IICA

Training Programme in Food Preservation

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EDITED BY: MARLENE ANTOINE

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All the recipes, practicals and lectures were prepared by **Pearl Carrington**, the tutor for the training program.

All processes were vetted and sanctioned by **Linda Sammy, BSc., MSc.**, a qualified Food Technologist.

Typing and layout were done by **Deborah Daniel-Arthur** and editing by **Marlene Antoine**.

INTRODUCTION

BACKGROUND AND OBJECTIVES

The Inter-American Institute for Cooperation on Agriculture (IICA), in collaboration with the Ministry of Agriculture, Land and Marine Resources (MALMR), is presently engaged in a technical cooperation project entitled, "Enhancing the Participation of Women in the Rural Development Process in Trinidad and Tobago through Institutional Strengthening".

The main objective of the project is to improve the quality of life of rural families with specific reference to women. This is to be achieved through the strengthening of national institutions which provide support to the promotion of women in the agricultural development process, as well as, direct support to five selected groups.

A major component of the project is the provision of technical assistance to the women's groups towards the development of self-sustaining, income-generating micro projects. This includes training in food preservation, agronomy, gender awareness and small business management, as well as, leadership skills and cooperative principles. The groups are also assisted in developing project proposals for external funding.

This publication documents only one aspect of the training package which aimed at enhancing the utilization of farm products through food preservation.

The introductory training course in food preservation is designed for persons interested in preserving food for the home, in particular the farm household, utilizing products from the 'backyard' garden plots.

Although at this level the end products may be only appropriate for the immediate household use, they provide a great potential for self-employment opportunities.

Persons desirous of getting into commercial production must refer to the Food and Drug Division of the Ministry of Health as well as agencies, such as the Caribbean Industrial Research Institute (CARIRI) and the MALMR, for information on processing technologies and the agronomy of the particular food crop used as raw materials.

For further information on the technologies underlying the development of agro-processing, reference could also be made to another IICA publication, "Technical Assistance and Training Programme, Part II: Food Technology in Agro-Industry" 1993.

FOOD PRESERVATION

Food preservation refers to the variety of methods designed to prolong the useful life of a commodity to make it safe, palatable, stable, nutritional and appeasing. Food is preserved by removing, killing or retarding the activity of the micro-organisms which can cause spoilage and illness, or by slowing down the natural chemical and enzymic reactions taking place in the commodity. One advantage of preserving raw foods is to avoid wastage due to the seasonal over-supplies.

Preservation methods usually include a combination of the following: high temperature; low temperature (chilling or freezing); dehydration; concentration (high salt or high sugar); chemical preservatives; fermentation; and ionizing radiation.

The newer technologies, which incorporate a refinement of the more traditional methods, usually require high initial investment in machinery and are more applicable to extremely large volumes which, in the long run, may result in economies of scale. These include the following: reverse osmosis; liquid sterilization; individual quick freezing; instant powder products and retort pouch. These were not dealt with in this training programme.

TRAINING PROGRAMME

The methodology utilized in the IICA/MALMR project was developed by the MALMR as part of the Urban Gardening Programme. It involves largely practical sessions demonstrating the more traditional methods of preservation, supplemented by lectures and hand-outs.

This programme on food preservation was repeated among five women's groups. At the end of each programme, the groups are assisted in organizing an "Achievement Day" exercise during which supporters from within the respective communities are invited to view samples of the products on display. IICA also distributes certificates of attendance to those participants who complete all the sessions.

The training programme in food preservation consists of an introductory session and four weekly classes; each class of four hours duration.

INTRODUCTORY SESSION:

During the first contact with the tutor, the participants are introduced and shown samples of the products to be made. An informal survey is conducted to determine whether any of the participants have been trained in any of the processes and whether participants have been utilizing any of the techniques previously learnt. An assessment of the strengths and weaknesses of any previous training is undertaken with the objective of learning from mistakes and avoiding duplication.

The introductory session includes an outline of the training programme and a lecture on "Hygiene in Handling Food" in which the following points are emphasised:

- Clean clothing must be worn at all times. All participants are required to be dressed in aprons and hats or head scarfs.
- No eating or spitting is permitted in the preparation area.
- Nails must be kept short with no nail polish.
- Hands and face must be washed prior to preparing food. All jewellery must be removed. If necessary, a person should stand before a cooling fan to help evaporate excess perspiration. (Perspiration, which contains salt, can spoil certain foods, in particular, fish).

  Copper, brass or iron cooking utensils must be avoided. The use of stainless steel is recommended. (A common cause of contamination is dirty spoons.)
- All surrounding areas must be kept clean.
- Waste disposal must be kept separate from the immediate handling area. (Polluted air and pests are common causes of contamination.)
- Bottles to be used in processing must be sterilized by one of the following methods:
  - immersion in boiling water for 10-15 minutes
  - immersion in a solution of metabisulphite (6 crushed campden tablets and 1 tbsp citric acid dissolved in 1 pint of water) for 5 minutes.
  - baking in a oven for 10-20 minutes at 100°F
  - immersion in a solution of domestic bleach (1 tsp to 4 litres of water) for 10-15 mins.
- Fruits for processing may be sterilized in a solution of 1 crushed campden tablet to 1 pint of water per 4 lbs of fruit. (Campden tablets are a source of sodium metabisulfite)

The introductory session also includes a lecture on labelling during which participants are encouraged to date and label all products which are made. The information to be included on the label are:

- name of the product;
- contents or a list of the ingredients;
- address of the producer;
- net weight (i.e. weight of product in container); and
- date of manufacture.

WEEKLY CLASSES:

The practicals and lectures follow a basic format as follows:

Day	Practicals	Lectures
1	Wine Making, Condensed Milk	Liqueur
2	Chow Chow, Pickles	Bakery Fruit Filling, Smoked Fish, Desserts, Jams, Relishes
3	Hams, Ketchup	Vinegar, Mustard, Bacon
4	Salted Fish, Mayonnaise	Butter, Cheese, Jub Jub, Marshmallows

The schedule of practical sessions is guided by the time factor. A recipe which is time consuming, for example, wine making (which involves washing, peeling and chopping of raw materials) is combined with another which is relatively quick to complete, such as condensed milk.

Additionally, when time permits, miscellaneous lectures are given. These include sterilization of bottles, heat sealing of wine seals and polythene bags, evaporated milk, construction of smoke houses, jellies, fruit drinks and soy sauce. These have not been documented since they were not a consistent feature of the programme.

The participants are required to test the recipes during the week following the classes and to bring samples of their efforts to the next class. Consequently, each class is preceded by a critique of the samples brought in, highlighting some of the more common mistakes.

RECIPES:

Although the training programme followed a pre-determined format, for documentation, the recipes have been grouped in the following categories: Milk Preservation; Preservation of Fruits and Vegetables (which is sub-divided into Pickling and Candying); Meat Preservation; Sauces and Wine Making.

Some general information preceeds each grouping. The language has been kept as simple as possible and imperial measurements given to allow for widespread dissemination. Where applicable, the local names of fruits and vegetables are used.

MILK PRESERVATION

Cheese and butter represent two traditional processes for converting milk, which is a very perishable food, into less perishable commodities.

Cheese-making is a very old process. Because of the difficulty in controlling the microbial activities, the process still retains some aspects of an art, even when undertaken in modern, commercial production. There are as much as 1000 names of cheeses.

Enzymes (such as rennet) or acids (such as citric acid) are used for producing curds in cheese making.

Bag of Curds suspended for drainage

CHEESE

Ingredients

4 litres Cow's Milk
2 tbsp Citric Acid Solution/Lime Juice
Salt (to taste)
Melted Beeswax

Method

Boil milk for 1-2 mins, cover and cool to luke warm.
Add citric acid/lime juice, stir, cover and leave for 2 hours.
Pour curdled milk into cheese cloth and allow curds to drip dry.
Place curds into a large bowl, add salt to taste (about 1/2 oz or 2-3 tsp per pound of curds. Mix lightly.
Pack into a mould. Apply pressure using a weight. Let stand overnight.
Turn out cheese from mould, dip into melted beeswax.
Leave to mature for 3-6 months in a cool, dry area.

Notes:
Citric acid, lemon or lime juice is used to coagulate the milk.
Mixture for citric acid solution: 1 tsp citric acid to 1 tbsp of water.
In processing, use 1/2 tbsp citric acid solution to 1 litre of milk.
Goat's milk may also be used.

BUTTER

Ingredients

Cow's Milk
Salt

Method

Boil milk and remove cream by skimming.

Place cream in electric cake mixer and whisk until thickened.

Place thickened cream/butter into a bowl and wash until the water becomes clear.

Add salt to butter according to individual taste (about 1 tsp per pound of butter).

Notes:
Goat's milk can also be used.
Store in tightly covered containers in the refrigerator.

CONDENSED MILK

Ingredients

2 cups Powdered Milk (full cream or low fat)
2 cups White Granulated Sugar
1 cup Boiling Water
2 ozs Margarine or Butter
A few drops of Vanilla Essence

Method

Mix the powdered milk and sugar in mixing bowl.

In electric blender, pour water and blend all ingredients until sugar is melted and the mixture smooth.

Pour at once into warm sterile jars. Seal and store in refrigerator.

Notes:
In processing, the water should not be allowed to cool.
Care should be taken to prevent heat damage to electrical appliances.
Product should be refrigerated.
For household use only.

PRESERVATION OF FRUITS & VEGETABLES

PICKLING

Pickling is the preservation of food in vinegar or brine or a combination of the two.

There are two types of salting methods:

> **Dry Salting:** using dry salt on fruits or vegetables. Dry salting gives a crisper texture. Use 1 oz salt (about 5 tsp) to 1lb of vegetables.
>
> **Brining:** fruits or vegetables are immersed in a solution of salt and water. Use 2 ozs salt (about 3 tbsp) to 1 pint of cold water (2 cups).

Salt is used as a preservative and to control fermentation. Iodised salt should not be used for pickling as it causes discoloration.

Pickles can be made of fruits, vegetables or a combination of both, either whole or chopped, cooked or uncooked.

In processing, the fruits/vegetables should be of good quality. They must neither be bruised nor discolored and should be at the correct stage of maturity. It is essential to blanch fruits/vegetables prior to pickling. Blanching involves briefly heating the fruits/vegetables in steam or boiling water followed immediately by cooling in tap or ice water. Blanching preserves natural color and flavor.

In processing, never use metal caps to cover pickles since the vinegar will make the lid rust and will spoil the taste and color of the pickle. The containers are inverted (turned upside down) to sterilize the underside of the caps.

Sugars and spices are added to give flavor such as sweet, sour, hot or spicy.

DILUTED ACETIC ACID

Ingredients

1 fl oz Acetic Acid
2 cups Water (boiled and cooled)

Method

Mix Acetic Acid and water.
Bottle and label.

Notes:

Concentrated acetic acid gives off extremely pungent fumes and should only be handled in a well ventilated area. Do not inhale!

Vinegar is the name given to the fumented product. Dilute acetic acid can be used as a vinegar substitute in many recipes without affecting shelf-life and flavor of the product.

SWEET/SOUR PICKLES

Ingredients

2 lbs Mixed Vegetables (carrots, cauliflower, cucumber, onion, salad beans, christophene)
2 ozs Salt (about 3 tbsp)
2 cups Water
3 cups Vinegar
12 ozs White Granulated Sugar (1 1/2 cups)

Method

Remove skins from carrots, onions and christophenes. Slice salad beans (2 inches). Remove seeds from cucumbers but do not peel. Cut vegetables into desired shapes. Blanch for 2 mins. Cool.

Prepare a brine using salt and water. Soak vegetables in brine overnight.

Rinse vegetables under running water to remove salt. Drain. Pack vegetables in sterilized jars.

Add sugar to vinegar, cover and boil for 2 mins. Pour the hot vinegar/sugar solution to cover the packed vegetables, leaving 1/4 inch headspace.

Quickly clean necks of jars and seal tightly at once. Invert for a few seconds then leave in upright position to cool.

Notes:
Green fruits such as mangoes (peeled, sliced, diced) or whole plums can be added, as well as, a whole pepper which lends a hot and spicy taste. Use white vinegar and white sugar for clean appearance.

GREEN PAW PAW RELISH

Ingredients

6 lbs Paw Paw
1 lb Onions
3 tbsp Spice
3 tbsp Lime Juice
1/2 lb Salt (for Brine)
2 lbs White Granulated Sugar
1 Hot Pepper
1 Pint Vinegar (2 cups)
1/4 lb Raisins

Method

Peel, wash and shred paw paw. Peel and slice onions. Blanch for 2 mins and cool. Pack in dry salt and leave overnight. Rinse and drain.
De-seed pepper and cut into pieces.
Add sugar to vinegar, cover and boil for 2 min.
Add paw paw, onions, raisins, pepper, spice and lime juice to vinegar/sugar solution.
Cook to desired consistency stirring to prevent sticking or burning.
Fill at once into warm sterilized jars allowing 1/4 inch headspace. Quickly clean the necks of the jars and seal tightly at once. Invert for a few seconds then leave in an upright position to cool.

CHOW-CHOW

Ingredients

2 lbs mixed Vegetables (cauliflower, carrot, christophene, bodi, string beans, cucumber, onions)
1 pt Vinegar (2 cups)
1 tbsp Pickling spice, clove, cinnamon
2 tbsp Prepared Mustard
2 tbsp Turmeric Powder
2 oz White Granulated Sugar (1/4 cup)
1 tbsp Corn Flour
1 dessert spoon Ground Ginger (Optional)
2 oz Salt (about 3 tbsp) for brine

Method

Cut vegetables into neat pieces. Blanch for 2 min and cool. Pack in dry salt and leave overnight. Rinse under running water and drain thoroughly.

Tie spices securely in a muslin bag, suspend in the vinegar, cover and boil for 5 minutes. Strain into mixing bowl.

Mix all dry ingredients and prepared mustard with just enough vinegar to give a smooth paste. Pour into strained hot vinegar and stir well.

Return paste to the pan and cook until just thickened. Put in vegetables and cook for 10 minutes.

Fill hot into warm sterilized jars, leaving 1/4 inch headspace. Quickly wipe the necks of the jars clean and seal at once. Invert for a few seconds, then leave to cool in an upright position.

PRESERVATION OF FRUITS & VEGETABLES

CANDYING

Candied foods are foods preserved by the high concentration of sucrose (cane sugar) which draws water out of the food. The food is then protected from spoiling since micro-organisms, such as yeasts and moulds and particularly bacteria cannot survive under such low moisture conditions.

Preserved or candied fruits can be used in many ways. For example, as a confectionery or snack, or as substitute raisins, prunes, cherries and currants in bakery products or as toppings. A good end product will depend on the texture, acidity and maturity of the fruit used. Use only firm, unbruised fruits which are at the correct stage of maturity.

BAKERY FILLING/TOPPINGS

Some fruits are usually peeled before processing, e.g. paw paw or water melon. Very acid fruits or citrus peels can be simmered in salted water to remove acidity and bitterness before processing. For very bitter rinds, the procedure may have to be repeated several times.

After immersion in the sugar concentrate, the food must be dried. Average yield is 3 lbs fresh fruit to 1 lb dried fruit. There are three basic methods of drying:

1. *Oven:* Line cookie sheet with foil. Spread out fruit in single layer. Use lowest oven temperature. Leave the door of the oven slightly open to permit air to circulate. Turn occassionally until dry.

2. *Air:* Put well-drained fruit in a tray lined with foil or greased proof paper. Cover with fine net. Place outdoors in semi-shaded area. Allow to air dry.

3. *Solar:* A simple solar drier for home use can be constructed using a cardboard container/box with 5 inch or 12 cm sides, painted on the inside with black emulsion paint. Place tray inside. Spread out fruit in single layer. Cover with glass that extends beyond all four sides of box. Dry in sunlight.

Candying *(continued)*

JELLIES

Jellies are made from the juice of fruits. The characteristic quality of any jelly is clarity, so only clear fruit juice and sugar are used. To extract the juice, the fruit and water are simmered together then allowed to drip through a clean piece of muslin cloth or tea towel. To prevent jelly from becoming cloudy, do not squeeze. For best results, use ripe fruits. Fruits should not be over ripe or immature as such fruits may be lacking acid and pectin and will not give jelly a good set.

JAMS

Jams are made from the pulp of fruits. The pulp and sugar are simmered together with stirring to prevent sticking and burning. Some jams may set in 25-30 mins depending on the type of fruit used. Allow jam to cool slightly before bottling.

To check for setting, pour a little jam or jelly on a cold saucer. Leave for 2-3 mins. If, when touched, it holds together, the setting point has been reached.

BAKERY FRUIT FILLING

Ingredients

Fruits (firm, mature, unblemished)
Spice (bayleaf, stick of spice or cinnamon)
Sugar
Water
Food Coloring/Browning/Caramel
Flavoring (cherry, lime/lemon, orange, pineapple, kola)

Method

Each fruit is processed separately. Normally the stems, seeds and skins are removed. Prepare fruits as follows:

Breadfruit flower	- scrape, scald.
Bilimbi	- remove flower, leave whole
Carambola	- remove ribs, slice crosswise
Dunks	- remove stems
Passion fruit	- scald, skin, de-seed
Pomerac	- remove seeds
Green Paw Paw	- peel, dice, scald

(continued...)

Bakery Fruit Filling

Method *(continued)*

Simmer highly acid or bitter fruits in salted water (1 tsp salt per litre of water). Rinse, drain and weigh.

Use equal amounts of fruit and sugar to quarter amount of water, for example 4 lbs fruit and 4 lbs sugar to 16 fl oz (2 cups) water.

To make syrup, bring water to the boil. Add sugar, stir until dissolved. Cook for 5-10 min.

Add fruits, spices and coloring. Simmer until fruit is tender, but firm. Add flavoring.

Remove from heat. Cover, let stand for 48 hours. Drain and dry.

Pack in air tight containers when dry.

Notes:

To make substitute 'Raisins' or 'Prunes', you can use any one of the following fruits: Breadfruit Flowers, Bilimbi (condicion), Carambola (five fingers), Sour Cherry (goosberry), Dunks, Guavas, Pomerac, Passion Fruit. For "Mixed Peel", use Citrus Peel and for "Mixed Fruits", use green Paw Paw.

Artificial flavorings, such as the instant soft drink mixes, can be used.

For a dark finish such as in making prunes and raisins, brown sugar is suggested. For a natural or clearer finish, white sugar is preferred.

Test for dryness - no impression on fruit when squeezed lightly with fingers.

CHRISTOPHENE FILLING

Ingredients

12 Christophenes (mature but not fibrous)
2 lbs White Granulated Sugar
1 tbsp Pear Essence
1 tbsp Lime Juice
1 cup Water
2 Bayleaves
1 stick Spice (cinnamon)

Method

Wash christophene, peel and remove seeds, cut into 1/4 - 1/2 inch thick slices.

Boil sugar, water, bayleaf and spice stick for 5 minutes. Lower heat.

Add christophene. Simmer until tender. Add a little lime juice and pear essence.

Pack hot into warm sterile jars leaving 1/4 inch headspace.

Working quickly, clean necks of jars and seal tightly at once. Invert for a few seconds then allow to cool in the upright position.

Notes:

To be used as a filling in pies and pastries

CHRISTOPHENE DESSERT

Ingredients

12 Christophenes (mature but not fibrous)
2 lbs White Granulated Sugar
1 cup Water
1 tbsp Pear Essence

Method

Wash christophene, peel and remove seeds.

Cut in halves and blanch in hot water for 5 minutes. Cool under running tap water or iced water.

Prepare a simple syrup using sugar and water.

Boil christophene in the simple syrup until tender. Add Pear Essence. Leave in syrup for 48 hours.

Reheat to boiling and pack into warm sterilized jars.

Quickly wipe necks of jars and seal tightly at once. Invert for a few seconds then return to the upright position to cool.

Notes:
Use as a dessert. Serve chilled.
Other fruits can be used, e.g. pomerac, pineapple, ripe mangoes (firm)

JUB JUB

Ingredients

4 cups White Granulated Sugar
4 pks (50g) Gelatin (unflavoured)
2 cups Water
Castor Sugar
Flavoring (lime, lemon, cherry, grape)

Method

Soak gelatin in 1/2 cup water, stirring to prevent lumps.

Boil the remaining water with granulated sugar until dissolved (10 - 15 minutes).

Remove from heat, add gelatin and stir.

Pour into lightly oiled tins, one for each flavor/ color.

Sprinkle flavoring into each tin and stir.

Leave to set for 24 hours at room temperature.

Cover with a fine net to protect from flies.

Cut into desired shapes and roll in castor sugar.

Place on greased-proof paper to air dry.

Notes:
Artificial flavoring, such as the instant soft drink mixes, can be used.

MARSHMALLOWS

Ingredients

1 1/4 cups White Granulated Sugar
1 Egg White
4 pks (50g)Gelatin
Icing Sugar
1 cup Water
1 tsp Essence of Almond
1 tbs Glucose
Finely Chopped Nuts (optional)
Coloring (optional)

Method

Line large shallow (baking) tins with grease proof paper, dusted heavily with icing sugar.

Soak gelatin in 1/2 cup cold water until granules become swollen and no dry gelatin remains. Cut gelatin into pieces (this helps gelatin to dissolve quickly). Put into mixing bowl.

Bring 1/2 cup of water to boiling point. Stir in sugar until grains are dissolved. Boil for 20-25 minutes.

(continued.....)

Marshmallows

Method *(continued)*

Pour the boiling syrup over the gelatin pieces in the mixing bowl, stirring to dissolve gelatin granules. Beat briskly and continuously for about 5 minutes (an electric mixer is desirable) until thickened.

Add stiffly beaten egg white and continue beating until mixture of gelatin, simple syrup and egg white is very thick and white (about 20 minutes). Add nuts at this stage (optional)

Pour into prepared tins. Sprinkle icing sugar (and nuts - optional) over top. Leave to stand for 24 hours at room temperature.

Turn out of tin, peel off paper lining and place on tray dusted heavily with icing sugar. Cut into cubes, dusting with icing. Leave to dry covered with napkin.

Marshmallows should not be packed into air-tight containers until about 4 days after being made.

PINEAPPLE JAM

Ingredients

2 lb Pineapple (very ripe)

2 lb White Granulated Sugar

1 tsp Lime or Lemon Juice

Method

Wash pineapple, peel and blend to a puree (mash thoroughly)

Boil pineapple puree for 5 minutes or until tender.

Add lemon juice and sugar.

Stir until sugar dissolves (to prevent sticking and burning). Continue boiling rapidly until set.

Pour at once into warm, sterilized glass jars. Allow 1/4 inch headspace. Clean the necks of the jars and seal tightly at once. Invert for a few second then return to the upright position to cool.

Notes:

To check for setting, pour a few drops of the jam mixture on a cold saucer. Leave for 2-3 mins. If, when touched, it holds together, the setting point has been reached.

PUMPKIN JAM

Ingredients

3 lbs Pumpkin
2 oz Ginger (fresh) - grated
Grated rind and juice of 2 lemons
3 lbs White Granulated Sugar
1/2 cup Water

Method

Wash pumpkin, peel and dice.
Boil pumpkin in water until tender. Drain and puree (mash thoroughly) .
Add grated rind and juice of lemons and grated ginger to pumpkin puree.
Bring to the boil, add sugar. Boil for 20 minutes or until thick, stirring to prevent burning and sticking.
Pour while hot into warm, sterile glass jars. Allow 1/4 inch headspace. Seal tightly right away.
Invert for a few seconds then return to the upright position to cool.

Notes:

To check for setting, pour a few drops of the jam mixture on a cold saucer. Leave for 2-3 mins. If, when touched, it holds together, the setting point has been reached.

MEAT / FISH PRESERVATION

Several methods or a combination of methods can be used to preserve meat, depending on the desired end product. The two main methods are dry curing and wet curing.

1. Dry Curing:

   In dry curing, the dry curing ingredients are rubbed into the surface and inner cavity of the meat or fish. Alternatively, the meat or fish is packed in layers of dry salt.

2. Wet Curing:

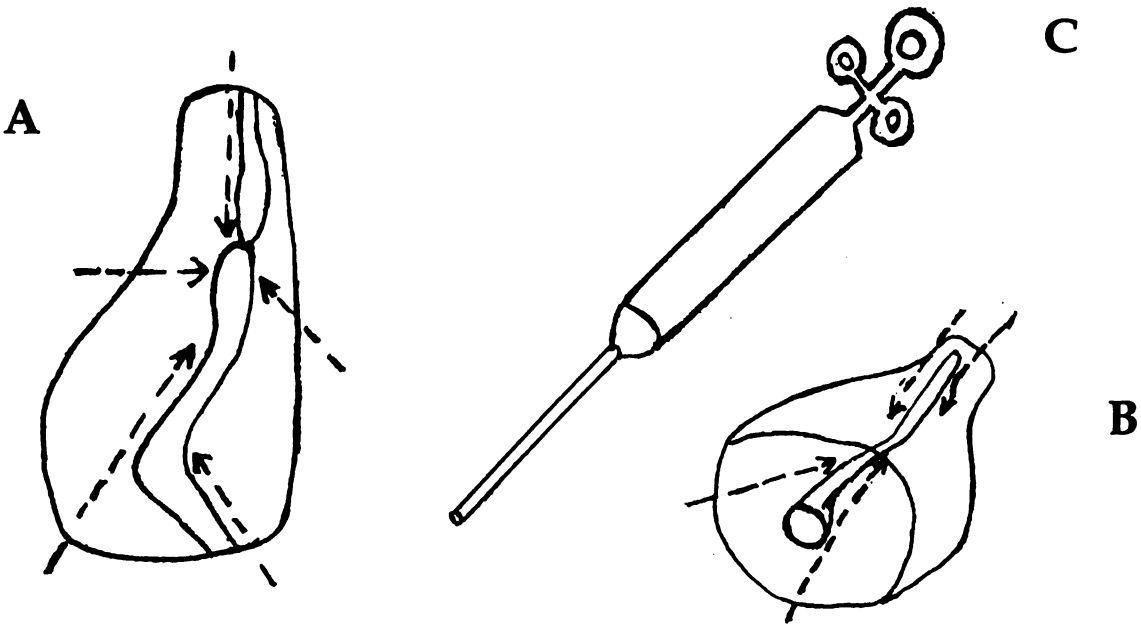
   This can be done in two ways - internal injection and cover pickle.

   • Internal injection (pumping) of meat is one of the best safeguards against spoilage. The wet curing solution is injected into large pieces of meat, such as legs and shoulders. Particular attention should be paid to areas very close to and surrounding the bone (see diagram on page 24). After pumping the meat, rub the outside surfaces with dry sugar cure using 2 tbsp sugar cure to every lb of meat.

   • Cover pickle is the immersion of the meat in the pickling solution during the curing period. This is usually done after pumping. The solution must completely cover the meat.

Diagram: Injection or Pumping of Meat

The broken arrows at A and B show where the needle should be inserted into the meat. C shows a ham pump used for pumping.



PORK/BEEF HAM

Ingredients

Pork or beef (meat must be chilled)
Tender Quick Salt* (1 oz per lb of meat)
Ham Curing Sugar *(2 tbsp per lb of meat)
Cooled boiled water (1 cup water to 1 oz Tender Quick Salt)
A few drops of Liquid Smoke (optional)

Method

Dress meat (trim fat, wipe off excess blood and impurities). Wash thoroughly and chill overnight.

Prepare liquid curing solution by dissolving the Tender Quick Salt in water.

Inject meat using 1-1 1/2 tbsp per pound of meat. This must be properly done all around the bone and then into the meat (see page 24).

After injecting, rub on ham curing sugar and liquid smoke on the outside of meat. Place in dish/ bowl/ clear plastic bag. Cover securely.

Leave in refrigerator for two days for every lb of meat. At the end of curing, drain and wipe dry.

Bake ham at 375°F for 20 mins for each lb of meat.

If not ready to be eaten, it can be placed in a vest-like material and hung to air dry or smoked, or placed in deep freezer.

Notes: ***The liquid smoke is used for flavoring.***

***e.g. "Morton's"**

CHICKEN HAM

Ingredients

Chicken (meat must be chilled)

Ham Curing Sugar* (2 tbsp per 1 lb of meat)

A few drops of Liquid Smoke (optional)

Method

Gut and clean chicken . Chill 4-6 hours.

Rub chicken thoroughly with sugar cure, inside and outside.

Place in a covered bowl or clear white plastic bag.

Mix 2-3 drops liquid smoke in 2 tbsps of water and pour over chicken.

Leave in refrigerator for 3-4 days. At the end of curing, drain and wipe dry.

Bake until tender and golden brown. If not ready to be eaten, seal in a plastic bag and place in deep freezer.

Notes:

Turkey, duck and fish can also be used.

Remember to pump large pieces of meat, such as large turkeys.

***e.g. "Morton's"**

BACON

Ingredients

1/2 oz Tender Quick Salt* or 1 tbsp Sugar Cure*
1 lb Pork (belly portion)

Method

Rub the meat with 1/3 of the Tender Quick Salt/ Sugar Cure. Two hours after, rub in the second 1/3. Twenty four hours after, rub in the remaining 1/3 of the salt or sugar cure.

Wrap in white or clear plastic and put in the refrigerator (not deep freezer). At the end of 7 days, check the meat and turn over. Leave for a further 7 days. Bacon takes two weeks to cure.

At the end of 14 days, remove meat from the plastic. Drain and dry thoroughly.

Freeze before slicing.

Notes:

For added flavor, a mixture of black pepper and corn meal can be rubbed on before freezing.

***e.g. "Morton's"**

SALTED DRY FISH

Ingredients

Fish (avoid using oily types)
Course Grain Salt
(1 lb salt to 3 lbs of fish)

Method

Use fresh fish. Scale, remove head and gut. If using shark, remove skin.

Place in chilled salt water (2 tsp salt per litre of water) for approx. 10-15 minutes to remove excess blood.

Fillet (split) fish. If using shark, cut into pieces of 1/2 inch thickness.

Salt fish by thoroughly rubbing salt throughout the fish. Use 1 lb of salt to 3 lbs of fish.

Place salted fish in a covered container. Leave in the refrigerator (not deep freezer) for 5 days.

Drain and place on plastic coated wire racks. Cover with a fine net to protect from insects.

Dry in semi-shaded area.

Notes:
Test for dryness: no impression on fish if squeezed lightly with fingers.
Some recommended species include shark, cro-cro and red fish.

SMOKED HERRING

Ingredients

3 lbs Large Herring
1 lb Course Grained Salt
2 tbsp Liquid Smoke
5-6 tbsp Browning/Caramel

Method

Clean, scale and gut herring.

Place in chilled salted water (2 tsp salt per litre of water) for approximately 10-15 minutes to remove excess blood.

Allow fillets to drain. Rub herring thoroughly with salt.

Mix browning with 2 tbsp liquid smoke.

Place salted fillets in a plastic bowl/clear plastic bag or container and pour in mixture of browning and liquid smoke.

Cover and place in refrigerator for 5-7 days.

Drain and dry/smoke.

SAUCES

There are several different types of sauces. The basic types are pouring (for example ketchup), and coating, (for example mayonnaise and mustard).

Ketchup is a pouring sauce which is processed hot.

Mayonnaise is an uncooked coating sauce which can be made using an electric mixer, food processor or blender.

For best results, all ingredients to be used in processing should be at room temperature.

MAYONNAISE

Ingredients

2 Eggs
2 tsp Mustard
2 tbsp Vinegar
2 tbsp White Granulated Sugar
1 pint Salad/Vegetable Oil (2 cups)
1 tsp Lemon Juice
1/2 tsp Salt

Method

Put eggs, mustard, sugar, vinegar, lemon juice and salt into electric mixer or blender.
Mix or blend for 2 minutes.
Add salad oil, drop by drop, until mayonnaise is the consistency of whipped cream.
Put into sterilized jars and seal.
Store in refrigerator.

Notes:
Should mayonnaise curdle (which will happen if the egg is cold or the oil has been added too quickly) put a fresh yolk into clean mixer and blend. Add curdled mixture a little at a time until it thickens.

PREPARED MUSTARD

Ingredients

2 ozs Mustard Powder
1/2 cup Vinegar
1/4 cup Water
1 tbsp Salt
1 tbsp Turmeric Powder

Method

Soak mustard powder in 1/4 cup water overnight.

Put 1/4 cup vinegar, salt, turmeric powder in a pot.

Add soaked mustard mixture to pot.

Simmer for 2 minutes. Cool.

Blend with remaining 1/4 cup vinegar.

Bottle in sterile jars leaving 1/4 inch headspace. Seal tightly.

Store at room temperature or in refrigerator when opened.

PUMPKIN SAUCE

Ingredients

3 lbs Pumpkin
2 medium Onions (sliced)
1/2 cup Water
2 tbsp Prepared Mustard
1 cup White Granulated Sugar
1 cup Vinegar
2 tsp Salt
Enough Corn Starch to thicken
Celery, All Spice
Little White Pepper

Method

Peel, wash and cut pumpkin into chunks. Put 1/2 cup water, pumpkin and onions in covered pot to boil until soft. Blend in electric blender with mustard until smooth.

Return to heat, add sugar, celery, all spices, salt and coloring. Lower heat, simmer for 10 mins.

Add vinegar, simmer for 5 mins. Add corn starch, made into a paste with a small amount of water and stir until mixture thickens.

Pour at once while hot into sterile bottles; fill to the top of the bottle since the mixture would settle on cooling. Clean the neck of the bottles and seal tightly at once. Invert for a few seconds then cool in the upright position.

Store at room temperature or in refrigerator after opening.

Notes:
A savory sauce to be used as substitute ketchup.
The approved food coloring is #40 Red.

WINE MAKING

Wine is made from the fermentation of whole fruits, from fruit juice only, from pulp or a combination of fruit juice and pulp, as well as nuts, herbs, flowers, roots and vegetables. Fermentation occurs in two phases: aerobic, which allows for the multiplicaton of yeast cells; and anaerobic, in which yeast metabolises to convert sugar into alcohol. It must be emphasised that wines should be allowed to ferment to completion before aging, as this can cause problems later on.

During the aging period, tropical fruit wines tend to referment in hot weather. Wines must therefore be stabilized before aging. Stabilization practices include repeated racking and filtration and sometimes treatment with preservatives.

The wine making process can be simplified as follows:

1. Selection of fruits
2. Washing
3. Preparation
4. Fermentation
5. Sediment separation (racking)
6. Clarification
7. Addition of Sugar
8. Filtration
9. Aging and Bottling

Although some fruits ferment in 3 to 4 weeks, aging takes a much longer time, usually months.

Wines need time to age (mature). Lighter wines are low in alcohol, body and flavour and are ready for drinking within 3 months. Heavier wines need 6-9 months before drinking.
In processing, the following points are emphasized:

- Bottles must be sterilized before use. Remove old labels from recycled bottles.
- Corks must be sterilized overnight in sulfited or chlorinated water or 1/2 an hour in hot water. Any other bottle covering used must also be sterilized.

Wine Making *(continued)*

- Red or Rosé wine must be put in dark colored bottles as the color will fade if exposed to light.
- Keep contents full to the brim or cover to prevent oxidation. Fill bottles to within 1/2 inch or 1 1/2 cm of the top of the bottle. Store at an angle so that corks remain swollen.
- Wines must be labelled with the type of wine and date of bottling (making).
- Store in a cool, dark place. If stored in a large container, use within one week of opening. Store in bulk, then bottle.

The quality of wine is determined by the following criteria: Sight, Color, Clarity, Smell, Bouquet, General Taste, Sweetness, Acidity, Tannin, Body and Fruitness.

When serving, use clear wine glasses to show off to the best advantage. Wines need some time to breathe. Serve 1/2 - 2/3 full, leaving room for bouquet to level.

To dispel some common misconceptions, remember :

- Wines do not get stronger with time.
- Certain fruits do not make stronger wines than others.
- Too much sugar will spoil the taste.
- Brown sugar does not make better/stronger wine. Since the consistence of the molasses in brown sugar tends to vary, white sugar should be used for clarity and consistency.

FRUIT WINE

Ingredients

3 1/2 lbs Fruit
2 lbs Granulated Sugar
1 gal Water (boiled and cooled)
1/2 lb Raisins/Sultanas
2 tsp Yeast
2 Campden Tablets/gal

Method

Wash and prepare fruits (peel, pulp, de-seed, etc.).

Add fruits, raisins and one crushed campden tablet into clean sanitised container with water.

Stir and leave for 24 hours.

Strain into clean container, add sugar and yeast, cover securely and attach airlock. Store in a cool place and leave to ferment for 4-6 weeks.

Siphon (rack) into clean, sanitized gallon container, add second campden tablet. Fill to the brim to prevent oxidation. Reattach airlock.

Store in a cool place and rack repeatedly as sidement forms. Bottle after 6 months.

Notes:

Use: mature ripe fruits; airtight, stainless steel glass or white, plastic containers; white sugar for clarity.

GUAVA LIQUEUR

Ingredients

3 1/2 lbs guavas (ripe)
2-3 drops red food coloring (optional)
3 lbs Sugar
2-3 tsp Bitters
1 bottle White Rum (750 ml)
8 cups Water

Method

Boil guavas in 8 cups water to extract juice.
Strain, add sugar to extracted juice.
Boil juice to make a thin syrup. Cool.
Add rum, bitters and food colouring.
Pour into stone or glass jars.
Cover securely, set aside for 21 days.
Siphon (rack) and bottle.

Notes:

The guava pulp can be used for jam making.

NOTES ON MEASUREMENTS

1. Check recipe for ingredients.
2. Check measuring equipment, e.g. spoons, scales, etc.
3. When using cups, do not shake. Use a knife to level tbsp, tsp and cup measures.
4. All measurements using cups and spoons are level.

Abbreviations:

tbsp	=	tablespoon	min	=	minute
tsp	=	teaspoon	hr	=	hour
c	=	cup	kg	=	kilogram
d	=	dessertspoon	g	=	gram
oz	=	ounce	pk	=	pack
lb	=	pound	gal	=	gallon
pt	=	pint	l	=	litre

Common Metric Kitchen Measures:

1 tbsp	=	15 millilitres	1 d	=	10 millilitres
1 tsp	=	5 millilitres	1 c	=	250 millilitres
4 c	=	1 litre			

Grams to Ounces:

30 g	=	1 oz	250 g	=	8 oz
100 g	=	3.5 oz	375 g	=	13 oz
120 g	=	4 oz	450 g	=	16 oz
200 g	=	7 oz			

Household Measurements *(continued)*

Range of Oven Temperatures:

Very Cool	-	225-250°F
Cool	-	275-300°F
Moderate	-	325-375°F
Hot	-	400-450°F
Very Hot	-	450-500°F

Water:	1 cup = 8 fl oz 1 cup = 250 ml 2 cups = 1 pint
Butter:	1 cup = 250g 1 tbsp = 15g 1 dessertspoon = 10g
Flour:	2 cups (sifted) = 230g 2 tbsp = 15g 2 dessertspoon = 10g
Granulated Sugar:	1 cup = 230g 1 tbsp = 15g 1 dessertspoon = 10g
Salt:	1 cup = 365g 1 tbsp = 18g
White Pepper:	1 tsp = 3g
Red #40:	1 tsp = 2.1g
Citric Acid:	1 tsp = 4.5g
Potassium Sorbate:	1 tsp = 3.5g
Sodium Benzoate:	1 tsp = 2.2g

WHAT IS IICA?

The Inter-American Institute for Cooperation on Agriculture (IICA) is the specialized agency for agriculture of the Inter-American system. The Institute was founded on October 7, 1942, when the Council of Directors of the Pan American Union approved the creation of the Inter-American Institute of Agricultural Sciences, to be headquartered in Costa Rica.

IICA was founded as an institution for agricultural research and graduate training in tropical agriculture. In response to changing needs in the Americas, the Institute gradually evolved into an agency for technical cooperation in the field of agriculture. These changes were officially recognized through the ratification of a new Convention on December 8, 1980. The Institute's purposes under the new Convention are to encourage, facilitate and support cooperation among its Member States so as to promote agricultural development and rural well-being.

The Member States participate directly in the Inter-American Board of Agriculture (IABA) and the Executive Committee, the Institute's governing bodies, which issue the policy guidelines executed by the General Directorate. Today, IICA has a geographic reach that allows it to respond to needs for technical cooperation in the countries, through its Technical Cooperation Agencies and five Regional Centers, which coordinate the implementation of strategies tailored to the needs of each region.

The participation and support of the Member States and the relations IICA maintains with its Permanent Observers and numerous international organizations provide IICA with channels to direct its human and financial resources in support of agricultural development throughout the Americas.

The 1994-1998 Medium Term Plan (MTP) provides the strategic framework for orienting IICA's actions during this four-year period. Its general objective is to support the efforts of the Member States in achieving sustainable agricultural development, within the framework of hemispheric integration and as a contribution to human development in rural areas. The Institute's work is aimed at making changes in three aspects of agriculture: production, trade and institutions, using an integrated approach to development which is based on sustainability, equity and competitiveness. IICA carries out its technical activities in four Areas of Concentration: Socioeconomic Policies, Trade and Investments; Science and Technology, Natural Resources and Agricultural Production; Agricultural Health; and Sustainable Rural Development. IICA's actions receive support from two Specialized Services: Training, Education and Communications; and Information, Documentation and Informatics.

The Member States of IICA are: Antigua and Barbuda, Argentina, Barbados, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, the United States of America, Uruguay and Venezuela. Its Permanent Observers are: Arab Republic of Egypt, Austria, Belgium, European Communities, france, Germany, Hungary, Israel, Italy, Japan, Kingdom of the Netherlands, Portugal, Republic of Korea, Republic of Poland, Romania, Russian Federation and Spain.

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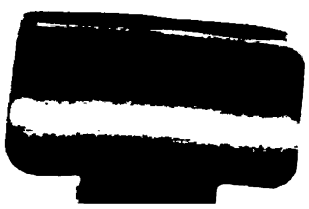

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