



# FOOD SECURITY THROUGH FOOD PROCESSING: A STUDY ON FOOD SECURITY INITIATIVES UNDERTAKEN BY PURANDAR LAXMI MAHILA SHETKARI PRODUCER COMPANY LIMITED, PUNE DISTRICT

Asst. Prof Raisa A. H. Shaikh  
Research Scholar, Abeda Inamdar Senior College.

**Dr. Venkatachalam Rama**  
Research Guide, M.C.E. Society's Abeda Inamdar Senior College Research Centre in Commerce.

## Abstract:

Food security is defined by the United Nations' Committee on World Food Security as - All people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their food preferences and dietary needs for an active and healthy life. Food security is directly affected due Food wastes, which has an impact on the environment and contributes to climate change; wastes economic capital and the finite resources used in food production. Food loss is the consequential decline in the quantity or quality of food due to the decisions and actions by food suppliers in the chain, excluding retailers, food service providers and consumers. According to FAO, Food loss refers to any food that is discarded, incinerated or otherwise disposed off along the food supply chain from harvest. Food Processing is one way for reducing food wastes and food losses. Thus, the main objective of food processing is the provision of a safe and nutritional food supply, increase useful life of foods, optimize nutrients and reduce losses and waste. The current study investigates the best practices of food processing techniques undertaken as an initiative to reduce food losses and increase the shelf life of farm produce by Purandar Laxmi Mahila Shetkari Producer Company Limited, Pune District. The study can further help marginal farmers and other producer companies to reduce Farm wastes and improve sustainability and livelihood.

**Keywords:** Food Security, Food Processing, Agriculture, Sustainable farming, Food technology, Farmer Producer Organizations.

## Introduction:

Food security is defined as "all people having physical, social, and economic access to sufficient, safe, and nutritious food that meets their food preferences and dietary needs for an active and healthy life at all times," according to the United Nations' Committee on World Food Security. As a result, food security is immediately jeopardised. Food waste has a negative influence on the environment and contributes to climate change, as well as wasting economic capital and precious resources used in the food producing process. Food loss occurs when the quantity or quality of food is reduced as a result of decisions and actions performed by food suppliers along the supply chain, excluding retailers, food service providers, and consumers. The FAO defines food loss as any food that is thrown away, burnt, or otherwise disposed of from harvest through the end of the food supply chain. Processing farm products is one method for reducing food waste and losses. Food processing aims to ensure a safe and nutritious food supply while also extending food shelf life, optimizing nutrients, and reducing losses and waste. The researcher has undertaken a study to evaluate the best practises of food processing procedures as part of an endeavour to reduce food losses and extend the shelf life of farm goods practiced by Purandar Laxmi Mahila Shetkari Producer Company Limited, Pune District. The research could also aid marginal farmers and other producers in reducing farm waste and improving their sustainability and livelihood.

## Research Problem

- 1. Lack of Labour**  
Farmers have been migrating to the city areas of Pune due to a lack of irrigation and agricultural inputs. Farmers of a younger generation, particularly those with a formal education, are migrating to cities to work in "white collar employment."
- 2. Surplus Production:**



Due to over-cultivation and a lack of consumers, farm produce is discarded or left unharvested, resulting in wastage.

**Objective of study:**

1. To understand the concept of food security
2. To understand the role of food processing in food security
3. To study the initiatives undertaken by Purandar Laxmi Mahila Shetkari Producer Company Limited to reduce food wastes.

**Scope of the study**

- This Research is helpful for farmers to reduce Farm food wastes through food processing.
- This research can be further helpful for farmers who wish to commercialize agricultural produce through processing and packaging.

**Review of literature****The sustainable development goals**

The United Nations adopted the Sustainable Development Goals (SDGs), also known as the Global Goals, in 2015 as a universal call to action to end poverty, safeguard the environment, and ensure that by 2030, everyone lives in peace and prosperity. The 17 SDGs are interconnected, recognising that actions in one area have an impact on outcomes in others and that development must strike a balance between social, economic, and environmental sustainability.

**Food Wastes**

**Food Loss**<sup>1</sup> refers to food that is spilled, spoiled, or otherwise lost, or suffers a quality or value drop throughout its journey through the food supply chain before reaching its final destination. Food loss is common in the food supply chain during the production, post-harvest, processing, and distribution stages.

**Food waste**<sup>2</sup> refers to food that has completed the food supply chain and is of good quality and fit for consumption but is rejected before being consumed, whether or not it has been permitted to spoil or expire. Food waste occurs most frequently (but not always) at the retail and consumption stages of the food supply chain.

**Farm food wastes**

On farms, food loss occurs for a variety of causes. Farmers frequently plant more than consumers demand to protect themselves from pests and bad weather. Weather, pests, and illness may prevent food from being gathered. Farmers may throw out edible produce due to market conditions off the farm. Farmers will occasionally leave their crops unharvested if the market price of produce is lower than the cost of transportation and labour. When farmers produce more of a commodity than customers are willing to buy, or when demand for a product declines unexpectedly, this practise is known as dumping<sup>3</sup>.

**Perishable foods** are subject to loss during food transportation and distribution, especially in underdeveloped countries where access to adequate and consistent refrigeration, infrastructure, and transportation can be difficult. Even if these products make it to market, they are frequently thrown away due to their short shelf lives.

**Food security** exists when all people have physical, social, and economic access to enough, safe, and nutritious food that fits their dietary needs and food choices in order to live an active and healthy life. Availability, access, usage, and stability are the four pillars of food security.<sup>4</sup>

**COVID-19's impact** resulted in substantial and widespread increases in global food insecurity, affecting vulnerable households in almost every country, with effects likely to last until at least 2022.

The following are the primary threats to food security at the country level: Higher retail prices, along with lower earnings, are forcing an increasing number of households to limit the amount and quality of their food consumption.<sup>5</sup>

**Food processing**

Food and nutrition security, a major worldwide concern, depends on ensuring that all people have access to safe, cheap, and

<sup>1</sup> <https://www.unep.org/thinkeatsave/about/definition-food-loss-and-waste>

<sup>2</sup> <https://www.unep.org/thinkeatsave/about/definition-food-loss-and-waste>

<sup>3</sup> <https://foodprint.org/issues/the-problem-of-food-waste/>

<sup>4</sup> [https://www.fao.org/fileadmin/templates/cfs/Docs1314/GSF/GSF\\_Version\\_3\\_EN.pdf](https://www.fao.org/fileadmin/templates/cfs/Docs1314/GSF/GSF_Version_3_EN.pdf)

<sup>5</sup> <https://www.worldbank.org/en/topic/agriculture/brief/food-security-and-covid-19>







nutritious fresh and processed foods. Increased food production will help to meet the challenge of providing nutritious meals to 9 billion people by 2050.

Consumer health and wellness may be improved by using emerging food processing technologies to reduce calorie consumption, improve gut health, reduce salt intake, improve food safety, reduce food waste, reduce allergic foods, promote fresh yet stable meals, and create age-specific goods. Ingredient, packaging, and process solutions are among the food technology available.

**Sugarlite**, for example, is a smart sugar manufactured from a combination of sugar and stevia that has the flavour, appearance, and sweetness of sugar but half the calories. It is advantageous for weight loss.

**Food Processing and Food Production** have several benefits to the society including 1. Provides employment. 2) It generates revenue for the Government 3) It reduces food wastes and makes it available during scarcity. 4) It allows for specialization 5) It increases GDP.

#### Research design / methodology /approach:

Purandhar Taluka has 109 villages and three towns. According to the 2011 Census of India, Purandhar Taluka has 51259 houses with a total population of 235659 people, 119906 men and 115753 females. Because women farmers are actively involved in food production, Zendewadi was chosen as the research area.

Location: Zendewadi, Purandar Taluka, Maharashtra

Sample Frame: Women Farmers

Sample Size: 10

Data Collection: Primary and Secondary Data

Instrument/Tool: Questionnaire

#### Data Collection

- The study was based on both primary and secondary data collection.
- Primary data was collected through Personal interview from farmers who were called for panchayat samiti meeting.
- Zendewadi in Purandar Taluka was selected for the study purposively as it is one of the important Green Peas, and Fruit producing areas in Pune District.

#### Food processing initiatives

*"If you educate a person how to prepare food, you can feed a town," remarked Philip E Nelson, the 2007 World Food Prize Laureate (P Nelson, personal communication, 2013).*

Food processing is the act of altering or modifying foods from the time they are harvested until they reach customers in order to increase their quality or shelf life. Food processing dates back to the Stone Age. Food preservation became required as agriculture and animal husbandry developed, both to minimize rotting and to ensure availability during times of scarcity. Food processing was perhaps the first "technology" that was sufficiently effective, and it led to the formation of specialized food businesses in cultures. As a result, food processing was most likely a stepping stone to urbanisation.<sup>6</sup>

Maharashtra's agricultural industry accounts for 25% of the state's GDP. With state-of-the-art facilities and near proximity to the JNPT Shipping Port, Maharashtra's Pune District is a significant export hub. Figs, Sitaphal, Gauva, Green Peas, Mango, Tomatoes, Indrayani Rice, Maize, and Onions are produced in abundance in the Purandar Taluka of Pune District. Farm food wastes, on the other hand, are a source of poverty for small farmers. The research is important in understanding how food processing affects the decrease of farm food waste.

Food production prior to machinery procurement by purandar laxmi mahila shetkari producer company limited. Purandar Laxmi Mahila Shetkari Producer Company Limited used traditional food processing methods. Manual pickling of raw mango, spice manufacture, fried onion production (brishta), tomato ketchup and chutney production, and gauva pulping were among the food processing operations. The quantity of product produced was insufficient for commercialisation. Eventually, these farmers stopped producing and began leaving their crops unharvested, resulting in agricultural food waste.

**Food processing post trainings and machinery procurement**

<https://academic.oup.com/ajcn/article/99/6/1525/4577499>



Trainings on capacity building were started with the help of NABARD and the HELPO Foundation. Purandar Laxmi Mahila Shetkari Producer Company Limited's women farmer members were taught how to preserve food using both natural and chemical ways. Standardizing and Grading, Packaging and Labeling for Commercial Markets were also covered in the training. These farmers were taught production costing and MRP pricing methodologies. The request for machinery acquisition was finally approved by NABARD.

#### **Machineries used for food processing:**

##### **Pulping machine**

##### **Application:**

Pulping machine is best for extracting the pulp and separating the seeds and skin from fruits and vegetables including mango, tomato, guava, papaya, tamarind etc.

##### **Process:**

Fruit and vegetables are fed into the coarse pulping chamber, which presses the fruit against the sieve using blades and brushes. The extracted pulp goes through the sieve's perforations, pushing stone and skin ahead and out the other end. After that, the pulp is refined and the fine skin is removed using a fine sieve. It's possible to collect and process the refined pulp further.

##### **Green peas processing**

• **Pea Podder** : is a pea podder built specifically for de-podding pea pods. For tensioning, the conveyor is equipped with stainless steel rollers with flanged bearings on one side and take-off bearings on the other.

• **Elevator** : Used to transport grains to the winnower.

• **Peas** should be washed to remove soil, foreign particles, and other contaminants.

• **Flotation Washer** : lighter items will float in water, while good items will be pushed down by water pressure, and stones will fall.

• **Recovery Drum** : For separating trash from pea grains.

• **Conveyor** : A device that aids in the movement of goods from one location to another.

• **Blanching** : for fruits and vegetables is done with a blancher. Use to blanch peas and extend their shelf life.

• **Cooler** : For cooling and chilling fruits and vegetables. Peas' shelf life should be extended.

• **Blast Freezer/IQF** - A blast freezer is a type of freezer that is used to keep food frozen at an extremely low temperature in order to avoid the growth of microbes.

• **The Freezer Cold Room** is an in-line system that chills all products to a temperature of -20 degrees Celsius.

• **Capacity** : 1000 Kg/Hour to 10000 Kg/Hour.

##### **Food vacuum packaging machine:**

It is one of the most efficient food packing machines because it eliminates air, keeping food fresh. Aerobic bacteria, which are responsible for the rapid deterioration of foods, do not grow or are immobilized in this environment.

**Food vacuum packaging machines** help to increase the shelf life of food goods, allowing them to be sold in freezers or cold display storage units at a variety of retail stores.

#### **Data Analysis**

1. A detailed interview schedule was established in both Marathi, Maharashtra's regional language, and English in accordance with the study's objectives. The Interview Schedule is composed using different scales:

2. **Dichotomous Questions** were used for Yes/No type of questions.

3. **5 Point Likert Scale** was used to gather different opinionated type of questions.

4. **Sampling** : Convenience and Simple Random sampling was used.

##### **Sampling Design**

1. Population is Infinite.

2. Sample Size : 10 Women Farmers

**Table 1.1 Frequency Distribution Table**

Components	Total % of Respondents	Total % of Respondents	Mean	Sd
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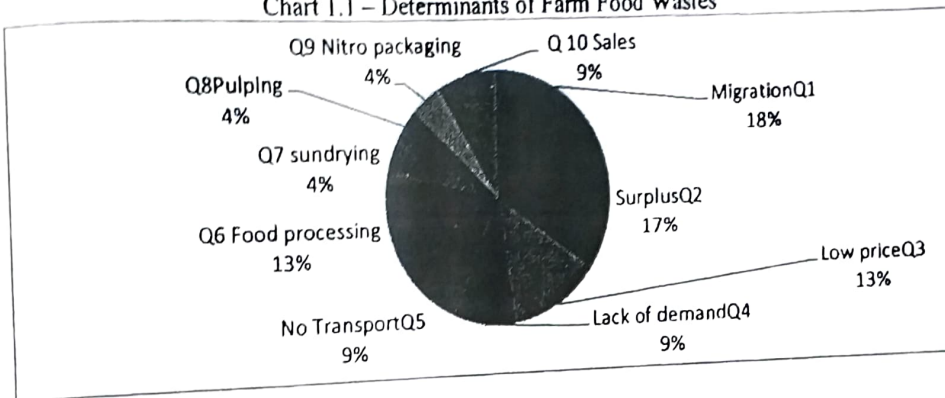






	said "YES"	said "NO"		
1 Migration of Famers	70%	30%	1.4	0.5164
2 Surplus production incurs losses	60%	40%	1.4	0.5164
3 Low price quotes by buyers	70%	30%	1.3	0.52705
4 Lack of market demand	80%	20%	1.2	0.44096
5 Lack of transportation	80%	20%	1.2	0.44096
6 Uses Food processing	70%	30%	1.3	0.52705
7 Sun drying	80%	20%	1.2	0.44096
8 Pulping	90%	10%	1.1	0.31623
9 Nitro Packaging	90%	10%	1.1	0.31623
10 Food processing has increased sales and reduced food losses	90%	10%	1.1	0.31623

Chart 1.1 – Determinants of Farm Food Wastes



#### Findings

- 1 Farmers' migration:** 70% of farmers think that farmer migration has resulted in a labour shortage during harvest season. Food waste has resulted from unharvested crops.
- 2 Excess output results in losses:** 60% believe that excess production and poor demand cause crop rotting, resulting in farm food waste.
- 3 Buyers' low pricing quotes:** 70% of farmers believe that when purchasers offer the lowest price, the worried farmer will either sell at a loss or refuse to sell at all. Food waste occurs when product is left idle.
- 4 Lack of market demand:** 80% believe that there low market demand Agricultural food waste is caused by a decrease in market demand and non-sales of farm produce.
- 5 Transportation issues:** 80% believe that a lack of transportation to distribute produce to consumers or destinations results in farm food waste.
- 6 Food processing:** Food processing techniques have enhanced the shelf life of farm produce and decreased food waste by 70 percent.
- 7 Sun drying:** 90% of farmers feel that using sun drying methods extends the shelf life of their produce.
- 8 Pulping:** According to 90% of farmers, pulping and freezing fruits extends shelf life, boosts market demand, and enhances availability during non-seasonal periods.
- 9 Nitro Packaging:** has enhanced the shelf life of green peas, processed tomato ketchup, and mango pulp, according to 90% of respondents. It has resulted in a rise in market demand.
- 10 Food processing:** has raised sales and decreased food losses: 90% of respondents believe that employing machines for food processing has improved sales and reduced farm food losses.





**Suggestions:**

1. Food Processing trainings must be organized for farmers who are facing problems due to farm wastages.
2. Sun drying methods of food processing is useful for production of chips from vegetables and fruits. Advance sundrying machineries are available for bulk processing. These machineries can be procured by farmers.

**Conclusions:**

1. Food processing is the act of altering or modifying foods from the time they are harvested until they reach customers in order to increase their quality or shelf life. Food processing dates back to the Stone Age. Food preservation became required as agriculture and animal husbandry developed, both to minimize rotting and to ensure availability during times of scarcity.
2. Food Processing and Food Production have several benefits to the society including 1. Provides employment. 2) It generates revenue for the Government 3) It reduces food wastes and makes it available during scarcity. 4) It allows for specialization 5) It increases GDP.
3. This research can be further helpful for farmers who wish to commercialize agricultural produce through processing and packaging.

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