

Feeding of Kargo (*Piliostigma reticulatum*) to Small Ruminants in Jigawa State: A Preliminary Study

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Abstract

A survey was conducted to investigate the use of Kargo (*Piliostigma reticulatum*) as feedstuff for small ruminants in Jigawa State, Nigeria. A total of 120 structural questionnaires were administered to randomly selected livestock rearers in six Local Government Areas of Jigawa State during the months of October to May (dry season) of 2013. The results obtained showed that the respondents examined vary in age group from 11 years to above 61 years with majority being within the ages of 31- 40 years (42.72%). Male respondents constituted 64.08%. Almost all the respondents had some form of education and their experience in small ruminant rearing vary from 1 year to 40 years. Majority of the respondents (81) encountered had a flock size (21-40) which constitute 78.64%. Livestock species kept by the respondents vary from sheep alone 14.56% to those that kept goat alone 23.30%, while those that kept both sheep and goat were the majority 62.14% among the respondent encountered and 41.74% fed Kargo as sole feed during dry season. However, majority of the respondents 66.02% fed their animals Kargo leaves and Kargo pods, whilst 21.36% fed Kargo leaves alone, and 12.62% fed Kargo pods only. The study concluded that farmers had some level of awareness on the potential value of Kargo as feedstuff for small ruminants and therefore recommended that they should be enlighten on it nutritive value.

Keywords: Jigawa State, Kargo, Small Ruminants, and Utilization.

Introduction

Fodder trees and shrubs constitute a vital component in livestock productivity in the arid and semi-arid tropical zones where about 52% of the cattle, 57% of the sheep, 65% of goats and 100% of the camels in tropical Africa are found (Dicko and Sikena, 2003). According to Le Houérou, (1980) fodder trees and shrubs play an essential and multiple roles in the balance of the Sahelian and Sudanian ecosystems exploited by man and his animals. Their roles become more important as the dry season grows longer, and decreases as the mean annual rainfall increases. According to Dicko and Sikena, (2003) and Le Houérou, (1980) fodder trees and shrubs supply goats and camels with bulk of their nutritive requirements and complement the diet of cattle and sheep with protein, vitamins and minerals during dry season. Skerman, (1977) reported that at least 75% of the shrubs and trees of Africa serve as browse plants and many of these are leguminous.

The overall importance of browse was summarised in the Commonwealth Agricultural Bureaux statement (1947) 'more animals feed on shrubs and trees or on associations in which shrubs and trees play an important role than on true grasslands'. McKell, (1980) pointed out that shrubs and trees are the most visible plant forms in many landscapes, yet they have been neglected in most scientific research. One of such shrub is Kargo which is present in high quantity in Jigawa state during the dry season.

Kargo (*Piliostigma reticulatum*) is a leguminous medium-sized tree which grows wild in the tropics and is one of the commonest species of *Piliostigma* (Hochst) in the northern part of Nigeria (Dalziel, 1948, and Keay, 1989), where it is locally known as Kargo or Kalgo (Akin-Osanaiye, *et al.*, 2009). According to Diack, *et al.*, (2000) *Piliostigma reticulatum* is an endophytic legume, with no nodules, non-fixing N, from the *Cesalpiniaceae* family, is usually a shrub but can occasionally be a tree. It grows on sandy, clayey and lateritic soils, During the dry season, it can regrow up to 90cm with a canopy diameter of 100 to 175cm. Annually, 1268g of dry weight biomass per shrub are produced, for an average density of 317 shrub per ha (Leung, *et al.*, (1968). According to Leung, *et al.*, (1968) fresh leaves of *Piliostigma reticulatum* contain per 100 g edible portion: water 78.3 g, energy 268 kJ (64 kcal), protein 4.8 g, fat 0.1 g, carbohydrate 14.4 g, fibre 6.8 g, Ca 435 mg, P 80 mg, and ascorbic acid 68 mg.

This study aimed at investigating the utilization of Kargo (*Piliostigma reticulatum*) by small ruminant in Jigawa state.

Materials and Methods

Description of the study area

The survey was conducted in Jigawa state during the dry season period of 2013, Jigawa State is located between latitudes 10° 57' North and 13° 03' North and longitudes 8° 08' East and 10° 37' East. Most part of Jigawa State lies within the Sudan Vegetation Zone. On some parts of the Southern boundaries Guinea Savannah exist (TNFDP, 2011). The annual rainfall varies from 500mm to 1000mm with a mean of 600mm and rainfall is

higher in the Southern part of the State (TNFDP, 2011). The mean daily maximum and minimum temperatures are 35°C and 19°C, respectively. The maximum temperature has two peaks occurring in April and October. The lowest temperatures are recorded during the month of December and January. At this period the temperature can fall as low as 10 °C or lower at night. The mean relative humidity can be as high as 80% in the month of August and as low as 15% in December. The State has an altitude of between 400 – 600m above sea level (TNFDP, 2011).

Procedures

A survey was conducted in six (6) Local Government Areas (L.G.As) of Jigawa state. The Local Government Areas were Dutse, Kaugama, Miga, Gagarawa, Mallam-madori, and Sule tankarkar. A total of 120 structural questionnaires were administered to randomly selected livestock rearers within the Local Governments with 20 respondents per Local Government Area during the dry season of 2013. The respondents were selected by systematic sampling procedure and interviewed. The structured questionnaires captured respondents biodata, rearing experiences, flock size; species and dry season feed resources.

Data collection and analysis

The data obtained from this study was analyzed using simple descriptive statistics of Microsoft Excel 2007.

Results and discussion

Biodata

Biodata of respondents is presented in Table 1. The age groups of respondents vary from 11 to 61 years and above with majority being within the range of 31- 40 years (42.72%). This was followed by those within the ages of 21 – 30 years (35.92%). Respondents within the ages of 61 and above were the least and constitute 1.94%. Male respondents constituted 64.08% while 35.92% were female. Approximately 73 of respondents (70.87%) were married. Almost all of the respondents had some form of education, 37.86% had Quranic education, 5.83% primary school and 25.24% secondary education, 28.16% tertiary education while 2.91% of the respondents had adult education.

Kargo utilization by small ruminants increases with increase in age of the farmers group from 11-20years (2.91%), 21-30 (35.92%) up to 31-40 years of age (42.72%) where it reach its peak and start to decline thereafter from 41-50 years (9.71%), 51-60 years (6.80%) and reaches the least level with increase in age group 61 and above years (1.94%). The decline may be attributed to age where in most cases older group disengages themselves from livestock husbandry and hand over to younger generation. However the age group 31-40 years obtained in this study is low than that reported by Garba and Muhammad (2008) on sabara as browse and a potential milk enhancer in ruminants in the same study area, this can be attributed to the fact that their study largely involved large ruminants farmers where older aged rearers were active. The encountered of more males than females in the current study is in agreement with Sodiya (2005), Muhammad *et al.*, (2008), Garba and Muhammad (2008) and Abdurrahman and Muhammad (2012) reports on different studies. Involvement of married farmers than single in present study was in agreement with Sodiya, (2005) and Abdurrahman and Muhammad (2012) were they both reported that Fulani/hausa-fulani culture discourage divorce. This tradition according to Garba and Muhammad (2008) explained why in most study involving Fulani/ hausa-fulani married respondent predominant single. Western education level in the current study was encouraging as compared to early study by Garba and Muhammad (2008) and this is as a result of more awareness by extension workers for better understanding improvement on new technology in the region.

Experience, flock size and livestock species kept

Experience, flock size and livestock species kept by respondents in the study area is presented in Table 2. All the respondents encountered had some experience in small ruminants rearing from 1 year to 40 years. Majority of the respondents were within 11 – 20 years of rearing experience representing 77.67%. This was followed by those with 1-10 years' experience and those with 21 – 30 years; they both had 9 respondents each with 8.74%, while the least were those with 31 – 40 years' experience in rearing were 5, constitute 4.85%. Majority of the respondents (81) had a medium flock size (21-40) which constitute 78.64%, followed by those with small flock size (18 respondents) constitute 17.48%, while the least were those with large flock constituting 3.88%. Livestock species kept by the respondents vary from those that kept sheep alone (15 respondents) representing 14.56% to those that kept goat alone (24 respondent) constituting 23.30%, while those that kept both were the majority (64 respondents) representing 62.14% of the respondent encountered.

Experience of respondents in livestock keeping 11-20 years as obtained in this study was in line with the findings of Garba and Muhammad (2008). They reported 11-20 years age as the highest experience in rearing in their study on browse plant (*Guiera senegalensis*) in the semi-arid environment. Thereafter this suggest that testing of feeding operation improvement technology should focus respondents with production experiences of 11 – 20 years and with medium flock size (21-40) for possible meaningful impact.

As obtained in this study ownership of combination (sheep and goat) was higher and this may be attributed to complimentary in feeding habits. Smith (2006) reported that sheep grazes lower grasses while goat's browses shrubs and trees. It was also revealed that ownership of goat were higher than that of sheep, this

may be attributed to the fact that goat are known for browsing (Smith, 2006). Muhammad (2008) reported goats are easier to handle than sheep in terms of nutrition.

Feed resources used

Feed resource used for feeding small ruminants by respondents is presented in Table 3. Respondent encountered revealed that small ruminant feed resources during dry season ranges from Kargo, grasses, soya bean bran, ground nut hay, magarya and Sabara (*Guiera senegalensis*). Majority of the respondents (41.74%) uses Kargo alone, followed by those that uses Kargo and sabara combination (23.30%), others uses Kargo and soya bean bran (13.59%), while some uses Kargo and ground nut hay (9.71%). Very few of the respondents use Kargo and magarya 6.81%. The least were those that use grasses alone 4.85%. However, majority of the respondents encountered fed Kargo leaves and Kargo pods to their small ruminants (66.02%), and 22(21.36%) fed Kargo leaves only, while (12.62%) fed Kargo pods only. None of the respondents fed branches only or combination of leaves, pods and branches to his small ruminants.

The findings of this study revealed that most farmers' uses Kargo alone or in combination for feeding small ruminants in Jigawa State. Otchere and Nuru (1988) had reported that ruminant animals reared in the Sahel zone are fed primarily on native rangelands where browse woody vegetation contribute to their nutrition. Several reports have demonstrated the superior nutritive values of browse plant and their acceptability by goat (Agishi, 1984; Bibi-Farouk *et al.*, 2006; Garba and Muhammad, 2008).

Conclusion

This study concluded that farmers in the semi-arid zone had some level of awareness on utilization of Kargo and therefore recommended that they should be enlighten on it nutritive values.

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Table 1: Biodata of respondents in the study area

Variables	Respondents	Percentage
Age (Years)		
11-20	3	2.91
21-30	37	35.92
31-40	44	42.72
41-50	10	9.71
51-60	7	6.80
61 and above	2	1.94
Total	103	100
Gender		
Male	66	64.08
Female	37	35.92
Total	103	100
Marital status		
Married	73	70.87
Single	30	29.13
Total	103	100
Educational status		
Qur'anic education	39	37.86
Primary school	6	5.83
Secondary school	26	25.24
Tertiary education	29	28.16
Adult education	3	2.91
None	-	-
Total	103	100

Table 2: Experience, flock size and livestock species owned by respondents in the study area

Variables	Respondents	Percentage
Experience in rearing (Years)		
1-10	9	8.74
11-20	80	77.67
21-30	9	8.74
31-40	5	4.85
41 and above	-	-
Total	103	100
Flock size		
Small (1-20)	18	17.48
Medium (21-40)	81	78.64
Large (41 and above)	4	3.88
Total	103	100
Livestock species kept		
Sheep	15	14.56
Goat	24	23.30
Sheep and Goat	64	62.14
Total	103	100

Table 3: Feed resources used by respondents for feeding small ruminants in the study area

Variables	Respondents	Percentage
Feed resources used during dry season		
Kargo only	43	41.74
Grasses only	5	4.85
Kargo and soya bean bran	14	13.59
Kargo, ground nut and Grasses	10	9.71
Kargo and Magarya	7	6.81
Kargo and sabara	24	23.30
Total	103	100
What part(s) of Kargo do you fed small ruminants		
Leaves only	22	21.36
Pods only	13	12.62
Leaves and pods	68	66.02
Total	103	100

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