ASPECTS OF SMALLHOLDER GOAT FARMING SYSTEMS IN RIVERS STATE (I): AVAILABILITY AND PREFERENCE FOR DOMESTIC WASTES

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ABSTRACT
A diagnostic survey was conducted to elicit information on aspects of smallholder West African Dwarf (WAD) goat farming systems and domestic food crop wastes availability and preference in Rivers State. Structured questionnaires were administered to 21 smallholder goat farmers in seven communities selected from three Local Government Areas (LGAs) with 20, successfully, retrieved and data analyzed using descriptive statistics. Results indicate that, majority (55%) of the farmers were females, 70% above the youthful age of 40, 70% had primary or secondary education, and 35% take farming as a main occupation. Also, 85% had less than 12 heads of goats with only 10% managing their flock intensively while, 84% successfully integrated food crops and vegetables. Their major challenges were inadequate space (29%), theft (23%), feeding and nuisance (18%), and disease (12%). Cassava, yam and plantain peels were the most available and preferred domestic wastes while, cassava peel was the most preferred (56%) followed by plantain peel (17%). Cassava and plantain peels are recommended for further nutritional evaluation studies as supplemental feed resources for goats, especially, under smallholdings during the dry season.
Keywords: Diagnostic survey, domestic waste, farming system; preference; small ruminant.

INTRODUCTION
Due to constraints such as low availability and poor forage quality during the dry seasons, smallholder ruminant animal farmers often resort to the use of household crop wastes as complementary feeding resources (Onwuka *et al.*, 1997). In this system, forages are supplemented with domestic wastes and agro-industrial by-products such as pineapple peels, cassava peels, yam peels, plantain peels and leaves that are usually discarded in large quantities (FAO and IFAD, 2001; Aro *et al.*, 2010). Domestic wastes and other crop by-products dumped without proper usage and allowed to decompose emit offensive odours, especially, around homesteads causing environmental pollution (FAO and IFAD, 2001; Karaimu, 2015). In some cases, intensively managed stock is transcended to semi-intensive management to prevent or minimize drastic losses in body weight and cushion pressure on the farmers. Despite these accruable benefits there is still very poor adoption of domestic waste as feed resources by famers. But, exclusion of beneficiary farmers from the conception, planning and execution of most intervention researches have been blamed for resistance to adoption. However, Action Research following participatory approaches and executed as on-farm trials with the farmers participating right from conception of research goal(s) to adoption phase has been demonstrated to yield better interest (Shelton *et al.*, 2005; Faure *et al.*, 2014). The study was conducted to assess availability and preference for domestic wastes under smallholder goat farming systems.

MATERIALS AND METHODS
Twenty-one smallholder goat farmers in seven communities from three LGAs (Obio-Akpor; Ikwerre; Emohua) were surveyed in a direct farmer-to-farmer identification process using structured questionnaires to elicit data on their production systems and other socio-economic parameters. The three LGAs and the specific communities and the distribution of the 20 questionnaires that were, successfully, retrieved are: Obio-Akpor (Alakahia, 2; Choba, 4; Rumualogu, 4; Rumuekini, 2; Rumuosi, 2), Ikwerre (Aluu, 5), and Emohua (Emohua, 1). Data were analysed using IBM SPSS Statistics V21.0 while, the results were presented as tables.

RESULTS AND DISCUSSION

Demographic results (Table 1) indicate that, 55% of the farmers were females, which agrees with earlier studies (Anaeto *et al.*, 2009; FMWA and SD, 2006). However, the results indicate low youth engagement in goat farming with only 35% of them less or up to 40 years of age. Goat farmers with no education was 5%, below tertiary education 70%, and tertiary education 25%. Only 35% of the respondents considered goat farming as their main occupation (Enwelu *et al.* 2015) while, others (65%) also engaged in civil service and business.

Results on aspects of the farms surveyed are presented in Table 2. Majority (45%) owned 1-6 goats compared to the average of 7 goats reported elsewhere (Enwelu *et al.*, 2015). Most (90%) practiced either semi-intensive or extensive goat management system, which corroborates earlier reports (Ummuna *et al.*, 2014). Majority (37%) also raised food crops and vegetables followed by 32% who grow only food crops as noted by Enwelu *et al.* (2015). Inadequate space (29%) and theft (23%) were identified as their two most crucial challenges while, feeding (18%), nuisance (18%) and disease (12%) were of less concern to them (Ummuna *et al.*, 2014; Enwelu *et al.*, 2015).

Table 3 shows availability and preference for the wastes by goats. Cassava peel was the most available (30%) followed by yam and plantain peels (20% apiece) while, cassava leaves were the least available (5%). The goats preferred cassava peels most (56%) followed by plantain peel (17%) with guinea grass being least preferred (6%). The availability and preference for cassava peels is an indication of its greater potential for the use as cost-effective feed resource, for goats by smallholders, compared to others (Karaimu, 2015).

CONCLUSION

Goat farming is, mostly, at smallholder level characterised by poor youth participationand low intensification in communitiesvisited. The, relatively, high availability and preference for cassava, yam and plantain peels by WAD goatscall for increased attention to increase usage and minimize their continued wastage as environmental nuisance. Similar surveys are needed in the 23 LGAs of Rivers State to thereby contribute to SDG Goal 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

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Table 1: Demographic information of the smallholder goat farmers

Parameter	Item	Frequency	Percentage (%)
Gender:	Male	9	45
	Female	11	55
	Total	**20**	**100**
Age (years):	Below 25	3	15
	25-40	3	15
	Above 40	10	70
	Total	**20**	**100**
Qualification:	None	1	5
	FSLC/SSC	14	70
	Tertiary	5	25
	Total	**20**	**100**
Main occupation:	Yes	7	35
	No	6	65
	Total	**20**	**100**

Table 2: Aspects of smallholder goat farming systems

Parameter	Item	Frequency	Percentage (%)
Herd size (number of goats):	1-6	9	45
	7-12	8	40
	13-18	2	10
	≥ 19	1	5
	Total	**20**	**100**
Management system:	Intensive	2	10
	Semi-intensive	11	55
	Extensive	7	35
	Total	**20**	**100**
Other farm enterprises:	Food crop	6	32
	Vegetable	1	5
	Poultry	3	16
	Food crop & vegetable	7	37
	Food crop & poultry	1	5
	Vegetable & poultry	1	5
	Total	**19**	**100**
Challenges:	Inadequate space	5	29
	Feeding	3	18
	Theft	4	23
	Nuisance	3	18
	Disease	2	12
	Total	**17**	**100**

Table 3. Availability and preference by goats for common feedstuffs

Parameter	Feed availability		Feed Preference	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Plantain leave	3	15	2	11
Cassava peel	6	30	10	56
Yam peel	4	20	2	11
Guinea grass	2	10	1	6
Cassava leave	1	5	-	-
Plantain peel	4	20	3	17
Total	**20**	**100**	**18**	**100**