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Assessment of Goat Milking Training Using Method and Method Demonstration Extension Teaching Methods among Rural Women in Kwara State, Nigeria

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ABSTRACT

Milk, a good source of protein, is inadequate in supply and not affordable for the majority of the rural communities of Nigeria. To increase milk production from available animal resources, extension services have included goat milking training using video and method demonstration in their service delivery packages. This study, therefore, assessed goat milking training using video and method demonstration among rural women in Kwara State, Nigeria. The study assessed the knowledge level of the respondents (rural women who reared goats in their households) on goat milking and the perception of the respondents on goat milking training. An Interview guide was used to collect data after training. Data analysis was done using descriptive statistics and the Kruskal Wallis H test. The findings of the study were that: 58.3% of the respondents had high knowledge of goat milking; women who had a positive perception towards goat milking training conceded that the training is simple and arouse the interest of other women (WMS=2.83); perceived benefits of goat milking training were; readily available milk ($\bar{x}$=2.64); and the video extension teaching method at two exposures was most effective, followed by method demonstration at two exposures (χ^2 =83291; $P_{value} \leq 0.001$). The study concluded that the video extension teaching method at two exposures is most effective and recommended its use in disseminating innovation.

1. Introduction

The demand for animal products is projected to increase progressively due to extensive urbanization, rapid growth of the human population and income dynamics. Despite the potential expansion of beef and dairy production, dairy goat production as an option for enhancing food security and income generation in Nigeria does not seem to be explored. Essentially, goat milk is nutritionally superior to cow milk, and it has a unique feature that makes it an alternative to cow milk and its products. It is widely used by those with digestive problems or those allergic to cow milk. The percentage is as high as 80% in some countries in sub-Saharan Africa (FAO, 2011). Women now make up the majority of the agricultural sector in developing countries,

but recent evidence suggests that their productivity is constrained by a lack of appropriate skill training (Danida, 2004).

There has been limited research on the specific content, format, and context of Extension programming that will effectively meet the needs of women farmers. Taylor and Fransman (2004) suggested that programs that provide different kinds of learning and encourage dialogue and exploration of different experiences are likely to create appropriate environments for women to learn. Implications to agricultural extension education include the affirmation that the right educational elements, rather than a collection of best practices, are required for educational designs that enable resource-poor women farmers to succeed personally and economically (Othman and Grudens-Schuck, 2003).

Extension is the process of enabling change in individuals and communities (State Extension Leaders Network, 2006). Extension, in general terms, is a function that can be applied to various areas of society; it is applicable to various areas of development. Extension education is the primary process through which the farmers can learn the reason for change, the value of change and the results that can be achieved through change (Okunade, 2007).

1.1 Research Objectives

The specific objectives are to:

1. Describe the socio-economic characteristics of the rural women;
2. access the level of knowledge from training on goat milking using video and method demonstration extension teaching methods;
3. assess the perception of the respondents on goat milking training;
4. identify the perceived benefits of goat milking by the respondents;
5. identify the factors influencing the acceptance of goat milking;
6. determine the other training needs of the rural women on goat milking apart from goat milk production and
7. ascertain the constraints to the adoption of goat milking in the study area.

1.2 Hypotheses of the Study

(i) H_1: There is no significant difference in the effectiveness of video and method demonstration extension teaching methods in disseminating goat milking among rural women.

(ii) H_2: There is no significant relationship between selected socioeconomic characteristics and the effectiveness of video and method demonstration extension teaching method.

2. Methodology

The study was conducted in Kwara State, Nigeria. It is in the North Central geo-political zone of Nigeria. It falls within the Guinea savannah of the agro-ecological zones. Kwara State has a land area of about 36,825Sqkm. It lies between latitude 9°25′35″N and longitude 3°30′38″E, and it is bounded by Niger and Sokoto to the North; Oyo, Ondo and Edo to the South; Benue, Plateau and FCT to the East; and shares international boundary with the republic of Benin to the West. The 2018 population figure of Kwara State was estimated to be 3,390,188 people (http://www.citypopulation.de/php/nigeria)

Kwara State is primarily agrarian, with a large expanse of arable land and rich fertile soils. Agriculture is the main stay of the economy, and the principal cash crops are cotton, cocoa, coffee, kolanut, tobacco, bean seed and palm produce. The rearing of animals is also common among the tribes. Animals such as goats, cattle and sheep are reared for milk, meat, hide and skin and other commercial purposes.

The target population of this study was rural women who reared goats. The multi-stage sampling procedure was used to get a representative of respondents. Firstly, Kwara State was purposively selected owing to the comparative advantage of the involvement of the students of the Department of Animal Production University of Ilorin consistently in dairy goat projects, which have, over time, included the production of dairy goat milk and its processing into other products. Secondly, simple random sampling was used to select two local government areas, namely Ilorin East and Isin. Thirdly, three locations in each selected local government area were purposively selected in favour of the recommendation of KWADP owing to the assumed high goat population. Finally, simple random sampling was used to select women from different households in each of the villages. A sample size of 30 women was selected from each of the 6 villages. This made a total of 180 women for training and data collection. The 30 participants made up each of the 6 groups. The 6 groups of 30 participants each were then trained using 6 treatments. The treatments are as follows:

- Video method demonstration training at one exposure; Lajiki
- Physical method demonstration training at one exposure; Abanta
- Video and Physical method demonstration training at one exposure; Ijara-Isin
- Video method demonstration training at two exposures: Oke-Oyi
- Physical method demonstration at two exposures: Iwo-Isin
- Video and method demonstration at two exposures: Oke-Aba

The decided extension teaching methods for this study are video teaching method at one exposure, method demonstration method at one exposure, a combination of video and method demonstration method at one exposure, video at two exposures, method demonstration at two exposures and a combination of video and method demonstration at two exposures. The treatments were administered to six different villages that were randomly selected from Ilorin-East and Isin LGAs of Kwara state. The villages were Oke-Oyi, Abanta, Lajiki, Ijara-Isin, Iwo-Isin and Oke-Aba respectively. The list of households with large numbers of goats was obtained from the village heads or women group representatives. A random selection of the thirty households was made, and only the women from the selected households participated in the training. Due to a lack of baseline data, the main focus was on thirty rural women from each of the selected six villages. The two different extension teaching methods addressed all the steps involved in goat milking. The interview guide gathered both quantitative and qualitative data on the rural women who were exposed to the training on goat milking.

The materials used for teaching are recorded videos featuring the process of goat milking. The video featured a detailed explanation of the milking procedure by a milking expert. A script was written on goat milking, which was translated into a video CD. The CD was played to train the respondents from Lajiki, Oke-Oyi, Ijara-Isin and Oke-Aba, and for the respondents from Iwo-Isin, Abanta and Ijara-Isin, the milking expert physically demonstrated goat milking procedure to them. The goat and other milking materials were made readily available.

Knowledge was measured through a knowledge test covering all aspects of training on goat milk and goat milking. The questions were Thirty-five, and the right response was scored one, and the wrong scored zero. The knowledge index was determined by the mark obtained against the mark obtainable. The highest mark obtained by the respondents was thirty-five (100%), while the lowest score obtained was zero (0%). Scores ≤ 20 were grouped as no knowledge, 21-40 = Low knowledge, 41-60 = Moderate knowledge and ≥ 61 = High knowledge. The scores obtained from the knowledge index were used as a standard to determine the effectiveness of extension teaching.

An interview schedule was used for data collection in phases. The first phase involved conducting two focus group discussions (FGDs) comprising of five participants each. (Morgan,1993). The outcomes of the FGDs were used to frame items for the interview schedule to determine the effectiveness of video and method demonstration on the rural women's learning process. None of the respondents had any prior knowledge of goat milking.

An interview schedule guide was designed, and the interview guide was given to experts in the Department of Agricultural Extension and Rural Development of the University for Validation. The researcher administered it to the respondents individually to gather primary data. The questions covered socio-economic characteristics, knowledge index, and effectiveness of the two extension teaching methods, perceived benefits of goat milk, factors that can inform attitudes concerning goat milking, other training needs on goat milk and constraints to the practice of goat milking.

3. Results and Discussion

The analysis was done using frequency counts, percentages, means, standard deviation, Chi-Square, Kruska Wallis and Mann Whitney test.

3.1 Perception of the respondents on goat milking training

The data in Table 1 shows that the rural women agreed that the type of skill acquired in goat-milking is sufficient for personal practice (Weighted Mean Score =2.78). They agreed that the type of training received enabled them to gain knowledge that could help them get an alternative source of milk (WMS = 2.83) and that knowledge on goat-milking could help them include goat milk as an additional source of protein (WMS=2.97). They further agreed that the new knowledge gained would help them make goat milk an additional source of income (WS= 2.77). Also, the rural women trained agreed that the knowledge gained could be shared with other women (WMS=2.91) and that the simplicity and benefits of the training could arouse the interest of other women (WMS= 2.83). The respondents agreed that goat-milking can be used to empower rural women (WMS = 3.24). The implication here is that any venture that can improve the livelihood of the women will likely be embraced to enhance financial independence. In addition, it indicated that the training received is sufficient to train others without an expert's help (WMS= 2.48) and also useful to them (WMS= 2.70).

Furthermore, responses from the respondents, as shown in Table 1, indicate that the respondents agreed to have obtained a good knowledge of goat milking from the training and they can train others (WMS = 2.75). Also, the result shows that they had never heard about goat milk and goat-milking before the training and are interested in practicing it (WMS= 2.87). In the same vain, it depicts that the trainees were interested in goat milk as prescribed by the training because of the advantages it has over cow milk (WMS= 2.71). The result also indicated that the interest/non-interest of others did not affect them because they saw the training as comprehensive (WMS= 2.81). They agreed that their interest was based on goat availability (WMS= 3.11). However, the respondents disagreed that the knowledge acquired during the training is useful for goat milk consumption (WMS= 2.18) and that the knowledge is applicable for goat milk production (WMS= 2.32). In a study conducted by Haenlein (2004), he concluded that positive perceptions of goat milk were based on the fact that goats are easily accessible to rural households, so there is ease in accessing its milk.

Table 1 also shows the rank order analysis to determine respondent's attitudes towards goat milking. The mean rank order utilizes a mean response of "2.5" (scored from the Likert Scale of 4 to 1, i.e. from severely agreed to severely disagreed; means of 2.5 and above show agreement with items while means of less than 2.5 show disagreement with the items. Almost all the respondents agreed on the items of the statement;

however, the most agreed upon of the perception statements was" Goat milking can be used to empower rural women", and the least agreed upon was "Training received was sufficient to train others without expert's help". The implication was that training on goat milking could empower rural women and that the women would still need more training to independently practice goat milking.

Table 1: Distribution of respondents based on perception of goat milking training

N	Perception Statements	SD	D	A	SA	Mean	Remark
1	Type of skill acquired in goat-milking is sufficient for personal practice	9 (5.0)	40 (22.2)	113 (62.8)	18 (10.0)	2.78	Agreed
2	Type of training received has enabled participants gained knowledge that will help get alternative source of milk	7 (3.9)	36 (20.0)	117 (65.0)	20 (11.1)	2.83	Agreed
3	Type of skill acquired on goat-milking is sufficient for personal practice	11 (6.1)	34 (18.9)	119 (66.1)	16 (8.9)	2.97	Agreed
4	This new knowledge can help make goat milk an additional source of income	7 (3.9)	51 (28.3)	99 (55.0)	23 (12.8)	2.77	Agreed
5	Knowledge gained can also be stepped down to others in respective women group	1 (0.6)	34 (18.9)	125 (69.4)	20 (11.1)	2.91	Agreed
6	Participants think other women will also desire this type of training considering the simplicity and benefits	2 (1.1)	17 (9.4)	135 (75.0)	26 (14.4)	2.83	Agreed
7	Goat-milking can be used to empower rural women.	0 (0.0)	20 (11.1)	137 (76.1)	23 (12.8)	3.24	Agreed
9	This knowledge is useful for goat milk consumption	18 (10.0)	114 (63.3)	46 (25.6)	2 (1.1)	2.18	Disagreed
10	This knowledge is applicable for goat milk production	14 (7.8)	97 (53.9)	67 (37.2)	2 (1.1)	2.32	Disagreed
11	Participants now have good knowledge of goat milking because of this training and can train others	1 (0.6)	49 (27.2)	124 (68.9)	6 (3.3)	2.75	Agreed
12	I have never heard about goat milk and goat-milking before now but	2 (1.1)	29 (16.1)	140 (77.8)	9 (5.0)	2.87	Agreed

	because of training received am interested in practicing it.						
13	I am interested because of the advantages goat-milk has over cow milk	6 (3.3)	51 (28.3)	113 (62.8)	10 (5.6)	2.71	Agreed
14	The interest/disinterest of others does not affect me because I see training as comprehensive	21 (11.7)	31 (17.2)	89 (49.4)	39 (21.7)	2.81	Agreed

Source: Field Survey 2019

3.2 Knowledge Level of Respondents on Goat Milking after the Training

Table 2 shows that at the end of the training, 7.8% of the respondents had moderate knowledge about goat milking procedures, 58.3% had high knowledge, 8.9% had low knowledge, and 25.0% had no knowledge of the procedures. The moderate to high knowledge levels of the respondents may probably be due to the training method they were exposed to and their age, which affords them quick learning ability. Knowledge is the foundation of a process in which attitudes, norms and perceptions of possibilities to act are carefully monitored to clarify and decide between behavioral alternatives (Sundblad, 2008). Since knowledge of goat milking using two different extension teaching methods was high, it indicates that the women were interested in and would likely practice goat milking.

TABLE 2: Knowledge rating of respondents

Level of knowledge	**Frequencies N=180**	**Percentages**
Low Knowledge (0-20)	45	25.0
Fair knowledge (21-40)	16	8.9
Moderate Knowledge (41-60)	14	7.8
High Knowledge (61 and above)	105	58.3
Total	180	100.0

Source: Field Survey 2019

3.3 Results on Comparison of Knowledge from the Different Extension Training Methods.

Table 3: Comparison of Knowledge from the six Teaching Methods

Training Methods	Mean (WMS)	Standard Deviation
Video @1 Exposure	1.00	0.00
Method Demonstration @1Exposure	2.43	0.57
Video+Method Demonstration@1 Exposure	2.73	1.48
Video @2 Exposures	4.00	0.00
Method Demonstratio@2 Exposure	4.00	0.00
Video+Method Demonstration@2 Exposures	3.83	0.76

Source: Field Survey 2019.

3.4 Effectiveness of the two Extension Teaching Methods

Table 4 is a Kruskal-Wallis H test result that showed that there was a statistically significant difference in effectiveness of the teaching methods, $\chi^2(5) = 83.291$, $p = 0.0001$, with a mean rank effectiveness score of 32.87 for "Video teaching at one exposure", 61.95 for "Method demonstration at one exposure", 143.68 for "Video teaching at two exposures", 88.07 for "Method demonstration at two exposures", 110.13 for "Combination of video and demonstration method at one exposure" and 103.92 for "Combination of video and demonstration method at two exposures". The two extension teaching methods at different exposures have significantly different means. It can be inferred that there was a substantial difference in the effectiveness of each teaching method. Video at two exposures is the most effective extension teaching method in disseminating goat milking to rural women in Kwara state. It is followed by method demonstration extension teaching method at two exposures and then a combination of the two at two exposures.

Table 4: Kruskal Wallis H test showing the Effectiveness of the two Extension Teaching Methods

Effectiveness	**N**	**Mean Rank**	**χ^2**	**df**	**p value**	**Decision**
Video training at one exposure	30	32.87				
Method Demonstration at one exposure	30	61.95				
Video training at two exposures	30	143.68				
Method Demonstration at two exposures	30	88.07	83.291	5	0.0001	Significant difference exist between mean scores
Combination of video and demonstration method at one exposure	30	110.13				
Combination of video and demonstration method at two exposures	30	103.92				

Hypothesis One: (H_1)

Hypothesis one, which states that "there is no significant difference in the effectiveness of the two extension teaching methods in disseminating goat milking among the rural women" was tested using Mann Whitney U test. This test compared all six (6) teaching methods with one another, resulting in 15 pairs, which were tested by assessing the mean scores from the knowledge indices of the respondents based on their location. However, in all pairings, the result of the hypothesis showed that out of all the variables derived by pairing all six different teaching methods, only the three teaching methods with two exposures were not significantly different in their knowledge index means, as shown in Table 5. The indication is that, at two exposures, the level of knowledge of goat milking is almost the same for both videos, method demonstration, and a combination of the two at two exposures. This finding is in line with Okunade (2007), who stated that the mass media methods will arouse the interest for more information, which will enable the farmer to have a better understanding of the innovation and that skills are better acquired through group contact methods. There were significant differences in all other pairings of teaching methods at one exposure. This result supported hypothesis one, and it implies that respondents who are trained using any of the two teaching methods at two exposures will have a better understanding of the subject matter compared to those trained at one exposure.

Test of Hypothesis

TABLE 5: Mann-Whitney U test showing difference in mean values of knowledge index based on training methods

Pair	Type of training method	N	Mean Rank	U	p value	Decision
1	Video training at one exposure	30	15.50	0.000	0.0001	Significantly
	Method Demonstration at one exposure	30	45.50			different
2	Video training at one exposure	30	15.50	0.000	0.0001	Significantly
	Video training at two exposures	30	45.50			different
3	Video training at one exposure	30	15.50	0.000	0.0001	Significantly
	Method Demonstration at two exposures	30	45.50			different
4	Video training at one exposure	30	21.50	180.000	0.0001	Significantly
	Combination of video and method demonstration method at one exposure	30	39.50			different
5	Video training at one exposure	30	16.50	30.000	0.0001	Significantly
	Combination of video and method demonstration method at two exposures	30	44.50			different
6	Method Demonstration at one exposure	30	15.50	0.000	0.0001	Significantly
	Video training at two exposures	30	45.50			different
7	Method Demonstration at one exposure	30	15.50	0.000	0.0001	Significantly
	Method Demonstration at two exposures	30	45.50			different
8	Method Demonstration at one exposure	30	28.13	379.000	0.286	No
	Combination of video and method demonstration method at one exposure	30	32.87			Significant different
9	Method Demonstration at one exposure	30	17.50	60.000	0.0001	Significantly
	Combination of video and method demonstration method at two exposures	30	43.50			different
10	Video training at two exposures	30	30.50	450.000	1.000	

	Method Demonstration at two exposures	30	30.50			No Significant different
11	Video training at two exposures	30	37.00	255.000	0.0001	Significantly
	Combination of video and method demonstration method at one exposure	30	24.00			different
12	Video training at two exposures	30	31.50	420.000	0.154	No
	Combination of video and method demonstration method at two exposures	30	29.50			Significant different
13	Method Demonstration at two exposures	30	37.00	255.000	0.0001	Significantly
	Combination of video and method demonstration method at one exposure	30	24.00			different
14	Method Demonstration at two exposures	30	31.50	420.000	0.154	No
	Combination of video and method demonstration method at two exposures	30	29.50			Significant different
15	Combination of video and method demonstration method at one exposure	30	25.03	286.000	0.001	Significantly different
	Combination of video and method demonstration method at two exposures	30	35.97			

Table 6: Correlation between selected socioeconomic characteristics and effectiveness of the two extension teaching methods

Variable	r-value	p-value	Decision
Age	0.162**	0.001	Significant
Marital Status	0.114	0.178	Not significant
Religion	0.043	0.464	Not significant
Educational level	-0.011	0.740	Not significant
Sources of income	0.049	0.554	Not significant
Herd size of goat	0.036	0.238	Not significant
Household size	0.051	0.561	Not significant
Source of credit	0 156**	0.001	Significant
Access to livestock extension services	0.023	0.221	Not significant
Membership of association	0.158**	0.001	Significant

Source: Field Survey, 2016

4. Conclusion and Recommendation

The effectiveness of both the Video extension teaching method and Method demonstration extension teaching method in disseminating goat milking among the rural women indicated that, on the one hand, the Video extension teaching method at two exposures was most effective in arousing awareness and enhancing

self-directed learning through gain of knowledge and sharing experience. The method demonstration extension teaching method at two exposures, on the other hand, better supports knowledge application through guided technical backstopping. A combination of the two at two exposures also proved effective as the two methods effectively complemented each other. The social learning concept is central to the learning framework, empowering rural women to play a central role in their own learning and innovation while drawing on external knowledge and practices to adapt to their own peculiar conditions.

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