

# Mani+

**Mani+ is a Ready To Use Supplementary Food (RUSF)** made from peanut paste, milk, sugar, vegetable oil, and a custom vitamin/mineral mix

•Designed for children 6 months to 36 months

•Treatment period: 12-18 months

A daily dose of 40g provides:

•225 cal

•6g protein

•14g fats

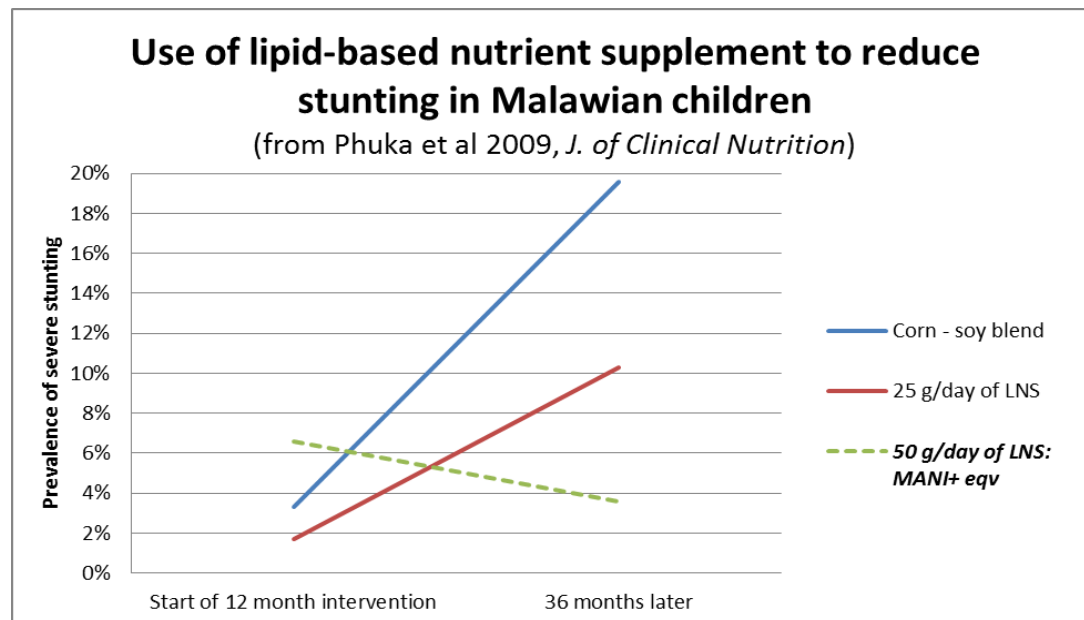
•16g carbohydrates

+the micronutrients most needed by Guatemalan children,  
including B12, Zinc, Iron, Iodine



# Efficacy of RUSF for Treating Chronic Malnutrition and Moderate Acute Malnutrition

- Clinical studies to date have been conducted in Africa
- Results show clear positive results:
  - RUSF intervention results in **15-19% reduction in stunting** (height)
  - RUSF intervention results in **20-46% reduction in wasting** (weight)
- Results show **RUSF superior to Sprinkles and to Corn-Soy blend flours**
- RUSF intervention show to **decrease risks for anemia and diarrhea**
- The Gates Foundation reports that **RUSFs have been shown to be the most effective treatment for chronic malnutrition** (2011, *Fortifying the Market*)



# Randomized comparison of 3 types of micronutrient supplements for home fortification of complementary foods in Ghana

Adu-Afarwuah S, Lartey A, Brown KH, Zlotkin S, Briend A, Dewey KG.

*American Journal of Clinical Nutrition* 2007 86(2):412-20.

- Comparison of Sprinkles, Nutritabs, and RUSF in a randomized trial in a community in Ghana; N = 313
- **49% of those who consumed the RUSF were able to walk by 1 year compared to 25% of those in the nonintervention group, and only the RUSF had a positive impact on growth**
- **At 12 mo the RUSF group had a significantly greater weight-for-age z score (WAZ) (-0.49 +/- 0.54) and length-for-age z score (LAZ) (-0.20 +/- 0.54) than did the Sprinkles and Nutritabs groups combined (WAZ: -0.65 +/- 0.54; LAZ: -0.38 +/- 0.54)**

| Anthropometric index | Sprinkles<br>(n = 96)       | Nutritab<br>(n = 101)     | RUSF<br>(n = 97)          | P <sup>2</sup> |
|----------------------|-----------------------------|---------------------------|---------------------------|----------------|
| WAZ                  | -0.63 ± 0.54 <sup>a,b</sup> | -0.67 ± 0.54 <sup>a</sup> | -0.49 ± 0.54 <sup>b</sup> | 0.05           |
| LAZ                  | -0.36 ± 0.54 <sup>a,b</sup> | -0.39 ± 0.54 <sup>a</sup> | -0.20 ± 0.54 <sup>b</sup> | 0.04           |
| WLZ                  | -0.59 ± 0.66                | -0.69 ± 0.67              | -0.50 ± 0.66              | 0.12           |

# Reducing wasting in young children with preventive supplementation: a cohort study in Niger

Isanaka S, Roederer T, Djibo A, Luquero FJ, Nombela N, Guerin PJ, Grais RF.  
*Pediatrics* 2010 126(2):442-50

- Comparison of the incidence of wasting, stunting, and mortality among children aged 6 to 36 months receiving RUSFs or RUTFs; n = 1645
- In villages with ongoing preventive supplementation program, **the RUSF strategy was associated with a 46% reduction in wasting and a 19% reduction in stunting**

|  | RUTF strategy | RUSF strategy     |
|--|---------------|-------------------|
| <b>Wasting</b>                                 |               |                   |
| Village with previous nutritional intervention |               |                   |
| N  | 347           | 330               |
| No events / child-year                         | 70 / 290      | 36 / 282          |
| Incidence rate / child-year                    | 0.24          | 0.13              |
| Unadjusted HR (95% CI)                         | 1.00          | 0.52 (0.32, 0.84) |
| Adjusted HR (95% CI)                           | 1.00          | 0.54 (0.31, 0.94) |
| <b>Stunting</b>                                |               |                   |
| N  | 330           | 289               |
| No events / child-year                         | 165 / 216     | 127 / 183         |
| Incidence rate / child-year                    | 0.76          | 0.69              |
| Unadjusted HR (95% CI)                         | 1.00          | 0.89 (0.72, 1.11) |
| Adjusted HR (95% CI)                           | 1.00          | 0.81 (0.66, 1.00) |
| <b>Mortality</b>                               |               |                   |
| N  | 873           | 772               |
| No events / child-year                         | 25 / 856      | 10 / 747          |
| Incidence rate / child-year                    | 0.03          | 0.01              |
| Unadjusted HR (95% CI)                         | 1.00          | 0.46 (0.31, 0.68) |
| Adjusted HR (95% CI)                           | 1.00          | 0.49 (0.23, 1.01) |

# The effect of adding ready-to-use supplementary food to a general food distribution on child nutritional status and morbidity

Huybregts, L., HOUNGBE, F., SALPETEUR, C., BROWN, R., ROBERFROID, D., & AIT-AISSA, M. *PLoS Medicine* (2012). 9:1-11.

- Study of RUSF intervention (46g dose) in Chad; n=1038
- **RUSF intervention group had a higher gain in height-for-age** (+0.03 Z-score/mo; 95% CI: 0.01, 0.04; p<0.001)
- children in the intervention group had a **significantly higher hemoglobin concentration** at the end of the study than children in the control group (+3.8 g/l; 95% CI: 0.6, 7.0; p = 0.02), reducing the odds of anemia
- RUSF group also had **significantly lower risk of self-reported diarrhea** (−29.3%; 95% CI: 20.5, 37.2; p<0.001) and fever episodes (−22.5%; 95% CI: 14.0, 30.2; p<0.001).

| Outcome  | Control Arm (n=440) | Intervention Arm (n=598) | p-Value |
|--|---------------------|--------------------------|---------|
| <b>Wasting</b>   |                     |                          |         |
| End point mean WHZ (SD)                                  | −1.09 (0.95)        | −1.05 (0.93)             |         |
| Intervention effect (95% CI), Z-score/mo <sup>a</sup>    | Reference           | −0.002 (−0.032, 0.028)   | 0.89    |
| Cumulative episodes WHZ < −2                             | 174                 | 241                      |         |
| Number of observed child-months                          | 1,427               | 2,199                    |         |
| Number of episodes per child-month (95% CI) <sup>b</sup> | 0.12 (0.10, 0.14)   | 0.11(0.09, 0.14)         |         |
| Incidence rate ratio (95% CI) <sup>c</sup>               | Reference           | 0.86 (0.67, 1.11)        | 0.25    |
| <b>Stunting</b>  |                     |                          |         |
| End point mean HAZ (SD)                                  | −2.06 (1.39)        | −1.79 (1.46)             |         |
| Intervention effect (95% CI), Z-score/mo <sup>a</sup>    | Reference           | 0.03 (0.01, 0.04)        | <0.001  |
| End point prevalence of stunting, percent (n)            | 52.3 (230)          | 46.2 (276)               |         |
| OR of end point stunting (95% CI) <sup>d</sup>           | Reference           | 0.69 (0.45, 1.07)        | 0.099   |
| <b>MUAC</b>  |                     |                          |         |
| End point MUAC, cm (SD)                                  | 14.1 (1.2)          | 14.3 (1.1)               |         |
| Intervention effect (95% CI), cm/mo <sup>a</sup>         | Reference           | 0.01 (−0.02, 0.04)       | 0.49    |

<sup>a</sup>Analyzed using a linear mixed model with random effects cluster, household, and child, adjusted for child's age at baseline, child's sex, SES, and baseline value.

<sup>b</sup>Confidence intervals are estimated from a Poisson model adjusted for clustering.

<sup>c</sup>Analyzed using a mixed Poisson regression model with random effects cluster, household, and child, adjusted for child's age at baseline, child's sex, SES, and baseline value.

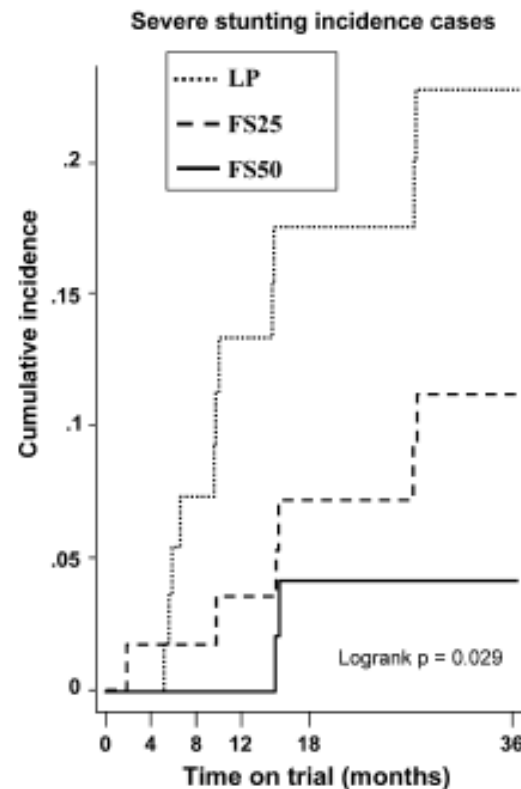
<sup>d</sup>Analyzed using a mixed logistic model with random effects cluster and household, adjusted for child's age at baseline, child's sex, SES, and baseline value.

doi:10.1371/journal.pmed.1001313.t003

# Postintervention growth of Malawian children who received 12-mo dietary complementation with a lipid-based nutrient supplement or maize-soy flour

Phuka JC, Maleta K, Thakwalakwa C, Cheung YB, Briend A, Manary MJ, Ashorn P.  
*American Journal of Clinical Nutrition* 2009 89(1):382-90

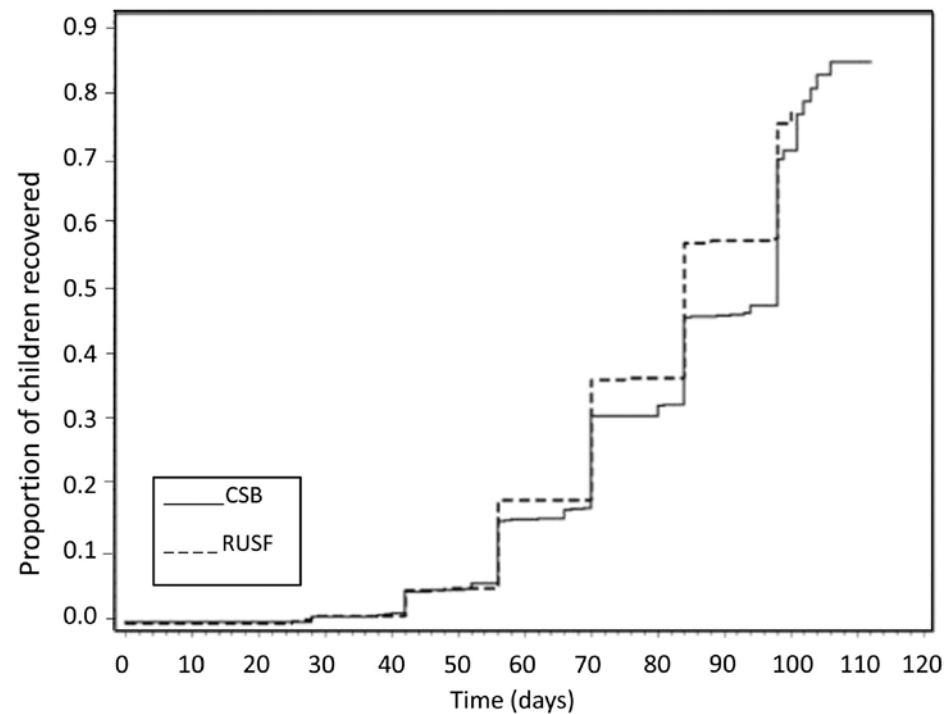
- Comparison of maize-soy supplement, 25g RUSF, and 50g RUSF; n=182
- **twelve-month-long complementary feeding with 50 g RUSF shown to have a positive and sustained impact on the incidence of stunting** in terms of weight-for-age changes and weight-for-length changes
- The cumulative 36-mo incidence of severe stunting was 3.6% for 50g RUSF group versus 19.6% in in maize-soy group and 10.3% in 25g RUSF group (P = 0.03)



# Treatment of moderate acute malnutrition with ready-to-use supplementary food results in higher overall recovery rates compared with a corn-soya blend in children in southern Ethiopia

Karakochuk et al., *American Journal of Clinical Nutrition* 2012 96(4):911-6

- study in Ethiopia comparing corn-soy blend to RUSF; n=1125
- **children in the RUSF group had a 15% higher recovery rate than the corn-soy group**
- RUSF was less susceptible to food sharing because of its portrayal as a medicine not to be shared among the household
- even when total energy intake between the two groups is comparable, the RUSF blend is superior in nutrient content, encouraging greater growth and recovery.



# 6 Month RUSF Intervention

## Pop Wuj Clinic, Quetzaltenango Guatemala

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Washington University Saint Louis

2012

N= 14

·all lengths increased and those results were significant, ranging from 6.9 cm to 7.85 centimeters of increase

·t-tests showed children improving on their z-score for height

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| Comparison            | Mean Pre | Mean Post | Difference, post-pre | t-value | Significance |
|-----------------------|----------|-----------|----------------------|---------|--------------|
| Pre LAZ -<br>Post LAZ | -2.826   | -2.501    | <b>.324</b>          | -.737   | .478         |