

## AWARENESS OF CASSAVA PEEL UTILIZATION AS A FEEDSTUFF AMONG LIVESTOCK FARMERS IN OGBOMOSO ZONE OF NIGERIA

Taiwo Kayode OJEDIRAN\*, Victor DUROJAIYE\*, Rasheed Gbolagade ADEOLA\*\*, Janet Temitope OJEDIRAN\*\*

Ladoke Akintola University of Technology, \*Department of Animal Nutrition and Biotechnology, \*\*Department of Agricultural Extension and Rural Development, P. M. B. 4000, Ogbomoso, Nigeria. E-mails: tkojediran@lautech.edu.ng, durojaiye.v@gmail.com, rgaadeola@lautech.edu.ng, jtojediran@lautech.edu.ng

**Corresponding author:** jtojediran@lautech.edu.ng

### Abstract

*A well-constructed questionnaire was used to obtain data from livestock farmers through an interview schedule (n = 220) in five local government areas in Ogbomoso, Southwest Nigeria. This study assesses the characteristics of the livestock farmers, type of livestock kept, type of feed used, energy feedstuffs used in feed compounding, quantity of feed used daily, level of awareness of cassava peel utilization as livestock feedstuff, factors affecting the utilization of the identified potential energy feedstuff and constraints to the use of cassava peel as livestock feedstuffs. The survey results revealed that the respondents were mostly part time livestock farmers, middle aged men with less than 10 years farming experience, who kept majorly poultry and pigs amongst other livestock such as goat, sheep and mini-livestock. Compounded rations were commonly used with maize as the main energy feedstuff and the quantity of feed used daily indicated that they were small-scale farmers. Majority of the respondents were aware of the potential use of cassava peel as livestock feedstuff but indicated that availability of maize and sorghum, nutrient quality and seasonality influenced their utilization while ease of use and cost were factors also considered in Ogbomoso south and Ogo Oluwa for the use of sorghum. Cost and quantity were not of serious concern for use of whole cassava in livestock feed but storability, availability and seasonality were the major factors affecting its use as energy feedstuff while nutrient quality and rate of spoilage were constraints for the use of cassava peel. It can therefore be recommended that agricultural extensionist should work together with livestock nutritionists and re-orient the farmers with available research outputs that had addressed the constraints of cassava peel usage for it to compete with maize as an energy feedstuff.*

**Key words:** cassava, livestock, feedstuff, farmers, utilization

### INTRODUCTION

Cassava (*Manihot Esculenta Crantz*), is known for its edible roots. The crop thrives in regions which fell under the tropical and subtropical climates of the world. It is popular in the Sub-sahara Africa as a staple food crop [13] because of its divers uses. Africa, the largest producer contributed not less than 57% (149.54 Mt) of the global production in 2011 and Nigeria was ranked the largest producer in Africa [12]. Cassava tubers have been transformed in to numerous food and foodstuffs like *gari*, *fufu* and edible flour for making confectionaries. Thus, cassava vastly contributes to human livelihood and survival [11]. It is also a raw material for industrial production of starch flour, ethanol, wafers, gums, liquid adhesives etc.

Processing of cassava roots or tubers into these various essential food and industrial products comes with a lot of wastes of which cassava peels accounts for the largest (30%). Only an inconsequential proportion is occasionally offered to goats and other livestock [1] while the remaining enormous portions are usually piled along rural roadsides and in places where tillage and processing of the tubers is a regular and widespread subsistence livelihood activity. These peels cause environmental issues and becomes an inconvenience quite than a potential raw material and feedstuff resource in West Africa [2].

The incapability to salvage the situation and reuse the peels economically leads to unneeded waste and reduction of natural materials and resources. The peels have the

potentials for the production of fuel in the form of biogas, substrate for mushroom culture and quality animal feedstuff [6; 3; 18; 5; 10] but local farmers are rarely aware of these potentials especially as a feed resource if processed.

This study therefore assessed the level of awareness of cassava peel utilization as a feedstuff among livestock farmers in Ogbomoso Zone of Nigeria.

## MATERIALS AND METHODS

A total of 220 livestock farmers were randomly selected and interviewed across the five Local Government Areas (LGAs) of Ogbomoso, Southwest, Nigeria. The selection was not evenly distributed because of the uneven distribution of feedmills and livestock farmers across and within Ogbomoso zone: Ogbomoso North, Ogbomoso South, Surulere, Oriire and Ogo Oluwa. The respondents'/livestock farmers were randomly interviewed using pre-constructed questionnaire at the available feedmills. The

questionnaire consists of seven categories: characteristics of the livestock farmers, livestock kept, feed type used, energy feedstuff used in feed compounding, quantity of feed used daily, level of awareness of cassava peel utilization as livestock feed, factors affecting the utilization of the identified potential energy feedstuffs and constraints to the use of cassava peel as livestock feedstuffs. The respondents include 64 in Ogbomoso North, 56 in Ogbomoso South, 30 in Surulere, 40 in Oriire and 32 in Ogo Oluwa. The data collected were analysed using descriptive statistics including frequency count and percentage.

## RESULTS AND DISCUSSIONS

### Characteristics of the respondents

The farmers exhibit many similar characteristics (Table 1) among the five LGAs.

First, they were mostly middle aged. Their average age is around 42, and they were mostly men.

Table 1. Characteristics of the Respondents

Characteristics	North	South	Surulere	Oriire	Ogo Oluwa	Mean
<b>Age</b>						
21-30	21(32.81)	25(44.64)	9(30.00)	8(20.00)	10(31.25)	42
31-40	28(43.75)	22(39.29)	18(60.0)	26(65.00)	14(43.75)	
41-50	10(15.63)	9(16.07)	3(10.0)	5(12.50)	6(18.75)	
51 and above	5(7.81)	0(0.00)	0(0.00)	1(2.50)	2(6.25)	
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)	
<b>Gender</b>						
Male	57(89.06)	53(94.64)	27(90.00)	33(82.50)	31(96.88)	
Female	7(10.94)	3(5.36)	3(10.00)	7(17.50)	1(3.13)	
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)	
<b>Farming experience</b>						
1-5	37(57.81)	37(66.00)	13(43.33)	14(35)	15(46.88)	7
6-10	23(35.94)	12(21.43)	10(33.33)	20(50)	6(18.75)	
11-15	3(4.69)	5(8.93)	4(13.33)	2(5.00)	8(25.00)	
16-20	1(1.56)	1(1.79)	3(10)	2(5.00)	2(6.25)	
21-25	0(0.00)	1(1.79)	0(0.00)	1(2.50)	0(0.00)	
26-30	0(0.00)	0(0.00)	0(0.00)	1(2.50)	1(3.13)	
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)	
<b>Full/parttime</b>						
Full time	24(37.50)	19(33.93)	13(43.33)	20(50.00)	15(46.88)	
Part time	40(62.50)	37(66.07)	17(56.67)	20(50.00)	17(53.12)	
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)	

Source: Field Survey, 2018.  
 (Percentages are in parenthesis)

Secondly, they generally had less than 10 years farming experience. On the average of 7 years. Finally, they are mostly part-time farmers. This implies that most of the respondents are youths and are in their active years. This supports the findings of [9] and [4], that people within the labour force of any nation are usually active, dynamic, energetic and creative. This could boost their adoption of cassava peel as a feedstuff for livestock since they are likely to adopt new technologies unlike the older people who are more conservative. According to [19] farming activities is an energy demanding work; hence men are more involved in production while the women are more engaged with food processing and marketing in agriculture. Most of the farmers are new comers who are engaged in other businesses or occupation as

also observed by of [15] and as such may not be aware of alternative feedstuffs. Although, the livestock industry in Nigeria had spanned through many decades [7], the outbreak of diseases such an Avian influenza and African swine disease caused a lot of farms to fold up. The drift of youths towards livestock farming may have been informed because of the increased demand for livestock products and under employment.

#### Livestock kept by the respondents

Table 2 shows the distribution of respondents based on type of livestock kept. There were some variations in the livestock regime among the five LGAs. Although, the farmers kept poultry birds, pigs, goat and sheep but the combination varies. Other livestock kept are rabbit, snail, cattle and fish.

Table 2. Distribution of Respondents Based on Type of livestock Kept

Livestock	North	South	Surulere	Oriire	Ogo oluwa
Poultry	46(71.88)	28(46.43)	26(86.67)	31(77.50)	22(68.75)
Pig	39(60.94)	40(71.43)	15(50.00)	26(65.00)	20(62.50)
Goat	16(25.00)	6(10.71)	8(26.67)	13(32.50)	9(28.13)
Sheep	8(12.50)	2(3.57)	5(16.67)	7(22.50)	8(25.00)
Rabbit	7(10.94)	4(7.14)	6(20.00)	8(20.00)	8(25.00)
Snail	2(3.13)	0(0.00)	0(0.00)	0(0.00)	0(0.00)
Cattle	1(1.56)	0(0.00)	3(10.00)	1(2.50)	2(6.25)
Fish	1(1.56)	0(0.00)	0(0.00)	0(0.00)	0(0.00)

Source: Field Survey, 2018.  
 (Percentages are in parenthesis)  
 \*Multiple Response

For example, in Ogbomoso North, 71.88% of the respondents kept poultry birds, 60.94% of the respondents kept pigs, 25.00% of the respondents kept goats, 12.50% of the respondents kept sheep, 10.94% of the respondents kept rabbits, 3.13% of the respondents kept snail, 1.56% of the respondents kept cattle and 1.56% of the respondents kept fish as their livestock. In Ogbomoso South, 46.43% of the respondents kept poultry birds, 71.43% of the respondents kept pigs, 10.71% of the respondents kept goats, 3.57% of the respondents kept sheep, 7.14% of the respondents kept rabbits and 3.57% of the respondents kept turkey. In Surulere, 86.67% of the respondents kept poultry birds, 50.00% of the respondents kept pigs, 26.67% of the respondents kept goats, 16.67% of the respondents kept sheep,

20.00% of the respondents kept rabbit, 6.67% of the respondents kept turkey, while 10.00% of the respondents kept cattle. In Oriire Local Government 77.50% of the respondents kept poultry birds, 65.00% of the respondents kept pigs, 32.50% of the respondents kept goats, 22.50% of the respondents kept sheep, 20.00% of the respondents kept rabbits, 10.00% of the respondents kept turkey while 2.50% of the respondents kept cattle. In Ogo-Oluwa local government 68.75% of the respondents kept poultry birds, 62.50% of the respondents kept pigs, 28.13% the respondents kept goats, 25.00% of the respondents kept sheep and rabbit, 3.13% of the respondents kept turkey, while 6.25% of the respondents kept cattle. This implies that a larger percentage of the respondents kept poultry and pig with other livestock in smaller

number. This distribution could be as a result of vast growing attention that poultry and pig production have received over the years in Nigeria. Also, quick return on investment, ability to attain market weight within short period (FAO, 2011) [8] may have contributed to the choice of enterprise.

**Identification of the commonly used feed types and feedstuffs**

Besides the availability of finished feeds from different companies, most farmers use compounded ration, although, there were multiple responses, however, major feed type use is compounded from available feedstuffs (Table 3). In Ogbomoso North, 85.94% and 31.25% of the farmers used compounded and finished feed respectively while 92.86% and 17.86% of the farmers in Ogbomoso South used compounded and finished feeds respectively. The respondents from Surulere Local Government used 86.67% compounded feeds and 23.33% used finished feeds. 85% and 22.50% of the farmers respectively used

compound finished feed in Oriire Local Government.

Moreover, the respondents from Ogo-oluwa Local Government used 90.63% compound feeds and 28.13% finished feeds respectively.

Consequently, majority (more than 80%) of the respondents from the 5 local governments used compounded feed compared to lower percentages that used finished feeds for feeding their livestock. This could positively impact the rate of adoption of new technologies in feed formulation since majority of the livestock farmers do not use finished feed, meaning that they will have to formulate their own feed and they would have sought to use cheap but effective feedstuffs available such as cassava peel. Observable from the animal kept is that the major livestock reared are monogastrics which depend on formulated feeds. The result from [7] gave credence to this finding.

Table 3. Distribution of Respondents Based on Feed Type Used in Feeding their Livestock

Feed type	North	South	Surulere	Oriire	Ogo Oluwa
Compounded Feed	55(85.94)	52(92.86)	26(86.67)	34(85.00)	29(90.63)
Finished Feed	20(31.25)	10(17.86)	7(23.33)	9(22.50)	9(28.13)

Source: Field Survey, 2018.

(Percentages are in parenthesis)

\*Multiple Responses

**Energy Feedstuff Used in compounding Livestock feed**

During this survey, farmers were asked to give their subjective energy feedstuffs used

when compounding their livestock feed (Table 4).

Table 4. Distribution of Respondents Based on Energy Feedstuff Used in Feeding their Livestock

Energy feedstuffs	North	South	Surulere	Oriire	Ogo oluwa
Maize	57(89.06)	53(94.64)	27(90)	37(92.50)	32(100.00)
Sorghum	14(21.87)	4(7.14)	4(13.33)	6(15.00)	4(12.50)
Cassava peel	12(18.75)	9(16.07)	4(13.33)	6(15.00)	1(3.12)

Source: Field Survey, 2018.

(Percentages are in parenthesis)

\*Multiple Response

Comparable response was given by the farmers. In all the five LGAs, maize was the major energy feedstuff while sorghum which is also grain cereal and cassava peel were seldomly used.

The use of these alternatives to maize was higher in Ogbomoso North than other LGAs. This show that majority of the livestock farmers use maize as an energy feedstuff. This could have resulted from availability, ease of

handling and nutrient composition as observed by [7].

This could limit the awareness and use of cassava peel as feedstuffs by the livestock farmers.

[16; 17] had demonstrated that sorghum and cassava can be used in poultry diets but the farmers may be unaware.

#### Assessment of the Quantity of Feed Used Daily and Frequency of energy Feedstuffs used

Table 5 shows the inquiry about the quantity of feed used daily and the frequency of energy feedstuffs used. More than 60 % of the

farmers in Ogbomoso North, South, Oriire and Ogo Oluwa use about 100kg of feed daily compared to around 50 % in Surulere, while between 25-27% farmers in all LGAs use between 101- 200 kg daily.

This implies that majority of the respondents used about 100kg of feed for their livestock daily. Thus, most of the farmers are small scale farmers and this is majorly because they are mostly part-time farmers. Commercial farms which used large quantity of feed may be said to have their own feedmill as reflected in this result.

Table 5. Distribution of Respondents Based on Quantity of Feed Used Daily and Frequency of energy Feedstuffs used

	North	South	Surulere	Oriire	Ogo Oluwa
<b>Quantity of feed used</b>					
< 100kg	39(60.94)	37(66.07)	16(53.33)	29(72.50)	20(62.50)
101-200	14(21.88)	15(26.79)	7(23.33)	8(20.00)	8(25.00)
201-300	6(9.38)	3(5.36)	3(10.00)	0(0.00)	4(12.50)
301-400	1(1.56)	0(0.00)	1(3.33)	2(5.00)	0(0.00)
401-500	2(3.13)	1(1.79)	1(3.33)	0(0.00)	0(0.00)
>501	2(3.13)	0(0.00)	0(0.00)	1(2.50)	0(0.00)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)
<b>Frequency of energy feedstuff use</b>					
<b>Maize</b>					
Often	53(82.81)	49(87.50)	23(76.67)	35(87.50)	28(87.50)
Rarely	9(14.06)	7(12.50)	2(6.67)	3(7.50)	4(12.50)
Never	2(3.13)	0(0.00)	5(16.67)	1(5.00)	0(0.00)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)
<b>Sorghum</b>					
Often	16(25.00)	1(1.79)	3(10.00)	8(20.00)	3(9.38)
Rarely	25(39.06)	42(75.00)	17(56.67)	18(45.00)	23(71.88)
Never	19(29.69)	12(21.43)	9(30.00)	11(27.50)	4(12.50)
Indifference	4(6.25)	1(1.79)	1(3.33)	3(7.50)	2(6.25)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)
<b>Cassava peel</b>					
Often	20(21.25)	7(12.50)	11(36.67)	12(30.00)	8(25.00)
Rarely	23(35.94)	30(53.57)	9(30.00)	18(45.00)	11(34.38)
Never	18(28.13)	15(26.79)	9(30.00)	9(22.50)	10(31.25)
Indifference	3(4.69)	4(7.14)	1(3.33)	1(2.50)	3(9.38)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)
<b>Whole cassava</b>					
Often	14(21.88)	2(3.57)	7(23.33)	7(17.50)	3(9.38)
Rarely	8(12.05)	3(5.36)	3(10.00)	7(17.50)	2(6.25)
Never	24(37.5)	32(57.14)	11(36.67)	14(35.00)	11(34.38)
Indifference	18(28.13)	19(33.93)	9(30.00)	12(30.00)	16(50.00)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)

Source: Field Survey, 2018.

(Percentages are in parenthesis)

From the result, 87.5% of the farmers attested that they often use maize in their diet formulation in Ogbomoso South, Oriire and

Ogo Oluwa while it was 82.81% in Ogbomoso north and 76.67% in Surulere. This shows that maize is a major energy

feedstuff as also shown on Table 5. 25% of the farmers in Ogbomoso north often use sorghum in feed formulation which is the highest among the LGAs while between 2-20% often use it in other LGAs.

Most of the farmers in the five LGAs admitted to rarely use it while 12.5-30% had never used sorghum in feed formulation. In Ogbomoso North, 21.25% of the respondents often use cassava peel as livestock feedstuff, 35.94% of the respondent rarely use cassava peel, 28.13% of the respondent never used cassava peel while 4.69% of the respondents were indifferent to using cassava peel as livestock feedstuff. In Ogbomoso South, 12.50% of the respondents often use cassava peel as livestock feedstuff, 53.57% of the respondents rarely use cassava peel, 26.79% of the respondents never used cassava peels, 7.14% of the respondents were indifferent to using cassava peel as livestock feedstuff. In Surulere Local Government, 36.67% of the respondents often use cassava peel, 30.00% of the respondents rarely use it, 30.00% never used cassava peel while 3.33% of the respondents were indifferent to using cassava peel as livestock feedstuff. In Oriire Local Government, 30.00% of the respondent often use cassava peel as livestock feedstuff, 45.00% of the respondents rarely use cassava peel, 22.50% of the respondents never used cassava peel while 2.50% of the respondents were indifferent to using cassava peel as livestock feedstuff. In Ogo-Oluwa Local Government, 25.00% of the respondents often use cassava peel as livestock feedstuff, 34.38% of the respondents rarely use it, 31.25%

of the respondents never used cassava peel as livestock feedstuff while 9.38% of the respondents were indifferent to using cassava peel as livestock feedstuff. This implies that majority of the respondents rarely use cassava peel as livestock feedstuff.

Some farmers who often use cassava as a feedstuff can be found in Ogbomoso north (21.88%) and Surulere (23.33) while in all LGAs, majority of the farmers had never use whole cassava and this ranges from 34.38 – 57.14%. This implies that majority of the respondents never used whole cassava as livestock feedstuff. This may be because of the knowledge gap of its proper utilization or because it is a major staple food.

As earlier stated for energy feedstuff used in compounding livestock feed; majority of the livestock farmers use maize as an energy feedstuff. This could have resulted from availability, ease of handling and nutrient composition [7], thus limited the awareness and use of cassava peel as feedstuffs by the livestock farmers.

#### Assessment of the Level of Awareness of Utilization of Cassava Peel as Livestock Feedstuff among Respondents

Table 6 shows the distribution of respondent based on awareness of cassava peel utilization as a livestock feedstuff. 85.94, 85.71, 83.33, 87.5 and 87.5% of the farmers in Ogbomoso north, Ogbomoso South, Surulere, Oriire and Ogo oluwa respectively agreed to be aware of potentials of cassava peel as a feedstuff while 14.06, 14.29, 16.67 12.5 and 12.5 % from the same LGAs were unaware.

Table 6. Distribution of Respondent Based on Awareness of Cassava Peel Utilization

Awareness	North	South	Surulere	Oriire	Ogo Oluwa
Yes	55(85.94)	48(85.71)	25(83.33)	35(87.5)	28(87.5)
No	9(14.06)	8(14.29)	5(16.67)	5(12.5)	4(12.5)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)

Source: Field Survey, 2018.

(Percentages are in parenthesis)

This implies that majority of the respondents were aware of the potential use of cassava peel as livestock feedstuff. This is similar to the report of [14] that most cassava processors in rural communities of southwest, Nigeria were aware of the potential uses of cassava

peel for mushroom production, animal feed and biogas production but were unaware of any improved form of utilization causing it being disposed as waste.

### Factors Affecting the Utilization of the Identified Potential Energy Feedstuffs

Factors considered to be responsible for the utilization of identified potential energy feedstuff (Table 7) are availability, ease of use, nutrient quality, seasonality, cost, quantity needed and others such as dustiness, processing etc. Of these factors, for maize, availability and seasonality cut across all the LGAs.

Ease of use and cost were factors for consideration for livestock farmers in

Ogbomoso south and Ogo Oluwa while in Ogbomoso north (14.06) and Surulere (16.67) considered nutrient quality. This implies that majority of the respondents indicated availability of maize, nutrient quality and seasonality of maize as the major factors affecting its utilization as livestock feedstuff. This corroborates the report of [7].

As observed for maize, availability and seasonality cut across all the LGAs for the use of sorghum.

Table 7. Distribution of Respondent Based on Factors Affecting their Utilization of Identified Potential Energy Feedstuff

Factors	North	South	Surulere	Oriire	Ogo Oluwa
<b>Maize</b>					
Availability	24(37.5)	14(25)	14(46.67)	17(42.50)	11(34.38)
Ease of use	4(6.25)	12(21.43)	1(3.33)	2(5.00)	5(15.63)
Nutrient quality	9(14.06)	4(7.14)	5(16.67)	3(7.50)	1(3.12)
Season	12(18.75)	6(10.71)	3(10.00)	9(22.50)	8(25.00)
Cost	2(3.13)	8(14.29)	1(3.33)	1(2.50)	4(12.50)
Quantity	4(6.25)	2(3.57)	0(0.00)	0(0.00)	0(0.00)
Others	9(14.06)	10(17.86)	6(20)	8(20.00)	3(9.37)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)
<b>Sorghum</b>					
Availability	24(37.50)	14(25.00)	14(46.67)	17(42.50)	11(34.38)
Ease of use	4(6.25)	12(21.43)	1(3.33)	2(5.00)	5(15.63)
Nutrient quality	9(14.06)	4(7.14)	5(16.67)	3(7.50)	1(3.12)
Season	12(18.75)	6(10.71)	3(10.00)	9(22.50)	8(25.00)
Cost	2(3.13)	8(14.29)	1(3.33)	1(2.50)	4(12.50)
Quantity	4(6.25)	2(3.57)	0(0.00)	0(0.00)	0(0.00)
Others	9(14.06)	10(17.86)	6(20.00)	8(20.00)	3(9.37)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)
<b>Whole cassava</b>					
Availability	14(21.88)	4(7.14)	6(20.00)	12(30.00)	6(18.75)
Ease of use	5(7.81)	2(3.57)	3(10.00)	3(7.50)	2(6.25)
Nutrient quality	2(3.13)	1(1.79)	4(13.33)	0(0.00)	0(0.00)
Season	14(21.88)	10(17.86)	5(16.67)	6(15.00)	7(21.88)
Cost	7(10.94)	1(1.79)	2(6.67)	1(2.50)	3(9.37)
Quantity	2(3.13)	3(5.36)	0(0.00)	0(0.00)	2(6.25)
Other	20(31.25)	35(62.50)	10(33.33)	18(45.00)	12(37.50)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)

Source: Field Survey, 2018.

(Percentages are in parenthesis)

The observable similarity in the use of maize and sorghum may be because they were grains because availability of maize, nutrient quality and seasonality of maize and sorghum as the major factors affecting its utilization as livestock feedstuff.

Prominent factors affecting the utilization of

cassava in all considered LGAs were others such as dustiness, processing and storability. Season is also a factor across the LGAs. Availability of the whole cassava was also prominent except in Ogbomoso south (7.14%) while nutrient quality was of concern to farmers in Surulere. Although, cost and

quantity was not of serious concern and this implied that it is not costly but storability, availability and seasonality of whole cassava as the major factors affecting its use as energy feedstuff.

**Constraints to the use of cassava peel as livestock feedstuffs**

Constraints to the use of cassava peel as livestock feedstuffs on Table 8, shows that

availability (67.5-75%), ease of use (73.33-78.57), seasonality (56.25-93.33), cost (83.33-93.75), quantity needed (80.00-90.63) were not constraints to the use of cassava peel in livestock diets except nutrient quality (53.33-71.87, other than in Ogbomoso North 51.56%) and spoilage (54.69-87.50%). Other constraints identified by [7] were water content, dustiness and cost of processing.

Table 8. Constraints to the use of cassava peel as livestock feedstuffs

Constraints	North	South	Surulere	Oriire	Ogo Oluwa
<b>Availibility</b>					
Yes	16(25.00)	14(25.00)	9(30.00)	13(32.50)	8(25.00)
No	48(75.00)	42(75.00)	21(70.00)	27(67.50)	24(75.00)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)
<b>Ease of use</b>					
Yes	14(21.87)	12(21.43)	8(26.67)	10(25.00)	8(25.00)
No	50(78.13)	44(78.57)	22(73.33)	30(75.00)	24(75.00)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)
<b>Nutrient quality</b>					
Yes	31(48.44)	37(66.07)	16(53.33)	26(65.00)	23(71.87)
No	33(51.56)	19(33.93)	14(46.67)	14(35.00)	9(28.13)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)
<b>Seasonality</b>					
Yes	18(28.13)	12(21.43)	2(6.67)	12(30.00)	14(43.75)
No	46(71.88)	44(78.57)	28(93.33)	28(70.00)	18(56.25)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)
<b>Cost</b>					
Yes	7(10.94)	6(10.71)	5(16.67)	5(12.5)	2(6.25)
No	57(89.06)	50(89.29)	25(83.33)	35(87.5)	30(93.75)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)
<b>Quantity needed</b>					
Yes	6(9.37)	10(17.86)	6(20.00)	8(20.00)	3(9.37)
No	58(90.63)	46(82.14)	24(80.00)	32(80.00)	29(90.63)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)
<b>Spoilage</b>					
Yes	35(54.69)	42(75)	19(63.33)	25(62.50)	28(87.50)
No	29(45.31)	14(25)	11(36.67)	15(37.50)	4(12.50)
Total	64(100.00)	56(100.00)	30(100.00)	40(100.00)	32(100.00)

Source: Field Survey, 2018.  
 (Percentages are in parenthesis)

**CONCLUSIONS**

Livestock farmers in Ogbomoso zone, southwest Nigeria were mostly part time, middle aged men with less than 10 years farming experience. They kept majorly poultry and pigs. Although, they also keep goat, sheep and other mini-livestocks in small quantity. Compounded rations were most commonly used with maize as the main energy feedstuff and the quantity of feed used

daily indicated that they were small scale farmers.

Majority of the respondents were aware of the potential use of cassava peel as livestock feedstuff but indicated that availability of maize and sorghum, nutrient quality and seasonality affects their utilization while Ease of use and cost were also factors considered in Ogbomoso south and Ogo oluwa for the use of sorghum. Cost and quantity were not of serious concern for use of whole cassava but storability, availability and seasonality were



the major factors affecting its use as energy feedstuff while nutrient quality and rate of spoilage were constraints for the use of cassava peel. It can therefore be recommended that agricultural extensionist should work together with livestock nutritionists and re-orient the farmers with available research outputs that has addressed the constraints of cassava peel usage for it to compete with maize as energy feedstuff.

## REFERENCES

- [1]Adebayo, K., Sangosina, M. A., 2005, Farmers' Perception of the Effectiveness of some Cassava Processing Innovations in Ogun State, Nigeria. Paper Presented at the 19<sup>th</sup> Farm Management Association of Nigeria (FAMAN) National Conference. Pp 72.
- [2]Adebayo, K., Anyanwu, A. C., Osiyale, A. O., 2003, Perception of Environmental Issues by Cassava Farmers in Ogun State, Nigeria – Implications for Environmental Extension Education. *Journal of Extension Systems*, 19: 103-112.
- [3]Adebayo, G. J., Banjo, N. O., Abikoye, E. T., 2009, Evaluation of yield of oyster mushroom (*Pleurotus pulmonarius*) grown on cotton waste and cassava peel. *African Journal of Biotechnology*, 8 (2):215-218.
- [4]Adebo, G. M., 2014, Effectiveness of E-Wallet Practice in Grassroots Agricultural Services Delivery in Nigeria - A Case Study of Kwara State Growth Enhancement Support Scheme. *Journal of Experimental Biology and Agricultural Sciences*, 2(4): 410-418.
- [5]Adelekan, B. A., 2012, Recent Advances in Renewable Energy: Research, Applications and Policy Initiatives. *Physical Review and Research International*, 2(1): 1-21.
- [6]Agwu, A. E., Anyaeche, C. L., 2007, Adoption of improved cassava varieties in six rural communities in Anambra State, Nigeria. *African Journal of Biotechnology*, 6 (2): 89-98.
- [7]Bello, K. O., Adetoye, A. M., Irekhore, O. T., 2015, Assessment of the use of cassava as alternative energy feedstuff in livestock feeds in Nigeria. *International Journal of applied Agricultural and Apicultural Research*, 11 (1&2):67-76.
- [8]FAO, 2011, Faostat: Production, Crops, Cassava, 2010 data". and Agriculture Organization Corporate Statistical Database (FAOSTAT). Accessed on 24 March 2018.
- [9]Henri-Ukoha, A., Orebiyi, J. S., Obasi, P. C., Oguoma, N. N., Ohajianya, D. O., Ibekwe, U. C., Ukoha, I. I, 2011, Determinants of Loan acquisition from the Financial Institutions by Small-scale Farmers in Ohafia Agricultural zone of Abia State, South-east Nigeria. *Journal of Development and Agricultural Economics*, 3(2), 69-74.
- [10]Kortei, N. K., Dzogbefia, V. P., Obodai. M., 2014, Assessing the Effect of Composting Cassava Peel Based Substrates on the Yield, Nutritional Quality, and Physical Characteristics of *Pleurotus ostreatus* (Jacq. ex Fr.) Kummer. *Biotechnology Research International*, Article ID 571520, 9pp.
- [11]Lebot, V., 2009, Tropical Root and Tuber Crops: Cassava, Sweet Potato, Yams and Aroids. CABI, Cambridge, M. A., USA. 64(1):86-87.
- [12]Mehari, G., Amsalu, N., Tewedros, M., 2015, Estimates of genetic components for yield and quality of cassava genotypes at Jimma, Southwest Ethiopia. *International Journal of Plant Breeding and Genetics*, 9(1: 1-12).
- [13]Nassar, N. M. A., Ortiz, R., 2007, Cassava improvement: challenges and impacts. *The Journal of Agricultural Science*, 145(2): 163-171.
- [14]Odediran, O. F., Ashimolowo, O. R., Sodiya, C. I., Sanni, L. O., Adebayo, K., Ojebiyi, W. G., Adeoye, A. S., 2015, Awareness of Cassava peel utilization forms among cassava processors in rural communities of Southwest, Nigeria. *International Journal of Applied Agricultural and Apicultural Research*, 11 (1&2):93-102.
- [15]Ogunmefun, S. O., Achike, A. I., 2015, Informal insurance practices in low income farmer communities: Odogbolu case study (Ogun State, Nigeria). *International Journal of Agricultural Policy and Research*, 3 (12): 412-418.
- [16]Ojediran T. K., Ajayi, A. F., Emiola I. A., 2018, Condensed Tannin in Two Varieties of Sorghum (*Sorghum bicolor*): Effect on the Growth Performance and Nutrient Digestibility of Broiler Chickens. *Scientific Papers: Animal Science and Biotechnologies*, 2018, 51 (2): 26 -33.
- [17]Ojediran, T. K., Abioye, I. A., Ajayi, A. F., Emiola, I. A., 2019, Replacement value of cassava vinasse meal for maize on growth performance, haematological parameters and organoleptic properties of Japanese quails (*Coturnix japonica*). *Acta fytotechn zootechn*, 22(1): 7–12.
- [18]Onuoha, C. I., Uchechi, U., Onuoha, B. C., 2009, Cultivation of *Pleurotus pulmonarius* (mushroom) using some agro-waste materials. *Agricultural Journal*, 4(2): 109-112.
- [19]Oyediran, W. O., Dick, T. T., Owolade, E. O., Oluade, E. A., 2015, Contributions of Growth Enhancement Support Scheme (GESS) programme to food security and poverty alleviation of Agricultural Cooperatives in Ogun State, Nigeria. *Journal of Educational Policy and Entrepreneurial Research (JEPER)*. 2(6):13-22.

