

Reading Manual for Jaggery

Under PMFME Scheme



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Abbreviations & Acronyms

Sr:No.	Abbreviations &Acronyms	Full Forms
1.	PM FME	Prime Minister's Formalisation of Micro Food Processing Enterprises Scheme
2.	PVDC	Poly Vinylidene Chloride
3.	PVC	Poly Vinyl Chloride
4.	PET	Polyethylene terephthalate
5.	PA	Polyamide
6.	PE	Poly Ethylene
7.	WVTR	Water Vapour Transmission Rate
8.	EVAl	Ethylene Vinyl Alcohol
9.	EVOH	Ethylene-vinyl alcohol copolymer
10.	HACCP	Hazard Analysis and Critical Control Point
11.	GAP	Good Agricultural Practices
12.	GMP	Good Manufacturing Practice
13.	SOP	Standard operating procedure
14.	FSSAI	Food Safety and Standards Authority of India
15.	FoSCos	Food Safety Compliance System
16.	FBO	Food Business Operator
17.	FLRS	Food Licensing and Registration System
18.	FSS	Food Set and Sound Nutrition
19.	PFA	Prevention of Food Adulteration
20.	GST	Goods and Services Tax
21.	MoFPI	Ministry of Food Processing Industries
22.	FPOs	Farmer Producer Organizations
23.	SHGs	Self Help Groups

CHAPTER-1

INTRODUCTION

1.1 HISTORY OF JAGGERY (GUR)

Literature indicates that India and China were the earliest countries where the sugarcane was grown and sugar was made. In 286 BC Chanakya, the wise Minister of Chandragupta Maurya Chanakaya in his book ChanakyaNiti gives simile of sugarcane to explain the relationship of the body and Atma/ Parmatma

As there is fragrance in the flowers, oil in tils, fire in the wood and 'ghee' in the milk and gur (jaggery) in the sugarcane juice the 'Atma' and 'Paramatma' resides in our body.

During 100-200AD Charak Samhita mentions at least 5 sugar products- Phanita, Guda, Matsyandi, Khanda and Sarkara. Shushruta was born after Charak and he wrote Shushruta Samhita in which we find ample mention of gur. Gur finds mention in many old Ayurvedic literature. In latter it has been considered as a nutritionally rich substance endowed with innumerable medicinal qualities. Gur has been called rasayan, i.e., which extends the life, keeps the body disease free and maintains yauvana- the bloom of youth. Bhava Prakash, another book on Ayurvedic medicine advocates that use of gur with ginger pacifies cough, with harr eliminates pitta and with sonth (dried ginger) is beneficial in all diseases caused by vata factor.

As per Shushruta Samhita ,Pure gur eliminates vata, and pitta, purifies the blood. Old gur is particularly beneficial, when given to a lactating mother after the child birth.

In 647 AD Chinese Emperor, Tai Tsung sent a mission to Magadha (India) to learn the art of sugar manufacture. Perhaps this is the first instance, on record, of a technological commission investigating a manufacturing process in a foreign country.

In India 36% population lives below poverty line. Per capita availability of cereals and pulses for majority is 468 gms/day which is less than needed.43% children under the age of 3 years &51.8% married women in the age of 18 – 45 years suffer from anemia. Energy rich food is needed.Food product's sweetness is the number one property in terms of consumer acceptability & flavor. Sweetness increases food palatability. Jaggery is eco-friendly

nutritive sweetener. Jaggery has superior medicinal and nutritional value as compare to sugar. It preserves minerals and vitamins found in cane juice, viz., calcium, iron, potassium, copper, zinc, phosphorus and magnesium. The ayurvedic medicine advocates that jaggery consumption purify blood, improve digestion and strengthens lungs, bones and nervous system. The low glycemic index and chain of sucrose make jaggery a slow glucose releasing sweetener. Hence, awareness should be created among the peoples for jaggery consumption benefits through mass media publicity, campaigns and advertisement.

Proximate composition of sugar and jaggery (per 100 gm)

Constituent	Sugar	Jaggery
Sucrose, g	99.5	60-85
Reducing sugar, g	-	5 - 15
Protein, g	-	0.4
Fat, g	-	0.1
Calcium, mg	-	8.0
Iron, mg	-	11.4
Phosphorus,mg	-	4.0
Total minreals,g	0.05	0.6 – 1.0
Moisture, g	0.2 – 0.5	5-10
Energy, kcal	398	312 - 383

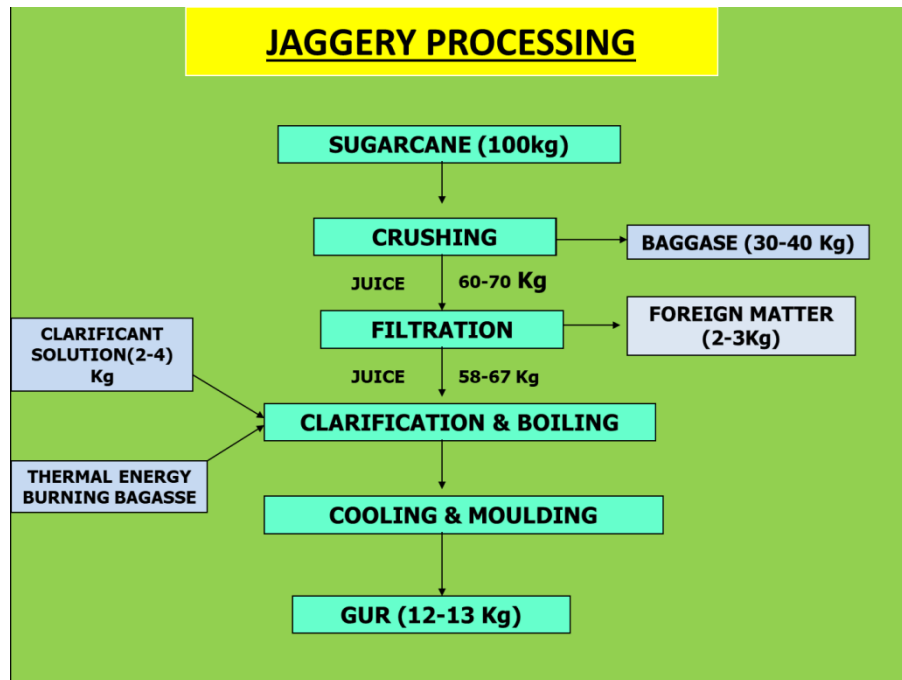
Gur also has 168mg carotene, 0.02 mg thiamine, 0.05mg riboflavin, 0.05 mg vitamin c

Jaggery is one of the largest and ancient cottage industries of unorganized sector in India. Jaggery making plants are generally tiny in size and the machineries of the plants are fabricated by local artisans or engineering workshops. Despite being decentralized and unorganised, the jaggery industry has not flourished much and the product is still being produced by adopting traditional ways, lacking in quality and hygiene.

All India Coordinated Research Project (AICRP) on Post Harvest Engineering & Technology (PHET), ICAR-Indian Institute of Sugarcane Research (IISR) centre has developed a model three pan jaggery unit which is a modern jaggery unit, highly efficient, compact, hygienic and cost effective and can be used for producing value added jaggery conforming to the standards of BIS and FSSAI. The capacity of the unit is scalable upto 10 quintals of jaggery per day. The jaggery can be moulded in many shapes and after packaging it is being sold at least at Rs. 60/kg. .

By establishing jaggery making units on IISR pattern, the production of quality jaggery could be ensured. The quality jaggery so produced may find its way not only in domestic market but also in a couple of neighbouring countries. As the urban people are becoming

more health conscious the demand for quality and hygienic jaggery will be more in time to come.



1.2 PROCESSING OF JAGGERY

Selection of Sugarcane

Selection of good quality matured sugarcane having high sucrose content, high purity and low colloids is an important first step towards manufacturing quality jaggery.

Harvesting and cleaning of cane

Cane with brix more than 21 per cent should be harvested close to the ground and cleaned off dry leaves, trashes, green tops, roots and mud clods. Remove 2-3 immature internodes along with top portion. Soil adhering to the cane should be removed. The cleaned sugarcane should be immediately transported to the crushing yard and crushed within 24 hours of harvest. Delay in crushing may cause inversion losses.

Extraction of juice

For crushing of cane, horizontal power crusher able to extract 60 to 70% juice was used. Horizontal roller crushers yield 2-4% more juice compared to vertical roller crusher. At this process two products are obtained raw sugar cane juice as main product and bagasse. Level of extraction and concentration of soluble solids of sugar cane juice affects directly productivity. Percentage of extraction $(\text{Weight of juice} \times 100 / \text{Weight of cane})$ depends on operation

conditions of crusher, which also has a significant effect on quality and quantity of sugar cane juice. Factor affecting extraction of juice are gap between rollers (6mm, crushing – 1mm extracting), size and speed of rollers, orientation of rollers, grooves on rollers (grip, preparation and juice drainage) and bearing and bushes.

Settling tank

The juice is then collected through underground PVC pipeline into the juice settling tank covered with thick layered cloth where small particle impurities are filtered from the juice. The juice is allowed to remain in the tank for one hour so that heavy impurities settles down due to gravity and the clean juice is then pumped into the specially designed open pans kept on furnace.

Juice filtration

The juice that comes out of crusher has some impurities, such as ions, colloid and dirt of soil, waste pulp and wax. Colloid are made up of soil, wax, fats, proteins, vitamins, glues, pentine, tannin and coloring material. Its percentage is low which ranges from 0.05 up to 0.3%. ionic and molecular dispersion correspond basically to sugars and minerals constituents. Hence the filtration of juice is essential to obtain jaggery free of soluble solids and impurities. The extracted juice is filtered with three layered wire mesh or thick cloth to separate undissolved impurities like trashes, pieces of bagasse, and roots etc. It is then passed through vibro or mechanical filters to get clear juice.

Juice Clarification

Clarification process eliminates solids in suspension, colloidal substances and coloring compounds by the accumulation of these impurities. Once pre-filtration process is finished sugar cane juice continues its progress to the first furnace at a temperature close to room temperature to be heated up to 50-55°C, which allows the formation of particles of higher density and larger sizes, which are easier to be removed. At this point, part of substances that generate, impurities to the finished product are still in suspension without being removed due to their sizes, unless, a clarification agent is added. The pre-heated juice is moved to a second furnace where a clarification agent is supplied to increase coagulation of impurities. Coagulation comprises of a series of chemical and physical reaction between the coagulant and the solution of sugar cane juice and as a result of this reaction the forces that keep together the particles are destabilized. Clarification of juice loaded in pans is very important

for making light yellow coloured, crystallized and impurities free jaggery, which is edible and also suitable for storage. The dissolved impurities in the juice are removed with the help of herbal / vegetative clarificants. Phyto -clarificants are rich in gums & mucilage which are polyglucuronic acid and act as a flocculent. These polymers dissociate on heating and form charged particles with large number of active sites to attract negatively charged impurities (colloidal, colouring & ash forming impurities). Some of these are mentioned below.

S. No.	Name	Botanical Name	Parts which are used	Additional gm per quintal juice	Brief method of using
1.	Deola	Hibiscus ficulneus	Stem and roots	40-45	Dipped in water for about 2-4 hrs, Pound and rubbed. Thus mucilaginous liquid obtained is added
2.	Bhindi	Hibiscus esculentus	do	45-50	do
3.	Phalsa	Grewia asiatica	Green bark	50-55	do
4.	Semai	Bombax malabaricum	Green bark	55-60	do
5.	Sukalai	Kydin calycina	Dry bark	45-60	do
6.	Castor	Ricinus communis	Seed	70-75	Soaked, decorticated ground with water is mixed after straining
7.	Groundnut	Arachis hypogaea	Seed	70-75	do
8.	Soybean	Glycine max	Seed	30-40	do

Deola (Hibiscus ficulneous) used @40-45g/q juice was found to be the most effective vegetative clarificant at pH 6.0. Coagulated scum was removed with the help of long perforated spoon and kept in the scum-settling tank. The settled juice is mixed in the boiling juice. Chemical clarificants are also being used. Some of them are mentioned below.

Chemical & Quantity required per q juice	Action	Immediate effect on product	Remarks
Hydros (Sodium hydro sulphite) 3.5g	Colour bleaching	Brightens colour temporarily	Hastens colour darkening and process of spoilage within a month.
Lime (Calcium oxide) 100 to 125ml	Removes juice acidity. Helps in	Liming to pH 6.3 to 6.6 results in good	Better storibility of hard jaggery .

of 10% lime	clarification	quality. Useful in solidification of jaggery from waterlogged, lodged canes. Excess liming results in hard jaggery.	
Sodium carbonate 2.5 to 4.0 g	Reduces acidity	Helps in setting and improving jaggery quality from inferior canes	Better storibility of hard jaggery
Sodium bicarbonate (Add in cooling pan) 5 to 8 g	Colour bleaching	Brightens colour temporarily	Hastens process of spoilage
Sajji (50% sodium carbonate + 6.4% Sod. Sulphate + 4.5% Sod. Choride) 400 ml of 5% Solution	Partial neutralization of juice acidity and colour bleaching	Brightens colour temporarily and reduces the taste.	Poor storability.
Super phosphate 50g	Increases natural acidity and improves colour	Reduces crystallization	Poor storability

Concentration

The juice is boiled till it reaches striking point temperature. (115°C – 118°C). Churning is done for uniform heating hence better product quality. It is then removed from the pan and kept in the wooden/ steel cooling pan. It is the final stage of the whole production process, it occurs at a temperature higher than boiling point of water. Inversion of sucrose depends on temperature, pH and the remaining time in the furnace. From 100°C inversion of sucrose

speeds up significantly, due to this reason sugar cane juice should remain for the shortest time in the furnace and run a pH close to 5.8 to avoid an increment in reducing sugars.

Cooling and moulding

The juice concentrate is thoroughly mixed with the laddle. The slurry is, then poured into the moulding frames of desired shapes and sizes (2.5 cm cubical shape weighing 20-22 gm or 2.5 cm x 2.5 cm x 1.25 cm square shaped weighing 10-11 gm) developed by IISR, Lucknow.



Grading of Jaggery

Jaggery produced in different parts of the country differs significantly in quality as well as chemical composition due to varietal differences of sugarcane and differences in agro-climatic conditions, cultural practices and methods of manufacturing. The quality of jaggery produced and brought by farmers in the market yard is judged by visual observations. Flavour, hardness and taste are checked by eating and finger pressing. Different qualities of jaggery is exhibited in different lots as per merchants choice on quality for sale in the markets. There may be mismatch between qualities of one market to that of the others. Therefore, to avoid such situation and maintain proper quality, precise grading packaging storage and development of standards are essential. There are number of physical and chemical characteristics which are essential for grading of jaggery. The packaging and storage are echo influenced by jaggery grading. The colour, hardness and texture are the

important physical characteristics which affect marketing of the jaggery. In general, light golden coloured jaggery is preferred for eating purpose. But in the mandis the traders give higher prices to the white coloured jaggery prepared using chemical clarificants like hydros. The hardness and moisture content of jaggery are inversely proportional to each other. The texture depends upon crystalization which is tested by scratching the lumps surface with knife.

Some of the important chemical characteristics of jaggery are the taste, flavour, sucrose content, reducing sugars, moisture conten, dirt and dust based which different systems of grading of jaggery have been in vogue in diferent states. And at National level BIS developed Indian Standards for categorizing the jaggery.

CHAPTER – 2

MACHINERY REQUIREMENT

2.1 IISR FURNACE

The improved design of triple pan furnace with provisions of various special features was developed at IISR Lucknow which works satisfactorily and has the overall heat utilization efficiency of 30%. The water evaporation rate was 2.18 kg per kg of bagasse. Also the hygienic environment of working was maintained and Drudgery involved in shifting hot juice from one pan to another was removed due to provisions of different elevations for gravity flow of the juice.



2.2 SPECIAL FEATURES OF THIS FURNACE

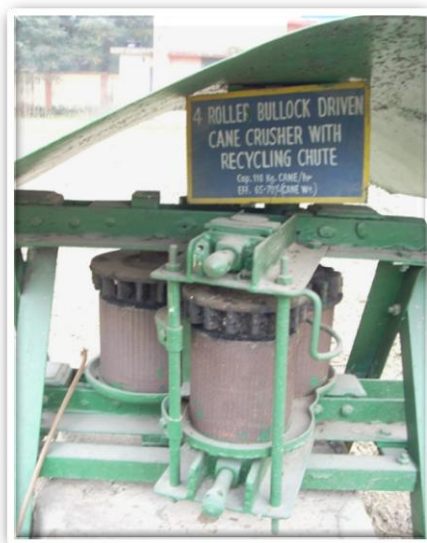
- (i) It has provisions of grate from bottom of the feeding hole till centre of the furnace after which frame made of mild steel rod was attached which improved burning of bagasse.
- (ii) It has two air inlet-. mild steel pipes form chimney sides to the middle chamber for continued and smooth supply of fresh air into the combustion chamber.
- (iii) The gap between grate surface and the bottom of the pan was kept as 60 cm due to which heating was more effective.
- (iv) The pans were made of thick mild steel . sheets with thick bottom which avoided over heating and charring of the juice concentrate.
- (v) The placement of pans at different elevations made operations easy and trouble free.

- (vi) Had visibly better natural draft.
- (vii) Change in the kind of fuel did not result in decline of its efficiency.
- (viii) The maintenance and ash removal were conveniently done.
- (ix) Its operation responds quickly and also quite effective to its combustion as it reduced time requirement for juice concentration and hence for jaggery manufacturing.
- (x) It saves significant quality of bagasse and has larger output capacity.

Economics

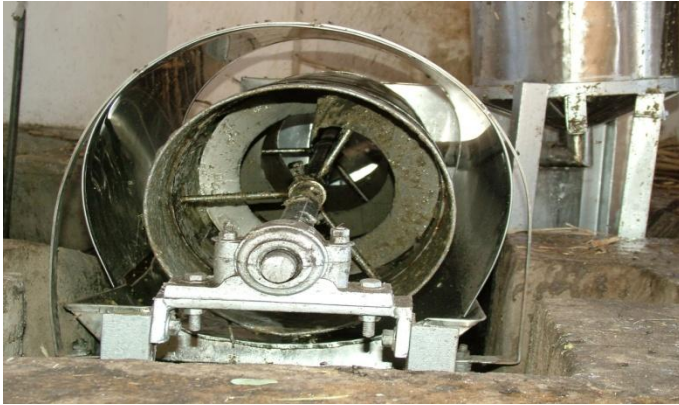
Capacity of plant	110 qtls/day
Jaggery production	13.2 Qtls/day
Working period	125 days
Total investments (Machinery & working) (excluding land)	Rs 10 lakhs
Land area needed	400sq m
Covered area	9mX6m
Payback period	4 years

2.3 MACHINERIES FOR JAGGERY PROCESSING



Bullock Driven (Now absolute)

Juice recovery 50%



Mechanical Rotary Filter



Power Operated Crushers

Juice recovery: 60-70%

Horizontal roller crusher: 2 - 4 %

better recovery

Capacity: 2-3 qtls /hr – 10 qtls /hr

Power needed: 5 hp - 16 hp



Filter

CHAPTER 3

PACKAGING

3.1 INTRODUCTION

Jaggery commonly known as Gur in India. Jaggery is the natural sweetener obtained on concentrating the sweet juices of sugarcane with or without prior purification of juice and without use of any chemical/ synthetic additives or preservatives, into a solid or semisolid state. Jaggery is considered as a food material, as it contains a large quantity of minerals in addition to energy and is consumed directly as. There are mainly three forms of jaggery which are available in market which is solid jaggery, liquid jaggery and granular jaggery. In India, approximately 80 per cent of jaggery prepared is solid jaggery and remaining 20 per cent includes liquid and granular jaggery.

3.2 DETERIORATIVE FACTORS OF JAGGERY

Moisture Content

Moisture absorption from humid atmospheres promotes inversion of reducing sugars which in turn leads to loss of structure, texture, and body hardness of jaggery and often to liquefaction.

Microbial Contamination

In high humidity condition moisture absorption occurs. Beyond a certain level of moisture content, microbial infection and biochemical degradation sets in.

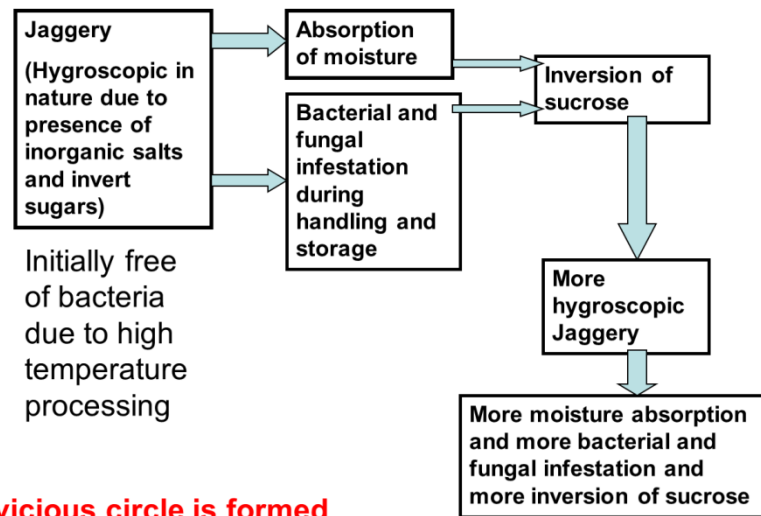
Jaggery storage and packaging

The storage of jaggery is imperative as it is manufactured during October to April while consumed round the year. Loss of jaggery during storage is estimated to be 7 25 per cent depending upon the storage conditions. Losses are of two types:

Qualitative (Loss in sucrose, increase in reducing sugars, loss in taste, colour, texture, flavour, hardness etc.)

Quantitative (Loss in weight, spoilage)

Deterioration mechanism



Most important aspect of storage is to preserve the quality of jaggery without affecting taste, flavour, hardness and colour. The method of storage varies widely depending upon the tradition, quantum of storage, weather conditions and resources available to the farmers. Various storage structures such as drying cum storage bin, masonry bin cum bed, drying cum storage go down and cold storage have been tried to store jaggery with varying degree of success. To minimize the adverse effects to temperature and humidity on jaggery during storage, various materials as ash, wheat and rice straw, alkathene lined bags, aluminium foil, polyethylene sheet have been tested. Recently modified atmosphere packaging is also being used for storage. Nitrogen and vacuum packaging of jaggery has been studied and found beneficial for jaggery storage.

3.3 JAGGERY PACKAGING

The packaging material to be used must be carefully chosen, taking into account both practical and marketing specifications, in order to ensure the consistency of the spices during handling, transport, storage, and delivery. In general, the packaging specifications for spices are listed below:

- To protect the product from spillage and spoilage.
- To provide protection against atmospheric factors such as light, heat, humidity, and oxygen.
- The selected packaging materials should have high water vapour and oxygen barriers.

- The packaging material should have a high barrier property to prevent aroma/flavour losses and in gross of external odour.
- The volatile oil contained in the spice substance has a tendency to react with the packaging material's inner/contact layer, often leading to a greasy and sticky packet with the printed matter being smudged.
- Therefore, the wrapping material should be resistant to grease and oil and be compliant with the commodity.
- The packaging content should, in addition to the above practical specifications, have good machinability, printability and be readily available and disposable.

3.4 TYPE OF PACKAGING

Bulk Packaging: The conventional approach is to use gunny/jute bags with a size varying from 10kg to 70kg for the packing of whole spices. Jute bags can be supplied with a polyethylene loose liner container, or maybe without a liner. Often double gunny bags, particularly for whole seeds are also used. An inner polyethylene lining is provided with the double gunny sack. The consistency of the jute fabric used varies from one trader to the other with respect to the gram mage and the weave (ends/picks).

There is no standardization about the type of fabric used and its consistency. A number of jute fabrics are used, including hessian, lightweight DW, A-twill, hard Cee, etc. Some spice traders/packers have recently used alternative bulk packing media, such as woven plastic bags that can be laminated or supplied with a loose liner bag, and plastic liner bag multiwall paper sacks. To overcome the toxicity issues associated with jute, plastic-based alternative wrapping materials are used. In comparison, the plastic bags/liners often help to maintain for a longer time the consistency of the spices packed inside.

Jumbo bags (Flexible Intermediate Bulk Containers) (FIBCs) for the export of spices are the new theme. These bags have a size of up to 1 tonne and have different benefits, such as:

- Bags are flexible, collapsible and durable
- It can be used to store granules, powder, flakes, and other free-flowing substance
- It is possible to prevent commodity waste/spillage and tampering.
- Since handling is mechanized, less labor is required.
- Time saved for loading and unloading

- Bags are low in weight and freight rates are also minimized.
- Creates an eco-friendly working environment free of emissions

Institutional packaging: Spice traders also make use of institutional power packs ranging from 2 kg to 10 kg. The range of packets used includes lightweight laminated pouches and woven plastic sacks that replace conventional materials such as tinplate containers and jute bags.

Consumer Packages: The possibilities open to spice traders/exporters when selecting a consumer pack for the domestic and export market are very large. The choice of the packaging material, however, depends on a number of factors, which are listed broadly below:

- ✓ Shelf-life duration, i.e. the degree of protection required by the commodity against pick-up of moisture, preservation of aroma retention, decoloration, etc (this is more critical in the case of powdered spices)
- ✓ During packaging, transportation, and delivery, environmental conditions
- ✓ Business type/sector
- ✓ Preferences for users
- ✓ Printability and appeal of aesthetics

The package types generally used as consumer packs are:

- ✓ Glass bottles of various sizes and shapes with labels and provided with metal or plastic caps. The plastic caps have added inbuilt features of tamper evidence, dispensing, grinding, etc.
- ✓ Printed tinplate container with/without dispensing systems
- ✓ Printed tinplate container with/without dispensing systems
- ✓ Plastic containers with plugs and caps with dispensing and tamper evidence features
- ✓ Printed flexible pouches – pillow pouch, gusseted pouch, stand-up pouch.
- ✓ Lined cartons

3.5 MATERIAL OF PACKAGING

Due to their simple availability, excellent printability, lightweight, machinability, and cost-effectiveness printed flexible pouches have recently become quite popular. The laminate/film may also be customized to serve a particular purpose, depending on the practical and marketing criteria. The

rinted flexible pouches are generally laminates of various compositions. Some of the commonly used laminates are:

- ✓ Polyester/metallised polyester/LDPE
- ✓ BOPP/LDPE
- ✓ BOPP/metallised polyester/LDPE
- ✓ Polyester/Al foil/LDPE

Polyester and BOPP-based laminates are usually more common in the packaging of cumin powder and other spices due to its potential and characteristics of both of these two films. In general, the polyester used for lamination is 10 to 12 μ m thick. The film is good clarity with outstanding transparency, excellence, and printability thereby improving the sales appeal. The film has very low moisture and gas permeability and thus guarantees a long shelf life of the contents of aroma, flavor, and flavor retention.

It may be Heat sealable or non-heat sealable. The film has high yields, is stable under climate change, and has an outstanding moisture barrier. The film is glossy, crystal clear, and smooth and has high mechanical strength and non-contamination properties for food contact applications. The sealant coating of LD – HD or LDPE may be replaced by LLDPE. Co-extruded films can also be used. Flexible materials based on PVDC, EVOH and EVAL still need to be tested, since they are now on the market and have high barrier properties.

Glass Containers

Bottles/Jars are commonly used. The glass used for food packaging is soda-lime glass. Most bottles and jars are tailor-made specifically for one product or one manufacturer. Closures for glass containers are more standardized. Glass containers can be reused or recycled. Eliminates the risk of potentially harmful chemicals found in some plastics that can leach into food.



Glass Closure and Sealing Lug Jars

Also known as Twist Off(T/O) caps, lug caps are compatible with containers whose threads are non-continuous. Lugs on the interior of a lug cap, correspond with the non-continuous threads and close by a partial rotation.



LUG Cap Sealer
(Mechanical)



LUG Cap Sealer
(Pneumatic)



Flexible Packaging

The printed flexible pouches are generally laminates of various compositions.

1. Polyester/metallised polyester/ LDPE
2. BOPP/LDPE
3. BOPP/metallised polyester/LDPE.
4. Polyester/AL foil LDPE



Composite Containers

Composite containers are also used for packaging of Jaggery solid and powder. The containers are round and the body (side wall) is made of PE coated foil laminated spirally wound paper. The top and bottom ends of the container may be made from metal or plastic. The inner face is coated with plastic film or a combination of film and aluminum foil- This ensures optimum barrier properties against moisture and oxygen.



Kraft Packaging

Kraft packaging has good strength, printability and appearance. Other advantages are its low cost, wide availability and low weight. Currently very popular material in food packaging. Made by sulphate pulping process. Poly amide or polyamine resin is used to coat or laminate to improve barrier properties.



3.6 PACKAGING MACHINERY



Bag filling machine



Automatic FFS machine

CHAPTER-4

FOOD SAFETY REGULATIONS AND STANDARDS OF CUMIN POWDER

4.1 INTRODUCTION TO FSSAI

The Food Safety and Standards Authority of India (FSSAI) has been established under Food Safety and Standards, 2006 which consolidates various acts & orders that have hitherto handled food-related issues in various Departments. The FSSAI is responsible for setting standards for food so that there is one body to deal with and no confusion in the minds of consumers, traders, manufacturers, and investors. The Act aims to establish a single reference point for all matters relating to food safety and standards, by moving from multi-level, multi-departmental control to a single line of command.

Highlights of the Food Safety and Standard Act, 2006-

Various central Acts like Prevention of Food Adulteration Act, 1954 , Fruit Products Order , 1955, Meat Food Products Order , 1973, Vegetable Oil Products (Control) Order, 1947, Edible Oils Packaging (Regulation) Order 1988, Solvent Extracted Oil, De- Oiled Meal and Edible Flour (Control) Order, 1967, Milk and Milk Products Order, 1992 etc will be repealed after commencement of FSS Act, 2006.

The Act also aims to establish a single reference point for all matters relating to food safety and standards, by moving from multi- level, multi- departmental control to a single line of command. To this effect, the Act establishes an independent statutory Authority – the Food Safety and Standards Authority of India with head office at Delhi. Food Safety and Standards Authority of India (FSSAI) and the State Food Safety Authorities shall enforce various provisions of the Act.

Establishment of the Authority-

Ministry of Health & Family Welfare, Government of India is the Administrative Ministry for the implementation of FSSAI. The Chairperson and Chief Executive Officer of Food Safety and Standards Authority of India (FSSAI) have already been appointed by Government of India. The Chairperson is in the rank of Secretary to Government of India.

4.2 FSSAI REGISTRATION & LICENSING PROCESS

According to Section 31(1) of Food Safety and Standards (FSS) Act, 2006, Every Food Business Operator (FBO) in the country is required to be licensed under the Food Safety & Standards Authority of India (FSSAI).

As per FSS (Licensing & Registration) Regulations, 2011, Licenses and Registrations are granted to FBOs in a 3 tier system

- Registration - for petty FBOs with annual turnover less than Rs 12 lakhs
- State license - for medium-scale food manufacturers, processor and transporters
- Central License - for large-scale food manufacturers, processor and transporters

FSSAI registration is done online on the FSSAI website through Food Safety Compliance System (FoSCoS)

- FoSCoS has replaced the Food Licensing and Registration System (FLRS).
- Petty food business operators are required to obtain FSSAI Registration Certificate
- “Petty Food Manufacturer” means any food manufacturer, who manufactures or sells any article of food himself or a petty retailer, hawker, itinerant vendor or temporary stall holder (or) distributes foods including in any religious or social gathering except a caterer;

or

- Other food businesses including small scale or cottage or such other industries relating to food business or tiny food businesses with an annual turnover not exceeding Rs. 12lakhs and/or whose production capacity of food (other than milk and milk products and meat and meat products) does not exceed 100 kg/ltr per day

Any person or entity that does not classify as a petty food business operator is required to obtain an FSSAI license for operating a food business in India.

FSSAI License - two types - State FSSAI License and central FSSAI License

Based on the size and nature of the business, the licensing authority would change.

- Large food manufacturer/processors/transporters and importers of food products require central FSSAI license

- Medium-sized food manufacturers, processor and transporters requires state FSSAI license.
- License period: 1 to 5 years as requested by the FBO.
- A higher fee for obtaining FSSAI license for more years.
- If a FBO has obtained the license for one or two years, renewal may be done, no later than 30 days prior to the expiry date of the license.

4.3 FOOD SAFETY & FSSAI STANDARDS & REGULATIONS

Food Standards

“2.9.8: Cumin (Zeera, Kalonji) 2.9.8.2 Cumin (Safed Zeera) powder”

Cumin (Safed Zeera) powder means the powder obtained by grinding the dried mature seeds of (*CuminumCyminum L*). It shall have characteristic aromatic flavour free from mustiness. It shall be free from mould, living and dead insects, insect fragments, rodent contamination. The powder shall be free from added colour and harmful substances.

It shall conform to the following standards:—

- (i) Moisture - Not more than 10.0 percent by weight.
- (ii) Total ash on dry basis- Volatile oil content on dry basis- Not less than 0.09 percent by v/w (weight per volume).
- (iii) Acid insoluble ash on dry basis- Not more than 1.5 percent by weight.
- (iv) Non-volatile ether extract on dry basis- Not less than 15.0 percent by weight
- (v) Volatile oil content on dry basis- Not less than 1.3 percent by v/w

Food Safety

Part I - General Hygienic and Sanitary practices to be followed by Petty Food Business Operators applying for Registration.

Sanitary and Hygienic Requirements for Food Manufacturer/ Processor/Handler

The place where food is manufactured, processed or handled shall comply with the following requirements:

1. The premises shall be located in a sanitary place and free from filthy surroundings and shall maintain overall hygienic environment. All new units shall set up away from environmentally polluted areas.
2. The premises to conduct food business for manufacturing should have adequate space for manufacturing and storage to maintain overall hygienic environment.
3. The premises shall be clean, adequately lighted and ventilated and sufficient free space for movement.
4. Floors, Ceilings and walls must be maintained in a sound condition. They should be smooth and easy to clean with no flaking paint or plaster.
5. The floor and skirted walls shall be washed as per requirement with an effective disinfectant the premises shall be kept free from all insects. No spraying shall be done during the conduct of business, but instead fly swats/ flaps should be used to kill spray flies getting into the premises. Windows, doors and other openings shall be fitted with net or screen, as appropriate to make the premise insect free The water used in the manufacturing shall be potable and if required chemical and bacteriological examination of the water shall be done at regular intervals at any recognized laboratory.
6. Continuous supply of potable water shall be ensured in the premises. In case of intermittent water supply, adequate storage arrangement for water used in food or washing shall be made.
7. Equipment and machinery when employed shall be of such design which will permit easy cleaning. Arrangements for cleaning of containers, tables, working parts of machinery, etc. shall be provided.
8. No vessel, container or other equipment, the use of which is likely to cause metallic contamination injurious to health shall be employed in the preparation, packing or storage of food. (Copper or brass vessels shall have proper lining).

9. All equipments shall be kept clean, washed, dried and stacked at the close of business to ensure freedom from growth of mould/ fungi and infestation.
10. All equipment's shall be placed well away from the walls to allow proper inspection.
11. There should be efficient drainage system and there shall be adequate provisions for disposal of refuse.
12. The workers working in processing and preparation shall use clean aprons, hand gloves, and head wears.
13. Persons suffering from infectious diseases shall not be permitted to work. Any cuts or wounds shall remain covered at all time and the person should not be allowed to come in direct contact with food.
14. All food handlers shall keep their finger nails trimmed, clean and wash their hands with soap, or detergent and water before commencing work and every time after using toilet. Scratching of body parts, hair shall be avoided during food handling processes.
15. All food handlers should avoid wearing, false nails or other items or loose jewellery that might fall into food and also avoid touching their face or hair.
16. Eating, chewing, smoking, spitting and nose blowing shall be prohibited within the premises especially while handling food.
17. All articles that are stored or are intended for sale shall be fit for consumption and have proper cover to avoid contamination.
18. The vehicles used to transport foods must be maintained in good repair and kept clean.
19. Foods while in transport in packaged form or in containers shall maintain the required temperature.
20. Insecticides / disinfectants shall be kept and stored separately and `away from food manufacturing / storing/ handling areas.

Regulatory Quality Control

- The plant in which the food is made, its correct design and construction, cleanliness and worker hygiene.

- The physical characteristics of the food (including foreign bodies and adulteration), the chemical composition (for example levels of preservatives) and micro-biological quality.
- The correct labelling of the product including related aspects such as sell-by date, etc.

4.4. LABELLING STANDARDS (REGULATION 2.5 OF FSS)

Labelling requirements for packaged food products as laid down in the Part 2.4 of the Prevention of Food Adulteration (PFA) Rules, 1955, and the Standards of Weights and Measures (Packaged Commodities) Rules of 1977, require that the labels contain the following information:

1. Name, trade name or description
2. Name of ingredients used in the product in descending order of their composition by weight or volume
3. Name and complete address of manufacturer/packer, importer, country of origin of the imported food (if the food article is manufactured outside India, but packed in India)
4. Nutritional Information
5. Information Relating to Food Additives, Colors and Flavors
6. Instructions for Use
7. Veg or Non-Veg Symbol
8. Net weight, number or volume of contents
9. Distinctive batch, lot or code number
10. Month and year of manufacture and packaging
11. Month and year by which the product is best consumed
12. Maximum retail price

Provided that — (i) the nutritional information may not be necessary, in case of foods such as raw agricultural commodities, like, wheat, rice, cereals, flour, spice mixes, herbs, condiments, table salt, sugar, jaggery, or non –nutritive products, like, soluble tea, coffee, soluble coffee, coffee-chicory mixture, packaged drinking water, packaged mineral water, alcoholic beverages or flour and vegetables, processed and pre-packaged assorted vegetables, flours, vegetables and products that comprise of single ingredient, pickles, papad, or foods served for immediate consumption such as served in hospitals, hotels or by food services vendors or halwais, or food shipped in bulk which is not for sale in that form to consumers.

Wherever applicable, the product label also must contains the following

The purpose of irradiation and license number in case of irradiated food. Extraneous addition of colouring material.

Non-vegetarian food – any food which contains whole or part of any animal including birds, fresh water or marine animals, eggs or product of any animal origin as an ingredient, not including milk or milk products – must have a symbol of a brown color-filled circle inside a brown square outline prominently displayed on the package, contrasting against the background on the display label in close proximity to the name or brand name of the food.

Vegetarian food must have a similar symbol of green color-filled circle inside a square with a green outline prominently displayed.

All declarations may be: Printed in English or Hindi on a label securely affixed to the package, or Made on an additional wrapper containing the imported package, or Printed on the package itself, or May be made on a card or tape affixed firmly to the package and bearing the required information prior to customs clearance.

Exporters should review the Chapter 2 of the “FSS (Packaging and Labeling) Regulation 2011” and the Compendium of Food Safety and Standards (Packaging and Labeling) Regulation before designing labels for products to be exported to India. FSSAI revised the labelling Regulation and a draft notification to that effect was published on April 11, 2018, inviting comments from WTO member countries and the comments received are under review and the publication date remains unknown.

According to the FSS Packaging and Labelling Regulation 2011, “prepackaged” or “pre packed food” including multi-piece packages, should carry mandatory information on the label.

CHAPTER - 5

OPPORTUNITIES FOR MICRO/UNORGANIZED ENTERPRISES

5.1. PM-FME Scheme:

Ministry of Food Processing Industries (MoFPI), in partnership with the States, has launched an all India centrally sponsored "PM Formalisation of Micro Food Processing Enterprises Scheme (PM FME Scheme)" for providing financial, technical and business support for up-gradation of existing micro food processing enterprises. The objectives of the scheme are:

- I. Support for capital investment for up-gradation and formalization with registration for GST, FSSAI hygiene standards and Udyog Aadhar;
- II. Capacity building through skill training, imparting technical knowledge on food safety, standards & hygiene and quality improvement;
- III. Hand holding support for preparation of DPR, availing bank loan and up-gradation;
- IV. Support to Farmer Producer Organizations (FPOs), Self Help Groups (SHGs), producers cooperatives for capital investment, common infrastructure and support branding and marketing.