MINISTRY OF AGRICULTURE
AND LAND RECLAMATION (MALR)
ARAB REPUBLIC OF EGYPT

THE PROJECT FOR THE MASTER PLAN STUDY

FOR

RURAL DEVELOPMENT

THROUGH IMPROVING MARKETING OF AGRICULTURAL PRODUCE

FOR

SMALL SCALE FARMERS

IN UPPER EGYPT

TECHNICAL MANUALS

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JAPAN INTERNATIONAL COOPERATION AGENCY

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PART I

Technical Manual

For

Post-harvest and Processing

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Forward

This is a technical manual for explanation of agricultural processing methods introduced during the Pilot Project of the IMAP.

For the Pilot Project of the IMAP, four villages were selected for the implementation, one in Delga village, Dayr Muas District, Minia Governarate and the others, in Rifa village, Assiut district, in El Egal El Bahary village, El Badary district, and in Arab El Kadadeh, Abnoub district in Assiut.

This manual also explains the agricultural methods as well as the room sizes, number of equipment, O&M organization for the units & facility as well as business training methods, which were used during the operation of the units and facility of the Pilot Project.

1. Primary Agricultural Processing Unit (Delga village)

Contents

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1. Introduction

To expand the market channel of agricultural crops grown by the small-scale farmers, it is proposed for farmers to primarily process their horticultural crops and to sell in and around villages taking into consideration the producing and consuming in the villages.

Project description:

1. The village cooperative manages and operates the unit
2. The unit produces various agricultural products using the agricultural crops grown in the village.
3. The unit is for making of pickles, dried vegetable, or frozen vegetable, etc. or their combination.
4. Farmers in the village participate to the unit operation and supply the low materials.
5. Traders and retailers in the village participate to sell the processed products.
6. Governorate and district offices conduct the technical and marketing supports.
7. Related agencies support the district and governorate offices.

Processing Unit in Delga village

Produce: Pickles, Drying onion & vegetables

Additional: Frozen vegetables

Introduction of food processing

Definition of science of food process;

Is a science that looks at all the scientific and practical considerations for the exploitation of materials, which more than demand consumption from agricultural crops and livestock. To transform it to industry food product, conservation, or used it to preparing items of food or non-food. It can be traded on international market, so that they remain healthy and vitally for longest possible period.

Sections of food process :

First: divided into two parts in terms of its inception:

1- Old food process: it known from long time ago on the basis of long practical experience without sufficient scientific, its included: sun drying, liquor, smoking, jam and drinking

2- modern food process: it known from recently on the basis of practical and scientific after various scientific experience, its included; conservation industry in cans (sterilization), industry drying, fruits juice

Second: divided into three parts in terms of needs of capital:

1- rural industry: need to small capital for drinking industry, jam, pickles, alcohol and perfume

2- rural industry: need to average capital for sun drying, pressed dates, molasses, local sweat, halva, pickles

3- Big industry: need to big capital, high technical efficiency, factories, and expansive machines for sugar and oil industry, conservation in cans, industry drying, cooling and freezing

Economic benefits of food process

1- We can keep food in a good case to consumption it at its lack time with good price

2- Keeping the surplus of food product at its season, thus avoid the loss if the product was display in the market over flowing quantity of consumption and need for cheap

3- Some food process such as drying to reduce the cost of shipping and transportation because it detracts from the size and weight of food material

4- The possibility of supply ships and planes traveling from their need of conserved food also can be used for trips and explorations

5- To supply the armies and fleets in the battlefield and the delivery of the peoples during the war and famine

6- Increase the areas of work of labor, leading to increased salaries and the high standard of living as well as the need for a large number of specialists and agricultural technicians

7- To help the other industries are complementary such as packaging for the food after process and shipping packaging

8- Also helps to do other industries to take advantage of processing waste in the production of goods of economic value and increase profit , such as fur and leather tanning remnants of slaughtered animals - and the alcohol industry and vinegar from the remnants of the sugar cane industry

Trends in the state on the food industry and the projected expansion

One of the main goals of our revolution to build a new society enjoy the high standard of living of its personnel as a result of increasing the national income and doubled To achieve this, the work plan for economic development in the industrial field draw manufacturing policy aims to:

1- Achieving self-sufficiency in all that can be produced economically from industrial products which consumed by the domestic market and imports from abroad

2- Expansion of industries that can find a market for export to overseas " we must work plan to double the national income and should be followed always follow-up plans to re-double the national income, to meet the anticipated increase in population

Must be established Egyptian General Food Industries where you supervise the manufacturing sector, food production factories and anticipation of this sector and prevent the artificial competition in some cases, the factories that produce products per

Science-related food industries:

1- Agricultural and horticultural

2- Biochemistry, mineral and Applied

3- Bacteriological

4- Natural

5- The plant and animal

6- Engineering kinds

7- Economics

Food

The definition of food:

Vehicle Dynamics and chemical works on the body composition and growth or compensate for the lost during the work and helped him to resist the disease and the generation of heat and effort required to work and carry out various Food is vital, is the basis of life.

General composition:

Food is generally composed of organic materials, plant or animal, often enter the body through the mouth, fresh or cooked to digest in the gastrointestinal tract and then absorbed in the blood to representation in the construction of the body and configured to facilitate the resurrection of its operations and dynamic movement such as thinking and work and breathe, etc.

Food components:

Food and its various kinds consist of major components; can divide according to their functions:

First: Constructive materials such as: 1 - proteins, 2 - mineral salts

Second: The materials for generating energy and effort: 1 - carbohydrates, 2 - fat, 3 - in the rare proteins

Third: organization material: 1 - vitamins, 2 - water, 3 - mineral salts

The needs of the daily intake of protein:

Human adult requires 1-gram protein per 1 kilogram of his weight per day divided into three snacks. Pregnant women need 1.5 - 2 grams. Children and young people less than 18 years old needs 2-4 grams per 1 kilogram of weight per day and should preferably be half the amount of the source animal and the other half from a vegetarian source.

Salting and pickling

Pickling means keeping food for some kinds of vegetables and fruit by replacing its juice with a brine and cause some chemical be changes in the components of the materials, used by the activity types of lactic acid bacteria, which produce lactic acid, which is doing the preservative. Packing all of the fruit and vegetable in brine diluted or concentrated for a period, is through chemical changing that are having produced as preservatives, absorb vegetable intake of salt and spoken of by fermentation, to give vegetables taste and color. The conservation period between several days to several years if the degree of salt concentration in the brine less than 10% conservation period is not more than a few days and if it reach to 16% it can keep for several years.

1- Salting is one of two ways:

- Wet salting: immersion vegetable in brine focus 10% and stored for five weeks at 30 degrees C, during which growth and reproduction of lactic acid bacteria, and then raises the salt concentration in the brine gradually until it reaches to 15% and should be isolated brine from air through the development of Bags inside the containers and closing.

- Dry salting: used for salting the Low acidity and neutral vegetables, by mixing vegetables with dry salt and left it for two days to consist concentrated liquid to absorb the juice of vegetables, where it dissolves. And usually is mixed 10-K for every 100 K from vegetables, mix well then put the weight of wooden or stone to filled the vegetables, just under the surface of the brine is formed. If the brine were less than 10%, we can increase its concentration by adding salt. In addition, left it without moving, to not fail in the bottom and cause a greater

concentration of substrates only. Then raise the concentration of vegetables, gradually even up to 15% degree. We can reserve this vegetable in brine for several years and the purpose of the gradual increase in raising the concentration of brine is to maintain the appropriate factors for the growth and proliferation of lactic acid.

2- Processing and preparation for marketing of pickles:

- Remove the excess part of the salt to make vegetables good for consumption: by soaking pickles in warm water for 12 hours with stirring. May repeat this process if necessary - or soaking it in cold water 1-2 days with change of water 2-3 times daily and can be Add alum or calcium chloride by 0.5% to water to give vegetables tissue stiffness.
- Gradient to different sizes and can be packaging each size
- Peeling and slicing such as peeling onions, this salted with its crust, to maintain its white color. Turnips and carrots cut into slices or cubes with appropriate size

3- Packing:

Pickles are packaged in cans or jars, add the brine the proportion of salt in which 5-8% and the brine is either be salted only or has a few percentage of acidity and must be pasteurized on the degree of 165-185 ° F. (75-85 ° C) for half an hour before adding Pickles

Materials and tools, which used for pickling:

1- Salt: must be free of salts of calcium, magnesium, iron and alkaline salts so as not to cause a change in the characteristics of pickles or weaken the power of cohesion. Because the lactic fermentation is stands at a concentration of 13%, and have not fermentation by false yeast in the concentration of 15%, usually used coarse salt.

2- Water: should be clean-free of chemicals and organic and preferably when preparing brine, water is heated to the point of 85 ° F. (30 ° C) to facilitate the soluble of salt

3- Vinegar: used the vintage and pasteurized vinegar, free from sediment and acetic acid bacteria or mikoderma

4- Spices: Spices quantities vary by type of pickles and the desire of the consumer. We can add spices as solid, powder, or oil form. Spices have no effect maintain because of the small quantities are used - and summed up the used way to add in the brine or cell and boiled them to gain the desired taste and then cooled and filtered before use, prefer the use of spice oil for ease of use and impact strength

5- Materials which give vegetables a solid mainstay such as alum or calcium chloride

6- Pickling Basins: made of material that is prone to rust or corrosion such as basin or large barrels wooden or painted pottery and covered with wood, and increase the weight of the cover by wood or stone deaf, pickling basins can made of cement

7- Sugar: You may add a little of glucose to the brine about 1-2% to stimulate the lactic acid bacteria to quickly configure the acidity which caused weakening and prevent the growth of harmful bacteria

Pickles spoiling:

1- growth of mikoderma: it is false yeast mixed with soil bacteria, multiply on the surface of brine and make a white membrane or gray color becoming thicker and cause harm because it analyzes the lactic acid to carbon dioxide and water so it cause acidity be less and make mikuderma start in the activity and analysis of vegetables and weaken the power of cohesion and has a bad smelling, the encourages the growth of mikuderma lack of concentration of brine, absence of direct sunlight and the presence of air, and can be resisted as follows:
• Remove the layer of mikoderma once configured without broken it so as not to fall in brine and damaged it
• store the pickles in the sun, as these neighborhoods do not grow in direct sunlight
• prevent and isolate the air from pickles by adding a thin layer of oil over the surface of brine to isolate it from the air which necessary for growth and activity the mikuderma

2- composition of gas pockets of carbon dioxide: The result of the growth of bacteria like Coliform anaerobic within the tissues of vegetables and its activity because the lack of acidity in the brine and the low salt concentration of about 5% and resist by increasing salt more than 6% and increased the pH by adding acetic acid

3- coloring pickles: pickles and its brine colored with black or brown color because it polluted with metals or its salts, especially iron

4- swollen cans: either the acid reaction with metal and jars cover or inadequate the pasteurization and generate carbon dioxide (CO 2) which resulting from lactic acid bacteria

Green olive Pickling:

1- The home method: make a crack in the fruit or soaked in renewed water for 4-5 days and then soaked in water again for another day and then packed fruit in jars with brine of 10% with squeeze 10 lemons per liter of brine and a week after getting focus again to 10%, then to 12% after three days and stored in a warm place with the addition of 2 spoons of yogurt and pickles must be put inside the bag and closes well and there is no air inside the bag

2- The Spanish method: soak fruit after sorting in caustic soda solution strength of 2-3% for 4-6 hours to remove most of the bitterness of the fruit and then wash with water well to remove the effects of alkaline. Then but it in a brine of 10% with the addition of 0.5 - 1% lactic acid for activate the lactic fermentation. After two weeks adjusted the focus to 10% with the addition of vinegar concentration 4%, 3% of the volume of the brine until the fermentation has happened. Then covers the surface of bags and be packed inside the bag and there is no air.

Black olive Pickling:

- Elect a ripe, black and solid fruits - then make a dry salting by mix 1K salt with 10k fruits, pressure with a suitable weight and leave in a warm place for a week and then soak the fruit in brine 10% to pickling it and Compensation for loss of fruit juices during the salting drying process Then packed fruits after painted with a layer of oil

Cucumber Pickling:

- Elect a solid fresh, small and incomplete maturity fruit and free from scratches and insect and fungal infections. putting it in brine of 10% without washing and weighing on the surface of the fruit to become fully immersed in brine and then raise the proportion of salt to 10% during the first week of the pickling, add 1% glucose sugar to encourage the storage because the cucumber is poor in sugars, after 4-6 weeks rise the focus gradually to 15%, then stored it in a warm place until the pickling

- processing: remove the excess salinity by soaking in warm water for 12 hours with stirring, then soaked in new water again and add alum or calcium chloride at rates of 0.5% into soaking water, to give the cucumber more hardness, or soak in cold water for 1-2 days with changing the water every day

- Packing: cucumber packed in Cans or jars, then add brine at 200 ° F. (93.5 ° C) for 8 minutes and then closed

Onions pickling:

- Don’t remove roots and leaves only when packing - put onions in brine 10% and maintains the concentration ratio until pickling for 45 days in a warm and sunny place, then prepared onions by removing roots and leaves and soaking it in warm water with a little acidity and salt sulfate sodium to make it white, then packing it in suitable package with the addition of brine containing 5% salt and 3% vinegar

Limon pickling:

- Elect large and similar fruits and wash it, then make a two perpendicular lengthwise incomplete and stuffed with salt, saffron, cumin black by "10: 5: 1, " respectively, and packaged fruits in pottery containers, glass or, with Pressure at it, leave it to the next day, completing the juice which is separated from fruits with lemon juice which enough to flooding fruits, then covered fruits with pepper and lemon peel, which was squeezed , and put it inside the bag and closes well and be free from air and put it in a warm place until the pickling for two months

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2. Practical Training for Pickles Making

Inputs:

1- 20.5kg carrot
2- 22kg cucumber
3- 7 kg onion
4- ½ kg Red pepper
5- ½ kg green pepper
6- 8.5kg lemon
7- 45 bags salt
8- 17 bags yoghurts
9- 1.5 kg Spices (laurel, cloves, cardamom, coriander, ginger)
10- 1 kg sugar
11- 3 bottles Vinegar

1. Pickles in Egypt

1- Washing all vegetables, then soaked it in water with vinegar for 15 minutes (1 small cup for 1 plastic container)


2- Cut the top and the bottom of the carrot

3- Sterilized jars by putting the jars in the water until boiling, then place the jars upset down on the towel or Sterilized table



4- Mix 5 packages of yoghurt+ ½ kg sugar in one beaker


5- To make the brine: fill the pot with (15-liter) water+ (1/2 liter) vinegar + through the water boiling, we can add the spices (laurel, cloves, cardamom, coriander, ginger). Then Put the pot in

the cold water to pasteurized it, after the water get warm we can add 10 bags of salt (300g/ one package) + yoghurt mix (we can add all the yoghurt mix to the brine or add one spoon of yoghurt mix for each jar)





6- Filter the brine by gauze

7- Put the cucumber in the plastic bags (1/2kg / bag) then add the brine to the plastic bags and welding it

8- Cut the carrot to 4 pieces or to small pieces by the corrugated knife and put it in the plastic bags (1/2kg / bag) then add the brine

9- Put the onion without peeling in the strainers and put it in the boiling for two mints then put it in the plastic bags (1/2kg / bag) then add the brine (for onion we increase the salty of brine so we add 100g/1liter brine). We can peel it after pickling through selling.



10- lemon:

- Soak the lemon for 3 days with changing the water in the morning and evening

- Mix (safflower+ 2bags of salt+ fennelflower) and divided it to 2 plat



- Divide the amount of lemon to 2 amount to make two kind of lemon pickles
- First amount: make an half lengthwise crack until the middle of the lemon then stuff the mixture into the lemon then put the lemon in the jars and add the brine and close it




- Second amount: boil the lemon then put it in the jars or plastic bags with adding 1piece of laurel+2pieces of cloves+1 piece of red pepper+1 piece of green+ 1 spoon of yoghurt+ 1spoon of safflower mixture then add the brine



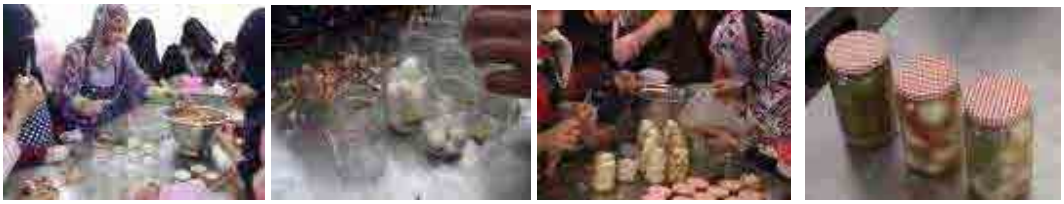

11- We can cut the carrot using the corrugated knife after pickling through selling.

<u>2. Japanese pickles</u>:

1- 1 piece of laurel+2pieces of cloves+1 piece of red pepper+ 1 piece of green pepper for each jar

2- Put the cucumber in the jar with 1 spoon of spice then add the brine to the jars and close it good


3- Peel the onion and cut the top and the bottom and put it in the jars with adding 1piece of laurel+2pieces of cloves+1 piece of red pepper+1 piece of green+ 1 spoon of yoghurt then add the brine



- The brine used for both kind (Egyptian and Japanese pickles)

Output:

1- 37 plastic bags of cucumber,
2- 36 plastic bags of carrot,
3- 53 jars of cucumber,
4- 47 jars of carrot
5- 17 jars of lemon
6- 15 jars of onion
7- 12 plastic bags of lemon
8- 7 plastic bags of onion

3. Lecture Documents for Dried Vegetables Making

Onion drying industry

Egypt is more than exporters of onion, Egyptian onion is the most suitable varieties for drying because it has high proportion of solids and keeping its taste and pungent smell, which makes it desirable in overseas markets and increasing demand in northern Europe, England and America

Steps of onion drying industry:

1 - Receiving and separation: exclude infected fungal and pesticides injuries, as well as coloring and red onion
2 - Peel: Peeling the onion used in hand peeling because labor is cheap and not to the possibility of peeling onion in a flame because, we need to separate the cortex and the class that followed.
3 –Preparing: cutting and removing the connection of crust, and the connection of roots.
4 - Washing: stuffed it in brine (Meta sulfite sodium) to cleanse the onion and to maintain its color. Then washing it by washing machines.
5 - Cutting: cutting the onion into thin slices with thickness (4-6 ml) by a special cutting machine equipped with the expulsion of the acrid smell that occur during the cutting process.
6 – putting in the trays: Once you cut onions we can put it in the drying trays, which has an area about 3 × 6 foot and distribute the onion in layers not exceeding a thickness of 3 cm.
7 - Drying: dryers are industrial in the tunnel system with parallel reverse the temperature of 140 ° F. (55 - 57 ° C) for 7-9 hours, taking into account not to increase the temperature so as not to cause yellowing of color
8 - Drying separation: onion secreted after leaving directly from the tunnel to exclusion the parts that are not completely dry, as well as coloring parts and unburned.
9 - Packing: packed onion in cans the capacity about (4 GB gallons) or (7 kilograms) or container about (100 kg).

Onion powder are traded on the following image: a fragmented onions, sliced onions, onion powder

The proportion of dry onion 10-12: 1

Note:
Must not be less drying temperature for 112 ° F. (45 ° C) to prevent the growth of microorganisms

Drying industry

Intended of conservation drying: is to reduce the amount of what it contains material from moisture and raise the concentration of components soluble solids to the extent, which does not allow the growth and activity of microorganisms, and to stop the work of the enzymes. maintaining the components of a food item and not to change the properties of natural, chemical, and vowed not to damage either during drying or storage and that by evaporate a large part of moisture Thermoforming.

The percentage of moisture after drying in the vegetables from 4-6% and in the fruit between 16-24% because of the high content of fruit soluble solids and become the proportion of soluble solids after drying from 65-68% of the weight of dried, making it the work of the preservative in material dried

The importance of drying: the importance of drying due to the characteristic of dried food from other foods preserved in one of the other methods of preservation, including the following:

1 – It considering as a concentrated food characterized by size and lightweight, which facilitates the transfer of operations, shipping and storage and reduce the cost of these operations, reducing their selling prices relatively.
2 - Lower costs for preparation, processing and lack of need for the use of extra high-priced materials such as sugar or use a special packaging such as tin cans.
3 - Possible to keep food for a long time in a valid state-to-use without changing their attributes or components if it takes into account the technical assets in packaged and stored.

Types of drying:

1 - Solar drying or natural: use the natural heat of the sun as a source of heat and air as a means to expel the air and the transfer of evaporated moisture from the food to get rid of excess moisture on the allowable percentage of drying.
2 - Industrial Drying: this organized by temperature and air speed and relative humidity to control in industrial drying period and the percentage of moisture in the dried foodstuff.

The main factors underlying the industry drying:

1 - Expel the excess part of the moisture of food to be dried to prevent damage due to various factors of corruption.
2 - Retain as much as possible of the characteristics

Controls in these two considerations, the following basic factors:

1 - The use of temperatures sufficient fit with the installation Chemists and natural food enough so that these degrees of heat to expel moisture, depreciation and destruction of microorganisms without the enzymes that lead cells to burst and burned.
2 - Control the movement of air speed of the user and the organization and trends.
3 - Control relative humidity in the air used in drying and the extent of moisture saturation at the passage of food to be dried.

Note: use the solution is composed of Meta sulfite sodium and Meta sulfite potassium by 1.2 grams per liter of saline divided equally between them

The benefits of the process of sulfating:

1 - Stopping or inhibition of enzymes, especially oxidized, which helps to preserve color in vegetables and fruits.
2 - Sulfur dioxide is a preservative CHEMICAL affects the microorganisms causing corruption.
3 - To maintain what they contain a food item of vitamins, especially vitamin A, C, only damage was vitamin B-1.
4 - Help to speed up the drying process by using higher degrees of heat to shorten the drying period without burning components of the material.
5 – It considering as a repellent to prevent birds and insects approached the food item and kill them, especially with the solar-dried foods.

When you must use the trays for drying into account the following:

1 - Must be keep the trays clean immediately after use and dried to be a washing with strong spray of water with the use of brushes in the cleaning.
2 - Preferably washed from time to time, using dilute solution of caustic soda and warm water.
3 - Must be steaming trays before and after the use, by using sulfur dioxide gas so it does not grow mold.
4 - Preferably pant trays with a thin layer of paraffin oil to prevent adhesion of food during the drying.

Packing:
Should such conditions in the stomach to fill containers of food:
1 - To be resistant to moisture absorption and is a window for air.
2 - Light weight sealed.
The best containers, which used in the packing cans, metal containers and bags of flexible cellophane and waxed paper.
Preferably using solid packing to bear the loosening air or replaced with an inert gas or neutral.

Storage:
Must take care to store dried material in places such conditions are:
1 - The stores are dry with constant temperature.
2 - To be indirect lighting and does not reach them in direct sunlight.

3 – Floor and walls have not any cracks and impermeable to moisture.
4 - It must be has well fortified against insects and rodents, especially around vents, windows and doorways.

Features of dried material:
1 - Retains its characteristics and advantages of fresh color and taste, flavor and smell.
2 - To regain the form when it has been submerged in the water and the speed of its absorbed.
3 - To be free from defects as the existence of parts burned out or cobalt or color and must not exceed these defects of 2% by weight.

The Defects of materials dried and how to avoid them:
1 - Change the color and taste of straw and this is due to separation of oxidative enzymes, which can be prevented and reduction of the strength by provisions of the processes of boiling and sulfating.
2 – losing The components of the material, especially vitamins and sugars, due to the lack of practical provisions sulfating and the use of high temperatures, is avoided by the provisions of the process of sulfating that helps to save the vitamins, especially vitamin A, C, and the use of appropriate temperatures.
3 - If the moisture limit is increase, the growth of fungi and the activity of bacteria, which cause damage will be increase. Must be not increase the proportion of moisture in the final product after drying for 5-6% in vegetables from 16 to 24% in fruit.
4 - food exposure to damage by insects and rodents if stored in bad stores, which must work with him to fortify it with adding insect net in the windows and filling cracks and holes and resist the insects and rodents and destroy it firsthand.

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4. Practical Training for Dried Vegetable Making

I. Sun Drying

Inputs:

1- 11kg okra

2- 2 bottles Vinegar

3- 11kg molokhia

1. Okra:

1- Wash okra, then soaked it in water with vinegar for 15 minutes

2- Put okra in boiling water for 1 minute, then left it in the strainers for a few minutes

3- Cut the head and the bottom

4- For freeze: we fill okra in plastic bags (1/2 kg /bag), welding it and put it in the freezer

5- For draying: put it in the thread (the thread be in the middle of okra) , in the form of necklace

6- Hung the necklace to dry in the sun, we keep it in the same form after drying in plastic bags


2. Molokhia:

1- Sort molokhia to select any other plants or grasses

2- Wash molokhia with water, then wash it with water and Vinegar then wash it again with water only

3- Cut molokhia's leaves

4- Scatter molokhia's leaves to dry

5- After drying we crush it and keep it in plastic bag

Output:

1- 8 plastic bags (1/2kg) + (165g) (freeze okra)

2- 1 plastic bag (244g) + 1 plastic bag (340g) (drying okra)

3- 1 kg molokhia

II. Oven drying
(Onion drying)

Inputs:

1- 39kg onion (big)

2- Meta sodium sulfide or meta potassium sulfide or both

1.2g Meta sodium sulfide/1liter water

30g Meta / 25 liter water

Step:

1- Paint oven trays with oil and put it in the oven with high temperature to erase any prevent and rust in the trays

2- Peeling onion and cutting the top and bottom of the onion

3- Wash onion in 3 plastic container (first one only with water, second one water with 30g of meta sodium, third one only water)


4- Cut onion to slices

5- Scatter the slices in the trays

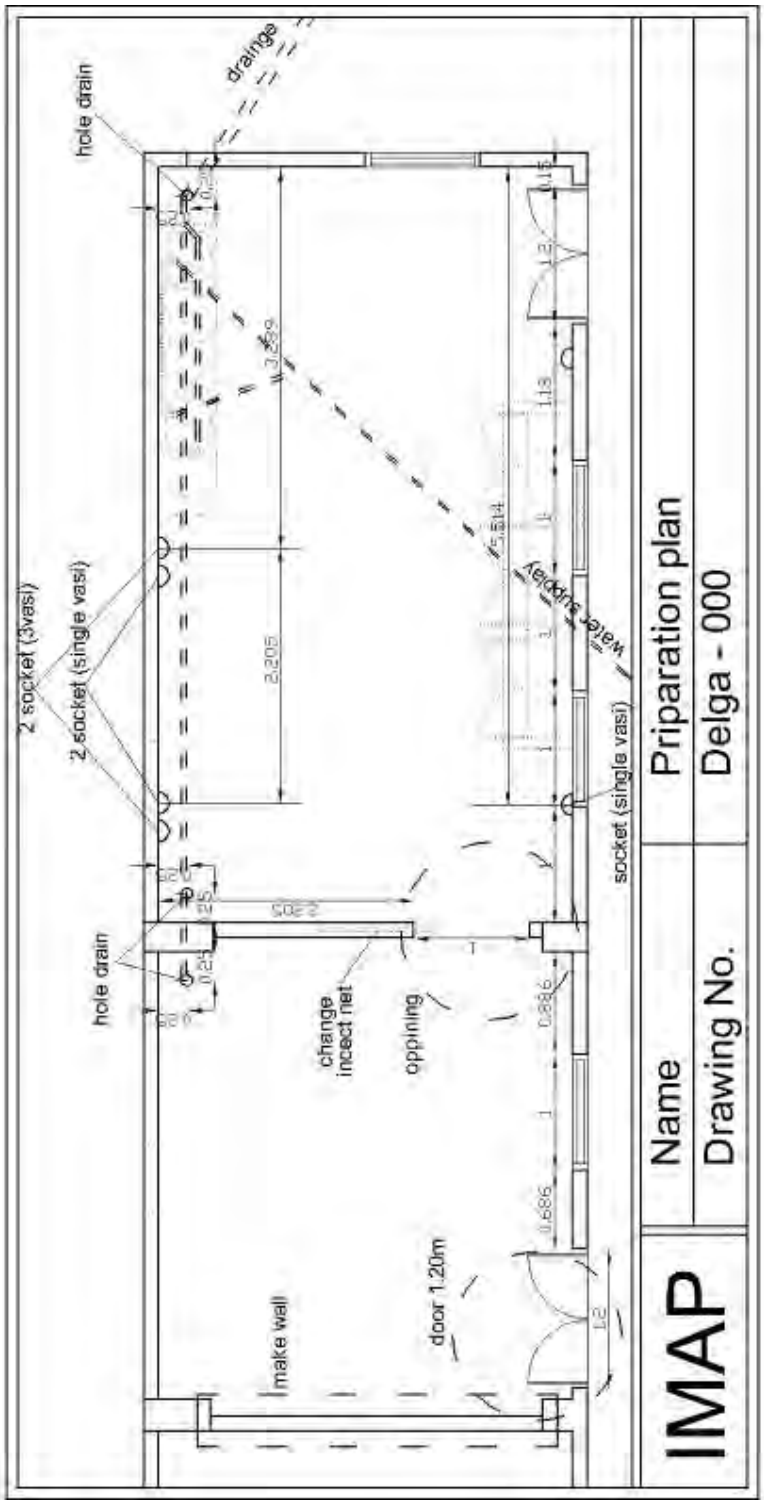
6- Put it in the oven and left the door of oven be open the temperature of oven around 52°

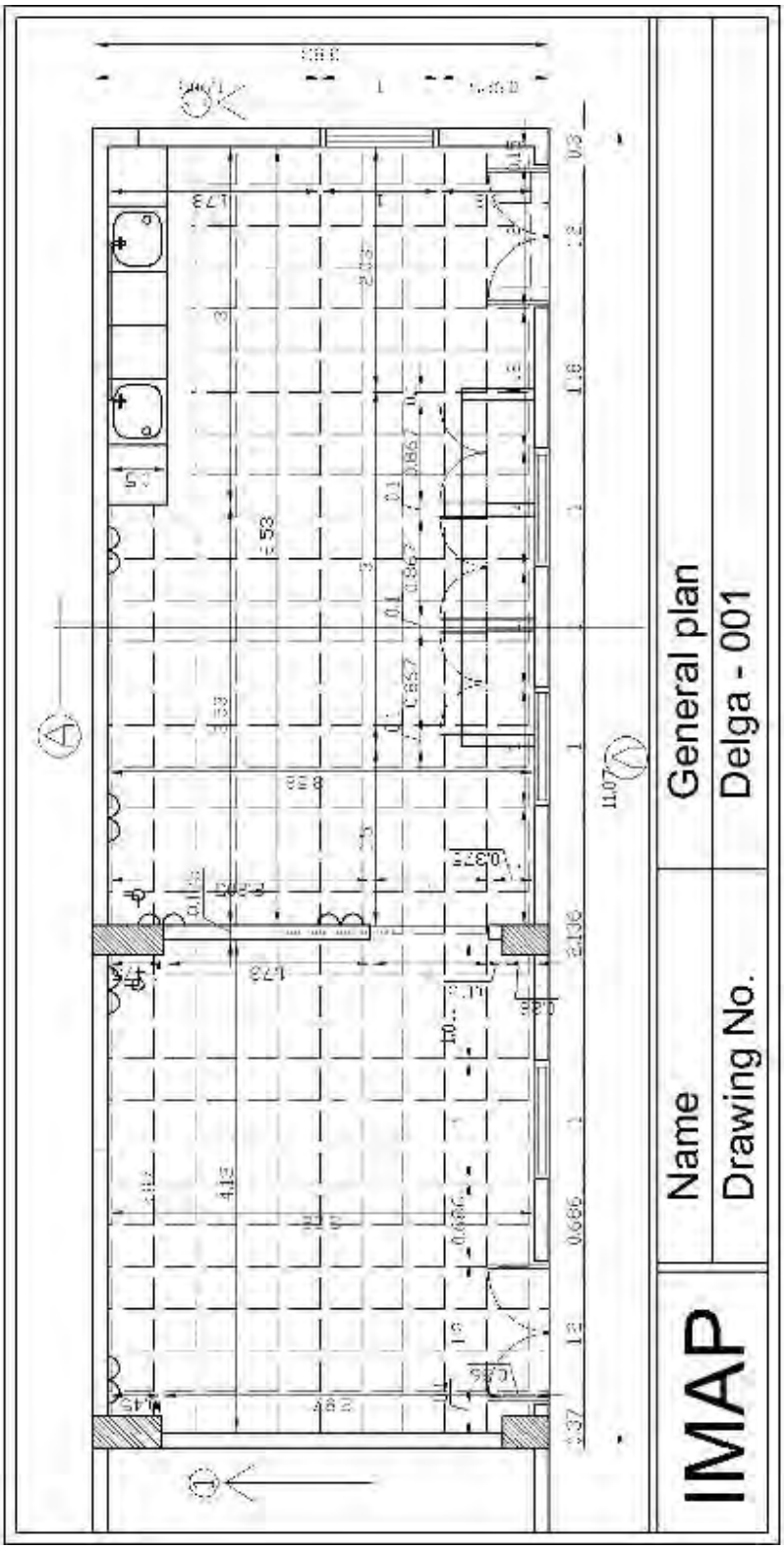

7- Onion take around 7-9 hours to get dray

8- After draying we can keep onion as a draying slices or crushed it to be as a powder

5. Drawings of Primary Agricultural Processing Unit

in Delga Village

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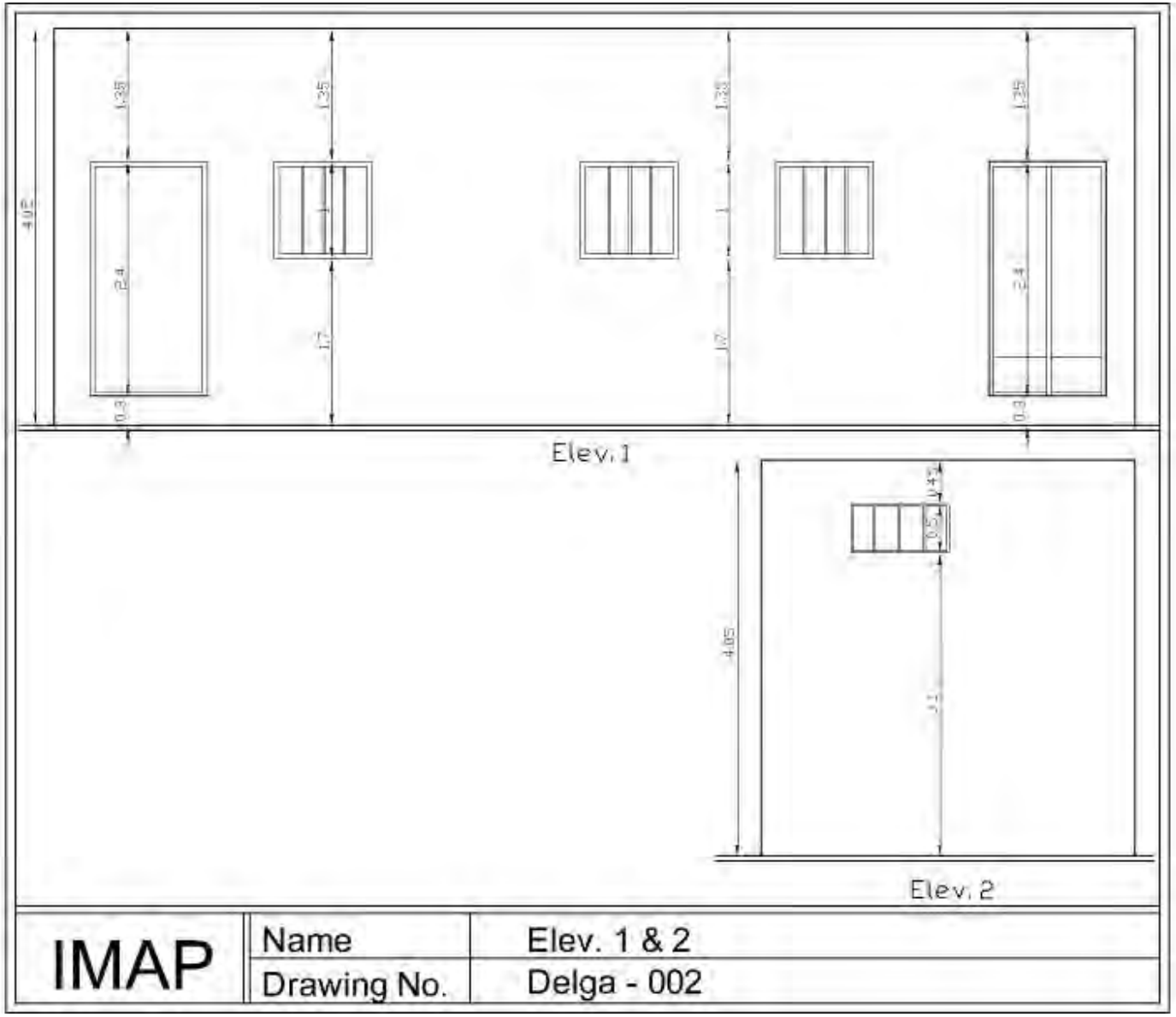
General plan
Drawing No.
Delga - 001


Elev. 1
Elev. 2
IMAP
Name
Elev. 1 & 2
Drawing No.
Delga - 002

6. Procured Equipment in Delga

Processed Food الغذاء المصنع

1- Pickles المخللات

2- Drying onion & vegetables تجفيف البصل & الخضروات

Equipment list

No.	Description: Name of Equipments أسماء المعدات	Specifications: Materials, Size, Capacity, Weight المواصفات: المواد، الحجم، الوزن	Required Quantity الكمية المطلوبة	unit الوحدة	Remarks ملاحظات
1	Table مناضد ستانليس ستيل	stainless, 200cm x 100cm x 75cmH سم ارتفاع 75 × سم 100 × سم 200	2	unit	
2	Gas tank انبوبة غاز بوتاجاز	approx. 1.2m x ϕ40cm قطرها 40 سم x حوالي 1.2 متر	2	unit	
3	Gas Burner بوتجاز	2-burner type, (order made) with 120cm x 60cmx60cmH, frame base شعلة, بوتجاز مسطح تصنيع يدوى 2 سم ارتفاع 60 × سم 60 × سم 120	1	unit	
4	Refrigerator ثلاجة	approx. 60cm x 60cm x 165cm 4 shelves, 2 doors (cooling, frozen) سم 165 × سم 60 × تقريبا 60 سم (رفوف, 2 باب (مبرد, مجمد 4 ,	2	unit	
5	Shelves ارفف	Kitchen shelves, steel made, 100cm x 120cm x 160cmH (40cm x 4 shelves) (movable) سم 160 × سم 120 × رفوف مطبخ, 100 سم (رفوف(متحرك 4 ,	1	unit	
6	Basket صناديق قمامة	plastic, 60 liters بلاستيك, سعة 60 لتر	3	pc	
7	Chair مقاعد	wood made, (material zan) خشب زان	6	unit	
8-1	Electric sealer ماكينة لحام الأكياس	approx. length 400mm,500 w handy type تقريبا 60 سم × 60 سم × 165 سم (رفوف, 2 باب (مبرد, مجمد 4 ,	2	unit	
8-2	Electric sealer ماكينة لحام الأكياس	approx. length 400mm,500 w foot type نوع مسطح, طول من 30-40 سم	1	unit	
9	Gas Oven فرن غاز	80cmx 100cmx 170cmH, 3 shelves with base	1	unit	
10	Vegetable Dryer (oven) (مجفف خضروات (فرن	75cm x 100cm x100cmH, 6 trays type, with table	1	unit	
11	Fire extinguisher طفاية حريق	ABC type, 6 kgs ABC كجم, نوع 6	2	unit	
12-1	Scale (small) ميزان	table-top type, accuracy 0.1g 0 kg - over 10kg, digital diplay 0 كجم- 10 كجم (اقصي), عرض رقمي, دقة 0.1 جرام	1	unit	
12-2	Platform scale (balance) ميزان زو منصة	0 kg - over 50kg, digital diplay, accuracy: 5g 0 كجم- 50 كجم (اقصي), عرض رقمي, دقة: 1جرام	1	unit	
13-1	Plastic container طشت بلاستيك	φ50cm x depth 40cm, 30 liter مجوف 40 سم , 30 لتر × قطر 50 سم	6	pc	
13-2	Plastic container طشت بلاستيك	for product cooling & preserving, φ50cm x depth 60cm, 50 liter مجوف 60 سم , 50لتر, لتبريد المنتج & حمايتة x قطر 50 سم	20	pc	
13-3	Pot حلل	Alumminum ,30 liter 30 لتر, المونيوم	6	pc	

Equipment list

No.	Description: Name of Equipments أسماء المعدات	Specifications: Materials, Size, Capacity, Weight المواصفات: المواد، الحجم، الوزن	Required Quantity الكمية المطلوبة	unit الوحدة	Remarks ملاحظات
14	Strainer (filter) مصافى	Aluminum, with legs, ϕ35cm ستانليس ذات اقدام , قطر 35 سم	6	pc	
15	Jar (measuring) دورق مدرج	stainless, 2 litres ستانليس ستيل يسع 2 لتر	2	pc	
16-1	Bottle (grass) برطمانات (زجاج)	for product, 500g container with cap للمنتج, سعة 500 جرام ذات غطاء	200	pc	
16-2	Bottle (grass) برطمانات (زجاج)	for product, 300g container with cap للمنتج, سعة 300 جرام ذات غطاء	200	pc	
17-1	Kitchen knife سكاكين	blade 15cm - 25cm, stainless, 6 different kinds ,انواع مختلفة, ستانليس 6 شفرة من 15سم- 25 سم	1	set	
17-2	Kitchen knife سكاكين	blade 20cm, stainless شفرة 20 سم, ستانليس	3	pc	
17-3	Onion slicer قطاعة بصل (شرائح)	Length approx. 25cm, stainless brade طول حوالي 25 سم, شفرة ستانليس	5	pc	
18	Kitchen lighter ولاعة مطبخ	manual operated ولاعة يدوي	2	unit	
19-1	Plastic bag أكياس بلاستيك	for product, 1.0 kg container للمنتج, سعة 1.0 كجم	2	kg	
19-2	Plastic bag أكياس بلاستيك	for product, 500 g container للمنتج, سعة 500 جم	2	kg	
19-3	Plastic bag أكياس بلاستيك	for product, 300 g container للمنتج, سعة 300 م	2	kg	
20	Plastic dish (plate) أطباق بلاستيك	ϕ20cm قطرها 20 سم	4	pc	
21	Spoon مغرفة	Aluminum, ϕ15cm, with handle 50cm ستانليس, قطرها 15 سم, ذات يد 50 سم	2	pc	
22	Wood spoon معالق خشبية	flat type, length 30-40cm نوع مسطح, طول من 30-40 سم	2	pc	
23	Kitchen glove مساكات سميكة	cloth made مصنوعة من القماش	6	pairs	
24	Latex glove قفازات مطاطيه	for hygiene, protection, not transpalent للنظافه, الحماية, ليست شفافة	20	pairs	
25	Soap صابون سائل	liquid type, 4 liter/bottle سائل, 4 لتر/ العبوة	2	bottle	
26	Scrubbing brush ليف سلك	stainless, round type ستانليس, النوع الدائري	10	pc	
27	Towel فوط	cloth made مصنوعة من القماس	20	pc	
28	Kitchen robe مريلة مطبخ	for hygiene, protection, cotton made للنظافه, الحماية, مصنوع من القطن	10	pc	
29	Tea cup كوب شاى	for tea serve لعمل الشاي	12	pc	
30	Kitchen board الواح تقطيع	plastic, 30cm x 45cm سم 45 × بلاستيك, 30 سم	5	pc	
31	Gauze شاش	with 0.9m 0.9 متر	10	meter	
32	Wax (candle wax) شمع	12pcs/bag, white color 12 قطعة/ العلبه, لون ابيض	10	bag	
33	Parchiment paper ورق زبدة شفاف	60cm x 100cm سم 100 × مادة ورقيه, 60 سم	10	sheet	
34	Scissors مقص	blade 20cm, stainless شفرة 20 سم, ستانليس	5	pairs	
35	Desk and chair مكتب و كرسي	for book keeping (account), wood made, desk: approx. 120 cm × 60 cm × 75 cm H للحسابات, خشب ارتفاع سم 75 × سم 60 × سم 120 ,	1	set	

2. Post-harvest Facility (Arab El Kadadeh village)

Contents

1. Introduction
2. Practical Training for Dried and Processed Basil Making
3. Drawings of Basil Drying & Processing Facility
4. Procured Equipment, Kadadeh

1. Introduction

Medical and aromatic crops such as basil are obliged to dry to sell. During the process, quality and quantity become low. Therefore, it is proposed to establish the processing facility such as drying yard or drying facility to increase the quality and reduce the proceeding loss to obtain more income for farmers in and around the villages.

Project description:

1. the village cooperative manages and operates the facility
2. The facility produces dried and primarily process products to sell the traders and/or exporters to final process to export.
3. Farmers in the village participate to the facility operation and supply the low materials.
4. Traders in the village and traders or exporters outside the villages participate to trade the processed product.
5. Governorate and district offices in cooperation with the traders and exporters conduct the technical and marketing supports.
6. Related agencies support the district and governorate offices.

Processing Facility in Kadadeh

Produce: dried & primarily graded basil

2. Practical Training for Dried and Processed Basil Making

1. Basil Drying

1- Basil receiving and weighing (received from small scale farmers)
(available around 3-6 ton/day; unit production: around 6 ton/feddan of green basil)



2- Basil drying by Kafas (piled up around 5 stages, required turn-over of basil; drying period: around 3 days)



3- Dried basil collecting & weighing (Unit production: around 18% of green basil)



2. Basil Processing by Machine

1- Leaves separating (machine capacity: 5 ton/hour dried basil)



2.- Grading (machine capacity: 2-3 ton/hour basil leaves)





3- Packing & weighing (Unit production: around 11% of green basil)

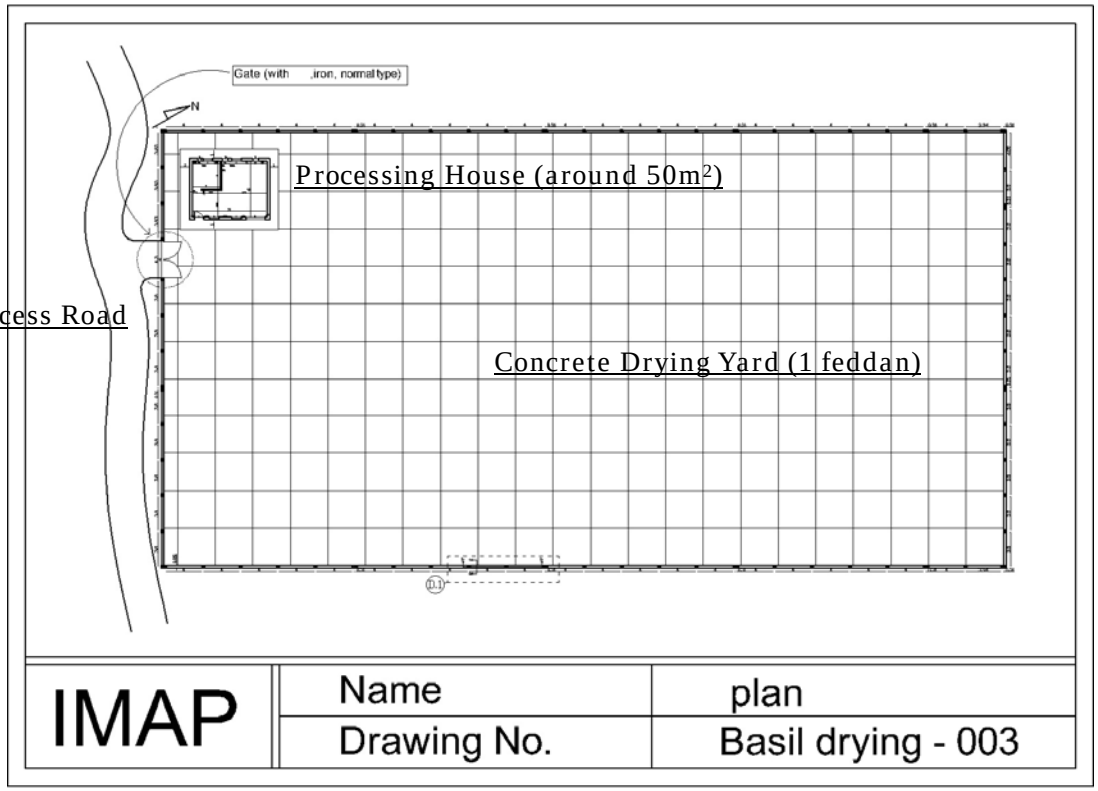



3. Others:

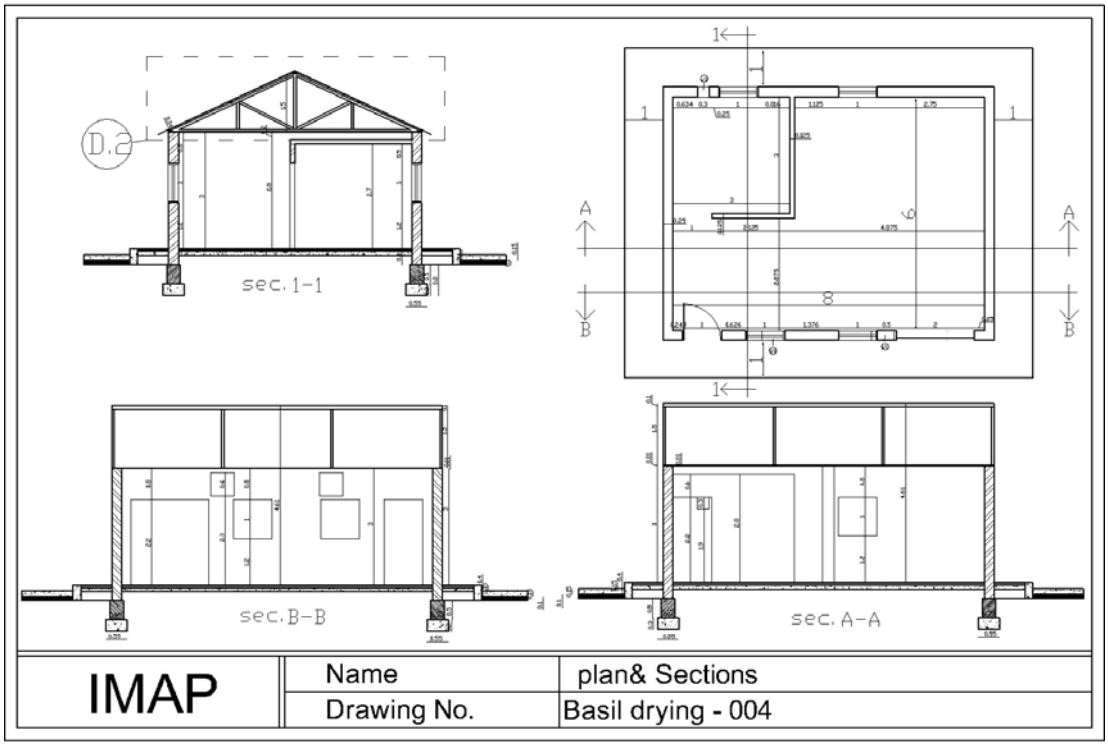
Seminar (governorate, district and village cooperatives, farmers, traders)



3. Drawings of Basil Drying & Processing Facility



Concrete Drying Yard with Processing House



Processing House

4. Procured Equipment, Kadadeh

Processed Food تصنيع الغذاء

1- Basil Drying, Threshing

No.	Description: Name of Equipments أسماء المعدات	Specifications: Materials, Size, Capacity, Weight المواصفات: المواد، الحجم، الوزن	Required Quantity الكمية المطلوبة	unit الوحدة	Remarks ملاحظات
1	Basil Kafas	approx. 90cm x 60cm x 20cm depth	2,000	pcs	
2	Crushing tools (Stand fork)	approx. blade 40cm width, 20cm height, 20 blade, iron made, finishing paint	5	unit	
3	Thresing machine	3-4t/day capacity, approx. 60cm x 1.6m x 2.0m height, with 3HP, 3-pahse motor, wood made step (60cm width x 1.0m length x 1.0m height)	1	unit	
4-1	Sieve (big holes)	approx. 1.0m diameter, wood frame, 5mm hole mesh	10	unit	
4-2	Sieve for dust	approx. 1.0m diameter, wood frame, 40" mesh	2	unit	
5	Sack for product	cloth made, approx 1.1m x 0.7m width	300	pcs	
6	Platform scale (balance)	0 kg - over 50kg, digital diplay, accuracy: 1g 0 كجم- 50 كجم (اقصي), عرض رقمي	1	unit	
7	Sewing machine	weight approx. 5 kg, single thread type	1	unit	
8	Thread	roll type for sewing machine	20	roll	

3. Agricultural Processing Unit (Rifa and El Egal El Bahary villages)

Contents

1. Introduction
2. Lecture Documents of Agricultural Processing
3. Practical Training for Tomato Paste Making
4. Practical Training for Carrot Jam Making
5. Practical Training for Frozen Okra Making
6. Practical Training for Fig Jam Making
7. Drawings of Agricultural Processing Unit in Rifa Village
8. Procured Equipment, Rifa
9. Drawings of Agricultural Processing Unit in Bahary Village
10. Procured Equipment, Bahary

1. Introduction

Tomato and pomegranate, etc. are thrown away if they are damaged or their prices to sell are low. To use the damaged or thrown crops effectively, it is proposed to establish the simple processing facility to convert useful to be consumed.

Project description:

1. The village cooperative manages and operates the unit
2. The unit produces various agricultural products using the agricultural crops grown in the village.
3. The unit is for tomato paste making, pomegranate seed packing, etc. as well as combination of jam, juice, frozen vegetable making.
4. Farmers in the village participate to the unit operation and supply the low materials.
5. Traders and retailers in the village participate to sell the processed products.
6. Governorate and district offices conduct the technical and marketing supports.
7. Related agencies support the district and governorate offices.

Processing Unit in Rifa village

Produce: Tomato paste, Carrot Jam, Frozen okra

Additional: Fig jam

Processing Unit in Bahary village

Produce: Pomegranate seed packing and juice, Orange jam & juice

Additional: Fig jam, Frozen okra

2. Lecture Documents of Agricultural Processing

Instructions for making Jams:-

1. The pots used in making the jam should be suitable for the amount of jam and bigger than the components inside it.

2. In the case of commercial production, if the producer wants to manufacture special pots for jam, those pots must have should be with half circular bottom to facilitate stirring process.

3. The tools used in stirring should preferably be made of wood (mosky or zan) and its size should be suitable with the size of pots used in cooking the jam, this helps in holding the tools easily without being affected by the heat of the pots.

4. Take in account that there isn't any emission of odors or fumes from the gas source used in heating the jam as it might affect the odor and the taste of the final product – also it is preferable to distribute the heat equally below the pots….which has its effect in speed up the cooking phase.

5. Stirring should be continued during the cooking and the speed of stirring has to be increased gradually till reaching the end of cooking – also it's preferable to decrease the heat near the end of cooking to avoid caramelizing or blackening of some parts exposed to high temperature.

6. During cooking the jam it's preferable to uncover the pot in the beginning to get rid of the moisture in the fruits so help in concentrating the ingredients, and there is an ability to cover the pot till components start boiling.

7. The amount of sugar can be increased or decreased (from the illustrated amounts for every type of fruit) according to the desire of the consumer but with attention during using or storing the jam.

8. Glucose (corn honey) can be used with the ordinary sugar with this percent sugar +1 glucose and the aim is to minimize the cost.

9. It is always preferable to use sugar with light color as it helps making jam with light color which is more desirable to the consumer.

10. Froth formed during the process of making jam should be removed on and on as it is a material harmful to health.

11. Adding the pectin: the amount of pectin should be mixed well first with small amount of sugar then add the mixture gradually to the pot with continue stirring. by this way the pectin distributes in the whole jam mixture and avoid formation of cluster which doesn't dissolve or melt in water which if happened will cause defects in the produced jam

12. When adding the dark colored gelatin it should be soaked first in an amount of water which equals 3 times the weight of the gelatin whether cold or warm water ,the time of soaking is around 12 hours, the result solution is added to the mixture gradually during the cooking with continued stirring.

13. In some types of jams as fig jam neither pectin nor gelatin is added as it is already rich with pectin substances and gives the ideal texture with no need for adding any pectin or gelatin.

14. Pectin and gelatin are always added in the late stages in cooking as if we add them from the start it will weaken their effect.

15. When there is a need to add artificial colors those colors must be healthy and not harmful to health and also it must be dissolved first in an amount of warm water then this solution is added to the jam components (near the end stage) and in every time we should take a sample to compare with the needed color, and it is prohibited for the producer to use any colors of unknown sources but they should use the products of food extract industry companies, for example: Cairo extracts company (OR company).

16. Citric acid is added (directly to the mixture during cooking with no need to dissolve first in water).

17. Carnation (cloves) and vanilla are added near to the end of cooking to prevent evaporation of the aroma during cooking.

18. Ways to know that the jam is well cooked:

- ***The spoon way:-***

Take small piece from the jam on a stainless steel spoon and quickly let it cool in air then pour it from the spoon. . . if the jam is well cooked the consistency tends to be solid not loose.

- ***The dish way:-***

Put a suitable amount on a flat stainless steel dish – let the dish to cool quickly

by exposing the outer surface of the dish to cold water- then take a small amount from the dish with the tip of your finger , if it stayed for a while on the tip of the finger before falling down it is well cooked.

- ***Using the thermometer:-***

If there is mercury thermometer which can measure high temperature it can be carefully used to avoid breaking it, or use metal thermometers (which are available in laboratory equipments stores) and it can be immersed in the jam in the last stage of cooking when temperature reach 104.5 degree centigrade it means the jam is well cooked.

Industrial and commercial quality considerations of the jam:

1) It is preferable to use glass packets with white transparent color too be easy to see what type of fruit used inside.
2) The solid appearance and the homogenous texture between parts of the packets.
3) The good taste of the used fruits.
4) The jam must be free from any impurities or burn of some parts.
5) Good sealing of the jar to be impermeable to air.
6) The percentage of solid dissolved materials is 68- 70 %.
7) In case of using artificial colors it has to be healthy approved.
8) The color of jam must match the used fruit.

Freezing citrus

1) Use ripe solid fruits with few or no seeds (abo sora).
2) Peal the fruit well with removal of the white layer around the lobes.
3) Put the whole lobes side by side in the box and put cold light or moderate syrup on it.
4) Cover and put in the freezer – it is good in fruit salad dishes and decorating cakes, orange may be preserved as juice with lemon juice.

Note:-
Light syrup means adding 400 gm of sugar for every 2 cups of water.
Moderate syrup means adding 600 gm of sugar for every cups of water.
Then the sugar is dissolved in water on flame with low grade heat for 2-3 minutes then let it cool

before use. Or the sugar may be added to the fruit in alternative layers by using 2-3 large spoonfuls for every ½ frozen kilos.

Strawberry and grape

1. Choose the good solid ones – take off the green crown then wash.
2. The big strawberries is cut into 1 cm thickness slices , use the grapes without seeds and it is preserved as whole ones
3. The fruits are stored in boxes – add light syrup or water with lemon juice – close the box and freeze it.
4. On serving unfreeze the fruit carefully then serve it while still keeping some ice.
5. It is good for fruit salad dishes or for stuffing and decorating tarts and pies, the strawberry and grape could be preserved as juice with added lemon juice, also can add sugar.

How to make tomato sauce

The steps:-

1. Exclude the damaged fruits and those with fermented odor.
2. Choose the completely ripped fruits.
3. Take off and exclude the green stems.
4. Wash the fruits very well then shred them by hands pr use the squeezers directly to obtain the tomato juice with help of some water.
5. Use refinery does not allow seeds to pass for draining the juice.
6. The drained juice put in piece of cloth (dabalan) with bag shape and then tie this cloth from above
7. Hang those bags near to a wall to permit draining of the extra water with the juice, this step is important to minimize time and effort needed to concentrate the juice.
8. Continue hanging the bags for 6-8 hours, in summer shorten the time to avoid spoiling of the juice and you can overcome this problem by adding salt with percentage 10 gm/ liter and 1 gm sodium benzoate/ liter before hanging the bags.

9. Take the content of the bags which know is thick and put them in pot on flame with continued stirring till reach the suitable texture.

10. When the solid dissolved material reaches 25% it means the sauce concentration is good. if there is no equipment to measure the solid dissolved material, when the color turns to deep red it means that it reached the wanted texture.

11. The sauce packed while still warm in plastic or glass jars or in tin if there is an ability to mechanically close it.

Production of tomato paste (sauce)

The steps:

1- Exclude the damaged fruits and those with fermented odor and wash the fruits very good then divide it to half or quarters.
2- Use an electric mixer to mash and drain the juice using a refinery with narrow holes or piece of cloth to get rid of the remnants of the crust and seeds.
3- Drained juice put inside a pot on the fire till boiling with continuous stirring till reach the suitable texture.
4- We make equation to the acidity by adding amount of sodium bicarbonate to the concentrated juice while stirring, the acidity must not be more than 0.09 to 1.5 % with caution while adding sodium bicarbonate because carbon dioxide will get out which make the sauce boiling strongly.
5- After that we should add amount of salt 1:2 % (10 to 20 gram per liter) and must dissolve the salt in a little water before adding it.
6- Should continue to boil for one to three minutes with continuous stirring then packed the sauce in glass jars and before close the jars should put a little amount of corn oil, and kept refrigerated until use.

Concentration of tomato sauce:

The temperature at which the evaporation of tomato juice happen consider an important criterion to control the quality , cause evaporation in high temperature lead to more cooking for tomatoes and that will make it's color brown not red .

Carrots jam

Ingredients:

- One kilogram Carrots after washing and curettage.
- One and a quarter kilogram sugar.

- Three gram citric acid per one kilogram sugar.
- 20 gram pectin or gelatin per one kilo sugar.
- Half teaspoon of cinnamon or soft cloves as needed.

Steps of making Carrots jam :

1- Wash the carrots well then curettage with knife and wash it again after that then weighed.
2- Boil the carrots well after adding fewer amounts of water but must enough to cover the carrots.
3- After cook the carrots we mince it using the manually chopper or cut the carrots to small pieces then mash it in the refinery to become a paste.
4- Put the paste on a flame and add to it the sugar , citric acid and pectin or gelatin.
5- You must continuous stirring the paste and move the top layer (bubbles).
6- Put some cinnamon or soft cloves as needed to make the taste and smell better.
7- After cooking well, must move the paste from the flame.
8- leave it to cool a bit , then packed while still hot in clean and dry jars and close the jars after became cool .

types of spoilage and its causes :

1 -Saccharification:

Its occurs as a result of adding large amount of sugar or not adding citric acid with sufficient quantity so it must to use the specific amount of sugar and citric acid .

2 - Weak texture:

Its occurs as a result of not adding sufficient quantity of sugar which is lead to not cooking the jam well , so we must add the accurate amount of sugar , and know the point which the jam be cook well .

3 - Defects in general appearance:

The presence of impurities which has a different color.

4 - Poor taste:

Its occurs as a result of the lack of complete concentration or use small amount of sugar so it's better to complete the concentration and add accurate amount of sugar.

5 – Appear the fungal growth on the surface of jam:

Its occurs if the jars closed before the jam be cool , that will lead to the accumulation of moisture on the lid then drops of water falling on the surface of the jam, which cause the appearance of fungal growth on the surface of jam .so jars must be closed after it became cool jam .

Frozen fresh Okra

Okra contains many mineral elements such as phosphorus, iron, calcium and with a high content of vitamin C, also nicotinic acid which is Shield of pellagra disease also It is food that treat constipation and protects the lining of the stomach and intestines.

***First: Terms of harvesting the crop*:**

- Harvest or collect okra must be before the completion of growth so as not to increase fiber or hardening (okra became so bigger)

Second: the steps of frozen:

1- The process of sorting and grading :

Good selection of fruits and excludes fruits damaged and classified it as it's size, usually preferred small sizes.

2- Washing process :

By using water in a large plastic dishes.

3- Processing :

Is to remove the upper part of the okra in a pyramid shape carefully without scratch the interior parts so the fruits don't Leak its liquid.

4- Boiling process :

Put Okra in a refinery then put the refinery in boiling water (and this water added to it amount of salt and one gram of sodium benzoate or big spoon of lemon) for three minutes then take the refinery out from the boiling water and leave it till all the water fell down from the refinery .

5- Cooling process :

Is done by the water to assist in the elimination of the enzyme and also to stop the effect of steam on the product.

6- Packing process :

It done by using Polyethylene bags in different weighing according to the need with suction the air from inside the bags then bags shall be close strongly by using a welding machine.

7- Freezing process :

Freezing must be happen directly after boiling, and the bags can stay at the freezer for 6 months.

8- Storage process :

Frozen vegetables are stored on the degree of - 18 while maintaining the stability of the temperature at this level.

Frozen fresh pomegranate

Steps :

Frozen Fresh Pomegranate

1- Washing pomegranates, and cut it to two part, then hyper pomegranates seeds
2- Put pomegranates seeds in suitable container with sugar and mix it
3- Packaging process: packaging in bags of high density polyethylene with deferent weights by demand, with the explosion of air and don't leave spaces then govern the closer of bags by using closer machine

Pomegranate Syrup Making

(Pomegranate Syrup)

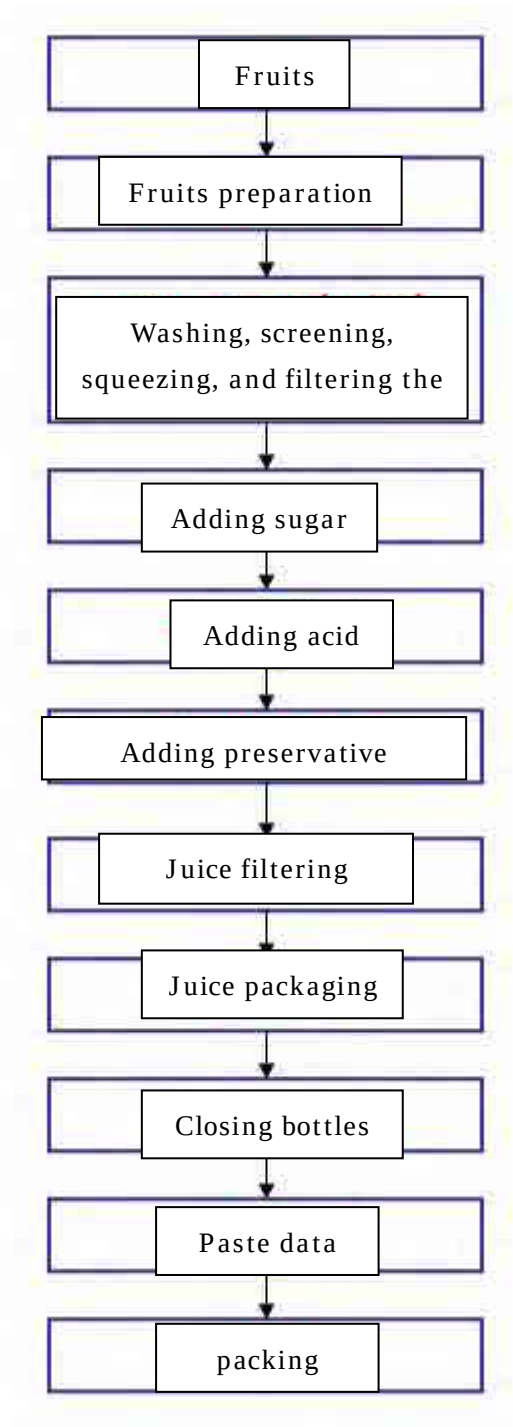
Components:

1 kg pomegranate
500gr sugar
1.5gr citric acid or (juice of 1 lemon)
½ cup of water
1 small spoon of flower water
½ gr of sodium benzoate

Method:

1- Select the fruits which has a dark red seeds and free of fungal infection then washing it well
2- Separate seeds from peel – cutting pomegranate fruit latitude to two part, then put the part on your hand and knocked on the peel side with wood spoon and but seeds in deep bowl
3- Pick up the white pieces from bowl
4- Mixing seeds with some water with electric mixer
5- Using filter with narrow holes or gauze to separate seeds from juice
6- Transform juice to the cooking pot and adding sugar and stirring with wood spoon until boiling to being strength condenses
7- Add citric acid or lemon juice and left it boiling for 5 mints
8- Add water flower to the juice and mixed it well
9- When it still hot we Packaging it in dray and clean bottles and closed it well
10- Diluted by demand

Diagram of local juices manufactory



Orange Jam Making

(Orange Jam)

component :

1 kg orange
1.250 kg crystallized sugar
1 big spoon of lemon juice or 3gr citric acid/ 1kg sugar
Few cinnamon as desired

method:

1- Selecting the orange with thick and coarse peel not the sleek one, this kind like (seed orange or navel orange, or summer orange)
2- After washing remove the peel from fruits
3- Cutting the peel to thin slices (1-2 ml), length about 2cm
4- Boiling this peel for once or twice to get rid of boiling water and to remove the sour test (it is essential volatile oil)

5- Squeezing orange fruits to get pure juice without seeds or bug
6- Melted 1.25kg sugar with 1liter orange juice and put it on heat and add 1 big spoon of lemon juice, but cinnamon in bundle of gauze then add it to them to get spatial taste

7-adding the orange peel to this liquid with kipping boiling and stirring be continuous with low heat until to end and remove the cinnamon bundle and remove any layer on the face of jam during cooking

8-when the jam still hot we can baking it in clean and dray jars .

9- closing jars with tide lock lid

10- clean the out jars by wet cloth and left jars in airy place to get cold

Manufacture of orange juice

Components:

Enough orange fruits for make 1 liter of orange juice
1.400 kg pure white sugar
2gr of sodium benzoate
Enough lemon fruits for make 200ml of lemon juice
.250 liter of water

Method :

1- Good washing then minced peel of 6 orange fruits
2- Adding a small amount of sugar to the peel minced and mixed it well
3- Squeezed orange and filtered it with dray and clean gauze (narrow holes) and also lemon separately
4- Add sugar to water and melted it over low heat
5- Add orange and lemon juice and mixed it will, then add benzoate after melted it in small amount of hot water then mixed all together with continuous stirring until melted
6- Bring the peel minced and minced it again then but it in peace of gauze to squeeze it to extract oil , and add this oil to the juice with stirring
7- When it still hot we can Packaging it in dray and clean bottles and closed it well after completely cooled
8- Diluted by demand

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3. Practical Training for Tomato Paste Making

Steps of tomato paste making

- Ingredient

* 10kg hard tomato
* 9-10 gm sodium bicarbonate for each 1 concentrated liter of tomato juice
* 10-20 gm salt for each concentrated liter of tomato juice

1- Receiving

* Estimated weight 10kg
* Duration 2 min
* Equipment Plastic containers, strainers
* Manpower 2 persons

Notes: The damaged fruits or the fermented one must be excluded.

2- Putting in water cleaning

* Duration 10 min
* Facilities cleaned area, water supply
* Equipment strainers
* Manpower 2 persons

3- Removing the higher tip of tomato

* Duration 15 min
* Equipment Plastic containers, Knifes
* Manpower 6 persons

4- Squeezing 10kg of tomato

* Duration 5 min
* Equipment Squeezer, plastic container
* Manpower 5 persons

5- Filter the tomato juice

* Duration 30 min
* Equipment plastic containers, strainers
* Manpower 3 persons

Notes: make sure that the juice id free from any crust or seeds after filtration.

6- Boiling the filtered tomato juice

* Duration 2 hours
* Equipment Gas burner, pot, strainers
* Manpower 2 persons

Notes: Put the remaining of the filtration in strainers over the pot in order to extract all the juice from it.

7- Jar sterilization

* Duration 10 min
* Equipment oven
* Manpower 2 persons

Notes: Turn on the oven till become hot then turn it off then enter the clean and wetted jars and its covers

8- Putting a paper with a wax in jars cover

* Duration 15 min
* Manpower 2 persons

Notes: This process is for keeping the sauce sterilized.

9- Testing the ripping of tomato sauce

* Duration 1 min
* Equipment Plate, wooden spoon

Note: The ripping mark is disappearance of the water from the drop of the sauce which taken on the plate and getting a suitable texture.

10- Estimate the amount of the concentrated tomato paste

* 10 kg produce about 3 liter concentrated paste if the tomato is hard.
* Duration 10 min
* Manpower 3 persons

11- Estimation of the amount of sodium bicarbonate and add it to the paste

* Duration 10 min
* Manpower 3 persons

Notes: The amount of the sauce is about 3 liter, so the amount of sodium bicarbonate will be 40 gm.

Take caution while adding sodium bicarbonate because it make the sauce boiling strongly.

12- Estimate the amount of salt and add it to the paste

* Duration 10 min
* Manpower 3 persons

Notes: The amount of the salt will be about 30:35 gm it depends on the taste (It must be tasted to make sure that the amount of the salt is suitable)

13- Put the paste in the jars

* Duration 15 min
* Manpower 3 persons

Notes: Leave the paste till cool

Use the scale to estimate 350 gm putted in the jar as net weight of tomato paste.

14- Adding drop of corn oil

* Add drop of oil on the paste surface as a preservative substance to delay its expired date.
* Close the jars and keep it in the refrigerator.

15- Clean the equipment and the whole place

* Duration 30 min
* Manpower 6 persons

Notes: The total time for tomato paste making is about 4 hours.

Faults of tomato paste making

* Brown color of the paste that because increasing the temperature during cooking (the color must be red)
* Appearance of some moulds on the surface of the sauce that because the jars not sterilized well or the jars may be covered while the paste stell hot so the steam which evaporated cause this mould affection.

4. Practical Training of Carrot Jam Making

STEPS OF CARROT JAM MAKING IN RIFA

Ingredient

* 1 kg carrot after washing and curettage
* 3 gm citric acid for each 1 kg sugar
* 750 gm sugar for each 1 kg carrot

1- RECEIVING

* Estimated weight	10 kg carrot
* Duration	1 min.
* Equipment	Plastic containers, scale
* Manpower	2 persons

2- WASHING THE CARROTS

* Duration 5 min.
* Facility Cleaned area, water supply
* Equipment Strainers
* Manpower 2 persons

3- TRIM THE CARROTS WITH KNIFE AND WASH IT AGAIN AFTER THAT

* Duration 15 min.
* Equipment Plastic containers, knives, clean boards
* Manpower 6 persons

4- CUT THE CARROTS TI SMALL PIECES

* Duration 30 min.
* Equipment Knives, boards
* Manpower 4 persons

5- BOIL THE CARROTS WELL AFTER ADDING FEWER AMOUTS OF WATER

* Duration 90 min.
* Equipment Pot, gas burner
* Manpower 2 persons

6- ADD THE SUGAR AND THE CITRIC ACID

* 10 kg carrot produce 9 kg carrot after corrugate
* So sugar amount will be about 6.75 kg
* So citric acid amount is 21 gm
* Duration 10 min.
* Equipment Scale

7- CONTINUOUS STIRRING AND REMOVE THE TOP LAYER (BUBBLES)

* Duration 30 min
* Equipment Wood spoon
* Manpower 2 persons

8- TESTING THE RIPPING OF THE JAM BY THE THERMMETER

* Duration 1 min.
* Equipment Thermometer

Notes: The ripping point is 104.5°C.

9- PUT THE JARS INSIDE THE OVER FOR STERILIZATION

* Duration 10 min.
* Equipment Oven
* Manpower 2 persons

Notes: Use lower flame in this stage.

10- POUR THE JAM IN THE STERILIZATION JARS AND LEAVE TO COOL

* Duration 15 min.
* Equipment jars, large spoons, funnels
* Manpower 3 persons

Notes: 1- Remove the superficial whie layer from the surface of the jam and cover it by a piece of gauze to protect it from the outer pollution.

2- Use the scale to estimate 350 gm of jam as a net weight in each jar. The empty jar weight is 170 gm.

TYPES OF SPOILAGE AND ITS CAUSES:

1- Saccharification

It occurs as a result of adding large amount of sugar or not adding citric acid with sufficient quantity so it must to use the specific amount of sugar and citric acid.

2- Weak texture

It occurs as a result of not adding sufficient quantity of sugar which is lead to not cooking the jam well, so we must add the accurate amount of sugar, and know the point which the jam be cooked well.

3- Defects in general appearance

The presence of impurities which has a different color.

4- Poor taste

It occurs as a result of the lack of complete concentration or use small amount of sugar so it’s better to complete the concentration and add accurate amount of sugar.

5- Appear the fungal growth on the surface of jam

It occurs if the jars closed before the jam be cooled, that will lead to the accumulation of moisture on the lid then drops of water falling on the surface of the jam which cause the appearance of fugal growth on the surface of jam, so jars must be closed after it became cool jam.

5. Practical Training for Frozen Okra Making

Steps of making frozen fresh okra

Terms of harvesting the crop:

* Harvest or collect okra must be before the completion of growth so as not to increase fiber or hardening (okra becomes so bigger)

1- The process of sorting and grading

- Good selection of fruits and excludes fruits damaged and classified it as it's size, usually preferred small sizes.

* Duration 10 minutes per kg
* Manpower 2 persons

2- Washing it

* Duration 10 min per kg
* Facility Basin, water supply
* Equipment Strainers
* Manpower 2 persons

3- Processing it

* Is to remove the upper part of the okra in a pyramid shape carefully without scratch the interior parts so the fruits don’s leak its liquid.

* Duration 10 minutes per kg
* Facility Knives
* Manpower 4 persons

4- Boiling it

* Put okra in a strainer then put the strainer in boiling water (and this water added to it amount of salt and one gram of sodium benzoate or big spoonful of lemon) for five minutes then take the strainer out from the boiling water and leave it till all the water fell down from the strainer.

* Duration 5 minutes
* Facility Gas burner, pot, strainer
* Manpower 2 persons

5- Cooling it

* Is done by the water to assist in the elimination of the enzyme and also to stop the effect of steam on the product.

* Duration 5 minutes
* Facility Water supply
* Manpower 1 person

6- Packing it

* Is done by using polyethylene bags in different weighing according to the need with suction the air from inside the bags then bags shall be closed strongly by using a sealing machine.

* Duration 5 minutes per kg
* Facility Plastic bags, sealing machine
* Manpower 2 persons

7- Freezing it

* Freezing must be happen directly after boiling, and the bags can stay at the freezer for 6 months.

* Duration 2 minutes
* Facility Freezer

6. Practical Training for Fig Jam Making

Steps of fig jam production in Rifa and Bahary

*** Ingredient**

* Fig: 21 kg
* Sugar: 750 gm for each 1 kg of fig so we will use about 15 kg.
* Citric acid: 3 gm for each 1 kg of sugar so the total amount is 75 gm

1- Receiving

* Estimated weight 21 kg
* Duration 5 min
* Equipment Plastic containers, strainers
* Manpower 4 persons

Notes: The damaged fruits or the fermented one must be excluded.

2- Putting in water cleaning

* Duration 20 min
* Facilities cleaned area, water supply
* Equipment Strainers, plastic containers
* Manpower 6 persons

Notes: Must be cleaned well because there is a lot of sand in it.

3- Removing the tip of the fig and cut it to small pieces

* Duration 1 hour
* Equipment Plastic containers, Knives
* Manpower 6 persons

4- Weighing the loss and cut it from the total amount

- The weight of the removed tips is about 500 gm so the net weight of fig is 20 kg and 500 gm.

5- Put the fig in the pot with sugar

* It must be putted alternatively (layer of fig and layer of sugar on it) to be mixed well with each others. And extract the water from the fig by the help of the sugar.

6- Put the pot on the heat

* Put it in the beginning on high heat till boiling then make the heat low with continuous mixing.

* Equipment Gas burner, pot, wooden spoons

* Manpower 2 persons

7- Jar sterilization

* Duration 10 min

* Equipment Oven

* Manpower 2 persons

Notes: Turn on the oven till become hot then turn it off then enter the clean and wetted jars and its covers also putted.

8- Putting a paper with a wax in jars cover

* Duration 15 min
* Manpower 2 persons

Notes: This process is for keeping the jam sterilized.

9- Removing the ream which above the surface of the jam

* Remove the surface layer of the jam to be clear from any ream.

10- Putting the amount of the citric acid

* Put all the amount of the citric acid which estimated before according to the amount of the sugar. So 75 gm of citric acid will be added.

11- Testing the ripping of the jam

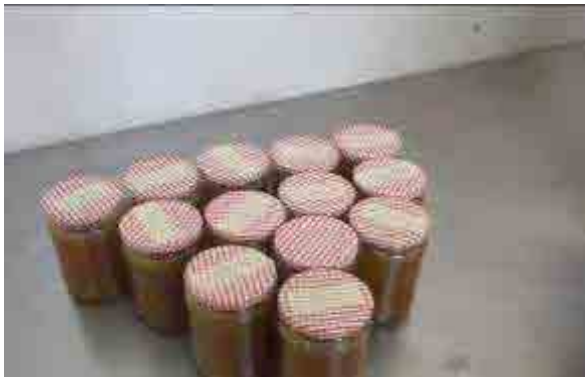
- It is tested by mercury thermometer.
- The ripping point is about 104℃.

12- Pour the jam in the jars

* Duration 30 min
* Manpower 6 persons

Its produce is about 70 jars.

13- Leave it to cool then cover it



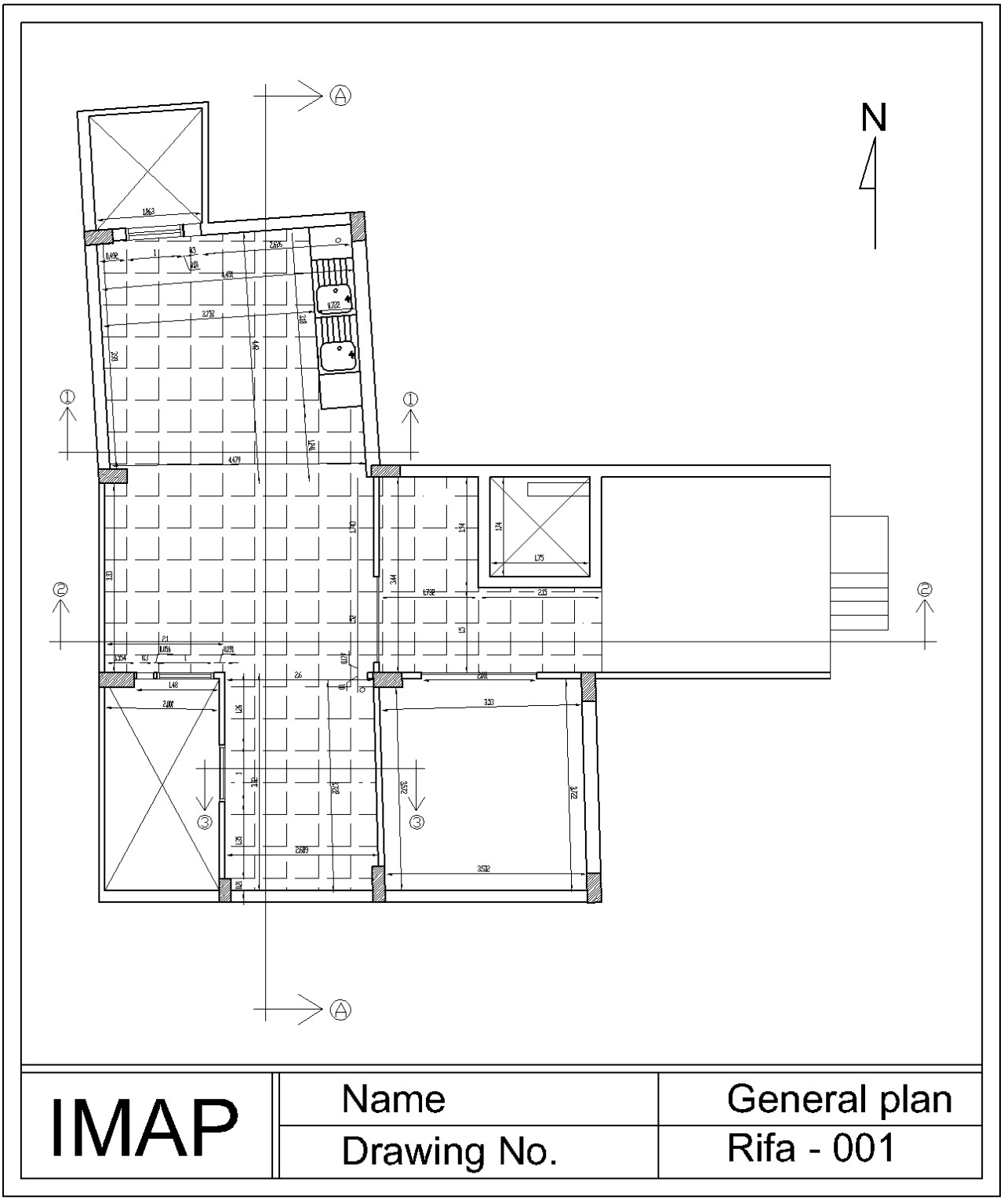
- Leave it till complete cooling and cover it by a piece of gauze to protect it from the outer pollution then cover it.
- Notes: The faults of the fig jam the same as the orange jam.

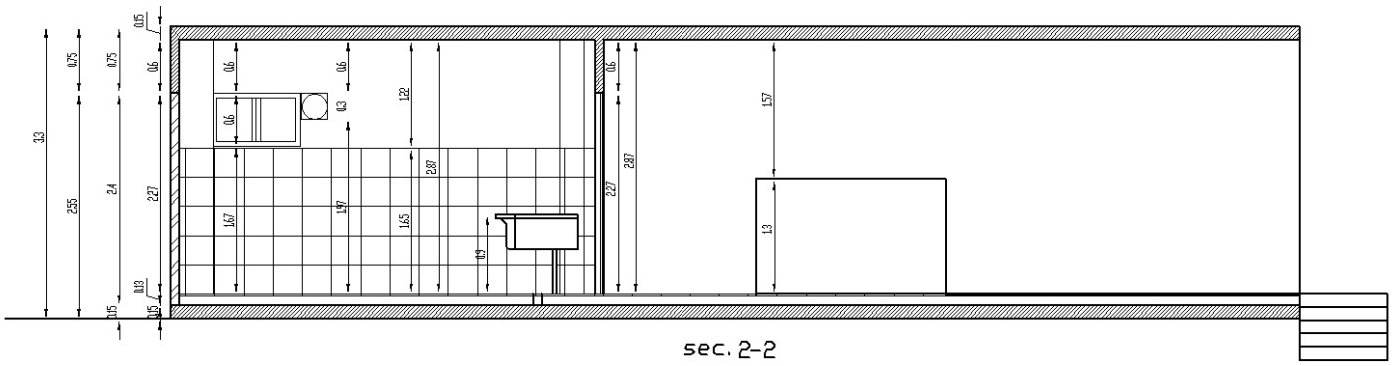
14- Clean the equipment and the whole place

* Duration 30 min
* Manpower 6 persons

Notes: The total time for fig jam making is about 3 hours.

7. Drawings of Agricultural Processing Unit in Rifa Village





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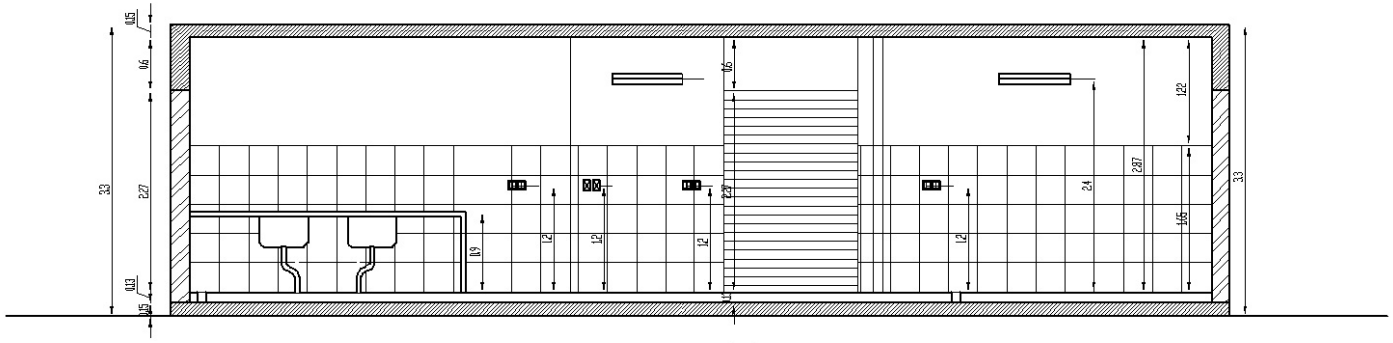
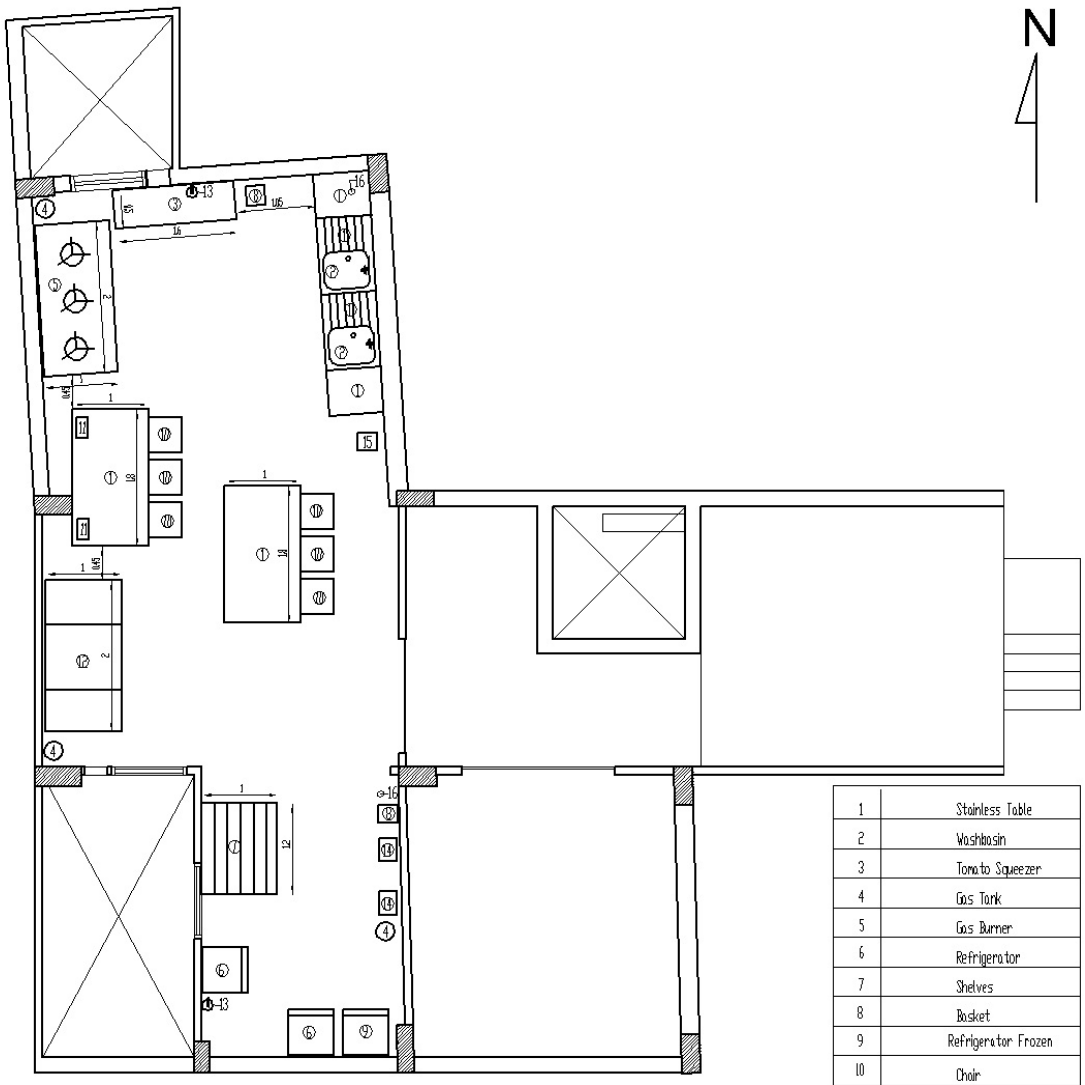


sec. A-A

IMAP	Name	Section2-2 &A-A
	Drawing No.	Rifa - 002



1	Stainless Table
2	Washbasin
3	Tomato Squeezer
4	Gas Tank
5	Gas Burner
6	Refrigerator
7	Shelves
8	Basket
9	Refrigerator Frozen
10	Chair
11	Electric Sealer
12	Gas oven
13	Fire extinguisher
14	Scale
15	Pot
16	Hole Drainge

IMAP	Name	Furn. plan
	Drawing No.	Rifa - 006

8. Procured Equipment, Rifa

Processed Food تصنيع الغذاء

1- Carrot Jam مربى الجزر

2- Frozen Okra تجميد البامية

3- Tomatoes Paste صلصة الطماطم

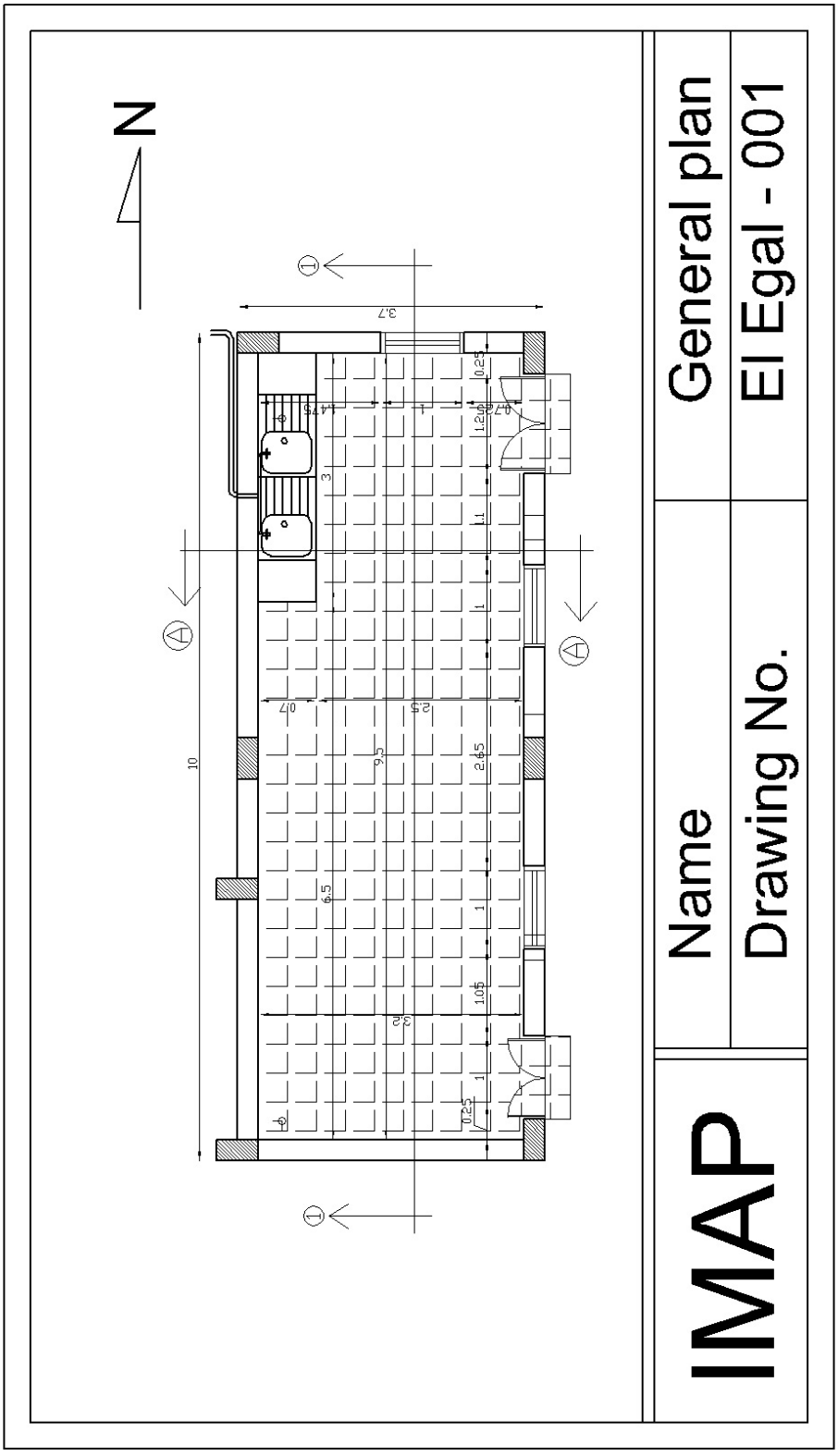
Equipment List

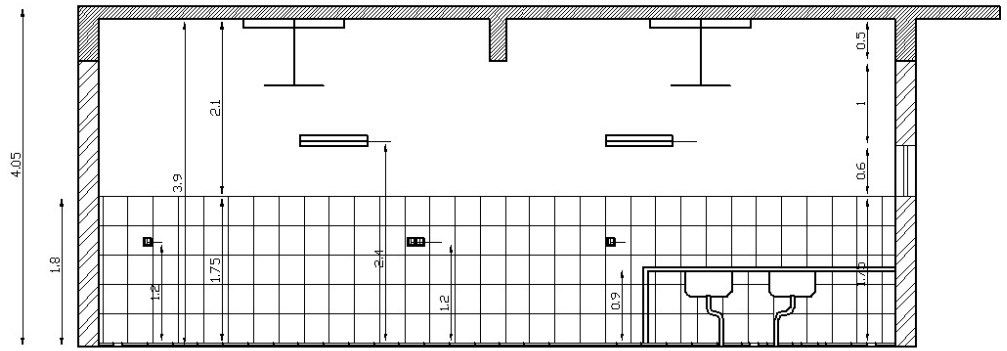
No.	Description: Name of Equipments أسماء المعدات	Specifications: Materials, Size, Capacity, Weight المواصفات: المواد، الحجم، الوزن	Required Quantity الكمية المطلوبة	unit الوحدة	Remarks ملاحظات
1	Table مناضد ستانليس ستيل	stainless, 200cm x 100cm x 75cmH سم ارتفاع 75 × سم 100 × سم 200	2	unit	
2	Squeezer عصارة	with 1.5HP motor (3 phase), iron cast body belt, relay cord & base table (approx. 90cm x 40cm) موتور 1.5 حصان (3 مرحلة), سير (40سم × قاعدة (حوالي 90 سم ,	1	unit	
3	Gas tank انبوبة غاز بوتاجاز	approx. 1.2m x ϕ40cm قطرها 40 سم × حوالي 1.2 متر	4	unit	
4-1	Gas Burner بوتجاز	2-burner type, (order made) with 120cm x 60cmx60cmH, frame base شعلة, بوتجاز مسطح تصنيع يدوى 2 سم ارتفاع 60 × سم 60 × سم 120	2	unit	
4-2	Gas Burner بوتجاز	1-burner type, (order made) with 60cm x 60cmx60cmH, frame base شعلة, بوتجاز مسطح 2 سم ارتفاع 60 × سم 60 × سم 60	1	unit	
5	Refrigerator ثلاجة	approx. 60cm x 60cm x 165cm 4 shelves, 2 doors (cooling, frozen) سم 165 × سم 60 × تقريبا 60 سم (رفوف, 2 باب (مبرد, مجمد 4 ,	2	unit	
6	Shelves ارفف	Kitchen shelves, steel made, 100cm x 120cm x 160cmH (40cm x 4 shelves) (movable) سم 160 × سم 120 × رفوف مطبخ, 100 سم (رفوف(متحرك 4 ,	1	unit	
7	Basket صناديق قمامة	plastic, 60 liters بلاستيك, سعة 60 لتر	3	pc	
8	Freezer ديب فريزر	approx. 60cm x 60cm x 120cm 5 doors سم , 5 ادراج 120 × سم 60 × حوالي 60 سم	1	unit	
9	Chair مقاعد	wood made, (material zan) خشب زان	6	unit	
10	Electric sealer ماكينة لحام الأكياس	approx. length 400mm,500 w handy type امتداد اللحام حتى 400ر مم , 500 واط	2	unit	
11	Gas Oven فرن غاز	3-oven type, (oder made) with 80cm x 100 cmx 17mH, frame base	1	unit	
12	Fire extinguisher طفاية حريق	ABC type, 6 kgs ABC كجم, نوع 6	2	unit	
13-1	Scale (small) ميزان	table-top type, accuracy 0.1g 0 kg - over 5kg, digital diplay 0 كجم- 5 كجم (اقصي), عرض رقمي	1	unit	
13-2	Platform scale (balance) ميزان	0 kg - over 40kg, digital diplay, accuracy: 1g 0 كجم- 40 كجم (اقصي), عرض رقمي	1	unit	
14-1	Plastic container طشت بلاستيك	φ50cm x depth 40cm, 30 liter مجوف 40 سم , 30 لتر × قطر 50 سم	6	pc	
14-2	Pot حلل	Alumminum ,30 liter 30 لتر, المونيوم	6	pc	
15-1	Strainer مصافى	Stainless, with handle, ϕ20cm ستانليس ذات يد طويلة , قطر 20 سم	3	unit	
15-2	Strainer مصافى	Stainless, with handle, ϕ25cm ستانليس ذات يد طويلة , قطر 25 سم	3	pc	

Equipment List

No.	Description: Name of Equipments أسماء المعدات	Specifications: Materials, Size, Capacity, Weight المواصفات: المواد، الحجم، الوزن	Required Quantity الكمية المطلوبة	unit الوحدة	Remarks ملاحظات
16	Strainer مصافى	Aluminum, with legs, ϕ35cm ستانليس ذات اقدام , قطر 35 سم	6	pc	
17	Jar (measuring) دورق مدرج	stainless, 2 litres ستانليس ستيل يسع 2 لتر	2	pc	
18	Bottle (grass) برطمانات	for product, 350g container with cap للمنتج, سعة 350 جرام ذات غطاء	300	pc	
19-1	Kitchen knife سكاكين	blade 15cm - 25cm, stainless, 6 different kinds ,انواع مختلفة, ستانليس 6 شفرة من 15سم- 25 سم	1	set	
19-2	Kitchen knife سكاكين	blade 20cm, stainless شفرة 20 سم, ستانليس	3	pc	
20	Kitchen lighter ولاعة	manual operated, handy type يدويا, نوع في المتناول	2	unit	
21-1	Plastic bag أكياس مفرغة من الهواء	for product, 1.0 kg container للمنتج, سعة 1.0 كجم	2	kg	
21-2	Plastic bag أكياس مفرغة من الهواء	for product, 500 g container للمنتج, سعة 500 جم	2	kg	
22	Plastic dish (plate) أطباق بلاستيك	ϕ20cm قطرها 20 سم	4	pc	
23-1	Spoon مغرفة	Aluminum, ϕ15cm, with handle 50cm ستانليس, قطرها 15 سم, ذات يد 50 سم	3	pc	
23-2	Spoon مغرفة	Aluminum, ϕ25cm x 10cm, with handle approx. 25cm ,سم 10 × المونيوم, قطرها 25سم مقبض 25 سم	4	pc	
24	Wood spoon معالق خشبية	flat type, length 30-40cm نوع مسطح, طول من 30-40 سم	7	pc	
25	Kitchen glove مساكات سميكة	cloth made مصنوعة من القماش	6	pairs	
26	Latex glove قفازات مطاطيه	for hygiene, protection, not transpalent للنظافه, الحماية	20	pairs	
27	Soap صابون سائل	liquid type, 4 liter/bottle سائل, 4 لتر/ العبوة	2	bottle	
28	Scrubbing brush ليف سلك	stainless, round type ستانليس, النوع الدائري	10	pc	
29	Towel فوط	cloth made مصنوعة من القماس	20	pc	
30	Kitchen robe مريلة مطبخ	for hygiene, protection, cotton made للنظافه, الحماية, مصنوع من القطن	10	pc	
31	Tea cup كوب شاى	for tea serve لعمل الشاي	12	pc	
32	Kitchen board الواح تقطيع	plastic, 30cm x 45cm سم 45 × بلاستيك, 30 سم	5	pc	
33	Gauze شاش	with 0.9m 0.9 متر	10	meter	
34	Thermometer ترمومتر زنبقي	max. 105℃, stainless cover, alchole غطاء معدني ,يصلح للقياس حتى105 درجة منوية	3	pc	
35	Wax (candle wax) شمع	12pcs/bag, white color 12 قطعة/ العلبه, لون ابيض	10	bag	
36	Parchiment paper ورق زبدة شفاف	60cm x 100cm سم 100 × مادة ورقيه, 60 سم	10	sheet	
37	Scissors مقص	blade 20cm, stainless شفرة 20 سم, ستانليس	5	pairs	
38	Desk and chair مكتب و كرسي	for book keeping (account), wood made, desk: approx. 120 cm × 60 cm × 75 cm H للحسابات, خشب ارتفاع سم 75 × سم 60 × سم 120 ,	1	set	

9. Drawings of Agricultural Processing Unit in Bahary Village





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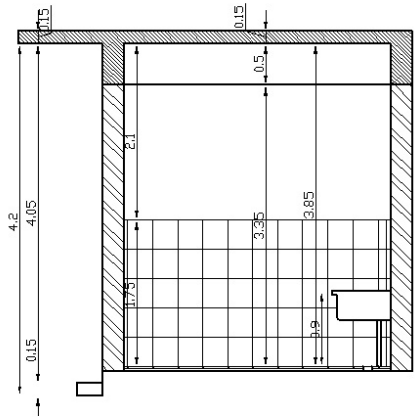
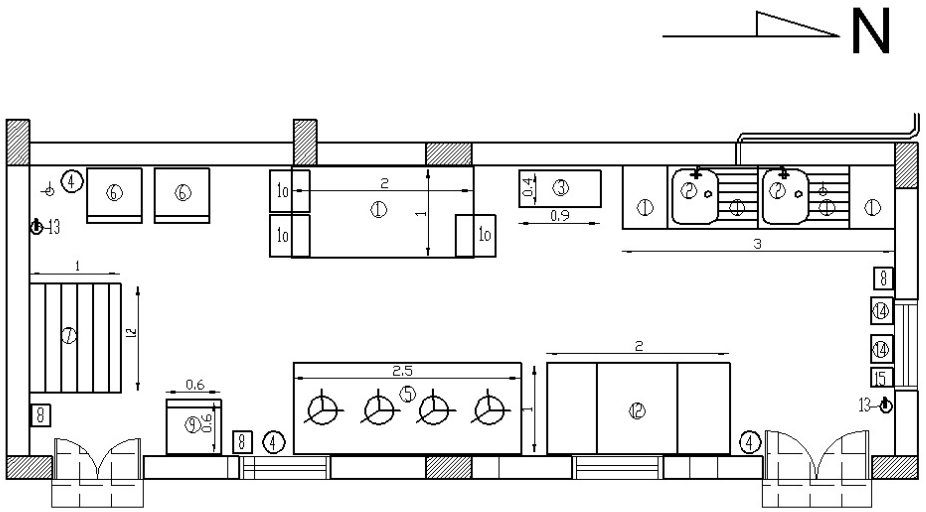


sec. A-A

IMAP	Name	Sec.1-1&A-A
	Drawing No.	El Egal - 003



1	Stainless Table
2	Washbasin
3	Squeezer
4	Gas Tank
5	Gas Burner
6	Refrigerator
7	Shelves
8	Basket
9	Refrigerator Frozen
10	Chair
11	Electric Sealer
12	Gas oven
13	Fire extinguisher
14	Scale
15	Pot

IMAP	Name	Furn. plan
	Drawing No.	El Egal - 006

10. Procured Equipment, Bahary

Processed Food تصنيع الغذاء

مربى البرتقال ***1-*** **Orange jam**

شراب البرتقال *2* **- Orange juice**

شراب الرمان ***3-*** **Pomegranate juice**

حبوب الرمان ***4-*** **Pomegranate seed**

Equipment List

No.	Description: Name of Equipments أسماء المعدات	Specifications: Materials, Size, Capacity, Weight المواصفات: المواد، الحجم، الوزن	Required Quantity الكمية المطلوبة	unit الوحدة	Remarks ملاحظات
1	Table مناضد ستانليس ستيل	stainless, 200cm x 100cm x 75cmH سم ارتفاع 75 × سم 100 × سم 200	2	unit	
2	Washbasin حوض غسيل	Stainless, 50cmx150cm, with both side table, with strainer & strainer cap سم ارتفاع بمصفاة, غطاء 90 × سم 80 × ستانليس, 75 سم للمصفاة	2	unit	
3	Squeezer عصارة	with 1.5HP motor (3 phase), 5t stainless press, with belt, relay cord & base table (approx. 90cm x 40cm)	1	unit	
4	Gas tank انبوبة غاز بوتاجاز	approx. 1.2m x ϕ40cm قطرها 40 سم × حوالي 1.2 متر	4	unit	
5	Gas Burner بوتجاز	2-burner type, (order made) with 120cm x 60cmx60cmH, frame base شعلة, بوتجاز مسطح 2 سم ارتفاع 60 × سم 60 × سم 120	2	unit	
6	Refrigerator ثلاجة	approx. 60cm x 60cm x 165cm 4 shelves, 2 doors (cooling, frozen) (سم , 4 رفوف, 2 باب (مبرد, مجمد 165 × سم 60 × تقريبا 60 سم	2	unit	
7	Shelves ارفف	Kitchen shelves, steel made, 100cm x 120cm x 160cmH (40cm x 4 shelves) (movable) رفوف مطبخ (سم , 4 رفوف(متحرك 160 × سم 120 × سم 100 ,	1	unit	
8	Basket صناديق قمامة	plastic, 60 liters بلاستيك, سعة 60 لتر	3	pc	
9	Freezer ديب فريزر	approx. 60cm x 60cm x 120cm 5 doors سم , 5 ادراج 120 × سم 60 × حوالي 60 سم	1	unit	
10	Chair مقاعد	wood made, (material zan) خشب زان	6	unit	
11-1	Electric sealer ماكينة لحام الأكياس	approx. length 400mm,500 w handy type امتداد اللحام حتى متر مربع, 500 واط, نوع يدوي 400	2	unit	
11-2	Vacuum sealer ماكينة لحام الأكياس	approx. length 400mm,500 w foot type, vacuum type امتداد اللحام حتى 400 مم, واط, نوع قدمي 500	1	unit	
12	Gas Oven فرن غاز	3-oven type, (oder made) with 200cm x 100cm frame base سم 100 × شعلات فرن مسطح 200 سم 3	1	unit	
13	Fire extinguisher طفاية حريق	ABC type, 6 kgs ABC كجم, نوع 6	2	unit	
14-1	Scale (small) ميزان	table-top type, accuracy 0.1g 0 kg - over 5kg, digital diplay 0 كجم- 5 كجم (اقصي), عرض رقمي	1	unit	
14-2	Platform scale (balance) ميزان	0 kg - over 40kg, digital diplay, accuracy: 1g 0 كجم- 40 كجم (اقصي), عرض رقمي	1	unit	
15-1	Plastic container طشت بلاستيك	φ50cm x depth 40cm, 30 liter تجويف 40 سم , 30 لتر × قطر 50 سم	9	pc	

Equipment List

No.	Description: Name of Equipments أسماء المعدات	Specifications: Materials, Size, Capacity, Weight المواصفات: المواد، الحجم، الوزن	Required Quantity الكمية المطلوبة	unit الوحدة	Remarks ملاحظات
15-2	Pot حلل	Alumminum ,30 liter 30 لتر, المونيوم	5	pc	
16-1	Strainer مصافى	Stainless, with handle, ϕ20cm ستانليس ذات يد طويلة , قطر 20 سم	3	unit	
16-2	Strainer مصافى	Stainless, with handle, ϕ25cm ستانليس ذات يد طويلة , قطر 25 سم	3	pc	
17	Strainer مصافى	Aluminum, with legs, ϕ35cm ستانليس ذات ارجل , قطر 35 سم	6	pc	
18	Jar (measuring) دورق مدرج	stainless, 2 litres ستانليس ستيل يسع 2 لتر	5	pc	
19	Bottle (grass) برطمانات	for product, 350g container with cap للمنتج, سعة 350 جرام ذات غطاء	100	pc	
20-1	Kitchen knife سكاكين	blade 15cm - 25cm, stainless, 6 different kinds انواع مختلفة, ستانليس, شفرة من 6 15سم- 25 سم	1	set	
20-2	Kitchen knife سكاكين	blade 20cm, stainless شفرة 20 سم, ستانليس	3	pc	
21	Kitchen lighter ولاعة	manual operated, handy type يدويا	2	unit	
22-1	Plastic bag أكياس مفرغة من الهواء	for product, 1.0 kg container للمنتج, سعة 1.0 كجم	2	kg	
22-2	Plastic bag أكياس مفرغة من الهواء	for product, 500 g container للمنتج, سعة 500 جم	2	kg	
23	Plastic dish (plate) أطباق بلاستيك	ϕ20cm قطرها 20 سم	4	pc	
24-1	Spoon مغرفة	Aluminum, ϕ15cm, with handle 50cm ستانليس, قطرها 15 سم, ذات يد 50 سم	3	pc	
24-2	Spoon مغرفة	Aluminum, ϕ25cm x 10cm, with handle approx. 25cm سم 10 × المونيوم, قطرها 25سم, مقبض 25 سم	4	pc	
25	Wood spoon معالق خشبية	flat type, length 30-40cm نوع مسطح, طول من 30-40 سم	7	pc	
~~26~~	~~Measuring spoon~~ ~~معالق قياس بلاستيك~~	~~plastic, differenc 3 sizes, 3 pcs/set~~ ~~3 احجام مختلفة~~	~~2~~	~~set~~	
27	Kitchen glove مساكات سميكة	cloth made مصنوعة من القماش	6	pairs	
28	Latex glove قفازات مطاطيه	for hygiene, protection, not transpalent للنظافه, الحماية, ليس شفاف	20	pairs	
29	Soap صابون سائل	liquid type, 4 liter/bottle سائل, 4 لتر/ العبوة	2	bottle	
30	Scrubbing brush ليف سلك	stainless, round type ستانليس, النوع الدائري	10	pc	
31	Towel فوط	cloth made مصنوعة من القماش	20	pc	
32	Kitchen robe مريلة مطبخ	for hygiene, protection, cotton made للنظافه, الحماية, مصنوع من القطن	10	pc	
33	Tea cup كوب شاى	for tea serve لعمل الشاي	12	pc	
34	Kitchen board الواح تقطيع	plastic, 30cm x 45cm سم 45 × بلاستيك, 30 سم	5	pc	
35	Gauze شاش	with 0.9m 0.9 متر	10	meter	
31	Thermometer ترمومتر زئبقي	max. 105℃, stainless cover, alchole غطاء معدني يصلح للقياس حتى105 درجة مئوية,	3	pc	
32	Wax (candle wax) شمع	12pcs/bag, white color 12 قطعة/ العلبه, لون ابيض	10	bag	
33	Parchiment paper ورق زبدة شفاف	60cm x 100cm سم 100 × مادة ورقيه, 60 سم	10	sheet	

Equipment List

No.	Description: Name of Equipments أسماء المعدات	Specifications: Materials, Size, Capacity, Weight المواصفات: المواد، الحجم، الوزن	Required Quantity الكمية المطلوبة	unit الوحدة	Remarks ملاحظات
34	Scissors مقص	blade 20cm, stainless شفرة 20 سم, ستانليس	5	pairs	
35-1	Big cone أقماع	aluminum, ϕ20cm - height approx 20cm المونيوم, قطر 20 سم, ارتفاع تقريبا 20 سم	6	pc	
35-2	Middle cone أقماع	aluminum, ϕ15cm - height approx 15cm المونيوم, قطر 15 سم, ارتفاع تقريبا 15 سم	6	pc	
36	Desk and chair مكتب و كرسي	for book keeping (account), wood made, desk: approx. 120 cm × 60 cm × 75 cm H للحسابات, خشب, ارتفاع سم 75 × سم 60 × سم 120	1	set	

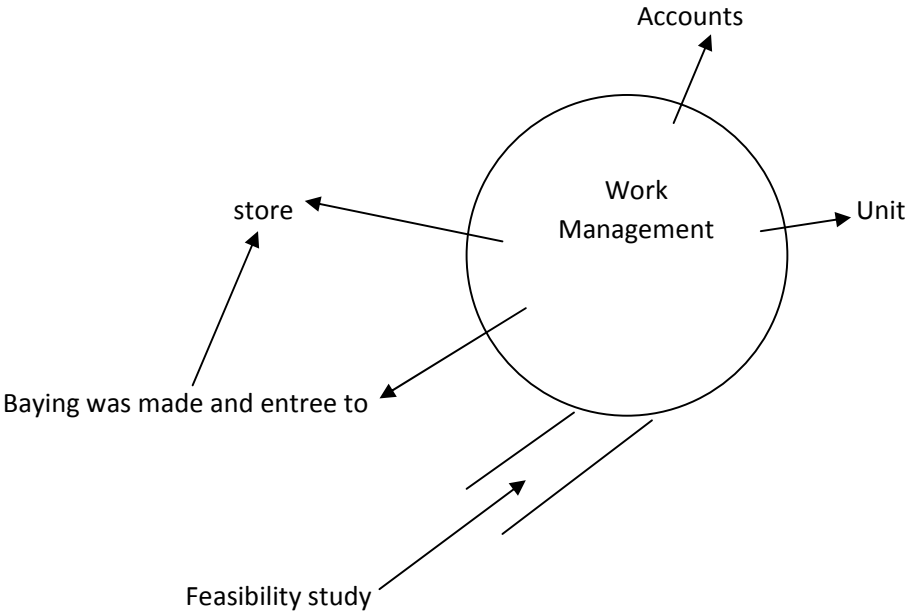
4. Business training documents

Contents

1. Lecture Documents for Business Training
2. Sample of Monitoring & Evaluation System
3. Sample Form of Activities
4. Sample of Sales Sign
5. Other Management Documents (PDCA cycle, 3S)

1. Lecture Documents for Business Training

1- Work Management Training



- for each stage of processing, there was 20% wastage, for example: peeling onions 20%, the separation before peeling 20%, this percentage authorized
- should make a manufacturing minutes : by the purchase committee 1- 2- 3-

total	Unit price	amount	unit	category
				onion
2000	1000	2	ton	carrot
20	1	20	kg	salt
40	10	4	kg	Bags or jars
260				total

Product:

total	Unit price	amount	unit	category
	3	1000	kg	Pickles carrot (bags)
	3	920	2/1kg	jars
				total

Profit = 2000-1500 = 500L.E

- and recognize the product to the store official and give him an copy of the record and give an copy to accounts and keep anther copy in the unit process
- Costs of production: there are direct costs such as the price of raw materials (carrots ...) and non-core (salt, bags ..), indirect costs such as consumption of additional machinery or equipment, publicity and advertising of the product
- determine the number of required workers by the manufactured amount, make for them attend book and determine their percentage of the profit
- make a tender when you buy, the store official and is responsible for the transaction with the vendor and makes the minutes after the receipt
- The distribution of profits every 6 months or a year of which shall be deducted 10% for equipment tools
- There are records for the organization of work:
  1 - Book for attend and departure
  2 - Book special for workers (data such as wages, bonuses, discounts, date of Joining ...)
- stores records of raw materials:
  For the supplier:
  We write the name of the supplier and the supplier it

specified time for delivery	raw material delivery method	amount	type
	Delivery to the process unit	100kg	onion

  This record has three copies, one for supplier, one for store official and one for accounts
- examination minute book:
  Class - Specifications - shelf life - the percentage of material non-conformity with the specifications and be deducted from the quantity
  This record has 2 copes, one for accounts to determine the value and the other with stores
- Received permeations Book:
  Name of the supplier - materials - kind - and weight - value
  This record of three copes, one supplier + invoice and the other with the accounts and one with the stores
- record Book of movements of raw materials:
  supplier name - Invoice number - their source - number of exchange - the type of output - Balance the rest of the store - on the exchange - the items - Qty - value - the value of the unit
  This book is very important and the basis for organizing work
- exchange permeations of raw materials:
  Knowing is the supervisor of the production (manufacturing) we define:

- The required quantity for manufacturing
- The type of operation
- Resulting from the operation

two copies of this book, one for processing unit and the other to store

- receipt book of products:

  Daily output - type - type of packaging - pack weight (size) - Production - Date of operation - production pictures - Picture storage

total	Unit price	amount	products	date	day	total	Unit price	amount	Type of raw material	date	day
32	1	32bags	taamia	7/20	Thru	25	5	5kg	Broad bean	7/20	Thru
						2	2		vegetables		
						0.5	0.5		salt		
						1	1		spices		
						28.5					total

Total sales= value of the product sold- costs = profit

Profit = 32-28.5=3.5

Daily record book

- Monthly total:

profit	total	Unit price	amount	products	date	day
5	32	1	32bags	taamia	1/1	Thru
6	48	4	6bags +6 jars	Fig jam	1/2	Fri
						Sat
						Sun

- products Exchange Book:

  writes by store official:

  Type of products received - quantity - value - the name of the person or the client - the addressee - the invoice number

  Has three copes, one for the stores official and one for the accounts + Copy of the invoice and the third copy for the client + original invoice
- monthly and daily books are most important books of the products and raw materials by those books we can do without the other books

- the production movement Record:
  Includes: items - degree - quantity - receipt permeations - received permeations - invoice numbers - the name of clients - the remaining balance in the stores
  by this record we know everything about product in the first income until he left (as inventory of product movement)
  Book to record all the daily calculations and then we collect it in the monthly book
  • There is a 5% incentive or reward for, or superior people filled the most active

2- Feasibility Economic Study

- Definition: we make this study before any project to now the possibility to implement this project or not, it included expected costs and the expected economic yield
- What is the importance of the feasibility study? - Determine the profitability
  - The possibility of implementation
  - Reduce the loss
- Stages of feasibility economic study
  1- The study stage: Thinking about the type of project (idea itself)
    - Preliminary study: determent the type of the project - the market in terms of quality, type, price, transportation costs, the place of purchase - and the costs of Equipment
      Following this study we turn to
    - Detailed study: basic components of the feasibility study:
      1 - technical study: the place or conditions of the unit process in terms of building (ventilation, drainage, doors,...)

  2 - Technical study of the equipment, we must determine the production capacity, according to this capacity we determinate the equipment size
  This equipment has certain specifications for example the type of stainless, thick…Thus

  3 - The cost of electricity and water
    - Market study: Where and to whom and the price of the product
    - Economic Survey: What is the return of economic

Revenue - cost

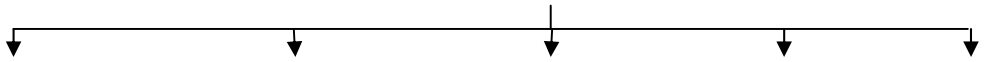
Operating costs: labor costs - raw materials
Electricity – Water

investment costs:
Costs of land
construction - equipment

- Social study: to know the availability of raw materials in the country of the project, and the acceptance of this community to this product.
- Environmental study: a healthy and productive environment in which to serve the

project

- Study funding: determine funding source, must conduct a study of the loan (size, Interest of the loan, period to allow, straight)
- Legal study: the procedures and laws for licensing - procedures loans
- Management study: make structure and functional



protective workers worker technical accountant Head of project

- Make an organizational study for work

3- Practical application of the feasibility study

1 – Determine the type of project or the product: pickled, drying, and freezing vegetables.
We determent this product as the needs of the market - availability of raw materials - that provide employment - Marketing - congestion projects competition.

2 –project responsible: members - Association – Commission.
Our project in Dlga coop.
3 - Place of the project: Agricultural Coop.
4 - Features of the project: the market need for the project - availability of raw materials and take advantage of them in the form of pickles - to provide workers.
5 - Study the marketing of pickles: the Egyptian market study found that there needs to Pickle.
6 - Technical study: the building (ventilation openings by type of project - finishing the building), equipment specifications (Type - Specifications - Qty) by the production capacity we determent equipment and specifications based on production capacity.
7 - the economic study (the study of Finance): The investment costs = fixed capital - working capital
Fixed assets: Cost of land, rent or owned if it is owned we deducted its price but if it is rent we add its price such as salaries - finishing plant – equipment.
Changing asset: such as(raw materials - packing materials - electricity - water - gas - Rent – salaries).

Fixed assets:

	Land costs
	Building finishing
	equipment
	total

Changing asset

	Raw materials
	Packing materials
	electricity
	water
	gas
	rent
	salaries
	total

Total revenue

Total price	Unit price			category
3000		1000kg	1kg	onion
1000		500kg		
5000		500kg		carrot
				total

Total investment costs: costs of fixed assets + costs of changing assets

Total revenue

Profit = revenue - costs

* But before you calculate the profit percentage according to the depreciation in the building or equipment or raw materials or transportation car

%10	building
%15	equipment
%1	Raw materials
%20	transportation
	Total depreciation

If the building cost 50000 LE: depreciation × percentage of depreciation

50000 × 10% = 5000 pounds deducted from the production cycle

Equipment 20,000L.E: 20000 × 15% = 3000 pounds

Collected all the depreciation ratios and add them to the Changing costs or the secondary costs of operating + Capital + loan premium + administrative expenses (such as soap, Bill Tel ....)

Profit = sales - costs

to calculate the return on capital = profit / investment cost × 100

By Dr. Rokaya Gissa Mohamed
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2. Sample of Monitoring & Evaluation System

(Draft)
Monitoring & Evaluation and Marketing System for Processing of Agricultural Produces

1. Organization

(1) Organization of monitoring and evaluation (M&E) consists of representatives of Counterpart (C/P) of Agricultural Directorate, Agricultural District Office and the Study Team of the Project.

(2) After the Project finished, they except the Study Team continue the monitoring and evaluation.

(3) M&E will be done according to this system and reports from the Village Cooperative, executing body.

(4) Organization of M&E should hold the periodical meeting with the Village Cooperative to secure the progress of the processing by giving their suggestions and instructions to the Village Cooperative.

(5) Organization of M&E should help the Village Cooperative buy the raw materials, process them and sell the produces.

(6) Village Cooperative should submit monthly reports with the comments of the processing conditions.

2. Processing

(1) Village Cooperative should process the product and make the safe and sure produces by means of the better usage of the processing facility and equipment constricted and installed by the Project with the help of the organization of M&E.

(2) Processing should be done considering of the making of safe, sure and steady quality produces.

(3) Village Cooperative should make and submit a yearly plan and monthly plan and reports for progress of processing to the organization of M&E. (refer to the blank form for them)

(4) Village Cooperative should keep surely the processing facility and equipment to be constructed and installed by the Project.

3. Buying and selling

(1) Village Cooperative should buy the raw materials to be processed at lower price like buying from farmers in the area.

(2) Good one to be processed should be selected in the processing facility from the raw materials.

(3) Village Cooperative should make a list of farmers who sell the raw materials.

(4) Produces should be sold as soon as possible.

(5) Village Cooperative should sell the produces at reasonable price at his office, retail shops in the area as well as Agricultural District Office and Governorate Directorate Office, and large shops in

the cities.

(6) Village Cooperative should make a list of shops and traders who sell his produces.

(7) Buying and selling should be recorded according to the stipulated forms (refer to the blank forms), with the consideration of the suggestions and instructions by the representatives of M&E.

4. 3S Activities

(1) Village Cooperative should conduct at all times the 3S activities for the processing following the blows and sign board on the wall of the processing house.

(2) Seiri (arranging) activity means putting the things in order to be separated as raw (green), sleep and dead conditions.

(3) Seiton (clearing) activity means putting the things up to be able to take out the necessary things every time, anybody and at once.

(4) Seiso (cleaning) activity means cleaning up to keep the facility and equipment hygienic.

(5) Village Cooperative should suggest and instruct the workers as well.

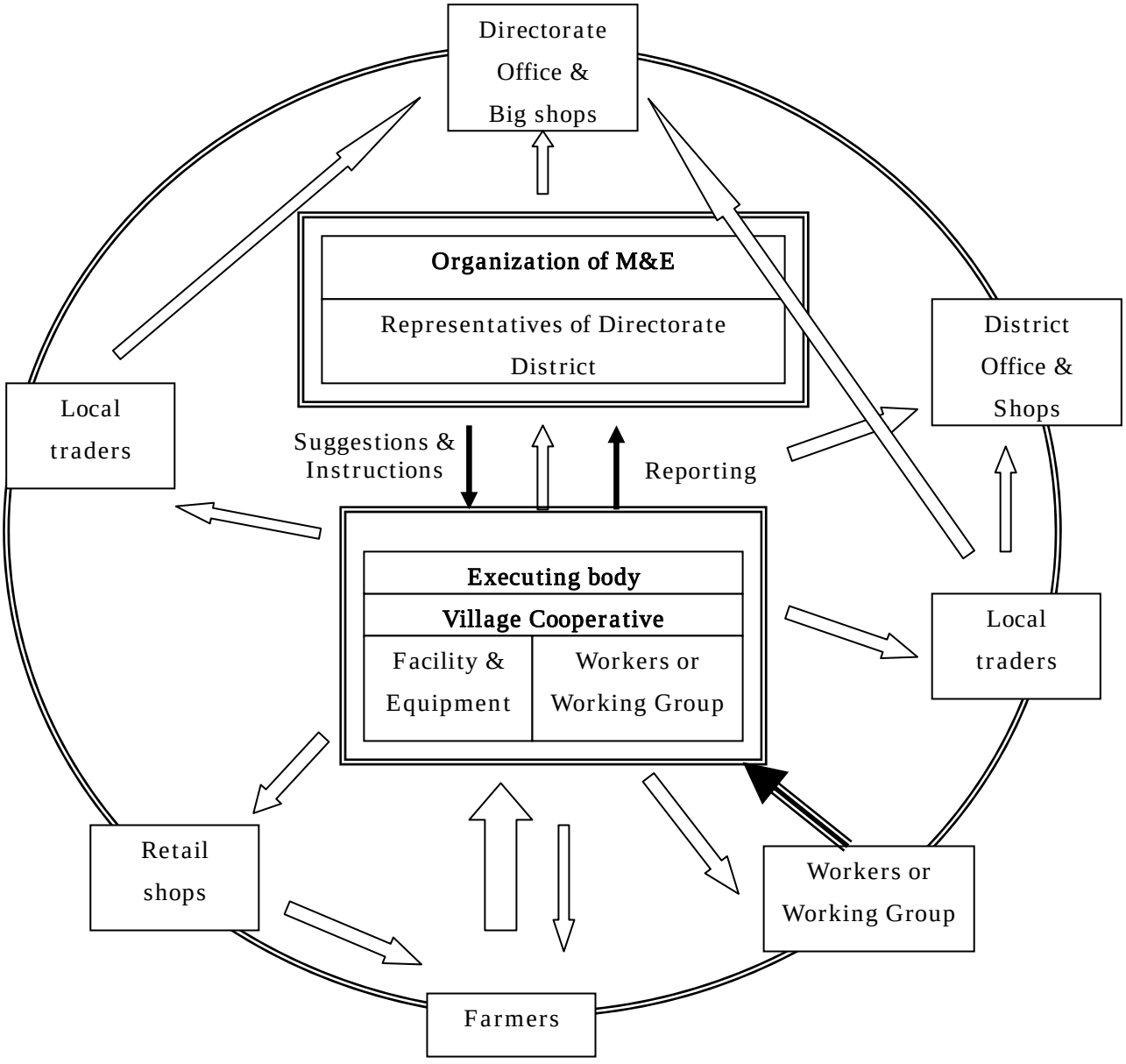

Figure-1: M&E and Marketing System Flow

3. Sample Form of Activities

Sample Form (1)

Report for Processing
to Agricultural Directorate and District Agriculture Office

* Please mention monthly processing conditions and difference between plan and actual works.
* Details of the above should be informed at the monitoring survey to the organization of M&E.

Date: _____

from Village Cooperative: _____ Reporter: _____

Sheet No. _____

No.		Report by Village Cooperative	Suggestions and Instructions by organization of M&E
1	**Organization**		
	1	Issue of management & responsibilities	
	2	Others	
2	**Processing**		
	1	Difference of monthly plan and records summary (attached records)	
	2	Issue of processing conditions and yearly plan	
	4	Others	
3	**Buying and Selling**		
	1	Difference of monthly buying plan and records detailed (attached records)	
	2	Difference of monthly selling plan and records detailed (attached records)	
	3	Others	
4	**3S activities**		
	1	About arrangement, clearing and cleaning	
	4	Others	

Sample Form (2)
Summary: Record Sheet of Monthly Buying & Selling

Sheet No._____

Village Cooprative: _____ Month:_____

Product Name: _____ Recorder:_____

No.	Buying (raw materials)							Production		Selling			
	Date	Item	Buying					Processed date	Quantity (kg, cc)	Stored q'ty	Selling (LE)		
			Quanty (kg, cc)	Unit (LE)	Amount (LE)	Seller's name	Receipt No.				Q'ty	Unit	Amount
	Bringing forward:												
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
Total:													
Carrying forward:													

Sample Form (3)
Monthly Plan

Sheet No._____

Month:_____

Village Cooprative: _____ Recorder:_____

No.	Expecting Processing		Main Material Required				Remarks
	Date of process	Name of process	Name of material	Quantity (kg, litre)	Seller's name	Expected Price (LE)	
Total:							

Sample Form (4)
Monthly Record

Sheet No._____

Month:_____

Village Cooprative: _____ Recorder:_____

No.	Processed		Main Material Used				Remarks
	Date of process	Name of process	Name of material	Quantity (kg, litre)	Seller's name	Amount (LE)	
Total:							

Smaple Form (5)
Material Buying Check Sheet

Village: _____

Recorder: _____

Date: _____

Sheet No. _____

No.	Date	Name of Material	Buying			Receipt No.
			Q'ty	Unit Price	Amount (LE)	
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
Sub-total						
Total:						
Grand total (sheet No.___ to No. ___):						

Sample Form (6)
Records of Expenditure & Selling

Village: __________

Product: Tomato paste

No.	Date	Materials buying					Worker Fee			Expenditure				Total cost (LE)	Production			Selling					Remain		Benefit
		Materials	Q'ty (kg)	Unit	Unit Price	Amount (LE)	Nr of worker	Unit price	Amount (LE)	Water, Elec. Gas, Charge, Repair, etc.	Q'ty	Unit Price	Amount (LE)		Kinds	(kg)	Q'ty of pack	Date	Q'ty	unit	Unit Price	Amount (LE)	Q'ty	unit	

Sample Sheet (7)
Questionnaire for Processed Product
(Product: _____)

Would you please choose your favorite in the following questionnaire?
Put the round mark on selected one, fill the qeustions and/or make your comments.

Date:_____

1 What is the product?

Processed (Pickles, Dry vegetables)
Kind: _____
Size: (_____cc, _____gram)
Package: (bottle, plastic bag, other:)
Buying price: LE_____

2 What is the taste of the product?

(1) Taste: (Better, Good, Poor)

(2) Hotness (Too hot, Good, Not hot)

(3) How many days did you consume for?, How many persons had it?
(Days:_____ Person: _____)

(comments)

3 What is the price? (High, Reasonable, Cheap)

(comments)

4 How is the package size and ways?

(1) Size: (Too large, Good, Too small)

(What is a preferable size? _____)

(2) Packing way: (Better, Good, Poor)

Preferred package: (Glass bottle, Plastic bottle, Plastic bag, Other:)

Preferred sealing: (Natural seal, Vacuum, Others:)

(comments)

5 Any other comments:

Sample Form (8)
Production Calendar

Village: _____

Date: _____

Month	Production	Expected Produce Amount	Remarks
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Sample Form (9)
Management Group of the Processing Unit

No.	Name	Position	Responsibility for the Unit		Remarks
			Cae 1	Case 2	
1		Manager	General manager, 1 person	General manager, 1 person	
2		Assist	Assist manager, 1 person	-	
3		Accountant	Account, 1 person	Account, 1 person	
4		Staff	Supply, 1 person	Supply, 1 person	
5		Staff	Organization of the Unit, 1 person	-	
6		Staff	Marketing, 1 person	(included in Supply)	
Total:			6 persons	3 persons	
7		Board of member	Borad of member, 6 persons	Borad of member, 6 persons	
Remarks:			The unit organization has full responsibility	Considering that the farmers and traders would paticipate the Unit.	

4. Sample of Sale Sign

New product !!

Cheap !!

Fresh !!

Good Quality and Taste !!

Village Cooperative made !!

Closing

This technical manual could be complied with the great helps of counterparts, trainers, translators, and related personnel for the Pilot Project under the “Project for the Master Plan Study for Rural Development through Improving Marketing of Agricultural Produce for Small Scale Farmers in Upper Egypt” (IMAP). We would like to say thank you to these personnel. Especially, the following personnel were directly related to this technical manual preparation.

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It is appreciated that as this manual is one of the samples for agro-processing implementation in order to the rural development, it would be fully utilized by the cooperative, farmer groups and entrepreneurs, etc., and if necessary to arrange and create the new methods before/during implementation referred to this manual.

Thank you very much.