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REVIEW ARTICLE

A Comprehensive Review of Traditional Food Processing Methods and Their Effects on Food Security

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Abstract: Traditional food processing methods, which have been used for centuries across various cultures, play a crucial role in ensuring food security. These methods, including fermentation, drying, smoking, milling, and preservation, help extend the shelf life of food, improve its nutritional quality, and enhance food availability, especially in regions prone to seasonal fluctuations and food shortages. Traditional processing methods also contribute to the development of local economies by empowering small-scale farmers and processors. However, these techniques can have both positive and negative effects on food security, depending on their efficiency, scalability, and sustainability. This review explores a range of traditional food processing methods, analyzing their impact on food preservation, nutrient retention, and the socio-economic aspects of food security. Additionally, it discusses the challenges and opportunities presented by integrating traditional food processing into modern food systems. Emphasis is placed on how these methods can complement contemporary technologies to build resilient food systems that address hunger, malnutrition, and poverty, particularly in rural and resource-poor settings.
Keywords: Traditional food processing, Food security, Preservation, Nutrient retention, Sustainable food systems, local economies, Small-scale farmers.

INTRODUCTION

Food production in simpler term means the processing of raw material into an edible food product or dish so that it is easily consumable by the humans either at the comfort of home or at a food processing industry. The process of food production comprises of art and scientific approach. Food production has many branches and it escalates with basic things like washing, filling, categorization, doping of ingredients in a suitable proportion, presentation, etc.

When humans for the first time became civil and settled agriculturally as well as started growing food for the all year use, we developed a deep knowledge and a close relation with the sources and production of our food.The 21st century innovations and industrial revolution have made all this possible.

Production of food has become more and more difficult now that too without hurting nature. In the year 2040, there will be nine billion mouths to feed. In order to meet those needs humanity, have to undergo some of the changes because food demands will change, developing economies will require more meat and on the other hand, limited resources such as drinking water and phosphate will have to be managed suitably. Wageningen University & Research approaches this modern-day challenge through the motto 'two times more, with two times less'.

Usually, the processing of raw ingredients into final food products is called as food production. Food production industries that take raw food ingredients and process them into finished and market ready food product. The food production consists of the processing of raw materials like Fruits, vegetables and cereals in them reap form and meat directly after the slaughtering process and process these raw materials so that it is easily consumable by the consumer.

The range of food processing can range from minimal to rigorous such as minimal processing consists of cleaning and packaging; to the more complex processes involve lots of doping, ingredients, and methodology as well. The process of food production processes creates end products with more than suitable inventory storage life so much so that even greater than raw material.

Some food production schemes go back to prehistoric times. This consists of smoking and salting meats for long duration storage and fermentation or choosing vegetables. In the nineteenth century, putting food in preserved cans had become a common practice in food production. Home cooks started practicing traditional food production techniques, such as fermenting, pickling and canning, to produce food for the family.

Although food production methodologies produce hygienic food products with long inventory life, they also have downsides. During the excessive heat and purifying processes, raw foods lose nutrients. Food production industries also dope artificial colors and preservatives to make food more pleasing to the eyes as well as taste buds. Although government regulatory bodies check up on all the additives, many health private sector groups challenge the use of these doping ingredients at large scale When food is made to feed a greater number of people, it termed as bulk food production. There is no specific definition for bulk food production but one can state as 'Any Food processed for a number more than twenty-five can be stated as Bulk or Mass or Volume Food Production"

ORIGIN OF FOOD PRODUCTION

The change in food production patterns from the primitive age which involved hunting and gathering to farming was the most unmistakably cultural "Revolution" in human innovations and ecology. It consists of more varying and important macro-evolutionary spectacle.

It has been proven by the archeologists that humans seem to have attained the biologically "Modern" stature in Southern Africa sometime by the 100,000 years ago, and fully modern human had been replaced Neanderthals by ca 40,000 bp in the outskirts of glacial Europe. The agricultural emergence, by contrast, was at first technologically advanced, behavioral and social. Any different genetic variation is most likely to be an insignificant branch of the food production revolution.

The variation in the culture based entertained by the growth of maintenance depends on plant and animal taming was in some ways as affected as any of the said bio-cultural transformations of the deeper past decade. A fully developed agrarian society of millions of people is in some way a big or bigger innovation step in the statement of social organization as the step from weakly helpful primate troop of sixty animals to the cooperative hunting group of varying sizes.

The food production uprising greatly attracted earlier researchers because it was the economic base of "Civilization" which includes literacy, mathematics, state political organization and statements alike. There is no second opinion that this varying trait which is deriving non-directly from agriculture

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signifies good changes from hunting and collection. In industrial community presently, humans are dealing with the consequences of the food production and processing revolution that started almost 10,000 years ago.

The variation in food production has been deeply studied since the early 1950s and thus the emergence of societies solely dependent on food production is also much better observed than any earlier variation of human environmental patterns. The location for observing this development is more than one because they are observably present and the food scavengers who gave rise to them were crowded.

Several chief archeological groups started in the year the 1950s, conducted various sophisticated research schemed explicitly to check previous hypotheses about farming origins. Archeologists of the previous generation worked in the area of the first civilizations. One of the famous researchers, V. Gordon Childe made some varying speculations about the above topic.

The most prime and early projects were led by Robert and Linda Braidwood in the near east and Richard MacNeish in Mesoamerica and the Andes. These observations have led multidisciplinary groups of archeologists, botanists, zoologists, radiocarbon daters, ecologists, and geomorphologists to research in sections carefully chose to be in the likeliest sections for the variation from hunting and gathering to agricultural maintenance.

They purposely observed for an indication of plant and animal names and other points of the ecological relations of the sequence of societies across the change. The output of these and similar researches give a clear picture of the events of the revolution, although the procedures involved are less clear. A large literature understanding the events in terms of processes has fully-fledged in the period since these investigations started.

Protuberant names related with process hypotheses to clarify farming origins include Kent Flannery and Lewis Binford. A varying number of botanists were also fascinated to work on the evolution of plant tames from their wild descendants.

TYPES OF FOOD PRODUCTION AND PROCESSING

Food production and processing are further categorized into different types which include, farming, selection, crop management, reaping, crop production, preserving, sweltering, sterilizing, pudding, carving, butchers, agitating, pickling, drink and beverage makers, restaurants, etc.

METHODS OF FOOD PRODUCTION

- Chopping or cutting of vegetables.
- Preserving food.
- Grinding and steeping.
- Emulsification.
- Food product fermentations.
- Fermenting beer at breweries.
- Boiling, broiling, frying, grilling, steaming and mixing.
- Sterilization.
- Fruit juice processing.
- Removing the outer layers either by peeling and peeling.
- Gasification of soft drinks.
- Conserving and packaging of food products by vacuum packs.

TYPES OF FOOD PROCESSING

Food processing is the set of methodology and techniques used to transform raw products into food for consumption by the customer.

- Cutting
- Mixing
- Standardizing
- Cooking
- Sterilizing
- Blending
- Spray-drying

TRADITIONAL FOOD PROCESSING METHODS

Food production and processing attain preservation and reduce the risk of getting spoiled. It increases the inventory life, stabilizes food's texture and makes sure that products meet high standardized guidelines and regulations. Traditional food processing methods include sterilization, pasteurization, blanching and microwaving kills human pathogens and micro-bacterial which makes foods to spoil. These methods are widely used for various foods and drinkables throughout the world.

PASTEURIZATION

Pasteurization is a process which got its name from the inventor and scientist Louis Pasteur. This traditional food processing method involves dairy products such as milk, butter, yogurt etc. pasteurization method kills human pathogens in food. Presently, America uses the high temperature-short temperature Pasteurization method which basically involves raising the temperature of a dairy product let's say milk to one hundred and sixty-one degrees Fahrenheit for fifteen seconds led by quick cooling, according to the United States Department of Agriculture which is the full form used in place of USDA. Pasteurization makes milk products safe for human consumption, while also developing and absorbing quality.

STERILIZATION

Sterilization is the most used disinfectant technique for food until now. It basically involves heat treatment to inactivate enzymes while minimizing the foundation of catalyst in the process. It has been observed to kill all human pathogens and micromaterials, which tends to make the spoiling of foods. All packaged and canned foods are sterilized in large containers to make sure the preservation is intact for more than two years. It has also been observed that sterilization may probably not kill all the microbes therefore, as, with any food product, varying precautions must be considered, such as cooling, proper handling and cooking to make sure food organisms are handled correctly and will not create any health risks.

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BLANCHING

Blanching is the process which again involves thermal treatment but in hot water or super steam. This method is used primarily used for packaged fruits and vegetables. It usually disarms enzymes that destroy color, texture, flavor and nutritional value in the vegetables.

Vegetables are blanched before the packaging to help clean and reduce microorganisms and capture gases. Blanching also prevents the vegetable's leafy tissues from flaccid, which allows for easier handling during the wrapping process.

MICROWAVING

Microwaving is a food processing method that uses heat for small quantities of food such as frozen products. Microwave ovens use electromagnetic radiation to control the water molecules found in food, which then spreads by conduction to the base of the food. Microwaves penetrate the food ten inches from the base of radiation and penetrate three to four inches into the food. Therefore, ovens may be partial in size to cook portions faster. The efficiency of microwaving is lost on larger portions of food.

LINKING FOOD PRODUCTION AND FOOD SECURITY

Presently many efforts to predict the hike in farming production needed to attain global food security over the coming next quarter to almost century, for example, International Food Policy Research Institute, the world bank, Food and Agriculture Organization, the Consultative Group for International Agricultural Research, and the Stockholm Environment Institute. They share a thought that food production will have to be hiked constantly over the coming years to feed the increasing global population.

But global forecasts do not unavoidably benefit when it comes to speaking food security at the local stage. What is most commonly absent is the position of the 'entitlements' of people and the 'abilities' these abilities make. Food production is not the same as food obtainability. This is production minus exports, and plus imports. Average availability and the ability to attain food are not similar. While some food production is unquestionably among the most important impacts in the fortitude of food privileges, the relations are complex and many issues are vital.

Present levels of farming productivity and production say quite about potential levels because they are a response largely to present levels of demand and price as well as market conditions. As observed by the researchers: Food is being prepared by farmers and others not to simulate how much can be harvested, but to make it useful economically, to consume, to sell, to exchange. One cannot directly infer how much could have been prepared merely by observing at what was prepared. Food cannot be produced beyond the hiked demand for it.

Thus, food manufacture is a vital part of food security, but not the only branch. Some eight hundred million people currently have completely insufficient consumption levels and accessibility to food. But most of these people, who would otherwise consume more, do not have sufficient earnings to demand more food and cause it to be produced. For financially weak people, increased demand and hiked manufacture are part of the same branch. If production limitations filter agricultural growth, they act as brakes on revenues, demand as well as supply. In countries with heavy reliability on agriculture, progression towards improved food security does go hand in hand to make farming more productive.

This left us with a contradiction. Food security mostly depends on admission and prerogatives towards food, which is contingent on better profits for many. If profits are hiked, then more food will be produced. But for many people in many countries around the world, hiked income is contingent on developments to farming. It is vibrant that planning to improve rural food security must also an emphasis on generating and supporting relationships which allow hiked food production to support well rural economies. Many definitions of food securities are already implemented. These have been subject to argue, as a famous researcher Maxwell and Smith in the year 1992 stated more than one hundred and eighty items discussing concepts and definitions, and more definitions are already being discovered according to the Department for Environment, Food and Rural Affairs in the year 2006.

THE CURRENT STATE OF FOOD SECURITY

An almost good portion of people around the world have access to food. Most of the malnutrition in people mostly found in developing and emerging countries, when analysis based on aggregate national calorie obtainability and expectations about food spread and nutritional needs. More location estimates are probable with varying household surveys, which usually show a higher occurrence of food deficiency than the estimate by the Food and Agriculture Organization. Using food energy shortfall as the measure of food uncertainty, surveyors stated average rates of food insecurity of fifty-nine percent for twelve African countries, as compared to a thirty-nine percent estimate from Food and Agriculture Organization for the same period. While there is a medium indication, medium contract on absolute numbers, there is vigorous evidence, a high agreement that sub-Saharan Africa has the highest amount of food-insecure people.

With a projected local aggregate of twenty-six-point eight percent of the population malnourished in the time between the years 2010–2012, and where charges higher than fifty percent can be found stated by Food and Agriculture Organization in the year 2012. The largest numbers of food- insecure persons are found in South Asia, which has roughly three hundred million malnourished according to the Food and Agriculture Organization in the same year. In addition to the usual measures of calorie availability, food security can be widened so that it can include nutritional aspects based on the variation of diet which includes not only staple foods but also vegetables, fruits, meats, milk, eggs and fortified foods as stated by the Food and Agriculture Organization in the year 2011. There are vigorous pointers and high contract that lack important micronutrients such as zinc and vitamin A affect hundreds of millions of additional people.

Food uncertainty is poverty run hand in hand. Around the world, about twenty-five percent to thirty percent of underprivileged people, measured using one dollar in the United States to 2 dollars in the United States per day standard, live in urban areas. Most deprived countries have a larger section of people living in rural areas and poverty rates tend to be hiked in rural areas by slight margins in South Asia and Africa, and by large margins in China.

In Latin America, poverty is more tilted towards urban areas, with more so than two-thirds of the poor in urban areas, a section that has been increasing in the past decade. Metropolitan sectors will go on to have many economically weak people for few upcoming decades, even as population hike is greater in metropolitan sectors. The consequences of price unpredictability are separate from the effects of gradual price rises, for two main reasons. One is, rapid changes make it hard for the underprivileged to adjust their actions to favor creating higher value items. Second, hiked volatility leads to higher uncertainty about the future and can diminish willingness to capitalize scarce resources into output enhancing possessions, such as fertilizer purchases in the case of farmers or rural development in the case of governments.

There are various factors which have been observed to contribute to hiked price instability such as poorly surveyed local market places, hiked incidence of varying weather events, and greater assurance on production sectors with high acquaintance to such risks, biofuel requirements and increased relation between energy and farming markets according to the world bank in the year 2012. Susceptibility to food price instability depends on the grade to which homes and countries are net food purchases. The level of combination into global, regional, and local markets and their relative grade of volatility, which in turn is conditional on their respective domination which consists of robust evidence, medium agreement as stated by the World Bank in the year 2012. For food generation systems, the number and forte of non-climate pointers, such as farming development or hiked use of irrigation and insecticide in the section of crops,

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make explaining a clear bassline most difficult. Almost all the non-climatic points are not very well categorized in terms of spatial and temporal distributions, and the links between these sections and specific output of attention, for example, corps or fish production is often difficult to be analyzed.

Acknowledgment of any practical changes to climate trends is more intricate by the fact that representations connecting climate and framing must, indirectly or directly, make expectations about farmer behavior. In most cases, representations indirectly expect that farming practices or technologies did not adjust in response to climate over the period of interest.

FOOD SECURITY AND FOOD PRICES

Food productions walk hand in hand with food security. One does not work without the other, and the indications that climate variations have affected food production states some effect on food security. Yet analyzing this effect is an extremely hard task, requiring considerations about the many non- climatic factors that deal with climate to figure out food security. There is a limited direct indication that mistakenly connects climate variation to effects on food security. One most important aspect of food security is the prices of internationally traded food supplies. These prices show the overall balance of supply and demand, and the accessibility of food for consumers related to regional to the markets all around the world. Although food costs are constantly declined for most of the twentieth century as stated by Food and Agriculture Organization In the year 2009 since AR4 Climate Change report prepared in the year 2007 there have been various periods of fast increases in international food costs. A major section in present price changes has been hiked crop demand, notably with the help increased in use in biologically obtained fuel production related both to energy policy orders and oil cost variations.

Yet variations and movements in food manufacture are also widely said to have played a vital role in recent cost changes, with present price spikes often the said climate extremes in major producers. Moreover, some of these extreme situations have tuned more likely as an output of climate tendencies. Domestic policy responses can also boost international cost responses to weather events, as was the case with export bans announced by various countries since the year 2007 as stated by Food and Agriculture Organization in the year of 2008. In a study of global production responses to climate, trends estimated a price increase of 19 percent due to the impacts of temperature and precipitation trends on supply, or an increase of 6 percent once the beneficial yield effects of increased carbon dioxide over the study period were considered. Because the price models were developed for a period ending in the year 2003, these estimates do not account for the policy responses witnessed in recent years which have amplified the price responses to weather.

CONCLUSION

Traditional food processing methods have long been integral to maintaining food security, especially in resource-constrained environments. By improving the availability, safety, and nutritional value of food, these practices contribute to resilience against food crises, foster local economies, and support cultural diversity. However, their effectiveness in promoting food security is contingent upon proper implementation, education, and access to resources. As modern challenges such as climate change and global food systems evolve, integrating traditional practices with contemporary technologies could offer a balanced and sustainable approach to food security.

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CONFLICTS OF INTEREST

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