

Assessment of Freshcut Fruit Handling and Vending in the Central Business Area of Koforidua, Ghana

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ABSTRACT--- *Local freshcut fruit vending create employment and also facilitate fruit consumption to promote public health. However, handling of the fruits and unhygienic practices can affect the quality and safety of freshcut fruits. This study was conducted to assess the handling practices and vending of freshcut fruits in Koforidua Ghana, using questionnaires administered to 54 randomly selected freshcut fruit vendors. The results showed that the enterprise is dominated by females (92.6%) and majority (75.9%) of respondents is literate. Many (72%) of the vendors have engaged in freshcut within five years (range <1-5) years indicating freshcut as recent value addition activity. Fruits are sourced from wholesalers (48.1%) and farmers (40.7%) and included pineapple, watermelon, mango and pawpaw. The main source of water for washing the fruits was pipe borne water (64.8%) and no sanitizers were added to the water. A total of 85.1% of the vendors used transparent LDPE bag as primary packaging. Selling containers during vending included metal tray (59.3%), safe(glass box)20.4% and unsold freshcut fruits were kept in either refrigerator (25.9%) or in store-room (9.3%). Vendors (74.9%) had no other sources of income. Majority (81.5%) of the vendors had no professional training related to safe preparation and processing of freshcut fruits. Vending sites included roadside (streets), bus/taxi station and market. Freshcut fruit vending is a local enterprise that provide income for the women engaged in the trade. It is recommended that professional training be provided on good hygienic practices of handling to improve the quality and safety of the freshcut fruits for consumers and enhance the business.*

Keywords--- employment, handling practices, local freshcut fruits, vendors

1. INTRODUCTION

Agriculture is the third largest contributor to Ghana's Gross Domestic Product (GDP), accounting for 23.1%, with majority (55.8%) of the working population employed in agricultural activities. About 38 percent of women have responsibility for agricultural activities in Ghana [1].

The fruit subsector is one of the most developed among the non-traditional products contributing a large share of domestic income and foreign exchange. A total value of US\$30,943,000 of fruits was exported in 2010 [2]. Diversification into exotic fruit varieties and value addition including processing into juice and the production of minimally processed (freshcuts) products create employment and increase income particularly for both men and women farmers and fruit processors.

Freshcut produce has been defined by the International Fresh-Cut Produce Association [3] as: "any fresh fruit or vegetable that has been physically altered from its original form (by peeling, trimming, washing, and cutting) to obtain a 100% usable product that is subsequently bagged or prepackaged." An important criterion for a fruit or vegetable to be considered a "freshcut" product is for the tissue to be in a living, respiring physiological state [4]. The freshcut fruit industry in Ghana is in its infancy with few companies such as Blue Skies Holdings, Volta Integrated Agriculture Development (Kingdom Fruits) exporting to Europe. In the informal sector, the processing and vending of freshcut fruits packaged in transparent polyethylene bags is a growing business in major cities. This activity provides employment and could also facilitate fruit consumption to promote public health. With value-added high quality well packaged freshcut fruits, fruit growers and processors will increase the domestic demand for their commodities, market directly to

consumers, enhance the profitability of their raw materials/farms by offering a more valuable fruit product, and aid in the economic sustainability of fruit production in Ghana.

In spite of this huge potential, there is limited information on the local freshcut industry in Ghana. This study therefore aims at providing useful information that can help promote the industry by assessing the handling practices and vending of locally prepared freshcut fruits in the central business area of Koforidua in the Eastern Region of Ghana.

2. MATERIALS AND METHODS

2.1 Study area

This study was conducted in the central business area of Koforidua City, Ghana (6°5'64N, 0°15'54W) in May 2015. The central business area was chosen for this study due its large number of street foods including fresh fruit vending activities.

2.2 Study design and data collection

Questionnaires with both open and close-ended questions were developed and administered to 54 randomly selected freshcut fruit vendors. Selection of participating freshcut fruit vendors was based on their willingness to participate in the study and their readiness to give the required information.

Data were collected from the vendors on socio-demographic characteristics, type and sources of fruits, water sources for washing, freshcut fruit preparation tools and serving utensils, storage, packaging, vending sites, daily sales and any formal training on freshcut fruit preparation. Statistical analysis was carried out on data collected using SPSS version 20.

3. RESULTS

3.1 Socio-demographic characteristics

The study involved 54 respondents from the central business area of Koforidua who are engaged in freshcut fruit vending. Fresh fruit as well as freshcut fruit vending is dominated by female (92.6%)(Table 1). Vendors 26-35 years old constituted the largest proportion (37%). In sum total vendors between the ages of 26-45 constituted 62.9% of the total respondents. Married respondents constituted 51.8% with single being 46.3%(Table 1). On average each respondent had three (3) dependants. Vendors who had Junior High School (JHS) education were the highest (40.2%) with majority (75.9%) of the total respondents being literate. Significantly high (74%) number of vendors had been in fruit vending business for long period of time (range= 1-10 years) while 72% have engaged in freshcut within five years (range <1-5 years)(Table 1). All year round (during the peak and off seasons fruits) of freshcut vending occurs in 48.1% while 51.9% do not, switching to other ventures in the off-season.

Table 1: Socio-demographic characteristics of the respondent(n=54)

<i>Variable</i>	<i>Grouping</i>	<i>Percentage</i>
Sex	Female	92.6
	Male	7.4
Age range	<18	3.7
	18-25	14.8
	26-35	37
	36-45	25.9
	46-55	16.7
	56-65	1.9
Marital status	Single	46.3
	Married	51.8
	Divorced	1.9
Educational level	Non-formal	24.1
	Primary	27.7
	Junior High School	40.7
	MSLC	1.9
	Senior High School	5.6
Years of Vending Fruits	<1	11.1
	1-5	35.1
	6-10	38.9
	11-15	9.3
	Over 15 years	5.6
Years of vending Freshcut fruit	<1	29.6
	1-5	42.6
	6-10	24.0
	11-15	1.9
	Over 15 years	1.9
Year round vending	Yes	48.1
	No	51.9

MSLC=middle school leaving certificate

3.2 Sources of raw materials and methods of preparation of freshcut

Fruits were mainly sourced from wholesalers (48.1%) and farmers (40.7%) from a farmers' market at Adawso about 17.5 km from Koforidua (Table 2). Others (1.8%) obtained fruits from local open market in the Koforidua municipality. Type of fruits sourced included pineapple, watermelon, mango, pawpaw, orange, banana and passion fruit. However fruits sold as freshcuts are pineapple, watermelon, mango and pawpaw. The main source of water for washing the fruits was pipe borne water (64.8%) while 16.7% are from well water. Fruits are washed by 88.9% of the vendors; however, 11.1% of them did not wash the fruits before severing (Table 2). Majority of vendors (83.3%) peeled and cut the fruits using sharp knife into pieces whose sizes depended on the type of fruit while 16.7% of them used both sharp knife and fork. Pieces of fruit are then collected into the primary packaging container using the fork or knife. Majority (81.5%) of the vendors had no professional training related to safe preparation and processing of freshcut fruits with only 18.5% reported to have received training from the local authority, church, NGO and peers (fellow vendors) (Table 2).

Table 2: Sources of raw materials, method of preparation and training acquired in trade(n=54).

Variable	Grouping	Percentage
Source of fruits	Farmers	40.7
	Wholesalers	48.1
	Other	1.9
	Farmers & Wholesalers	9.3
Sources of water	Pipe borne water	64.8
	Well water	16.7
	Bore hole	3.7
	Pipe borne & well water	3.7
	No washing	11.1
Method of preparation		
(a) Washing	Yes	88.9
	No	11.1
(b) Tools used (peeling, cutting, etc)	Knife	83.3
	Fork & Knife	16.7
Acquired training	Yes	18.5
	No	81.5

3.3 Freshcut fruit handling practices

Significant (61.1%) proportion of vendors packed freshcut fruits in transparent LDPE bag & black LDPE bags with the transparent LDPE bag and black LDPE bags serving as primary and secondary packaging respectively (Table 3). In total 85.1% of all the vendors used transparent LDPE bag as primary packaging. Selling containers during vending included metal tray (59.3 %), *safe* (glass box) 20.4% and plastic bowl 1.8%. Waiting customers (Direct delivery) who were directly offered accounted for 12.9% (Table 3). Unsold freshcut fruits are stored in refrigerator (25.9%) and store room (9.3%). Some vendors (40.7%) give out small left over after the day sales and others (7.4%) discard while 16.7% make complete sale within the day. Vendors with no other sources of income accounted for 74.9%. The average weekly revenue of the 54 vendors amounted to GHc497 (approx. \$100) (Table 3).

Table 3: Prepared freshcut fruit handling practices other source of income (n=54)

Variable	Grouping	Percentage
Type of packaging	No packaging	1.9
	LDPE bag	24.0
	Black LDPE bag	7.4
	LDPE bag & Black LDPE bag	61.1
	HDPE dish/cup & Black LDPE bag	5.6
Selling containers during vending	Metal tray	59.3
	Safe (glass box)	20.4
	Safe & Tray	5.6
	Direct delivery	12.9
	Plastic bowl	1.8
Storage of unsold freshcut	Refrigerator	25.9
	Store room	9.3
	Give away	40.7
	Discard	7.4
	Complete sales	16.7
Other sources of income	Yes	24.1
	No	74.9

LDPE=low density polyethylene HDPE=high density polyethylene

4. DISCUSSION

4.1 Socio-demographic characteristics

The study was conducted to determine handling practices and vending of freshcut fruits in the central business area of Koforidua, Ghana. Generally, the freshcut vendors were adult females with majority in the age range 26-45 years. According to FAO 2012 [5], women dominate the food vending sector (which includes fruits and vegetable) in West Africa. This can be attributed to the fact that fresh fruit vending require minimal investment capital. In addition such marketing activities are basic venture for women to earn income to support their families [6]

Although there is high literacy, the level of education is low among the vendors and this has been reported by Bendeck et al [7] that, in urban Ghana, street food vendors are mainly from underprivileged and in most cases, their level of education is low and it is therefore difficult for them to have access to formal employment. Freshcut fruit vending therefore can be said to provide employment for them.

Many of the vendors have been in the selling of fruits for a long period of time, however, freshcut as value addition appear to be a recent activity. This has been reported by Rico et al.,[8], that tremendous growth in the ready-to-use fruit and vegetable industry has been largely due to increasing demand for fresh, healthy and convenient foods. Many of the local freshcut vendors provide this product for consumers in the Koforidua business area all year round and vending sites included road side (streets), taxi/bus stations and market.

4.2 Sources of raw materials and methods of preparation of freshcut

Fruits used in the preparation of the freshcut (pineapple, water melon, mango and pawpaw) were all obtained mainly from farmers and wholesalers in the region particularly Adawso Market- a farmers' market about 17.5km from Koforidua and transported from the market in trucks and buses. This shows the potential role of fresh fruit as well as freshcut vending in promoting local fruit production and consumption.

Though majority of vendors washed the fruits before severing using water from tap, well, or bore hole, the water was without disinfection. In addition, fruits were washed using the same water several times before it was replaced. Such water probably further increase the microbial load and therefore encourage contamination consequently. This is in agreement with the findings of Cardinale et al. [9] that in Senegal unhygienic practices were reported. Generally, it is required that all fruit used for freshcut be subjected to effective washing and rinsing using potable water which has been sanitized. Guidelines for packing fresh or minimally processed fruit and vegetables generally specify a washing or sanitizing step to remove dirt, pesticide residues, and microorganisms responsible for quality loss and decay [10]. Main tool for cutting the fruit is a sharp knife, while a fork or the same knife is used to fetch the pieces of fruit into the primary packaging which is then put inside the secondary packaging also serving as carrier bag. Most of the vendors had never acquired any formal training on food processing and personal hygiene particularly on freshcut fruits. This has been reported by Chukuezi [11], that formal training in food vending remains low in many African countries and in Nigeria training rates were as low as 5%.

4.3 Freshcut fruit handling practices

Most freshcut vendors used transparent LDPE bag & Black LDPE bag(carrier) as primary and secondary packaging respectively. This is due to its availability and low cost and convenience. Polythene bags are manufactured locally and are available in different sizes, ranging from narrow strips of 3 x 5 cm to larger bags measuring 25 x 40 cm. These film wraps are desirable for packaging food because they are much less permeable to water vapour and gases than paper [12]. They are used to package both solid and liquid foods. The pre-packed freshcut is displayed for sale on mostly metal trays and glass boxes (with aluminium frame) locally known as *safe*. In some cases freshcut is prepared by vendors and delivered direct to waiting customers without having to pre-pack. After a day's vending activity, leftover freshcut is stored in refrigerator, store room or discarded by some vendors. Others are able to sell every freshcut prepared in the day while most of the vendors said they had very little left over which they give away to neighbours, children and anyone willing to take. Most of the vendors had no other income venture apart from freshcut fruit sales activity.

5. CONCLUSION

In conclusion, fresh fruit as well as freshcut fruit vending is dominated by women between the ages of 26-45 with low level of formal education. Freshcut sale appear to be a recent activity as most of the vendors have been engaged in within the past five years. Fruits are mainly sourced from farmers and wholesalers and type of fruits vended as freshcut included pineapple, water melon, mango and pawpaw. Vendors washed fruits using pipe borne or well water without sanitizers and fruits were washed using the same water several times before it is replaced. Cutting was done with knife and a fork as additional tool in handling the pieces of fruit. The vendors have not received any professional training on good hygienic practices of food handling related to safe preparation and processing of freshcut fruits.

Freshcut fruit vending is a profitable thriving business activity that provide income for the women engaged in the trade. It is therefore recommended that the capacity of the vendors be developed in the form of professional training on good hygienic practices of handling to improve the quality and safety of the freshcut fruits for consumers as well as enhance the enterprise.

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