Coconut has been growing in the coastal provinces of P.N.G for a very long time for copra production. The benefits farmers obtain from sale of copra may not really pay the cost of producing the copra. However, because of the lack of skill and knowledge on how to add value to our coconut, people are still producing copra or given up on the crop. This short course on coconut downstream processing is an alternative way of adding value to our coconut with simple readily available materials which will reduce production cost. There are two modules on this short course.

Coconut downstream processing

Making Coconut Oil

RATIONALE

Coconut has been growing in the coastal provinces of P.N.G for a very long time for copra production. The benefits farmers obtain from sale of copra may not really pay the cost of producing the copra. However, because of the lack of skill and knowledge on how to add value to our coconut, people are still producing copra or given up on the crop. This short course on coconut downstream processing is an alternative way of adding value to our coconut with simple readily available materials which will reduce production cost. There are two modules on this short course.

The development of this short course was sponsored by the ADB-PNG EMPLOYMENT ORIENTED SKILLS DEVELOPMENT PROJECT (EOSDP) and produced by curriculum officers at the SKILLS TRAINING RESOURCES UNIT (STRU).
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Program: AGRICULTURE AND FISHERIES
Course: COCONUT DOWNSTREAM PROCESSING
Module Code: AF006i
Module title: Making coconut oil
Competency Profile: Coconut downstream processing

Duties

A. Making coconut oil
   - A2. Dry the shredded nut
   - A3. Extract the oil
   - A4. Deodorized the oil
   - A5. Set and Filter the oil.
   - A6. Pack oil

B. Making coconut soap
   - B1. Prepare all materials required for 1 bar of soap
   - B2. Mix caustic soda and water
   - B3. Add coconut oil into caustic soda and water mixture
   - B4. Prepare a mould
   - B5. Pour paste into mould
   - B6. Determine readiness of soap
**Program:** AGRICULTURE  
**Course:** Coconut downstream processing  
**Module code:** AF006i  
**Module:** Making coconut oil  
**Duration:** Approx. 8 hours  
**Content:**

**A1. Prepare the nuts**
- Collect nuts
- Husk nuts
- Clean and split nuts
- Grate/scrape nuts

**A2. Dry the shredded nut**
- Prepare drying canvas
- Drying procedure
- Check if nut is well dried

**A3. Extract the oil**
- Ways of extracting oil
- Extract oil using bag and stick

**A4. Deodorized the oil**
- Mix oil and water
- Boil mixture

**A5. Set and filter the oil**
- Settle oil
- Filter oil

**A6. Pack oil**
- Sterilize containers
- Fill containers

**Pre-requisite:**
There are no pre-requisite to this module

**Delivery method:**
- Demonstration
- Practical activity

**Instructor:**
The ideal instructor to deliver this course should have Experience in making coconut oil

**Assessment Method:**
A holistic approach is to be taken with assessment of the learning outcomes using one or more of the following:
- Questioning (oral, multiple choice or short answers)
- Demonstration of practical tasks

Wherever possible practical tasks that simulate real work practices should be used in the assessment.

**Assessment Condition:**
All tools and materials required for assessment will be provided. 
(refer to specific learning outcome)

**Reference:**
Peter, Nguna and Malakai, Tabar. Kamapim oil long kokonas Na wokim kokonas sop. 2004. Cocoa Coconut Institute of PNG

Coconut downstream processing Training Notes: OISCA Training Centre, Rabaul, E.N.B.P, PNG. Ph: 983 9290
Overview of Learning Outcomes
On successful completion of this module a trainee will be able to:
• A1.1 Prepare the nuts
• A2.1 Dry the shredded nuts
• A3.1 Extract the oil from dried shredded nut
• A4.1 Deodorized the extracted oil
• A5.1 Set and filter the oil
• A6.1 Pack oil

APPENDIX 1: Training and Assessment guide

Task A1: Prepare nuts
Suggested minimum instructional time: 1 hour

Learning outcome: 1.1 Prepare Nuts

Teaching strategy:
Learning activities for the trainee must include the instructor to:
• Identify and explain the type of nuts to be collected
• Demonstrate proper husking and cleaning of nuts
• Explain ways of grating nuts
• Demonstrate proper grating of nuts using scraper

Assessment condition:
The trainee must be given access to:
• Nuts
• husker
• all relevant information
• scraper

Assessment criteria:
• Non-germinated nuts are collected
• Nuts are husked and remaining fibre is cleaned
• Nuts is split and scraped/grated

Assessment method:
To demonstrate the achievement of the above criteria the trainee will given a Practical task.

APPENDIX 2: Training and Assessment guide

Task A2: Dry the shredded nuts
Suggested minimum instructional time: 1 hour

Learning outcome: 2.1 Dry the shredded nuts

Teaching strategy:
Learning activities for the trainee must include the instructor to:
• Explain preparation of the canvas for drying
• Explain and demonstrate the drying procedure
• Discuss proper drying of shredded nuts.

Assessment condition:
The trainee must be given access to:
• canvas
• shredded nut
• all relevant information

Assessment criteria:
• Canvas is anchored with a heavy object
• Shredded nut is spread evenly on the canvas
• Shredded nut is dried for 3-4 hours
• Properly dried nut has less milk content

Assessment method:
To demonstrate the achievement of the above criteria the trainee will give a Practical task.

APPENDIX 3: Training and Assessment guide

Task A3: Extract the oil
Suggested minimum instructional time: 2 hours

Learning outcome: 3.1 Extract oil from dried shredded nut

Teaching strategy:
Learning activities for the trainee must include the instructor to:
• Identify and explain ways of extracting coconut oil
• Explain and demonstrate the set up of extracting stand
• Explain and demonstrate extraction of oil using bag and stick

Assessment condition:
The trainee must be given access to:
• Tools, knives,
• Clean empty rice/flour bags
• Stick
• shredded nut
• all relevant information

Assessment criteria:
• Two methods of extracting coconut oil are identified
• Extracting stand is firm and strong
• Oil is extracted from shredded nut

Assessment method:
To demonstrate the achievement of the above criteria the trainee will given a
• Practical task
• Oral questions
APPENDIX 4: Training and Assessment guide

Learning outcome: 4.1 Deodorized the oil

Teaching strategy:
Learning activities for the trainee must include the instructor to:
• Explain the reason for deodorizing oil
• Explain the ratio for mixing oil and water
• Explain and demonstrate deodorizing procedure

Assessment condition:
The trainee must be given access to:
• Appropriate pot or sauce pan
• water
• firewood
• extracted oil
• all relevant information

Assessment criteria:
• Reason for deodorizing oil is explained
• Ratio of water to oil is explained
• Boiling of oil and water mixture is explained
• Pure oil is retained

Assessment method:
To demonstrate the achievement of the above criteria the trainee will given a
• Practical task
• Oral questions

APPENDIX 5: Training and Assessment guide

Learning outcome: 5.1. Set and filter oil

Teaching strategy:
Learning activities for the trainee must include the instructor to:
• Explain the reason for setting and filtering oil
• Explain and demonstrate the steps in straining the oil using a strainer

Assessment condition:
The trainee must be given access to:
• Appropriate Pot or sauce pan
• Deodorized oil
• Plastic strainer (if no strainer, use a clean piece of cloth)
• all relevant information

Assessment criteria:
• Reason for settling and filtering oil is explained correctly
• Oil is settled and filtered
• Pure oil is retained.

APPENDIX 6: Instructional notes

Steps:
1. Collect nuts
Collect matured non-germinated nuts. Germinated nuts should not be collected because they have less oil in them.
Collect the required number of nuts into a bag or wheel barrow.

Note: as a general guide when collecting nuts for oil making, the following rates should give an idea of how many nut to collect.
• 20 dry nuts can produce up to 1 Litre of virgin coconut oil
• 2000 dry nuts can produce up to 100 litres of virgin coconut oil

eg: If you intend to produce 10 L of coconut oil, simply multiply the intended required oil by 20, in this case it is 10 x 20 = 200 nuts. So to produce 10 Litre of coconut oil, you need 200 nuts.
2. Husk the nuts.
Using a sharpen strong stick or metal husker, husk the nuts.

3. Clean and split the nuts

This can be done using a coconut scraper or grater.
A2. DRY THE SHREDDED NUT

Steps:
• Spread a black plastic called visqueen plastic or canvas on a good lawn or over a table.
• Dry the scraped or grated nut for 3-4 hours under direct sunlight.

• Make sure to turn the shredded coconut every hour for even drying.
• After 3-4 hours of drying, check to see if it is properly dried by squeezing.

• If no milk is present, the shredded coconut is well dried and ready for extracting oil. If milk is still present, allow it to dry a few more hours.

Note: Drying depends on the amount of sunshine.

A3. EXTRACT THE OIL

Extraction of oil can be done using a manual press or by using a stick and bag.

Steps:
Prepare your bag and stand
• Cut a piece of an empty rice bag measuring approximately 60 centimetres x 80 centimetres and fold it in half to avoid it from breaking when squeezed. Wash the bag thoroughly with water.
• Make a stand by driving two posts into the ground at 80 cm height and about 80 cm apart. Tie or nail another post across joining the two post posts at about 70cm above the ground.
• Once your stand is set, place a dish right under the centre of the cross bar
• Then get two handfuls of dried shredded coconut and place it on the centre of the bag.
• Fold the ends of the bag lengthwise around the shredded nut.
• Place the folded bag of shredded coconut around the centre of the cross bar and hold the ends of the bag upward.
• Push a stick through the loose fold around the centre of the cross bar.

• Let one person to hold the ends of the bag while another person does the extraction by turning the piece of stick in one direction to squeeze the bag.

• Continue turning in the same direction to squeeze the bag until oil is removed.

• To loosen, turn the stick in the opposite direction and dispose the squeezed coconut into a clean bag. It can be further used for other products like stock feed etc.
• Continue the above process until you finished squeezing all shredded coconut

A4: DEODORIZED THE OIL

Deodorizing is done to remove the odor of the coconut.
• Deodorizing is done by mixing 2 parts of oil to one part of water. This means that for every two cups of oil add one cup of water.

Note: When mixing oil and water, use the same measuring cup.
• Pour the mixture into a clean saucepan (size depends on the amount of oil to be deodorized.)
• Boil the mixture over the fire until all water evaporates from the oil.
• When all water has evaporated, the oil is deodorized.
Setting and filtration is done to remove foreign particles from the oil.

- Let the deodorized oil cool off and allow other particles to settle in the container.
- After the oil has settled, strain the oil using a strainer into another container. Discard off the remaining oil at the base of the container as it contains settled foreign particles.

Filtered oil can be packed to empty plastic containers with lids.

- If you are using used plastic containers, you have to sterilize the containers by washing with detergent and warm water.
- After sterilizing dry the containers and fill them with your coconut oil.

The oil must be stored in a cool place and can be used for cooking, making soap or for sale.
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