Soybean processing and utilization: The way to good health

Introduction

Tropical soil Biology and fertility is an institute of International Center for Tropical Agriculture. Its main activities include research on the role of biological and organic resources in tropical soil biology and fertility and its relationship to the natural and social environment in order to provide farmers with improved soil management practices to sustainably improve their livelihoods.

TSSF-CIAT strategy of improving livelihoods through science led research has been linked to health (nutrition), food consumption, and markets and it addresses the real needs of the poor; intersecting between the components of soil fertility, production yields, markets, processing, nutrition and health. Successful resource management and sustainable agricultural productivity need to be pro poor i.e. it must touch the realms of soil fertility, markets, income generations, food/nutrition security, nutrition and health.

Why Soy Beans?

Nutritional benefits

Proper nutrition keeps the body fortified to support the best possible immune function, prevent nutrition-related immune deficits, and help to ward off opportunistic infections. Therefore:

- Soybeans play a role in nutritional maintenance, an essential feature of optimal effectiveness of medicine while helping to diminish nutrition-related side effects.
- Soybeans deliver high quality nutrition in small volumes, which is especially important because adequate food is cost.
- Soybeans considers an important resource for the health sector because of its high level of protein (40%) and oil (20%).
- Soybeans are more of the nut-like sources of essential omega three fatty acids which may help reduce the risk of coronary heart disease. Compared to other beans like navy beans, soybeans have a higher fat content, but this fat contains these heart healthy omega three.
- Protein quality is good with no cholesterol and lactose (i.e. can lower blood cholesterol), thus improving heart function.
- Fat contains thiolic acid that is essential for absorption of nutrients and is a precursor of hormones that regulate growth of healthy cells.
- Protein contains isoflavones and genistein for effective health improvement (reduced osteoporosis through increased bone density).
- Protein contains protease inhibitors (universal anti-carcinogen) and phytochemicals (capable of blocking action of cancer-causing enzymes and tumors respectively)
- Contains adequate amounts of B vitamins and iron
- When properly processed, soybeans can be incorporated into traditional dishes without altering the taste or texture

Soil Conservation

Being a leguminous plant, the dual-purpose soybean has the ability to fix significant amount of atmospheric nitrogen to soil through the formation of nodules on root. Also as a result of the strong and fairly deep root system and dense foliage, this crop has excellent ability to reduce soil erosion.

Cash Income

Soybean is a tradable commodity and can be processed to produce Soymilk and other products which are sold to generate income thereby improving economic status of individuals.

In the context of a project aiming at using soybean processing and utilization as a entry point to solving nutrition and health problems of rural and urban households affected by HIV/AIDS in targeted areas in Kenya, it is being implemented by TSSF-CIAT in collaboration with National University of Agriculture, in collaboration with National University of Agriculture, Vihiga County, Kenya.

Soybean protein and oil are high quality food ingredients, which are high in protein and fat content, respectively. Furthermore soybean protein and calorie can help prevent the "body wasting" associated with HIV/AIDS.

The project is "Soxbean processing and utilization for improving health and nutrition of rural livelihoods in HIV affected areas of Kenya." Soybean processing and utilization is being used as an entry point

Goal

- To improve rural livelihoods in Kenya through improved nutrition, enhanced access to income, and sustainable agricultural production by increasing soybean production and linking production with available markets.

Food and Nutrition Training Strategies: Training is done at three levels. They are:

Household level processing
- Training of clients/patients at AMPATH using one-day training at a time and spread over several weeks.
- Training of Farmers at Butere/Mutisio using two day community level processing and large scale level processing.

Using mainly written instruction incorporated into traditional dishes and product development methods.

Training Sessions

- The training of Trainers is done in English while training of farmers is done in Swahili or local vernacular depending on where the training is done.
- During these trainings, other topics other than soybean processing and utilization are covered. Such topics include:
  - Food Hygiene and sanitation
  - Small business management
  - Nutrition education
  - Other nutrient: seed traditional foods in the area and
  - HIV/AIDS in relation to nutrition and food

Effect of HIV/AIDS

Potential bioactive constituents in soy

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<thead>
<tr>
<th>Component</th>
<th>Function</th>
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<tbody>
<tr>
<td>Genistein</td>
<td>Proteinase inhibitors</td>
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<tr>
<td>Glycine</td>
<td>Lactose</td>
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<tr>
<td>Daidzein</td>
<td>Phytosterol</td>
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<tr>
<td>Equol</td>
<td>Lecithin</td>
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<tr>
<td>Phytic Acid</td>
<td>Amino Acids</td>
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<td>Glycollins</td>
<td>N-3 fatty acids</td>
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<tr>
<td>Saponins</td>
<td>Fiber</td>
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<tr>
<td>Protein</td>
<td>Globulins</td>
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<tr>
<td>Peptides</td>
<td>Protein</td>
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