

## Fortified complementary food: The Vietnam experience

Jacques Berger<sup>1</sup>, Serge Trèche<sup>1</sup>, Bertrand Salvignol<sup>2</sup>, Nguyen Cong Khan<sup>3</sup>, Chantal Goudeau<sup>2</sup>

1. Institut de Recherche pour le Développement (IRD), UR 106, 911 avenue Agropolis, BP 5045, 34032 Montpellier cedex, France
2. Groupe de Recherche et d'Echanges Technologiques (GRET), 211 rue La Fayette, 75010 Paris, France
3. National Institute of Nutrition, 48B Tang Bat Ho, Hanoi, Vietnam

### Abstract

The Fasevie project is carried out in Vietnam since 1997 within the framework of a collaboration between the National Institute of Nutrition in Hanoi (NIN), and two French organizations, the "Institut de Recherche pour le Développement" (IRD) and the "Groupe de Recherche et d'Echanges Technologiques (GRET)". The Fasevie project is based on the definition and implementation of strategies to improve complementary feeding of infants and young children in Vietnam. This project began after the findings that growth retardation in infants and children was very prevalent in Vietnam (about 37% of children under five), especially in the central provinces along the coast, in the south-central highlands and in mountain areas in the north. Preliminary surveys showed that growth retardation is related to a too early introduction of complementary foods and to the use of inappropriate complementary foods of low nutritional quality.

The Fasevie project is concentrated in three provinces of the central region of Vietnam (Ha Tinh, Da Nang and Quang Nam). A first experimental phase of three years (1997-1999) allowed us to test different formulas of complementary foods suitable for the Vietnamese context, to identify the companies and to start experimental productions and finally to test some distribution networks. The technological innovations provided by GRET and IRD in form of locally made low-cost extruders allow the production of instant products. These flours (*Favilo*, *Favina*) are made with local raw materials (rice, soybeans, sesame) and fortified with vitamins and minerals. They allow the preparation of high energy and nutrient dense gruels with appropriate consistency and flavor. The cost of such complementary foods is, for comparable nutritional quality, about two to six times less than commercial products available on the Vietnamese market.

The second step of the Fasevie program began in 2000 with the implementation of strategies in pilot districts. The objective of these strategies based on nutritional education campaigns directed to women is to promote the use of adequate feeding practices and complementary foods. The project promotes a local and practical approach of nutrition with the aim to improve the conditions of diversification of nutrition for infants and young children. This concretely translates into i) the production of infant flours (*Favilo*, *Favina*) and their promotion through different channels such as preventive health services, Women Union, local mass-media...; ii) the promotion of the use of a food complement (*Favilase*) at the household level. This complement, a mix of processed soybean flour, sources of amylase, vitamins and

minerals has to be added to traditional rice based gruels to improve their nutritional quality; iii) nutritional education by the spreading of messages about nutrition adapted to the age of the children.

These actions are currently under evaluation through two studies. The first one will evaluate the efficacy of the *Favina* flour and of the food complement *Favilase* to prevent growth retardation and micronutrient deficiencies in infants and children. The second will evaluate the effectiveness of a global strategy aimed at promoting appropriate feeding practices and the use of *Favina* flour or *Favilase* complement. In addition, the effect of the education campaign on knowledge, attitudes and practices of mothers and women in age of taking care of children will be evaluated through repeated cross-sectional surveys in the province of intervention.

This evaluation period will be complemented by research activities in the pilot unit of NIN to produce new formulas for infant flours in order to take into account food availability and feeding practices in other provinces of Vietnam. Other types of foods (snacks, biscuits) will be also considered in order to contribute to meet the requirements in micronutrients (primarily Iron, Zinc, Vitamin A) of children after the period of gruel consumption.

The assets of the project will be popularized through the edition of reports, elaboration of a Website and organization of seminars and workshops to inform policy makers and relevant organizations. These activities will be directed to Vietnamese institutions for an extension of the strategy at national level and to the international community (international organizations and NGO's, publication of evaluation studies in international journals) with the hope to contribute to the reduction of malnutrition in infants and young children in developing countries with limited resources.

## **1. Introduction**

Vietnam's rapid economic development since the 1986 implementation of the "Doi Moi - restoration" policy generated important differentiation in the populations access to both goods and services. The basic education and health services, formerly accessible to all and provided free by the state have also been partially liberalized. Although the health of the population improved overall, strong variations appeared between social categories, between cities and rural villages regionally throughout Vietnam. Thus, if the two delta regions of the Red River and Mekong river have experienced accelerated development, other regions notably the northern mountain provinces, central coastal provinces and the southern highland regions have shown only marginal development, these regions being recognized amongst the poorest in Vietnam.

From the nutritional point of view, serious problems persist among the most vulnerable groups: infants, young children and women of child bearing age. National nutritional surveys conducted since 1995 show the high prevalence of protein-energy malnutrition (PEM) and deficiencies in micronutriments such as Vitamin A, iron and iodine, which influence the physical and mental development of children.

In order to determine the causes of the chronic infant malnutrition which concern 37% of the young children of Vietnam, the National Institute of Nutrition of Vietnam (NIN), GRET and IRD conducted several surveys in two provinces: in 1996, in Ha Tinh province (350 kms south of Hanoi) and in 1998 and 2000 in Quang Nam province (850 kms south of Hanoi). In each province, two surveys on 400 infants and young children were conducted. It was established that the nutritional situation worsens considerably between six and twelve months of age, that the feeding practices are characterized by a too early introduction of complementary food and an insufficient recourse to special food of transition like the gruel. Moreover, the nutritional quality and the energy density (quantity of nutrients per meal) of the gruel prepared at home with rice flour, sugar and mungo-bean flour are not adequate. Only 20% of mothers can afford to purchase commercial infant flour at the local market. Imported flours are expensive and the price is too high for the majority of mothers.

## **2. History of the action and experimental assets**

An experimental phase carried out from year 1997 to year 1999 associated scientific and economic partnership with a pragmatic and progressive approach through a project called Fasevie. This action, concentrated in three provinces of the Center area (Ha Tinh, Da Nang and Quang Nam), allowed:

**The diagnosis of the nutritional situation** in the targeted zones

**The creation of a pilot unit** in the NIN: development and test of simple and reliable methods of manufacture; development of various formulations of flours fulfilling the nutritional requirements of infants and small children.

**The identification in three provinces of local companies** interested in the active development of flour production and the support in the installation of small-scale enterprises.

- Province of Ha Tinh (1997): Hatifaco
- Province of Da Nang (1998): Huong Lan Co. Ltd.
- Province of Quang Nam (1999-2000): Quang Nam Food Company

**The installation of the production units**, in the 3 provinces, in order to produce, under hygienic optimal conditions, the foodstuffs intended for the young children.

**The training of the workmen** in order to guarantee good manufacturing practices.

**The manufacture technology transfer:** an extruder was developed in Vietnam specifically for the Fasevie project. This machine allows, due to its configuration the manufacture of both pre-cooked or instant products. The machine, locally built is less expensive to produce and repair than imported material.

**To test the marketing of the products**, either on reserved markets (agreement of provisioning the World Food Program), or on the current markets of consumption.

### **3. Results of the experimental phase**

In January 2000, a seminar of restitution of the assets of this experimental phase was organized in partnership between the National Institute of Nutrition, IRD and GRET. This seminar gathered the whole of the national and international actors who have shown an active participation in the field of young children nutrition (United Nations Organizations and International NGOs) as well as the partners of the project (Ministry of Health, Institute of Nutrition, People Committees, Health services, Technical partners, GRET, IRD, etc.).

The main results of this first phase are:

#### ***The production of an infant flour, containing local raw materials, of an accessible price***

One defines the complementary food as being that which comes in complement to the breast-feeding and not to replace it. It is important to recall that this transition food between a liquid milk diet and a solid food containing cereals, must be conceived by taking into account the needs of the infant and young child in terms of nutritional contributions, and adaptability to a new food having a different consistency, a different taste. This change of food must be done gradually by taking into account the socio-cultural and psycho-emotional (the relation mother-child will be changed) factors.

The composition of flour is based on raw materials, which are available locally (rice, soy, sesame). The technological innovations suggested within the framework of the project allow the production of instant infant flours fortified with vitamins and minerals. This flour allows the preparation of high energy and nutrient dense gruels with appropriate consistency and flavor. These flours are of a nutritional quality equivalent of the imported flours, which are 6 times more expensive than our product, which is also of a higher quality than the locally produced infant flours, which are 2 times more expensive than our product. The price of the produced flour is currently of 10000 VND (0.67 USD) for one 400g box and 5000 VND (0.33 USD) for a 150g sachet of Favilase.

### ***The performance and flexibility of the production facilities***

The selected companies, which took benefit from the necessary know-how and technology transfers, produced 350 tons of infant flours in 11 months for WFP in 1998-1999.

The transformation units are powerful and especially very flexible because of their small size. For instance, they have satisfied the manufacture requirements imposed by the order of WFP, and showed commercial opportunism.

### ***The reliability of the process of transformation***

These flours, analyzed by the health services of the province and by the laboratory of the UR106 of IRD-Montpellier (France), meet the national and international nutritional and microbiological quality standards. Moreover its organoleptic quality was tested in the province before its final marketing and the product showed excellent acceptability.

Since June 1998, the quality of the flour produced under these conditions is controlled by an independent laboratory and so far no contamination or any other vice of quality was detected. The produced flours respect the recommendations of the World Health Organization.

## **4. Extension and evaluation of the Fasevie project**

The second step of the Fasevie program began in 2000 with the implementation of strategies in pilot districts. The objective of these strategies based on nutritional education campaign directed to women is to promote the use of adequate feeding practices and complementary foods. The project promotes a local and practical approach of nutrition with the aim to improve the conditions of diversification of nutrition for infants and young children.

The activities of this second phase of the Fasevie project covers:

### ***Nutritional education in the province of Quang Nam***

The nutritional education campaign of the FASEVIE program aims at improving the nutritional situation of the young children in certain districts of the province of Quang Nam. Following the diagnoses on the nutritional situation realized in 1996, 1998 and 2000, the program promotes a local and concrete approach to nutrition, namely a support to the improvement of the conditions of food diversification of the young children. This support results concretely in the infant flour and food complement production and the promotion of the use of these products as well as the circulation of nutritional information adapted to the age of the child. In the province of Quang Nam, the FASEVIE program undertook its nutritional education campaign in the district of Thang Binh. In this district of 21 communes, the program targets 9,000 mothers of children of less than two years and each mother of a new-born baby is enrolled in the system of nutrition training, i.e. 2,500 mothers per year.

### ***Improvement of the complementary food: products adapted to the context***

Within the framework of the FASEVIE program, the foodstuffs company of the province of Quang Nam agreed to produce infant flours containing rice. The production facility installed in the town of Tam Ky currently produces flour FAVINA.

Other products are currently being produced. The instant flours are now available in different formulas (sweet or salted formulas). A new product, FAVILASE, a complement based on soy bean flour, commercial amylases and fortified with vitamins and minerals to be added with rice flours or cooked rice, allows to improve nutritional value of traditional gruels with the aim to reduce the cost on the household level.

## ***Promotion of the complementary food use***

### **A simple message**

The Fasevie team of Quang Nam is made up of two trainers: a medical doctor specialized in nutritional education and a teacher specialized in training and pedagogy. While working in close collaboration with a doctor of the health center of the province and the vice-president of the women union organization of the province, this team aims to train two «relay» trainers per district and to ensure the follow-up of the various training made in the province. The training taught to the two «relay» trainers focus around a single message: «To prevent your child suffering from malnutrition, it is absolutely necessary that he/she consumes in sufficient quantity, from the age of 4-6 months old, in complement to the mother milk, a food having the adapted characteristics to his/her nutritional needs». This message comprises several aspects and, to be well understood the campaign informs on:

- The nature and consequences of malnutrition,
- The promotion of the exclusive breastfeeding until the age of 4-6 months, and promotion of continuation of breastfeeding until 2 years of age.
- The desirable calendar of weaning and importance of the mother's milk,
- The fact that a good food is a condition absolutely necessary, but not sufficient, to the physical and intellectual development of the child,
- The specific characteristics that must have a complementary food depending on the age of the child and the importance of taking care that the consumed quantities are sufficient.

### **A complete training at all levels: Province / District / Commune / Household**

A first selection allows choosing two "relay" trainers in a district, who work full-time for the Fasevie program. The training includes 4 days of technical training (nutrition) and two days of training in pedagogy. Indeed, the "relay" trainers in their turn will train, during 3 days, approximately 10 to 15 volunteers per commune. These volunteers will each be responsible for about thirty families whom they will visit on a regular basis to provide the necessary nutritional information.

- At the province level, the team FASEVIE trains the "relay" trainers and provides them with a booklet including the necessary technical and teaching aspects, plus additional documents to ensure the follow-up of the training.
- At the commune level, the volunteers receive a document gathering the same data but in a more simplified way.
- And finally the mothers receive a small booklet synthesizing the recommendations about infant nutrition and a small-illustrated poster.

The follow-up / evaluation of all the trainers is ensured to guarantee a maximum effectiveness of the nutritional education campaign.

## **A direct and targeted diagram to distribute the information**

At the household level the distribution of information is done directly by the volunteers and at an individual level. Indeed, each volunteer has the responsibility of about thirty households comprising children of different age groups (less than 4 months, from 4 to 6 months, from 6 to 9 months and 9 to 24 months). For each child, the volunteer visits the mother at home and delivers the "message" to her corresponding to the age group of her child. Thus the mother feels more concerned with the "message" and she will pay more attention to it. The individual visit also allows greater confidence and trust to be developed between the mother and the volunteer. The mother will feel much freer to ask questions about the nutrition of her child. In the district a projected 9,000 mothers will receive the "message" during the initial campaign and then each year an additional 3,000 mothers will be integrated into the nutritional education program.

## **A sustainable system from its starting**

The financing of the campaign is quite innovating. Each volunteer receives free, in exchange of his engagement in the program, a complete training and 10 boxes of infant flour. At the time of the information meetings of the mothers, the volunteer has the possibility of selling these infant flours at the market price or 10,000 VND/box (~ 0.67 \$US). When the 10 boxes are sold, the volunteer has the possibility of repurchasing 10 new boxes at the ex-factory price, i.e. 8,500 VND/box (~ 0.57 \$US). This system has several advantages, it permits the company to make the promotion of its products without specific expenses (advertising, etc.), it permits the mothers to profit from a concrete response to the problems of malnutrition of their child and finally it permits the volunteer to receive a small remuneration in reward of her work of information. Presently this system enabled, in one month, the sale of 2,000 boxes and the information provided to a total of 1,200 mothers in three "test" communes in the district of Thang Binh (Quang Nam province).

## ***Evaluation of the strategy***

The original strategy implemented in the province of Quang Nam consists in coupling the promotion of the products resulting from the unit of Tam Ky with nutritional education campaigns carried out by networks of volunteers in connection with the health centers. This strategy is under current evaluation through:

### **A study of efficacy of the two products (Favina and Favilase)**

This study aims to evaluate, over a 6-month-period starting from the 5<sup>th</sup> month of age, the growth, the micronutrient status, the morbidity and the nutritional intakes of three groups of 120 children receiving, respectively, the usual/traditional food of the province of Quang Nam (pilot group), Favina and Favilase.

### **A study of the evolution of nutritional knowledge**

of the mothers of children targeted by the strategy and of the women in age to deal with these children in the district of Thang Binh. Representative samples of 150 mothers and 100 women in age to deal with the children will be surveyed with KAPB questionnaire every 6 months during 2 years starting from November 2000.

## **A study of the effectiveness of the strategy**

This study aims to evaluate the impact of our strategy on the nutritional status of children aged between 0 and 24 months and on the evolution of food practices.

Food practices and consumption questionnaires and anthropometrical measurements will be carried out in two groups of 400 children from 0 to 24 months old, from respectively the intervention zone (district of Thang Binh) and the control zone (district of Nui Thanh), before the beginning of the intervention and after two years of implementation of the strategy.

## **5. Popularization phase**

The assets of the project will be popularized through the edition of reports, elaboration of a Website and organization of seminars and workshops to inform policy makers and relevant organizations. These activities will be directed to Vietnamese institutions for an extension of the strategy at national level and to the international community (international organizations and NGO's, publication of evaluation studies in international journals) with the hope to contribute to the reduction of malnutrition in infants and young children in developing countries with limited resources.

## **Acknowledgements**

The Fasevie project is implemented with financial support from The General Council of Cotes d'Armor (1996-2002), The Regional Council Nord Pas-de-Calais (1997-2002), French Ministry of Foreign Affairs (on State/Region contract: 1997-2000, direct: 2000-2003), Hoffmann La Roche (1999), Foundation Sight and Life (1999-2002), The French Committee of UNICEF (2001-2003), IRD (1996-2003), GRET (1996-2003).