



# THE JiVitA JOURNAL

## Evaluating Complementary Food Supplements (CFS) to Improve Child Growth and Reduce Stunting in Rural Bangladesh

*A collaborative study of the Center for Human Nutrition, Johns Hopkins University, the International Center for Diarrhoeal Disease Research, Bangladesh (icddr,b), the World Food Program (WFP), DSM Ltd, and the JiVitA Project.*

**Early childhood growth stunting** continues to affect rural populations of South Asia, reflecting risks of chronic undernutrition, morbidity and mortality. In Bangladesh, more than 40% of children suffer from chronic malnutrition (stunting) and 16% are acutely malnourished or wasted -in the first five years of life. Several recently developed complementary food supplements (CFS) are provided through nutrition programs for the prevention of undernutrition. However, many of these products, designed to optimize nutrient density and composition to yield improved outcomes, have not yet been tested adequately for their impact on growth and other outcomes such as body composition and cognition, under typical settings. The JiVitA project of Johns Hopkins University is currently testing, through a controlled, community-based trial, three such products in a malnourished community setting in rural northern Bangladesh, in collaboration with the World Food Program (WFP) and the International Center for Diarrheal Disease Research, Bangladesh (icddr,b) with in-kind support and knowledge transfer in food technology from DSM, Basel, Switzerland. The CFSs are designed to have high energy density and micronutrients bioavailability and contain dairy (milk powder). Two of the test foods are ready-to-use are composed of locally sourced ingredients following recipes designed or adapted by the icddr,b.

The ongoing field trial will examine the impact of feeding these CFSs to children from 6 to 18 months of age on growth rates, prevalences of stunting and wasting, and other outcomes. The study findings will be widely disseminated and, depending on results, our collaborative team plan to be engaged in advocacy and efforts to expedite production and use of tested local CFS products in Bangladesh and the region.

### Research objective:

The goal of this research is to carefully design, develop and test three CFS products in a setting of chronic undernutrition in northwestern, rural Bangladesh (JiVitA is located in the District of Gaibandha) for their ability to improve growth and reduce stunting, reduce wasting, and improve micronutrient status and cognition. The field trial expects to enroll a total of 5320 children and provide a daily supplement over the course of a year.

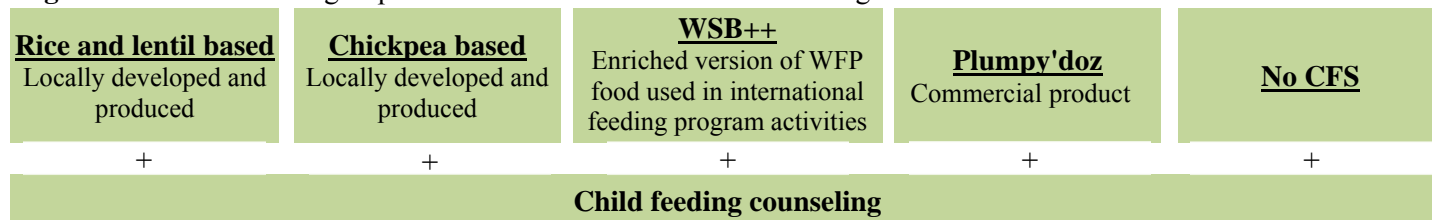


### Five Intervention Groups:

The study is a cluster-randomized feeding trial in which children, beginning at 6 months of age, are enrolled into one of five groups. While care givers of enrolled children receive regular nutrition counseling, four study groups additionally receive one type of CFS daily for a year in their home (Figure). The CFS daily serving sizes are defined to provide roughly the same amount of calories and micronutrients across all CFS interventions within defined age groups: from 6 until 12 months of age and from 12 until 18 months of age. The caloric amount of 125 and 250 kcal, respectively, was selected to provide no more than 45-50% of daily, non-breastmilk energy and ~70% of micronutrient needs from complementary foods, in addition to breast milk, within these age group categories.

- **Rice-lentil and chickpea based CFSs:** High energy and micronutrient dense foods formulated by scientists at icddr,b and manufactured locally (Olympic Foods, Dhaka) using nationally available ingredients. These are called Deshi 1 and Deshi 2, respectively.

**Figure.** Five intervention groups in the cluster randomized child feeding trial



- **WSB++**: A micronutrient enriched version of WFP’s Super Cereal *Plus* typically deployed for international feeding programs for treatment and prevention of under nutrition.
- **Plumpy’Doz (Control)**: An international, commercially produced product (Nutraset, France) which has been shown to improve growth in Africa.
- **Nutrition counseling alone (Control)**: Counseling sessions are provided by trained staff one-on-one to mothers of all enrolled infants in the home during nine sessions throughout the year of participation (in all five groups). Standard procedures include distributing educational materials and guiding discussions on the important of continued breastfeeding along with complementary food components and preparation.

**Hypothesis:**

We hypothesize that the two locally developed and produced CFS products (Deshi 1 and Deshi 2) and WSB++ will be better than nutrition counseling alone in improving linear growth. In addition, we postulate that these CFS products will be comparable to, or more effective than, Plumpy'doz in accelerating linear growth.

**Study Site and Design:**

The intervention trial is being conducted across a contiguous, population-dense, rural area of ~450 sq km in the District of Gaibandha in northwestern Bangladesh. It is a site where the JiVitA Project has been carrying out public health nutrition research for over 12 years. Each of the site’s 596 village clusters has been randomized to one of the five feeding arms. Infants are enrolled as they turn 6 months of age after obtaining parental consent and are expected to participate for a 12-month period to capture seasonal and annual growth effects of the interventions. Throughout participation food supplements are delivered to the home, once every week by a JiVitA staff worker.

Detailed information is recorded twice a week on amounts of the standardized portions being fed to and consumed by children. During the same visit, histories of diarrhea, fever and acute lower respiratory infection are obtained. Weight,

length, and head, chest, and mid-arm circumference measurements are taken every 3 months to track linear and ponderal growth and to assess stunting and wasting status. 24 hour dietary intakes are recorded at the time of anthropometric assessments to gain reliable, age-dependent estimates of breast milk and other complementary food intakes. A subset of 750 children (150 per group) are also assessed periodically for body composition and, at the end of the trial, they will be assessed for cognitive function and micronutrient status. Changes in maternal knowledge, attitude and child feeding practices are also being assessed in this sub-sample.

**Expected Policy Relevant Results:**

By its end, this project will have generated new data on the impact of three new complementary food supplements on enhancing child growth, nutritional status, cognition and health in a rural South Asian context, where rates of undernutrition are high. Importantly, two of the evaluated products will have been locally sourced and produced in Bangladesh. Data will also be available on the acceptability, ease of use and costs, enabling cost-effectiveness analysis with respect to improving growth outcomes. As findings merit, our collaborative team will be prepared to advocate the use of these nutritionally enhanced food products to help children grow under ambient, cross-seasonal conditions as faced by families with young children in rural Bangladesh.

**Implementing Partners:**



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