Soybean Utilisation Guide









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National Soybean Network

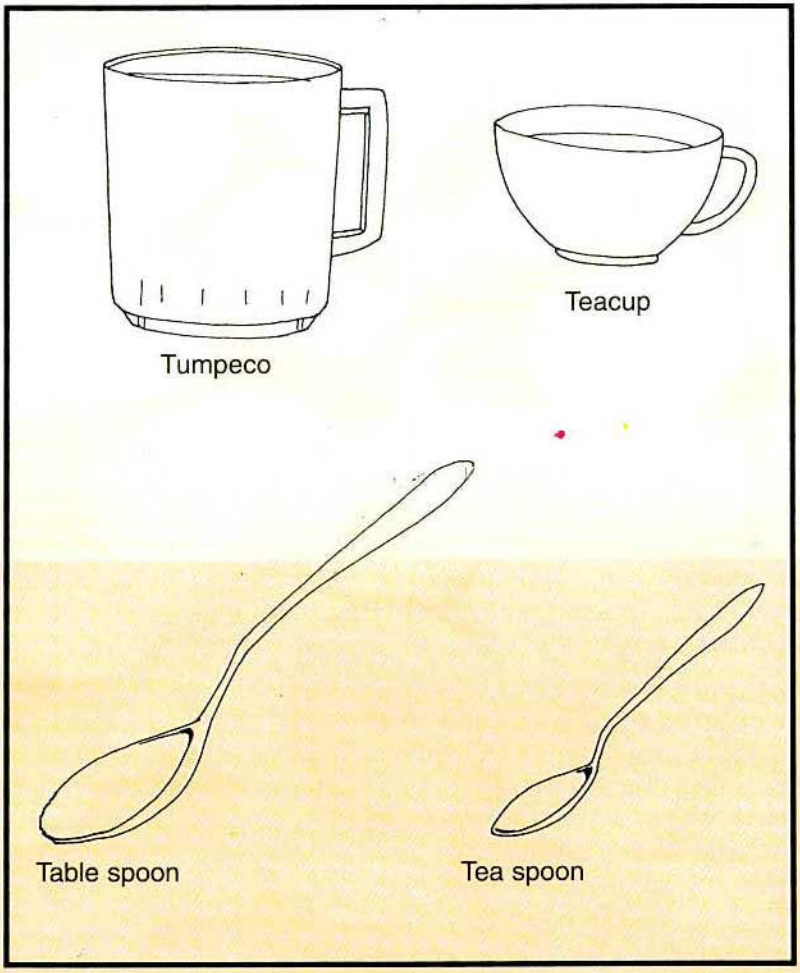
Makerere University

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SOYBEAN UTILISATION GUIDE



Measures used in this Guide



Soybean is unique among vegetables; no other single vegetable plant supplies all the essential nutrients for hu man and infant growth. It is an important crop as a source of cooking oil and soymilk for human consumption plus soycake and soymeal as a livestock feed. But its adoption, production and utilisation have been very slow due to cultural, technical and socioeconomic constraints.

The mature soybean seed has three major components, the seed coat (hull), the cotyledon and the embryo axis (hypocotyl). It is a typical legume seed differing, in colour, size and shape depending on variety.

Chemical composition of soybean varies depending on variety and the growing conditions, but reasonable average figures are 40% protein, 20% lipid, 35% carbohydrate and 5% ash on a dry weight basis. Of particular significance, however, is the excellency of soybean protein. Soybean proteins contain a high content of essential amino acids particularly lysine, isoleucine and leucine. It is, however, low in the sulphur containing amino acids, cysteine and methionine.

Whole soybean contains 1.6-% potassium, 0.3% calcium, 0.3% magnesium, 110ppm iron, 50ppm zinc, and 20ppm copper. These minerals can contribute to the overall requirement especially for children and pregnant women.

Soybean contains anti nutritional factors. These are biologically active substances, they are not "toxic' but may inhibit the availability of desired substances that are otherwise useful to the body. Some of these substances are trypsin inhibitor (TI), haemagglutinin, phytic acid, goitrogens and urease. `

Soybean off-flavour is caused by an enzyme **lipoxygenase** that is present in the soybean cells. This enzyme **must** and can be inactivated before such an off-flavour is produced. Damaging of the cell tissue by pounding or grinding exposes the sites of the enzyme and fat. However as long as the tissue remains dry, the off-flavour is not produced. The addition of cold water to the tissues causes an instant reaction between the enzyme and fat which results into a strong, "beany odour" and "off flavour".

These components have caused reluctance in certain circles to accept soy products in the human diet. The flatus problem (Tummy gas) is, however, shared by other legumes like beans and peas but is fortunately not insurmountable through proper processing.

When sound, dry soybean seed are soaked at room temperature they absorb water and double in weight in approximately 6 hours, 5 cups of water to1 cup of soybean. Well-soaked, sound soybeans do not develop

off-flavour, because the enzyme and fats remains apart. **However, rough handling of soaked beans will damage the tissue and allow the enzyme and fats to come together and produce a beany off-flavour. The off- flavour will also develop if raw dehulled soybeans** (soybeans after removing the skin) **are soaked at room temperature. Once the off- flavour has been developed, it cannot be eliminated.**

The enzyme can be inactivated prior to development of off-flavour by dropping the undamaged soaked beans into boiling water and boiling for 5 to 10 minutes.

Dropping the whole dried soybean also inactivates the enzyme but requires a longer (10- 15) minutes boiling time. If dehulled, dry soybeans are dropped into boiling water, the enzyme is inactivated within 10 minute.

Table 1: Boiling time required to destroy the trypsin inhibitor by the type of beans (javaheri/Nelson and weingartner of INSOY, University of Illinois, Personal consultation in Illinois – 1988).

Type of Soybean	Boiling Time *(Minutes)*
Whole dry soybeans	45
Whole dry soybeans soaked for six hours	30
Soybean grits	15
Dehulled soybeans	10
Soybean flour	5

Roasting soybean for six hours to an acceptable brown colour destroys TI. However, roasting dry soybean to an acceptable brown colour does not completely destroy TI. If soybeans are roasted to dark brown, the TI is destroyed but the protein is also damaged. Roasting dry soybean for direct consumption is therefore, not recommended.

Grain Quality

Soybean used for human food must be of high quality. Foreign materials, such as stems, pods, sticks and stones must be removed. Crushed and damaged beans should be removed especially if soaking is included in the recipe.



All moldy seeds must be removed, they are of no value and may contain toxins. Green soybean grain or soybean with green spots must also be removed especially for preparation of soybean milk as the chlorophyll affects the colour and taste of the product.

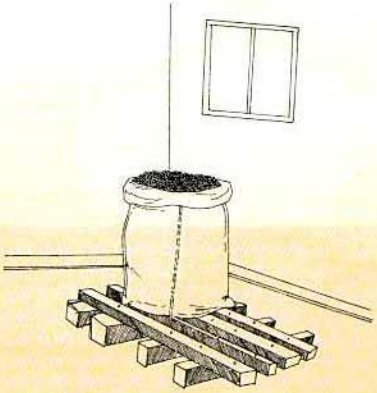
Texture

Dry whole soybean needs to be cooked for a long time to reach an acceptable texture (7 hours). This wastes energy. However soaking for 6 hours reduces cooking time by half.

In recipes where soybean is either pounded into grit or used as flour the question of texture does not arise.

Summary

To prepare tasty and acceptable soybean products, and to avoid undesirable tastes and texture;



1. Use good sound soybeans for cooking. Remove moldy,coloured and damaged beans.

2. Drop soybeans in boiling water in such a way that boiling doesnot stop.

3. Never pound wet, raw soybeans before cooking.

4. Never bring broken damaged soybeans in contact with cold water.



5. Flavour all soybean preparations as desirable.



Table 2: The Nutritive value of soybean compared to that of lean Beef

Soybean *(dry beans)*		**Beef** *(boneless)*
Protein	35-40%	20%
Fat	20%	3.8%
Carbohydrates	30%	-
Moisture Content	13%	74.6%
Ash Content	4%	-
Iron	0.01%	4.6%
Calcium	0.01%	-

Table 3: The Nutritive value of Soy milk as compared to cow's milk (Values in Nutri Units)

	250gm of soy milk	**250gms of cow's milk**
K calories	1	2
Proteins	3	3
Thiamin	4	2
Riboflavin	1	4
Niacin	1	-
Iron	2	-
Calcium	1	9

Table 4: Nutritive value of Soybean compared with other legumes (Nutri units/ 90gms)

	Soybeans	Mixed Beans	Cowpeas	Peanuts
K calories	3	3	3	5
Proteins	12	6	7	9
Thiamin	14	7	13	13
Riboflavin	3	2	1	2
Niacin	2	2	2	14
Iron	6	7	4	2
Calcium	5	2	2	1

Table 5: Comparative cost of commodity and protein in selected food sources in Nigeria (Naira)

Commodity	Price per kg	%protein	%relative cost
Pork	12.00	12	100.00
Beef	20.00	20	100.00
Eggs	9.00	13	69.23
Cowpeas	3.75	20	18.75
Maize	2.25	9	25.00
Soybean	2.00	40	5.00
Chicken	16.00	20	80.00

Source: Osho 1991



BASIC PREPARATION

Important

In all preparation, soybeans must be dropped gradually into boiling water to avoid development of any undesirable off-flavour.

Avoid soaking as much as possible in order to eliminte chances of developing BASIC PREPARATION

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In all preparation, soybeans must be dropped gradually into boiling water to avoid development of any undesirable off-flavour.

Avoid soaking as much as possible in order to eliminte chances of developing off flavour caused by rough handling of soaked beans.
If done correctly soaking reduces cooking time.

Procedures for cooking whole dry soybean

Note: cooked soybeans are preferably used in recipes with other ingredients.

1. Choose clean sound soybeans
2. Boil water (5 cups for each cup of dry soybeans)
3. Drop beans into boiling water gradually so that boiling does not stop.
4. Gently boil the soybeans for 60 minutes. Freshly harvested soybeans attain the desired degree of softness faster than older beans.
5. Do not add salt until the soybeans have been cooked. Salt prolongs cooking and softening time.

Procedure for cooking crushed soybean

Method One:

1. Pound the whole soybean in a hand grinder or in a mortar.
2. Boil the soybean grits by dropping them directly in boiling water and simmering for 30 minutes.
3. Use same amount of water as above.

Method Two:

1. Boil whole dry soybeans as above.
2. Pound the cooked soybeans into a paste.
3. Use same amount of water as above.

Procedures for Dehulling soybean (Removing skin)

- Boil whole dry soybean as above
- Place the boiled beans in a basin of fresh cold water
- Rub the beans between the fingers to remove hulls and decant
- Repeat several times to remove all the skin.

Procedures for Preparation of Soy flour

1. Boil the soybeans as above
2. Dehull the soybeans (optional).
3. Place the boiled soybean on a mat to dry, under the sun
4. Grind the dry cooked soybean in a mortar, grinder or hammer mill, and sieve (in the case of pounded soy)

SOYBEAN RECIPES

1.0 SOY MILK

Ingredients:

- Soybean 2 tumpeco
- Water 10 tumpeco



1.1 Method of Preparation I

1. Sort and soak the beans over night in cold water and drain.
2. Drop the soaked beans into the same amount of boiling water gradually and boil for 30 minutes.
3. Drain and pound into pulp.
4. Place the pulp into a container, and for each cup add 2 cups of water and stir thoroughly with a wooden spoon.
5. Strain the mixture using a clean white cloth,squeezing to get the milk out.
6. Boil the resultant milk and use as desired.
7. Package the rest in a bottle/ container.

1.2 Method of Preparation II

1. Sort and clean the beans.
2. Drop beans gradually into the boiling water and boil for 45minutes.
3. Drain and pound to a fine paste in a mortar.
4. Add 2 tumpecos of clean water to 1 of pulp.
5. Continue as in method 1 above.

2.0 SOYBEAN BEVERAGE



Ingredients

- Soybeans 1 tumpeco cup

Method of Preparation

1. Clean and sort the beans
2. Roast until darkish brown (almost burning).
3. Allow to cool and grind into powder to make soybean coffee.
4. Use as coffee.

NB. Suitable for people who are not interested in caffeine rich drinks

3.0 SOYBEAN SNACK

Ingredients

- 1 Soybean 1 tumpeco cup
- water 5 tumpeco cups
- Salt to taste
- Piri piri (chile powder) to taste
- Cooking oil for frying 3-4 tea spoons

Method of Preparation

1. Boil the water and gradually drop the beans into it.
2. Boil for 45 minutes and drain leaving some little water in the beans.
3. Add salt to taste and simmer for about 10 minutes.
4. Dry the blanched beans slightly to get rid of excess water.
5. Fry the beans in hot cooking oil till the beans turn golden brown.
6. Sprinkle with salt and piri piri to taste.
7. Store in an airtight container

4.0 Soy Based Local Dishes

4.1 SOYBEAN RELISH

Ingredients

- Soybean flour 1 tea cup
- Onion 1 large
- Tomatoes 4medium
- Pumpkin leaves or cabbage, green bean leaves and rape leaves 25
- Curry powder to taste
- Salt to taste

Method of Preparation

1. Wash and chop the leaves and put into a pan.
2. Cook in little water.
3. Slice the onions and the tomatoes and put into the pan.
4. Cook until leaves are soft.
5. Mix tea cup of soyflour with 1teacup of water in a bowl and add to the cooked leaves.
6. Cook for 10 minutes more.
7. Serve with ugali/matooke etc

4.2 PUMPKIN/SOYBEAN RELISH

Ingredients

- Pumpkin 1 small
- Soybean flour 1/4 cup
- Onion 1 large
- Tomatoes 2 big
- Water 1 1/2 teacup
- Salt to taste

Method of Preparation

1. Slice pumpkin,remove seeds, and peel
2. Cut the pieces into cubes and place in a pan.
3. Peal and slice the onion and tomatoes and add to the pumpkin cubes.
4. Boil in salted water until tender.
5. Stir the soybean flour in the 1 1/2 cups of water and add to the cooked ingredients in the pan.
6. Cook for anoyher 10 minutes.
7. Mash and mingle thoroughly under a low fire
8. Serve hot.

4.3 TOMATO/SOYBEAN MASH RELISH

Ingredients

- Soybean mash 1 tea cup
- Onion 1
- Tomatoes 4
- Salt to taste
- Cooking oil 2 table spoons
- Water 1 tea cup

Method of Preparation

1. Pound the cooked soybean in a mortar to form a smooth paste.
2. Peel and slice 1 onion and 4 tomatoes.
3. Fry the sliced onions and tomatoes in oil till done
4. Add soybean paste salt and water to the pan and cook for 15 minutes.
5. Serve hot.

4.4 SOYBEAN MASH RELISH

Ingredients

- Soybean paste 1 tea cup
- Eggs (beaten) 2
- Onion (chopped) 1
- Green pepper 1
- Cooking oil 2 table spoonful
- Salt to taste
- Water tea cup



Method of Preparation

1. Fry soybean mash in hot cooking oil until mash is dried
2. Add chopped onion, green pepper and salt.
3. Mix well fry until golden brown.
4. Add eggs, little water and mix well.
5. Cook until done and serve hot.

4.5 CASSAVA LEAVES/SOYBEAN RELISH

Ingredients

- Pounded cassava leaves 2 tea cups
- Onion 1 (sliced)
- Tomato 1 (big & chopped)
- Soybean flour 1 tea cup
- Salt to taste

Method of Preparation

1. Pound the clean, young and tender cassava leaves well.
2. Cook leaves for $1^{1/2}$ hours.
3. Drain off any excess water.
4. Add onion, tomato and $1^{1/2}$ tea cups of fresh water.
5. Cook for 10 minutes.
6. Add 1 teacup of soy flour and salt mixed in little water.
7. Cook for 10 more minutes and serve hot.

N.B: We can also prepare relish from pumpkin leaves. This can be done by removing the veins and cleaning the young pumpkin leaves. Method of preparation is similar to the above.

4.6 SOY-VEGETABLE SOUP

Ingredients

- Soybean paste 1/2cup
- Amaranthus 1handful
- Tomato (chopped) 1
- Onion (chopped) 1 medium
- Green pepper (chopped) 1
- Cooking oil 3 tablespoons

Method of Preparation



1. Wash and cut the vegetables into small pieces
2. Fry the onion, tomatoes, and pepper
3. Add soybean paste to the fried ingredients and stir well
4. Add green vegetables and simmer until the greens are done
5. Mash well and pass through a sieve to obtain the soup
6. Add salt to the soup, reheat and serve hot.

4.7 CASSAVA RELISH

Ingredients

- Fresh peeled and chopped Cassava 6 teacups full
- Pounded Peanuts 3 teacups full
- Soy flour (slightly roasted) 1 teacup
- Onions, (chopped) 2
- Tomatoes (chopped) 2
- Salt to taste
- Water 3 teacups full

Method of Preparation

1. Add the chopped onions and sliced tomatoes to the washed fresh cassava.
2. Boil till tender
3. Mix the pounded g/nuts and the soybean flour with a little water and add to the cooked ingredients.
4. Add salt to taste and simmer till its gravy is thick
5. Serve hot

5.0 MAIZE SUMP

Ingredients

• Fresh green maize (cooked)	3 tea cups
• Soy flour	1/2 tea cup
• Groundnut paste	1/2 tea cup
• Salt	to taste

Method of Preparation

1. Roast the soyflour slightly.
2. Mix a paste of groundnuts and soy flour with a cup of water and add to the maize grain in the pan; and mixwell.
3. Scoop ladles of the mixture and wrap in banana leaves or foil paper
4. Steam for an hour
5. Serve it hot or cold as a snack

6.0 BOILED MAIZE AND SOYBEAN

Ingredients

• Maize grains	4 teacups
• Soybean	1 teacup
• Salt	to taste

Method of Preparation

1. Drop beans into boiling water and cook for 60 minutes
2. Cook the maize separately and when almost ready mix it with soybeans and continue cooking until ready.
3. Add salt to taste.
4. Serve it hot.

6.1 SOY-MAIZE MEAL (AKARA)

Ingredients

• Maize flour	3 tea cups
• Soy flour	1 tea cup
• Onion	1 (medium)
• Garlic	1 clove
• Salt	to taste
• Pepper(hot)	pinch
• Cooking oil	1 litre

Method of Preparation

1. Measure the dry ingredients into a bowl.
2. Add chopped onions, garlic, a pinch of pepper and salt to taste, mix well.
3. Add a little water at a time while mixing all the time to form a paste.
4. Heat oil in a deep pan.
5. Scoop tablespoon, fulls of the paste and drop into the hot oil.
6. Deep fry until golden brown.
7. Serve with tea

6.2 SOY (KATOGO)

Ingredients

• Matooke	20 fingers
• Soy flour	$1^{1/2}$ small cups
• Onions	1 large
• Tomatoes	4 medium
• Pepper(green)	1 large
• Salt	to taste
• Curry powder	1 teaspoon
• Water	as required



Method of Preparation

1. Peel the matooke and put it into a saucepan with some water.
2. Slice onions, tomatoes, and pepper and add to the matooke.
3. Cook until ready
4. Mix soyflour with water and add to the ingredients on fire and simmer till ready.
5. Add salt and curry powder.
6. Serve hot

N.B: Similar Katogo can be made from Cassava, sweet potatoes, yams and Irish potatoes

6.3 MAIZE/SOYA UGALI (NSHIMA)

Ingredients

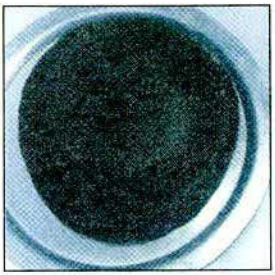
• Soy flour	1 tea cup
• Maize flour	3 tea cups
• Water	as required



Method of Preparation

1. Sift soy and maize flours into a bowl.
2. Boil water in pan.
3. Add the flour mixture into boiling water gradually while mixing.
4. Mingle vigorously and thoroughly until it forms a smooth dough (ugali).
5. Steam the ugali if desired
6. Serve hot with sauce

6.4 MILLET/CASSAVA/SOY UGALI



Ingredients

- Soy flour 1 teacup
- Millet flour 3 teacups
- Cassava flour 2 teacups

Method of Preparation

1. Prepare as maize/soy Ugali but using millet/cassava flour instead of maize flour.
2. Serve hot with sauce.

7.0 SOY-RICE PATTY

Ingredients

- Soybean 1tea cup
- Rice 1/2 tea cup
- Onion (chopped) 1tablespoon
- Green pepper (chopped) 1 tablespoon
- 0.5g Baking soda 1/4 teaspoon
- Salt to taste
- Water 1 litre
- Cooking oil as needed

Method of Preparation

1. Crush dry soybean prior to cooking using mortar and pestle
2. Mill rice in a fine powder using a grinder
3. Boil 1 litre of water and add 0.05% Sodium bicarbonate (0.5g $NaHCO_3$).
4. Blanch the crushed soybean for 15 minutes by dropping it directly in the boiling water containing 0.05% sodium bicarbonate (0.5g $NaHCO_3$)
5. Add salt and rice to the partially cooked beans.

6. Cook mixture on slow fire for 15 minutes with occasional stirring to form a paste
7. Mix cooked paste with chopped onion and pepper.
8. Form patties from the above mixture and shallow fry until brown on both sides.

7.1 SOY-POTATO PATTY

Ingredients

• Soybeans under Soy-Rice Patty)	1 cup (prepare as described
• 0.5g baking soda	1/4 tea spoon
• Diced potato (Irish)	21/2 cups
• Salt	1/4 tea spoon
• Onion (Finely chopped)	1 table spoon
• Green pepper (chopped)	1table spoon
• Oil enough to shallow fry	

Method of Preparation

1. Blanch the crushed soybean for 10minutes by dropping directly into 800 ml boiling water containing 0.05% sodium bicarbonate (0.5g $NaHCO_3$).
2. Add diced potato and salt to the partially cooked, crushed soybeans. Cook mixture on slow fire for an additional 15 minutes.
3. Grind to a heavy paste or dough using a hand grinder.
4. Mix paste with finely chopped onion and green pepper.
5. Form patties and shallow fry until brown on both sides.

8.0 SAVORY SOYBEANS

Ingredients

• Soybean	1 tumpeco
• Tomatoes	4 medium
• Onions	4 medium
• Garlic	4 cloves (crushed)
• Dania	1/2 a bundle
• Cooking Oil	1 tablespoon
• Water	as required



Method of Preparation

1. Drop clean beans gradually into boiling water and boil for 1 hour
2. Drain and pound in a mortar to a fine pulp.
3. Slice the onions and tomatoes,crush the garlic and chop Dania.

4. Heat the oil and fry the onions, tomatoes and dania.
5. Add pounded soybean paste and stir for a while under low fire
6. Add enough water and season as needed.
7. Serve with rice or Irish potatoes.

8.0 SOYA TOFU

Ingredients

• Soy milk	3 teacups
• Strong Vinegar	2 tea spoons

Or

• Lemon juice	2 tea spoons
• Cooking oil	as required

Method of Preparation

1. Boil the soy milk
2. Add vinegar or lemon to the boiling soymilk
3. Continue boiling for 2-3 minutes
4. Filter thoroughly in a clean cloth to strain off the whey. Tofu remains in the cloth.
5. Fold the cloth over and set the tofu on a flat hard surface.
6. Press down with a heavy weight to remove excess water
7. After 30-60 minutes, remove and cut into cubes and deep fry.

NB. Tofu can then be used in making curry.

9.0 Weaning Foods

9.1 SOY-RICE MIX

Ingredients

• Rice	3 tea cups
• Cabbage (shreded)	2 tea cups
• Soybean (cooked and pounded)	2 teacups
• Tomatoes(diced)	1/2 teacup
• Tomato paste	3 tablespoons
• Onion (shredded)	1
• Cooking oil	as desired
• Salt	to taste
• Curry powder	1 teaspoon



Method of Preparation

1. Heat oil and fry the onions
2. Chop tomatoes and add to the onions and fry until ready paste
3. Add tomato paste, cabbage and soybean paste
4. Wash and add the rice and mix well
5. Simmer until rice is ready.
6. Serve hot

9.2 BANANA MASH

Ingredients

- Ripe bananas 2
- Soy-milk 1/2tea cup

Method of Preparation

1. Peel bananas and mash with folk or rub through sieve
2. Add milk or soybean mash
3. Stir and mix well.
4. Reheat and spoon feed to infants

9.3 SWEET-POTATO SOYBEAN WEANING FOOD

Ingredients

- Soybean flour 1 tea cup
- Sweet-potatoes 2 tea cups (cooked)
- Salt to taste



Method of Preparation

1. Peel, wash and cut potato into cubes
2. Boil until soft
3. Mix soy flour to 1/2 a cup of water and add to cooked potatoes
4. Simmer for 10 minutes
5. Mash and add salt to taste

9.4 SOY-WHEAT WEANING FOOD

Ingredients

- Soy grits 1 teacup
- Wheat flour 1 teacup
- Baking soda 1/4 teaspoon
- Brown sugar 2 tablespoons
- Salt a pinch
- Water as desired

Method of Preparation

1. Cook the soy grits for 10 minutes by dropping directly into 750 ml boiling water containing 0.05% so dium-bicarbonate
2. Add wheat flour, brown sugar and salt to the cooked beans.
3. Mix well and cook all ingredients for an additional 15 minutes.
4. Pass through a hand grinder to form a smooth slurry
5. Re-heat and serve.

9.5 Vegetable mash (weaning dish)



Ingredients

• Edible local or cultivated vegebales	1 handful
• Carrot	1
• Tomato	1
• Soybean paste	2 tablespoons

Method of Preparation

1. Cook all vegetables including the carrot and tomato
2. Take some cooked vegetables and rub through a sieve.
3. Mix in cooked soybean paste,reheat for 10 minutes and feed to infants.

9.6 SOY-SIM SIM SAUCE

Ingredients

• Soy flour	1 teacup
• Sim-sim	$1^{1/2}$ teacups
• Onion (chopped)	1
• Tomato (chopped)	1
• Salt	to taste
• Cooking oil	4 tablespoons

Method of Preparation

1. Clean, wash sim-sim and roast till done
2. Winnow to remove husks, pound and grind to a smooth paste.
3. Mix sim-sim paste (1 cup) and soybean flour (1cup) with a portion of cold water to form a thick slurry.
4. Fry onions and tomatoes in hot oil.
5. Add mixed paste to the fried onions and tomatoes add salt, stir and simmer for 15 minutes, serve with sweet potatoes

9.7 SOY/G.NUT SAUCE

Ingredients

• Soy paste	1teacup
• Groundnut paste	1/2 teacup
• Tomato (chopped)	1 medium
• Onion (chopped)	1 medium
• Garlic(crushed)	1 clove
• Salt and pepper, curry	to taste
• Cooking oil and water	as desired

Method of Preparation

1. Sort and roast ground nuts.
2. Remove the skin and pound to a smooth paste.
3. Mix 1/2 cup groundnut paste to 1/2 cup soybean flour with a cup of water.
4. Fry the onions, tomatoes and garlic.
5. Add the groundnut/soy flour mixture to the fried onion, tomato and garlic.
6. Stir and simmer for 15minutes
7. Serve hot with cassava/soy ugali

10.1 SOY-RICE PORRIDGE

Ingredients

• Soy flour	1 teacup
• Rice powder	1/2 teacup
• Salt	1/4 teaspoon
• Sugar	3 tablespoons
• Water	4 teacups

Method of Preparation

1. Boil water in a pan
2. Mix the rest of the ingredients with water and add to the 4cups of boiling water stiring constantly
3. Add to boiling water.
4. Let it cook for 20–30 minutes.
5. Serve hot

10.2 SOY-MAIZE PORRIDGE

Ingredients

- Soy flour 1 tea cup
- Maize flour 3 tea cups

Method of Preparation

1. As for the soy-rice porridge



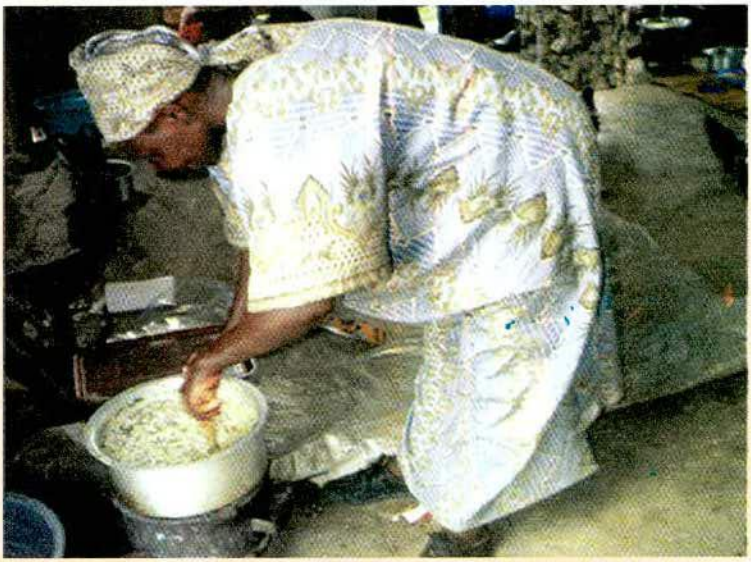
10.3 SOY-MILLET PORRIDGE

Ingredients

- Soy flour 1 tea cup
- Millet flour 3 tea cups
- Sugar to taste

Method of Preparation

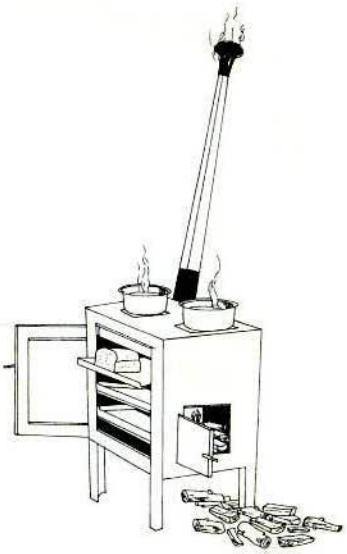
1. As for the soy-maize porridge using the listed ingredients.



11. Soy Products that Generate Income

11.1 SOY BREAD





Ingredients

• Wheat flour	3 teacups
• Soy flour	1 teacup
• Egg (beaten)	1
• Yeast	1 tablespoon
• Margarine	$^1/_2$ teacup
• Warm water or scalded milk	1 teacup
• Sugar	4 tablespoons

Method of Preparation

1. Activate the yeast by soaking in warm water mixed with 1 tablespoon of sugar.
2. Sift the soya and wheat flours into a dish or bowl and add sugar to the mixture
3. Rub margarine into the mixture and add the beaten egg44
4. Add the activated yeast to the mixture and mingle into a light dough
5. Place the dough on to a floured board and knead thoroughly
6. Place the dough into a large bowl, cover with a damp towel and place in a warm oven or under the sun
7. Re-knead the dough lightly when it has doubled in size
8. Roll the dough,cut and place into greased baking tins
9. Cover with damp cloths, place in a warm place and allow to rise to double in size again
10. Bake in a moderately hot oven(350°F) until done (the bread sounds hollow when tapped)

12.1 HIGH PROTEIN SOY BISCUITS

Ingredients

12.1.1

- Soy flour 1 teacup
- Wheat flour 3 teacups
- Groundnut paste 2 tablespoons
- Sugar 1 teacup
- Baking powder 2 tablespoons
- Margarine 1 teacup
- Salt 1 pinch
- Eggs (beaten) 2
- Water/milk



12.1.2

- Soy flour 1 teacup
- Wheat flour $1^{1/2}$ teacups
- Simsim paste 2 tablespoons
- Sugar 2 tablespoons
- BlueBand 1 tablespoon
- Baking powder $1^{1/2}$ tablespoons
- Salt 1 pinch
- Eggs 2
- Water/milk

Method of Preparation

1. Sift all dry ingredients into a bowl
2. Add the rest of the ingredients into the bowl
3. With fingertips rub together all ingredients
4. Add milk/water and knead
5. Roll out on a floured board and cut into desired shapes
6. Grease the baking sheet and place on the biscuits
7. Bake in a hot oven until the biscuits are light brown for 20-25 minutes
8. Cool and pack in airtight containers

12.2 SOY BISCUITS

Ingredients

• Soy flour	1 teacup
• Wheat flour	3 teacups
• Margarine	1 teacup
• Sugar	1 teacup
• Eggs	2
• Lemon rind	1 lemon
• Baking powder	2 teaspoons
• Vanilla	few drops
• Salt	1 teaspoon



Method of Preparation

1. As for high protein soy biscuits using the listed ingredients.

12.3.1 SOY-WHEAT CAKE

Ingredients

• Soy flour	1 teacup
• Wheat flour	3 teacups
• Eggs	5
• Sugar	1 teacup
• Margarine	1/2 teacup
• Milk or water	1/2 teacup
• Salt	1/2 teaspoon
• Vanilla	1 teaspoon
• Baking powder	2 tea spoons



Method of Preparation

1. Sift the soy and wheat flours into a bowl
2. Cream margarine and sugar
3. Add beaten eggs little at a time alternating with the flour mixture to the creamed margarine and sugar
4. Add spices to the mixture
5. Add a little milk to lighten the batter
6. Place into greased baking or patty tins
7. Bake in a moderately hot oven (test for readiness by pricking the center with a fork. If the fork comes out clean the cake is ready)

12.3.2 CAS-SOY CAKE

Ingredients

• Cassava flour	6 teacups
• Soy flour	1 teacup
• Eggs	9
• Margarine	8 tablespoons
• Lemon or orange juices	2 tablespoons
• Lemon rind	1 lemon
• Cinnamon	1 teaspoon
• Baking powder	1 tablespoon
• Sugar	8 tablespoons

Method of Preparation

1. As for soy wheat cake using the listed ingredients

12.4 SOY-WHEAT FINGERS

Ingredients

• Soy fingers	1 teacup
• Wheat flour	2 teacups
• Sugar	1 teacup
• Margarine	1/2 teacup
• Baking powder	3 teaspoons
• Milk or water	



Method of Preparation

1. Mix all the dry ingredients into a bowl
2. Rub in the margarine
3. Add water or milk to make stiff dough
4. Cut into finger shapes
5. Grease the baking sheets and place the fingers into the greased sheets
6. Bake in a hot oven at 400°F for 15 minutes.

12.5 SOY-SCONES

Ingredients

• Wheat flour	1/2 tea cups
• Soy flour	1/2 tea cup
• Baking powder	2 tea spoons
• Milk	1/2 tea cup
• Margarine	1/2 tea cup
• Salt	2 pinches to taste

Method of Preparation

1. Sift all dry ingredients into a bowl and rub in the margarine.
2. Add milk and knead lightly
3. Roll to 1/2 cm thickness on floured board.
4. Cut into round shapes and place the greased baking sheet.
5. Bake in a hot oven at 400° F or 30 minutes or until brown in colour.

12.6 SOY COOKIES

Ingredients

- Wheat flour 3 teacups
- Soy flour 1 teacup
- Sugar 1 teacup
- Shortening 1/2 teacup
- Salt 1/2 teaspoon
- Baking soda 1/2 teaspoon
- Water 1/2 teacup
- Eggs 3



Method of Preparation

1. Measure the soy and wheat flours into a bowl
2. Add all the dry ingredients to the flours
3. Melt margarine and add to the mixture and mix thoroughly
4. Add the beaten eggs and some water or milk and make a stiff dough
5. Roll on a floured pasty board
6. Cut into desired shaoes and sizes using cookie cutters
7. Bake in a hot oven until light brown
8. Cool and pack in airtight containers.

12.7 SOY DOUGHNUTS

- Soy flour 1 teacup
- Wheat flour 2 teacups
- Sugar 1 teacup
- Cooking oil 1/2 teacup
- Baking powder 3 teaspoons
- Eggs 2
- Milk or water
- Salt a pinch
- Oil for deep frying 1 litre



Method of Preparation

1. Mix all dry ingredients
2. Rub in 1/2 a cup of cooking oil
3. Add beaten eggs, water / milk to a stiff dough.
4. Cut into doughnut shapes and deep fry.

12.8 SOY PANCAKE



Ingredients

• Soy flour	1 teacup
• Wheat flour	3 teacups
• Eggs	1
• Salt or sugar	as required
• Oil	
• Milk or water	

Method of Preparation

1. Sift wheat and soy flour into a dish.
2. Add sugar
3. Add enough milk and a beaten egg to make a thick batter.
4. Heat the dry frying pan
5. Scoop spoonfuls of the batter and shallow fry till brown on both sides.

12.9 SOY-CHAPATI

Ingredients

• Wheat flour	3 teacups
• Soy flour	1 teacup
• Salt	1 teaspoon
• Water	1 teacup

Method of Preparation

1. Mix all the dry ingredients into a bowl
2. Add water and knead into a soft dough
3. Cover with plastic wrap and let dough stand at room temperature for about 1 hour.
4. Roll each chapati on lightly floured surface to form a thin-circle 6-8 inches in diameter.
5. Heat a large frying pan over medium heat until hot.
6. Shallow fry each chapati until golden brown on both sides (about 1 minute on each side)

13.0 SOY-BAGIA

Ingredients

• Soy flour	1/2 tumpeco cups
• Cassava flour	2 tumpeco cups
• Curry powder	2 tablespoons
• Salt	1 tablespoon
• Oil	1/2 tea cup
• Water to mix	1 tumpeco
• Oil for deep frying	$1^{1/2}$ teacups

Method of Preparation

1. Sift the soy and, cassava flours into saucepan and mix with tea cup of oil
2. Add little water to make a soft dough
3. Add salt to taste
4. Add curry powder and knead
5. Pass the dough through a bagia press
6. Heat oil and deep fry the bagia into golden brown
7. Cool and pack in air tight containers

14.1 BANANA FRITTERS

Ingredients

• Soy flour	1/4 teacup
• Wheat flour	2 teacups
• Maize flour	1/2 teacup
• Bananas (mashed)	2
• Soymilk	2 tea cups
• Sugar	4 tablespoons
• Eggs	2
• Salt	1 teaspoon
• Baking powder	2 teaspoons

Method of Preparation

1. Mix all ingredients in a bowl and form a light dough
2. Drop spoons full into a pan of hot cooking oil
3. Fry until both sides are golden brown
4. Sprinkle with sugar and serve.

14.2 CASSAVA FRITTERS

Ingredients

• Cassava flour	3 teacups
• Soy flour	1 teacup
• Sugar	4 tablespoon
• Salt	1/2 teaspoon
• Baking powder	1 teaspoon
• Cooking oil	3 tablespoons
• Egg	1

Method of Preparation

1. Sift dry ingredients into a bowl and mix well
2. Add the beaten egg to the dry ingredients and mix well,then add water to make a paste
3. Roll and cut into pancake shapes and deep fry until golden brown.
4. Serve hot or cold

14.3 GREEN MAIZE FRITTERS WITH SOY

Ingredients

• Fresh maize	2 cobs
• Egg	1
• Soy flour	1/4 teacup
• Sugar	1 tablespoon
• Salt	1teaspoon
• Cooking oil	as required



Method of Preparation

1. Remove the maize grain from the cobs and pound in a mortar.
2. Remove from mortar and place in basin.
3. Mix with other ingredients except the oil,to make a light dough.
4. Heat the oil and drop spoonfuls of the mixture into it.
5. Fry until light brown on both sides.
6. Avoid over frying
7. Serve warm.

14.4 SOY FRITTERS



Ingredients

• Soybean (boiled)	1 teacup
• Onion	1
• Tomatoes	4
• Egg	1
• Cooking oil	as required

Method of Preparation

1. Drop beans into boiling water and boil for 60 minutes
2. Pound the beans in a mortar to a smooth paste
3. Slice the onion and the tomatoes and add to the Soybean paste
4. Add beaten egg to the mixture and mix
5. Fry spoonfulls and serve warm.

14.5 CURRIED FRITTERS



Ingredients

• Soybean (cooked)	1 teacup
• Wheat flour	1/2 teacup
• Onion	1 small
• Chilies	1 teaspoon (optional)
• Curry powder	1 teaspoon
• Cooking oil	as required

Method of Preparation

1. As for soy fritters.

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