

Improvement of Fortified Blended Foods CSB Products and Unimix

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Historical Formulation Approach

USA

Industrial by-products

**69.5% Cornmeal – processed
gelatinised**

21.8% Soy flour –defatted, toasted

**5.5% Soy Oil- refined, deodorized,
stabilized**

**3.0% Minerals and Vitamin
Antioxidant premix**

WFP

Local raw materials

80% Maize

20% Whole soya

0.4% Minerals and Vitamins

**Production in close proximity
to need**

Uses of FBFs

- General Food Ration Distribution
- Supplementary Feeding Programmes (mostly with curative objectives)
- MCHN programmes
- Schoolfeeding
- HIV & AIDS programmes

CSB considered to be ineffective in addressing moderate acute malnutrition, because of:

- Inadequate composition (micronutrients, energy density, lipids, fibres, anti-nutrients)
- Sharing at household level

2 types of CSB / Unimix

- CSB +, only change is MN profile
for older children, P&L women
- CSB ++, improved MN profile (particularly type II nutrients), better protein quality by addition of 8% milkpowder, dehulling of soya (less fibre), higher fat content, tighter microbiological specs .
for under-two's

CSB Product formulations

For older children and adults (CSB +)

Maize	72.5-77.5%*
Whole soy	20-25%*
Vit/ min mix	0.2%
Ca Carbonate	1.52%
Pot. Chloride	0.763%

* Product to be formulated to nutritional specification not fixed formula

For young children (6-24 months) (CSB ++)

Maize	60-65%*
Dehulled soy	15-20%*
Skim Milk Pdr	8%
Sugar	9%
Soya oil	3%
Vit/ min mix	0.2%
Ca Carbonate	1.52%
Pot. Chloride	0.763%

Product composition (on Dry Matter)

For older children and adults (CSB +)

- Energy 380 kcal (min)
- Protein 14% (min)
- Fat 6% (min)
- Crude fibre 5.0 (max)
- Moisture 10.0% max

For young children (6-24 months) (CSB ++)

- Energy 420 kcal
- Protein 16% (min)
- Fat 9% (min)
- Crude fibre 3.0 (max)
- Moisture 9.0% (max)

For older children and adults (CSB +)

- Urease 0.01-0.2 pH units
- Total aflatoxin 20 ppb
- Mesoph.aerobes 100,000 cfu/g
- Coliforms 100 cfu/g

For young children (6-24 months) (CSB ++)

- Urease 0.01-0.15 pH units
- Total aflatoxin 5 ppb
- Mesoph.aerobes 10,000 cfu/g
- Coliforms 10 cfu/g

Vitamins Added per 100g

Original CSB

Vitamin A	1664 IU
Thiamine	0.128 mg
Riboflavin	0.448 mg
Niacin	4.8 mg
Pantothenic acid	
Vitamin B6	
Folate	60 mcg
Vitamin B12	1.2 mcg
Vitamin C	100mg
Vitamin D	5 mcg
Vitamin E	8.3 mg
Vitamin K	

For CSB + and CSB ++

Vitamin A	1664 IU
Thiamine	0.128 mg
Riboflavin	0.448 mg
Niacin	4.8 mg
Pantothenic acid	6.7 mg
Vitamin B6	1.7 mg
Folate	60 mcg
Vitamin B12	2 mcg
Vitamin C	100mg
Vitamin D	5 mcg
Vitamin E	8.3 mg
Vitamin K	100mcg

Minerals added per 100g

Original CSB

Iron*	8 mg
Zinc	5 mg
Calcium	100 mg

For CSB + and CSB ++

Iron *	8 mg
Zinc	5 mg
Calcium	600 mg
Potassium	400 mg
Phosphorus	200 mg

* Iron as ferrous fumarate

Next steps

- Common specifications for Unimix and CSB++ products
- Field trials of CSB ++ to start in Mali and Malawi to include shelflife studies
- Evaluation of cost-benefit of CSB ++