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SURVEY OF SUITABLE LOCAL FORAGES AND CROP RESIDUE AS FEEDSTUFFS FOR RABBIT PRODUCTION IN TARABA STATE, NIGERIA

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Abstract

A survey of suitable local forage crops and crop residue for feeding rabbit was carried out in Taraba State, Nigeria. The specific objectives of the study were, to examine the nutritional content of common forages and crop residues used in feeding rabbit, identify the suitable and available forages for feeding rabbit in the study area. Three (3) research questions were posed and answered by the study. Survey research design was used for the study. The sample for the study was one hundred and ten (110) respondents comprising seventy-five (75) rabbit farmers and thirty-five (35) animal husbandry teachers which was obtained using Taro-Yamen's formula. The instrument for data collection was a 20-item structured questionnaire. The instrument was validated by three experts. Cronbach-Alpha reliability method was used to determine the internal consistency of the items. The instrument was administered to the respondents by the [redacted] researcher. Mean and standard deviation was used to answer research questions while the t-test was used in testing the hypotheses. The findings of the study revealed that forages and crop residues such as *Panicum maximum* (Guinea grass), *Tridax procumbens*, potato leaves, cassava leaves and spinach leaves are suitable and available feed for rabbit. Therefore, it was recommended that rural rabbit farmers should adopt the use of these forages and crop residue for feeding rabbit.

Keywords: Forages, Crop Residue, Feedstuff, Rabbit Production, Suitability

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Introduction

The continuous demand for quality animal protein has made the production of mini livestock an integral part of the Nigeria's livestock industry. Adeyemi, Ajado, Okubanjo and Eniolorunda (2011) stressed that, rabbit occupies a unique niche in that it is a mini livestock that is easy to manage, highly prolific and has a short generation interval. Assan (2014) opined that, mini-livestock encompasses small indigenous vertebrates and invertebrates both domesticated and wild genetic animal resources which can be produced on sustainable basis for food, animal feed and as a source of income. Ubua, Akintunde, Bassey and Ardo (2013) asserted that the continued concentration of research on micro-livestock such as cattle, sheep and goats has not solved the problem of protein inadequacy in Africa hence the need to shift production emphasis to the domestication of micro-livestock such as snail, grasscutter, rabbit, guinea pigs, quail and African giant rat.

According to Adeyemi *et al.,* (2011), poultry, pig and rabbit production represent the fastest means of correcting the shortage of animal protein intake. This is because, apart from their high rate of reproduction, these species are characterized by the best efficiency of nutrient transformation into high quality animal protein. Similarly, Aduku and Olukosi in Egena *et al.,* (2014) opined that rabbits have potential for quick income generation, great profit, short term capital investment content and simple management skill requirement. Rabbit production has the potentials for providing quality animal protein at a relatively cheaper rate as compared to the ruminants.

Egena *et al.,* (2014) reported that rabbit meat has the highest percentage protein (21%) and least fat content compared to other meat sources and its low cholesterol and sodium content makes it highly recommendable especially for people prone to or with cardiovascular diseases. Rabbit just like other non-ruminants are highly prolific and proficient converters of feed to meat. Cheeke in Adeyemi *et al.,* (2011) reported that, rabbits have the ability to thrive on agricultural and agro-industrial by-products and they convert forages into meat more efficiently than ruminant animals.

However, the greatest impediment to sustainable livestock production especially among the rural farmers is the high cost of feeds and feeding stuffs. Conventional livestock feeds are often expensive and most at times inaccessible by rural farmers especially in the rural communities. Iyeghe-Erakpotobor, Sekoni, and Esievo (2009) opined that commercial feeds are expensive in most developing countries,

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and out of reach of smallholder farmers who mainly raise rabbits in their backyards. This has necessitated the need to seek for alternative protein sources in forage.

In a similar vein, Antyev, Tor-Agbidye, Yakubu and Nyameh (2013) asserted that considering high cost of cereals for livestock feed production, it is necessary to look for alternative sources. Adeyemi, Sobayo, Aluko and Oke (2008) agrees that, the cost of feeding rabbits is however very high, a condition that also prevailed for other Nigerian livestock species. Rabbits are herbivorous animals which can be fed conveniently with hay and local forages. This has been practiced over the years especially by rural rabbit farmers. Onifade, Abu, Obiyan and Abanikannda (1999) assert that forages such as *Panicum maximum* (Guinea grass), *Tridax procumbens*, potato leaves, cassava leaves and haulms, *Talinum triangulare*, are commonly fed to rabbits by local people.

Forages, according to Cheeke and Patton in Obua, Okocha, and Nwaoha (2012) are extensively used in rabbit production as supplements to concentrate meal, pellets or in complete diets. In addition to supply of proteins and energy, forage supply fibres to aid proper digestion in rabbits. The potential of forage as feed for rabbit is of particular significance because of their ability to effectively digest leaf protein. Obue *et al.,* (2012) further asserted that the nutritional potential of forage is enormous for rabbits, yet many farmers do not know the right types of forage to feed their rabbits. Many forage plants have not been identified as feed for rabbits while several identified plants are undervalued because of insufficient knowledge about their potential feeding value. However, at different levels of our educational system, Animal Husbandry Teachers have tried to teach topics bothering on the use of local forages and crop residue in feeding rabbits.

The benefits of feeding rabbits using local forages can never be overemphasized. Aduku and Olukosi (1990) and Onwudike (1995) reported that, feeding of rabbits with forage allowed for better rate of growth when compared to rabbits which were not fed forage. This paper therefore, sought to explore the essential features of forages in feeding rabbit for the purpose of minimizing production cost and achieving better growth.

Purpose of the Study

The purpose of the study was to examine the suitability of local forages and crop residues in feeding rabbit. Specifically, this study sought to:

1. examine the nutritional content of common forages and crop residues used in feeding rabbit in Jalingo Local government area

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2. examine the suitability of forages and crop residues for feeding rabbit in Jalingo local government area.
3. identify the available forages and crop residue for feeding rabbit in Jalingo local government area.

Research Questions

1. What is the nutritional content of common forages and crop residues used in feeding rabbit in Jalingo Local government area?
2. What are the suitable forages and crop residues for feeding rabbit in Jalingo local government area?
3. What are the available forages and crop residue for feeding rabbit in Jalingo local government area?

Research Hypotheses

1. There is no significant difference in the mean ratings of rural rabbit farmers and Animal Husbandry teachers on the suitability of forages and crop residues for feeding rabbit in Jalingo local government area.
2. There is no significant difference in the mean ratings of rural rabbit farmers and Animal Husbandry teachers on the availability of forages and crop residue for feeding rabbit in Jalingo local government area.

Methodology

Survey research design was used for this study. The design was suitable for the study because data was collected from a sample of rural rabbit farmers and Animal Husbandry teachers who are a representative of the entire population. The study was conducted in Taraba State, Nigeria.

The population for the study was all the rural rabbit farmers and Animal Husbandry teachers in Jalingo Local Government Area of Taraba State. The sample for the study was one hundred and ten (110) respondents made up of 75 rural rabbit farmers and 35 Animal Husbandry teachers. Simple random sampling technique was used to select the above mentioned sample size.

The instrument used for data collection was a 20-item questionnaire which was developed from literature review. It was titled "Local Forages and Crop Residue Rabbit Questionnaire (LFCRRQ)". The questionnaire had four point response options of Strongly agree (4), agree (3), disagree (2) and strongly disagree (1).

The researcher employed the assistance of two research assistants in the administration of the LFCRRQ. The research assistants were instructed on what to

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do in administering the questionnaire. A total of 110 copies of the LFCRRQ were distributed to the respondents and all were retrieved. Weighted mean and standard deviation were used to answer the research questions while t-test was used to test the hypotheses at 0.05 level of significance.

Results and Discussion

Table 1: Gross Energy, Dry Matter and Crude Protein content of some crop-residue and forages utilize for rabbit feeding

S/No	Crop-residue/forages	Gross Energy (kcal/kg)	Dry Matter %	Crude protein %
1	Cassava peel	4.59	92.75	7.29
2	Yam peel	3.87	89.31	6.06
3	Plantain peel	4.17	91.19	5.99
4	*Panicum maximum*		89.28	9.54
5	*Tridax procumbens*		90.26	13.82

Sources: Longe and Fagbenro-Byron, Olorede *et al.,* Abu and Onifade, Onifade and Babatunde in Onifade *et al.,* (1999) and Obue *et al.,* (2012)

The above table presents some common and available crop residue feedstuffs and forage species that are used for feeding rabbit. The gross energy ranges between 3.87kcal/kg to 4.59kcal/kg with a dry matter ranging between 89.28% to 92.75% and crude protein content between 5.99% to 13.82%.

Research Question 2

What are the suitable forages and crop residues for feeding rabbit in Taraba State?

Hypothesis 1

There is no significant difference in the mean ratings of rural rabbit farmers and Animal Husbandry teachers on the suitability of forages and crop residues for feeding rabbit in Taraba State.

Table 2: Mean, Standard Deviation and t-test analysis of respondents on the suitability of local forages and crop residue for feeding rabbit in Taraba State (N=110)

S/No	Item	$\bar{X}$	SD	t-cal	t-crit.	Remarks
1.	*Panicum maximum*	3.61	.66	1.56	1.96	*NS

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2	*Tridax procumbens*	3.60	.69	1.75	1.96	*NS
3	Spinach leaves	3.57	.60	0.63	1.96	*NS
4	Potato leaves	3.06	.85	0.05	1.96	*NS
5	Moringa leaves	2.44	.95	0.74	1.96	*NS
6	Cassava leaves	2.63	1.03	0.09	1.96	*NS
7	Cassava peel	3.03	.91	1.47	1.96	*NS
8	Yam peel	3.01	1.04	1.19	1.96	*NS
9	Plantain peel	3.17	.78	0.50	1.96	*NS
10	Water Melon peel	3.25	.90	1.16	1.96	*NS

N= Number of Respondents, X=Mean, SD=Standard Deviation, t-cal = t-calculated, t-crit. = critical value, *NS=Not significant and Not rejected, **=significant and rejected.

Data in Table 2 revealed that 9 items on suitability of local forages and crop residues for feeding rabbit had their grand mean values ranged from 2.63 to 3.61, indicating that their mean values were above the cut-off point of 2.50. This shows that the 9 items are the forages and crop residue that are suitable for feeding rabbit in Taraba State, Nigeria. Similarly, the other item which is moringa leaves had a grand mean value of 2.44 which showed that it is not suitable for feeding rabbit in Jalingo local government area of Taraba State. The Table also showed that the grand standard deviation of the items ranged from .60 to 1.04, indicating that the respondents were not too far from the mean and from the opinion of one another in their responses on the suitability of local forages and crop residues for feeding rabbit in Taraba State.

The table further indicated that, the t-calculated value of all the 10 items ranged from 0.05 to 1.75 which is less than the t-critical value of 1.96 at 0.05 level of significance. This implied that there was no statistical significance difference in the mean ratings of rural rabbit farmers and Animal Husbandry teachers on the suitability of local forages and crop residues for feeding rabbit. Therefore, the null hypothesis was retained. This further imply that the experience of rural rabbit farmers and animal husbandry teachers does not significantly differ on the suitability of local forages and crop residues for feeding rabbit in Taraba State.

The findings in table 2 agrees with Onifade *et al.* (1999) who asserted that forages such as *Panicum maximum* (Guinea grass), *Tridax procumbens*, potato leaves, cassava leaves and haulms, *Talinum triangulare*, are commonly fed to rabbits by local people. Furthermore, forages, according to Cheeke and Patton in Obua,

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Okocha, and Nwaoha (2012) are extensively used in rabbit production as supplements to concentrate meal, pellets or in complete diets.

Research Question 3

What are the available forages and crop residue for feeding rabbit in Taraba State?

Hypothesis 2

There is no significant difference in the mean ratings of rural rabbit farmers and Animal Husbandry teachers on the availability of forages and crop residue for feeding rabbit in Taraba State.

Table 3: Mean, Standard Deviation and t-test analysis of respondents on the availability of local forages and crop residue for feeding rabbit in Taraba State (N=110)

S/No	Item	$\bar{X}$	SD	t-cal	t-crit.	Remarks
11.	*Panicum maximum*	3.60	.71	0.24	1.96	*NS
12	*Tridax procumbens*	3.56	.62	0.44	1.96	*NS
13	Spinach leaves	3.59	.65	0.69	1.96	*NS
14	Potato leaves	3.53	.60	0.13	1.96	*NS
15	Moringa leaves	3.31	.85	0.63	1.96	*NS
16	Cassava leaves	3.36	.82	0.94	1.96	*NS
17	Cassava peel	3.29	.83	0.89	1.96	*NS
18	Yam peel	3.31	.80	2.29	1.96	**
19	Plantain peel	3.15	.97	0.50	1.96	*NS
20	Water Melon peel	3.32	1.03	0.05	1.96	*NS

N= Number of Respondents, X=Mean, SD=Standard Deviation, t-cal = t-calculated, t-crit. = critical value, *NS=Not significant and Not rejected, **=significant and rejected.

Data in Table 3 indicated that all the 10 items on availability of local forages and crop residues for feeding rabbit had their grand mean values ranged from 3.15 to 3.59, indicating that their mean values were above the cut-off point of 2.50. This shows that all the 10 items are the forages and crop residue that are available for feeding rabbit in Taraba State, Nigeria. The Table also showed that the grand standard deviation of the items ranged from .60 to 1.03, indicating that the respondents were not too far from the mean and from the opinion of one another

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in their responses on the availability of local forages and crop residues for feeding rabbit in Taraba State.

The table further indicated that, the t-calculated value of all 9 items ranged from 0.05 to 0.94 which is less than the t-critical value of 1.96 at 0.05 level of significance. This implied that there was no statistical significance difference in the mean ratings of rural rabbit farmers and Animal Husbandry teachers on the availability of 9 of the local forages and crop residues for feeding rabbit. Therefore, the null hypothesis was retained. This further imply that the experience of rural rabbit farmers and animal husbandry teachers does not significantly differ on the availability of local forages and crop residues for feeding rabbit in Taraba State. However, yam peel had a t-calculated value of 2.24 which is greater than the t-critical value of 1.96 at 0.05 level of significance. This implied that there was statistical significance difference in the mean ratings of rural rabbit farmers and animal husbandry teachers on the availability of yam peel as a crop residue for feeding rabbits in Taraba State. The findings in table 3 agrees with Onifade *et al.* (1999) who asserted that forages such as *Panicum maximum* (Guinea grass), *Tridax procumbens*, potato leaves, cassava leaves and haulms, *Talinum triangulare*, are commonly fed to rabbits by local people.

Conclusion and recommendation

Rabbits are herbivorous animals which can be fed conveniently with hay, local forages and crop residue. The potential of forage as feed for rabbit is of particular significance because of their ability to effectively digest leaf protein. It is therefore recommended that, rabbit farmers, especially rural and low income farmers should adopt the use of forages and crop residue such as *Panicum maximum* (Guinea grass), *Tridax procumbens*, potato leaves, cassava leaves and haulms as feed for rabbit.

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