

ASSESEMENT OF LOCAL METHODS OF VEGETABLE CROPS PRESERVATION IN BAMA LOCAL GOVERNMENT AREA OF BORNO STATE, NIGERIA.

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Abstract

The study focuses on local method of vegetable crops preservation in six out of nine district of Bama Local Government Area of Borno State. Primary and secondary data were used for the study; Primary data was obtained through interview with the respondents using questionnaires. Secondary source of data use for the study include textbook, journals, magazines, previous studies and seminar paper. Descriptive statistics such as percentage and frequency were used for data analysis. It was discovered from the study that the majority of the respondents were male with 70.0% while the 30.0% were female, the study also shows that 6.0% of the respondent fall within the age range of 21-30 years, 6.0% falls within the range of 31-40 years and 84.0% fall within 40 years and above. There was long period of years spent in vegetable farming with 8.0% have less than 5 years experience, 20.0% have 6-10 years experience, 26% have 11-15years and 46.0% have more than 16 years farming experience. The result also indicates the methods of vegetable preservation used by the respondents in the study area that 2% of the vegetable farmers use dehydration, 18% of the respondents use cooling method, 40% are using drying method also 40% are using addition of chemicals. From the result, it was recommended that the majority of the farmers used chemicals as a method of preservation and some responded that it is harmful if not properly used. Thus government and other voluntary organizations should try to enlightened farmers on the hazard of chemical application in preservation. The people in the study area are using sun-drying method sometimes because it is cheaper. The effects of this method is that it create favorable condition for the pathogenic organism like; bacteria, virus and fungi so there is need for government to provide adequate storage facilities in order to reduce the hazard of such method (sun-drying). Effective means of transportation should be available in order to ease the movement of vegetable from producing area to the consuming centre. Education and mobilization for efficiency in production, handling, processing and storage.

KEYWORDS: Vegetable crops, Preservation and Local method.

Introduction

Vegetables are annual or perennial herbaceous plant whose edible part are characterized by a very high moisture content of about 80% and above in its' fresh and unprocessed condition (Agusiobo, 1976). Although quantitative evidence is not easily available, there is considerable increase in consumption. It is common knowledge that there is hardly any house-hold that does not use one type of vegetable or the other in their daily diet. This is due to increase awareness of the importance of good health. They contained a valuable vitamin C and mineral salt for healthy development of the body.

Vegetables are also important supplement for protein and starchy food items. It is estimated that the proportion required in a balance diet is 45% (Agusiobo, 1976). Vegetables are also major sources of vitamin A, B, C, D, E and K. minerals such as Iron, Phosphorus, Calcium, Sodium, Potassium, Magnesium and Iodine are also supplied by vegetables. In addition, pulse vegetables, root vegetables supply carbohydrates in form of starch (e.g potatoes) and sugar (e.g carrot); Green vegetable provide cellulose. Vegetables also act as appetizers because they add texture, colour and flavor to the food. They differ widely in their composition and nutritive values, depending on the type and part of vegetables used, most fresh and raw vegetables furnish about 25 kilo calories of energy. It is beneficial to eat them fresh and raw but at times becomes impossible due to the presence of cellulose which is difficult to digest and which became stronger as the vegetable grow older and in green vegetable, cabbage for instance is too coarse to eat un-cooked. Table 1 represents the average composition of nutritive value of vegetables.

Table 1: Average composition of nutritive value of vegetables

Vegetables	Water	Carbohydrate	Protein	M/salts	Vitamins
Roots	75-85%	5-18%	0.5-2%	0.8-1%	A, B and C
Green	87-93%	3-8%	1-2%	1-2%	A, B, C and K
Pulse	70-78%	14-18%	5-15%	0.5-2%	B.

Source: Angols Moloney, 1971.

Table 1 giving the importance of vegetable to human health, growth and development, some vegetables are plentiful only at certain season and as such they are seasonal food. Vegetables are grown locally in this areas and are mostly preserved locally because of their perish ability; although they can be stored for a long period of time by refrigeration it is expensive. Large quantities of vegetables are now processed so that they can be stored indefinitely at low-cost, this can be by drying example the grapes dried to produce raisins, current and saltiness by canning, by making jams and turning. The major constraint is the lack of knowledge of the preservation techniques, these leads to poor and or spoilage of most of the preserved produces.

The study was carried out in order to stress the basic importance of preservation techniques and help farmers and researchers to understand the causes of spoilage of vegetables, thereby acquire a sound knowledge in preserving vegetables. The study suggests solution to other preservation techniques which are non-common and to look for possible ways of improving the local preservation techniques with a view of identifying the general methods and practices of preservation of vegetables.

The study draws attention of the farmers, researchers, government and individuals to the importance of vegetable preservation. The study also goes a long way in helping the farmers as well as vegetable marketers to understand the problems militating against vegetable storage and preservation.

Vegetables are very important and useful food, they provide vitamin, minerals, protein and carbohydrates (Joy *et al*, 1979). Vegetables contribute to good nutrition, they make basic diet more appetizers and flavor of soup, a mixture of several vegetables (example leaf vegetables and seed vegetables) can provide diet of high quality compared to that of the best animal product. Although common onion (European vegetable lettuce and cabbage) are now more nutrition than tropical vegetables. The daily need of vegetables are normally about 150-250g per person of which at least 50g (a hand full) should be leaf vegetables which means a consumption of 55.90kg per person per year. It is

particularly important that growing children and breast feeding mothers consume sufficient quantities of leafy vegetables and other essential nutrient. Ihekoronye, *et al*, (1985) stated that vegetable are abundant immediately after early rains but became scarce later in the season, which means that they are short season crops which are consumed earlier.

About the deterioration of vegetables in the study of Fox and Cameroon (1982) discover that damage done to vegetables by spoilage alone account for about 10-20% or more. Uddoh, (1980) further stated that approximately four million naira (₦ 4,000,000) worth of vegetables are wasted annually in Nigeria. The researchers had tried to find out what some authors view about aspects of food preservation. Food preservation method in reference to Brain (1982) in his book food science, a chemical approaches fourth edition says that most unprocessed food deteriorate when kept on as a result becomes inedible.

Dry vegetables cheese butter, bacon and other several traditional food products have their origin in a design to make use of food surplus for immediate requirement. Brain, (1982) stated that micro-organism are present. In dust soil, sewage and on land, there are found anywhere that their presence in or on food is inevitable unless special step are taken to kill them, if food is to be kept in a good conditions a length of time it is essential that the growth of micro-organisms be prevented.

Factors responsible for deterioration of vegetable among others are:

1. Economic factor: farmers are faced with financial problems which brought about difficulties in obtaining and purchases of sufficient materials requires for effective preservation example glass jars, additives, can knives and drying materials such as mats.

2. Handling factor: Handling is a factor which is responsible for spoilage of vegetables to the farmers, most vegetable crops do not have fixed price which will over stay without been preserved before, while prices rise and falls.

3. Transportation factors: The problem of conveying vegetables to the market become more critical as centre's for population expand and land for vegetable grown close to a town become more difficult to find. Bad road and lack of bridge to vegetable producing area hinders timely evacuation to where it can be disposed. Valuable vegetables in remote areas are left unsold leading to spoilage.

4. Illiteracy/Ignorance factor: The farmers due to Ignorance tend to refuse to accept changes on the new techniques of processing and preservation which always pose great difficulties in the process. The extension workers are limited compared to the numbers of vegetables farmers, thus knowledge of modern system of preserving vegetable crops may not reach all the farmers producing vegetables, therefore the deterioration/spoilage of vegetables will increase.

5. Temperature factor: The vegetables are made up of living tissues and life processes continues after harvest. The higher the temperature the quicker the rate of physiological activities associated with life tissue example respiration, maturity, ripening, onset of deterioration leading to water loss, shrinking, drying, death and decay.

6. Pest: Living organisms such as rodents, insects, fungi, bacteria and yeast cause considerable losses to vegetable crops. Rodents and insects attack vegetable crops during storage and are more difficult to control for many reason. Their ability to live and share the same type of food with human beings, the prolific nature of most members and their well developed senses of smell, taste and hearing can easily render most control strategies ineffective.

Preservation is the act or process of protecting something against deterioration, especially the fresh one's lost their values, color, taste and smell if kept beyond a certain period of time and finally become unfit for consumption. It also deals with extending the storage life of product which otherwise quickly decay in warm or areas where the climate is warm and humid, food product get spoil very quickly.

Joy, *et al.*, (1978) stated that it is very important to process and preserve food every time of the year because it plays a vital role in reducing scarcity during drought, disasters such as famine and wars. The

storage of vegetable product is necessary in order to provide a constants supply and surplus during the period of low production. This will further control the price and maintain their quality and quantity. Jan, (1977) stated that food preservation is processing of food for future use. That the objective of crop preservation is to prevent bacteria or chemical action that causes the food to decay to became poisonous or unfit for consumption.

Co-operative extension service of Kankas University, (1987) stated that one of the oldest methods of preservation is drying for many peoples' it was convenient way to preserving food. The popular method of preservation is based on the principles that mould, yeast and bacteria thrives in moisture therefore, foods which are sufficiently dehydrated will not spoil. Attention is paid to numbers of simple preservation techniques, meant to preserve on a small scale such as the house hold or village level. So special attention is paid to small scale method to make it possible for people to proceed and preserve (store) their surplus economically.

The need for preservation of all agricultural produce arises due to seasonal nature and perishes ability of some produce to make it possible their long time storage, where by man accomplished all the year round available and produce defense on growing and harvesting season. The main benefit or advantages of preservation are;

- ✓ Stabilizations of price and reduction in amount of wastage. In time of scarcity, preserved food can be a welcome addition to diet. Through preservation sale out of season are possible. Independence of the normally cover market price in the harvesting seasons.
- ✓ Preservation of food is very important especially in the third world developing countries, because it helps to make the food surplus so that the problems of malnutrition will be prevented
- ✓ Food preservation helps people to protect themselves against starvation.
- ✓ Food preservation help in making exchange of different food stuff amongst different nations.
- ✓ Food preservation helps to make change or to vary the method of preparing food.
- ✓ It help to increase economic status of a nation or a country.
- ✓ Most unprocessed food deteriorate and become inedible in order to protect the food against the growth of micro-organism, enzymes, insects, rats and others, therefore preservation method is necessary.

Preservation can be carried out in two ways;

- By retention of qualities and properties of the product.
- By radical changes which result in new product with completely new qualities and properties.

The principal methods of food preservation which falls into one or both of the categories these include;

- De-hydration- is the oldest known method of vegetable preservation, archeological evidence indicates that the Stone Age swiss lake dwellers dried vegetables and fruits similar to apple. Vegetable dehydration is an industry meant great strides during the 20th century.
- Drying- Air drying may be accomplish by two methods i.e natural and artificial. In natural drying the vegetables are exposed to direct sunlight. In artificial drying the vegetable is placed in a special hydration chamber and exposed to current of hot air. The temperature may exceed 400°F (over 200°C) and as the air circulates around the vegetables most of the moisture of vegetable evaporates.
- Cooling- This method of preservation like freeze drying combine of vegetable preservation, the vegetable is dried until 50-75% of its' moisture has been removed. It is then freezes, cooling is generally limited to vegetables, for prefilling and a few vegetables, although, cooling reduce the weight and volume of vegetables it is necessary to keep vegetables frozen until it is used or cooked.

Treatment with chemicals- This method of vegetable preservation however, is generally by heating it to a sufficient high temperature to boil off the water. It is then allowed to cool and can again be used for drying air. A large of chemicals are hygroscopic the most commonly used are; Lithium chloride, Calcium chloride and Lithium bromide certain of glycols of which ethylene glycol is the best known are also hygroscopic and can used for drying air. Active can be corrosive to metal part of a system unless inhibitors are used in the solutions.

Methodology

The study focuses on local method of vegetable crops preservation in six out of the nine districts of Bama Local Government Area of Borno State. The targeted population of the study are the vegetable farmers, simple random sampling was used to select representative sample of vegetable farmers. A total number of fifty (50) vegetable farmers were administered a questionnaire to fill.

Two major types of data were used for the study: these are Primary and Secondary data. Primary data was obtained through interview with the respondents using questionnaires. Secondary source of data used for the study include information from textbook, journals, magazines, previous studies and seminar paper. Descriptive statistics such as percentage and frequency were used for data analysis.

Result and Discussion

Table 2: Socio-economic characteristics of respondents (N=50)

Variable	Frequency	Percentage (%)
Sex		
Male	35	70.0
Female	15	30.0
Age		
Less than 20years	2	4.0
21-30years	3	6.0
31-40years	3	6.0
40years and above	42	84.0
Farming Experience		
1- 5 years	4	8.0
6-10 years	10	20.0
11-15years	13	26.0
16 years and above	32	46.0
Respondents' Occupation other than vegetable farming		
Yes	12	24.0
No	38	76.0

Source: field survey, 2003.

Table 2 indicate that majority of the respondents were male with 70.0% while the 30.0% were female, it also shows that 6.0% of the respondent fall within the age range of 21-30 years, 6.0% falls within the range of 31-40 years and 84.0% fall within 40 years and above. There was long period of years spent in vegetable farming with 8.0% have less than 5 years experience, 20.0% have 6-10 years experience, 26% have 11-15years and 46.0% have more than 16 years farming experience.

Table 3 Average hectares of land that respondent cultivate

Hectares	Frequency	Percentage (%)
1-3 hectares	1	2
4-6 hectares	11	22
7-10 hectares	16	32
11 hectares and above	22	44

Source: field survey, 2003.

Table 3 indicates that 2% of the respondents cultivate 1-3 hectares of land, 22% cultivate 4-6 hectares of land, 32% cultivate 7-10 hectares of land and 44% cultivate 11 hectare and above. This indicates that the majority of the respondents 44% cultivate more than 10 hectares of land annually.

Table 4 The methods of vegetable preservation used by the respondents

Methods of preservation	Frequency	Percentages (%)
Dehydration method	1	2
Cooling method	9	18
Drying method	20	40
Addition of chemical/packages	20	40

Source: field survey, 2003.

Table 4 indicates the methods of vegetable preservation used by the respondents in the study area. 2% of the vegetable farmers use dehydration, 18% of the respondents use cooling method, 40% are using drying method also 40% are using addition of chemicals. In this case researchers observed that chemical and drying methods are usually used than other methods of preservation.

Summary

The study was carried out to focus the local methods of vegetable crop preservation among vegetable farmers in Bama Local Government Area of Borno State the major objectives of the study is to stress the basic importance of preservation techniques and to look for possible ways of improving the local preservation techniques with a view of identifying the general methods and practices of preservation of vegetables.

Six districts were selected out of which fifty (50) respondents were randomly selected for the study. Data for the study were collected from both primary and secondary sources. The data obtained was analyzed using descriptive statistic. According to the result on the socio-economic characteristics of the respondent, majority of the respondents were male with 70.0% while the 30.0% were female, it also shows that 6.0% of the respondent fall within the age range of 21-30 years, 6.0% falls within the range of 31-40 years and 84.0% fall within 40 years and above. There was long period of years spent in vegetable farming with 8.0% have less than 5 years experience, 20.0% have 6-10 years experience, 26% have 11-15years and 46.0% have more than 16 years farming experience. The result also indicates the methods of vegetable preservation used by the respondents in the study area that 2% of the vegetable farmers use dehydration, 18% of the respondents use cooling method, 40% are using drying method also 40% are using addition of chemicals.

Recommendations

Based on the findings the study recommended the following:

1. The majority of the farmers used chemicals as a method of preservation and some responded that it is harmful if not properly used. Thus government and other voluntary organizations should try to enlightened farmers on the harzard of chemical application in preservation.
2. The people in the study area are using sun-drying method sometimes because it is cheaper. The effects of this method is that it create favourable condition for the pathogenic organism like;

bacteria, virus, fungi e.t.c. so there is need for government to provide adequate storage facilities in order to reduce the hazard of such method (sun-drying).

3. Effective means of transportation should be available in order to ease the movement of vegetable from producing area to the consuming centre.
4. Education and mobilization for efficiency in production, handling, processing and storage.

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