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Enhance food security through fruit and vegetable preservation

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Abstract
Food preservation at family level: Saving food helps in long haul stockpiling, and accommodates family level food security. Pickling and Sun-drying is a normally drilled technique and helps safeguard leafy foods. Current techniques incorporate canning, and freezing, the essential target of food conservation is to forestall food decay until it tends to be devoured. Cultivates frequently produce an excess of food at one at once than can be eaten before deterioration sets in. Protecting food likewise offers the valuable chance to have a wide assortment of food varieties all year.
Post-gather misfortunes of foods grown from the ground address one of the significant difficulties looked by Ethiopia's agriculture area. Among the primary variables in these misfortunes are unfortunate taking care of practices and restricted utilization of misfortune lessening and worth adding advances.

- Food preservation gives the food more assortment.
- Food preservation broadens food's time span of usability.
- Food preservation grows the stockpile of food.
- Food preservation eliminates food squander.
- Food preservation assists with lessening dietary inadequacies.

Keywords: Food, preservation, security, vegetables, fruits

Introduction
Food and Nutrition security has become a global issue in the present scenario. The world has enough food to feed everyone, yet an estimated 854 million people worldwide are still undernourished. In India alone 300 million people are malnourished. Food security cannot be safe guarded only by increasing the food production but it requires reduction in losses too. There are higher losses of grains in farms, transportation and during storage due to insect pests and rodents. Similarly, nutrition security a not only consuming nutritious foods but preserving its nutritional value as well. This can be achieved by adopting modern storage techniques, preservation and cooking methods at house-bold level in a scientific way.
India's diverse climate ensures that all varieties of fresh fruits and vegetables are available. It ranks second in the world in fruit and vegetable production after China. According to the National Horticulture Database published by the National Horticulture Board, India produced 86.602 million tons of fruits and 169.478 million tons of vegetables in 2014-15 But unfortunately, due to a lack of skilled labor, poor cold storage, inefficient post-harvest management and minimal technological intervention, India is the second largest producer in the world and accounts for only 1% of the world's fruit processing In India, the wastage of fresh fruit and produce is increasing due to challenges in valued very highly by the industry, It is obvious that there are great opportunities for the development of fruit and vegetable processing .The development of the processing industry according to modern and scientific points of view would bring several benefits Therefore, to avoid surpluses on the market, they can be processed, stored and enjoyed out of season Variety of be-products can be prepared like jam, jelly, pickles, marmalade, squashes, etc., frozen, dehydrated and dried vegetables.
Food security, at the individual, family, public, provincial, and worldwide levels is accomplished when all individuals, consistently, have physical, social and financial admittance to adequate, protected and nutritious food to meet their dietary necessities and food inclinations for a sound and dynamic life.

The principal issue is absence of monetary social and actual admittance to food at public and family levels as well as insufficient sustenance Food security is basically based on three points of support, food accessibility, food access, and food use.

The main challenge in front of our country is to overcome the problem of food security. To combat this problem we as home scientists need to train and demonstrate methods of fruits vegetables preservation to women, especially women this will enhance their food storage skills and help in their overall development.

Objectives

1. To carryout awareness campaigns on food security through preservation
2. To impart training on fruits and vegetables preservation methods.
3. To enhance the awareness of women on cooking methods to safeguard food and its nutritional value.

Practical scientific utility

With the help of this project, there will be no farm wastage of farm produce. Entire production will be stored at farm as well as household level. The methods and equipments/ implements introduced during the project will help women to store seasonal fruits and vegetables without any wastage. This will further help is securing crop for future use as well as for family consumption along with safeguarding agricultural productivity.

Reviews of research

Eva K Baguma (2014) [1] Uganda is therefore facing food security challenges due to food wastage, an inefficient food preservation culture and a lack of knowledge and understanding regarding nutrition and food value. The introduction of canning, pickling and fermenting specifically for the preservation of fruits and vegetables, will have a significant impact on household food security and in turn contribute to household nutrition, health and income. They also have very limited access to credit and alternative sources of income, so this pushes them to sell their produce at a loss. Usually, this surplus produce is sold to produce brokers operating between the farmers in the rural areas and the consumers in the cities at a low bulk price. With the limited shelf life of most of this fresh produce, farmers are left with no choice but to take whatever they can get for the surplus of risk getting stuck with spoiling produce.

Adeyeye SAO (2017) [2] The study revealed that the world faces multiple challenges to food security including under nutrition and overconsumption, rising food prices, population growth, rapid diet transitions, threats to agricultural production, inefficient production practices and supply chains, and declining investment in food system research. Many people lack adequate amounts of foods that are rich in the nutrients needed for health and a productive life. According to FAO, 1996, chronic under nutrition affects 43 percent of the Africa's population or some 215 million people in sub-Saharan Africa. The use of simple but effective on-farm and off-farm storage facilities and agro-processing technology should be promoted to add value to products and increase their shelf life. The Strategic Grain Reserve Scheme should be modernized, strengthened and upgraded to a National Food Reserve Program, which will enable it to handle all staples and essential food products. This will help in attainment of national food security goal. Research limitations/implications the paper reviewed the role of food processing and appropriate food storage technologies in ensuring food security and availability in Africa.

Morone *et al*., (2017) [3]. Reducing all food losses will result in a more secure global food system and it is important for us to show how consumers can reduce food waste in households. This is where food preservation has an important role in facilitating this waste reducing action because it improves the utilisation of food. It has also been identified that understanding why food is wasted by consumers during meal occasions develops of waste reduction strategies that can be used for different foods and preservation methods.

Asogwa, Okoye & Oni, (2017) [4] highlights one way of reducing this huge post-harvest loss and improve food security is the recognition, promotion, and utilization of indigenous knowledge, skills, and practices in food handling, processing, preservation and storage. Kundu P, *et al.* (2018) [5] highlighted the facts that 64.0 percent beneficiaries were educated up to secondary level and only 12 percent were graduated and belonged to agricultural community. Most of the women were doing little bit of pickle work like lemon and chilly pickle. But they were unaware about other preservation procedures like formation of squashes, chutneys, murrabha, etc. They did not have enough knowledge about precautions to be taken while doing preservation activities. Beside this they were unaware about the important chemicals used in preservation like sodium benzoate and potassium meta-bisulphate. The maximum knowledge observed was in how to make tomato chutney (92.0%) followed by anvola pickle, mixed pickle, squash/sherbets and jam making. The study also highlighted the facts that today rural women want to stand up on their own feet but they lack self-confidence and family support. Therefore, more efforts are to be directed to persuade rural women to start their own cottage industry on preservation

Kuyu CG, (2019) [7] depicts to improve food security, safe and economic use of the available food, and avoiding wastage or loss is very important. Indigenous knowledge of food processing, preservation, and storage plays a vital role to help all stakeholders to maintain product safety and support the country in the reduction of food insecurity problems. As poor rural households do not have the necessary facilities and technology to process, preserve, and store food, they have to use their indigenous knowledge that has been passed on from generation to generation.

Kumar A, (2019) [6] reported Considering food borne diseases due to consumption of spoiled food, proper preservation of foodstuffs is very important. Although, there are many existing techniques used for food preservation, considering the economic viability and social responsibility, more effective and safer techniques must be searched. There is much scope of food preservation including packaging commercially.

Sarkar A, *et al.* (2021) [8] study constructed a statistically valid and reliable framework that quantified the determinants of FS within the circumstances of the COVID-19 outbreak The 15 reliable and valid determinants of FS were extracted from an in-depth literature investigation from several published peer-reviewed journal articles, different books, and various reports, along with some discussion with professors and industry professionals and were categorized into three aspects (effective utilization of food, food availability, and food access) by using the SPSS statistical tool.

Justification for undertaking proposed study

Food security usually defined as the availability of healthy and enough food for healthy life to all the people in all over the world at all the times at reasonable cost. The history of food preservation for its security is as old as the history of mankind, the best examples are the storage of food by ancient Egypt kings in great famines of the world. But today there is more need of food security due to increasing population. The population of world increases greatly so for constant healthy food supplying to whole world requires its proper preservation and handling.

Women are nearly responsible for food preparation for their families. However, these contributions many times go unnoticed due to the fact that they are not counted in surveys and statistics, since most of the work women perform in agriculture and the processing of food is unpaid, Women involve in two dimensions of food security Le availability and accessibility.

Thus, the concept of preserving food grew rapidly with an aim to provide food to all. The goal of food preservation is to inhibit any biochemical reactions and to restrict entry of bacteria or fungi. The technique allows minimization of wastage with improved shelf life

Methodology

Kanpur Nagar is purposively chosen as locale of the study this is done with the intention that UP is a major state of the country, and women have an important role to play in the development of the state as well as the country.

Selection of Block: There are total 10 blocks in Kanpur Nagar, out of which 01 block Kaliyanpur were selected purposively for the research purposes.

Selection of area: From Kaliyanpur block Jawahar Nagar, Ram Krishna Nagar, Gandhi Nagar, Nehru Nagar area were selected purposively for the research.

Selection of Respondents: Eighty household women were selected randomly from each area.

Results and Discussion

The findings of the study are introduced through composite summary Table.

Table 1: Distribution of the respondents on basic of age, N=80

Age of respondents	Frequency	Percentage
18 - 20	09	11.25
21 - 30	18	22.50
31 - 40	26	32.50
41 - 50	22	27.50
Above-50	05	06.25
Total	80	100.00

The data reveled in Table 1 shows the age of the respondents of fruit and vegetable preservation. Maximum number of respondents i.e. 32.50 percent falls between the 31-40 years of age group whereas 22.00 percent of respondents fall in the age group between 40-50 years. Only 6.3 percent of respondents fall in the age group above 50 years.

The data presented in Table 2 that, Majority 41.25 percent of the respondents were found to be education High school diploma or equivalent degree, 21.30 percent Bachelor's degree and 17.50 percent of the respondents were found to be educated less than a high school diploma. Only 02.50 percent respondents were Ph.D. holder.

Table 2: Distribution of the respondents on basic of education, N = 80

Education of respondents	Frequency	Percentage
Illiterate	04	05.00
Less than a high school diploma	14	17.50
High school diploma or equivalent degree	33	41.25
Bachelor's degree	17	21.30
Master degree	10	12,50
Ph.D.	02	02.50
Total	80	100.00

Table 3: Distribution of the respondents on basic of marital, N = 80

Education of respondents	Frequency	Percentage
Married	56	70.00
Divorcee	02	02..50
Separated	03	03.75
Widow	06	07.50
Unmarried	13	16.25
Total	80	100.00

The data highlighted in Table 3 that maximum seventy percent respondents married followed by 16.25 percent un married followed by 7.50 percent widow, 3.75 and 2.50 percent respondents respectively separated and divorces.

Table 4: Distribution of the respondents on basic of current employment status, N = 80

Current employment status	Frequency	Percentage
Self-employment	04	05.00
Home maker	61	76.25
Student	05	06.25
Government	10	12.50
Total	80	100.00

The data depicted in Table 4 that maximum 76.25 percent respondent's home maker followed by 12.50 percent respondents in government job followed by 6.25 percent respondents students. Only five percent respondents self-employed.

Table 5: Distribution of the respondents on basic of income, N = 80

Income of respondents	Frequency	Percentage
Less than Rs. - 20000	23	28.70
Rs. 21000 - 40000	15	18.80
Rs. 41000 - 60000	21	26.25
Above Rs - 61000	21	26.25
Total	80	100.00

The data presented in Table 5 revealed that, Family income of the respondents The data showed that the maximum thirty five percent respondents were found to be having their family income between Rs 20,000- 30,000 per month followed by 27.50 percent having family income between Rs.30, 000-40,000 and twenty percent Rs 40,000 and above per month. Only 17.50 percent respondents were having monthly income below Rs 20,000.

Table 6: Distribution of the respondents on basic of family size, N = 80

Family of respondents	Frequency	Percentage
3 - 4	36	45.00
5 - 6	44	55.00
Total	40	100.00

The data pertaining in Table 6 that family size shows that fifty five percent of respondents were having 5-6 members in their family and 45 percent having less than 3 to 4 members in their family.

Table 7: Distribution of the respondents on basic of family type, N = 80

Family of respondents	Frequency	Percentage
Nuclear	26	32.50
Joint	54	67.50
Total	80	100.00

The data presented in Table 7 that Maximum number of respondents i.e. 67.50 percent belong to joint family whereas 32.50 percent of the respondents were from nuclear family system.

Table 8: Distribution of the respondents on basic of food stock at the moment, Practice Preserving and canning food and Knowledge about food additives, N = 80

Food Stock at The Moment	Frequency	Percentage
Yes	63	78.75
No	17	31.25
Total	80	100.00
Practice Preserving and canning foods	**Frequency**	**Percentage**
Yes	61	76.25
No	19	23.75
Total	80	100.00
Knowledge about food additives	**Frequency**	**Percentage**
Yes	22	37.50
No	58	72.50
Total	80	100.00

The data depicted in Table 8 shows the maximum 78.75 Percent respondents have food stock and only 31.25 percent respondents have not food stock in household at the moment. Above data showed that 76.25 percent respondents practice preserving and canning food and 23.75 percent respondents have no practice preserving and canning food. Above table highlighted that 72.50 percent respondents don't know about food additives. Only 37.50 respondents know about food additives.

Table 9: Distribution of the respondents on basic of Most common ingredients preserved at home, N = 80

Food stock at the moment	Frequency	Percentage
Fruits	26	32.50
Vegetables	54	67.50
Total	80	100.00

The data revealed in Table 9 that maximum 67.50 percent respondents preserved vegetables at home and only 32.50 percent respondents preserved fruits at home.

Table 10: Distribution of the respondents on basic of use to preserve fruit, vegetables, pickles tomatoes and other high acid food, N = 80

Use to preserve fruit, vegetables, pickles tomatoes and other high acid food	Frequency	Percentage
Boiling	21	26.25
Pressure cooker	35	43.75
Oven canning	04	05.00
Open kettle method	13	16.25
Don't preserve high acid food at home	07	08.75
Total	80	100.00

The data indicated Table 10 that maximum 41.25 percent respondents use pressure cooker to preserve fruits and vegetables followed by 26.25 percent respondents are using boiling method. 16.25 and 5 percent respondents respectively use open kettle method and oven canning. Only 8.75 percent respondents don't preserve high acid food at home.

Table 11: Distribution of the respondents on basic of common procedures of preservation

Common procedures of preservation	Frequency	Percentage
Drying	10	12.50
Pickling	35	43.75
Jam	04	05.00
Squash	02	02.50
Chutney	10	12.50
Murabba	12	15.00
Freezing	07	08.75
Total	80	100.00

The data pertaining in Table-11 that Maximum 43.75 percent respondents use common procedures of preservation is pickling followed by fifteen percent preserving by murabba followed by 12.50 percent respondent's uses preservation procedures drying and chutney. Only 2.50 percent respondents' procedures of preservation by squash.

Table 12: Distribution of the respondents on basic of common preservative used during preservation, N=80

Common preservative used during preservation	Frequency	Percentage
Sugar	26	32.50
Salt	29	36.25
Vinegar	17	21.25
Sodium benzoate	04	05.00
Potassium /sodium meta bisulphate	04	05.00
Total	80	100.00

The data depicted in Table 12 that maximum 36.25 percent respondents use salt during preservation followed by 32.50 use sugar, 21.25 use vinegar and only Five percent use sodium benzoate and Potassium /sodium meta bisulphate for food preservation.

Table 13: Distribution of the respondents on basic of Knowledge about food additives, N = 80

Knowledge about food additives	Frequency	Percentage
Yes	22	37.50
No	58	72.50
Total	80	100.00

Above Table 13 highlighted that 72.50 percent respondents don't know about food additives. Only 37.50 respondents know about food additives.

Outcomes of the study

With the help of this study, there will be no farm wastage of farm produce. Entire production will be stored at farm as well as household level. The methods and equipments Implements introduced during the project will help household women to store seasonal fruits and vegetables without any wastage. This will further help is securing crop seeds for future use well as for family consumption.

To improve food security, safe and economic use of the available food, and avoiding wastage or loss is very

important. Indigenous knowledge of food processing, preservation, and storage plays a vital role to help all stakeholders to maintain product safety and support the country in the reduction of food insecurity problems. Proper preservation of foodstuffs is very important. Although, there are many existing techniques used for food preservation, considering the economic viability and social responsibility, more effective and safer techniques must be searched. There is much scope of food preservation including packaging commercially.

Conclusion

The impact of the training highlights the facts that most of the ladies started preservation work at their home. The study also highlighted the facts that today women want to stand up on their own feet but they lack self-confidence and family support. Hence more efforts are to be directed to persuade women to start their own cottage industry on preservation. Fruit processing industry is considered to be the sunrise sector of the Indian economy. India has a strong potential for production, consumption and exports. Citrus, Banana, mango, guava, grapes, pineapple and apple are the major varieties grown in India. Favorable agro-climatic conditions make India a potential producer of fruits. Due to inadequate cold chain facilities, logistics infrastructure and post- harvest handling activities, the fruit processing industry is still in its infant stage. Lack of Capacity building initiatives at the farmers, processors and exporters' levels has also contributed towards this effort. Apart from this high competition from global markets and fast obsolescence of technology are the two crucial threats which need to be answered today.

Reference

1. Baguma EK. Bridging the Food Gap: Addressing the feasibility and applicability of three key traditionally Western food preservation techniques to improving household food security and reducing malnutrition in Uganda. SIT Graduate Institute SIT Study Abroad SIT Digital Collections; c2014, 7455.
2. Adeyeye SA. The role of food processing and appropriate storage technologies in ensuring food security and food availability in Africa. Nutrition & Food Science. 2017;47(1).
3. Morone P, Papendick F, Tartiu VE. Food Waste Reduction and Vaporisation: Sustainability Assessment and Policy Analysis. Springer International Publishing AG. 2017.
4. Asogwa IS, Okoye JL, Oni K. Promotion of indigenous food preservation and processing knowledge and the challenge of food security in Africa. Journal of Food Security. 2017;5:75-87.
5. Kundu P, Sabarwal K, Singh S. Enhance Food Security through Fruit and Vegetable Preservation. 2018 Apr;7(4).
6. Kumar A. Food Preservation: Traditional and Modern Techniques. Acta Scientific Nutritional Health. 2019;3(12):45-49.
7. Cha Kuyu CG, Bereka TY. Review on contribution of indigenous food preparation and preservation techniques to attainment of food security in Ethiopia; c2019. https://doi.org/10.1002/fsn3.1274
8. Sarkar A, Hongyu W, Jony AA, Das A, Memon WH, Quin L. Evaluation of the determinants of food security within the COVID-19 pandemic circumstances - a particular case of Shaanxi, China. Global health research and Policy. 2021;6:45.
9. Food and Agriculture Organization of the United Nations. Online Available: https://www.fao.org/3/aj288e/aj288e01.pdf.