

What is the evidence for the effectiveness, safety and acceptability of 'Ready-To-Use Feeds'?

March 2011

This rapid response was prepared by the Uganda country node of the Regional East African Community Health (REACH) Policy Initiative.

Key messages

- Most of the literature found confirms or suggests that Ready-To-Use Feeds are generally efficacious and effective, and acceptable in both children and adults, both as a treatment but also as a prevention of malnutrition.
- Literature reviewed shows that most RUTFs are safe for both adult and child populations. However, the use of RUTF among children with moderately acute malnutrition may not be safe given the high concentration of nutrients in the formulation
- Issues to resolve include among other things the development of locally produced RUTF to international standards, the integration of outpatient treatment protocols into international health and nutrition guidelines, and operational research into integration of community-based treatment of severe acute malnutrition into health systems in non-emergency contexts.



Who requested this rapid response?

This document was prepared in response to a specific question from a policy maker in Uganda.

! This rapid response includes:

- **Key findings** from research
- **Considerations about the relevance** of this research for health system decisions in Uganda

X Not included:

- Policy or practice related recommendations
- Detailed descriptions

What is SURE Rapid Response Service?

SURE Rapid Responses address the needs of policymakers and managers for research evidence that has been appraised and contextualised in a matter of hours or days, if it is going to be of value to them. The Responses address questions about arrangements for organising, financing and governing health systems, and strategies for implementing changes.

What is SURE?

SURE – Supporting the Use of Research Evidence (SURE) for policy in African health systems - is a collaborative project that builds on and supports the Evidence-Informed Policy Network (**EVIPNet**) in Africa and the Regional East African Community Health (**REACH**) Policy Initiative (see back page). SURE is funded by the European Commission's 7th Framework Programme. www.evipnet.org/sure

Glossary

of terms used in this report:

www.evipnet.org/sure/rr/glossary

Background

Millennium Development Goal (MDG) 1 aims to halve both the proportion of people living on less than \$1 a day and the proportion of people suffering from hunger as measured by the prevalence of underweight children and access to the minimum recommended calories per day (United-Nations, 2000, United Nations Department of Economic and Social Affairs). Uganda is on track to meet the first target of reducing poverty. However at the current rate, it is unlikely that Uganda will meet the second target to halve hunger and malnutrition by 2015 (United Nations Department of Economic and Social Affairs).

Uganda currently produces sufficient food to meet the needs of the current and fast growing population; however the proportion of Ugandans unable to access adequate calories has increased by 10% over the last decade (from 59 percent in 1999 to 69 percent in 2006) (UBOS). The picture in children is at unacceptably high rates with 38% children under 5 suffering from chronic malnutrition (stunting), 16% from underweight and 6% from acute malnutrition (UNICEF, 2007).

Malnutrition may be treated in a number of ways. Although the current guidelines for its management are highly based on techniques that are facility based, a recent innovation is to use nutrition as a drug through therapeutic feeds and manage several cases in the community. The World Health Organization (WHO) has recommended this as well in its joint statement with the World Food Program, the United Nations System Standing Committee on Nutrition and the United Nations Children's Fund made in 2007 (World Health Organization, 2007). These therapeutic feeds also called "Ready to use therapeutic feeds" (RUTF) are referred to as RUTAFAs in Uganda. This innovation is mostly home-based and would improve the heavy public health problem. In Uganda this has already been happening with support from the USAID funded NULife (Food and Nutrition Interventions for Uganda).

This intervention has been assessed in many settings of both low and middle income, and even those of high income and this paper will present the evidence on efficacy, effectiveness, safety and acceptability of therapeutic feeds in the treatment of acute malnutrition.

How this Response was prepared

After clarifying the question being asked, we searched for systematic reviews, local or national evidence from Uganda, and other relevant research. The methods used by the SURE Rapid Response Service to find, select and assess research evidence are described here:

www.evipnet.org/sure/rr/methods

Summary of findings

Efficacy and effectiveness

Most of the literature found confirms or suggests that RUTF is generally efficacious and effective in both children and adults, both as a treatment but also as a prevention of malnutrition. Studies have demonstrated an equivalent efficacy of RUTF made locally in Malawi and Senegal to a product imported from France using a more complex recipe (André Briend and Steve Collins, 2010).

A recent summary of the evidence available on the role of therapeutic nutrition products in home based management of severe acute malnutrition in children concluded that home based management of severe acute malnutrition using therapeutic nutrition products suggests that it is efficacious (Tarun Gera, 2010). In another systematic review by Ashworth and colleagues, it was noted that if and when carried out well, treatment and rehabilitation at home with the home diet is more cost-effective than inpatient care (Ashworth A., 2006). However the cost effectiveness of ready-to-use therapeutic foods when compared to the home or family diet had not been established. Furthermore that where children have access to a functioning primary health-care system and can be monitored, the rehabilitation phase of treatment of severe malnutrition should take place in the community rather than in the hospital but only if caregivers can make energy- and protein-dense food mixtures or are given RUTF. It remains to be seen what it means in terms of the cost of RUTF, logistics of procurement and distribution, and sustainability, for routine health services.

In their review, Gatchell and colleagues noted what they established as the key future challenges to sustaining community-based therapeutic care as a treatment of severe acute malnutrition (Gatchell V et al., 2006). These challenges included the development of locally produced RUTF, development of international standards on local RUTF production, the integration of outpatient treatment protocols into international health and nutrition guidelines, and further operational research into integration of community-based treatment of severe acute malnutrition into health systems in non-emergency contexts. These are the issues that one needs to pay attention to when formulating guidelines on the use of RUTF in the health system.

A study in Malawi where children with oedema were exclusively treated with RUTF for 8 weeks reports a high recovery rate (83%) , while a controlled, comparative, clinical effectiveness trial conducted in southern Malawi concluded that children on home therapy with RUTF recovered better (79% vs 46%) and were less likely to relapse or die (8.7% vs SURE Rapid Response Service

16.7%) than children on standard therapy based on international guidelines (Ciliberto MA et al., 2006, Ciliberto MA et al., 2005). Another study from southern Malawi too, an operational study, found that home-based therapy with RUTF resulted in acceptable recovery in both severely malnourished (89%) and moderately malnourished (85%) children with no requirement for formally trained medical personnel (Linneman Z et al., 2007).

RUTF is also effective in preventing different forms of malnutrition; Isanaka and colleagues carried out a cluster randomized trial in Niger which showed that RUTF distributed for a 3-month period was efficacious in preventing different forms of wasting including severe wasting in children aged 6 to 60 months (Isanaka S et al., 2009). RUTF was distributed to all families with children aged 6-60 months with no malnutrition in 12 villages, and a daily consumption was enforced. The distribution of RUTF during the period of the year with documented food shortages improved weight maintenance among children and reduced wasting by 36% and severe wasting by 58%. However, the distribution was massive and untargeted and it remains to be seen whether it is a cost-effective and sustainable intervention.

Safety

Literature reviewed shows that most RUTFs are safe for both adult and child populations. Tarun's review of the evidence also concluded that home based management of severe acute malnutrition using therapeutic nutrition products was safe (Tarun Gera, 2010).

Because earlier preparations of RUTF had to be prepared using water, there was always a danger of diarrhea from unclean water or unhygienic conditions. To prevent this risk, it was emphasized that liquid diets had to be used with clean water and then refrigerated and where this was not possible, that that prepared be discarded if not consumed immediately, which meant preparations had to be done as many times as children were fed everyday which might not be practical or feasible in the community. To deal with this problem, the decision was to use a Ready-to-Use Therapeutic Food (RUTF) which can be consumed directly by the child without the addition of water. In 1997, there was a proposal to use a diet with a nutritional composition very close to the F-100 diet recommended by WHO for the recovery phase which is made by replacing in the original recipe about half of the dried skimmed milk with peanut butter, removing all the water and increasing the amount of oil. The elimination of water from the RUTF recipe removes the dangers of bacteria contamination as bacteria need water to grow, making this food safe for use in the community.

However, the use of RUTF among children with moderately acute malnutrition may not be safe given the high concentration of nutrients in the formulation. And so in a bid to find a safe alternative, more recently it has been shown that fortified foods with milder nutrient concentration compared to the average ready-to-use feeds are more effective in treating moderately acute malnutrition compared to Corn/Soy blend (Matilsky DK et al., 2009).

Acceptability

Once the major constraint imposing that children stay for several weeks in the inpatient centres is removed, trials to test acceptability have proven positive (Briend A et al., 1999, Diopel HI et al., 2003). Inpatient treatment of severe acute malnutrition may be necessary only for its complicated forms and only until medical complications requiring medical attention are addressed (Collins S and Yates R, 2003). The change of the initial WHO F-100 recipe needed to produce RUTF is minimal, and ideally it can be produced in any health facility with a clean kitchen and a mixer. RUTF is now manufactured to international quality standards in several countries across Africa (Ortez, April 2010). This has reduced the cost of RUTF, created some employment and upgraded food manufacturing in several countries; it also provides some demand for local farm crops that through the targeted purchase from small holder farmers is providing economic benefits back to vulnerable groups (Ortez, April 2010).

Comparison has also been made with already present and accepted local preparations. A trial was done to compare the acceptability (among other things) of Ready-to-Use Therapeutic Food with cereal legume based *khichri* among malnourished children (Brinda Dube et al., 2009). (In India, *khichri* (rice and green gram gruel) is often used for the dietary management of moderately malnourished children as a practical and culturally acceptable food for young children). The proportion of children who accepted RUTF eagerly was 58% as against 77% for *khichri*; 42% children on RUTF and 23% on *khichri* accepted the meal but not eagerly. It was concluded that RUTF was acceptable among malnourished children.

Another study, a prospective descriptive study to assess acceptability and effectiveness of a locally made ready-to-use therapeutic food in HIV-infected chronically sick adults in Malawi concluded that locally made RUTF was acceptable to patients (Paluku Bahwere et al., 2009). Although, some patients linked gastrointestinal symptoms to the RUTF they were taking, these symptoms did not influence their intake of the feed. This finding suggests that these symptoms were minor or that patients were encouraged to overcome them because of the improvement of their health status as a result of the RUTF intervention.

However note should be taken of a recent qualitative study of RUTF whose objective was to study the acceptability among HIV-positive adults in Homa Bay, Kenya; it reported that only half of the patients receiving the feed actually complied with the full prescribed dose of 2000 kcal/day (Dibari F et al., 2008). Reasons given for this non-compliance included poor taste, diet boredom, bulky weight (~12kg as two-week supply needed to be carried by the patient, and patients would tend to reduce their daily intakes to ensure that the amount received lasted until the next scheduled clinic visit), and sharing of supply with other household members.

Conclusion

The evidence reviewed suggests that RUTF or RUTAFAs as it is referred to in Uganda is a generally effective, safe and acceptable intervention for the treatment and prevention of several forms of malnutrition especially the severe forms. Issues to do with the development of locally produced RUTF, development of international standards on local RUTF production, the integration of outpatient treatment protocols into international health and nutrition guidelines, and further operational research into integration of community-based treatment of severe acute malnutrition into health systems in non-emergency contexts, need to be resolved. Further issues to note also include its use in moderately acute malnutrition.

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The **Regional East African Community Health-Policy Initiative (REACH)** links health researchers with policy-makers and other vital research-users. It supports, stimulates and harmonizes evidence-informed policymaking processes in East Africa. There are designated Country Nodes within each of the five EAC Partner States. www.eac.int/health



The **Evidence-Informed Policy Network (EVIPNet)** promotes the use of health research in policymaking. Focusing on low and middle-income countries, EVIPNet promotes partnerships at the country level between policymakers, researchers and civil society in order to facilitate policy development and implementation through the use of the best scientific evidence available. www.evipnet.org

Annex

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Conflicts of interest

None known.

This Rapid Response should be cited as

Rhona Mijumbi, MPH, MSc. **What is the evidence for the effectiveness, safety and acceptability of ‘Ready-To-Use Feeds’ in low income countries?** A SURE Rapid Response. March 2011.

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