



PM Formalisation of Micro Food Processing Enterprises Scheme

Processing of Apple Wine



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CHAPTER- 1

INTRODUCTION

1.1. Apple wine

Cider is an ancient beverage. No one knows when or where it was first made, because the native distribution of its principal component, the apple, is so widespread, from the Near East to north- western Europe. In the cider market, ciders can be broken down into two main styles, standard, and specialty. The first group



consists of modern ciders and heritage ciders. Modern ciders are produced from culinary apples such as Gala. Heritage ciders are produced from heritage, cider specific, crab or wild apples, like Golden Russet.

Cider is an alcoholic drink (7-8% alcohol) made by fermenting apple juice. It comes in a variety of iterations still, naturally sparkling, bottle-fermented, method champenoise, carbonated, dry, medium, sweet, ice cider, cider brandy, acidic, tannic, wild yeast fermentation.

1.2. Apple

An apple is an edible fruit produced by an apple tree (*Malus domestica*). Apple trees are cultivated worldwide and are the most widely grown species in the genus *Malus*. The tree originated in Central Asia, where its wild ancestor, *Malus sieversii*, is still found today.



Apple (*Malus pumila*) is an important temperate fruit. Apples are mostly consumed fresh but a small part of the production is processed into juices, jellies, canned slices and other items.

In India, Apple is primarily cultivated in Jammu & Kashmir; Himachal Pradesh; hills of Uttar Pradesh and Uttarakhand. It is also cultivated to a small extent in Arunachal Pradesh; Nagaland; Punjab and Sikkim.

Various different types of apples are needed to make well-blended cider. Though opinions differ, the apples used in cider making are generally closely related to crab apples than ordinary eating apples (dessert apples) and have higher tannin content. These are mainly the 'bittersweet' and 'bitter sharp' varieties of apples. Selection of apple varieties depends on the taste and flavour of cider for sweeter cider, try Gala, Fuji, Cortland, Golden Delicious, or Red Delicious varieties; for a more acidic, tart flavour, go with Pink Lady, Braeburn, Jonathan, or McIntosh. Sometimes the sweet and acidic apple is used for making blended flavour.

1.3. Key Components of Cider

There are three main elements that are important for making quality cider. Sugar determines the alcoholic content of a cider and can be used to back-sweeten acidic ciders. Acidity provides a refreshing flavour and balances alcohol and sweetness. Tannins provide both astringency and bitterness to enhance flavour and mouth feel.



1.3.1. Sugar

Sugar is extremely important for hard cider production. Sugar is converted into alcohol and carbon dioxide by yeast. The more sugar you start with, the more alcohol you will have in your finished cider. Most apple varieties have enough sugar to produce a hard cider of about 7- 8% alcohol by volume (ABV). Most hard ciders are traditionally produced solely with the sugars in the apples themselves, with no additional sugars added. Generally 10-17% of the juice (degrees Brix)

1.3.2. Acidity

Generally 0.5 - 0.7% of the juice (Treatable acidity). The acidity balances sweetness and adds a refreshing character to ciders. Acidity is a major flavour characteristic of ciders. Higher levels of acidity tend to brighten up ciders and make them pop. Low acid levels tend to leave ciders seeming dull and flabby. The major acid in apples is malic acid. Malic acid is sharp and tart. Think of sour, green apples. Higher TAs result in more acidic ciders. Most ciders fall between 0.5 to 0.7% TA.

1.3.3. Tannins

Tannins are complex phenolic compounds that can play a most significant role in cider mouth feel. Tannins are a source of astringency. Astringency is that drying-out effect that you get on your tongue and in your mouth when you drink dark, black tea. Astringency enhances mouth feel by making it feel as if the cider has more viscosity, even though it doesn't. Generally 0.04-0.08% of the juice (400-800 ppm)

1.4. Health benefit of Apple wine

Apple wine contains polyphenols, which are compounds in plants that act as antioxidants. They can help the body to fight against free radicals and cell damage, lowering your risk of certain types of cancer, diabetes, and heart disease. Polyphenols also help to ease inflammation in the body. As Apple wine isn't filtered, it has more polyphenols than apple juice. It does, however, contain less than fresh, whole apples, which also contain a significant amount of fibre.

1.5. Statistics

1.5.1 Global scenario



The global cider market size was estimated at USD 4.33 billion in 2018 and is anticipated to register a CAGR of 3.1% from 2019 to 2025. One of the biggest growth factors is a growing demand for premium spirits due to rising per capita income as well as alcohol consumption as a status symbol. In alcoholic beverages, customers increasingly favour heritage,

efficiency, and novelty. The brand is touted as a gender-balanced group in which male drinkers account for 51% and women account for 49% worldwide. This percentage reflects 40% of citizens aged 20 to 30 years of age. The younger generation prefers to drink less alcohol and choose healthy alternatives that position cider as one of the preferred drinks in different categories. Compared to conventional beers, dry cider contains low sugar and carbohydrates and is considered healthier.

1.5.2 National scenario

The Indian Cider Market has been segmented by Source into sugar confectionery, chocolate confectionery, and bakers' confectionery. The large market for hard candies across the globe made sugar confectionery the largest segment of the India Cider Market. Sugar confectionery is widely accepted and preferred by the population of almost all groups and this segment is likely to hold its dominance on the market over the forecast period. The cider market consists of the retail sale of cider. The cider segment consists of Apple wine, flavoured cider, pear cider, and seasonal cider. Rising middle-class population and increasing disposable incomes leading to rising demand for alcoholic drinks such as beer. The India Cider Market is highly fragmented with a large number of players involved in a wide array of confectionery products. The market turned further competitive by the footprints of many Asian and Middle East companies entering the market with local confectionery flavours.

1.6. Types of Wine Made With Other Fruits

When you drink a fruit wine, you are sampling the best fruit an area or specific region has to offer, from citrus fruits to tropical varieties to berries. Some of the most popular types of fruit wines.

- **Pink Grapefruit Wine:** Pink grapefruit adds a tang to a white wine that complements light offerings, such as a fresh salad and deli sandwich. The key lime creates a tart wine reminiscent of a margarita.



- **Tangelo Wine:** One wine that is available only in the early part of each year is tangelo wine, made from short-season tangelos. The tangelo wine is a mixture of the flavours found in tangerine and grapefruit wines. Tangerine wines, which deliver a distinct citrus scent and flavour, are similar to the tangelo wines, and they are available all year.



- **Pineapple wine:** Pineapple wine offers a sweet flavour with a bit of zest;



- **Banana Wine:** Banana wine has a strong fruit flavour and best pair with kinds of seafood.



- **Mango wine:** Mango wine is slightly sweet and highly fragrant, and it pairs well with light seafood.



- **Guava wine:** Guava wine is amber in color, and its flavor profile is a blend of lemon,



pears, pineapple, and strawberries.

1.7.Scope of Apple wine industry

While cider is a millennia-old drink in the Western world, in India it is a relatively new introduction popularized by the microbrewery revolution. While there have been attempts to brew cider primarily as a means of tackling wastage in apple-growing areas like Himachal Pradesh, the initiatives have remained on a minuscule scale.

Good quality cider still comes via imports from the West countries. There is clearly a gap in the market triggered by a growing interest in craft brews and spirits.



The introduction of different premium brands will open up the Indian market to the variety of apple and other fruit-based ciders that are lighter alternatives to spirits, suited to the hot weather, and versatile enough to be adapted into cocktails.

CHAPTER 2

PROCESSING OF APPLE WINE

2.1. MANUFACTURING PROCESS

There are various steps involved in cider-making: harvest, sweating, washing, grinding, pressing, blending, testing, fermentation, racking off, filtering or fining, bottling, storage. Each step has its importance in the overall “image” of the final product.

In modern plants, the apples are crushed in a grater type mill made of stainless steel. Next, the pulp is crushed to extract the juice using a cider press. In modern plants, mechanic- hydraulically operated plate presses are used. The freshly pressed juice may be fermented straight away or concentrated and stored for later conversion to cider, in which case it is extensively treated to pasteurize and remove pectin.

2.2. Processing technologies of Apple wine

Selection of varieties and harvesting

This step involves the harvest of the prime material that makes a good cider:

- Several varieties of ripe apples are used to make a balanced cider blend. Green or immature apples make a poor cider; however, some may be added to increase the acid content (tartness).
- Rotten apples should not be mixed up with the good quality cider apples.
- Most ciders are a blend of juices from several apple varieties.
- A representative blend of apples would include approximately 50% sweet apples, 35% acidic apples, and 5% astringent apples.
- There are more than 20 varieties of apples that can be used such as Paula Red,



mcintosh, Jonathan, Empire, Ida Red, Gala, Jonagold, Rome, Fuji, Honeycrisp, Red Delicious, Golden Delicious, Northern Spy Etc.

Important parts of the apple in cider-making are the skin and pulp.

Apple skin: In the composition of apple skin, there are some essential oils and aroma, acids, tannins, certain bitter substances, yeast, and pigments. It gives the apple its distinctive aroma that's why is important to use only ripe apples for cider.

Apple pulp: The prime raw material is represented by apple pulp. It makes up 95% of the total weight of an apple, soluble, and insoluble parts:

- ☐ Soluble part becomes the “must”. Composition: 75-90% water, sugars, malic acid, tannins, Pectins, starch, oils, ash, nitrogenous material, and trace elements
- ☐ Insoluble part composition: starch, pectin, cellulose, nitrogenous material, and ash.
- ☐ The fibrous tissues together with the skins, seeds, and other insoluble substances are known as the pomace or marc.

Sweating

Apples should be stored on a concrete or wooden platform for about a week to ten days until a good firm squeeze leaves finger impressions on the fruit signals that they are ready for grinding. Sweating are not prefers in some varieties i.e. Newtown, Jonathan, and Rome Beauty. These varieties directly used for press after harvesting.



Advantages of sweating:

- ☐ Makes the apples fruit easy to grind.
- ☐ Increases the sugar contents in the juice.
- ☐ For developed good flavor and aroma.

Grinding

The fruit should be ground or milled to a fine pulp, in order to produce the optimum amount of juice. Apples can be ground whole including cores and skin. The finer the consistency of the pomace, the greater the yield of juice.



Pressing

After grinding, the pulps are fed to the juice press. As pressure is applied, the juice flows out. Clean collecting vessels made of plastic or stainless steel are recommended to avoid off- flavours and colours. Other metal containers like Copper, aluminium, iron, galvanized metal or chipped enamel containers should not be used. The juice now is called “must”.

Blending

Different types of fruit juices can be added for making blended in order to enhance the taste of cider. Proportions of juice that can be used for blend Apple wine are Neutral base juice (30-60%), Tart (10-20%), Aromatic (10-20%) and Astringent (5-20%). the blending can be done before grinding or before fermentation or after fermentation.



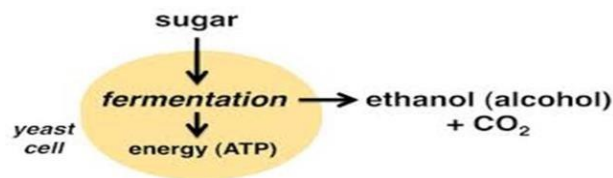
Testing

It is very important that the acid level should drop in cider. During the fermentation, the sugar is converted into alcohol. The amount of sugar in the fresh juice gives information on the alcoholic strength of the final product. If the cider is contaminated by acetobacter the vinegar is manufactured.

Fermentation

The fermentation process is started after juice extraction. Add the apple yeast and 2 grams per 5 liters of Cider Nutrient to the fermenter for good quality cider. food-grade plastics fermenter or stainless steel should be used as a fermenter tank.

The yeast flora that participates in fermentation converts the natural hexose sugars into alcohol and carbon dioxide (CO₂). Fermentations process are Depends on the temperature (20- 27°C for about 5 to 14 days) and the juice constituents, this type of fermentation can last for weeks or even months as long as the sugar is available to the yeast. When sugar is no longer available for yeast, the fermentation slows and then stops.



Racking off

Using a clean plastic tube the cider is drained off into the second fermenting tank or directly into bottles. The refermentation readings should be compared with these acid and alcohol levels.

Filtering

This step makes a cider crystal clear. It can be done by using a closed filter system to avoiding exposure to air in order to prevent acetic bacteria contamination.



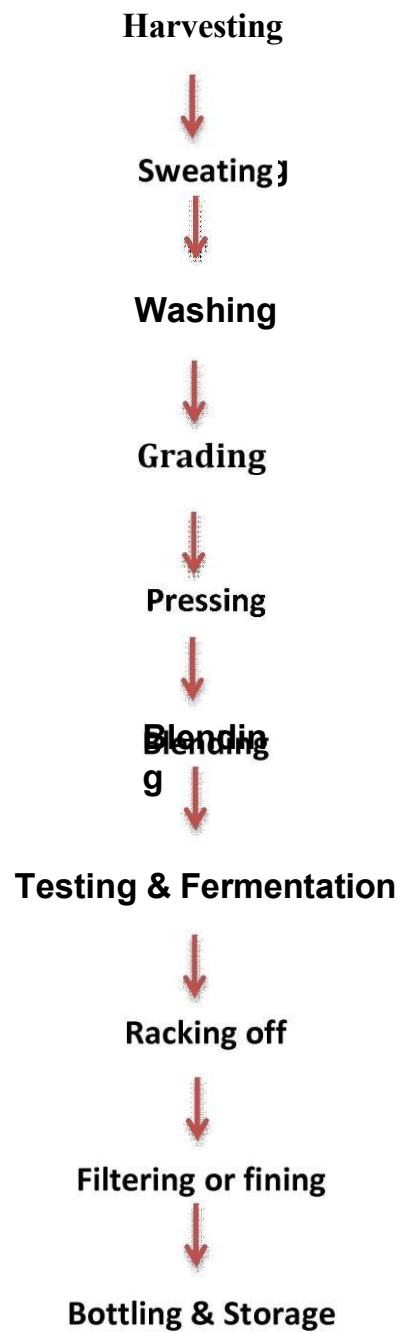
Bottling

- Use sterile bottles for cider. For “in-bottle fermentation” a small amount of sugars may be added to each bottle. To avoid killing the yeast by pasteurization after the addition of sugar, the addition of sulphur is most practiced.
- To prevent further fermentation Cap or cork the bottle properly and then pasteurize the cider.

Storage

The bottles should be kept in a cool, dark storage place for several months for flavour development.

2.3. Flow Chart of Apple cider Processing:



2.3. Raw material (for 1000 litter fresh juice)

S.no.	Component	Qty
	Apple fruit	1500-1700 kg
	yeast	2 gram/ 5 kg of juice
	Packaging plastic bottles	

2.4. Equipments involved

1. **Fruit washer machine:** Fruit washer machine is mainly used in washing fruits or vegetables; it is essential equipment on the fruit and vegetable juice processing line. Fruit washer machine is also widely used in the processing of varied fruit products.



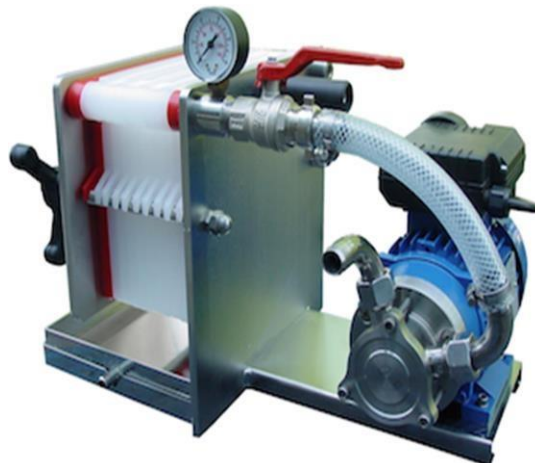
2. **Fruit mill:** The fruit mill is utilized to crush any fruit, before putting the same into Pulper or hydraulic press to extract juice.



3. **Juice press:** A cider press is used to crush apples or pears in order to extract the juice from its pulp.



4. **Filtration Unit:** Filtration is a key unit operation in the production to clarified juices of an apple, from clarification to final, filtration machine helps to ensure a quality product for cider production.



5. **Fermentation tanks:** the fermentation tank is used in the fermentation process for Apple wine . it is storage tanks that are used for the final step in the brewing process, after which the cider is ready to be bottled.



6. **Filling and capping machine:** The bottle filling and capping machine is used to fill cider in the glass, Plastic PET bottles, Containers etc., And automatically cap it with the option of screw caps and snap-fit caps.



2.5. PROJECT COMPONENTS

2.5.1. Land

The required land for date processing is estimated to be around 10000-15000 Sq.ft.

Civil Work

Workshop Area- This area includes the space for processing, cleaning, sorting and , processing, packaging processes. Total workshop area is approx. 10000 Sqft.

Inventory Area- This area includes the storage space for all the raw materials and storage space and finished goods. Total inventory area is approx. 2500 Sqft.

Office Area – This space includes staff working region. Total workshop area is approx. 1000, Sqft.

Land and building requirement may vary depending on the size of project

Misc. Assets

- ☐ Water Supply Arrangements
- ☐ Furniture
- ☐ Computer and Stationary

2.5.2. Power Requirement

With semi-automatic machines and equipment with manual handling, the Power Required is about: 30-40 kW, to operate this plant. (It is also depend on Project size and machines specification)

2.5.3. Manpower Requirement

Men and women both are involved in this. For a small unit to begin with around 25-30 people can work.

2.5.4. LICENSE & APPROVALS

- ☐ GST Registration
- ☐ Udyog Aadhar Registration (Optional)
- ☐ FSSAI Registration
- ☐ Factory license
- ☐ ESIC, EPF
- ☐ NOC from PCB

Chapter – 3

3.1. PACKAGING OF APPLE WINE

The beverage industry is one of the front-liners where massive investments are being made for expansion and technological up-gradation. The packaging of beverages both carbonated and non-carbonated is a complex technological branch in the Food Processing /Packaging industry. The traditional returnable glass bottle has given way to newer plastic containers as well as cartons. The current trend is to improve the conventional containers, extend their share in the large market, extend the shelf-life of the products, provide greater consumer convenience, and ultimately to produce economic packages.

3.1.1. The packaging requirements for all types of beverages are:

- ☐ Absolutely leak-proof and prevent contamination
- ☐ Protect the contents against chemical deterioration
- ☐ No pick up of external flavours
- ☐ Be hygienic and safe
- ☐ Retain carbonation in the case of carbonated beverages
- ☐ Economical, easy to use and dispose
- ☐ Good aesthetic appearance

3.2. The following attributes should be considered as a Quality parameter of Apple wine

- **Sight** – The colour of cider will vary with the apples used the effervescence
- **Smell** – The aroma of the apples
- **Touch** – Cider should have the right balance of malic acid and tannin
- **Taste** – The degree of sweetness
- **Sound** – The range of effervescence (bubbles, carbonation).

3.3. Selection of Packaging Material

Factors to consider include damage, fines, contamination, oxidation, and other things. In the selection of packaging materials for cider packaging the following need to be considered:

3.3.1. Water Vapour Transmission Rate (WVTR)

Knowledge of WVTR of packaging materials shows considerable effect. However, thermoplastic materials are not much affected.

3.3.2. Gas Transmission Rate

Gas Transmission Rate Permeability to gases like oxygen decides the shelf-life of oxygen-sensitive items. as the cider is very sensitive to oxidation.

Besides OTR, permeability to volatiles and flavors is important in cider product. Polyolefin has high values, whereas plastics such as polyester, nylons, ethylene vinyl alcohol (EVOH) have good barrier properties for transmission of volatiles. The odor permeability's (for volatiles used in candies) of some materials.

Odour Transmission of Packaging Materials

Packaging Material	Thickness (μ)	Days to Aroma Leakage			
		Vanillin	Menthol	Piperonal	Camphor
BOPP / PE	17/50	6	2	1	13
PET / PE	12/50	2	16	5	< 30
PET / EVOH	12/15	< 30	< 30	30	< 30
OPP / EVOH / PE	18/15/50	30	< 30	27	< 30
PET / EVOH / PE	12/15/50	15	25	27	< 30

3.3.3. Heat Seal Strength

The performance of a finished package is determined by the effectiveness of the package seal i.e. the permeability to water vapour, gases and volatiles increase if the seal is not perfect. Thermoplastic films such as polyethylene give excellent heat seals.

3.3.4. Performance Properties

Apart from the above-mentioned important properties, a material has to perform well on machines; therefore knowledge of physical properties like slip, stiffness, blocking resistance is also necessary. Twist retention for twist wrap is also of importance. The initial function of packaging is to protect.

3.4. Frequently-used plastic-based packaging materials for Apple wine

A very high quantum of polymeric materials, besides cellulosic and aluminum foil, are used for packaging items. The most common choice of packaging medium is plastic (generally flexible) as it provides the required protection and preservation, grease resistance, physical strength, machinability, and printability. Plastics being lighter in weight are, therefore, the most preferred material for the packaging of Apple wine. There are many changing trends in the packaging of beverages. Plastic-based packaging materials that can be used for beverages are listed below.

3.4.1. Polyethylene (PE)

It is considered to be the backbone of packaging films. Since one of the greatest threats to the quality of any product comes from moisture, polyethylene with its low water vapor transmission is of definite interest. Polyethylene films are fairly free of plasticizers and other additives and are quite extensively used as a part of lamination. Its ability to heat seal increases its value.

Low-Density Polyethylene (LDPE) is an economical material with low WVTR, however, it has a high permeability to flavors/volatiles, poor grease resistance, and are limp. High-density polyethylene (HDPE) is stiffer, more translucent, and has better barrier properties but needs a higher temperature for sealing.

Later additions include high molecular weight high-density polyethylene (HM HDPE) and linear low-density polyethylene (LLDPE). HM HDPE is a paper-like film with high physical strength and barrier properties but is less transparent than ordinary polyethylene. HM HDPE is available in twist-wrap grades. Polyethylene films are also suitable for making tetra packs etc. A copolymer of polyethylene and polyvinyl alcohol and EVOH has outstanding gas barrier properties especially when dry.

3.4.2. Polypropylene

Polypropylene films have better clarity than polyethylene and enjoy superior machinability due to stiffness. Lack of good salability has been a problem; however, PVDC and vinyl coating have been used to overcome this problem. Paralyzed polypropylene with an opal finish and attractive gloss is also used. Both as laminates and overwraps, PP film is now widely used for all types of packaging applications.

3.4.3. Poly Vinyl Chloride (PVC)

PVC is a stiff and clear film having a low gas transmission rate. PVC can be used as small wraps, bags, and pouches. PVC when co-polymerized with polyvinylidene chloride is known as Saran. Since it is a costly material, it is only used as a coating to obtain barrier properties and heat salability. PVC film is also used for twist wraps, as it has twist retention properties and is excellent on high-speed machines.

3.4.4. Polyesters (PET) and Polyamide (PA)

Polyethylene terephthalate film has high tensile strength, gloss, and stiffness as well as puncture resistance. It has moderate WVTR but is a good barrier to volatiles and gases. To provide heat seal property, PET is normally laminated to other substrates. Nylons or polyamides are similar to PET but have high WVTR.

3.4.5. Metallised Films

When polymeric films are metalized there is an improvement in their barrier properties. Metallization is also used for decorative purposes and aesthetics. The films, which are used for metallization, are PVC, PET, PP, and polyamides. To safeguard the interest of the consumer the Standards of Weights & Measures (Packaged Commodities) Rules, have imposed a limit on the weight of the wrapper.

3.5. Types of Packaging for Apple wine

3.5.1. Glass

The use of glass bottles for the packaging of fruit beverages was widespread although the hot-fill/hold/cool process had to be applied with care to avoid breakage of the containers. Glass is still the preferred packaging medium for high-quality Apple wine. However, over recent years, an increasing proportion is being packed aseptically, into cartons.

The improvements that have occurred in glass bottle packaging are:

- Lightweight

- ☐ Surface coating to increase abrasion resistance
- ☐ Use of wide-mouth containers fitted with easy-open-caps

3.5.2. Metal Containers:

Tinplate cans made of low carbon mild steel of 99.75% purity, coated with tin with easy-open ends are used. These tinplate containers are either 3 pieces or 2 piece containers. They are lacquered internally to prevent corrosion.

3.5.3. Plastic Containers:

Apple wine is a fermented product from apple juice, Packaging of such products is done through hot filling, to achieve extended shelf-life, PET bottles are usually used for filling applications. Special features are added to the containers through the design and manufacturing process. The package is heat-set in order to improve the temperature resistance of the containers. PET resins with a higher T_g (glass transition) temperature and/or a faster rate of crystallization are used. the plastic container is the more frequent packaging materials that are used in cider packaging.

3.5.4. Aseptic Packages:

Packed in aseptic packages provide excellent protection for beverages. These aseptic packages are made by combining thermoplastic with paperboard and aluminum foil. Their multi-layered construction enables the carton to protect the contents from various factors responsible for spoilage. The aluminum foil layer is a strong barrier for O₂ and light. The inner plastic layer made of polyethylene makes it possible to seal through the liquid. The outer paper layer provides stiffness making it possible for the cartons in a brick shape, thus, enabling maximum utilization of available storage and transportation space. Excellent graphics are possible leading to good display and shelf appeal and also providing information regarding the product. The aseptic process makes the product bacteria-free before being packaged.

3.6. Future Trends in packaging industry

It is projected that the global production of packaging materials will reach 180 million tons per year, with demand for more creative and advanced packaging materials growing annually. By 2018, the global packaging industry is forecast to increase to US\$975 billion and rise at a 4 percent annual rate. Asia alone has the capacity to make up more than 40 percent of global demand. Flexible packaging is currently rising by 4 percent to more than 16 million tons,

with a volume in excess of US\$50 billion. Many students and entrepreneurs have been drawn to this area of research by such tremendous development seen in the world economy. The well-being of the packaging industry is closely related to the economy of the world. The greater the success of the packaging industry, the greater the positive change of the world's economy.

The driving force responsible for the packaging industry growth.

- ☐ The aging of the population worldwide
- ☐ The movement towards smaller families
- ☐ The growing customer demand for convenience
- ☐ Growing awareness of health among consumers
- ☐ The trend of increasingly poor customers towards 'on-the-go' lifestyles
- ☐ Growing brand improvement/differentiation criteria in an increasingly competitive world
- ☐ Creation of new packaging materials
- ☐ Rising numbers of Nuclear Families
- ☐ Growing environmental consciousness and the introduction of new legislative standards for the recycling of packaging.

CHAPTER-4

4.1. FOOD SAFETY REGULATIONS AND STANDARDS OF PROCESSED APPLE WINE

Food Safety and Standards (Alcoholic Beverages) Regulation, 2018

3.1.4 Wine from fruits other than grapes 3.1.4.1 Cider:

Cider is a fermented alcoholic beverage made from apple juice. It may be soft cider having alcohol content of more than 0.5 upto 5.0 per cent, or hard cider having an alcohol content of more than 5.0 upto 9.0 per cent.

TABLE 2
[See regulation 3.1]

S. No.	Characteristics	Table or Grape Wine		Wine with carbon dioxide	Fortified Wine	Fruit Wine (other than grape wine)	Cider	Perry	Wine from other Agricultural and Plant Sources
		White	Red						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.	Ethyl alcohol content at 20°C, % by volume	7.0 to 15.5	7.0 to 15.5	7.0 to 15.5	15.0 to 24.0	7.0 to 15.5	More than 0.5 to 9.0	More than 0.5 to 9.0	1.5 to 8.0
2.	Residual extract (sugar free) g/l, <i>Max</i>	50.0	50.0	50.0	180.0	50.0	50.0	50.0	50.0
3.	Volatile acids as acetic acid g/l, <i>Max</i>	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
4.	Higher alcohols expressed as amyl alcohol (g/l) of absolute alcohol, <i>Max</i>	4.0	4.0	4.0	4.0	2.0	-	2.0	-
5.	Total acids expressed as tartaric (g/l of wine), <i>Max</i>	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
6.	Methyl alcohol (mg/l of wine), <i>Max</i>	250	400	400	400	400	250	250	250
7.	Esters expressed as ethyl acetate (g/l of absolute alcohol), <i>Max</i>	4.0	4.0	4.0	4.0	0.2	0.2	0.2	0.2
8.	Aldehydes expressed as acetaldehyde (g/l of absolute alcohol), <i>Max</i>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

S. No.	Characteristics	Table or Grape Wine		Wine with carbon dioxide	Fortified Wine	Fruit Wine (other than grape wine)	Cider	Perry	Wine from other Agricultural and Plant Sources
		White	Red						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
9.	Arsenic (mg/l), <i>Max</i>	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
10.	Cadmium (mg/l), <i>Max</i>	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
11.	Copper (mg/l), <i>Max</i>	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
12.	Iron (as Fe) mg/l, <i>Max</i>	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
13.	Lead (mg/l), <i>Max</i>	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
14.	Ochratoxin A (ug/l), <i>Max</i>	20	20	20	20	20	20	20	20

“-” means Not Applicable;

4.2. 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 equipments 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.

4.3. Labelling Standards

Labeling requirements for packaged food products as laid down in the Part VII 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

4.3.1 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 coloring 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 labeling 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 Labeling Regulation 2011, “prepackaged” or “pre packed food” including multi-piece packages, should carry mandatory information on the label.



Contact Us

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