

Assessment of Groundnut (*Arachis hypogaea* L.) Haulm as Livestock Feed and marketing in Kanifing Municipality and Brikama, The Gambia

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Abstract

*In The Gambia, information about the challenges affecting groundnut (*Arachis hypogaea* L.) haulm as livestock feed and its marketing remains limited. Therefore, this study investigated the constraints related to using groundnut haulm as livestock feed and its marketing in selected livestock markets in The Gambia. Abuko and Brikama Kraal markets, located in Kanifing Municipality and Brikama Area Council, respectively, were purposely chosen due to the high number of livestock traders and groundnut haulm marketers in these areas. Data were collected through structured questionnaires administered to 106 respondents, including 84 small ruminant traders and 22 groundnut haulm marketers. The collected variables included respondents' socio-demographic details, livestock and groundnut haulm marketing activities, types of feed sold, livestock kept, transportation modes, costs, storage practices, processing methods, and challenges faced by the respondents. The data were analyzed using descriptive statistics (frequency, percentages) in IBM SPSS Statistics Version 20. Results revealed that all respondents (100%) were male and married. The majority (33.0%) were aged 41-50 years. A high proportion (81.82%) of the haul markers had an average of D10,000 monthly turnover. Most (78.6%) of the livestock traders fed groundnut haulm mixed with wheat bran, and all respondents agreed that seasonal change, high-cost price, transportation, and storage were constraints to feeding of groundnut haulm and marketing. Crushing was the only processing method used by the respondents. The study concluded that groundnut haulm has a relatively high turnover, but faces high costs of price, transportation, and storage challenges. The government should establish storage facilities and upgrade road networks to improve the availability of groundnut haulm, while minimizing transportation challenges and costs.*

Keywords: Groundnut haulm, livestock feed, marketing constraints, storage, Gambia

Évaluation des fanes d'arachide (*Arachis hypogaea* L.) comme aliment pour le bétail et leur commercialisation dans la municipalité de Kanifing et à Brikama, en Gambie



Résumé

*En Gambie, les informations concernant les défis affectant l'utilisation des fanes d'arachide (*Arachis hypogaea* L.) comme aliment pour le bétail et leur commercialisation restent limitées. Par conséquent, cette étude a examiné les contraintes liées à l'utilisation des fanes d'arachide comme aliment pour le bétail et à leur commercialisation dans certains marchés à bétail de Gambie. Les marchés d'Abuko et de Brikama Kraal, situés respectivement dans la municipalité de Kanifing et le conseil de zone de Brikama, ont été délibérément choisis en raison du nombre élevé de commerçants de bétail et de vendeurs de fanes d'arachide dans ces zones. Les données ont été collectées au moyen de questionnaires structurés administrés à 106 répondants, comprenant 84 commerçants de petits ruminants et 22 vendeurs de fanes d'arachide. Les variables recueillies comprenaient les détails sociodémographiques des répondants, les activités de commercialisation du bétail et des fanes d'arachide, les types d'aliments vendus, le bétail détenu, les modes de transport, les coûts, les pratiques de stockage, les méthodes de transformation et les défis rencontrés par les répondants. Les données ont été analysées à l'aide de statistiques descriptives (fréquences, pourcentages) dans IBM SPSS Statistics Version 20. Les résultats ont révélé que tous les*

répondants (100 %) étaient des hommes mariés. La majorité (33,0 %) étaient âgés de 41 à 50 ans. Une proportion élevée (81,82 %) des vendeurs de fanes réalisaient un chiffre d'affaires mensuel moyen de 10 000 dalasis. La plupart (78,6 %) des commerçants de bétail nourrissaient leur bétail avec des fanes d'arachide mélangées à du son de blé, et tous les répondants ont convenu que le changement saisonnier, le coût élevé, le transport et le stockage étaient des contraintes à l'alimentation avec des fanes d'arachide et à leur commercialisation. Le broyage était la seule méthode de transformation utilisée par les répondants. L'étude a conclu que les fanes d'arachide ont un chiffre d'affaires relativement élevé, mais sont confrontées à des coûts d'achat élevés, ainsi qu'à des défis de transport et de stockage. Le gouvernement devrait établir des installations de stockage et améliorer les réseaux routiers pour améliorer la disponibilité des fanes d'arachide, tout en minimisant les défis et les coûts de transport.

Mots-clés : Fanes d'arachide, aliment pour le bétail, contraintes de commercialisation, stockage, Gambie

Running title: Groundnut haulm as livestock feed and marketing

Introduction

The livestock sector remains a critical component of the agricultural economy in The Gambia, contributing significantly to rural livelihoods and national development. Although various estimates differ, livestock continues to play a major role in agricultural production and employment, particularly in traditional and mixed farming systems where crop and livestock components are closely integrated (GLSR, 2010; Desmae *et al.*, 2022). Beyond its economic contribution, the sector enhances food security, improves household nutrition, and supports poverty alleviation among vulnerable populations (Shah *et al.*, 2025).

Groundnut (*Arachis hypogaea L.*), a member of the Fabaceae family, is one of the most important crops cultivated in The Gambia and other tropical and subtropical regions (Furo *et al.*, 2022). The country's agro-ecological conditions — including suitable climate, available arable land, and extensive local expertise — are conducive to groundnut production, making it a key cash crop for farmers (FAO, 2024). Groundnuts are grown widely across the country and have historically been among the major export commodities. Besides their economic importance, groundnuts contribute to mixed farming systems by enhancing soil fertility through biological nitrogen fixation, providing nutrient-rich grains for human consumption, and yielding haulms that

serve as valuable livestock feed (Furo *et al.*, 2022).

Groundnut haulms are widely recognized as a preferred feed resource for ruminant livestock, particularly during the dry season when natural pastures are scarce. Research across West Africa indicates that haulms are highly palatable and relatively nutrient-rich, often offering higher crude protein and energy content than many cereal straws, and thus making them suitable for animal fattening and sustained livestock performance under smallholder systems (ILRI Feed Database, 2023; Adewuyi *et al.*, 2022). Empirical studies have also demonstrated that haulm supplementation increases feed intake, improves digestibility, and enhances live weight gain and economic returns in small ruminants and cattle (Ayantunde *et al.*, 2014).

In The Gambia, the marketing of groundnut haulms has increasingly developed into an important economic activity, providing employment and supplementary income for farmers, traders, and other value chain actors. As a key by-product of groundnut production, haulms contribute to livestock productivity during periods of forage scarcity and support the livelihoods of smallholder farming households. However, the value and potential of haulm markets in The Gambia are still under-studied compared with other West African contexts where haulm marketing challenges — such as

transportation costs, storage losses, and market access — have been documented (Adewuyi *et al.*, 2022).

Despite their importance, the utilization and marketing of groundnut haulms face several constraints that are not yet well documented in the literature. A clearer understanding of these challenges is essential for improving haulm market efficiency and maximizing their contribution to livestock production and rural livelihoods. Therefore, this study aims to assess the constraints associated with the utilization of groundnut haulms as livestock feed and their marketing.

Methodology

Study Area

The study was conducted at Abuko (Kanifing Municipality) and Brikama livestock Markets. Abuko is located on Latitude 13° 24' 15.01" N and Longitude 16° 39' 20.99" W and Brikama lies on Latitude 13° 15' 60.00" N and Longitude: 16° 38' 59.99" W. These two locations were purposively selected for the study due to the high level of livestock trading and groundnut haulm marketing activities in the areas (Gambia Bureau of Statistics, 2023; Ministry of Agriculture, 2022).

Sampling Procedure and analysis

Both Census and simple random sampling techniques were adopted in this study. From the two study locations, all 22 groundnut haulm sellers were included in the study using a census approach and simple random sampling was used to select 84 small ruminant dealers from the study population so that every dealer has an equal chance of being selected.

Data collection

Data were collected using a structured questionnaire containing both closed- and open-ended questions to obtain voluntary information on respondents' socio-demographic characteristics, groundnut haulm utilisation, marketing activities, livestock trading, and

associated challenges. The interviews were conducted individually in Fula, Wolof, and Mandinka, which are the primary languages spoken by the respondents

Data analysis

The data collected were entered into IBM SPSS Statistics Version 20 and analysed using descriptive statistics, including frequencies, percentages, and tables. A 4-point Likert scale was used to assess the constraints faced by respondents, with response options ranging from strongly agree (4), agree (3), disagree (2), and strongly disagree (1). The cut-off point was calculated as $(4 + 3 + 2 + 1) \div 4 = 2.5$, which was used as the decision benchmark. Mean scores of 2.5 and above indicated agreement, while scores below 2.5 indicated disagreement.

Results and Discussion

Socio-demographic characteristics of respondents

Tables 1a and 1b shows the socio-demographic characteristics of livestock and haulm dealers in both study locations. It was revealed that all (100%) of them were male. This may be attributed to the predominance of the traditional system of livestock and haulm dealing, which is stressful, labor-intensive requiring movement from one location to another and requires physical strength that may be difficult for the women to cope with. This is consistent with the findings of Asogwa and Okwoche (2012) who highlighted male dominance in marketing of agricultural commodities. The dominance age range of 41-50 years obtained in the present study agrees with the report of Chah *et al.* (2013) that reported the age bracket of 35 - 45 years category for the crop-livestock production system in the derived guinea savannah. All (100%) the livestock and haulm dealers in the study locations were married. This may be due to the early income-generating nature of the business, which probably encourages them to start a family life and settle down at early age as compared to

professions that require a longer year of academic training to secure a job (Adewuyi, 2021). Most of the respondents in the study areas embraced livestock dealing and haulm selling as their major occupation. This may be due to the nature of the business, which requires spending a longer period at the work place. The literacy level among the respondents was generally low but surprisingly, there were sellers with tertiary education in the business, which is a sign that the business may be

lucrative afterwards; this agrees with the findings of Fakoya (2002) and Ayuk *et al.* (2011) that reported low literacy levels among farmers involved in the crop-livestock production system. It can be attributed to the general belief that farming is meant for the uneducated in society. All the respondents were Muslims; this may be because a greater percentage of the population of the Gambia are Muslims (The World Bank, 2022).

Table 1a: Socio-demographic characteristics of respondents

Variable	Frequency (n= 106)	%
Age (years)		
20-30	3	2.8
31-40	34	32.1
41-50	35	33.0
51-60	26	24.5
Above 60	8	7.5
Total	106	100
Sex		
Male	106	100.00
Female	0	0.00
Total	106	100.0
Marital status		
Married	106	100.0
Single	0	100.0
Total	106	100.0
Household size		
2-5	16	15.1
6-9	49	46.2
10-13	24	22.6
More than 14	17	16.0
Ethnicity		
Madinka	31	29.2
Wolof	25	23.6
Serer	9	8.5
Fula	39	36.8
Others	2	1.9
Total	106	100.0

Table 1b: Socioeconomic characteristics of respondents

Variable	Frequency	%
Religion		
Islam	106	100.0
Others	0	0.0
Total	106	100.0
Educational status		
Quranic	83	78.3
Primary	19	17.9
Secondary	3	2.8
Tertiary	1	0.9
Total	106	100
Occupation		
Haulm dealer	22	20.8
Livestock dealer	84	79.2
Total	106	100.0

Livestock trading and haulm utilization

Presented in Table 2 is livestock trading and utilization at the study location. The distribution of livestock sold shows that 45.2% of respondents traded both sheep and goats, which is slightly higher than those who sold only sheep (44.0%), while a much smaller proportion sold only goats (10.7%). This pattern suggests a greater reliance on sheep production, either alone or in combination with goats. The marked difference between goat-only sellers and the other categories indicates a clear dominance of sheep in the livestock market, which may be associated with higher demand or better economic returns, probably due to its importance for religious ritual, as Gambia is predominantly dominated by Muslims (The World Bank, 2022).

For goat breeds, 46.45% of respondents reported selling all breeds, followed by Sahelian goats (38.08%), while WAD (11.90%) and crossbreeds (3.57%) were less represented. The relatively high proportion of Sahelian goats compared to WAD goats indicates a preference for larger-bodied breeds, which may command better market prices. The difference between Sahelian goats and crossbreeds is substantial, suggesting a significant disparity in breed preference and

market supply. The dominance of the “all breeds” category further reflects a diversified marketing strategy, although it may mask specific breed preferences.

A similar trend was observed for sheep, where 67.83% of respondents sold all breeds, far exceeding individual breed categories such as WAD (14.28%), crossbreeds (11.9%), Ladum (4.76%), and BaliBali (1.23%). The large gap between the “all breeds” category and specific breeds suggests a highly heterogeneous market structure. The low frequency of premium breeds such as Ladum may indicate limited availability or selective retention for cultural or ceremonial purposes.

Feeding practices revealed a strong dominance of combined feeding, with 78.6% of respondents using groundnut haulm with wheat bran, compared to only 14.3% using groundnut haulm alone. The remaining categories (groundnut haulm + GNC and others) each accounted for only 3.6%. This indicates a highly skewed distribution toward supplementation practices, suggesting that farmers recognize the importance of balanced nutrition. The large difference between combined feeding and sole feeding practices implies a meaningful preference for

feed supplementation, likely driven by productivity considerations.

Regarding the reasons for feeding groundnut haulm as a bulk feed, the combined factor of availability and nutritive value (39.3%) ranked highest, followed closely by availability alone (36.9%). Price (15.5%) and nutritive value alone

(8.3%) were less influential. The close percentages between “availability” and “availability + nutritive value” suggest that availability is the primary driving factor, while nutritive value acts as a reinforcing consideration. The relatively low emphasis on price indicates that accessibility outweighs cost considerations.

Table 2: Livestock trading and haulm utilization

Variables	Frequency	%
Livestock sold		
sheep	37	44.0
Goat	9	10.7
both	38	45.2
Breed of goat sold		
WAD	10	11.90
Sahelian	32	38.08
Cross breed	3	3.57
All	39	46.45
Total	84	100.0
Breed of sheep sold		
WAD	12	14.28
Balibali	1	1.23
Ladum	4	4.76
Cross breed	10	11.9
All	57	67.83
Total	84	100.0
Feed fed to livestock		
Groundnut haulm only	12	14.3
Groundnut haulm+ wheat bran	66	78.6
Groundnut haulm + GNC	3	3.6
Others	3	3.6
Total	84	100.0
Reasons for feeding GH as Bulk		
Availability	31	36.9
Price	13	15.5
Nutritive Value	7	8.3
Availability and Nutritive Value	33	39.3
Total	84	100

The results in Table 3 indicate that the majority of respondents (72.7%) sold only groundnut haulm, while 27.3% sold a combination of groundnut haulm and wheat bran. This suggests

that groundnut haulm is primarily marketed as a standalone feed resource, with limited engagement in value addition. Recent studies have similarly reported that crop residues such as

groundnut haulm are commonly traded in their raw form due to ease of handling and strong demand among livestock producers (Food and Agriculture Organization, 2021).

With respect to the source of groundnut haulm, most respondents (59.1%) obtained supplies from the North Bank Region, followed by the Upper River Region (27.3%) and the Lower River Region (13.6%). This indicates a spatial concentration of supply, likely reflecting areas of higher groundnut production. According to the International Crops Research Institute for the Semi-Arid Tropics (2022), groundnut-producing regions in West Africa typically serve as major hubs for the supply of crop residues used in livestock feeding systems.

All respondents reported an average cost price of GMD 300 and a selling price of GMD 400 per 18 kg bag, suggesting a standardized pricing structure with a consistent gross margin. This reflects a relatively stable market system with limited price variation among traders. Recent findings by the International Livestock Research Institute (2023) indicate that livestock feed markets in developing countries often exhibit price uniformity due to localized trade networks and limited market integration.

Seasonal variation in sales showed that 100% of respondents recorded the highest sales during the dry season, with no respondents indicating peak sales during the rainy season. This highlights the strong seasonal demand for groundnut haulm as a livestock feed resource during periods of pasture scarcity. Similar observations have been reported by the Food and Agriculture Organization (2021), which emphasized the critical role of crop residues in sustaining livestock during dry seasons in sub-Saharan Africa.

In terms of sales volume, 45.45% of respondents sold an average of 20 bags per week, followed by 36.36% selling 10 bags and 18.18% selling 30 bags. This distribution indicates moderate variation in market participation, with most traders operating at a medium scale. According to

the World Bank (2022), differences in sales volume among smallholder traders are often influenced by access to capital, infrastructure, and market linkages.

The analysis of returns revealed that 81.82% of respondents earned more than GMD 10,000, while only 18.18% earned less than GMD 5,000. This demonstrates the profitability of groundnut haulm marketing, particularly for traders operating at higher sales volumes. Recent evidence from the International Fund for Agricultural Development (2021) shows that crop residue marketing contributes significantly to rural incomes and enhances the livelihoods of smallholder farmers in mixed crop–livestock systems.

Overall, these findings confirm that groundnut haulm marketing is a viable and economically beneficial enterprise, characterized by seasonal demand, stable pricing, and regional supply concentration. Its importance in supporting livestock production during the dry season further reinforces its role in improving food security and rural livelihoods, as also emphasized by recent studies (ILRI, 2023).

All (100%) adopted crushing as the only treatment method for the haulm. Crushing (grinding or chopping) is a physical processing method applied to crop residues to reduce particle size, increase surface area, and enhance microbial accessibility in the rumen, thereby improving feed intake and digestibility in livestock (Lukuyu *et al.*, 2021).

Table 3: Groundnut haulm marketing

Variable	Frequency	%
Type of Feedstuff sold		
Groundnut haulm only	16	72.7
Groundnut haulm+ wheat bran	6	27.3
Source of Groundnut Haulm		
North Bank region	13	59.1
Lower River region	3	13.6
Upper River region	6	27.3
Cost Price of 18Kg (GMD)		
300	22	100.0
Selling Price of 18Kg (GMD)		
400	22	100.0
Season of highest sales		
Dry	22	100.0
Rainy season	0	0
Average no of bags sold per week		
10	8	36.36
20	10	45.45
30	4	18.18
Average monthly return (GMD)		
Less than 5000	4	18.18
More than 10000	18	81.82
Processing method		
Crushing	22	100.00

1\$ (USD) = GMD74 (Gambian Dalasi),

Constraints to groundnut haulm as livestock feed

The results presented in Table 4 highlight the constraints associated with the use of groundnut haulms as livestock feed in the study area. Constraints with mean scores of 2.5 or above were regarded as major, while those with lower scores were considered non-major. Seasonal availability of haulms ($\bar{x} = 3.60$) indicates that their supply is highly dependent on the harvesting period, making them scarce during off-season periods. The cost of haulms ($\bar{x} = 3.40$) was also identified as a major constraint, suggesting that price significantly influences their utilization. This finding aligns with earlier reports that feed

cost constitutes a major challenge in livestock production (Aregheore, 2000; Devendra & Thomas, 2002). Storage ($\bar{x} = 3.05$) was perceived as another major constraint affecting haulm utilization. The lack of adequate storage facilities limits the quantity that can be purchased and stored, while prolonged exposure to adverse weather conditions may lead to quality deterioration, including mold infestation, discoloration, and losses due to theft. Storage challenges have long been recognized as a critical issue in agricultural marketing systems (Onyemauwa, 2010; Adewuyi, 2021). Similarly, the cost of transportation ($\bar{x} = 2.98$) was identified as a major challenge among livestock dealers

who source haulms directly from groundnut-producing areas. Groundnut haulms are bulky, as is typical of most crop residues, making

transportation cumbersome and expensive (Adewuyi *et al.*, 2021).

Table 4: Constraints to groundnut haulm as livestock feed

Factors	Mean (\bar{x})	Decision
Seasonal availability of haulm	3.60	Accepts
Cost price	3.40	Accepts
Storage	3.05	Accepts
Transport cost	2.98	Accepts

Constraints to groundnut marketing

The results presented in Table 5 highlight the constraints to groundnut haulm marketing in the study area. Constraints with mean scores of 2.5 or above were regarded as major, while those with lower scores were classified as non-major. Seasonal availability of haulms ($\bar{x} = 3.50$) indicates that supply is limited during certain periods of the year, which can lead to price fluctuations and increased costs. The cost of haulms ($\bar{x} = 3.27$) was also identified as a major constraint, corroborating earlier findings that feed cost remains a significant challenge in livestock production systems (Aregheore, 2000; Devendra & Thomas, 2002). Storage ($\bar{x} = 2.82$) was perceived as a major constraint, as most haulm marketers lack adequate storage facilities. This

exposes the haulms to deterioration from environmental factors such as dew and rainfall, as well as losses due to theft. Poor storage infrastructure has long been recognized as a key limitation in agricultural marketing in developing countries (Onyemauwa, 2010). Similarly, transportation cost ($\bar{x} = 2.64$) was identified as a major constraint due to the bulky nature of groundnut haulms, which increases handling difficulty and transport expenses (Adewuyi *et al.*, 2022). In contrast, inadequate capital ($\bar{x} = 1.68$) was not perceived as a major constraint, suggesting that groundnut haulm marketing can be initiated with relatively low capital investment. This is largely because crop residues are often available at minimal or no cost, depending on the location.

Table 5: Constraints to groundnut marketing

Factors as perceived by haulm sellers	Mean	Decision
Seasonal availability of haulm	3.50	Accepts
Cost price	3.27	Accepts
Storage	2.82	Accepts
Transport cost	2.64	Accepts
Inadequate capital	1.68	Rejects

Conclusion

The study examined the dynamics of groundnut haulm marketing and utilization in the study area. Results showed that the majority of livestock dealers supplemented haulm with wheat bran, achieving an average monthly turnover of D10,000 (\$136.98). Despite its economic potential, groundnut haulm marketing was

constrained by several challenges, notably high prices, transportation difficulties, and limited storage facilities.

Recommendation

The government should establish storage and processing facilities for haulm sellers in both areas. Additionally, improving road networks to link haulm sources with marketing centers is

crucial for reducing transportation costs. This would lower haulm prices, enable livestock dealers to supply adequate feed for their animals, and ultimately increase the net returns for haulm marketers.

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