

PRELIMINARY SURVEY ON MILK THISTLE (*SILIBUM MARIANUM*) UTILIZATION IN RUMINANT ANIMALS IN KANO STATE, NIGERIA.

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Abstract

A survey was conducted to assess the utilization of milk thistle (*Silybum marianum*) as a feed resource for ruminant animals in some selected Local Government Areas of Kano State a semi-arid region of Nigeria. A total of one hundred and fifty (150) structured questionnaires were designed and administered to randomly selected livestock farmers that reared goats in the selected areas. Information such as the nutritional and medicinal values of the milk thistle plant was obtained and analysed using simple descriptive statistics of frequency tables and percentages. The results obtained showed that most of the farmers were males (83.30%), (55.33%) were within the age of 30-40 years and married (93.33%). All respondents had some certain level of education. A multitude of the respondents (53.33%) were livestock and crop farmers (56.67%) of who owned their foundation stock through purchase. Most of the respondents (61.33%) rear goats, (90.00%) of the respondents practice semi-intensive systems of animal production. (86.67%) of the respondents have access to veterinary facilities and (50.68%) feed their animals with crop residue during the dry season, only (29.73%) feed their stock with fodders, browse plants and shrubs, and 19.59% with household waste. 70.00% of the respondents acknowledged that they knew milk thistle and 83.81% utilized the plant as an ingredient in the animal ration. while 8% is herbal medicine. Among the respondents that acknowledged they used the plant, 8.11% uses milk thistle for fattening while 21.62% used it as a milk enhancer, 29.73% fed it during feed scarcity, with 40.54% feeding milk thistle to cure ailments. The study concludes that milk thistle plants were identified as animal feed, milk enhancer, and traditional medicine for humans and ruminant animals in the study area and that the respondents have the knowledge of feeding milk thistle plants, and many have been feeding their ruminants with the plant. The study recommends that milk thistle plants be evaluated for nutritional and anti-nutritional components and mixed with other feed ingredients for better utilization by ruminants.

Keywords: Preliminary, Survey, Milk thistle, Utilization,

Introduction

Ruminant animals constitute a very important part of the livestock sub-sector of the Nigerian agricultural economy. The potential of small ruminant animals in the alleviation of the low animal protein intake by man in developing nations such as Nigeria has been reported (Fajemisin *et al.*, 2010). Attention has been focused on small ruminant production in the tropics as their advantages are becoming more understood than ever before, particularly for their ability to produce meat, milk, and skin, even in hostile environments (Makun *et al.*, 2013; Okoruwa *et al.*, 2012). Goats account for about 30% of the African ruminant livestock and contribute about 17 and 12% of the total meat and milk production, respectively.

Sub-Saharan Africa (SSA) accounts for over 60% of the total goat production in Africa with an estimated 147 million goats representing about 80 indigenous breeds or strains distributed across all ecological zone, and ruminant livestock production

systems (Lebbie, 2004) production in recent times has received a renewed interest as it occupies a strategic position in the socio-economic life of the people of Nigerian villages. Shortage of feeds, particularly during the dry season is one of the major factors limiting the productivity of livestock in the tropics (Rusdy, 2016). At the critical dry season, available feed for grazing by animals is almost bare ground with poor vegetation cover and low biomass (Muhammad and Kallah, 2013). Livestock producers often seek for alternative feedstuffs to meet the demand of their animals.

Milk thistle (*Silybum marianum*) /L./ Gaertner, Asteraceae) is an annual plant belonging to the Asteraceae family, and the plants are widespread in the arid and semi-dry areas of the Mediterranean regions (Tagliapietra *et al.*, 2014). It is a medicinal herb (Kren and Walterova, 2005; Ibrahim *et al.*, 2007), use in healing some animal diseases. For instance, milk thistle enhances the immune function against aflatoxin and improves the

carcass and growth performance of chickens (Grizzle *et al.*, 1999; Tedesco *et al.*, 2004, Kalore *et al.*, 2005; Chand *et al.*, 2011). The utilization of milk thistle could be a medicinal plant to remedy several diseases for animals (Awang, 1993). Fruits of milk thistle (*Silybum marianum*) have been used for more than 2000 years to treat liver and gall bladder disorders, including hepatitis, cirrhosis, and jaundice, and to protect the liver against poisoning with chemical and environmental toxins (Kren & Walterova, 2005). Animal studies reported that milk thistles can protect the liver from poisoning and liver damage (Ibrahim *et al.*, 2007). Therefore, the study aimed at investigating the utilization of milk thistle (*Silybum marianum*) by ruminant animals. The objective of the study was to conduct a preliminary survey in some selected Local Government Areas of Kano State to ascertain the use of milk thistle (*Silybum marianum*) in livestock feeding.

Materials and methods

Study Area

The study was conducted in three (3) Local Government Areas of Kano State. Kano State is located approximately between longitude 8° 45 E and 12° 05 E and latitudes 10°30'N and 13° 02' N and as such is part of sudano-sahelian zone Nigeria. According to Sanni and Okhimamhe (2010), the annual rainfall value is inconsistent from one year to another. The annual amount of rainfall may reach about 1000mm in the southern Kano part.

Data collection

The survey areas and the respondents were selected based on the existence of ruminant animal rearing to ascertain the utilization of milk thistle plants and were conducted in three (3) different Local Government Areas of Kano State. A total of one hundred and fifty (150) structured questionnaires were designed and administered to livestock farmers in Dawakin Tofa, Bichi, and Bagwai Local Government Areas of Kano State. In each of the Local Government Areas, fifty (50) respondents were selected using a random sampling technique, making a total number of one hundred and fifty respondents. Information from the administered questionnaires and personal observations were collected on the farmer's

demographic information, rearing experience, flock size, species of the ruminants kept, and feed resources used for either fattening, milk enhancement, or dry season feeding.

Data Collection

The data collected from the survey were analysed using the Statistical package for social sciences (SPSS 16). Descriptive Statistics were used to summarize the data

Results

The demographic information of the respondents was presented in Table 1 in appendix one. The results showed that the majority (83.30%) of the respondents were males and 55.33% of them were within the age group of 30-40 years. Most (93.33%) of the respondents were married, and only 6.60% were widows. All (100%) of the respondents had acquired some level of education ranging from Quranic education (50.00%), primary education (16.67%), secondary education (15.33%), tertiary education (14.67%), with only 3.33% having adult education.

The species of animal, rearing experience, ownership, and source of the livestock are presented in Table 2 in appendix Two. Most (61.33%) of the respondents reared goats only, 18.67% reared sheep only and 14.67% reared cattle only, and a few (5.33%) practices mixed (cattle, sheep, and goats) rearing. All the respondents had between 1 to 30 years of experience in livestock rearing. (56.67%) part of the respondents owned their stock, 21.33% said the stock belongs to their wives, 20.00% to children, and only 2.00% to their parents. (56.00%) of the respondents who purchased their foundation stocks, inheritance (24.00%), and gift are the lowest (20.00%) means by which the respondents acquired their stocks.

The results of systems of livestock production among the respondents were presented in Table 3 in appendix Three. Most of the respondents were livestock farmers (53.3%), some are mixed farmers practicing both crop and livestock farming (38. %) and 8.67% were crop farmers only. None of the respondents practices an extensive system of livestock production, about 16.33% practice an intensive system of production while the semi-

intensive system of production is commonly practiced by the majority (90.00%) of the respondents. There were multiple responses with regard to the sources of feeds fed to livestock in the dry season, 50.68% of the respondents feed their stock with crop residues, and other sources of feed during the dry season include fodders, browse plants, and shrubs (29.73%), and household waste (19.59%). (70%) of the respondents acknowledged that they have access to veterinary services for livestock while few (30%) had no access.

The respondent's knowledge of the utilization of the milk thistle plant in the study area was presented in Table 4 in appendix Four. Most of the respondents knew the plants (70.00%) and utilized them (83.81). Some of the respondents used the plant as herbal medicine (8%), (29.73%) uses the plant during feed scarcity, others (21.62%) of the respondents uses the plant as a milk enhancer while a few (8.11%) respondents use the plant for fattening.

Discussion

The age distribution of the respondents in the study area revealed that the majority of the farmers were young. This observation was in accordance with the report of Hussein *et al.* (2011) who reported that people in the age bracket of 30-60 years are the majority involved in farming activities. The survey revealed that the majority of the farmers had various levels of literacy such as Qur'anic, primary and secondary schools, adult education as well as tertiary education. The respondents further reported that milk thistles in the study area were fed to animals not as a whole but as a supplement for herbal medicine, fattening, as well as milk enhancement. The traditional content of the plant suggested that it has the potential to meet some of the nutritional requirement of the livestock and its utilization as livestock feed will increase growth performance and also improves the immune system as reported by (Grizzle *et al.*, 1999; Tedesco *et al.*, 2004, Kalore *et al.*, 2005).

Conclusion

The study concludes that milk thistle plants were identified as animal feed, milk enhancer, and traditional medicine for humans and ruminant animals in the study area and that the respondents

have the knowledge of feeding milk thistle plants and many have been feeding their ruminants with the plant. The study recommends that milk thistle plants be evaluated for nutritional and anti-nutritional components and be mixed with other feed ingredients for better utilization by ruminants.

Recommendation

Based on the findings of the current study, for optimal utilization of milk thistle, it is essential that details of the palatability, nutritive values, and antinutrients of the plant be evaluated. Thereafter, extension work needs to be done to inform livestock farmers of the importance of milk thistle plants as animal feed resources.

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References

- Awang, D. (1993). Milk thistle. *Canadian Pharmacists Journal*, 126: pp 403-404
- Chand, N., Muhammad, D., Dur rani, F., Qureshi, M. and Ullah, S. (2011). Protective effects of milk thistle (*Silybum marianum*) against aflatoxin B1 in broiler chicks. *Asian-Australasian Journal of Animal Sciences*, (24) 1011–1018pp.
- Fajemisin A.N. and Adeleye A.A, Alokun J.A. (2010) Nitrogen retention and haematological indices of West African Dwarf rams fed sun dried and fermented rumen digesta and cage hen dropping diets. *Proceeding of 35th Conference of Nigeria Society for Animal Production 14th – 17th March, 2010. University of Ibadan. Nigeria. 2010; 604-607.*
- Grizzle, J., Wiles, J., Benyard, R. (1999). Invitro screening of Nutraceuticals for immune support in Avians. *Journal of Poultry Science* 71 (9), 1577-1580.
- Lebbies, S.H.B. (2004). Goat Under Household, Conditions, Ruminant Research. 5:131-136.
- Ibrahim, M., Ottai, M. and Mergawi, R. (2007). Self-mating effects on growth traits and *silymarin* production of some selected lines among milk thistle (*Silybum marianum*) varieties. *World Journal of Agriculture Sciences*, (1): 97-104pp.

- Kalorye, D.R., Kurkure, N.V., Ramgaokar, I.S., Sakhare, P.S., Warke, S. and Nigot, N.K., (2005). Effect of Polyherbal feed Supplement Growell during Induced Aflatoxicosis, Ocharacosis and Combined Mycotoxico.
- Makun, H.J., Otaru, S.M. and Dunga, D.D. (2013). Effect of management practices on milk yield and live weight changes of indigenous breeds of goats supplemented with groundnut haulms and concentrate in sub humid zone of Nigeria. *Sokoto Journal of Veterinary Science*, 11(1): 45-50.
- Muhammad, I.R. and Kallah, M.S. (2013). The need for establishment of grazing reserve and stock route commission. A position paper to Honourable members of House of Representative of the Federal republic of Nigeria, at the Public Hearing of the bill of an act to provide the "Establishment of a National Grazing Reserve and Stock Route and the Creation of a National Grazing Reserve Commission for managing National Grazing Route and Reserve in all parts of the Nation for incidental matters on Tuesday 4th June 2013 at the Speakers Conference Hall, House of Reps New Building. National Assembly Abuja".
- Okoruwa, M.I, Igene FU, Isika MA. (2012). Replacement value of cassava peels with rice husk for guinea grass in the diet of West African dwarf sheep. *Journal of Agricultural science.*; 4(7) 254-261.
- Rusdy, M., (2016). Elephant grass as forage for ruminant animals Department of forage crop and grass land management, faculty of animal science, Husanuddin University Indonesia, livestock research for rural development 28 (A). States Forest Service Agricultural Handbook 709, Washington DC, USA.
- SPSS (2008). Statistical Package for Social Science for Window, Version 16.0.
- Sanni, D.O. and Okhimambe, A. (2008). Liking Climatic Change and Urbanization in Kano Metropolis and Environments in Sudano-sahelian Belt of Nigeria.
- Tagliapietra F, Cattani M, Guadagnin M, Haddi M, Sulas L, Muresu L, Squartini A, Schiavone S, Bailoni L (2014): Associative effects of poor-quality forages combined with food industry by products determined *in vitro* with an automated gas-production system. *Journal of Compilation*, 10, 1071. doi: 10.1071/AN14023.
- Kroll DJ, Shaw HS,

Tedesco, D., Steidler, S., Galletti, S., Tameni, M., Sonzogno, O. and Ravarotto, L. (2004). Efficacy of silymarin-phospholipid complex in reducing the toxicity of aflatoxin B [1] in broiler chicks. *Poultry Sciences*, 83: 1839-1843.

APPENDIX ONE

Table 1. Demographic Information of the Respondents

Parameters	Frequency	Percentage
Age		
20 -30	28	18.67
31– 40	83	55.33
41 – 50	21	14.00
51– 60	18	12.00
60 Above	0	0.00
Total	150	100
Gender		
Male	125	83.33
Female	25	16.67
Total	150	100
Marital status		
Single	0	0.00
Married	140	93.33
Divorced	10	6.67
Total	150	100
Educational background		
Quranic education	75	50.00
Primary education	25	16.67
Secondary education	23	15.33
Tertiary education	22	14.67
Adult education	5	3.33
Total	150	100

APPENDIX TWO

Table 2: Species of animal, Rearing experience, Ownership and Source of the Livestock

Variables	Frequency	Percentage
Species of the animals		
Cattle	22	14.67
Sheep	28	18.67
Goat	92	61.33
Mixed (cattle, sheep and goats)	8	5.33
Total	150	100
Rearing experience		
1 – 10	75	50.00
11 - 20	30	30.00
21 – 30	45	35.92
31 – 40	0	0.00
Above 40	0	0.00
Total	150	100
Animal ownership		
Self	85	56.67
Parent	3	2.00
Wives	32	21.33
Children	30	20.00
Total	100	100
Source of Animal		
Inheritance	36	24.00
Purchase	84	56.00
Gift	30	20.00
Total	150	100

APPENDIX THREE

Table 3: Systems of Livestock Production among the respondents

Variables	Frequency	Percentage
Primary Occupation		
Livestock farmers	80	53.33
Crop farming	13	8.67
Mixed farming	57	38
Total	150	100
System of production		
Extensive	15	10.00
Intensive	0	0.00
Semi-extensive	135	90.00
Total	150	100
Source of feed during dry season*		
Crop residues	150	50.68
Fodders, browse plants and shrubs	88	29.73
Household waste	58	19.59
Total	296	100
Presence of veterinary facilities		
Present	130	86.67
Absent	20	13.33
Total	150	100

*Multiple responses

APPENDIX FOUR

Table 4: Respondent Knowledge on utilization of Milk thistle in Ruminants Feed (n≥150)

Variables	Frequency	Percentage
Do you know that livestock feed on milk thistle		
Yes	105	70.00
No	45	30.00
Total	150	100
If yes, do you utilise it for livestock?		
Yes	88	83.81
No	17	16.19
Total	105	100
Method of feeding milk thistle		
Sole	0	0
With other feed ingredients	105	100
Total	100	100
Purpose feeding*		
Fattening	14	8.11
Milk enhancement	33	22
During feed scarcity	44	29.33
Cure ailments	59	39.33
TOTAL	150	100
Do you notice any sign of toxicity?		
Yes	42	28
No	63	42
Total	105	70