

OPPORTUNITIES AND BARRIERS IN DEVELOPING A PROJECT AIMING TO FIGHT INFANT MALNUTRITION IN TANZANIA

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Abstract

The project "pappa di Parma" aims to implement hyper-energy meals to fight child malnutrition. A key aspect is the use of locally available food raw materials. The research has been conducted in its starting phase at the University of Parma and it was implemented locally in Tanzania (Rukwa Region) where local and accessible food ingredients and technologies were searched for. Mothers and children were interviewed about the acceptability of the meals and about whole family's eating habits. The educational tools created were useful to raise awareness among the population about the issue of child malnutrition through the project "pappa di Parma".

Keywords

Infant malnutrition, food security, sustainability, nutrition education

The "pappa di Parma" project in Tanzania

In this paper, after a brief introduction of the socio-economic context of Tanzania, it will be presented the "Pappa di Parma" project, from when it was born to its implementation in Tanzania, whose purpose is to combat child malnutrition through the domestic preparation of high-energy food made with locally available raw materials. Moreover, it will be examined the tools created to provide information at the local level and finally it will be presented the data obtained through mothers' interviews about the food family habits.

The project "Pappa di Parma" has been developed in Tanzania with the contribution of three students of the University of Parma contextually to the Erasmus Overworld Programme.

The socio-economic context and the objectives of the project

Tanzania is one of the most peaceful, stable and prosperous countries in Africa. Despite growth averaging 6.5% per annum for over a decade, the Gross domestic Product GDP has struggled to stay ahead of high population growth (3% per year), leaving as many as 12 million Tanzanians below the poverty line. The country is ranked 151 out of 188 in the United Nations Human

Development Index, which classifies it as a country of 'Low Human Development'. Nevertheless, Tanzania has a well-defined ambition to become a Middle-Income Country by 2025 (Action against hunger & Iris, 2017).

The agricultural sector is currently the prevailing economic one representing 26.5% of total GDP. It is estimated that 87% of the poorest people live in rural areas and that the annual migration rate from countryside to cities is quite high, around 5.36% (United Republic of Tanzania, 2018). In urban areas, employment and school education levels are higher than in rural areas and this increases the gap in the Tanzanian population (Hassine, 2015).

In the United Republic of Tanzania malnutrition is still severely present, in particular, in the Rukwa region, where the level of stunted and underweight children was respectively 50.4 and 13.5%, (Nordang S, 2015), but the situation is even more dramatical in the southern areas of the nation where the percentage of malnourished children is above 50%. Malnutrition, in this case, means an insufficient intake of one or more macronutrients and / or micronutrients. The World Health Organization and Unicef have developed therapeutic food products called Ready-to-use therapeutic foods (RUTF). RUTF are high-energetic meals, distributed from multinational companies in sanitary emergency conditions only for a short period of time. The first and most commonly used RUTF contains sugar, dried skimmed milk, oil, peanut butter, vitamin and mineral supplements. They must also respond to three important characteristics: i) the taste and texture must be appropriate for children; ii) as "ready to use" product cooking must not be necessary; iii) the packaging should be suitable for feeding infant and safe assuring a long shelf-life. However, RUTF do not consider the eating habits of the local population, it is industrially produced by and, because of that, too much expensive for local people, therefore it can't represent a long-term solution. The project "pappa di Parma" was born in the first months of 2008 at University of Parma with the collaboration of the Pediatric School, the Human Nutrition Unit, Food Technology Unit and the academic spin off Madegus (Vanelli, 2014). The underlying principles are the same as RUTF. Hence, the aim is to formulate hyper-energetic supplementary food for malnourished children from 6 to 60 months, but with the sole and exclusive use of local ingredients and equipment. This feature could make the "pappa di Parma" production affordable for people living in villages and acceptable. Based on previous experiences in Sierra Leone (2009-2013) and Zambia (2011-2012), "pappa di Parma" was developed for Tanzania in 2018. The project is the result of a collaboration with Golfini Rossi Onlus, an Italian charity association, the University of Parma (Italy), Mvimwa Abbey (Rukwa Region, Tanzania) and the St. Joseph University (Dar es Salaam, Tanzania). The Abbey represents the core of the aggregation for all the small villages of the district with a population of 20,000 inhabitants, where water is collected from spontaneous pools, there is no electricity, agriculture is

minimal and the houses are rudimentary. The monks offer support to the local population in different ways: the Monastery runs professional schools for electricians, carpenters, blacksmiths, seamstresses, mechanics. Moreover, it supports and manages the St. Placidus Primary School with over 250 children, the St. Maurus Chemical Secondary School in Sumbawanga with over 1000 students and a college for future teachers. Finally, close to the monastery there's a dispensary equipped for simple surgical interventions, for analysis and examinations, there are rooms for recovery and delivery rooms.

Pappa di Parma development for Tanzania

Implementing baby meals with local ingredients

The preliminary phase of the project was the development of a database for local Tanzanian ingredient drafted through bibliographic data (Tanzania Food composition tables (2008); National nutrient database for standard reference (2015); West African food composition table (2012)).

The preparatory phase at the laboratories of Food and Drug of the University of Parma consisted in cooking six different recipes using ingredients inserted into the database. The recipes respected Fao nutrition criteria for malnourished children aged from 5 to 60 months who live in Tanzania (Fao, 2008). Simultaneously, the characteristics of the baby meals must be technologically, microbiological and sensory adequate.

The intervention phase in Tanzania, at the Benedictine monastery of Mwimva consisted in finding out ingredients in 5 city markets: Soko Kuu, Madela, Soko la Bangwe, Soko la Chanji and Soko la Majengo all located in Sumbawanga. There were numerous difficulties in the search for raw materials, including the distance between the Abbey and the local market of Sumbawanga (about 50 miles). Furthermore, the local inhabitants speak only Swahili and therefore the constant presence of an interpreter was necessary. Additionally, we turned to small shops to find missing food and tools. After ascertaining the extreme simplicity of the kitchen tools used by local population, we adapted the production method developed at the Department of Food and Drug's laboratory of University of Parma to the kitchen of the Monastery (Figure 1).

Pappa di Parma formulas were developed using:

- Frying pan, pot and ladle,
- Pestle and mortar to chop the ingredients,
- Filters, to crush and reduce cooked whole beans into paste,
- Containers for storing products,
- Digital food scale.



Figure 1. Abbey kitchen

In the monastery kitchen there is only one gas stove, while in the villages there are wood stoves. This instrumentation highlighted some problematics in the correct management of cooking. In addition, the lack of a refrigeration system limits the conservation of some raw materials and pappas themselves. For this reason, the pappas have been prepared daily. We went to Sumbawanga's market weekly, consequently the most perishable products last about 4 days for the high temperatures. All these difficulties extended the time for pappas production and compromised their standardization. Immediately after preparation, pappas were administered to the children of the villages in order to verify its acceptability. The presence of the monk-interpreter of the Monastery and of the Doctor of the dispensary (Figure 2), who ensured assistance in case of an allergic reaction, allowed the administration of "pappa di Parma".



Figure 2. Abbey dispensary, photo taken during the administration of Pappa

The survey was conducted over an overall period of three months and involved 287 children aged between 6 months and 5 years. Firstly, the three student of Parma University made a brief introduction to families about the project and short lesson of simple nutrition's concepts and the explanation of the ingredients used in the formulation and their importance. Then the children taste the meal with doctor and nurse monitoring and the last step of this investigation protocol was the administration of habit questionnaire to mothers.

Educational tools

Poster depicting baby food and the "pappa di Parma"

We created four posters depicting the final appearance of the relative four pappas and the required ingredients (Figure 3). The posters have an educational role being self-explicative images. This overtakes the linguistic barrier and population illiteracy. Since the equipment available in the houses of the villages is very rudimentary, it was imperative to find a unit of measure for the dosages of each raw material. In conclusion, the number of spoons, identified as better unit of measure, was placed near the picture of the ingredients.



Figure 3. Poster of pappa di Parma formulas

Moreover, also a poster about the nutritional benefits deriving from “pappa di Parma” consumption has been developed both in the official language of the United Republic of Tanzania, Swahili, and in English (Figure 4). The poster shows that a child eating the “pappa di Parma” can grow up healthy while a malnourished child cannot grow neither in weight nor in height, Lion has an iconographic meaning: it represents strength and energy. The measures of weight and height taken as references are those indicated by the Who as the adequate growth measures (Who, Unicef, 2009).

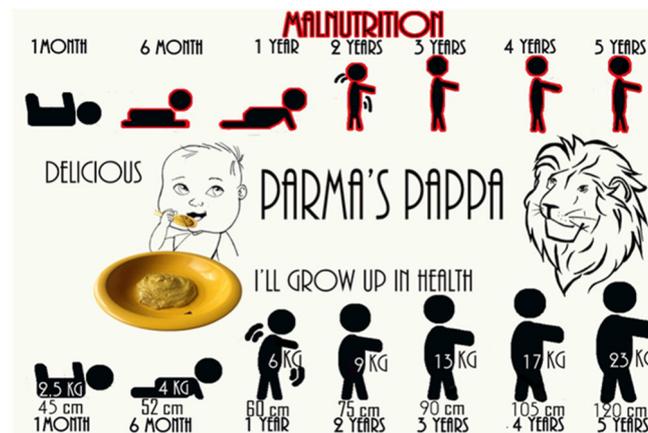


Figure 4. Posters of “pappa di Parma”

In order to make the project “pappa di Parma” understandable by local people, it was essential to know the socio-cultural context of the local population. Women, in particular, represent the true essence of the place in which they live, they embody the conjunction between the past and the future, they are at the same time mothers and daughters of a land that, albeit voiceless, shout out for help in the present. Every day the three students went to the dispensary to meet them, where most women receive help during childbirth and return for the monthly visits of the baby. Therefore, the interview has been randomized, because it wasn't possible to know which and neither how many mothers would have come to the dispensary. During these visits, children were weighed and monitored for growth. In the most extreme cases of malnutrition, the doctor would advise the family to go to Sumbawanga's hospital. Unfortunately, few families are able to bear the costs of travel and accommodation and to leave the rest of the family without someone to assist them. For this reason, it is very important to do a preventative job that avoids desperate situations that would have little chance of resolution. After the tasting of the baby meals, students tried to understand their food's habits through a simple and schematic questionnaire. Listening to their stories, students soon realized the inadequacy of some of their requests because they were too specific and set on European parameters, so they scaled down their approach. In fact, in Europe people are used to a very varied diet, on the contrary, the population of the villages always eats the same dishes, only in the more fortunate periods they manage to eat more expensive or difficult to find dishes (meat, fish, and fruit). For example, if a

family kills a cow, it could eat its meat for the entire following week and then not eat more meat for two months. For this reason, it was not possible to distinguish between the types of meat and it was very difficult to understand the real frequency of consumption of these foods. First, students asked mothers some personal information: age, the village of origin, how many children they had, how many months after birth they decided to start weaning and which food children eat in place of breast milk. Then, the attention shifted to the habits of the rest of the family: if they used to have breakfast and how, if they respected the main meals and which food they usually consumed, how often did they eat meat, fish, eggs, vegetables and fruit. Finally, students asked how much water they used to drink per day. Since they do not have the availability to use a food scale, a cup or spoons were used as a unit of measure. 185 interviews have been collected. The average age of mothers interviewed is around 25 years, most of them already had 3 children, who were usually weaned six months after birth with white corn flour porridges and, in rare cases, cow milk. The quantity varies from a minimum of 5 spoons to a maximum of 2 cups. For breakfast most adult people eat the same porridge and, more rarely, they prepare fried donuts which are traditionally called Mandazi. For lunch and dinner, adults and children eat Ugali, which is a sort of polenta prepared with white corn flour and water. Beans would never miss in the main meals, more rarely accompanied by seasonal vegetables. Only 11% of the women interviewed add potatoes or rice. Unfortunately, only 10% of families eat fruit every day or at least every two days. 79% of families consume meat maximum 4 times in a month. Fish and eggs are cooked more than three times a week by about 11% of the women surveyed. On average, adults drink 0.8 L of water a day: in the villages, it is easier to meet a kiosk that sells carbonated drinks rather than water, moreover the few water reserves are heavily contaminated and often insufficient for the entire population. The value of the interviews was strategic, as they were an opportunity to speak to the women of the villages also about health and nutrition. The goal was to give concrete and achievable suggestions in order to improve the eating habits rooted in their daily lives from centuries.

In conclusion, in order to be effective, the educational proposal must take place in a dialogue of mutual knowledge that has the strength and patience to enrich both sides.

The barriers that hinder the development of this project in Tanzania are not only of cultural nature, in relation to the food habits of the population, but also of a practical nature. The procurement of raw materials is a critical point of the process in particular due to the great distance that has to be done on foot, between the villages and the city where the market is located.

Nevertheless, this project started countless opportunities for improving conditions of Tanzanian population living in Rukwa Region, with the awareness that "What we are doing is just a drop in the ocean. However, the ocean would be less because of that missing drop" (Madre Teresa di Calcutta).

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Acronyms

Gdp	Gross Domestic Product
Rutf	Ready to Use Therapeutic Food
Who	World Health Organization
Fao	Food and Agriculture Organization