APR -17

Cattle Milk Processing Among the Smallholder Agro-Pastoralists in Kaduna State, Nigeria

I.I. Adedibu[1], A.O. Iyiola-Tunji[2] and T.K. Gambo[1]
[1]Department of Animal Science, Ahmadu Bello University, Zaria, Kaduna State Nigeria
[2]National Agricultural Extension and Research Liaison Services, Ahmadu Bello University, Zaria, Nigeria
Corresponding author: I.I. Adedibu; E-mail:iiipinyomi@yahoo.com, +2348036001668

Abstract
A survey was carried out among smallholder farmers in Kaduna State, Nigeria to understand the mode of milk processing carried out by them. The study was conducted at Giwa and Kauru Local Government Areas of Kaduna State. A total of 44 established cattle milk producers who also process and market the milk and dairy products were randomly selected. Data generated were analysed using frequency counts and percentages through Statistical Package for the Social Sciences. Majority (38.6%) of the agro-pastoralists were within the age range of 41-50 years of age. The males agro-pastoralists were more (72.7%) than the females (27.3%). 91.9% of the respondents were literate thus able to collect data if required. The respondents all process the fresh milk within the hour of collection. They pasturise (100%) and processed this milk into sour milk (100%), buttermilk (56.8%) and a few process into cottage cheese (2.3%). The respondents derived various social and monetary benefits from the processing and sales of their dairy products.

Keywords: Cattle, milk processing, milk products, agro-pastoralist

Introduction

Milk is widely acceptable with no known taboos associated with its consumption and use (Belewu, 2006). Milk is a highly nutritious food which is highly perishable due to high ambient temperature of the Nigeria but the shelf-life can be extended through processing into other more stable products such as yoghurt, cheese, buttermilk which may not require refrigeration. The processing of milk into dairy products such as cheese, sour milk, yoghurt, butter, buttermilk aside from increasing shelf-life also increases the premium paid by consumers because of value-addition over and above the amount payable for fresh milk (Gegner, 2001).

The objective of this study is to evaluate the mode of cattle milk processing among the agro-pastoralists in Kaduna State, Nigeria.

Materials and Methods

The study locations were Giwa Local Government Area (LGA) in the North and Kauru LGA in the Southern parts of Kaduna State. Theagro-pastoralists rear White Fulani (*Bunaji)* cattle breed primarily but cultivate food crops such as maize, sorghum, millet and soybeans. The cattle were grazed in the morning after milking on natural forages and crop residues. They were corralled in the night in the open field, near the homestead. Calves wereseparated from their dams prior to milking. Cows were partially milked once a day in the morning, the remainder of the milk being suckled by the calves.

Giwa and Kauru LGAs were purposively selected for the study due to the high level of cattle milk production, processing and marketing in the locations. A total of 44 established cattle milk producers who also process and market the milk and dairy products were randomly selected for this study. A cross-sectional research design was used for the study such that all the data was collected once and during the same period (Adedibu *et al.* 2013). The data were collected through focus group discussions and in-depth interview; meetings and discussions organized with various stakeholders and target groups involved in cattle milk production, processing and marketing. The interviews were targeted at key informants. Guided discussions and in – depth interviews were organized to elicit relevant data in line with the objectives of the study.

Data generated were analyzed using frequency counts and percentages through Statistical Package for the Social Sciences (SPSS, 2008).

Results and Discussion

The socio-economic distribution of the agro-pastoralist in this study (Table 1) indicated that the highest participation (38.7%) in milk processing fell between 41-50 years of age.The majority (70.5%) of the agro-pastoralists had obtained Arabic education while some had primary or secondary level education. This result implied that majority of the respondents would be able to properly document any information if required during

any formal research undertaken (Adedibu *et al*., 2013).A majority (72.7%) of the agro-pastoralists were male. This indicated that cattle business may be male biased.

Table 1: Age Distribution of Respondents

Age (years)	Frequency	Percentage
23-30	9	20.5
31-40	5	11.4
41-50	17	38.6
51-60	9	20.5
61-70	4	9.1
Total	44	100.0

Table 2: Level of education

Level of education	Frequency	Percentage
Arabic	31	70.5
Primary	7	15.9
Secondary	2	4.5
No-formal	4	9.1
Total	44	100.0

Table 3: Sex of the respondents

Sex	Frequency	Percentage
Male	32	72.7
Female	12	27.3
Total	44	100.0

Majority of the respondents (63.6%) processed the milk within an hour of collection (Table 4). This could be due to the due to the nature of milk as milk in the udder of a very healthy cow is not sterile having about 500 microorganisms per milliliter (Ihekoronye and Ngoddy, 1985). All the respondents pasteurized the collected milk (Table 5). They also processed into sour milk or *kindirmo*, buttermilk or *manshanu* and a few process into cottage cheese *wara*. The products into which the milk is processed is indicative of the typical smallholder processing units in arid, semi-arid regions of Africa and India (Falvey and Chantalakhana, 1999). Their milk and products are mainly for personal consumption and marketing within their immediate environment. The sour milk is a staple diet in these regions taken with millet meal balls or thick maize porridge (Falvey and Chantalakhana, 1999).

Table 4: Distribution of respondents based on storage time

Time (hours)	Frequency	Percentage (%)
0-1	28	63.6
1-2	16	34.4
Total	44	100.0

Table5: Distribution of respondents based on the methods used for preventing milk spoilage

Methods	Frequency	Percentage (%)
Pasteurization	44	100.00
Processed into cheese	1	2.30
Processed into butterfat	0	0.00
Processed into sour milk	44	100.00
Processed into buttermilk	25	56.80
Processed into Yoghurt	0	0.00
Unprocessed	0	0.00

*Multiple responses were allowed

The results (Figure1) showed that milk processing is a veritable tool in alleviating poverty in the smallholder farmers because it is value-addition venture (Gegner, 2001) generating revenue for the respondents. This study agrees with previous reports (World Bank, 2011; Faye and Konuspayeva, 2012) that processing of milk into dairy products attracts higher income and quick returns to the small-scale dairy producers rather than selling raw milk.

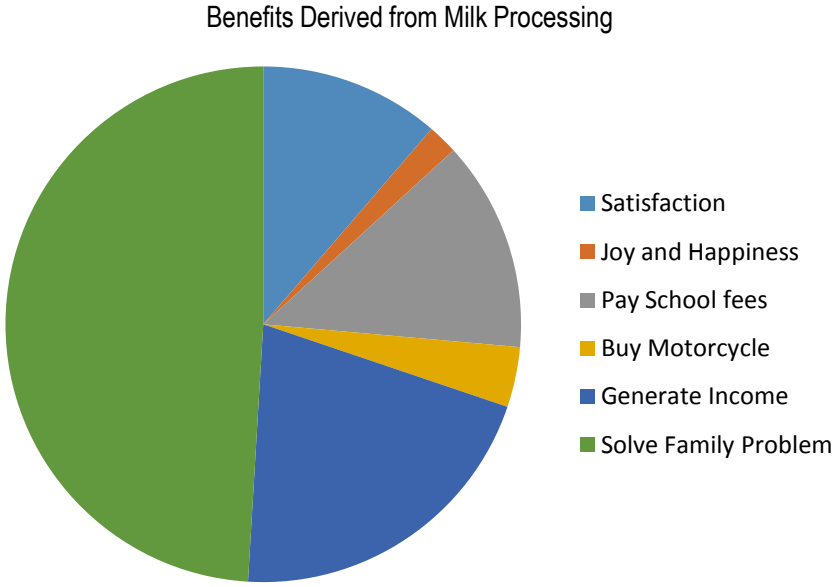

Fig. I: Pie chart showing the benefits derived from milk processing

Conclusion and Recommendation

The cow milk is usually pasteurized and processed within the hour of collection into sour milk, buttermilk, cottage cheese. The processing of the milk brought financial benefits to the agro-pastoralists.

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