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Diversified Agro Climatic Conditions of U.P. for Commercial Cultivation of Various Horticulture Subsectors

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ABSTRACT

The study is based on the chaining process of farming and food processing industries in Uttar Pradesh. As farming and food processing are two sides of a coin. The fundamental principle of preserving foods by heat is known as processing. The industry which had its beginning in the scarcity conditions of war when supply of large quantities of vegetables, fruits, meat etc. had to be arranged for the armed forces is now considered to be of perennial importance. It also assures a stable market to farmers and horticulturists and enables them to expand their production without fear in fall of demand as preserved foods are available all the year round. A sustainable quantity of large production of foods and vegetables in India is wasted as they are not preserved due to lack of scientific knowledge, if preservation industry and farming keep the pace with development work there will be no scarcity and wastage of food. For increase in level of processing, reduction of wastage and to increase exports, the ministry of food processing industries G.I introduced several schemes of financial assistance and for training the trainers recognized institutes such as CFTRI, Mysore is established. The state of U.P. has diversified agro climatic conditions for commercial cultivation of various subsectors of horticulture i.e. fruits, vegetables, flowers, spices, mushrooms, sericulture. The value of horticulture produce works out to about Rs. 14,000 crore in the state and post harvest losses works out to Rs. 3,000 crore. Since the farmers are short in financial and technical abilities, the quantity of food does not meet the requirement standards. They find it hard to link their farming with food processing and are unable to reap rewards of value addition. But now a day there is a growing awareness among farmers due to the initiative taken by Government of India and state of U.P. new processing units are working to decline the losses and reduce the wastage of crop.

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INTRODUCTION

Food processing activities include a wide range of treatments given to the food material during its movement from farm to the table. It indicates a close association between agricultural productivity and the technology of storage and preservation of the farm produce for the human consumption during lean production period. Processing of food begins in the field as the crop is harvested. From the nutritional angle, food processing also includes the steps taken towards better conservation of valuable nutrients. Food processing therefore refers to the application of techniques to foods in a systematic manner for preventing losses through appropriate techniques of preservation, processing, packaging, storage and distribution ultimately to ensure greater availability of a wide variety of foods to the consumer. For the developing country like India, it also implies the availability of the food to needy population below the poverty line at an affordable cost to improve the nutritional standards of the population at large. Thus, food processing activities should focus on:-

1. Reduction of the post harvest losses.
2. Preservation of perishable food commodities.
3. Retention of the nutrients.
4. Proper balance of the cost of processing with the purchasing power of the population.
5. Minimization of the waste and value addition.

The damage of premature and mature fruits and vegetables due to insects, rodents, birds, mechanical bruising ranges 20 – 25% in vegetables and 25 – 40% in citrus fruits if the processing of these fruits can be done at a proper time we can avoid wastage and losses to a great extent. Foods raw or processed are perishable commodities which gradually deteriorate by various biological forces. Deterioration in raw plant and animal tissues begins from the time of harvest and the rate of deterioration is variable. The intrinsic factors include water activity, pH and nutrient content. Raw foods with high biologically active water content such as leafy vegetables spoils rapidly whereas dry seeds containing structural water can be stored for years.. Food processing aims at controlling the extrinsic factors like storage, temperature, heat treatment and oxygen availability that can retard the rate of natural deterioration. Additives and chemical preservatives further influence the deterioration process.The processing operations can be classified into three categories preprocessing or post harvest treatments, processing and storage, transportation distribution and marketing.

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Uttar Pradesh is a rainbow land, representing a multihued Indian culture which has blossomed since times immemorial. The state has an extensive cover of alluvial soil and area wise it is fifth largest state of India. Agriculture and its allied activities is the mainstay of state economy. The State is the leader in production of farm commodities in the country and also produces fruit, milk, and vegetable in appreciable quantities. The area of food processing covers processing of cereals, pulses, fruits, milk, honey and spices. The farmers grow different crops and sell their produce to the entrepreneurs having processing facilities with in a reasonable distance of their farms. Table 1 shows area and production of horticulture in Uttar Pradesh since year 2001. The concept of Good Agricultural Practices (GAP) has evolved in recent years in the context of a rapidly changing and globalizing food economy and as a result of the concerns and commitments of a wide range of stake holders about food production and security, food safety and quality, and the environmental sustainability of agriculture. GAP farm production and post-production processes results in safe and healthy food and non food agricultural practices. Processing of some fruits and vegetables has been present in nearly all the households of the state by way of preservation in form of pickles and preserves.

Table 1. Area and Production of Horticulture in Uttar Pradesh

S. No.	**Year**	**Fruits**		**Vegetables**		**Potato**	
		Area (Lakh ha)	Prod. (Lakh Mt)	Area (Lakh ha)	Prod. (Lakh Mt)	Area (Lakh ha)	Prod. (Lakh Mt)
1.	2001 - 02	8.85	100.00	11.25	191.05	4.05	103.00
2.	2002 - 03	8.60	85.24	13.26	226.88	4.43	101.63
3.	2003 - 04	9.00	112.50	13.45	206.00	4.22	88.26
4.	2004 - 05	9.50	119.50	14.30	220.00	4.30	112.00
5.	2005 - 06	9.80	122.70	14.60	230.00	4.40	120.00
6.	2006 - 07	9.90	125.90	15.20	250.00	4.60	125.00
7.	2007 - 08	10.10	130.10	15.60	270.00	4.80	132.00

The State produces 44 Lakh MT of fruits and 162 Lakh MT of vegetables. The raw materials of fruits and vegetables grown locally are used by processing industry predominantly for producing processed food products like pickles, preserves, jam, jelly, sweet pickle and candy. The percentage of production and the major divisions producing the fruits and vegetables in large quantities in Uttar Pradesh are shown in Table 2.

Table 2. Major fruits and vegetables produced in Uttar Pradesh

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Fruits	**Percentage (%) of production in U.P.**	**Major divisions contributing maximum production**	**Kinds of processed food items produced**
Mango	75%	Agra, Kanpur, Lucknow, Bareilly, Allahabad	pickles, preserves, jam, sweet pickle and candy
Melon	25%	Agra, Allahabad, Varanasi	Juice/squash
Citrus	3.8%	Agra, Bareilly, Hathras, Kanpur	Juice/squash, pickles
Guava	8%	Allahabad, Bareilly, Lucknow, Agra, Moradabad, Kanpur	jam, jelly, sweet pickle and candy
Banana	8.7%	Gorakhpur	Banana Chips
Litchi	8%	Meerut, Saharanpur, Gorakhpur	Canned pulp and canned slices
Bael	13%	Agra,	Juice/squash, pickles, preserves and candy
Amla, Karonda	9%	Pratapgarh, Varanasi, Allahabad, Hathras, Kanpur	pickles, preserves, laddu, burfi etc.
Papaya	11%	Hathras	Candy processing (Tooty fruity)
Vegetables			
Potato	65%	Agra, Kanpur, Lucknow, Bareilly, Faizabad	Potato Chips, vegetable sauce
Pea	8.5%	Chitrkoot, Kanpur, Allahabad, Varanasi, Lucknow, Faizabad	Frozen pea, vegetable sauce
Tomato	2%	Agra, Kanpur, Jhansi, Goda, Lucknow, Bareilly,	Sauce, vegetable sauce
Carrot, radish	2%	Agra, Lucknow, Meerut, Saharanpur, Kanpur	Pickle, vegetable sauce
Pumpkin	2.5%	Lucknow, Agra, Bareilly, Faizabad, Kanpur	Pickle, vegetable sauce
Petha	8%	Varanasi, Meerut	Petha (sweet confectionary)
Chilly	3%	Azamgarh	Pickle, vegetable sauce

Hazard Analysis and Critical Control Point (HACCP)

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Food safety is the assurance that food will not cause any harm to the consumer when it is consumed and eaten according to its intended use. Food borne diseases are major health hazards in both developed and developing countries. The development of food safety is an effort to protect the general public from food products that do not meet health standards requirements. The HACCP can be defined as a system which identifies, evaluate and controls hazards which are significant for food safety. It is a systematic approach to the identification, assessment and control of microbial hazards in foods. It has been successfully applied in developed countries to minimize food borne health hazards. In India, quality control with regard to food products is being enforced through various regulatory mechanisms like the Prevention of Adulteration Act (PFA), Agricultural Grading and Marketing (AGMARK), Fruit Products Order (FPO), Agriculture and Processed Food Export Development Agency (APEDA). The HACCP system provides a systematic method to identify the potential hazards associated with food products at all stages, from growth, processing, manufacture and distribution of occurrence of hazards and identify the preventive measures for their control.

Licensing and Verification

It is compulsory to follow International Standards for Quality Control and maintaining standards. HACCP is to assure food safety through development implementation and effective management of a functional process hazard control program. The system identifies hazards and preventive measures for their control. The application of HACCP is compatible with the implementation of quality management system such as ISO 90001. The recent ISO standard is 2000

The objective of the present work is to study the development of Rural Entrepreneurship and awareness of technology for processing of food products by utilizing locally grown raw material among farmers and entrepreneurs. To analyze the increased level of processing, reduction of wastage, value addition, enhance in the income as well as increase in exports thereby resulting in overall economic development. The study throws the light upon the type of assistance and technical know-how provided by Ministry of Food Processing Industry Government of India (MFPI) to the growers, emerging entrepreneurs, and processing units regarding Good Agricultural Practices (GAP) Good Manufacturing Processes (GMP) and Food Safety.

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RESEARCH METHODOLOGY

The study was conducted in Agra District in the state of U.P by surveying and interviewing the persons working in small processing units and employees employed in Food Science Training Centre and Food Preservation Centre of state govt. located at Agra. Secondary data is collected from the available literature which comprises of records and statistical data provided by U.P State Horticultural Co-Operative Marketing Federation (HOFFD). Some data collected through different seminars conducted by (MFPI).

RESULTS AND DISCUSSION

For promoting vegetable based processing industry there is contract production of processing varieties in the vicinity of the processing industries. The big processing industries are providing their own seeds and green manure hence encourage contract farming.

Productivity is being improved to a large extent by crop rotation and now the farmers are able to supply the raw material at competitive prices to the processing industries.

Now a days use of nitrogen fixing plants, green manures and agro forestry techniques are commonly carried out for the improvement of soil fertility. The farmers who also keep livestock are using animal manure as a way to save cost and improving soil structure.

Biological methods of pest and disease control are in a new trend for cheap and sustainable plant protection. Productive use and disposal of plant and animal residues prevent damage to soil, water, human, plant, and animal health. It also helps in maintaining and improving ecological diversity and avoids loss of biodiversity and damage to habitat.

Small van cold storage is provided by Govt. of India for easy long distance transportation facility so as to transfer fresh vegetables and fruits to long distances.

Potato is the major raw material available in the state for processing, but the varieties grown are mostly for table purpose and hence chips making or French fry industry has not developed at large level in the state. However during the last few years, with special efforts of the department of horticulture and food processing, processing varieties like chipsona I and II have been successfully

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introduced among the farmers. Simultaneously a few cold stores have come up in the state for storing processing varieties at high temperatures, so that the reducing sugar content is curtailed during storage. This successful initiative of Govt. with active support of the industry has opened opportunities for potato based industries.

The Ministry of Food Processing Industries (MFPI) GoI provide facilities for technology up gradation, establishment and modernization of food processing industries in the form of financial assistance, training programs, seminars, workshops, surveys conducted by Food Processing and Training Centers (FPTC), Central Food Technological Research Institute (CFTRI), Mysore and Entrepreneurship Development Program (EDP) conducted by State Government.

CONCLUSION

The study throws a light on the farm production, the working of food processing units and the help provided to them by the Govt. agencies to promote them. The findings of the present study were quite useful in knowing that there was good awareness among farmers and entrepreneurs regarding transport, storage, effective distribution and marketing strategies of processed products till they reach the consumer who is the ultimate link of supply chain. The study also reveals the fact that the emerging entrepreneurs are entering in this field with good knowledge regarding waste minimization and cleaner production concerned with the technologies to protect food material, allow maximum recovery thereby preventing losses.

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