

# IMPROVING HEALTH THROUGH SOY

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A Basic Training Manual

**WISHH**

**World Initiative for Soy in Human Health**

*Enhancing human well-being through soy*

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## Acknowledgments

This guide has been developed by WISHH to support our field partners as well as trainers interested in utilizing and teaching others how to better utilize soy in their diets. The guide reflects the interests as well as the experiences of our many partners to date.

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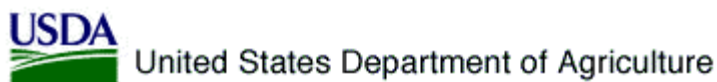
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We expect to update the manual in the future as the needs and interests of our field partners change. Comments and suggestions for future versions can be sent to the WISHH staff at:

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## Introduction

This guide is designed for WISHH's overseas partners involved in the care and feeding of others and those who are interested in improving their diet through soy. Such partners include, among others, persons involved in school feeding, institutional feeding, owners of small businesses and individuals interested in using soy.

This guide describes the health benefits of soy consumption and introduces ways to prepare value-added soy products. It is designed to improve knowledge of soy and increase skill in preparing healthy soy meals. Each chapter also contains guidance information for trainers involved in teaching others about the health benefits of soy and ways to incorporate soy into their diets.

This guide is divided into four chapters and several appendices:

**Chapter 1** introduces the soybean, its makeup and examines the different value-added soy products available for human consumption.

**Chapter 2** examines the health benefits of soy along with its macro and micronutrient components.

**Chapter 3** reviews basic hygiene required in the proper handling, preparation and storage of food. Chapter 3 also contains a Supervisor Checklist. This is a one-page guide for supervisors of personnel involved in food handling to ensure healthy practices are used.

**Chapter 4** examines how soy products can be utilized, while maintaining proper hygienic conditions, in order to produce health benefits.

**Appendix 1** provides a variety of soy recipes and basic guidance on how to prepare these tasty foods.

**Appendix 2** contains a consumer acceptability survey to be used by facilitators with groups trying new soy products and recipes.

Each chapter contains the following sections:

- a. **Pre-test.** Self test designed to test the reader's knowledge of a certain subject.
- b. **Learning Objectives.** Tells the reader what they will learn.
- c. **Body of text.** Contains the primary information of the lesson.
- d. **Post-test.** A 2<sup>nd</sup> self-test allowing the reader to test themselves to see if their knowledge increased.
- e. **Trainer Objectives** and options for introducing lessons. A brief guide for trainers and different, fun ways to teach the lessons.

## Chapter 1 – The Soybean

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### Pre-Test

*On a separate sheet of paper, answer the questions.*

1. What is soy?
2. List at least two health advantages of using soy.
3. List at least three different forms that soy comes in.

Don't worry if you cannot answer these questions! By the end of this brief chapter you will be able to answer these questions completely.

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### Learning Objectives

*By the end of the chapter, readers should be able to:*

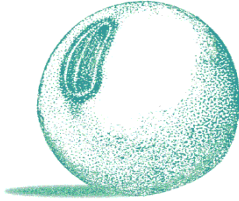
1. Briefly describe what soy is.
2. Identify at least two health advantages of using soy.
3. Identify at least three forms of value-added soy products.

## What is soy?<sup>1</sup>

Soy comes from the soybean plant. A soybean is a hard, dry bean that can be yellow, black or brown. Soybeans belong to the legume family – the same family as peas and lentils.



Soybeans have been a popular food in many parts of the world for more than 5,000 years.



Soybeans are often called 'super beans' because there are so many ways to use them.



## What can you make from soy?



The soybean can be made into lots of things. Many good foods are made from soy ingredients. You may have tasted some of these products. Soy milk and soy sauce are just two of these products. Soy ingredients have also been put into many other foods including noodles, breads, meat patties and sauces, making them more nutritious.

## Why should soy be used?

Using soy as food has many health advantages. Soy has many vitamins and minerals and is high in protein and fiber. These are all very important parts of a healthy diet. Adding soy to your favorite recipes can decrease fat and increase the nutritional quality. Soy may also help in preventing diseases such as chronic heart disease, cancer and osteoporosis. Soy has also been found to reduce cholesterol and lessen the impact of arthritis. We'll look at the nutritional components of soy in greater detail later in the manual.

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<sup>1</sup> Picture credits on this page: United Soybean Board/Soybean Checkoff

## What soy ingredients are there?<sup>2</sup>

Soy is now made into numerous things; there are four main products that are widely available. They can be used in a variety of foods. These are:



**Soy flour** – used in breads, pasta and other foods calling for flour

Full-fat soy flour is made from roasted soybeans ground into a fine powder; it contains more than 15% fat. Defatted soy flour comes from grinding soy flakes that have had the oil removed, usual through solvent extraction. This product has less than 1% fat. Defatted soy flour is 50% protein and can be stored for three to twelve months in a dry, cool environment.



**Textured soy protein** – is used as a meat extender or meat substitute

Textured vegetable protein is made from soy flour or soy protein concentrate. It is extruded into small granules or larger, chunk-sized nuggets. When made from defatted soy flour, it contains 50% protein as well as dietary fiber and soluble carbohydrates. When made from soy protein concentrate, it contains 70% protein as well as the dietary fiber.

**Soy protein concentrates** – used in breads, pastas, beverages and meat products

Soy protein concentrates come from defatted soy flakes that have had the soluble carbohydrates removed. It contains 70% protein and retains most of the dietary fiber. They are a good source of highly digestible protein and have a shelf-life of over one year.



**Soy protein isolates** – used in beverages, dairy products and added to meats

Soy protein isolates are produced when the protein is removed from defatted flakes. At 90% protein, they contain the highest amount of protein of any soy product. When stored in a closed container, they can last for more than one year.

We'll learn more about using soy foods in Chapter 4.

<sup>2</sup> Photo credits on this page, United Soybean Board, Illinois Center for Soyfoods, and Publisher, Stevens and Associates, Inc; Taken from, United Soybean Board, Soyfoods Guide. Stevens & Associates, Inc. Indianapolis, IN: 2004.



## Chapter 1 – The Soybean

### Post Test

Now that you have had a quick introduction to soy, try answering the following questions again. Be sure to cover up the answers at the bottom of this page.

*On a separate sheet of paper, answer the questions.*

1. What is soy?
2. List at least two health advantages of using soy.
3. List at least three different forms that soy comes in.

#### **Answer Key:**

1. What is soy?

*Soy comes from the soybean plant. It is a legume. Soybeans are dry, hard beans that can be yellow, black or brown.*

2. List at least two health advantages of using soy.

*Soy can aid in preventing chronic diseases such as heart disease, cancer and osteoporosis. It can also reduce cholesterol and limit the impact of arthritis.*

3. List at least three different forms that soy comes in.

*Soy is made into four main products that are widely available; these are soy flour, textured soy protein, soy protein concentrates and soy protein isolates.*

## Trainer Objectives and Options for Chapter One – The Soybean

Early on in the training it is important to ensure that the group is comfortable with one another. Being at ease in the training setting will encourage them to ask questions and help them learn. The following two exercises help accomplish those two things: one, making people comfortable with their colleagues, and two, encouraging people to ask good questions.

### Objectives:

1. **Getting acquainted:** Help the group to become more comfortable with one another.
2. **Asking good questions:** To encourage active involvement and response from the group.

### **Getting Acquainted**

#### Detailed Objective:

To enable first-time attendees in a training session to become acquainted with other participants; to build a climate of friendliness and informality.

#### Procedure:

Each person is given a blank name tag and asked to put his or her first name or nickname on it. Then they are asked to list four additional words that tell something about themselves such as:

- where they were born
- where they reside
- # of children
- favorite hobby

#### Example:

- Jim (Diego)
- Guatemala
- Honduras
- Three
- Disco

Give the group about five minutes to write down their five items. Have them start mixing around in groups of two to three, sharing their five points. Every few minutes instruct them to 'change partners' trying to get to know as many people as possible. After changing three times, ask them to return to their seats.

#### Discussion Questions:

1. Did you learn new things about your colleagues?
2. Was it easy to share things about yourself? Did people seem interested to get to know you?
3. How do you now feel about work with this group over the next few days (or day)?

#### Materials required:

Blank stick on name tags and marker, or squares of white paper, pens and tape

#### Time required:

Depends on group size, but can be done in approximately 20 minutes (total).

Source:

Newstrom, J.W. and E. E. Scannell. Games Trainers Play. New York, McGraw-Hill, 1980:39. (Original source, unknown).

### **Asking Good Questions**

Detailed Objective:

To stimulate reflection and active response from participants through the phrasing and timing of questions.

Procedure:

As a good facilitator, you want active participation from your trainees. Most participants have some relevant experiences to share and want to participate in the discussion. Others may be confused over an issue or certain topics. How can you as a good facilitator, stimulate active participation? Following are some suggestions:

- 1) Lay out expectations for questions at the start of the training. Let the participants know that you encourage and expect questions. (It's OK to ask questions). For example, tell the group (or even write it down on a flip chart):
  - Ask a question when you have one
  - Feel free to share an illustration
  - Request an example if a point is not clear
  - Search for ways in which you can apply a suggestion or idea to your work
  - Think of ways you can share ideas with your subordinates or coworkers
  - Be skeptical – don't buy everything you hear (at least without asking questions)
- 2) Respond positively to the first question asked. Trainees will be observing you closely to determine how serious you were.
- 3) Watch non-verbal behavior. You can often detect a desire to ask a question or challenge a point from facial expressions and body language without waiting for someone to raise their hand.
- 4) Remind the group that there are no stupid questions (just occasionally, stupid answers from the trainer!)
- 5) Repeat or rephrase the question to clarify your understanding of it and to ensure that the other participants heard it.
- 6) Pause for five or ten seconds after asking if there are any questions. It may seem like a long time, but the pressure is equally high on the group.
- 7) Never ask if there are any questions immediately before coffee breaks, mealtime or dismissal. Usually, these breaks take a higher priority than a question, or it can make the person asking the question unpopular or feel uncomfortable.
- 8) Include time for question and answer periods in your agenda.

- 9) Don't imply that you are rushed for time, but could answer one or two questions. It will be very clear that you prefer none.

Source: Newstrom, J.W. and E. E. Scannell. Games Trainers Play. New York, McGraw-Hill, 1980:17 – 18, 63. (Original source, portions originally adapted from Milt Badt, "Ways to Encourage Your Trainees to Ask Questions," Training, May, 1978: 74-5).

## Chapter 2 – Soy and Health

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### Pre-Test

*On a separate sheet of paper, answer the questions.*

1. List two advantages soy has over other forms of protein.
2. What are two benefits of incorporating soy into your diet?
3. What macronutrients do you find in a soybean?

These are tough questions. Don't worry if you could not answer them completely or even at all. This chapter will answer all of these questions and more!

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### Learning Objectives

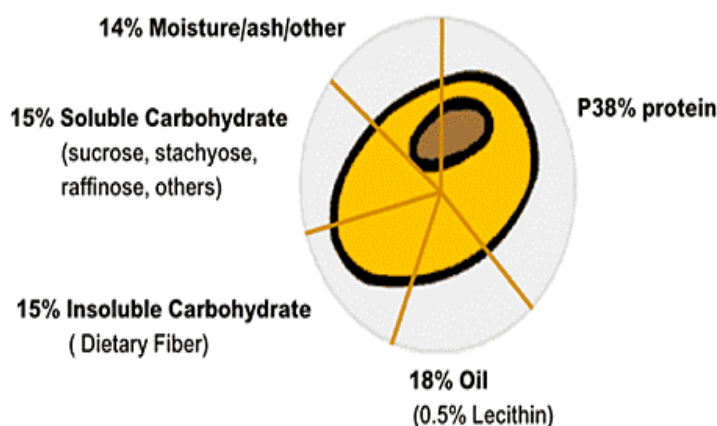
*By the end of the chapter, readers should be able to:*

1. Name two advantages soy has over other forms of protein.
2. List two benefits of a diet that includes soy.
3. List the macronutrient components of a soybean.

## What makes soybeans healthy?

Like many other foods, soybeans are packed with vitamins and minerals. However, soybeans have some unique characteristics which make them quite different from other healthy foods. Soybeans are high in protein, fiber, low in saturated fat and contain no cholesterol. They also contain a special type of polyunsaturated fat called omega-3 fatty acid. This is a good fat that may help reduce the risk for cancer and heart disease. Soybeans contain macronutrients and micronutrients essential to your body.

### Macronutrients of the Soybean



Source: United Soybean Board: Soyfoods Guide, page 9.

### Soy and Macronutrients

Soybeans are comprised of 38% protein, 18% fat and 30% carbohydrates.

| PROTEIN              | PDCAAS |
|----------------------|--------|
| Isolated soy protein | 1.00   |
| Casein               | 1.00   |
| Egg white            | 1.00   |
| Beef                 | 0.92   |
| Kidney beans         | 0.68   |
| Peanut meal          | 0.52   |
| Whole wheat          | 0.40   |

well as its amino acid balance. To obtain the PDCAAS, the food is first given a score based on its amino acid balance; then the score is adjusted to account for

### What are macronutrients?

Macronutrients are nutrients your body gets from the things you eat. Macronutrients come in three forms:

**Protein** – Protein provides *essential amino acids* that your body uses to make muscle tissue. Without these amino acids, you would eventually waste away and die.

**Fat** – There are several types of dietary fat -- saturated, trans-fatty acids, monounsaturated, and polyunsaturated. One type of "healthy" fat known as essential fatty acids, is one of the most essential nutrients for optimal health. Omega-3 fatty acid is one of these 'healthy fats'.

**Carbohydrates** - Carbohydrates are sugars and are necessary for energy; they can be simple or complex. This refers to how quickly they convert to sugar in the body; too many sugars in the diet are associated with numerous diseases including diabetes.

### Protein

Soybeans are higher in protein than legumes and most other plant foods. There are several ways to rate the quality of protein in different foods. The current method is the protein digestibility-corrected amino-acid score or PDCAAS. The PDCAAS takes into account the digestibility of a protein as

the food's digestibility. The table shows some selected foods and shows their PDCAAS score (the highest possible score is 1.0).

Soy protein products can be a good substitute for animal products because they offer a complete protein, meaning soy protein contains all of the essential amino acids necessary for human nutrition. Soy protein, when used as a substitute for animal protein, reduces the saturated fat and cholesterol of the recipe. A diet that incorporates soy protein may reduce high blood cholesterol.

### **Fat**

Essential fatty acids are those that the body cannot produce by itself and therefore it must be obtained through the diet. They are crucial to your health and well-being. In fact, life without essential fatty acids is impossible. Essential fatty acids heal, carry vitamins, enhance metabolism and bring oxygen to the tissues. They are required by our various organs, tissues and cells. Essential fatty acids act as solvents to remove hardened fat. They are also involved in generating the electric currents that maintain a regular heartbeat. There are two essential fatty-acids, omega-3 and omega-6.

Soybeans are low in saturated fat and contain no cholesterol. The fat in soybeans is mostly polyunsaturated. One important type of polyunsaturated fat found in soybeans is omega-3 fatty acid (also known as alpha-linolenic acid, LNA). Soybeans are one of the few plants to contain this healthful fat. This fat is essential in the diet and may reduce the risk for certain diseases such as heart disease and cancer.

### **Carbohydrates**

There are different types of carbohydrates and they are classified based on the number of sugar units in their total chain. Basically, carbohydrates can be simple (one or a few sugar units) or complex (three to more than ten sugar units). The American Heart Association recommends that people consume complex carbohydrates like – vegetables, fruits and grains – rather than the simple carbohydrates found in sugars. Complex carbohydrates add more fiber, vitamins and minerals to the diet than foods high in refined sugars. Foods high in complex carbohydrates are usually lower in calories, saturated fat and cholesterol.

Soy is a complex carbohydrate, classified as oligosaccharides (having three to ten sugar units in the total chain). Soybeans are also high in fiber. One-half cup of soybeans contains eight grams of fiber which is one-third of what many diets require. Soyfoods made from whole soybeans, like soy flour and textured soy protein, are a good source of fiber. Defatted soy flour and textured soy protein have approximately 18 grams of fiber per 100 grams of raw, edible product according to the American Soybean Association, Soy Protein Reference Guide. Other soyfoods, like soymilk, have had the fiber removed.

## Micronutrients and Soy

Soyfoods are high in several vitamins and minerals, particularly B vitamins, calcium and iron.

### B Vitamins

Soyfoods<sup>[MMS1]</sup> are a good source of folate, thiamine, riboflavin and B-6. B vitamins are important because they help form red blood cells and keep the nervous system, skin and vision healthy. Vitamin B deficiencies can cause a lot of problems. For example, folate deficiency can cause birth-defects in unborn babies<sup>[MMS2]</sup>.

### Zinc

One-half cup of soybeans contains about 1 mg of zinc, although some of the zinc is not absorbed by the body. Zinc deficiencies can retard growth, cause diarrhea and vomiting, and delay puberty as well as wound healing.

### Calcium

One half cup of soybeans has about 88 mgs of calcium. Although much can be lost in the processing (particularly soymilk), the calcium in soybeans is fairly well absorbed by the body. Calcium is necessary for strong bones and teeth and the proper functioning of muscles. Calcium deficiencies can retard growth in children and lead to bone loss in adults.

### Vitamin E

Whole soybeans are high in vitamin E. However, like some other vitamins and minerals, much can be lost in processing. Vitamin E is an antioxidant. Dietary deficiencies of vitamin can contribute to overall weakness and anemia.

### Vitamin K

Whole soybeans are rich in vitamin K, although quite a bit is also lost in processing. Vitamin K is necessary for proper blood clotting and a diet deficient in vitamin K can lead to bleeding problems.

### Iron

Many soyfoods are rich in iron, however, the iron may not be very well absorbed by the body. Soyfoods that are fermented, such as tempeh and miso, have iron that may be better absorbed by the body than other soyfoods. Iron helps produce hemoglobin which carries oxygen from the lungs to various parts of the body. Iron deficiency anaemia is the most common nutritional disorder in the world. It lowers

### *What are micronutrients?*

Micronutrients are essential vitamins and minerals that are needed in small or micro amounts by the body for proper functioning. There are a wide range of micronutrients, including:

| <b>VITAMINS</b>         | <b>MINERALS</b>   |
|-------------------------|-------------------|
| <u>Vitamin A</u>        | <u>Calcium</u>    |
| <u>Vitamin D</u>        | <u>Chloride</u>   |
| <u>Vitamin E</u>        | <u>Chromium</u>   |
| <u>Vitamin K</u>        | <u>Copper</u>     |
| <u>Thiamin</u>          | <u>Fluoride</u>   |
| <u>Riboflavin</u>       | <u>Iodine</u>     |
| <u>Niacin</u>           | <u>Iron</u>       |
| <u>Vitamin B6</u>       | <u>Magnesium</u>  |
| <u>Vitamin B12</u>      | <u>Manganese</u>  |
| <u>Folate</u>           | <u>Molybdenum</u> |
| <u>Biotin</u>           | <u>Phosphorus</u> |
| <u>Pantothenic Acid</u> | <u>Potassium</u>  |
| <u>Vitamin C</u>        | <u>Selenium</u>   |
|                         | <u>Sodium</u>     |
|                         | <u>Sulfur</u>     |
|                         | <u>Zinc</u>       |

Micronutrients that are in shortest supply and cause the most micronutrient malnutrition worldwide are:

|        |        |           |
|--------|--------|-----------|
| Iodine | Folate | Vitamin A |
| Iron   | Zinc   |           |

“More than 2 billion people in the world today are affected by micronutrient malnutrition.” (Food & Agricultural Organization, 1997).



our resistance to disease, inhibits children's ability to learn and play and is a major contributor in maternal mortality.

### A Healthy Diet – Food Illustration Guides<sup>3</sup>

Numerous countries world-wide develop food guides to illustrate to their residents the amounts and types of food that comprise a healthy diet. A study by J. Painter, J-H Rah and Y-K Lee of international food guides for twenty countries found a key message across all the guides examined,

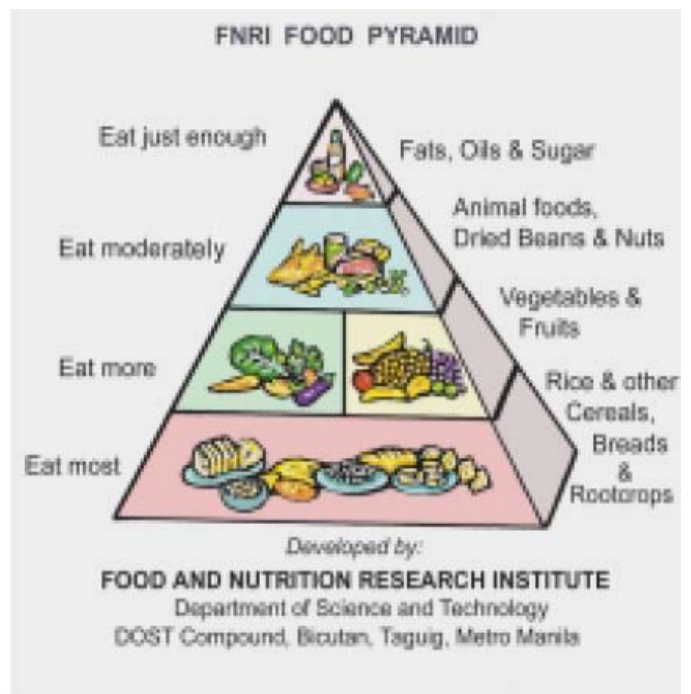
“(C)onsume large amounts of grains, vegetables and fruits with moderate intake of meat, milk and dairy products...”

Journal of the American Dietetic Association, April 2002, v. 102, no. 4:489.

Some pictorial representations from the article are included below and on the next page. Given the commonalities of dietary guidelines across many countries worldwide, there are some easy ways for everyone to make soy a part of their daily healthy diet (USB, 2004:6).



United States Food Pyramid



Philippines

Grains, Cereal, Rice and Pasta: Soy flour is found in this food group. Substitute up to one-fourth of the total flour in your favorite recipe with soy flour for an added nutrition boost.

<sup>3</sup> Food guide illustrations taken from Journal of the American Dietetic Association, April 2002, v. 102, no. 4:483 - 9.

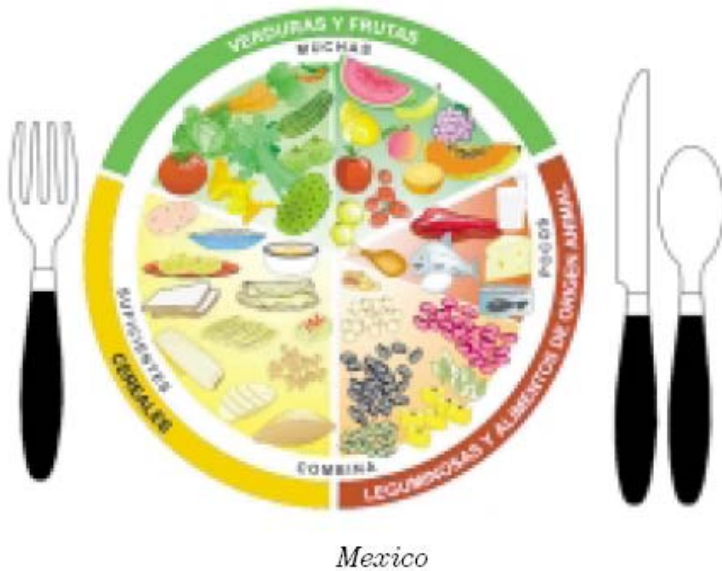
Vegetables: Given its high protein content, soybeans are counted as both a vegetable and a protein. Add canned or cooked soybeans to your diet for additional protein, fiber, vitamins and minerals.

### The Balance of Good Health



Milk, Meat and Dairy: Most countries encourage moderate intakes of this food group. Because it is a complete protein, you can add soy to your diet to meet your protein requirements without the added fat and cholesterol that can be found in some meat and dairy products. Many soy products like textured soy protein or 'soy mince' can act as a meat substitute or meat extender in many of your favorite recipes. It will lower the fat and cholesterol of the overall recipe while keeping all of the taste.

Fruits: Although soybeans and soy products are not considered a fruit, they do contain many of the things that make fruit healthy. This includes vitamins, minerals, fiber and even phytochemicals. Phytochemicals may reduce the risk of cancer; they are found in fruits and soybeans as well as other plant foods.



Regardless of the dietary guidelines for your country, soy can help you maintain a healthy life by meeting or exceeding those guidelines.

## Chapter 2 – Soy and Health

### Post-Test

Now that you've been introduced to soy and your health, try answering the following questions again. Be sure to cover up the answers at the bottom of this page.

*On a separate sheet of paper, answer the questions.*

1. List two advantages soy has over other forms of protein.
2. What are two benefits of incorporating soy into your diet?
3. What macronutrients do you find in a soybean?

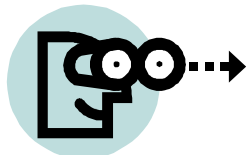
#### **Answer Key:**

1. List two advantages soy has over other forms of protein.  
*Soy protein is lower in saturated fat than animal protein and has no cholesterol.*
2. What are two benefits of incorporating soy into your diet?  
*It could reduce high cholesterol, as well as reduce the risk for cancer and heart disease.*
3. What macronutrients do you find in a soybean?  
*Protein (38%), fat (18%) and carbohydrates (30%).*

## Trainer Objectives and Options - Chapter 2 – Soy and Health

The topics covered in chapter two are more technical than chapter one, and may be more challenging to the group. If you can give the group some hands on things to do, they will be more likely to remember the lesson. Recall the old Chinese proverb:

If I hear it, I forget it.



If I see it, I remember it.

If I do it, I know it.



### Trainer Objectives

1. To add a dimension of motion to the training class.
2. To create opportunities for participants to demonstrate what they know.
3. To create opportunities to for additional inter-participant interaction.

It is important to brainstorm and come up with some ideas of things the group can do to illustrate the learning objectives outlined in Chapter 2. Some suggestions are listed below.

Break the class up into three groups, give them the following instructions.

#### Group 1

Group one's job is to draw a picture of a soybean (large, so everyone can see it), and divide it up into three sections for carbohydrates, fat, and protein. The proportions should roughly match what they learned. Following this, each member is going to do some acting – one person is to be a carbohydrate, one, a fat, and one, a protein; in each role, the person is to act out the function of that macronutrient. Encourage people to be creative using costumes and songs in addition to words and pictures.

#### Group 2

Group two's job is to act out the role of the vitamins and minerals found in soy. This can also be performed as a short skit or play. Participants should highlight what the vitamin or mineral can do and they can also have another person play acting what can happen to you if you don't enough of that vitamin or mineral.

#### Group 3

Group three's job is to perform a skit demonstrating the ways soy can improve your health; like group two, someone can perform the role of the healthy person, another as the non-healthy person or someone with a specific disease. Encourage them to find and

use props. Also let them ask questions if they are unsure of the manifestations of certain illnesses.

### Discussion Questions.

Ask a few questions after each group performs their skit or carries out their exercise that highlight the lessons that were to be learned. Allow other participants to answer the questions or to correct their colleagues if a question is answered incorrectly or incompletely. Be more of a facilitator and less of a teacher during this exercise.

### Materials Needed:

Flip chart paper and markers, or chalk board and chalk. Encourage participants to look for informal props in the room and yard. If near a kitchen, get permission from the owner to use items from the kitchen as props.

### Time Needed.

Approximately one hour to one and a half hours is needed for this exercise. It's important to give the group enough time to work through the exercise on their own and develop fun and creative skits. Build in time for these types of exercises. It is essential to allow the group to move around; it creates more energy within the participants and in the room as a whole. Hands-on exercises will help them learn (know and remember) the key messages.

## Chapter 3 - Hygiene

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- A. Personal Hygiene**
- B. Hygiene of Establishments**
- C. Hygienic Handling of Food**

### Pre-Test

*On a separate sheet of paper, answer the questions.*

1. List four practices that are important in good personal hygiene.
2. As a food preparer, what are three ways to keep your kitchen or work area safe and clean?
3. Name three important practices in preparing, cooking and storing food safely.

Many of you are food preparers and some of these answers may have come easily to you. There are numerous ways to keep ourselves, our food and our kitchens clean and safe. This chapter may alert you to a few new ways, or remind you of things you may have forgotten about.

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### Learning Objectives

*By the end of the chapter, readers should be able to:*

1. List at least four practices important in good personal hygiene.
2. List at least three ways to keep the work area safe and clean.
3. List at least three important practices in preparing, cooking and storing food safely.

## Good Hygiene and Soy

We learned in the previous chapters that soy can contribute to a healthy diet. However, just as important is the hygiene of the environment we live and work in, as well as our own personal hygiene. The health benefits of soy can be negatively affected by an unclean environment, poor personal hygiene and improper food handling practices.

### Personal Hygiene

Good personal hygiene is necessary for good health. Good personal hygiene can help prevent the spread of bacteria and germs from the body or clothing to food. It is the responsibility of all food handlers to know and practice basic personal hygiene. Food handlers can protect themselves and others by washing their hands, keeping their nails clean and short and wearing protective clothing and accessories such as gloves and hair nets.

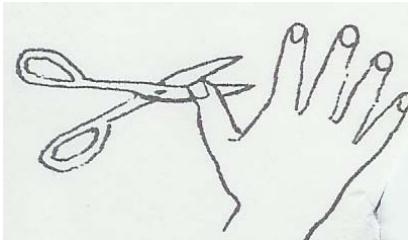
#### Hands

Hands should be kept clean at all times. Hands should be washed thoroughly with soap and warm water for at least 20 seconds:

- before beginning work
- before serving food
- after going to the toilet
- after helping children go to the toilet
- after changing diapers or nappies
- after handling raw foods
- after coughing or sneezing
- after drinking or smoking
- after touching any part of the body



**Do not dry hands on your clothes as they may be dirty.** Dry hands on a clean towel or shake to air dry.



Picture credit: David Werner, 1992.

#### Fingernails

Fingernails can trap dirt that can spread germs and disease. To prevent this, you should:

- keep fingernails short
- wash them thoroughly with a nail brush
- do not wear nail polish

### Jewelry



Jewelry can also trap dirt and spread germs to food and work areas. Dangling adornments (necklaces, bangles) could fall off the body and into the food; these items should not be worn.

While preparing food, don't wear jewelry, including wedding rings.

### Hair

Hair should be kept clean. Disposable hair nets should be used whenever available. They should completely cover the head when worn.

### Protective clothing

Protective clothing is meant to protect the food from you, and not you from the food! Protective clothing should:

- be clean
- be light in color
- be loose fitting
- include closed shoes with comfortable heels

### Health

Employees and those handling food should not work when sick. Even those with mild colds and fevers can pass germs on to students and customers.

Infected wounds, cuts, scratches and boils must be cleaned and covered with a bandage. Cuts, scratches or wounds on the hands must also be covered with gloves in addition to the bandage.

Smoking, eating and drinking is **never** allowed in the food preparation area.

Avoid coughing or sneezing over food.

### Disposable Gloves

Disposable gloves should be worn if available.

- Wash hands before gloves are put on; hands must also be washed when gloves are taken off
- Disposable gloves should not be re-used
- Change gloves as often as necessary to protect from spreading germs and bacteria
- Gloves should be discarded when damaged or soiled





## B. Hygiene of Establishments

Where ever food is prepared, in institutions, eating-houses, informal cafes, restaurants or even on the roadside, basic hygiene practices must be followed to prevent making customers' ill and causing disease outbreaks.



All food contact services must be washed, rinsed and when possible, sanitized.



**Wash:** Wash dishes, utensils, cookware, cutting boards, appliances & equipment and all cooking surfaces with hot, soapy water to remove visible soil.

**Rinse:** Thoroughly rinse off soap and film.

**Sanitize:** If available, dilute chlorine bleach in water and wipe down area. Do not rinse again.

**Drying:** Air dry only. Do not wipe.



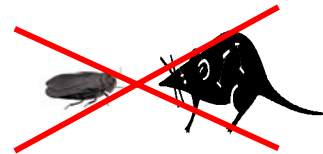
The following recommendations on eating houses, street vendors and informal cafes are provided by WHO, 2003:71-73:

*Eating houses, restaurants and areas where food is prepared for others, should have clean water for washing and drinking. If the establishment has customers, there should be separate sanitation facilities away from the kitchen area for cooks, food handlers and customers.*



*Street vendors should be legal (and regulated by local health authorities). They should be located close to water points and sanitation facilities in order to keep food, hands and cooking surfaces clean.*

*Kitchen and eating areas must be kept clean and free of vermin and insects.*



*Establishments should be well-ventilated with adequate lighting. Procedures for dealing with fires and accidents should also be well established.*

If cold storage is available, avoid overloading the cold storage unit; Refrigerators should be cleaned frequently and spills wiped up immediately.

Drying towels and clothes that come in contact with dishes and utensils should be changed every day.

### C. Hygienic Handling of Food

The way food is prepared and handled is also important in preventing the spread of bacteria and causing others to become sick. It is not enough maintain good personal hygiene and keep food preparation areas clean; food must also be prepared and handled safely.



Here are some important practices to keep in mind when preparing, cooking and storing food:

**REMINDER:** Wash hands thoroughly before preparing, handling and eating food.

**REMINDER:** Wash and keep food preparation surfaces, utensils and dishes clean.



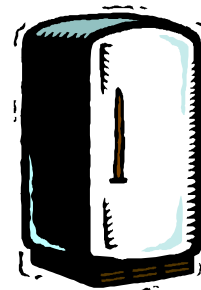
- Keep food covered and stored away from insects, flies, rodents and other animals.
- Wash all fruit and vegetables with clean water before eating, cooking or serving.
- Avoid letting raw food come into contact with cooked food.
- Ensure that all food is cooked thoroughly, especially meats, chicken and eggs.
- Do not eat raw eggs or foods that contain raw

eggs.

- Use safe water for drinking, cooking and cleaning dishes and utensils.
- Thoroughly defrost frozen meat and poultry before cooking.
- Discard all drips accumulated during defrosting of meat and poultry; thoroughly clean all soiled surfaces.
- Serve all food immediately after preparation, especially if it cannot be kept hot.
- Cooked food should be kept hot, at least 60° (HOT FOOD HOT).
- Cooked food should not be touched by hand.

***If refrigeration is available:***

- Avoid storing cooked foods unless you have access to a refrigerator
- Refrigerate cooked food to at least 10 C°
- Refrigerate cooked food in shallow containers
- Cold food should be kept cold (COLD FOOD COLD)



### **Tips on dry storage**

Dry storage areas should be well-ventilated, well-lit, clean and protected from pests as well as excessive heat and moisture.

- Foods should be rotated; foods placed in dry-storage first, should be used up first (practice FIRST-IN, FIRST-OUT).
- Keep all food containers covered.
- Clean up all spills immediately.
- Do not place any food items on the floor.
- Do not store trash or garbage cans in food storage areas.
- Cereal and grain products attracts vermin and pests and can easily become moldy; do not store for prolonged periods of time.
- Always wipe canned goods with a clean cloth before opening.

## Chapter 3 – Hygiene

Now that you've learned a few new things in promoting good hygiene, answer the following questions again. Try to include some new things that you've learned.

Be sure to cover up the answers at the bottom of this page.

### Post-Test

*On a separate sheet of paper, answer the questions.*

1. List four practices that are important in good personal hygiene.
2. As a food preparer, what are three ways to keep your kitchen or work area safe and clean?
3. Name three important practices in preparing, cooking and storing food safely.

**Answer Key – Chapter 3:**

1. List four practices that are important in good personal hygiene.  
*There are a number of practices important to good hygiene. These include:*
  - a. *Washing hands frequently and thoroughly for at least 20 seconds*
  - b. *Washing hands properly at key times*
  - c. *Not handling food when sick*
  - d. *Keeping cuts and wounds covered*
  - e. *No smoking, eating or drinking in food preparation areas*
  - f. *No wearing jewelry in food preparation areas*
  - g. *Using hairnets and disposable gloves properly and whenever available.*
  - h. *Wearing clean clothes*
  
2. As a food preparer, what are three ways to keep your kitchen or work area safe and clean?
  - *Washing all dishes, utensils and work surfaces with hot, soapy water*
  - *Keeping areas clean and clear of debris*
  - *Keeping areas free of vermin and insects*
  - *Make sure the area is well-lit and ventilated*
  - *Use cold storage areas properly – do not overload*
  - *Wipe up spills immediately*
  
3. Name three important practices in preparing, cooking and storing food safely.
  - *Keep food covered*
  - *Wash all fruits and vegetables with clean water before eating, cooking or serving*
  - *Do not let raw food touch cooked food*
  - *Serve cooked food immediately*
  - *Use safe water for drinking, cooking and cleaning*
  - *Keep hot food hot*
  - *Keep cold food cold*
  - *Do not place food items on the floor*
  - *Rotate goods; do not store for prolonged periods of time*

## Supervisor Checklist - Chapter 3 Hygiene

For use in institutions, restaurants, informal restaurants, cafes and other places where food handlers prepare food for others:

| Supervisor hygiene checklist   | No. of Observations |    |
|--|---------------------|----|
|  | YES                 | NO |
| <b>PERSONAL HYGIENE</b>  |                     |    |
| Are food handlers washing hands before beginning work?                                       |                     |    |
| Are food handlers wearing clean clothes?   |                     |    |
| Are food handlers wearing jewelry (i.e. watches, dangling necklaces, bracelets, rings etc.)? |                     |    |
| Are food handlers observed scratching head, face or body?                                    |                     |    |
| If yes, did they immediately leave the area and wash hands?                                  |                     |    |
| Are fingernails of food handlers short and clean?  |                     |    |
| Do food handlers have any uncovered cuts or scratches?                                       |                     |    |
| Does anyone appear to be sick (coughing, fever, sneezing etc.)?                              |                     |    |
| Are food handlers observed eating in the food preparation area?                              |                     |    |
| Are instances of spitting (on floors, in sinks etc.) observed?                               |                     |    |
| Are hairnets being worn (if available)?  |                     |    |
| Are gloves being used (if available)?  |                     |    |
| Are gloves changed after becoming soiled?  |                     |    |
|  |                     |    |
| <b>HYGIENIC HANDLING OF FOOD</b>   |                     |    |
| Is food stored in pans or containers on the floor?   |                     |    |
| Is food kept covered?  |                     |    |
| Are fruits and vegetables washed before use?   |                     |    |
| Are canned goods wiped clean before being opened?  |                     |    |
| Is raw food kept separately from cooked food?  |                     |    |
| If food reheated to at least 70° C (use thermometer)?  |                     |    |
| Are cooked foods served, eaten or stored immediately?  |                     |    |
|  |                     |    |
|  |                     |    |
| <b>Hygiene of Establishments</b>   |                     |    |
| Is the area clean and dry, free from dust and dirt?  |                     |    |
| Are dishes, utensils and cutting boards being washed with hot, soapy water?                  |                     |    |
| Are vermin or insects observed in the kitchen or food storage areas?                         |                     |    |
| Are there visible spills in the refrigerator, on shelves or on floors?                       |                     |    |
| Is the kitchen kept clean in all areas?  |                     |    |
|  |                     |    |

**Address any negative observations immediately.**

**Source:** Adapted from <http://www.allfoodbusiness.com/forms>

To build your own forms, go to: [www.dupagehealth.org/safefood/industry/qa/inspect1.asp](http://www.dupagehealth.org/safefood/industry/qa/inspect1.asp)

## Trainer Objectives and Options - Chapter 3 – Hygiene

There are many important key practices for participants to know and adopt in chapter three. The training option illustrated below, allows for some hands-on participation to demonstrate key skills without having to use up too much time.

### Objectives:

1. To illustrate key behaviors corresponding to the training objectives.
2. To add some dimension of movement to the training class.
3. To encourage use of checklists for critiquing behavior.

### Procedures:

- Identify one or two outgoing participants ahead of time (perhaps someone who excelled in the earlier skits, and someone who appeared to understand the key messages of chapter three).
- Explain the role the two participants will play. They are food handlers in a busy restaurant. They are going to (pretend to) make a certain soy recipe (trainer can decide) together. You may want to take them into an actual kitchen if one is available, so that some props can be used.
- On two note cards (or sheets of paper), list out the behaviors, positive and negative you want them to act out. One person could demonstrate all the positive behaviors, the other, all the negative behaviors. However, it is a stronger learning exercise if you mix it up for the observers. For example:

#### Food Handler #1

Begin work without washing hands  
Have visible dirt on clothes  
Make point of putting on hairnet  
Make point of putting on gloves  
Make point of keeping food covered while making the recipe  
Light up a cigarette while working  
Place pan of food on the floor nearby  
Sneeze into food

#### Food Handler #2

Wear dangling necklace and watch to work  
Wash hands before beginning to handle food  
Dry hands on pants  
Take a cigarette break away from food area but 'forget' to wash hands upon returning to work  
Wash cutting board with hot soapy water after cutting meat on it, but before using it for anything else  
Spit on floor near food handler #1  
Pick the pan of food off the floor and scold food handler #1  
Cough into sleeve

- Take ten minutes or so and let the two food handlers review their role. See what other behaviors they want to add. Encourage them to improvise as they go along.
- While the two food handlers are reviewing their role, explain what the rest of the class will do. The rest of the class will become the 'supervisors'. They will observe and record the positive and negative behaviors of the two food handlers. If possible, give them actual checklists to follow (photocopy the checklist from chapter 3); if a photocopier is not available, have them write down positive and negative behaviors they observe.

Discussion:

After the food handlers have worked in their kitchen for around ten minutes, ask them to stop but to stay where they are.

- Go around the room and have each 'supervisor' identify a positive behavior (until all the positive behaviors have been identified); see if the food handlers have anything to add.
- Following the same format, ask the supervisors to identify all of the negative behaviors (this is more fun, and easier, so have them identify the positive behaviors first). After the list has been exhausted, see if the food handlers have anything else to add.
- Ask the group which of the negative behaviors they've used before while preparing food? Which negative behaviors do they think will be the hardest to stop doing?
- Did the checklist help remind them what to look for? Will they use the checklist in their own jobs?

Time required:

Approximately 45 minutes, including preparation and discussion.

Materials required:

Copies of checklists or paper and pencils (could be done without props; students could mentally observe, but the exercise might be less useful that way). Kitchen and kitchen props if possible, but could be completely improvised.



## Chapter 4 – Using Soy Foods

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### Pre-Test

*On a separate sheet of paper, answer the questions.*

1. Name two ways you can use whole soybeans.
2. What are two ways soy flour can be used?
3. How can textured soy protein be used?
4. Name two ways soy protein concentrate can be used?

If you are not familiar with soy, these could be very challenging questions! Don't worry, these next few pages will introduce you to many different uses of some common soy products.

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### Learning Objectives

*By the end of the chapter, readers should be able to:*

1. Identify two ways whole soybeans can be used.
2. Identify two ways soy flour can be used.
3. Identify two uses for soy protein isolates.
4. List two uses of textured soy protein.
5. List two uses of soy protein concentrates.

## Utilizing Soy Foods

In Chapter One we were introduced to soybeans and some common soy ingredients that are now widely available. In this chapter we'll look at whole soybeans and key soy ingredients in greater detail and learn how to incorporate them into our daily diet.



### Whole Soybeans

Whole soybeans are used in many dishes. They are also the starting point for soymilk. Soybeans are harvested when they are mature and dry. They are mature when they become hard and dry in the pod.

Soybeans are blanched before cooking to prevent the 'beany' flavor that some people do not care for. Blanching destroys an enzyme called lipoxygenase that is responsible for

**Blanch** – to scald

#### Tips on using whole soybeans:

- Dry soybeans can be stored in airtight containers for long periods
- Whole soybeans should be soaked up to 8 hours before cooking; 4 cups of water for each cup of soybeans
- After soaking, drain and rinse beans
- Place in fresh water (4 cups of water for each cup of beans; tender or otherwise at a 1:4 ratio)
- Bring to a boil, reduce heat and skim off excess foam
- Simmer beans for approximately 3 hours or until tender
- Sodium bicarbonate can be added to the soaking beans to improve texture and reduce cooking time

*USB: 2004: 20*

Look for the following recipes using whole soybeans in this guide:

*Soybean Soup*

*Cocoa Soy Pudding*

*Soy-potato Weaning Soup*

the beany flavor. Do not eat soybeans raw. Soybean must be cooked to destroy the protease inhibitor found in soybeans. Heat treatment is necessary to decrease the activity of the inhibitors and to improve the digestibility of the soybeans. Soybeans can also be soaked in sodium bicarbonate to improve their texture and to reduce cooking time (USB, 2004:20). Whole soybeans can be dry, canned or green.

Green whole soybeans are also known as edamame. These are a special variety of soybean that are a bit sweeter and larger than regular soybeans. They can be purchased in the pod and then cooked and consumed. Canned soybeans are already cooked and come in the black or yellow varieties.

**Whole soybean uses:** Whole soybeans can be soaked, ground and cooked to be made into soymilk. They are also eaten as edamame, or eaten fresh and whole (after cooking) or out of a can.

*Image courtesy of ASA, B. Callanan, 2003*



## Soy Flour

Soy flour is made from roasted whole or dehulled soybeans that are then ground into a fine powder. Defatted soy flour, at 50% protein, is high in nutrition. Full-fat soy flour is less concentrated and contains approximately 35 – 40% protein (USDA National Nutrient Database for Standard Reference and Soyfoods Association of North America).

Soy flour is often used to fortify other foods by blending it with other flours. Most any recipe using flour can substitute 15% to 25% of the flour with soy flour. There are two kinds of soy flour: full-fat and defatted. Full-fat soy flour contains all of the natural oils found in whole soybeans. Defatted soy flour has the fats removed during processing. Both types of flour add a protein boost to any recipe, but defatted soy flour is more concentrated and has even more protein. Full-

**Gluten** – a sticky, nutritious mixture of proteins giving bread it's tough elastic quality

fat soy flour should be stored in the refrigerator or freezer while defatted soy flour can be stored on the shelf.

### Tips on Using Soy Flour

- Sift or stir soy flour before using as it tends to get packed down in the container
- Products baked with soy flour may brown more quickly, so consider lowering your oven temperature slightly
- Store full-fat soy flour in the refrigerator or freezer
- Defatted soy flour can be stored on the shelf (for 3 to 12 months if in a dry cool place)
- Soy flour can also be used to thicken cream sauces and gravies

(Source: USB, 2004:14)

Look for the following recipes using soy flour in this guide:

*Soy Bread*

*Fortified Soy Tea Biscuits*

*Soy Sweet Potato Baby Food*



Image courtesy of ASA, B. Callanan, 2003

Soy flour is gluten-free and therefore cannot replace all of the flour in a recipe. Yeast breads can substitute up to 15% of the flour with defatted

soy flour, while non-yeast breads and other recipes can substitute up to 25% of the flour with soy flour. (USB, 2004:14).

**Soy flour uses:** You can substitute 15 -25% of the flour in most any recipe, improving the nutritional content; it is often used to fortify other foods.

*The use of soy-fortified wheat flour can add up to 40 percent more protein in breads and other wheat-based foods. WISHH worked with the North American Millers' Association, World Food Program (WFP) and the National Soybean Research Laboratory (NSRL) to field test the soy-fortified*



*wheat flour in schools, commercial bakeries and home kitchens in Tajikistan. Photo Credit: Megan Puzey, (NSRL).*

## Textured Soy Protein

This form of soy protein is made from soy flour or soy protein concentrate. It is compressed, through a process called *extrusion*, into small granules (also known as soy mince) or larger, chunk-size nuggets. Textured soy protein is generally re-hydrated with water before it is used and then mixed with ground meat and vegetables or cooked by itself. Textured soy protein is a good protein substitute or extender and is one of the most economical forms of soy protein. It absorbs the flavors of the foods it is cooked with making it a good addition in soups and stews, as well as other dishes.



Textured soy protein will keep for several months when stored at room temperature in a tightly-closed container. When making soups or sauces, textured soy protein does not need to be re-hydrated before using (as long as there is plenty of liquid). In other types of recipes, however, you should re-hydrate the protein before using. Textured soy protein chunks should simmer for several minutes before using (USB, 2004:21)

**Textured soy protein uses:** Textured soy protein is used in soups, stews, chili; most any recipe calling for meat. It can be used as a meat substitute or meat extender.

### Tips on using textured soy protein:

- In general, textured soy protein will triple in volume when re-hydrated
- Textured soy protein can replace part or all of the meat in any recipe
- In beef patties or hamburgers, you can easily replace up to one-fourth of the meat with textured soy protein
- In recipes containing a high volume of liquid, like soups, you don't have to re-hydrate the textured soy protein before using

(Source: USB, 2004:21)

Look for the following recipes using textured soy protein (many of them call for soy mince) in this guide:

*Pumpkin Soup with Soy Meatballs*

*Potato-Veggies with Cabbage Stew and Sadza*

*Roasted Veggies with Cauliflower Stew*



Image courtesy of ASA, B. Callanan, 2003

## Soy Protein Concentrates

Soy protein concentrates are an excellent source of highly digestible protein. This is one of the reasons why it is a good choice for weaning foods. In addition to babies, it is also well-suited for children, pregnant and lactating women, the elderly, the ill and others with special protein needs. Soy protein concentrates come from defatted soy flakes and have a flour-like consistency. It contains 70% protein and retains most of the dietary fiber. Soy protein concentrates have many uses including breads, pastas, nutritional beverages, processed meat products and others. When stored properly, it has a shelf-life of up to one year.

### **Soy protein concentrate uses:**

Used as an additive to breads, pastas, nutritional beverages and processed meat products.

*Image courtesy of ASA, B. Callanan, 2003*



### **Tips on Using Soy Protein Concentrates:**

- .....
- .....
- .....

**Look for the following recipes using soy protein concentrates in this guide:**

- .....
- .....

## Soy Protein Isolates

Soy protein isolate is made wholly from defatted soy meal and contains the highest amount of protein of any soy product. It contains 90% protein and all of the essential amino acids. Soy protein isolate (SPI) is used

as an ingredient in high-protein foods including dairy foods, meat systems, infant formulas, nutritional beverages, cream soups, and sauces among other things. Due to its high protein content, soy protein isolate it is also highly suited for those people who have high protein needs. This can include children with growth problems or those who are malnourished, those suffering from infectious diseases, including HIV/AIDS and tuberculosis, as well as the elderly who may have a hard time simply getting enough protein in their regular diet.



*ASA Photo credit:  
John Lindblom*

**Soy protein isolates are primarily used in commercial products. In the home they are generally used to make high protein shakes.**

### **Tips on Using Soy Protein Concentrates:**

- Look for use-by dates on the container
- Store in dry, air-tight container
- Can last for many months.

**Soy protein isolates uses:** Can be added to meat, seafood and poultry dishes making them juicier and improving the cohesiveness and texture; it is also used in beverages and dairy-type products.

## Chapter 4 – Using Soy

Now that you've learned how to use some of the different soy products available, answer the following questions again. Be sure to cover up the answers at the bottom of this page

### Post-Test

*On a separate sheet of paper, answer the questions.*

1. Name two ways you can use whole soybeans.
2. What are two ways soy flour can be used?
3. How can textured soy protein be used?
4. Name two ways soy protein concentrate can be used?

**Answer Key:**

1. Name two ways you can use whole soybeans.  
*They can be eaten fresh and whole after cooking, or eaten canned; they can be cooked into soy nuts; whole soybeans can be soaked, cooked and made into soymilk.*
2. What are two ways soy flour can be used?  
*In breads, noodles, pastas, most any recipe call for flour etc.*
3. How can textured soy protein be used?  
*As a meat substitute or meat extended in almost any recipe calling for meat (stews, patties, soups etc.); It can also be used in sauces.*
4. Name two ways soy protein concentrate can be used?  
*It is generally used commercially, but can also be used to make high protein shakes. Commercially they are used in dairy foods, infant formulas, nutritional beverages, cream soups, sauces and many other things.*

## Trainer Objectives and Options - Chapter 4 – Using Soy

### Objectives:

1. To use quick demonstrations to attract and focus attention on the product being discussed and on the facilitator's message.
2. To add some dimension of movement to the class.

### Timing:

These activities are started at the beginning of the lesson. Mum Soy Ball is started after the lecture is complete.

### Procedures:

- As the facilitator introduces each soy product, pass around a sample of the product for each participant to see, touch, and smell and taste if possible. Be sure each participant gets an opportunity to see and hold the product.
- As the product is being passed around, pay attention to body language. See if they have questions about the product. Don't worry if they interrupt your lecture. Pause and answer their questions as you go.
- After the lectures on all the soy products are complete, tell the group they are now going to play "**Mum Soy Ball**".
- Have participants sit on their desks or in a circle and explain the rules of the game. People can only talk when they have the 'soy ball' (use the product samples that they group passed around earlier). If someone answers a question incorrectly, they have to sit in their seat and can no longer catch the ball.
- At first, the facilitator will ask the questions and throw the ball to someone who can answer the question. The facilitator asks the next question, but the person who now has the soy ball chooses who to throw it to. Only the person catching the soy ball can answer the question, everyone else must remain 'mum'. People can use body language to indicate they want the ball but the person with the ball can decide who to throw it to.
- After the facilitator has exhausted his or her questions (see pre or post-test for questions to ask, or make them up as long as they relate to the lesson); participants can pick questions (about anything learned that day) and continue to pass the ball around the room. Questions can get increasingly tougher to eliminate participants.
- The game can continue until only one person is left sitting on their desk (or left standing) or the facilitator can put a time limit (e.g. 15 minutes) on the game.

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## Appendix A - Soy Foods Recipes

The recipes on the following pages come from various sources. They have been tested, used and adapted in many countries around the world.

We'd like to especially thank the following individuals and organizations for sharing their recipes with us:

Humana – Zimbabwe.

Malnutrition Matters.

*Many of the recipes were originally published in "Soya Dairy Foods – Resource and Recipe Booklet" produced by Malnutrition Matters. Many of these recipes were compiled from many sources including:*

“The Tofu Cookbook” by Leah Leneman

“Earl Mindell’s Soy Miracle” by Earl Mindell

“Tofu Quick & easy” by Louise Hagler

“Tofu & Soyfoods Cookery” by Peter Golbitz

“The New Farm Vegetarian Cookbook” by Hagler and Bates

“From the Global Kitchen – A Collection of Vegetarian Recipes” by Plenty International

National Food Technology Research Center in Botswana (NAFTRAC).

National Soybean Research Laboratory, University of Illinois, Urbana-Champaign (NSRL).

South African Soy Foods Association (SASFA).

**Recipes Using Whole Soybeans**



**SOY BEAN SOUP**

**INGREDIENTS**

- 1-cup soybeans
- 2 onions
- 1 carrot
- 1 medium potato
- 1 clove garlic
- 2 liters beef stock (2 cubes)
- 1 tsp mixed herb spice
- 2 ml pepper
- 2 ml salt

**Directions:**

1. Soak the beans in water overnight and bring them to a boil in the soaking water. Let boil for 1 – 1 ½ hour until they are done.
2. Cut potatoes, carrot, in dices. Finely chop the garlic.
3. Boil the ingredients in beef stock for 15 minutes. Chop the onion and put it into the boiling vegetables and let boil for another 10 minutes.
4. Mix the beans with the vegetable soup and season to taste with salt and pepper.
5. Garnish with parsley.

**SOY POTATO WEANING SOUP**

**INGREDIENTS**

- 2 Tbsp oil
- 1 chopped onion
- 2 cups water
- 200 g mashed cooked potato
- 200 g cooked mashed soybeans

**Directions:**

1. Heat oil in saucepan and sauté the onion.
2. Add the water, mashed potato, mashed soybeans, and a pinch of salt. Bring to simmer for 5 minutes. Add more water if desired for a thinner soup, or let simmer a little longer until the soup thickens.
3. If desired, add other seasonings. Serve warm.

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## SOY BEAN SALAD

### INGREDIENTS

100 g mushroom, sliced  
1 small green pepper, chopped  
1 small red pepper, chopped  
1 avocado  
1 spring onion  
1 red apple, cubed  
1 carrot, cut into strips  
30 g margarine  
2-cups cooked soybeans  
125 ml mayonnaise  
2 TBS milk  
3 Vienna / bacon, polony, cut into strips

### Directions:

1. Slice mushroom and then sauté in margarine. Put the Vienna into hot boiling water for about 5 minutes and then dry them, fry only to brown a little bit.
2. Mix the margarine with the milk.
3. Mix all the ingredients and then toss with the mayonnaise dressing. Put in the refrigerator to infuse the flavors.

## MASHED SOYBEAN AND CABBAGE SOUP

### INGREDIENTS

2 tbsp cooking oil  
1 medium onion, finely chopped  
1 clove garlic, crushed  
1-cup soymilk  
1 c blanched and cooked mashed soybeans  
1 medium carrot, peeled and chopped  
1 tsp mixed herb spice  
1 tsp salt  
2 ml black pepper  
200 g small pieces of cabbage  
1-2-cups water

### Directions:

1. Heat oil in a pot and sauté the chopped onion and minced garlic until the onion softens.
2. Add the soymilk, the okara or mashed soybeans, the carrot, mixed herb spice, salt and pepper. Heat to a simmer and cook for 5 minutes.
3. Add the cabbage pieces and simmer until the cabbage softens. Add more water or soymilk, if desired, and adjust the seasonings to taste. Serve hot.

## MAKING SOY MILK AND OKARA AT HOME

*(More detailed directions can be found on pages 66 and 67).*

### INGREDIENTS

200 g whole soybeans, sorted and cleaned  
2 pinches baking soda (divided)  
45 ml sugar, or as desired  
2 ml salt, or as desired

### Directions:

1. Bring 1 liter of water to a boil on the stove. Add 1 pinch of baking soda.
2. Drop the whole soybeans directly into the boiling and blanch for 5 minutes. Drain and rinse the beans with hot water.
3. Bring another 1 liter of fresh water to a boil. Add 1 pinch of baking soda.
4. Drop the blanched soybeans directly into the boiling water and cook for another 5 minutes. Drain and rinse with hot water.
5. Grind the blanched beans with 2 liters of hot water for 3 minutes using a blender on high speed. If the blender is not large enough, do this in 2 batches. Work carefully and be sure the lid is tight, as this is hot.
6. Cool the mixture until it is just warm to the touch and squeeze it through cheesecloth to filter. Reserve the solids (the okara) for another use.
7. Simmer the filtered liquid on the stove for 20 minutes. Stir occasionally. If desired, add sugar and / or salt to taste. Refrigerate the soymilk to keep it fresh.

*Makes 1250 ml of soymilk and 625 ml of okara.*

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## SOY NUTS

### INGREDIENTS

200 g dry, raw soy cotyledons or whole beans  
2.5 ml baking powder  
Salt  
Flavor  
Oil for frying

### Directions:

1. Bring four cups water to a boil.
2. Add the baking soda and cotyledons or whole beans. Cook soybeans for 20 minutes.
3. Drain the blanch water and spread the cotyledons on paper towels to remove excess water.
4. Deep-fry the cooked cotyledons in small quantities until golden brown and crispy. Drain excess oil on paper towels.
5. Sprinkle salts and flavor to taste.

## **BLANCHING AND COOKING WHOLE DRIED SOYBEANS**

### **INGREDIENTS**

250 ml whole dry soybeans  
1 pinch of baking soda (if available)  
1250 ml water for boiling (plus more water for rinsing)

### **Directions:**

1. Bring about 5 cups water to a boil.
2. Add 1 pinch of baking soda to the boiling water
3. Drop the whole dry soybeans directly into the boiling water.
4. Let the soybeans cook at a low boil for 5 minutes.
5. Drain off the boiling water and rinse the soybeans in cold water.

Blanched soybeans are not ready to be eaten. They must be cooked before eating.

### **Directions for cooking whole soybeans:**

#### **Ingredients**

1250 ml water (plus additional as needed)  
1 pinch baking soda (if available)  
The blanched soybeans

### **Directions:**

1. Bring about 5 cups of water to a boil.
2. Add a pinch of baking soda to the boiling water.
3. Add the blanched soybeans and cook at a simmer for two to three hours. The time is approximate because factors such as the temperature of the cooking and the age of the dry beans will be firm but easily mashed when done.
4. Drain the beans to eat as is, or to use in a recipe.

Cooked soybeans are perishable. They should be eaten the day they are cooked, or else stored in a refrigerator for up to several days.

## COCOA SOY PUDDING

### INGREDIENTS

1-cup milk  
30 g roasted soybeans  
55 g cocoa  
2 eggs yolk  
1 tbsp castor sugar

### Directions:

1. Put the milk into a small saucepan with the roasted soybeans. Place over a low heat and bring to a boil. Turn off the heat and leave to infuse for 10 minutes.
2. Dissolve cocoa into a thin smooth consistency.
3. Whisk the egg yolks with the sugar until pale and creamy.
4. Strain the milk into the cocoa and add the egg yolk mixture.
5. Pour this mixture into a rinsed out saucepan and place over a low heat, stirring until the mixture thickens to that it will coat the back of the spoon (3-4 minutes), but do not boil. Strain into a bowl.

## Recipes Using Soy Flour

### DIPHAPHATA

#### INGREDIENTS

1 kg bread flour, additional for kneading  
30 g soy flour  
40 g sugar  
10 g salt  
2 cups warm water  
10 g instant yeast

#### DIRECTIONS:

1. Mix together the flours, sugar, salt and yeast.
2. Pour the water into the flour and stir until the moisture is absorbed. Use a little more water if necessary to moisten all the flour.
3. Turn the dough onto a floured board and about 5 minutes until the mixture is smooth and not too sticky. Allow the bread to rise for 20 minutes in a warm place.
4. Divide the dough into 8 portions and form each into a round ball. Use the palms to roll each ball into a very thin circle.
5. Cook the bread on each side in a lid of the three-legged pot for 2-4 minutes on each side, until it begins to show brown spots.

*Recipes using Soy Flour*

### SOY BREAD

#### INGREDIENTS

1 kg bread flour  
30 g soy flour  
40 g sugar  
10 g salt  
2 cups warm water  
10 g instant yeast

#### DIRECTIONS:

1. Make a homemade pit oven.
2. In a large bowl, mix the soy flour, bread flour, baking powder, salt and sugar.
3. Knead into soft dough and allow rising for 30 minutes in a warm place.
4. Divide the dough into different shapes in a baking sheet. Allow proofing for 10 minutes in a warm place.
5. Bake for 20 minutes.



## FORTIFIED SOY TEA BISCUITS

### INGREDIENTS

2 cups bread flour  
1 Tbsp soy flour  
40 g sugar  
2.5 ml salt  
50 g margarine (melted)  
100 ml soymilk

### DIRECTIONS:

1. Make a homemade oven pit.
2. Mix together the bread flour, soy flour, sugar, baking powder, and salt.
3. In a separate bowl, mix the margarine and water. Gradually pour the margarine and water mixture into the flour mixture and stir to combine.
4. Flatten with hand palm to make 1 cm thick, use a glass or cup to cut the dough into biscuit shapes.
5. Put the tea biscuits on a baking sheet and bake for 20-25 minutes, until beginning to turn golden.

## SOY SWEET POTATO BABY FOOD

### INGREDIENTS

1 cooked sweet potato, peeled and mashed  
100 ml maize-meal  
30 ml soy flour  
750 ml water  
250 ml milk  
50 ml sugar (optional)  
Salt to taste (optional)

### DIRECTIONS:

1. In a medium-sized pot, mix the mashed sweet potato, the soy blend, and the water until well blended.
2. Place the pot on the stove and cook until the mixture is boiling, stirring constantly. Simmer for 10 minutes.
3. If desired, add sugar and salt to taste. Add more water to adjust the consistency, if necessary.

## SOY FAT CAKES

### INGREDIENTS

4-cups cake flour  
30 g soy flour  
10 g instant yeast  
40 g sugar  
1 ml salt  
3-cups warm water  
Oil for deep-frying

### DIRECTIONS:

1. Sift the dry ingredients together in the same mixing bowl.
2. Knead into a soft medium consistency and put in a warm place for 30 minutes.
3. Punch the mixture again and then put in warm place for some 10 minutes to proof.
4. Deep fat fry and serve.

## WHITE MAIZE MEAL PORRIDGE

### INGREDIENTS

2-3-cups maize meal  
1 tbsp soy flour  
1.5 L water  
75 ml sugar  
Pinch of salt

### DIRECTIONS:

1. Mix maize meal and soy flour in a pot.
2. Stir in water and bring the mixture to a boil. Reduce heat and simmer, stirring occasionally, for 10 minutes.
3. Stir in the sugar and salt. Serve warm.

## **PAN DULCE (SWEET BREAD) - CENTRAL AMERICA**

*Yield: Makes one loaf (8 slices)*

This high protein recipe is a variation on traditional sweet bread. Pan dulce is good served at breakfast with coffee or other hot drinks (including soymilk) or for a midday snack.

### **INGREDIENTS**

1 cup unbleached white flour  
1 cup sugar  
1 teaspoon baking powder  
1 pinch salt  
¼ margarine, melted  
1 teaspoon vanilla  
1 egg  
½ cup soymilk  
1 cup firm tofu, grated

### **DIRECTIONS:**

1. Preheat the oven to 350F.
  2. Mix all of the dry ingredients together in a large bowl.
  3. Stir in the margarine, vanilla, egg, soymilk and tofu.
  4. When the batter is thoroughly mixed, place in a well greased bread pan.
  5. Bake for 45 minutes or until a knife inserted in the middle comes out clean.
- Per slice: Calories: 229; Protein: 5 g; Fat: 7 g; Carbs: 35 g.

## Recipes Using Textured Soy Protein

### SOY CHUNKS STEW

#### INGREDIENTS

2-cups soy chunks  
 1 cup mixed vegetables  
 1 red & green pepper  
 1 large onion  
 1 large tomato  
 3 chili beef cubes  
 1 large potato  
 4 tbsp oil  
 2 ml salt  
 2 ml pepper

#### DIRECTIONS:

1. Finely chop the onion, red and green peppers and fry them in oil until tender but firm.
2. Pour 1 L of water, beef cubes, soy chunks, potato and boil for 5 minutes.
3. Add the mixed vegetables, grated tomato, salt and pepper and reduce heat and allow simmering for 30 minutes.

*Serving:* Serve with rice, samp or porridge.

*Recipes using Textured  
Soy Protein*

### PAPRIKA PLANT-MINCE POT

*Serves 15*

#### INGREDIENTS:

400 g            soy mince  
 5 chopped     onions  
 1 chopped     cabbage  
 5 large tomatoes  
 1 tsp            paprika spices  
 4-5 cubes     chicken bouillon  
 1/2 liters      boiling water  
                   oil

#### Directions:

1. Heat 1 tablespoon of olive oil in a large pot. Add 1 teaspoon paprika and 5 chopped onions. Fry until onions are almost tender.
2. Add 1 ½ liter boiling water, and 4-5 chicken bouillon cubes. Let boil.
3. Add the soy mince. Let boil for a short time and sit on stove until the soy is tender and full of taste.
4. Add paprika to taste.
5. Add 1 finely chopped cabbage and 5 coarsely chopped tomatoes. Bring to a boil and turn down the heat – let sit on low heat until everything is tender.
6. Season to taste.

## PEPPER-FRIED SOY STEAK

Serves 10

### INGREDIENTS

400 g dry soy mince  
6 beef bouillon cubes  
6 green bell peppers, diced  
20 onions, chopped  
10 tomatoes, diced  
5 cloves garlic, minced  
5 large carrots, cut into batons  
2 tsp mustard, sweet basil, honey  
olive oil  
egg  
flour  
sadza

### DIRECTIONS:

1. Heat 1 ½ liter of water with the bouillon cubes. Add the soy and let it soak for ½ hour.
2. Turn up the heat and add the peppers and onion.
3. Cook until the water is gone (15 minutes); take 5 dl water and set aside.
4. Toss in diced tomato and olive oil.
5. Stir until warmed. Add egg and flour and mix thoroughly. Make 30 small patties.
6. Heat oil in a pan, add garlic and add the patties to fry. They are probably fragile, take care when turning.
7. Fry the carrots for 2 minutes; add the 5 dl soy-vegetable juice and the basil. Sauté for 5 minutes.
8. Add mustard and honey to taste. Season to taste with salt and pepper  
*Serve these steaks arranged with sadza and carrot and with the carrot-juice.*

## POTATO-VEGGIES WITH CABBAGE STEW & SADZA

Serves 15

### INGREDIENTS

400 g dry soy mince  
6 large onions  
5 large potatoes  
6 beef bouillon cubes  
1 head cabbage  
2 tomatoes  
2 tbsp parsley, chopped  
2 dl flour  
4 eggs  
salt, pepper, corn starch, oil  
sadza

**Directions:**

1. Clean onions and chop; clean potatoes and cut in half; boil them in salted water.

**Veggie Beef**

2. Heat 1 tbsp oil in a pot with 4 chopped onions. Fry until brown. Add 1 ½ liter water and 4 beef bouillon cubes; bring to a boil. Taste, check for a strong meaty taste.
3. Add dry soy mince and bring to a boil. Reduce heat and stir for 30 minutes; then turn off heat and let cool.
4. Add 4 eggs and 2 dl flour; mix with potatoes and blend. Season to taste.
5. Heat pan with small amount of oil. Take spoonfuls of veggie meat, fry them over low heat. They must form a crust before you try to turn them. Do not use too much oil, just enough to prevent sticking.
6. After frying, place the veggie beef on a large plate to be reheated in the oven.

**Cabbage Relish:**

7. Bring salted water to a boil. Add the shredded cabbage, and boil on low heat until cabbage is tender.
8. Add tomatoes, cut into slices. Use corn starch for thickening of the stew.
9. Season to taste.

*Serving:* Place some of the warm veggie beef on the plate, garnish with cabbage relish and parsley. Serve with sadza.

## PUMPKIN SOUP WITH SOY MEATBALLS

Serves 10

### Ingredients:

|          |                            |
|----------|----------------------------|
| 10       | hazelnuts                  |
| 300 g    | dry soy mince              |
| 8 - 9    | chicken bouillon cubes     |
| 5        | onions, chopped            |
| 2 tsp    | thyme                      |
| 2 cloves | garlic, minced             |
| 2        | eggs                       |
| 2 tsp    | flour                      |
|          | olive oil                  |
| 2 tsp    | steak spice or mince spice |
|          | salt and pepper to taste   |
| 500 g    | pumpkin in 3 x 3 cm dices  |
| 1 bundle | rape                       |
| 2        | bay leaves                 |
| 2 tsp    | rosemary                   |

### DIRECTIONS:

1. Chop the hazelnuts finely.
2. Heat 1 tsp. oil and fry the chopped hazelnuts with 2 of the chopped onions; while frying add the thyme, garlic and grind some pepper.
3. Add 1 ½ liter water to the mixture and let it boil; add 3 of the chicken bouillon cubes and the soy mince; let it simmer for ½ hour.
4. Pour out excess water. Blend the ingredients and add eggs and flour and 2 tsp olive oil. Mash and blend and press out water. Form into small firm balls.
5. Heat olive oil in pan on medium heat. Put the balls on the pan, fry while rolling until they are fried on all sides. (If dough is too loose for that, form flat cakes and fry on both sides).
6. Set the fried meat aside.
7. Fry 3 chopped onions in oil until translucent.
8. Add pumpkin squares and fry for a short period. Add 2 ½ liters of water and 5 chicken bouillon cubes, the bay leaves and the rosemary. Let everything boil till the pumpkins are done.
9. In a pan with hot oil, fry the chopped rape for 2 minutes. Add them to the soup. Add the meatballs to the soup. Simmer for 5 more minutes.

**RAPE STEW WITH CURRY-SOY MEATBALLS***Serves 10***INGREDIENTS**

|           |  |
|-----------|--|
| 50        | pecan nut halves                         |
| 300 g     | dry soy mince                            |
| 7         | beef bouillon cubes                      |
| 5         | eggs                                     |
| 2         | onions, chopped                          |
| 2-3 tsp   | curry, mild or hot - as you like it best |
|           | salt and pepper to taste                 |
| 2 tsp     | ground ginger                            |
| 10 cloves | garlic minced                            |
|           | clean water                              |
| 1 ½ liter | rape, shredded                           |
| 3         | tomatoes                                 |
|           | corn starch                              |

**DIRECTIONS:**

1. Preheat oven to 350° Celsius.
  2. Boil 2 liters of water with 4 of the beef bouillon cubes. Add the soy and let it soak up water for ½ hour.
  3. Spread out the pecan halves on another baking sheet. Bake for 3-5 minutes, shaking or turning periodically to prevent burning. This can also be done on a pan on a stove.
  4. Let cool. Place in blender and blend to a course meal.
  5. Fry the onion in a little oil.
  6. In a large bowl, combine ground nuts, the soy (let excess water drip away), egg, and onion. Add the spices, a little at a time, so that you do not make it more hot than you wish. Mix with a potato masher or just mash well with a large spoon and fork until well blended and smooth.
  7. Form into 1-inch balls and place on a prepared baking sheet.
  8. Bake for 10 minutes. Move balls around to coat with oil. Bake for another 10 – 12 minutes or until golden brown and firm.
  9. In another bowl with lid, add enough clean water to 1 cm of the pan. Add 3 bouillon, black pepper, the rape and tomato. Bring to a boil.
  10. Cover and reduce heat to medium-low. Cook until tender.
- Serving:* Arrange on a serving plate. Top with meatballs.



## RAPE-VEGGIES WITH CAULIFLOWER AND TOMATO-GARLICE SAUCE

Serves 10

### INGREDIENTS

|           |                           |
|-----------|---------------------------|
| 300 g     | dry soy mince             |
| 1 bundle  | rape, cleaned and chopped |
| 2 tsp     | rosemary, ground          |
| 8         | large onions              |
| 6         | beef bouillon cubes       |
| 2 dl      | flour                     |
| 4         | eggs                      |
|           | oil                       |
| 10        | tomatoes                  |
| 10 cloves | garlic, crushed           |
| 2 dl      | tomato ketchup or puree   |
| 2 tsp     | oregano                   |
|           | sadza                     |

### DIRECTIONS:

1. Heat 1 tbsp oil in a pot with 4 chopped onions, chopped rape and rosemary powder. Fry the onions until brown.
2. Add 1 ½ liter boiling water and 4 beef bouillon cubes. Bring to a boil. Check for a strong meaty taste.
3. Add dry soy mince and bring to a boil. Stir on low heat for 30 minutes. Turn off heat and let cool.
4. Add 4 eggs and 2 dl flour, mix and blend. Season to taste.
5. Heat pan with small amount of oil. Take spoonfuls of veggie meat and fry on low heat. They must form a crust before you try to turn them. They are delicate. Use a flat, broad spatula to turn. Do not use too much oil, just enough to prevent from sticking.
6. After frying, place the veggie beefs on a large plate to be reheated in the oven.
7. Heat a little oil in a pot. Add the rest of the chopped onions and garlic.
8. Let fry for 3 minutes, then add the chopped tomatoes and the oregano. Fry for 5 minutes at high heat, stirring constantly.
9. Add ¼ liter water, 2 beef cubes and fresh ground pepper. Let boil/sauté.
10. Turn down the heat and let rest until the mix is tender. Taste for seasoning with salt and pepper. Add sweetener if desired.

## ROASTED VEGGIES WITH CAULIFLOWER STEW

*Serves 15*

### INGREDIENTS

|         |                                |
|---------|--------------------------------|
| 400 g   | dry soy mince                  |
| 5 large | onions                         |
| 6       | beef bouillon cubes            |
| 2 tbsp  | curry powder                   |
| 2 dl    | flour                          |
| 4       | eggs                           |
| 2 head  | cauliflower                    |
| 2       | tomatoes                       |
|         | salt, pepper, corn starch, oil |

### DIRECTIONS:

#### Veggie Beef

1. Heat 1 tbsp oil in a pot with 4 chopped onions and half of the curry power (1 tbsp). Fry the onions until brown.
2. Add 1 ½ liter boiling water and 4 beef bouillon cubes. Bring to a boil. Check for a strong meaty taste, with a twist of curry.
3. Add the dry soy mince, and bring to a boil. Simmer on low heat for 30 minutes and then let cool.
4. Add 4 eggs and 2 dl flour, mix and blend. Season to taste.
5. Heat a pan with a small amount of oil. Take spoonfuls of veggie meat, fry them on low heat. They must form a crust before you try to turn them. They are delicate so use a flat, broad spatula. Use a small amount of oil, just enough to prevent from sticking.
6. After frying, place the veggie beef on a large plate to be reheated in the oven.

#### Cauliflower Stew

1. Heat a little oil in a pot with the rest of the curry (1 tbsp).
2. Add 2 chopped onions, add the cauliflower, cut into small florets.
3. Let fry for 3 – 5 minutes. Add ½ - 1 liter water.
4. Add 2 beef cubes, and fresh ground black pepper. Add the tomatoes in slices.
5. Bring to a boil. Turn down the heat and let it rest until the cauliflower florets are tender.
6. Add corn starch to thicken the sauce. Season to taste.

*Serving:* Place some of the warm veggie beefs on the plate and garnish with cauliflower stew and sadza.

## VEGGIE BEEF WITH PARSLEY-ONION STEW & SADZA

Serves: 15

### INGREDIENTS

400 g soy mince  
6 large onions  
6 beef bouillon cubes  
2 tbsp chopped parsley  
2 dl flour  
4 eggs  
salt, pepper, corn starch, oil

### DIRECTIONS:

#### Veggie Beef

1. Heat 1 tbsp oil in a pot with 4 chopped onions and half of the curry power (1 tbsp). Fry the onions until brown.
2. Add 1 ½ liter boiling water and 4 beef bouillon cubes. Bring to a boil. Check for a strong meaty taste, with a twist of curry.
3. Add the dry soy mince, and bring to a boil. Simmer on low heat for 30 minutes and then let cool.
4. Add 4 eggs and 2 dl flour, mix and blend. Season to taste.
5. Heat a pan with a small amount of oil. Take spoonfuls of veggie meat, fry them on low heat. They must form a crust before you try to turn them. They are delicate so use a flat, broad spatula. Use a small amount of oil, just enough to prevent from sticking.
6. After frying, place the veggie beef on a large plate to be reheated in the oven.

#### Onion Relish:

1. Heat a little oil in a pot. Add the chopped onion and fry for 3 minutes.
2. Add ¼ liter of water, 2 beef cubes and fresh ground black pepper. Sauté the onion over low heat until tender.
3. Mix in chopped parsley. Add corn starch to thicken the sauce.
4. Season to taste.

*Serving:* Place some warm veggie beef on the plate. Garnish with onion relish and sadza.

## **CABBAGE STEW WITH BUTTERNUT AND PORRIDGE**

### **INGREDIENTS**

1-cup dry soy mince  
2 chopped onions  
½ finely chopped cabbage  
3 chicken cubes  
125 ml lemon juice  
100 ml cooking oil  
1 butternut (cubed)  
1 tsp curry powder/mustard

### **DIRECTIONS:**

1. Heat oil and add chopped onions, let fry until onions are almost tender.
2. Add 1L of water, and cubes of chicken. Let boil.
3. Add the soy mince and let boil short time and leave it to cook until the soy is tender.
4. Add a finely chopped cabbage and cubed butternut.
5. Bring to a boil and turn down the heat, add lemon juice and curry powder or mustard. Cook until the cabbage is done but still firm. Serve.

## **SPINACH ROLLS, WITH CARROT DICE AND SAMP**

### **INGREDIENTS**

1-cup dry soy mince  
1 bunch of spinach  
2 large onions  
4 large carrots  
3 beef cubes  
1 tbsp tomato paste  
1 tbsp flour  
1 egg  
4 TBS oil  
2 ml salt  
2 ml pepper

### **DIRECTIONS:**

1. Heat 15 ml of oil in a saucepan and add one chopped onion, fry until brown. Add one 1L of boiling water and three beef cubes, then boil.
2. Add dry soy mince and bring to a boil for a few minutes then simmer for 30 minutes. Let it cool.
3. Add 1 egg and flour, mix and blend if the veggie mince is in large lumps.
4. Cut the carrots and the remaining onion in very small dices. Mix the onion and the carrot dices into the veggie dough together with a spoonful of tomato paste.
5. Season to taste.
6. Bring a large pot of salted water to a boil and let the spinach boil for 1 minute. Quickly cool it in cold water.

7. Place the spinach leaf in front of you; take a spoonful mixture of a veggie dough and place in the middle.
8. Fold the spinach around, close with a toothpick or use a meat string to tie around. Place the spinach roll in an ovenproof container. When all the rolls are made, sprinkle with oil, salt and pepper, soy sauce. Bake in oven for 15 minutes until lightly brown. Serve with samp.

## SOY MINCE VEGETABLE PATTIES

### INGREDIENTS

1-cup soy mince  
2 cups warm water  
1-cup flour  
1 tsp baking powder  
2 ml salt  
1-cup water  
1 potato, shredded  
1 carrot, shredded  
1 onion, chopped  
Few leaves spinach (finely chopped)  
Oil for frying

### DIRECTIONS:

1. Put the mince in a small bowl. Add warm water and let the mixture stand for 5-10 minutes, until the water is absorbed. Hydrate the mince.
2. In a mixing bowl, sift together the flour, baking powder, and salt. Stir in the water to make a smooth batter.
3. Add the potato, carrot, onion, spinach, and hydrated mince. Mix well.
4. Heat a little oil in the bottom of a frying pan. Drop the patty mixture by tablespoons into the hot oil and cook on both sides until brown.

## TSP VEGETABLE STEW

### INGREDIENTS

4 Tbsp oil  
1 chopped onion  
2 cloves garlic, crushed  
2-cups crushed or pureed tomatoes  
2 carrots, chopped  
1 green pepper, chopped  
100 g green beans, chopped  
2 cups water  
2-diced potatoes  
2-cups dry TVP  
1 tsp curry powder  
1 tsp mixed herb  
1 tsp black pepper  
5 ml salt  
10 g dried chilies  
15 ml marmite

### DIRECTIONS

1. Heat the oil in a large pot over medium heat. Add the onions and sauté until golden.
2. Add the remaining ingredients and stir well to combine. Bring to a boil, then reduce heat to and simmer until the stew thickens, about 30 minutes.

*Serve with any starch food.*

## Recipes Using Soy Milk

## *Recipes using Soy Milk*

### **POTATOES AND SPINACH SOY CASSEROLE**

#### **INGREDIENTS**

300 g potatoes (cut in quarters)  
200 g spinach (roughly chopped)  
100 g cheddar cheese (grated)  
1-cup soymilk  
1-cup milk  
2 onions (finely chopped)  
45 ml cooking oil  
5 ml turmeric  
5 ml curry powder  
5 ml pepper  
2 ml salt

#### **DIRECTIONS:**

1. Boil potatoes in salted water until tender.
2. Sauté onions in cooking oil; add turmeric, curry powder, pepper and salt to taste.
3. Add milk and allow simmering for about 10 minutes.
4. Add spinach and allow cooking for a minute.
5. Put the whole mixture into the ovenproof dish and cover with cheddar cheese and allow to brown under a hot grill for 3-5 minutes.

\*Instead of grilling, the dish can be served with soy white sauce.

### **SOYMILK FRUIT SMOOTHIE**

#### **INGREDIENTS**

350 ml soymilk  
125 ml mashed pineapple  
25 g banana, mashed

#### **DIRECTIONS:**

1. Put the soymilk and the fruits in a blender container. Blend until smooth.
2. If desired add sweetener and ice cubes and blend again.

#### **VARIATION**

Fresh orange, banana, mango, strawberry, coconut powder, crushed pineapple can be used.

## SOY SWEET SAUCE

### INGREDIENTS

1-cup soymilk  
2 egg yolks  
55 g castor sugar  
2 tsp cake flour  
3 tsp corn flour  
2 ml vanilla essence

### DIRECTIONS:

1. Scald the milk by bringing it just below boiling point in a saucepan.
2. Cream the egg yolks with the sugar and a little of the milk and when pale, mix in the flours. Pour on the milk and mix well.
3. Return the mixture to the pan and bring slowly to the boil, stirring continuously and vigorously to make it smooth. Allow cooling slightly, and then add vanilla essence.

## ORANGE & PEACH SOYMILK SHAKE

### INGREDIENTS

2-cups soymilk  
4 oranges  
4 peaches  
30 g sugar (optional)

### DIRECTIONS

1. Squeeze oranges and blend peaches.
2. Mix all the ingredients and shake well.
3. Sieve until clear. Refrigerate and serve cold.

VARIATION - Pineapple can be used also following the same method.

## CURRIED CARROT SOUP

*Serves 4*

### INGREDIENTS

6 medium carrots, thinly sliced  
2 cups vegetable stock  
1 small onion, chopped  
½ cup plain soymilk  
2 teaspoons curry powder

### DIRECTIONS

1. Combine all ingredients except the soymilk; Cook over medium heat until carrots are tender.



2. Pour into a blender and puree until smooth. Stir in the soymilk.
3. Cook over low heat until hot.

Per serving: 64 calories, 2 grams protein, 1 gram fat; 13 grams carbohydrate, 11% fat.

## SOY CREAM POTATO SOUP

### INGREDIENTS

- 4 Cups (1kg) potatoes, cubed
- 3 Cups (1/2 kg) onions, chopped
- 6 Cloves of garlic, minced (**or other local herb**)
- 1 Tbsp oil
- 4 Cups potato water, vegetable stock, or water
- 1/2 Cup fresh parsley, chopped (**or other local herb**)
- 2 tsp. Salt
- 1/2 tsp cracked red pepper, or black pepper or other spice
- 2 cups soymilk

### DIRECTIONS:

1. Boil potatoes until soft and reserve cooking water.
2. Fry the onions and garlic (or other flavor) in oil.
3. Add the potatoes and potato water and mash and blend with onions and garlic.
4. Return to the soup pot and stir in soymilk, salt, pepper or other spices.
5. Heat until almost boiling but **do not boil**.

## SOYMILK / OKARA / FRUIT PANCAKES

### INGREDIENTS

- 1 cup wheat flour
- 1 cup soymilk
- 1 cup okara
- 2 cups chopped fruit
- 2 eggs
- Cooking oil

*Okara is a pulp fiber and is a by-product of soymilk*

### DIRECTIONS:

1. Mix eggs, flour, soymilk and okara. If mixture is too thick to pour, add more soymilk.
2. Pour into medium-hot, oiled frying pan, making thin pancakes.
3. Chopped fruit can be added to the mixture, or rolled into the finished pancakes.

## SOY TOAST

### INGREDIENTS

4 slices of white bread, crusts removed  
2 eggs  
150 ml soymilk  
55 g butter  
2.5 ml oil  
A pinch of crushed roasted soybean

### DIRECTIONS:

1. Cut each slice of bread into 4 fingers.
2. Beat the eggs, milk and roasted beans together in a pie dish or soup plate.
3. Dip the bread fingers into this mixture, coating them well.
4. Melt half the butter with a tablespoon of oil in a heavy frying pan. When the butter is foaming, fry the bread in it until golden brown on both sides. Drain on an absorbent kitchen paper. Add the remaining butter and more oil as needed, until all the bread fingers are cooked.

## SOY MILK BREAD

*Yield: 2 loaves (16 slices each) Serving size: 1 slice*

*This could easily become your daily bread. For a change of pace, try kneading herbs, nuts or dried fruit into the dough, or shaping it into small loaves, rolls or free-form rounds.*

### INGREDIENTS

2-1/2 cups soy milk  
2 Tbs honey  
1/4 cup soy oil  
1 Tbs active dry yeast  
1/2 cup warm water  
1/3 cup soy flour  
2 cups white bread flour  
5 or more cups whole wheat flour  
2-1/2 tsp salt

### DIRECTIONS:

1. Bring soy milk and honey almost to a boil. Remove from heat, stir in oil, and let cool to lukewarm.  
Dissolve yeast in warm water and let sit about 5 minutes, until bubbles begin to form.
2. Combine soy flour, white flour, 4 cups of the whole wheat flour and salt in a large mixing bowl.
3. Add the yeast and soy milk mixtures and stir well. Add the remaining whole wheat flour as needed to make a soft dough.

4. Turn out onto a lightly floured board and knead until smooth and elastic, about 10 to 15 minutes.
5. Put dough into a lightly oiled bowl, cover and let rise until double in bulk, about 2 hours.
6. Punch down; shape into two loaves and let rise again in lightly oiled bread pans until dough reaches the top of the pan, about 45 minutes.
7. Bake for 35 to 40 minutes at 350°, until golden and bottom sounds hollow when tapped. Remove from pans to cool.

Per serving: 129 calories, 3 g total fat (0.4 g sat fat), 5 g pro, 23 g carb, 2.7 g fiber, 176 mg sodium, 0 mg cholesterol

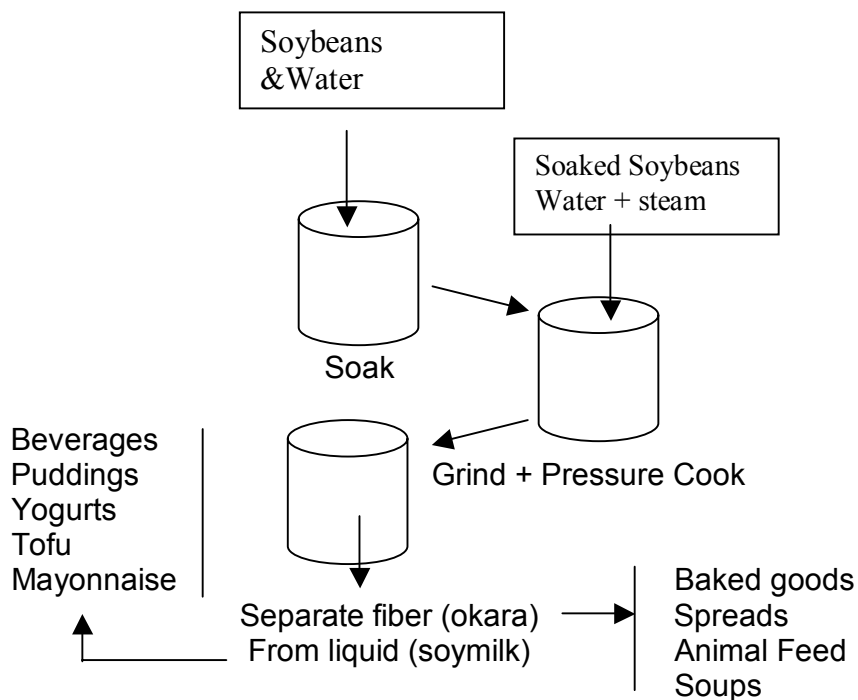
## Making Soymilk

Used with permission from *Malnutrition Matters*, from:  
*Soya Dairy Foods – Resource and Recipe Booklet*

Note that for best quality taste, yield and functionality, especially for commercial soymilk production, that there are much more detailed procedures to follow than is shown. The process below merely illustrates the basic procedure.

### Basic steps:

1. Soak soybeans in water. (Soak about 1 kg dry soybeans for each 7-8 L of soymilk output. Soak for about 5-10 hours depending on water and ambient temperature.)
2. Discard soaking water, rinse and transfer beans along with fresh water to grinding/cooking vessel. (Add about 6-7 L of water for each kg of soaked soybeans.)
3. Grind and pressure-cook mixture up to 110C for a few minutes. (Non-pressurized cooking will take much longer and is not recommended.)
4. Separate un-dissolved fiber (**okara**) from liquid (**soymilk**) with a press or centrifuge.
5. Make soyfoods from okara and soymilk base



The hot soymilk thus produced is functionally similar to cow's milk, and is vulnerable to the same microorganisms that can contaminate milk. The same sanitary guidelines as those used in the dairy industry must be used when producing soymilk and soyfoods derived from it. This also applies to the moist fiber residue; the okara must be used fairly quickly to avoid spoilage.

## Okara

The non-dissolved fiber that remains after filtering out the soymilk is called “okara”. It is approximately 75-80% water and still quite hot after it is freshly produced. This warm, moist mixture of mainly fiber, protein and carbohydrates must be used fairly quickly for human consumption since the okara is an ideal breeding ground for bacteria. In warm climates, the okara must be consumed or transformed within 4-6 hours. If used as an animal feed, the okara can be kept for approx. 1 day. It is possible however to inexpensively dry okara, and thus greatly increasing its shelf life, by placing the moist okara in direct sunlight on a screen and turning it over a number of times throughout the drying period. The dry okara can thus be kept for a period ranging from a few weeks to several months, depending on its moisture level (the lower the moisture, the longer it will last).

Okara has a smooth texture, akin to fine moist sawdust, and has a pleasant slight cereal taste. Like tofu, okara will take on the flavor of the ingredients with which it is blended, while adding fiber and protein to the food. Examples include soup thickener, meat extender and patties. Okara is ideal to use in baking applications, where it can replace 10-15% of the regular bread or pastry flour, while giving the regular dough up to 50% more protein. It has also been shown to extend the shelf life of bread products by a day or more.

Recipes Using Soy Protein  
Concentrates and Isolates  
- To be Added

*Recipes using Soy Protein  
Concentrates and Isolates*

## Appendix B – Consumer Acceptability Survey<sup>4</sup>

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**Instructions for Use:** The consumer acceptability survey provides data and feedback on participant’s opinions of the new foods prepared with soy products. The information is used to improve soy products and recipes made with soy. Tell the participants the name of the product and the recipe they will be testing.

**The facilitator should tell the participants:**

- the survey will take about five to ten minutes
- do not include your names
- responses will be kept anonymous and no names will be used in any reports
- the information will be used to improve soy products and recipes in the future
- answer all of the questions honestly
- do not leave anything blank; do not make up answers, if you don’t have an answer, write ‘don’t know’ or ‘no answer’

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<sup>4</sup> The Consumer Acceptability Survey is a modified version of one originally created by the National Soybean Research Laboratory, University of Illinois, Urbana-Champaign; updated December 2004.

## Consumer Acceptability Survey

Date: \_\_\_\_\_ Location: \_\_\_\_\_

Product Tested: \_\_\_\_\_ Recipe: \_\_\_\_\_

Age: \_\_\_\_\_

Gender:  Male  Female

**Instructions:** Please take five to ten minutes to answer the following questions. Evaluate the product by looking at it and tasting it. Pay attention to the APPEARANCE, FLAVOR and TEXTURE of the product. Indicate your opinion by marking an X in one box for each question.

Do not leave any questions blank. If you have no answer, mark 'don't know', or 'no answer'. Do not include your name; all responses are anonymous.

|  | Don't Know | Dislike Extremely  | Dislike very much | Dislike | Dislike some what | Neither like or dislike Neutral | Like some what | Like | Like very much | Like extremely |
|--|------------|--------------------|-------------------|---------|-------------------|---------------------------------|----------------|------|----------------|----------------|
| Considering ALL characteristics (APPEARANCE, FLAVOR and TEXTURE), what is your OVERALL opinion?    |            |                    |                   |         |                   |                                 |                |      |                |                |
| Re-taste the product as needed. Then indicate how you feel about each of the following categories: |            |                    |                   |         |                   |                                 |                |      |                |                |
| OVERALL APPEARANCE   |            |                    |                   |         |                   |                                 |                |      |                |                |
| OVERALL FLAVOR   |            |                    |                   |         |                   |                                 |                |      |                |                |
| OVERALL TEXTURE  |            |                    |                   |         |                   |                                 |                |      |                |                |
|  | Don't Know | Not at all intense | Somewhat intense  | Intense | Very intense      | Extremely intense               |                |      |                |                |
| How intense (noticeable, strong, powerful) is the soy flavor?                                      |            |                    |                   |         |                   |                                 |                |      |                |                |

What did you like the most? \_\_\_\_\_

What did you like least? \_\_\_\_\_

Are there any other comments you would like to share? \_\_\_\_\_

\_\_\_\_\_

Thank you!



