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CONSTRAINTS AND SOME REPRODUCTIVE PROBLEMS OF RABBIT PRODUCTION IN MAIDUGURI METROPOLITAN COUNCIL AND JERE LOCAL GOVERNMENT AREA OF BORNO STATE, NIGERIA

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ABSTRACT

In order to determine the challenges faced by rabbit farmers and suitable strategies required to enhanced the survival of rabbit kits, information on constraints and some reproductive problems of rabbit production in Maiduguri Metropolitan Council (M.M.C) and Jere LGAs of Borno state was investigated. Structured questionnaire was administered to 100 respondents in M.M.C and Jere LGAs. It was found that low market value for rabbit, neonatal death and loss from theft or predators were the major constraints observed in rabbit production within the study area. Mortality was high among young rabbits (1-2 weeks old), and the average number of survived rabbit kits was 1 – 5 kits per litter. In addition, seasonal variation, poor management and housing design were the immediate causes of neonatal mortality in rabbit within M.M.C and Jere LGAs of Borno state. Improved housing design, pre-natal nutrition and peri-natal hygiene was therefore recommended.

Keywords: Rabbit, Mortality, Neonate, Hutches, M.M.C and Jere

INTRODUCTION

Rabbit production in most developing countries are basically targeted for family consumption, especially where high quality protein like meat, fish and eggs are needed (Pasupathi, *et al.*, 2014). Rabbit farming is significant to small scale farmers due to its low cost of production, high production potentials, adaptability to a wide range conditions, high efficiency in converting forage to meat, which contain low fat and sodium levels, it's indeed a shortest route of improving their livelihood (Szendrő *et al.*, 2012). Neonatal mortality is estimated to be around 16-20% especially under the intensive system of managements (Gedenne *et al.*, 2017). In Nigeria the rate of post-partum mortality in rabbit kits is disturbing, particularly during the early stage of life. According to Szendro *et al.* (2012), mortality is high in rabbit kits within 4 to 8 weeks' old and subsequently, it will decrease to zero when they reach 3 months or older, depending on the management and farmer's education in rabbit production. These and other factors definitely limits the production potentials and lowers the income generation of most rabbit farmers. (Coureaud *et al.*, 2000; Drummond *et al.*, 2000).

Although, rate of neonatal mortality in rabbit is high, it may be averted, when adequate care of their general wellbeing is properly managed (Szendrő *et al.*, 2012). Most common causes of neonatal deaths in rabbits include; abandonment of the litters which are usually of unknown causes, insufficient milk production, cannibalism, mutilation and delivery of a malformed

newborn. In other words, chances of neonatal survivals are largely dependents on the dam after delivery (Coureaud *et al.*, 2000). The diet of the pregnant doe also influences postpartum mortality in which case, feeds and water must be uncontaminated especially with rodent feces (Chah *et al.*, 2017). In Borno state, where most residence are faced with poverty, malnutrition and different health challenges due to boko haram insurgency, increase production of highly prolific animals with low cost of production and short reproductive cycle such as rabbits will enhance and support them in regaining back their loss means of livelihood. However, studies regarding the constraint and challenges of rabbit production in the state is limited. This paper therefore focused on providing information on some limitations of rabbit farming by assessing the challenges and causes of neonatal mortality among rabbit kits in house hold farms within Maiduguri and Jere local government areas of Borno State.

MATERIALS AND METHODS

Study Area

The study was conducted in house hold farms within Maiduguri and Jere Local Government Areas of Borno State. The State is located in Northeastern part of Nigeria situated at an altitude of 354m above the sea level. It lies between latitude 10.2°N and longitude 9.8°E. Seasons are predominantly the wet (June to September) and dry (October to May) seasons.

Temperature ranges from 15 – 48°C depending on the season, with relative sunshine of 7 - 9 hours daily. Humidity varies between 19 to 78% and remains at 45% during the wet season (Mayomi and Mohammed, 2014).

Data Collection and Statistical Analysis

Purposive sampling technique was use in collecting data, where fifty (50) structured questionnaires were administered each to rabbit farmers in MMC and Jere LGA of Borno State. The questionnaires were to provide responses on social demographic status of the respondents, season and seasonal variation effect, reproduction effectiveness, management practice

(type of housing, feed and feeding arrangement, source of water and sanitation), limitations and marketing of rabbits as carried out by Upton, (2004). Obtained data were analyzed using Descriptive statistic and GraphPad instant® version 3 was used as the statistical package for the analyses.

RESULTS

Table 1: Distribution of Social Demographic Uniqueness of the Respondents in the Study Areas

The social demographic status of the respondent showed that most (80%) of the rabbit farmers were males, married, literate and civil servants.

Table 1: Distribution of Social Demographic Uniqueness of the Respondents in the Study Areas

Variables	Frequency (%)	
	Maiduguri	Jere
Gender		
Male	36(72)	40(80)
Female	14(28)	10(20)
Marital status		
Single	17(34)	19(38)
Married	33(66)	31(62)
Major Occupation		
Farming	13(26)	13(26)
civil service	20(40)	8(16)
Trading	11(22)	9(18)
Student	6(12)	9(18)
Level of Education		
Informal	3(6)	4(8)
Primary	11(22)	2(4)
Secondary	10(20)	13(26)
Tertiary	26(52)	31(62)

Source: Survey Field Data (2021).

Table 2: Showing the Management Practice of Rabbit Production within M.M.C and Jere LGAs of Borno State

The management practice of farmers in the study areas were presented in table 2; and nearly all famers were newly introduced to the rabbit farming. Sixty-two percent (62%) of the respondents practices intensive or semi-intensive system of management.

Table 2: Management Practice in Rabbit Production within M.M.C and Jere LGAs of Borno State

Items	Frequency (%)	
	Maiduguri	Jere
Rabbit Keeping Experience (Years)		
<1	21(42)	20(40)
2-5	13(26)	15(30)
6-10	11(22)	6(12)
>10	5(10)	9(18)
Flock size		
1-20	38(76)	26(52)
21-40	9(18)	24(48)
41-60	3(6)	0(0)
Management System		
Intensive	27(54)	31(62)
Semi- Intensive	20(40)	16(32)
Extensive	3(6)	3(6)
Source of Labor		
Family	40(80)	35(70)
Hired	3(6)	11(22)
Both	7(14)	4(8)

Source: Survey Field Data (2021).

Table 3: Distribution showing the Types of Rabbit Feeds used in the Study Area

In table 3; below the types of rabbit feed used in the study areas were shown, kitchen leftovers and leafy vegetables were the most common feed use for rabbit in the study areas.

Table 3: Distribution showing the Types of Rabbit Feeds used in the Study Area

Items	Frequency (%)		P-value
	Maiduguri	Jere	
Leafy vegetables	21(42)	18 (36)	2.954
Other vegetables	9 (18)	12 (24)	1.440
Kitchen left over	14(28)	12 (24)	0.679
Others	6 (12)	8 (16)	0.198

Source: Survey Field Data (2021).

Some Major Constraints in Rabbit Production within M.M.C. and Jere LGAs of Borno State

The major constraints encountered by rabbit farmers in the study areas were those of poor capital, lack of breeding space, lost from theft or predators, diseases, neonatal death and marketing of adult rabbits as indicated in (Figure 1).

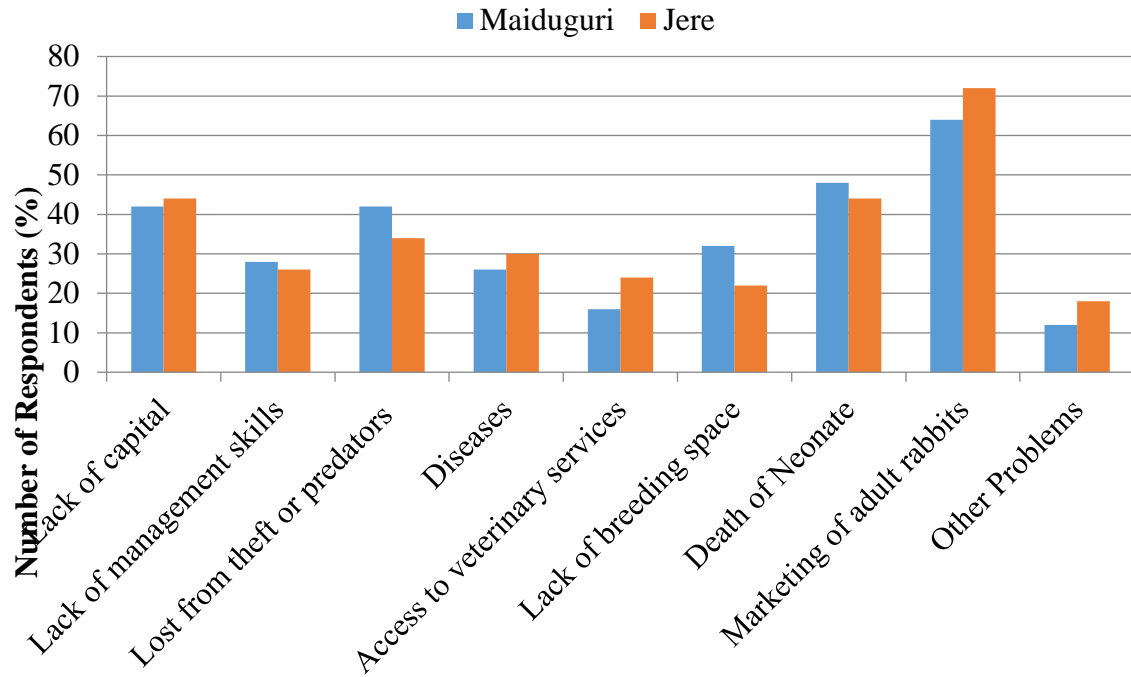


Figure 1: Histogram showing some Major Constraints in Rabbit Production within M.M.C. and Jere LGAs of Borno State
 Source: Survey Field Data (2021).

Some Reproductive Information on Rabbits within M.M.C. and Jere LGAs of Borno State Parameter

Regardless of the study area, most rabbits attained maturity between 6 -7 months of age, while 65 – 70 % of the respondents agreed that the average number of kits per doe were between 1–7 kits as indicated in figure 2.

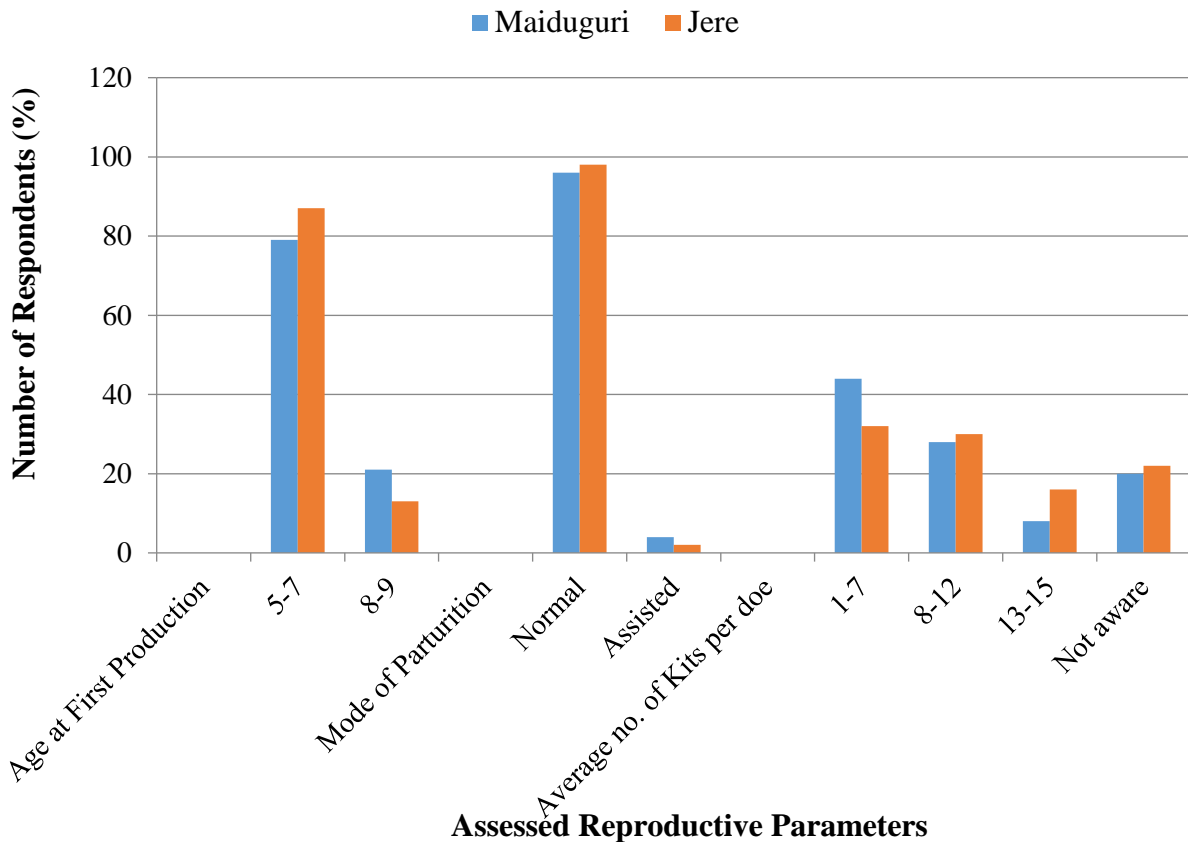


Figure 2: Histogram showing some Reproductive Information on Rabbits within M.M.C. and Jere LGAs of Borno State

Source: Survey Field Data (2021).

Some Reproductive Information of Rabbits within M.M.C. and Jere LGAs of Borno State

The average number of survived kits per birth was between 1-5 kits, many respondents (46 – 50%) disclosed that mortality is high in dry season than rainy season as indicated in figure 3

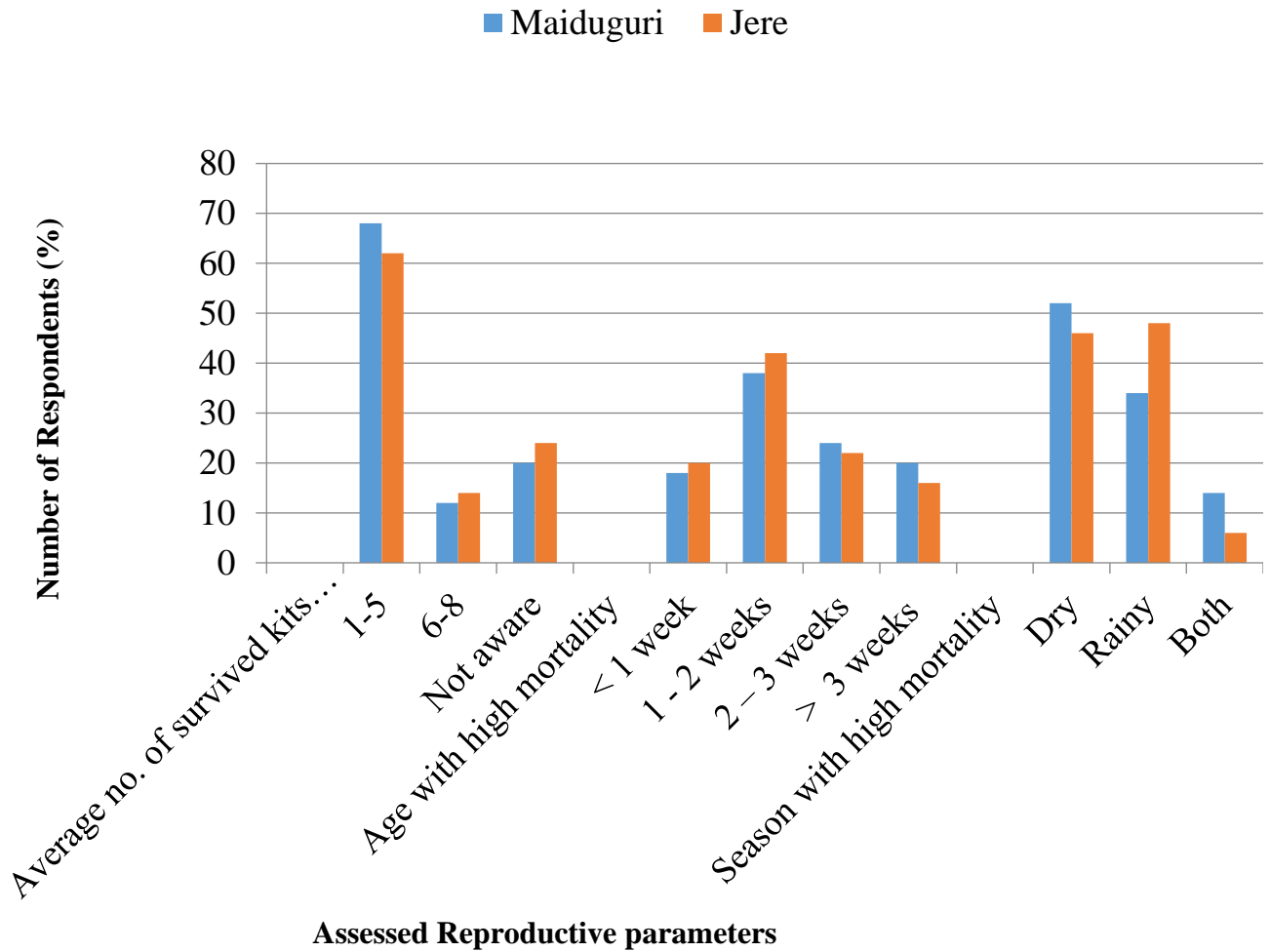


Figure 3: Histogram showing some Reproductive Information of Rabbits within M.M.C. and Jere LGAs of Borno State

Source: Survey Field Data (2021).

Rabbit Housing in which High Mortality is Observed within M.M.C and Jere LGAs of Borno State

Figure 4: Shows that high neonatal mortality is common in underground hutches than other housing designs. Rabbit farmers in Maiduguri and Jere experienced mortality in weaning stage but are more common in neonate especially between 1- 2 weeks of birth.

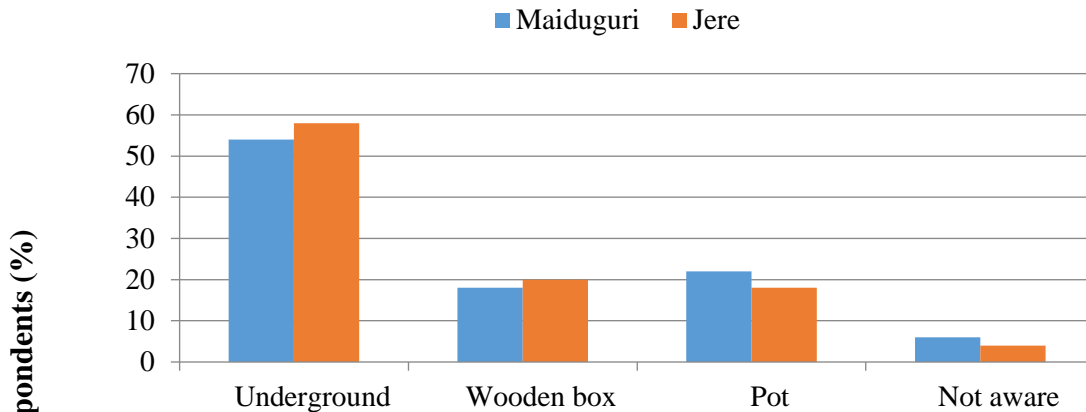


Figure 4: Histogram showing Rabbit Housing in which High Mortality is Observed within M.M.C and Jere LGAs

Source: Survey Field Data (2021).

DISCUSSION

Obtained data revealed that the social demographic status of the respondents (rabbit farmers) from the study areas were mostly male, this is similar to the report of Chah et al, (2017) and Sylvester *et al*,(2014) in Enugu and Zimbabwe respectively. Majority of the respondent in both Jere and Maiduguri were married, just as reported by Dairo et al, (2012). However, its contrary to the findings of Chah et al, (2017) in Enugu, this is because the culture and religion practiced in Borno encourages early marriage among youths. The study also revealed that most respondent have attended tertiary level of education as agreed by the report of Sylvester et al, (2014) in Zinbabwe, but differs with the findings of Dairo et al, (2012). In both M.M.C and Jere, rabbit production is still new a venture to most respondents, but some farmers especially in Jere were into the business for almost three (3) years, this finding correspond with the report of Chah et al, (2017) that only 7.5 % of the rabbit farmers in Enugu were having more than 10 years keeping experience, this indicate low patronage to rabbit farming in most Nigeria cities.

All year-round rabbit farming was the practice by most respondents in both study areas and this is because both areas share same geographic condition. However, Abu *et al*, (2008) stated that during dry season most rabbit lose weight, particularly in northern Nigeria. In addition, some farmers from Jere prefer dry season as their best time for rabbit production. In both M.M.C

and Jere farmers practiced intensive and semi-intensive system of management these may be attributed to the nature of their job (mostly civil servants) as also observed by Abu et al, (2008). Most respondents are small scale farmers with few stock (less than 20 rabbits) in their farms, which also agreed with the findings of Ozo and Madukwe (2005), this clearly indicate that rabbit production is not their major source of income and also demonstrating low demand for rabbit meat in the study areas. According to Mailu et al., (2014) that farmers in Taita -Tavet, Kenya keep few rabbits and mostly at subsistence level. The low income generated from rabbit productions may result from the meager resources injected in the farming business and the mentality of operating the rabbit farming bussiness on part-time basis as practice by most farmers in the area (Mensah et al., 2014). It was also observed that majority of rabbit farmers fed their rabbits with green leaves and kitchen left over, while in most rural and sub-urban areas, rabbits consume solely vegetable. The principal limitations faced by most rabbit farmers in the study areas include high neonatal mortality, lack of breeding space, non-readily available market for rabbit due to low demand for rabbit and rabbit product, lost from theft or accidents, lack of management skills and diseases, this observation was in conformity with the report of Owen, (2010). Some farmers disclosed that their rabbit attained maturity at early age (between 5-6 months) and usually kindle 6-8 kits per litter, these findings correspond to that of Abu *et al.*, (2008), most

farmers believed that due to excessive heat around April – June, majority of the kits delivered in underground hutches usually die as a result of heat stress, while on the contrary others think that more death is recorded during raining season, this is because most farmers did not provide proper housing for their rabbits, so when it rain heavily the kits will die of flood (Fayeye and Ayorinde 2010). Only few farmers housed their rabbits using pots and wooden boxes, although outdoor housing is often more expensive and defenseless but it has advantage over the indoors houses especially in terms of adequate ventilation and disease contamination, generally, rabbits are healthier in outdoor units (Chah et al., 2017). Conditions such as cannibalism, contamination, mutilation of the newborn, starvation (inadequate nutrition) and stampeding due to overcrowding were regards as major causes of neonatal mortality in rabbit, especially between day 1 to 14 post-partum. According to Pasupathi et al., (2014) neonatal mortality in rabbits is usually due to inadequate nutrition (decreased galactopois) which is mostly observed between 8 to 20 days of birth, while Bautista *et al.*, (2008) revealed that within the large rabbit litters, there is an intensive competition among littermates for dam's milk and weak kits of lower birth weight are more likely to die because of starvation. This may be due to decrease number of functional teats that occurred as a result of Mastitis. Bautista *et al.*, (2008) also reported that rabbit kits that died after 21 days are mainly due to pasteurellosis and hepatic coccidiosis. In addition, Drummond *et al.* (2000) revealed that the major causes of mortality in rabbit kits is due to weaking before 21 days and or respiratory diseases after three weeks of life.

CONCLUSION AND RECOMMENDATION

Low market value for rabbit, neonatal death and loss from theft or predators were among the constraints observed in rabbit production within M.M.C and Jere LGAs of Borno State. High mortality was observed in rabbit kittens between 1-2 weeks of age. Seasonal variation, poor management and housing design were the immediate causes of neonatal mortality in rabbit. Improved housing design, peri-natal hygiene and pre-natal nutrition is recommended to reduced congestion, risk of mastitis and enhancement of milk production respectively.

Authors Contribution

U.M Bamanga, S.O Asuku and M.H. Timta conceived the idea and designed the research, I.M. Alkali and R.I. Ali carried out the survey while A. Abba and D. Iliyasu wrote the first draft of the manuscript and finally A. R. Mustapha, M.M, Bukar

and A. M. Waziri reviewed the draft and make some correction.

Conflict of Interest

There is no conflict of interest in this work.

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