Information Sources on Preservation of Fresh Vegetables in Kwara State, Nigeria

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Abstract

This study assessed the sources of information on preservation of fresh vegetables among farmers in Ilorin, Kwara State. A total of 120 respondents were randomly selected. A questionnaire was developed to collect data. Data was analyzed using descriptive and inferential statistics. Findings indicated that respondents cultivate average of 2 hectares of vegetable farms. All (100%) of the respondents produced water leaf, African spinach, Saluyot leaf and African Basil. Drying (99.2%) and refrigeration (17.5%) of fresh vegetables were the main preservation methods adopted by respondents. Fellow farmers (mean=3.75), radio (mean=3.40) and farmers' group (mean=1.86) were the leading sources of information for preserving fresh vegetables. Education, farming experience and household size of the respondents were significantly related ($p<0.05$) to the sources of information used by respondents. This study recommends that extension organizations aimed at improving farmers' capacity on preservation of fresh vegetables should disseminate their information through farmers' groups and radio program.

Keywords: constraints, information sources, value addition, vegetables

Introduction

The transfer of information from a source to a receiver (extension to farmer) through a particular channel with the purpose to change farmers' attitude is called agricultural communication. Access to accurate, current and relevant information brings about knowledge to make informed decisions regarding day-to-day field farm operations, processing and overall well-being of farmers (Judamat *et al.,* 2010; Lwoga, 2010).

An information source is an individual or institution that generates or brings about a message (Starasts, 2004). It is a channel that contains and stores knowledge and/or information (Bitso, 2012). Koyenikan (2011) grouped information sources as informal and formal sources. The formal sources are radio stations, international and local print media (such as newsletters, newspapers and journals) and workshop/seminars, while the informal sources include family friends and fellow farmers. Before the introduction of modern medium of agricultural information transfer, town crier, folk songs, relation and association were some mediums of communication used for connection and networking in agricultural circles in Nigeria (Daudu *et al.,* 2009). Adio *et al.,* (2016) added that observation of extension workers, cooperative societies, friends and colleagues, people organizations, speeches, documents, picture and art work can also be described as information sources. The characteristics of a good information source are reliability, timelessness, relevance, accuracy, cost effectiveness and usability (Starasts, 2004).

The information sources available and utilized by vegetable farmers are of paramount importance for effective vegetable preservation.

This is because vegetables are composed of living tissues, if the tissues are not maintained after harvest it makes vegetables perishable and highly prone to losses (Mustapha and Yahaya, 2006). In Nigeria, enormous quantities of fruits and vegetables are produced (Ibeawuchi *et al.*, 2015). A digital assessment complied indicated that between 1969 to 2018, vegetables primary production of Nigeria grew substantially from 2.87 million to 16.4 million tones rising at an increasing annual rate that attained a maximum of 20.9% in 2014 as the world largest producer and then decreased to - 0.12% in 2018 (World data Atlas, 2019). Unfortunately, up to 33-40% of vegetables produced are rendered unfit for consumption due to spoilage after harvesting (Olayemi *et al.,* 2012; Mohammad *et al.,* 2012). This is a huge loss of important food even when the minimum food requirement of the population is not met (Otaha, 2013). In most cases farmers suffer such a huge economic loss due to lack of appropriate understanding of proper preservation methods (Yahaya and Mardiyya, 2019). Therefore, it is important not only to grow large vegetable farm, but also to save more through value addition for preservation and make it available over a long period time by protecting the vegetables from attack of pathogens and other environmental damage. Hence, it is important to document available channels through which farmers sourced for information to improve their knowledge on value addition practices and preservation of fresh vegetables. This is of paramount importance because of its valuable source of nutrients and proven crucial roles in alleviating hunger and food security of farmers in Nigeria (Badmus and Yekini, 2011; Enete and Okon, 2010; Mwinyihija, 2010). It is against this background that this study intends to identify farmers' sources of information on preservation of fresh vegetable in the study area.

The general objective of this study is to assess the sources of information on vegetable value addition among farmers in Ilorin East local Government Kwara State, Nigeria. Specific objectives of the study are to: (i) describe the socio-economic characteristics of vegetable farmers; (ii) identify various value addition practices for preserving fresh vegetables; (iii) itemize the sources of information on value addition practices for preserving fresh vegetables and (iv) identify constraints to vegetable value addition practices in the study area. The significant relationship between socio-economic characteristics and sources of information on value addition of vegetables as hypothesis was further assessed.

Materials and methods

The study was conducted in Ilorin East Local Government Area (LGA) of Kwara State. The LGA with headquarters located at Oke Oyi was created in October 1991 as one of the sixteen Local Government Areas of Kwara State. It is situated in the transitional zone between the Northern and Southern parts of Nigeria and located between latitude 8°5'N and longitude 4°5'E. It has an area of 486 km^2. It has a population of 207,462 at the 2006 census and projected at 280,000 in 2016 (National Population Commission, 2006). Farming activities is the main occupation of the people in the LGA.

A purposive sampling technique was used to select five communities (Oke-ose, Alalubosa, Oke-oyi, Marafa and Ile-apa) which are known for high vegetable production. In selecting respondents for the study, random sampling technique was used to select 24 vegetable farmers in each community making a total of 120 sample size. A questionnaire validated by experts in the Department of Agricultural Extension and Rural Development, University of Ilorin was used to collect data from respondents between February and April, 2017.

The data obtained was analyzed using frequency counts, percentages, means and inferential statistics of Pearson Product Moment Correlation (PPMC). PPMC coefficient (r) measures the strength of the linear relationship between two variables (Pearson, 1948). The choice of the Pearson model is its strength to measure the relationship between a dichotomous (yes or no) and an interval/ratio variable (Cramer, 1998; Chee, 2013). Pearson's r was calculated using the formula:

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{\{n\sum x^2 - (\sum x)^2\}\{n\sum y^2 - (\sum y)^2\}}}$$

r = correlation coefficient
x = independent variable
y = dependent variable
n = total number of observation

Dependent variable was the sources of information on fresh vegetables. List of value addition

Table 1. Socio-economic characteristics of the respondents

Socio-economic	Frequency	Percentage
Age in years		
40 and below	21	17.5
41 – 50	31	25.8
51 – 60	36	30.0
Above 60	32	26.7
Mean age = 52±13		
Sex		
Male	18	15.0
Female	102	85.0
Years of schooling		
0	42	35.0
1 – 6	78	65.0
Vegetable occupation		
Yes	103	85.8
No	17	14.2
Household size		
≤5	40	33.3
6-10	73	60.8
≥10	7	5.9
Mean=6.8±2.3		
Farm size (hectare)		
1 – 5		
6 – 10	119	99.2
Mean=2.30±0.9	1	0.8
Years of farming experience		
≤5	27	22.5
6 – 10	44	36.7
11 – 15	49	40.8
Mean= 9.8±3.6		
Membership of farmers' group		
Yes	8	6.7
No	112	93.3

Source: Field survey, 2017

practices adopted to preserve fresh vegetables were presented and measured on the scale of yes=1 or no=0. Independent variables were age in years, sex (male=1, female=0), education in years of schooling, vegetable growing as main occupation (yes=1, no=0), household size in persons, farm size in hectares, vegetable farming experience in years, and membership of farmers' group (yes=1, no= 0).

A list of 13 possible constraints to obtain information on preservation of fresh vegetables were presented to respondents and measured on 5 point scale of strongly disagree=1, disagree=2, undecided=3, agree=4, strongly agree=5. Mean score of responses for each constraint were generated. Summation of values assigned to scales (15) was divided by number of scale (5) to arrive at 3.0 mean score which was used as benchmark for decision making. Constraints with mean score at 3.0 and above were considered as severe constraints while mean score at 2.99 and below were considered as not severe constraints.

Table 2. Types of vegetable produced by respondents

Botanical Name	English/Local Name	Yes (%)
Basella rubra	Ajefawo	18 (15.0)
Corchorus olistorus	Jute or saluyot leaf/Ewedu	120 (100.0)
	Ebure	39 (32.5)
Abelmoschus esculentus	Okra/Ila/Lady finger	118 (98.3)
Murrayakoenigii	Curry leaf/Efirin Oso	79 (65.8)
Talinum triangulare	Water leaf/Gbure	120 (100)
Celosia argentia	Lagos spinach/Shoko yokoto	119 (99.2)
Amaranthus hybridus	African spinach, "Green"/EfoTete	120 (100)
Solanium marcrocarpon	African eggplant leaf/Efo Igbo	48 (40.0)
Mentha	Eku	91 (75.8)
Solanecio biafrae	Worowo	58 (48.3)
Taraxacum officinale	Dandelion greens (wild lettuce)/ EfoYarin	78 (65.0)
Crassocephalum rubens	Yorubanbologi/Ebolo	69 (57.5)
Basella alba	Malabar Spinach/Amunututu	82 (68.3)
Ocimumgratissimum	African Basil/Efirin	120 (100)
Lycopersicon esculentum	Tomato/Tomati	20 (16.7)
	Adayeba	18 (15.0)
Solanum macrocarpon	Gbagba	76 (63.3)

Source: field survey, 2017

Results and discussion

Results of socio-economic characteristics of the respondents were presented in Table 1. The table indicated that the average age of respondents was 52 years. The average number of persons in household was 7 persons. Respondents cultivate average of 2 hectares of vegetable farm size with average of 10 years of experience in vegetable farming. This finding on farm size indicated that vegetable farmers in the study area cultivated fairly large vegetable farm and were expected to produce abundant vegetables needed to be preserved. Fairly large number of household size found among respondents is an opportunity for family labour for vegetable farming. This will help farmers to reduce cost of farm operation when compared to hired labour (Yisa *et al.*, 2010).

Majority of the respondents further indicated that they were females (85%), cultivate vegetable farm as main occupation (85.8%), non-member of farmers' group (93.3%) and attended 1 to 6 years of schooling which is equivalent to primary school education. This finding is in line with the report by Ajibola *et al.,* (2015) that most of the vegetable farmers in Kwara State had no formal education.

The types of vegetable produced by respondents are presented in Table 2. The table shows that all (100%) of the respondents produced water leaf, African spinach, Saluyot leaf and African Basil. Majority further indicated they were engaged in the production of Lagos spinach (99.2%), Okra (98.3%), Eku (75%), Malabar Spinach (68.3%), Curry leaf (65.8%), Dandelion greens (65%), Gbagba (63.3%) and Yorubanbologi (57.5%).

As indicated in Table 3, majority of the respondents used drying method (99.2%) as a way of preserving fresh vegetables. Other methods adopted by few were refrigeration (17.5%) and dehydration (5%) as a value addition practices for preserving fresh vegetables in the study area. Similar finding was reported by Ibeanu *et al.,* (2010) that sun drying and refrigeration were the common methods of vegetable preservation in Enugu State.

The major source of information available to the vegetable farmers on value addition practices to preserve their fresh vegetables were ranked as fellow farmers (ranked first), radio (ranked second) and farmers' cooperative group (ranked third) (Tab. 4). Other studies had identified radio program as the most appropriate and preferred

Table 3. Value addition practices adopted to preserve fresh vegetables

Value addition practices	Yes (%)
Drying	119 (99.2)
Dehydration	6 (5.0)
Refrigeration	21 (17.5)

Source: field survey, 2017

Table 4. Sources of information on value addition among vegetable farmers

Sources	Regularly (%)	Occasionally (%)	Seldom (%)	Never (%)	Mean	Rank
Television	2 (1.7)	30 (25.0)	32 (26.7)	56 (46.7)	1.82±0.86	4th
Radio	49 (40.8)	70 (58.3)	1 (0.8)	0	3.40±0.50	2nd
Mobile phone	0	7 (5.8)	63 (52.5)	50 (41.7)	1.64±0.59	5th
Extension Agent	0	6 (5.0)	44 (36.7)	70 (58.3)	1.47±0.59	6th
Print materials	0	5 (4.2)	9 (7.5)	106 (88.3)	1.16±0.46	7th
Internet	0	0	0	120 (100)	1.00±0.00	8th
Fellow farmers	93 (77.5)	26 (21.7)	0	1 (0.8)	3.76±0.48	1st
Farmers' cooperative group	5 (4.2)	15 (12.5)	59 (49.2)	41 (34.2)	1.87±0.78	3rd

Source: Field survey, 2017

Table 5. Preferred sources of information among vegetable farmers on value addition

Preferred sources of information	Yes (%)
Television	46 (38.3)
Extension agent	96 (80.0)
Mobile phone	22 (18.3)
Printed materials	6 (5.0)
Radio	119 (99.2)
Fellow farmers	120 (100)
Farmers' group	42(35.0)

Source: Field survey, 2017

medium for receiving agricultural information (Okwu, *et al.*, 2007; Kughur *et al.,* 2016).

Further results on preference for sources as presented in Table 5 showed that majority of the respondents mostly preferred fellow farmers (100%), radio (99.2%) and agricultural extension agents (80%). These findings imply that information on preservation of fresh vegetables disseminated through fellow farmers and radio are preferred by vegetable farmers in the study area. Which could be attributed to easy access to fellow farmers and radio at no cost. The inclusion of agricultural extension agents could be attributed to face to face expert advisory services that could be obtained from them.

The results presented in Table 6 show the constraints to value addition of vegetables, all of them having been considered severe. However, pest and diseases (mean=4.63), lack of capital (mean=4.56) and poor extension services (mean=4.32) were the leading constraints to value addition practices to preservation of fresh vegetables in the study area.

The result of further the analysis shows that education (r = -0.222), farming experience (r = 0.458) and household size (r = 0.725) at of the respondents were significantly related to the

Table 6. Constraints to value addition of fresh vegetables among respondents

Constraints	Mean score	Severity	Mean rank
Lack of capital	4.56±0.71	Severe	2nd
Poor extension services	4.32±0.58	Severe	3rd
Lack of technical know-how	3.18±1.25	Severe	8th
Insufficient of skilled labour	3.10±1.14	Severe	9th
Farmers educational level	3.24±1.11	Severe	7th
Pest and diseases	4.63±0.68	Severe	1st
Seasonal practices	3.78±1.24	Severe	6th
Non-availability of market	4.00±0.95	Severe	5th
Lack of storage facilities	4.16±0.92	Severe	4th

Source: Field survey, 2017

Table 7. The relationship between selected socio-economic characteristics of the respondent and their sources of information on value addition

Variable	Coefficient (r)	p-value	Remark
Age	1.000	0	Not significant
Years of schooling	-0.222*	0.015	Significant
Household size	0.458**	0.001	Significant
Years farming experience	0.725**	0.001	Significant

Note: *Correlation is significant at 0.05 level; **Correlation is significant at 0.01 level.

sources of information used by respondents (Tab. 7). This implies that increase in number of persons in household and years of vegetable farming/ preservation experience will increase usage of information sources for value addition practices for fresh vegetable preservation while increase in education will decrease usage of the sources for information.

Conclusion

This study concluded that respondents are small-scale vegetable farmers. All of the vegetable farmers were engaged in the production of water leaf, African spinach, Saluyot leaf and African basil. Drying and refrigeration were the common means of preserving fresh vegetables. Fellow farmers, radio and farmers' group were the leading sources of information on preserving fresh vegetables. Farming experience and household size were factors influencing increased usage of information sources on preserving fresh vegetables. Pest/ diseases and capital were the leading constraints to value addition of fresh vegetables in the study area.

Based on the findings, this study recommends that extension organizations aimed at improving farmers' capacity on preservation of fresh vegetables should disseminate their information through farmers' groups and radio program. Concerned government institutions and extension personnel should come up with interesting and educative radio programs on value addition of vegetables so as to increase its shelf life, marketing opportunity and farmers' income. Large percentage of vegetable farmers who were non-members of farmers' group should join or form group where not existing, so that they can collectively source for needed capitals and loan to improve production. Extension services to vegetable farmers in the study area should disseminate improved practices to reduce pests and diseases infestation.

References

1. Adio E, Yusufu A, Kunle Y, Shehu N (2016). Use of Agricultural Information Sources and Services by Farmers for Improve Productivity in Kwara State, Library Philosophy and Practice (e-journal), 1456: 1-16.
2. Ajibola BO, Komolafe SE, Akangbe JA (2015). Constraints Faced by Women Vegetable Farmers in Kwara State, Nigeria and Its Agricultural Practices. Jordan J. of Agric. Sci, 11(4); 955-1006.

3. Badmus MA, Yekinni OT (2011). Economic Analysis of Exotic Vegetable Production among Urban Fadama Women Farmers in Akinyele Local Government Area Oyo State, Nigeria. International J. of Agric. Econ. and Rural Development, 4(1): 19–24.
4. Bitso CML (2012). An Analysis of the Information Behaviour of Geography Teachers in Developing African Country –Lesotho. Review of International Geography Education. Online 2: 192–218.
5. Chee JD (2013). Pearson's product-moment correlation: sample analysis Researchgate.net. https://www.researchgate.net/publication/262011045.
6. Cramer D (1998). Fundamental Statistics for Social Research. London: Routledge. p.456.
7. Daudu S, Chad SS, Igbashal AA (2009). Agricultural Information Sources Utilized by Farmers in Benue State, Nigeria. Production Agriculture Technology, 5(1): 39-48.
8. Enete AA, Okon TE (2010). Economic of water leaf production in Akwa Ibom State Nigeria. Field Active Science reports, 4(1): 1-5.
9. Ibeanu V, Onuoha N, Ezeugwu E, Ayogu R (2010). Food preservation and security at household level in rural Nsukka, Enugu State, Nigeria. Agro-Science Journal of Tropical Agriculture, Food, Environment and Extension, 9(2):125–130.
10. Ibeawuchi II, Okoli NA, Alagba RA, Ofor MO, Emma-Okafor LC, Peter-Onoh CA, Obiefuna JC (2015). Fruit and Vegetable Crop Production in Nigeria: The Gains, Challenges and the Way Forward. Journal of Biology, Agriculture and Healthcare, (2): 194-208.
11. Judamat ZA, Adekoya AE, Abu OA (2010). Information needs of small ruminant rearers in Peri-Urban areas of Southwest Nigeria. African Journal of Livestock Extension, 8: 72–78.
12. Koyenikan MJ (2011). Extension Workers' Access to Climate Information and Sources in Edo State. Nigeria Scholars Research Library Archives of Applied Science Research 3(4):11-20.
13. Kughur PG, Iornenge GM, Vihi SK (2016). Assessment of radio and television role in agricultural information transfer among farmers in Katsina-Ala Local Government Area of Benue State, Nigeria. UW Trends in Science & Technology Journal. 1(2); 442 – 447.
14. Lwoga ET (2010). Bridging the agricultural knowledge and information divide: The case of selected telecenters and rural radio in Tanzania. Electronic Journal on Information Systems in Developing Countries, 43(6): 1–14.
15. Muhammad RH, Hionu GC, Olayemi FF (2012). Assessment of the post harvest knowledge of fruits and vegetable farmers in Garun Mallam L.G.A of Kano, Nigeria. International Journal of Development and Sustainability, 1(2):510-515.
16. Mustapha Y, Yahaya SM (2006). Isolation and Identification of Post-harvest fungi of Tomato (*L. esculentum*) and Pepper (*Capsicum annum*) sample from selected Irrigated sites in Kano. Biological and Environmental Science Journal for the Tropics, 3: 139-141.
17. Mwakaje AG (2010). Information and Communication Technology for rural farmers market access in Tanzania. Journal of Information Technology Impact, 10(2): 111–128.
18. National Population Commission, Federal Republic of Nigeria, Official gazette. Legal Notice on Publication of 2006 Census Final Results. Federal Government Printer, Abuja. 2009
19. Okwu OJ, Kuku AA, Aba JI (2007). An assessment of use of radio in agricultural information dissemination: a case study of radio Benue in Nigeria. African Journal of Agricultural Research, 2(1): 014-018.
20. Olayemi FF, Adegbola JA, Bamishaiye EI, Awagu F (2012). Assessment of Post Harvest Losses of Some Selected Crops in Eight Local Government Areas of Rivers State, Nigeria. Asian Journal of Rural Development, 2(1): 13-33.
21. Otaha IJ (2013). Food Insecurity in Nigeria: Way Forward. An International Multidisciplinary Journal Ethiopia, 7(4): 26-35.
22. Pearson K (1948). Early Statistical Papers. Cambridge, England: University Press.
23. Starasts AM (2004). Battling the knowledge factor: a study of farmers' information seeking learning and knowledge process with an online environment in Queensland. Unpublished Ph.D Thesis.
24. World Data Atlas (2019). Nigeria-Vegetables primary production quantity. https://knoema.com/atlas/Nigeria/topics/Agriculture/Crops-Production-Quantity-tonnes/Vegetables-primary-production.
25. Yahaya SM, Fagwalawa LD, Ali MU, Lawan M, Mahmud S (2015). Isolation and Identification of Pathogenic Fungi Causing Deterioration of Lettuce Plant (*Lactuca sativa*) A Case Study of Yankaba and Sharada Vegetables Markets. J Plant Sci Res 3(1): 1-4.
26. Yisa ES, Ogaji A, Ajayi OJ, Yusuf TL, Shaffi A (2010). Assessment of the Effect of Agricultural Productivity on Rural Household Food Security in Katcha Local Government Area of Niger State. Proceedings of 11th Annual National Conference of National Association of Agricultural Economists. Nmadu JN, Ojo MA, Mohammed US, Baba KM, Ibrahim FD, Yisa ES eds., 280–286.