



BEST JOURNAL 14(3): 8 - 13

Date received:

Date accepted:

Printed in Nigeria



ASSESSMENT OF FEEDING ADAPTATIVE STRATEGIES USED BY DAIRY FARMERS IN EDU LOCAL GOVERNMENT AREA OF KWARA STATE, NIGERIA

**Badmos, A. A¹., Adisa, R. S²., Adeyemi K. D¹., Yusuff, A. T¹., Adefalu, L. L. ²Ifabiyi J. O³.,
Mohammed, N.M. ²Belewu, K. D. ³, Animashaun, J. O³. and Lawal, A.O⁴.**

¹Department of Animal Production,

²Department of Agricultural Extension and Rural Sociology,

³Department of Agricultural Economics and Farm Management

University of Ilorin.

⁴ITAD Ltd, Hove, U.K.

Correspondence Author: :badmos111@yahoo.com

ABSTRACT

This study focused on the assessment of dry season cattle feeding adaptation strategies by dairy farmers in Edu local government area of Kwara state, Nigeria. Two hundred dairy farmers were purposively selected for this study in the three agricultural districts (Lafiagi, Shonga and Tsaragi) of Edu local government areas based on predominance of cattle production, in 2016. Data were obtained using a structured questionnaire to elicit information on respondents' socioeconomics characteristics, health challenges of cattle, the effects of the nutritional challenges and seasonal pattern of feeding cattle during the dry season. The data were analyzed using frequency, percentage and mean score. Result shows the farmers' age number of children and herd size were 40.2 years, 6.0 children and 45 cattle heads, respectively. Majority (70%) had tertiary education and 50.0% kept White Fulani breed. The study also reveals that daily milk output during the rainy season (500 litres) were more than the dry season daily output (300 litres from a total of two hundred animals. Health issues including inflammation of teat and udder (50%), loss of weight (12.5%), reduction in milk production(25%) and sudden death(12.5%) are examples of secondary effects of dry season nutritional challenges. The study recommends the promotion of enlightenment programmes that will adequately expose dairy farmers to improve and adaptable dry season feeding strategies.

Keywords: Milk production, Dairy Farmers, Adaptive feeding, Kwara State.

INTRODUCTION

Cattle are highly valued livestock in Nigeria and are kept for beef, hide, milk or for traction. Tibi and Aphunu (2010) reported that the country had over 14.73 million cattle consisting of 1.47 million milking cows, 13.26 million beef cattle and about 99% of the cattle are managed traditionally. Cattle singly contribute about 12.7% of the agricultural Gross Domestic Product (GDP) and 3.2 to 4% of overall GDP of the country in Nigeria (CBN, 1999). Nigerians operating in cattle value chain makes daily living from the sale, transport, processing and marketing of cattle products, including meat, milk, skins and draught power.

Dairy management, which is the production, processing and distribution of milk and milk products is an enterprise that is yet to be fully developed in Nigeria since traditional techniques are still being used. There is a need to develop the industry because there is high demand for milk and dairy products due to increasing population and increasing nutritional awareness. Dairy farming is a major agricultural activity providing additional income to farmers in the Nigeria. According to FAO (1988), an estimated 183,000 rural households derived some income from the dairy industry in Nigeria.

One of the primary keys to a successful dairy operation is good nutrition practice. Nutrition determines the results of milk production, reproduction and health status. Inadequate supply of livestock feed during the dry season is probably the most limiting factor affecting pastoralists in Nigeria. In the dry season, milk production is far from being sufficient, due to challenges of livestock nutrition. The low milk yield is a problem, both for the farmers and consumers. During the dry season, the natural pastures and crop residues available for animals after crop harvest are usually fibrous and devoid of most essential nutrients including proteins, energy, minerals and vitamins which are required for increased rumen microbial fermentation and improved performance of the host animal (Dixon and Egan, 1987). The natural pasture lacks essential nutrients during the dry season, there is need to provide the animal with supplementary feeding. Animals grazing natural pasture during the dry season therefore lose weight with losses of up to 20 percent of late summer weight (Gammon, 1992). Cattle farmers usually adopt dry season cattle management strategies. Some of the dry season management strategies include selling the stock, movement of the animal to other place where there are pastures and provision of supplementary feeds.



According to FAO (2013), proteinous food (especially dairy products) consumption is below recommended levels in Nigeria. Sustainable dairy cattle production and management during the dry season will make animal protein (meat, milk and cheese) available and affordable to all Nigerians. Nutrition has been documented to be one of the most important factors limiting ruminant production (NCSR, 1985). Among the many problems faced by the dairy farms, scarcity of feed ingredients and their high prices are considered to be of major importance. The scarcity of forage resources during dry season have had a significant impact on cattle farmers, because of the reduced productivity (milk and meat), reduced fertility, increased susceptibility to disease and mortality.

Adaptability refers to capability to show necessary response and change for an existing or potential situation (Lukas, 1999). It involves coordinating, regulating and allocating of resources. Akgun *et al.* (2012) suggested that adaptive capabilities are reshaping of resources and coordinating of processes in time to develop more successful products and services. Adaptive strategies are short-term responses to an immediate and irregular decline in access to food for cattle (FAO, 1997). These strategies refer to people's activities whose main purpose is to meet their needs under conditions of extreme food scarcity and include making contingencies for the future. Coping strategies refer to a set of measures adopted to attempt to meet physiological, social, economic and political needs of everyday life. FAO (1997) noted that communities that have lived under drought situations for many generations develop coping strategies to lessen the impact of drought. Recently, dairy cattle farmers have developed effective responses to alleviate the scarcity of pastures for their cattle during the dry season. These indigenous responses go a long way in alleviating food shortages during dry season cattle feeding and milking. This exposure to drought hazards has necessitated responses involving a myriad of coping and adaptive strategies among the cattle farmers. Frankenberger (1992) argues that, over the years, environmental degradation (for example through bush burning, erosion, flooding, overgrazing and deforestation) and lack of water conservation measures may have served to further exacerbate the effects of pasture inadequacy during the dry season.

The dry season feeding adaptive strategies reported in literatures are sale of livestock, culling of excess stock, treatment of dry feeds with salt or urea, hay making on farms, seeding of pastures, pasture production, herd diversification, purchasing forage, investing in shallow or deep borehole, provision of salt licks, feed supplement, silage, feeding the cattle with crop residues (Blench and Marriage, 1999; Rockstrom, 2003). According to FAO (2004), it is generally

acknowledged that low resource agriculture is unable to sustain livelihoods during the dry season.

Lazarus and Folkman (1984) conceptualized two broad response dimensions among people facing stress: emotion focused coping involves modifying one's own feelings and controlling distress, and problem-focused coping activities are aimed at changing the stressful situation. Adaptation involves direct problem solving, cognitive decision making, and restructuring. Dairy farmers will look for alternative feeds, cognitive decision making and restructuring may involve destocking, selling, moving the cattle into new areas and conflict management.

Some evidence shows that problem-focused approach is an idea that can be used to explain the plight of dairy farmers during the dry season (Compas *et al.*, 1988). FAO (1997) noted that communities that have lived under drought situations for many generations develop coping strategies to lessen the impact of drought. Cattle farmers must have developed adaptation strategies over the years as experience is the best teacher.

Common pool resources like land, grazing space, water, etc are common source of conflicts

(Okaka *et al.*, 2008). Effect of climatic change (like drought) on competition over common natural resources like water and grazing space was investigated by Thèbaud (2002) who revealed that croppers and grazers coexist under very tense situation, which frequently breaks into physical conflicts. The scarcity of pasture and water for cattle during dry season often results in conflicts among the dairy farmers and between farmers and dairy farmers. Understanding the various feed resources and adaptive strategies used by dairy farmers to overcome dry season feed shortages is important in future planning and development of appropriate technologies. Also, studies of this type are needed to identify interventions that complement farmers' own strategies so that they are more efficient in managing the nutritional challenges during the dry season. The main objective of this study was to assess the seasonal feeding adaptation strategies, based on socioeconomic characteristics, nutritional and health challenges of dairy farmers in Edu Local Government Area of Kwara state, Nigeria

MATERIALS AND METHODS

Edu local Government is geographically located in the northern part of kwara state (5° 00'E; 8° 30'N) along river Edu. It is bounded by river Niger in the north and by Patigi local government area (LGA) of kwara state towards the east and as well as by Ifelodun LGA of Kwara state towards the west. The main occupation of the people are farming and fishing. Multi- stage sampling procedure was used in the selection of respondents within the three agricultural districts of the local government, namely: Lafiagi, Shonga and Tsaragi districts.



Farm locations were purposively selected from each agricultural district based on predominance of cattle production in the area. The selected farm locations were Sodo, Batagi, Gbogi, Dumagi, Todo, Efagi, Bokungi, Ndafo and Mafu. A total sample size of two hundred (200) respondents were selected for the study. Relevant data were collected with the aid of structured questionnaire and data was analysed using descriptive statistics such as frequency, percentage and mean, in line with the work of Sule *et al.* (2014).

RESULTS

The results from Table 1 reveals that the majority (60.0%) of the respondents were less than 40 years of age, while 30% were between the age of 41- 50 years and the mean age of the respondents was 40.2 years. Table 1 also reveals that 60.0% of the respondents were Muslims, while 40% were Christians and that majority (70.0%) of the respondent had tertiary education. Table 1 also reveal that majority (75%) of the respondents had between 1 to 8 children and mean numbers of children was 6.6. The seasonal daily milk output for two hundred cattle during the rainy season was 500 litres while dry season average milk output was 300 litres. Table 1 reveals that 50% of the respondents had herd size ranging from 41-50 dairy cattle and the average herd size was 45.4. It was further revealed in Table 1 that 50% of the respondents had White Fulani cattle breed and that more than half (60.0%) had conflicts with fellow cattle rearers while 2.5% had conflicts with farmers. Conflicts may occur as a result of competition over common resources like water, grazing space and grazing path. The results from Table 2 reveals that 35.0% of the respondents indicated that foot and mouth disease and tuberculosis were part of the dry season health challenges of the cattle. Rinderpest and anthrax had 15.0% reports each. The results as shown in Table 3 reveals that 50.0% of the respondents reported inflammation of teat and udder, 25.0% indicated reduction in milk production, while 12.5% reported loss of weight and sudden death as the effects of the nutritional challenges facing dairy farmers. The results from table 4 reveals that half (50.0%) of the respondents fed their cattle with crop residues during the dry season, 22.5 % of the respondents fed their cattle with silage, while 10 % each provided feed supplements and pasture grasses, respectively.

DISCUSSION

The respondents' socioeconomic characteristics as reported in Table 1, regarding the age range of the majority of respondents being less than 40 years is an

indication that the dairy farmers in the study area are still agile and economically active. This agrees with FAO (1990) who reported that the younger ones are more active than the aged and invariably more in the cattle business. The religious spread implies there is no religious bias against dairy farming in the area and religion might also have played a significant role in resolving the farmer/herdsmen crises. The tertiary education of majority of the respondents is an indication that the respondents will perform better since education influences job performance. This result is contrary to the findings of Okebukola (2001) who reported that the nomads who are migratory, consider formal schooling (and also school science) as non-relevant to daily living of pastoralism. The reported average daily milk output of 500 litres and 300 litres in the rainy and the dry season respectively is in agreement with the Millogo *et al.*, (2008) who reported that more milk was produced during the rainy season. The report that more than half of respondents had conflicts with fellow cattle rearers while some had conflicts with farmers is a result of struggle for feeding resources implies that conflicts may occur as a result of competition over common resources like water, grazing space and grazing path. The report on rinderpest, foot and mouth disease (Table 2) and other health challenges shows the effect of nutrition on the body immunity of livestock animals. The non availability of good quality pastures and unfavourable climatic conditions which expose the cattle to cold during the dry season may be responsible for the health challenges. This earliest indication of feeding stress would be the reduction in milk production and loss of weight (Table 3). This has possibly led to the observation in Table 4 where half of the respondents fed their cattle with crop residues during the dry season, 22.5 % of the respondents fed their cattle with silage, while 10 % each provided feed supplements and pasture grasses, respectively. Granzin, *et al.*, (1998) and Wohlt *et al.*, (1998) reported the positive effect of feed supplementation on milk production during the dry season.

CONCLUSION AND RECOMMENDATIONS

The study concluded that the dry season nutritional adaptive strategies used by the farmers include crop residues, silage, pastures, supplements, fodder banks and broiler litter (In the order: 50%, 22.5%, 10%, 10%, 2.5% and 2.5% respectively). The study established that dairy farmers were aware of the problem with dry season feeding which affected the productivity of their herds. The study recommends further training, and extension-cum-veterinary services of dairy farmers on other dry season adaptive strategies.



APPENDIX:

Table 1: Distribution of respondents by their socioeconomic characteristics

Variable	Frequency	Percentage	Mean
Age (years)			40.2
≤40	120	60	
41-50	60	30	
51-60	20	10	
Religion			
Islam	120	60	
Christianity	80	40	
Educational level			
No formal education	10	5	
Arabic education	20	10	
Primary education	10	5	
Secondary education	20	10	
Tertiary education	140	70	
Number of children			6.625
1-8	150	75	
9-11	25	12.5	
12-20	25	12.5	
Seasonal average daily milk output (litre)			
Rainy season	500	62.5	
Dry season	300	37.5	
Transport machinery			
Vehicle	30	15	
Motorcycle	180	85	
Type of farming			
Mono cropping	20	10	
Mixed farming	15	7.5	
Mixed cropping	15	7.5	
Only cattle	150	75	
Herd size			45.375
≤40	50	25	
41-50	100	50	
≥ 51	60	25	
Common breeds of cattle			
White Fulani	100	50	
Red sokoto	25	12.5	
Ketuku	25	12.5	
Nda'ma	25	12.5	
Muturu	25	12.5	
Conflicts			
Crop farmer	5	2.5	
Cattle rearer	120	60	

Source: Field survey, 2015

Table 2: Distribution of respondents according to dry season health challenges of the cattle

Diseases	Frequency	Percentage
Foot and mouth	70	35
Rinderpest	30	15
Tuberculosis	70	35
Anthrax	30	15

Source: Field survey 2015



Table: 3 Distribution of respondents according to seasonal effect of the nutritional challenges

Nutritional Challenges	Frequency	Percentage
Inflammation of teat and udder	100	50
Loss of weight	25	12.5
Reduction in milk production	50	25
Sudden death	25	12.5

Source: Field survey 2015

Table 4: Distribution of respondents according to dry season cattle feeding pattern

Cattle Feeding Pattern in Dry Season	Frequency	Percentage
Pasture grasses	20	10
Supplement	20	10
Salt Lick	5	2.5
Crop Residues	100	50
Silage	45	22.5
Broiler	5	2.5
Dietary Enzymes	-	-
Fodder Bank	5	2.5

Source : Field survey 2015

REFERENCES

- Akgün, A. E., Keskin, H., and Byrne, J. C. (2012). "Antecedents and Contingent Effects of Organizational Adaptive Capability on Firm Product Innovativeness", *Journal of Product Innovation Management*, 29, 171-189.
- Blench, R., and Marriage, Z. (1999). Drought and livestock in semi-arid Africa and Southwest Asia. London: Overseas Development Institute.
- CBN. (1999). Central Bank of Nigeria annual report of 1998, Lagos Nigeria, 10: 41 - 80.
- Compas, B.E., Malcarne, V.L., and Fondacoro, K.M. (1988). Coping with stress in older children and young adolescents. *Journal of Consulting and Clinical Psychology*, 56, 405-411.
- Dixon, R.M., and Egan, A.R. (1987). Strategies for utilizing fibrous crop residues as animal feeds, *Paper presented to the 7th AAFARR Workshop*, Chiang Mai, Thailand.
- FAO. (1988). Food and Agriculture Organization. 1988. Agricultural development in Nigeria 1965-80. *FAO*, Rome, Italy.
- FAO. (1990). Food and Agriculture Organization. *FAO Production Year Book*. Volume 46, page 153. Rome, Italy.
- FAO. (1997). Food and Agriculture Organization. Agriculture, food and nutrition for Africa. *FAO*. Publishing Management Group, Rome.
- FAO. (2004). Food and Agriculture Organization. Drought impact mitigation and prevention in the Limpopo River Basin: A situational analysis. *FAO Land Water Discussion*, Paper 4.
- FAO. (2013). Food and Agriculture Organization. Country Programming Framework (CPF) Federal Republic of Nigeria, Fiat Panis, pp 1-41. *FAO*.
- Frankenberger, T (1992). Indicators and data collection methods for assessing household food security. In: Maxwell S, Frankenberger T (eds.), *Household food security: Concepts, indicators, measurements*. A technical review. New York and Rome, UNICEF and IFAD.
- Gammon, D.M. 1992. Making the most of veld grazing. In: *Beef in Natal*. Department of Agricultural Development, Petermaritzburg, RSA.
- Granzin, B.C., Dryden, G.M and J.E Mccosker, (1998) The effect of the dietary ratio of rumen degradable protein to metabolisable energy on intake, digestion and milk production of Holstein Friesian cows offered rhodes grass hay (*Chloris gayana* cv. Callide), *Proceedings of 22nd Biennial Conference, University of New England*, Armidale, New South Wales, Australia, 20-24 April, 1998.
- Lazarus, R. S. and S. Folkman (1984). Stress, Appraisal and Coping. *Springer Publishing Company*, New York.
- Lukas, B.A. (1999) "Strategic Type, Market Orientation, and The Balance Between Adaptability and Adaptation", *Journal of Business Research*, 45, 147-156.
- Millogo ,V., Ouédraogo, G. A. Agenäs S and Svennersten-Sjaunja K (2008) Survey on dairy cattle milk production and milk quality problems in peri-urban areas in Burkina Faso. *African Journal of Agricultural Research* Vol. 3 (3), pp. 215-224. Available online at <http://www.academicjournals.org/AJAR>.
- NCSR. (1985), National Council for Scientific Research. Quantification and control of livestock production constraints in Zambia — *A multidisciplinary approach project proposal for 1985, LPRC*, Chilanga, Zambia.



- Okaka, W.T., Miguanga, G.A., Ngaira, J.K. and Mbege, J. (2008). Value addition issues in harnessing bio-energy resource products for Socio-economic welfare in east Lake Victoria Basin. *Proceedings of Bio-ern/ Vices Scientific Conference*. Spece Resort Hotel, Muyonyo, Kampala, Uganda.
- Okebukola, P.O. (2001) Street and Nomadic Children Education in Nigeria. *Science Journal of Lagos State University*, 2(4): 44!50.
- Rockstrom, J. (2003). Resilience building and water demand management for drought mitigation. *Physics and Chemistry of the Earth*, 28, 869–877.
- Sule-Enyisi, I., Umoh, V.J., Whong. C.M.Z. and Abdullai, I.O. (2014). Aflatoxin-producing ability of fungal isolates from maize and maize products. *Biological and Environmental Journal for the Tropics*. Vol 11Number 2, June 2014such frequency, percentage and mean.
- Tibi, K.N and Aphunu A .(2010). Analysis of the cattle market in Delta state - The supply determinants, *African Journal of General Agriculture*, 6 (4): 199 -203.
- Thébaud B. (2002). Sécheresse et conflit pastoral au Niger oriental, *Foncier pastoral etgestion de l'espace au Sahel*. Paris: Karthala/Nordic Consulting Group. 103-172.
- Wohlt, J.E., Corcione, T.T and Zajac, P.K.(1998), Effect of yeast on feed intake and performance of cows fed diets based on corn silage during early lactation, *Journal of Dairy Science*. 81 (1998) 1345–1352.