# Development of Micronutrient-rich Food Ingredients from Soybean and Moringa Oleifera

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## Introduction

Micronutrients are food ingredients needed by the body in small quantities but have great potential to modulate and enhance body functions thereby leading to growth and functioning of the immune and reproductive system. Micronutrients include vitamins such as vitamins A and C, and minerals like iron, iodine, zinc, selenium. Deficiency in micronutrients results into micronutrients malnutrition. Vitamin A, iron, and iodine deficiencies are the most forms of micronutrient malnutrition facing a large population of the world including Tanzania, where about 30% of the population is affected by micronutrient malnutrition. Children, pregnant and lactating women are the most risk groups. 24% of children under 5 years are vitamin A deficiency, with 1 child out of 7 dying. 47% of pregnant women are iron anaemia deficiency, whilst 20% of maternal deaths are caused by iron anaemia deficiency. Amongst the best suitable and sustainable strategies for combating micronutrients malnutrition are food based strategies favouring locally available food materials. Soybean and moringa oleifera are local crops/plants rich in micronutrients and therefore could help to fight micronutrients malnutrition in a cheap and sustainable way. Soybeans and moringa oleifera products can be used to enrich traditional foods with vital micronutrients and other nutrients thereby improving health and well-being of the Tanzanian society.

## *Moringa Oleifera as a Potential Source of Micronutrients*

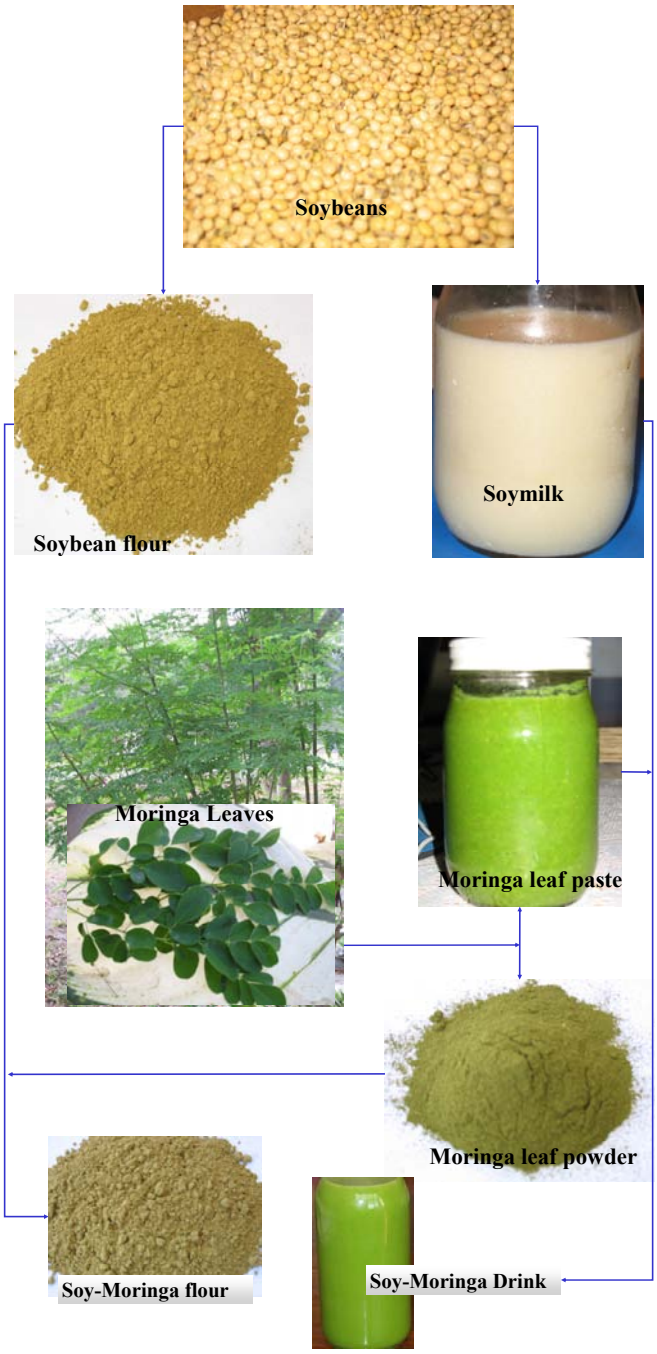
- **Protein** with a good balance of all eight essential amino acids and ten non-essential amino acids
- **Fat** with a good percentage of Polyunsaturated Fatty Acids (PUFAs)
- **Vitamins**:
  - Vitamin A (β-carotene), B-vitamins - B1, B2, B3, B6, choline, vitamin C, D, E and K
- **Minerals**:
  - potassium, magnesium, calcium, manganese, iron, copper, zinc, phosphorus, iodine, sulphur and selenium
- **Phytochemicals**
  - Phenolic antioxidants, e.g. flavonoids

## *Soybeans as a Potential Source of Micronutrients*

- **Protein** with a good balance of all eight essential amino acids
- High quality **Fats** with a good percentage of Polyunsaturated Fatty Acids (PUFAs)
- Essential **Minerals**:
  - sodium, potassium, magnesium, manganese, iron, copper, zinc, phosphorus, iodine, and selenium
- **Phytochemicals**
  - phytoestrogens, isoflavones

## Objectives of Micronutrients Research Project

- ***Overall objective***
  - ☞ Improve nutrition and health of the Tanzanians through adequate intake of micronutrients.
- ***Specific objectives***
  - ☞ Develop food products and ingredients rich in micronutrients from locally available plant materials.
  - ☞ Define engineering process control parameters for post-harvest handling and manufacturing, and to maintain the efficacy of functional food ingredients from indigenous plant materials throughout the food value chain.
  - ☞ Collaborate with the private sector to introduce into the market new food products with quick cooking properties, real nutritional benefits, desirable texture, good taste, stable shelf life, and optimum materials utilization.




## Benefits of the Project

- More income to farmers by cultivating soybeans and moringa trees as new income generating crops.
- Balanced nutrition to school children, pregnant and lactating women, and people living with HIV/AIDS leading to reduced micronutrients malnutrition.
- Tanzania's food processing Small and Medium Enterprises, which comprise about 85% women, improve their products through efficient processing techniques and develop new processes and products.
- Build capacity of the University in functional foods research and development.
- Create new opportunities for employment.

***Status of the Project: On-going (2005 -2007); Sponsor: NORAD***