



Preliminary study on utilization of *piliostigma thonningii* (kargo) pods as feed resource for small ruminants in Wudil Local Government Area of Kano State, Nigeria.

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Abstract

A survey was conducted to examine the utilization of *Piliostigma thonningii* (Kargo) pods as feed resource for ruminants in Wudil Local Government of Kano State, Nigeria. A total of 100 structured questionnaires were administered to one hundred randomly selected livestock rearers in five wards of the Local Government during the months of November to May (dry season) of 2019. The results obtained showed that the respondents varied in age group from 15 to 65 years with majority within the 36 - 40 years (40.00%) group. Male and female respondents constituted 41 and 59%, respectively. All respondents (100) had some form of education and their familiarity with small ruminant rearing varied from 1 to 35 years. Most of the respondents (65%) had flock size of 21 - 40. Ruminant animals reared by the respondents varied from sheep (24.00%) to goats (45.00%), while those that kept both sheep and goat together were 26.50%. All the respondents (100%) had awareness of feeding Kargo pods as supplement during dry season and 50% of respondents had rearing experience of 1-15 years. However, most of the respondents formulated feeds by mixing sorghum chaff, cowpea husk, wheat bran and maize bran. The study concluded that farmers in Wudil Local Government Area had awareness on the potential of Kargo pods as feed resource and it's being utilized with other crop residues to feed animals especially during dry season.

Keywords: Kargo, Pods, Ruminants, Utilization, Wudil.

Introduction

The quantity and quality of grasses and other browse plants fluctuate with seasons and stage of maturity (Makkar, 2000). The availability of forages is influenced by seasonal fluctuations following unpredictable climatic conditions. This calls for brainstorming as nutrition is among the key factors in determining animal performance (Ilo *et al.*, 2010). The search for alternative feed ingredients for livestock feeding has continue to attract the attention of researchers especially in the developing nations of the world (Lamidi *et al.*, 2008). Forages play kaiwudil@gmail.com

important roles in being converted into useful products (Olaride, 2003). Forages refers to as animal feed, fodder trees and shrubs (shoots or sprouts, especially tender twigs and stems of woody plants with their leaves, flowers, fruits or pods) that are naturally grazed by livestock. Fodder plants are plants which are grown in order to provide the nutritional needs of animals. Babayemi *et al.*, 2003 reported that fodder and shrubs are important components of ruminant diet. Van *et al.*, 2005 further stated that fodder plants have been found to play an important role in the nutrition of grazing animals in areas where

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few or no alternatives are available. Fodder is consumed in the livestock industry and the savannah areas account for about 10-15% fodder as livestock food in the dry seasons (Ondiek *et al.*, 2013). Fodder trees and shrubs were noted to support livestock such as cattle, sheep, goats, donkey and camel - in the dry season (Jamala *et al.*, 2013). Similarly, Ogunbosoye *et al.* (2015) maintained that insufficient feed supply is a major restriction to ruminant production during the dry season in the tropics and thus remain the basic cause of poor livestock performance. The dry season is characterized by poor quality feeds that lead to low feed intakes and reduced animal performance. Sustainable production of livestock usually involves efficient utilization of available feed resources (Sanon, 2007).

Piliostigma thonningii (Schum) is a leguminous medium size tree which grows wild in the tropics and is one of the browses spp in the Northern part of Nigeria (Iliyasu *et al.*, 2019) where it is locally known as Kargo or Kalgo. The plant *piliostigma* comprises three species in tropical Africa, Asia and Australia. *Piliostigma thonningii* and *Piliostigma reticulatum* have similarity in appearance but *P. thonningii* has larger leaves with hairs on the lower surface and usually occurs in less dry areas (Burkill, 1995). The *P. thonningii* fruits have been reported to be eaten by wild animals while farmers in the lower Savanna region ground up the seeds/pods as fodder for cattle during winter months (Jimoh and Oladiji, 2005). Therefore, the study aimed at investigating the utilization of Kargo pods (*Piliostigma thonningii*) by small ruminant in Wudil local government area of Kano State.

Materials and Methods

Study Area

The survey was conducted in Wudil local government area of Kano state during the dry season period of 2019. Wudil Local Government Area of Kano State is located between latitude 12°58'N and longitude 8°25'E on altitude of 408m above sea level. The climatic condition is characterized by low relative humidity with an annual rainfall of 890mm (occurring from May to October with a peak in August) and an annual temperature range of 38-43°C (Olofin *et al.*, 2008). The soil type of the area is loamy, with little organic matter. The natural vegetation of the area is savannah type which consisted of moderately tall grasses such as *Andropogon gayanus*, *Panicum maximum*, *Pennisetum pedicellatum* etc and scattered browse species like *Acacia spp*, *Balanite agiptica* *Zizipus spp* and *Piliostigma thonningii*. The area supports good agricultural activities with sorghum, millet, cowpea and groundnut being the major crops cultivated (Danbazau, 2008).

Data collection

The survey was conducted in five (5) wards of Wudil local government area of Kano State. The wards were Wudil, Kausani, Lajawa, Dagumawa and Indabo. A total of one hundred structured questionnaires were administered to 100 randomly selected livestock rearers within the wards with 20 respondents per ward. The respondents were randomly selected by systematic sampling procedure and interviewed. The structured questionnaires captured respondents biodata, rearing experiences, flock size; species and dry season feed resources.

Data analysis

The data obtained from the study were analyzed using simple descriptive statistics of frequency tables and percentages (Hudu *et al.* 2015).

Results

Biodata of respondents in the study area

Table 1 showed the biodata of the respondents. The age groups of respondents vary between 15 to 65 years and above with majority falling within the range of 36- 45 years (40.00%) and few respondents within the ages of 46-65 (11.00%). Male respondents in this study constituted 41.00% and 59.00% were females. About 46.00% of the respondents were married 34% were not married and 20% were divorced. Almost all of the respondents had certain level of literacy, 40.00% had Islamic education, 35.00% primary school education, 12.00% secondary education, 8.00% tertiary education while only 5.00% of the respondents had adult education.

Experience, flock size and livestock Species of Respondents in the study area

Livestock species kept, experience and flock size of respondents is presented in Table 2. Livestock species kept by the respondents were sheep alone 24.00%, goats alone were the majority 45.00%, while those that kept sheep and goats together were 31.00%. All the respondents had some experience in keeping small ruminants but majority (50.00%) of the respondents had 1 – 15 years of experience in keeping small ruminants, those with 16-20 years of experience constituted 30.00% and respondents with 21 – 30 years of experience had 12.00%, while few (8.00%) respondents had 31 – 35 years of experience. The flock sizes varied from small (1 – 20), medium (21 – 40) and large (above 40) animals per flock. Majority (65%) of the respondents had medium flock sizes, 25.00% had small flock size while only 10.00% had large flock size.

Management systems practiced, awareness of Kargo pods utilization in ruminants,

compounding ration with Kargo pods and reason for keeping sheep and goats by respondents in the study area

The management systems practiced, awareness of Kargo pods utilization in ruminants, compounding ration with Kargo pods and reason for keeping sheep and goats by respondents are presented in Table 3. Majority (59.00%) of the respondents practiced semi-intensive system, 24.00% practiced extensive system while 17% practiced intensive system of livestock rearing. All the respondents (100%) in the study area had awareness of *P. thonningii* pods utilization by small ruminants. The respondents in the present study feed *P. thonningii* pods during dry season with high percentage (75%) of them mixing the pods with other crop residues, those that feed the pods alone to their animals represents 25.00%. Some crop residues used in mixing rations for the animals by respondents includes rice bran, wheat bran, maize bran and cowpea husk. The reasons for keeping animals in this study area revealed that 88.00% of respondents which form the majority keep the animals for income generation while 12% of the respondents keep them for subsistence.

Discussions

This study revealed that all the respondents had certain level of education. In essence, their level of literacy was enough to enable farmers understand basic farm instructions in local *Hausa* language to help in adoption of innovation (Hudu *et al.*, 2015). The involvement of more females than males in this study agrees with the study of Abdurrahman (2017) who reported more females engaged in livestock production in semi-arid region of Nigeria. The marital status of the respondents observed in the present study indicated that majority were married, thus implying that rearing of ruminant was left in the hands of the married

people in the study area. The practice of semi-intensive system observed in this study could be as a result of ease of keeping goats that feed on household waste and processing by-products as supplement. The awareness of feeding *P. thonningii* to ruminants of the respondents observed to be similar with what Abdurrahaman (2017) who reported that *P. reticulatum* is a feed resource for sheep and goats that can increase the profit of livestock owners when used. The results of the study further revealed that ownership of goat was higher than that of sheep, this may be attributed to complimentary in feeding habits in goats. It could also relate to the fact that goats are hardier than sheep and are known for browsing (Abdurrahaman and Muhammad, 2015). Furthermore, Muhammad (2008), reported that goats are easier to handle than sheep in terms of nutrition. The results obtained in this study justified the findings of Abdurrahaman (2017) who stated that sheep and goats are kept traditionally and reared together for many reasons; short gestation period and use for festival and income during emergencies. Rearing experience among the respondents observed in this study is lower than the findings of (Garba and Muhammad, 2018) who reported a range of 11-20 years age as the highest years of experience in rearing in their study on browse plant (*Guiera senegalensis*) in the semi-arid environment. It is evident from the study majority of the respondents keep 21 – 40 animals, this revealed that high percentage of the respondent had medium flock size and further suggests that most of the farmers in the study area were low income farmers which perhaps could limit their purchase of conventional livestock feeds for livestock rearing. The farmers therefore, utilize their crop residues and forages available. By implication, few of the respondents had ownership of 1-10 animals and agrees with (Abdurrahaman, 2017) who reported that farmers owned 1-10

animals in their flock are small scale farmers, whose production is mainly based on rangeland feed resources, crop residues and household waste for security and income purposes.

Conclusion

In conclusion, results of this study evidently showed that farmers in Wudil local government area have established the use of Kargo pods and it's been utilized with other crop residues to feed animals especially during the dry season without adverse effect on refusal or health.

Recommendation

It is recommended that Kargo pods be evaluated (in terms of chemical and anti-nutritional components) and further enlighten farmers to feed Kargo pods in combination with other feed sources for better utilization.

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Table 1. Biodata of respondents in the study area

Variable	Frequency	Percentage(%)
Age		
15-25	16	16
26-35	33	33
36-45	40	40
46-65	11	11
Total	100	100
Gender		
Male	41	41
Female	59	59
Total	100	100
Marital status		
Married	46	46
Single	34	34
Divorced	20	20
Total	100	100
Educational background		
Primary education	35	35
Secondary education	12	12
Tertiary education	08	08
Adult education	05	05
Islamic education	40	40
Total	100	100

Table 2. Livestock species kept, experience and size of flock of respondents in the study area

Variable	Frequency	Percentage(%)
Rearing experience (Year)		
1-15	50	50
16-20	30	30
21-30	12	12
31-35	08	08
Total	100	100
Flock size		
Small	25	25
Medium	65	65
Large	10	10
Total	100	100
Specie of livestock kept		
Sheep	24	24
Goats	65	65
Sheep and Goats	26	26
Total	100	100

Table 3. Management systems practiced, awareness of Kargo pods utilization in ruminants, compounding ration with Kargo pods and reason for keeping sheep and goats by respondents in the study area

Variable	Frequency	Percentage(%)
Management system practiced		
Extensive	24	24
Intensive	17	17
Semi intensive	59	59
Total	100	100
Are you aware of Kargo pods utilization in ruminants' ration?		
Yes	100	100
No	00	00
Total	100	100
Do you compound ration with Kargo pods?		
Yes	75	75
No	25	25
Total	100	100
Reason for keeping sheep and goats		
Consumption	12	12
Income generation	88	88
Total	100	100