Original Research

Socio-Demographic Structure and Constraints of Smallholder Dairy Farmers in Oyo State, Nigeria

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Abstract

The contribution of dairy farming to the socio-economic development of Oyo state and Nigeria at large cannot be underestimated; we therefore sought to establish socio-demographic status and constraints of small holder dairy farmers at five milk collection centres built by FC WAMCO in Oyo state, Nigeria. Well structure close ended question-based questionnaires were administered in the study location. Farmer's demography revealed 63.64% and 36.36% male and female respectively, majority (46.54%) were between 30 and 40yrs. 73.82% do not have formal education, 40.18% reported 10 years of rearing. Major constraints identified were; lack of milking equipment reported by 97.64%, 93.82% reported lack of milk preservation facilities. 97.64% reported high cost of breeder stock. 51.82% were not aware of artificial insemination. Inaccessibility to good water was reported by 98.55%, 93.09% reported cattle rustling, 70% were not aware of any biosecurity measures.

Key words: Constraints, Dairy Farmers, Socio-demography, Smallholder, Oyo state

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Introduction

Livestock production is confronted with a number of constraints, which leads to low productivity and reduced profitability on the long run. Problems associated with reduced livestock productivity and profitability includes; inadequate consumption of protein of animal origin, poverty, unemployment, low contribution to the Nation's Gross Domestic Product (GDP) among others. Smallholder dairy farming has become popular in most developing countries (Mwenya, 1992; Banda *et al*., 2000; Ngongoni *et al*., 2006; Muchenje *et al.*, 2007). Nigeria with estimated population of livestock as follows; 19.5 million cattle, 72.5 million goats, 41.3 million sheep, 7.1 million pigs, 278,840 camels and 145 million chickens, 11.6 million

ducks, 2.1 million turkeys, and 974,499 donkeys (National Agricultural Sample Survey, 2011) making the nation the leading livestock producer in West Africa and rank number fourteen in world cattle production ranking by world ranking inventory (FAO, 2015). The smallholder dairy farmers form the bulk of milk producer in Nigeria though the demand is not being met locally which has led the country spending about N75 billion annually on importation of milk and dairy products. The annual demand for dairy products in Nigeria was estimated to be 1.45 billion litres, whereas the local production of milk in Nigeria was estimated to be around 450, 000 tons of milk per annum (FAO, 2010). The dairy industry is yet to be fully developed in Nigeria and in other West African countries. There is a need to develop the industry because of high demand for dairy products due to increasing population and increasing consumer knowledge and awareness about diet and nutrition,

The dairy sector has emerged as an important source of livelihood for a vast majority of the rural populace. Besides being a source of supplementary income and nutrition, the sector also provides draft power, fuel and organic manure. So many studies on constraints, objectives, prospects and challenges of small holder dairy farmers have been done in Kenya, Uganda and some other Africa countries. However, in Nigeria little is known of the challenges and constraints confronting smallholder dairy farmers especially with the operation of Friesland Campina WAMCO Nigeria in Oyo state. This study highlighted socio demographic structure and challenges encountered by smallholder dairy farmers in Oyo state, Nigeria and recommendations suggested.

Materials and Methods

The study was carried-out at Five Milk collection centres built by FC WAMCO operate in Fasola, Maya, Alaga, Iseyin communities, all in Oyo State, Nigeria. Oyo state covers approximately an area of 28,454 square kilometres.

Structured questionnaires (pre-tested) through interviews were used for data collection. The questionnaires were pre-tested on 60 small holder dairy farmers randomly selected from one of the milk collection centres. Face to face interview schedule and questionnaire approach were used. The questionnaires which were divided into four sections with each section addressing one objective, which are cattle farmers demography, constraints associated with milk transaction, constraints associated with cattle reproduction and management and constraints associated with feeds, weather and diseases respectively. 550 cattle farmers comprised (350 males and 200 females) selected using stratified random sampling were interviewed. We sought consent of the participants and assured them that information from them will be taken with high level of confidentiality. The farmers were interviewed through an interpreter based on the structured questionnaire designed for the study in line with the standard design by (Waters-Bayer and Bayers, 1994).

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Statistical Analysis

600 questionnaires were initially administered, during collation and sorting, 50 were rejected due to incomplete information and error of interpretation. Analysis was done on the remaining 550 questionnaires, which represented 91% of the response rate. Any response rate above 70% can be used as representative of the sampled population (Mugenda and Mugenda, 2003). The results were analysed based on simple descriptive statistical analysis.

Results and Discussion

Socio-demographic Status of Smallholder Dairy Farmers

Socio-demographic structure of small holder dairy farmers in Oyo state showed that there were more men than women in dairy farming (63.64 % males and 36.36 % females) respectively. This might be due to the fact that men are the heads of the families and they are the ones responsible for their households including their properties or possessions; men are also the ones that can ride motor cycles which are the major means of transportation from their various farm locations to the milk collection centres. This is in agreement with the findings of Adebowale *et al*. (2016), in which they reported 71.8 % men and 14.6 % as women in their study conducted on commercial poultry farming in southwest Nigeria. Ogunniyi *et al*. (2014) also reported 90 percent males and 10 percent females engaging in livestock farming in Oyo state. This is also similar with the findings of Obi (2016) who reported 67.2 % males and 32.8 percent females as the herdsmen/livestock farmers' structure in Anambra state, Nigeria. It also agrees with the findings of Portal (2016) who reported 59.6 % males and 40.4 % females engaging in dairy farming in Uganda. On farmers' age, the larger percentage of 46.54 % was within age bracket of 30-40 years, while just 1.45 % of the farmers were less than 20 years of age. This age structure is similar to the findings of (Ogunniyi *et al*., 2014) who also reported a similar trends in the ages of livestock farmers in Oyo state as follows; age group 40-49 years 52.5 % for poultry farmers, 32.5 % for piggery farmers and 37.5 % for goat farmers compare to ages 30-39 years that have 12.5 % for poultry, 17.5 % for piggery and 2.5 % for goat farmers.

Obi (2016) in Anambra state Nigeria, also reported larger percentage of 62.5 % for ages between 31-50 years old. This finding is in line with the findings of Rathod *et al*. (2012) who reported that higher proportions of farmers in India were in their middle ages. Ichaura (2013) in southern part of Kenya also reported similar trend of older people gotten involved in dairy farming compared to younger ones. On small holder dairy farmers educational status in Oyo state, highest percentage (73.82 %) of the farmers did not possess formal education, while the least percentage (2.91%) had tertiary educational status, this agrees with the report of (Bamaiyi, 2013) who reported that low level of education is one of the factors affecting animal production in Nigeria. This disagrees with the findings of Obi (2016) who reported 36.2 % with no formal education and 39.1 % with secondary educational status. This is also dissimilar to the reports of

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(Uddin *et al*., 2012) in Bangladesh, who reported highest percentage (65 %) of the farmers with primary educational status followed by farmers with secondary educational status (17.5 %). It implied that there was high level of illiteracy among the respondents because over 70 % of the smallholder dairy farmers were illiterate. This might be due to the fact that majority of these farmers were nomadic Fulani's which made it difficult for majority of them to attend schools. On years of rearing, majority (40.18 %) had about 10 years' experience and the least number of farmers 14.73 % had more than 20 years of rearing experience. This is also in concordance with the findings of (Ogunniyi *et al*., 2014) in Oyo state, where a similar situation of rearing experience by livestock holders was reported, farmers within age range of 6-10 years were more when compared to 15 years and above that were very few. Farmers between age bracket 6-10 years were 65 % poultry farmers, 5 % piggery farmers and 35 % goat farmers compared, 15 years of age which were 12.5 % poultry farmers, 0 % piggery farmers and 17.5 % goats farmers respectively. Water sources by the respondents indicated 60.18% of the farmers' derived water from rivers and stream, 31.45% sought from dams, 6.18% sought from well and very few numbers of farmers 2.18% sought from boreholes. These findings differ from the reports of Manza *et al*. (2017) who reported that farmers differed, in the North Eastern Nigeria possessed improved water sources and advanced water provision techniques such as automatic water bowl, bore holes, water tanks provision and so on. Majority of farmers in this study indicated surface water as the source of water for their animals. This might be attributed to relative free access by animals, unlike well and municipal water which require human or mechanical efforts to provide water for the animals. Surface water might be a potential source of disease spread among animals as it can easily be contaminated. Surface or ground water contamination is a health risk for both human and animals alike, and the associated ecosystem (Gilchrist *et al*., 2007). The higher percentage of small holder dairy farmers indulging in extensive system of management agrees with the findings of Uddin *et al.* (2012), who reported 85.9 % extensive and 14.1 % intensive management among small holder dairy farmers in Bangladesh.

In general, the socio demographic structure of small holder dairy farmers in Oyo state is similar to the findings of Ajayi (2010) who reported that smallholder dairy farming in Enugu state, Eastern Nigeria has remained subsistence and less commercial. Whereas, our findings were slightly different from the findings of Saleh *et al*. (2016), who reported improved socio-economic structure for dairy farmers in 16 states of Northern Nigeria (Table 1).

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Table 1: Smallholder dairy farmers' demography

S. No.			Frequency	Percentage
1	Sex	Male	350	63.64
		Female	200	36.36
2	Age	Less than 20	8	1.45
		20-30	109	19.82
		30-40	256	46.54
		40-50	162	29.46
		Above 50	15	2.73
3	Level of Education	Primary	102	18.55
		Secondary	26	4.73
		Tertiary	16	2.91
		No formal education	406	73.82
4	Period/Years of Rearing	Less than 5	109	19.82
		Less than 10	221	40.18
		Less than 20	139	25.27
		Greater than 20	81	14.73
5	Sources of Water	Well	34	6.18
		Borehole	12	2.18
		Dam	173	31.45
		River and stream	331	60.18
6	System of Management	Rural household/ backyard	0	0
		Extensive	400	72.72
		Semi-intensive	150	27.27

Constraints Associated with Milk Production

Majority percentage of respondents (75.27 %) agreed that low milk yield was a constraint; this is in conformity with the earlier report of the station experiment carried out by NAPRI, Zaria, which gave a consistent average of 1.70 litres for *bunaji* breed, 27 litres for crossbreed and 35 litres for Friesian dairy cattle (Ehoche *et al*., 1999). Similar findings were also discovered by Wachira (2015) in Kenya where smallholders dairy farmers reported low milk yield due to several reasons. The low milk prices reported as constraint by 78 % of the farmers as seen in this present study agrees with Nakiganda *et al.* (2006) who reported that low milk prices was seen as constraint by greater number of small holder rural dairy farmers in Uganda. This also agrees with the findings of Rathod *et al.* (2012) who reported that majority (82 %) of the farmers complained of low price of milk. Kotresh Prasad *et al.* (2017) also reported low milk prices as a major constraint faced by dairy farmers in India.

The greater number of smallholder farmers (93.82 %) reported lack of milk preservation facilities. This is similar to the findings of Zeqiri *et al*. (2015), who reported that greater percentage of farmers in Kosovo 86.7 % do not possess cooling tanks, which is a prerequisite for attaining milk safety and high-quality standards (Table 2).

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Table 2: Constraints faced by small holder dairy farmers associated with milk production

Constraints	Number/Percentage Positive/Yes	Number/Percentage Negative/No	Number/Percentage (Unaware/undecided)
Low milk yield	414 (75.27 %)	39 (7.09 %)	97 (17.64 %)
Milk purchase on credit	14 (2.55 %)	505 (91.82 %)	31(5.64 %)
Low milk price	429(78.00 %)	106 (19.27 %)	15 (2.73 %)
Inadequate milk demand	02 (0.36 %)	544 (98.91 %)	04 (0.73 %)
Lack of milk preservation facilities	516 (93.82 %)	19(3.45 %)	15 (2.73 %)
Low/poor milk quality	81 (14.73 %)	253(46 %)	216 (39.27 %)
Lack of milking equipment	537(97.64 %)	03(0.55 %)	10 (1.82 %)

Constraints Associated with Cattle Reproduction and Management

The widespread variations in the responses of the small holders' dairy farmers on constraints associated with cattle reproduction and management generally agrees to the observations by Duguma *et al.* (2011) who reported in their study of Analysis of Constraints Facing Urban Dairy Farmers and Gender Responsibility in Animal Management in Jimma Town, Libya. Greater percentage of the farmers (51.82%) were not aware of artificial insemination, 68.55% were not aware of failure of artificial insemination, 75.09 % reported that mastitis was not a constraint, 79.09 % disagreed that failure of conception was a constraint, this may be due to the fact that majority of these small holder farmers in the study locations are illiterate, thereby reducing their ability to understand most of these concepts. These findings are in line with the findings of (Dabas *et al*., 2004). About 92% of the respondents reported high cost of transportation as constraint, transportation challenge had been earlier reported by (Saleh *et al*., 2016) as one of the major constraints to dairy farming in the 16 Northern states of Nigeria. The water quantity and quality challenges reported by the majority of the farmers as constraints were not in agreement with the findings of Mamza *et al*. (2017) who reported that livestock farmers in the North-Eastern Nigeria had adequate access to water in quality and quantity.

The greater percentage of the respondents (70 %) were not aware of basic biosecurity measures as seen in this present study, this may justify the reason for their low milk yield. This is different from the findings of Mamza *et al*. (2017) who discovered that farmers paid better attention to animals' environment management practices such as manure management, footbaths and aprons to attendants, quarantine and vaccination practices. The animals' manure management practices by farmers is similar to the earlier report of Abiola and Olaogun (2016), who reported 45 % of livestock farmers in Oyo state operating open dumping system. (Table 3).

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Table 3: Constraints faced by smallholder dairy farmers associated with cattle reproduction and management

Constraints	Number/Percentage Positive/Yes	Number/Percentage Negative/No	Number/Percentage (Unaware/undecided)
High cost of breeder stock	537 (97.64 %)	5 (0.91 %)	8 (1.45 %)
Determination of good breeder stock	362 (65.82 %)	164 (29.82 %)	24(4.36 %)
Access to artificial insemination service	168 (30.55 %)	97 (17.64 %)	285(51.82 %)
Failure of artificial insemination	150 (27.27 %)	23 (4.18 %)	377 (68.55 %)
Mastitis	109 (19.82 %)	413 (75.09 %)	28(5.09 %)
Failure of conception	48 (8.73 %)	435 (79.09 %)	67 (12.18 %)
High cost of transportation	504 (91.64 %)	07 (1.27 %)	39 (7.09 %)
Accessibility to adequate quantity of water	536(97.45 %)	10 (1.82 %)	04 (0.73 %)
Accessibility to good quality water	542 (98.55 %)	06 (1.09 %)	02 (0.36 %)
Cattle rustling /Insecurity	512 (93.09 %)	37 (6.73 %)	01 (0.18 %)
Biosecurity	155 (28.18 %)	10 (1.82 %)	385 (70.00 %)

Constraints Associated with Feeds, Weather and Diseases

The challenges faced by the smallholder dairy farmers related to feeds, weather and diseases indicated greater number of the respondents identified high cost of concentrate feeds as constraint; this is in line with the report of Panchbhai *et al*. (2017) who reported high cost of feeds as a major constraint faced by Indian farmers. It might be due to low productivity of crops being used as concentrate, unfavourable climatic condition and competition for grains concentrate between human and animals, farmers-herders conflict, deforestation and overgrazing which would have been hampering crops productivity in the study area. This also agrees with the findings of (Kamala Kant *et al*., 2015) in India. Majority of the respondent (86.55 %) identified farmers' herders' conflict as constraint, this might be due to uncontrollable animal movement associated with pastoralism and extensive system of management being practiced by most of the small holder's farmers in the study area. It may also be as a result of inadequate pasture due to unchecked deforestation associated with charcoal production and uncontrollable tree felling going on in the study area. About 82.09 % of the respondents were not aware of dairy meal; this may be the reason why milk yield was very low as animals were only being fed with grasses and pastures after covering several kilometers for 8-10 hours per day in search of feeds.

Relatively greater number of farmers reported prolonged draught as constraint. This unfavourable climatic condition results in inadequate water for livestock, pastures and people, leading to reduced milk yields, famine, reduced income and poor economic situation. Heat stress associated with prolonged draught can predisposes animals to diseases, impacts animal production and profitability by reducing feed intake, milk production and reproduction. Ectoparasitism was identified by greater percentage of the respondent (98.91 %) as constraint; these may not be unconnected with the effects of ticks, flies, perking birds, mites, fleas,

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keds and so on, these ectoparasites suck blood, transmit infectious organisms, cause disturbances thereby hampering productivity and profitability of smallholder dairy farmers in general. Our findings are also in conformity with the reports of (Kanui *et al*., 2016) in Kenya (Table 4).

Table 4: Constraints of the smallholder dairy farmers associated with feeds, weather and diseases

Constraints	Number/Percentage Positive/Yes	Number/Percentage Negative/No	Number/Percentage (Unaware/undecided)
High cost of breeder stock	537 (97.64 %)	5 (0.91 %)	8 (1.45 %)
Determination of good breeder stock	362 (65.82 %)	164 (29.82 %)	24(4.36 %)
Access to artificial insemination service	168 (30.55 %)	97 (17.64 %)	285(51.82 %)
Failure of artificial insemination	150 (27.27 %)	23 (4.18 %)	377 (68.55 %)
Mastitis	109 (19.82 %)	413 (75.09 %)	28(5.09 %)
Failure of conception	48 (8.73 %)	435 (79.09 %)	67 (12.18 %)
High cost of transportation	504 (91.64 %)	07 (1.27 %)	39 (7.09 %)
Accessibility to adequate quantity of water	536(97.45 %)	10 (1.82 %)	04 (0.73 %)
Accessibility to good quality water	542 (98.55 %)	06 (1.09 %)	02 (0.36 %)
Cattle rustling /Insecurity	512 (93.09 %)	37 (6.73 %)	01 (0.18 %)
Biosecurity	155 (28.18 %)	10 (1.82 %)	385 (70.00 %)

Conclusion

This survey has been able to reveal that high illiteracy among smallholder dairy farmers, production system majorly extensive and subsistence with little or no technological and innovative input. There are mirages of challenges confronting the sector in Oyo state, Nigeria ranging from production to processing, preservation, storage, value addition and marketing.

Based on the findings of the survey it could be recommended that in order to improve smallholders' dairy farmers' productivity and profitability the various challenges identified by the farmers must be worked upon by the concern's stakeholders. Cooperative among farmers should be encouraged, trainings and workshops should be organized from time to time for the farmers, subsidies should be provided by NGO's to the farmers, Loan should be made available with minimal interest rate, enabling environment and legal frame-work policies for strategic dairy sector development should be enacted and promoted by the government.

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