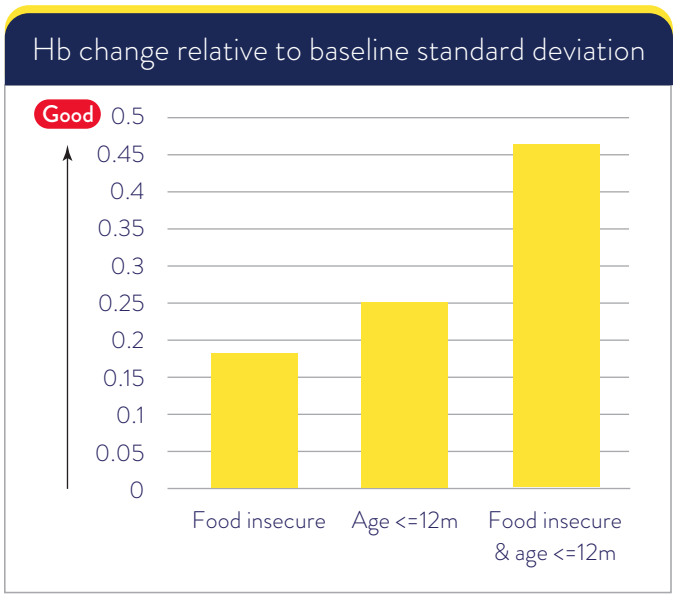
Background

HIV exposed children, regardless of their HIV status are at greater risk of malnutrition and consequently to an extent, slower motor and cognitive development than their HIV unexposed counterparts.

Aim

To test the effectiveness of Protein and Micronutrient Powder over a period of 6 months to improve nutritional status and child development in HIV exposed children 6-18 months of age in Accra.





Conclusion

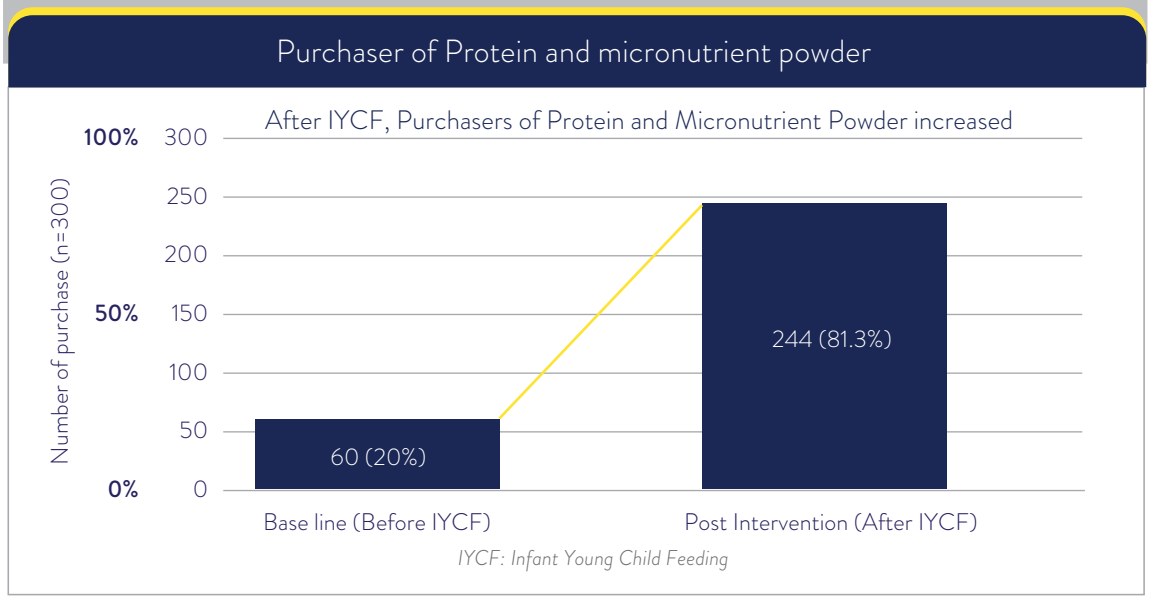
- Haemoglobin had significantly increased among both boys and girls of the intervention group when their households were food insecure and/or they were younger than 12 months at baseline.
- The impact of the intervention is the largest if the powder is given to younger children facing food insecurity.

https://www.ghanaweb.com/GhanaHomePage/health/Supplementation-intervention-to-improve-early-childhood-nutrition-and-HIV-exposed-children-launched-1728959

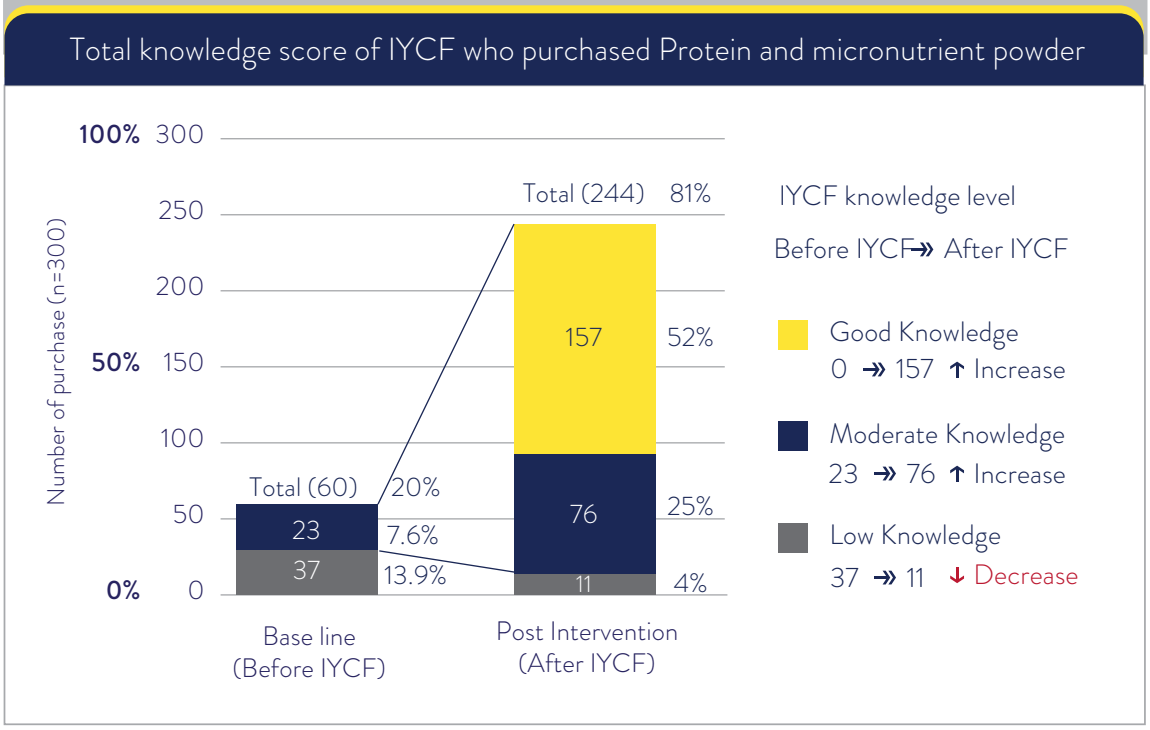
Appendix 6

Association between knowledge score categories and the Purchase of "Protein and Micronutrient Powder" at baseline and post-intervention

The proportions of caregivers buying Protein and Micronutrient Powder increased with increasing IYCF knowledge.



Purchase of Micronutrient Powder is an indication of IYCF knowledge



Appendix 6 (cont'd)

Association between knowledge score categories and the Purchase of "Protein and Micronutrient Powder" at baseline and post-intervention

Total knowledge score at Baseline						
Variables		Low knowledge	Moderate knowledge	Good knowledge	Total	Pearson Chi-Square
Purchase of "Protein and Micronutrient Powder" at baseline	Yes	37 (16.6)	23 (30.3)	0 (0)	60	0.032*
	No	186 (83.4)	53 (69.7)	1 (100)	240	
Total		223	76	1	300	
Total knowledge score at Post-intervention						
Purchase of "Protein and Micronutrient Powder" at baseline	Yes	11 (100)	76 (65.1)	157 (90.8)	244	<0.001**
	No	0 (0)	40 (34.9)	16 (9.2)	56	
Total		11	116	173	300	

Responses at baseline, post-intervention, and corresponding p-values

Source: M&E results of previous WFP-Ajinomoto Foundation-KOKO Plus Foundation project

Appendix 7

Research topics and their corresponding projects Market base approach and SBCC

Research Questions	Projects	Papers
Is poverty a significant constraint on the market-based approach?	Study (2016-2017)	Okonogi and Sakurai (2019) J. of Rural Econ. in Japanese **Income and prices do not have a significant impact on Protein and Micronutrient Powder purchases.**
Is the market-based approach effective in improving child nutrition?	Study (2016-2017)	Okonogi, Annan, and Sakurai (2021a) Working paper **Protein and Micronutrient Powder sales have increased children's weight.**
Does the provision of information on children's nutritional status induce behavioral change in mothers?	2019's M&E (Information about child's weight) of previous WFP Program	Okonogi, Annan, and Sakurai (2021b) Paper for ICAE 2021 **Information about children's weight has increased the weight of low-weighted children.**
	2020's M&E (Information about child's anemia) of previous WFP Program	Anemia information reduces children's anemia. **The impacts of the SBCC Approach and Information About Child Anemic Status on Infant Anemia: Experimental Evidence from Ghana." Nutrition 2022.**
Does the SBCC campaign induce behavioral change in mothers?	2020's M&E of previous WFP Program	SBCC reduces children's anemia. **The impacts of the SBCC Approach and Information About Child Anemic Status on Infant Anemia: Experimental Evidence from Ghana." Nutrition 2022.**

Appendix 8

Papers under review

Improving Infant Nutrition through the Market: Experimental Evidence in Ghana by Satoru Okonogi, Reginald Annan, Takeshi Sakurai :: SSRN

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3771891

The study assessed the impact of protein and micronutrients powder sales on the nutritional status of children (aged 6months at baseline). It conducted weekly experimental sale of the protein and micronutrients powder to randomly selected mother-infant pairs for half a year. It found that the introduction of the product on the market and subsequent purchase by caregivers significantly increased the weights of children fed the product by 277 to 930 g, depending on the quality of drinking water used in the household. Whereas weight gains of 605 to 930g were realized when safe drinking water was used, the maximum gain where water quality was compromised was 426 g. These suggests that the weight gain benefit of protein and micronutrients powder use is maximized when safe drinking water (and, by extension, overall good hygiene) are guaranteed. This highlights the importance of continued education about water and sanitation as part of nutrition education in infant and young child feeding recommendations.

Table: Impact of the protein and micronutrients powder on child body weight in districts where product is distributed with market based approach with SBCC

		Range of body weight (g)	
Condition	Z-score	Minimum	Maximum
Average effect of Protein & Micronutrients Powder sale on child body weight	0.213	277g	426g
Effect of Protein & Micronutrients Powder sale on child body weight when clean water is used for meal preparation	0.465	605g	930g

Appendix 9

Flyer for recommended feeding practice after 6 months

Appendix 9 (cont'd)

References

Page 5 of Final Project Proposal _2021 TAF Revised

Page 6 of Final Project Proposal _2021 TAF Revised

Page 8 of Final Project Proposal _2021 TAF Revised

Page 11 of Final Project Proposal _2021 TAF Revised

Page 12 of Final Project Proposal _2021 TAF Revised

Page 15 of Final Project Proposal _2021 TAF Revised

Fill the Nutrient Gap Ghana. Summary Report

Development and Sensory Shelf-Life Testing of KOKO Plus: A Food Supplement for Improving the Nutritional Profiles of Traditional Complementary Foods

World Health Organization. (2011). Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity [In: Vitamin and Mineral Nutrition Information System, editor]. Geneva: World Health Organization.

Page iv & v: World Health Organization. (n.d.). Anaemia https://www.who.int/health-topics/anaemia.

World Health Organization. (2016). WHO guideline: Use of multiple micronutrient powders for point-of-use fortification of foods consumed by infants and young children aged 6-23 months and children aged 2-12 years. Geneva: World Health Organization. (Additional references can be found on the previous page)
De-Regil LM, Jefferds MED, Peña-Rosas JP.

Point-of-use fortification of foods with micronutrient powders containing iron in children of preschool and school-age. Cochrane Database of Systematic Reviews 2017, Issue 11. Art. No.: CD009666. DOI: 10.1002/14651858.CD009666.pub2.

Notes

RECOMMENDED COMPLEMENTARY FEEDING PRACTICES

KOKO Plus Foundation

AGE	RECOMMENDATIONS			
Start complementary foods	Frequency (per day)	Amount of food (per meal)	Texture (thickness/consistency)	Variety
At 6 months	2 to 3 meals plus frequent breastfeeds	2 to 3 tablespoons Start with 'tastes' and gradually increase amount	Thick porridge	Breast milk
6 up to 9 months	2 to 3 meals plus frequent breastfeeds Give 1 to 2 snacks	2 to 3 tablespoons per feed Increase gradually to half (1/2) 250 ml cup/bowl	Thick porridge Mashed/pureed Family foods	Breast milk + Carbohydrate (Energy): Staples; Protein (Body building): Legumes & Seeds, Animal Source Foods; Vitamins & Minerals (Conditions): Fruits & Vegetables
9 up to 12 months	3 to 4 meals plus breastfeeds Give 1 to 2 snacks	Half (1/2) 250 ml cup/bowl	Finely chopped Family foods Finger food Sliced foods	
12 up to 24 months	3 to 4 meals plus breastfeeds Give 1 to 2 snacks	Three-quarters (3/4) to 1 250 ml cup/bowl	Sliced foods Family foods	

Protein and Micronutrient Powder can help you!!!

Add it to your Babies' Foods!!