

Research Article

Analytical Study of Household Consumers' Food safety Awareness level Regarding Milk and Milk products in Khartoum - Sudan

Mubark Y.H. ElnouR¹, Nahid M.T.Fawi² and Adil M. A. Salman^{3*}¹Researcher, University of Bahri, Faculty of Veterinary Medicine, Khartoum, Sudan²Associate Professor, University of Khartoum, Faculty of Animal Production, Department of Dairy Production, Khartoum, Sudan³Professor University of Bahri, College of Veterinary Medicine, Dept, of Food Safety and Veterinary Public Health**Article History**

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Abstract: This research aimed at analyzing household consumers' food safety awareness level regarding milk and milk products in Khartoum state - Sudan. Study was based on primary data collection using a scientifically structured questionnaire that addressed food safety parameters. A total of 150 consumers located in various geographical areas in the state were the sample of the study where they were chosen on a stratified random base. Collected data was analyzed using Statistical Package for Social Science (SPSS), to obtain frequency of distributions and chi-square values. Main results showed that 17.3 % of respondents purchased processed milk; 60.7% of these respondents purchased processed milk based on product brand; while 82.7% purchase fresh raw milk. Most of the consumers under study 79.8 % favored fresh raw milk over processed milk for their belief in its high quality compared to 20.2 % who favored fresh raw milk over processed milk due to its affordable price. 100% paid considerable attention to post purchase milk treatment; 50.7 % of respondents assured they were not satisfied with safety of milk in Khartoum state. 61.5% of consumers indicated they trust raw milk quality. Education level had non-significant effect on type of milk purchased, place of milk purchase -whether groceries or street vendor, type of utensils used- whether plastic or stainless steel and Product label reading. The study was concluded that more effort to be performed in understanding consumer perceptions and preferences to enable policy makers and dairy industry players to make practical decisions that could leverage food safety and awareness programs to avoid hazards and risks associated with contaminated milk and milk products consumption hence insuring a healthy society.

Keywords: Milk – food safety- awareness – household consumers-brand- Khartoum.

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INTRODUCTION

Food safety can be expressed as the degree of confidence that food will not cause any sickness or harm to the consumer when prepared, served and eaten based on its intended use [1]. It was also defined as the conditions and measures required for production, processing, storage, distribution and preparation of food in order to assure that it is safe, sound, wholesome, and fit for human consumption [2]. The last decade has pushed forward the concept of food safety as a significant quality of food [3]. Consciousness related with health is on the rise nowadays in addition to flourishing predispositions for improvements in well-being and health as a result of food choices [4], where health risks related with food consumption have started to cause more concern among consumers during the past decade [5], it is expected that interest in safe foods will increase as a result of social and political environments [6].

Consumers in the food chain are considered to be the main pivot that balances the business and marketing of food products. When addressing consumer food preferences, food safety influences the perceptions of consumer's decisions related with food preferences [7], where personal responsibility related with food safety should be well noticed as a mandatory factor for putting appropriate food safety behaviors into practice [8]. In addition physiological and behavioral factors related with consumer experience are all influenced by sensory properties of food products thereby applying pressure on consumer perceptions [9], thus inconsistencies related with attitudes and behaviors of consumers are especially important [10]. Psychological factors related with foods influence the selection of food greatly in comparison with the physical attributes of food products. Awareness of risks related with food safety have significant effects on both the behavior and attitude of consumers during the decision making process for purchasing [11]. Consumers use their senses for experiencing the appearance, taste, scent and texture

of the product [12] where consumer satisfaction in developed countries has transformed into a more daunting task for producers due to increasing critical and varied demands of consumers regarding food selection thus resulting in both vertical and horizontal quality differentiation [3].

The importance of this research arises from the fact that milk and milk products are of high demand and priority in Sudanese food culture implying the fact that food safety awareness among consumers should be analyzed thoroughly.

The objectives of this study were to assess consumers' awareness regarding food safety and the factors affecting their purchase decision; to analyze food safety practices performed by consumers' at the point of product purchase and to profile consumers' food safety knowledge.

MATERIALS AND METHODS

This study was performed in Khartoum State, during the year 2020; research was based on primary data collection using a cross-sectional questionnaire that was designed to meet the objectives of the study. Personal interviews were performed with consumers under research to collect the primary data.

A stratified random sample of 150 consumers comprised the sample of the study where respondents were selected from various parts of Khartoum State-Sudan. Stratification criteria included that the respondents should be family households who purchased and consumed fresh milk and/or processed milk products.

Collected data was further analyzed using the statistical package for social science (SPSS) version 21.0 to obtain frequency of distribution in addition to Chi-square values for certain variables under study.

RESULTS AND DISCUSSION

Upon analyzing the demographic profile of consumers under study almost one third 34.7% ranged between the ages 36-45 years. As for education level 64.7 % were of intermediate and secondary education whereas 35.3% were university graduates. As for type of milk purchased most of the respondents 82.7 % assured purchasing fresh raw milk in comparison to 17.3 % who purchased processed milk. Such a result indicates strong consumer preference for raw milk a fact that should be taken into consideration when addressing food safety hazards that could affect consumers. A result that aligns with Fawi & Abdalla [13] where that the majority of consumers in Khartoum State preferred fresh milk 88.7% compared by 42.0% who preferred processed milk. Table 1

Table-1: Demographic respondents' parameters; type of milk purchased

Item	%
Age of respondents	
20-35	22.7
36-45	34.7
46-55	19.3
< 55	23.3
Respondents educational level	
Intermediate	37.35
Secondary	27.35
University graduates	35.3
Post graduate	00.0
Type of milk purchased	
Fresh raw milk	82.7
Processed milk	17.3

When studying purchase source of fresh raw milk 46.8 % of the respondents preferred local groceries, 22.6 % preferred purchasing from milk men vendors, 16.1% purchased from pickup vendors while 14.1 % purchased directly from farms. Such a result reveals level of trust variation among consumers where it is clear that local groceries distributed within houses hold most preference for milk purchase, this could be attributed to convenience of place and consumers good link with sales man in such groceries. In India the emergence of modern milk marketing chains is posing stiff competition for the existence of traditional milk market agents, however, the basic

structure of milk production and marketing is not likely to change significantly in the near future and therefore, the dominance of traditional milk market chains will continue to persist in spite of the rapid growth of the organized and formal milk marketing chains [14].

Most of the consumers under study 79.8 % favored fresh raw milk over processed milk for their belief in its high quality compared to 20.2 % who favored fresh raw milk over processed milk due to its affordable price, a result that clearly indicates that milk quality is of high priority when taking purchase

decision. Impressively more than half of respondents under study 50.8% used stainless steel containers when purchasing raw milk compared to 33.1% who used plastic containers, a result that indicates a considerable level of awareness regarding food safety that can be further increased via strong extension services. Quality of fresh raw milk is of high priority for consumers when making their purchase decision where more than half of respondents 69.8% assured such a result. Kumar and Babu [15] stated that consumers perceive the quality of milk and dairy products on several perspectives and not only based on senses where upon regarding product quality, consumers are interested in sensory attributes such as taste or aroma, health aspect, comfort attributes and process attributes. When analyzing processed milk profile purchasers; 61.5% of

consumers indicated they trust raw milk quality and trust processed milk quality. 60.7% of respondents purchased based on product brand, 42.3% paid considerable attention to package label reading, and further 48.8% assured product brand is the most important item read on product label. These results indicate the strong influence of brands on consumer purchase decisions. Njazi *et al.* [16] in a study in Kosovo showed that 85.2% of consumers claimed that the date of product production is the factor that mostly cares consumers when buying milk and dairy products, followed by the product composition, whereas brand and the origin of the product were of no particular attention to consumers when buying milk and dairy products. Table 2.

Table-2: Fresh milk and processed milk purchase profile

Item	%
Fresh milk profile	
Fresh milk source of purchase	
Local grocery	46.8
Milk man (donkey man)	22.6
Pickup vendors	16.1
Direct from the farm	14.5
Reasons for favoring fresh milk over processed milk	
High quality of fresh milk	79.8
Affordable price of fresh milk	20.2
Type of utensil used when purchasing fresh milk	
Plastic bag	33.1
Plastic container	16.1
Stainless steel container	50.8
Most important factor affecting fresh milk purchase decision	
Quality of fresh milk	69.8
Price of fresh milk	20.0
Sales man and Selling area cleanliness	8.2
Type of selling place	2
Processed milk profile	
Reasons for favoring processed milk over fresh milk	
Don't trust fresh milk quality	34.6
High quality of processed milk	3.9
All of the above	61.5
Most important factor affecting processed milk purchase decision	
Product brand	60.7
Date of safe product usage	20.4
Product price	12.9
Product quality	6
Consumer pays considerable attention to reading product label	
Yes	42.3
No	30.8
Sometimes	26.9
Most important item in product label from consumers point of interest	
Date of safe product usage	30.6
Company name (brand)	48.8
Nutritional information	20.4
Processing method	0.2

Upon studying consumer after purchase behavior for product treatment impressively all respondents 100% paid considerable attention to treatment measures from sieving, boiling etc. and such a result reveals that consumers are keen to perform food

safety measures to protect their families. Consumers in modern world have become more concerned about health and food issues [17]. In developed countries, factors such as care for healthiness and environmental issues play an increasingly important role in food

choice [18]. When it comes to consumers knowledge regarding information about processed milk manufacture 48.7% indicated they have no enough knowledge compared to only 2% who owned such information, this result raises a clear fact that food culture is of high effect on purchase decision in addition to poor promotion quality of companies that should contain more nutritional and processing information about products, especially as 46.7 % of respondents indicated they don't trust promotional campaigns regarding processed milk quality and safety.

As for experiencing health issues after milk consumption 80% of respondents didn't experience medical issues, and for those encountering such issues 79.9% assured it was from processed milk, a fact that could need more research to prove such an issue. When addressing consumer measures taken after encountering health issues from milk consumption 43.3% stated they changed the place where they usually bought milk from in comparison to 40% who changed type of milk they consumed, such results clearly indicate the need for extension services that could fulfill consumers' food safety awareness measures. In a study in Khartoum, Barakat [19] found that that raw milk might cause hazards for human if it is consumed without pasteurization or heat treatment, it was recommended to

develop a program such as establishment of HACCP system for milk production, handling and dispatch.

As for Consumer satisfaction level considering safety and quality of milk in Khartoum state, 50.7 % of respondents assured they were not satisfied, moreover 65.3% suggested intensifying control over dairy farms for raising level of safety and quality of milk. Such a result calls for more action from governmental authorities regarding food safety measures to gain consumer trust. In china food processors initially sought HACCP certification to access export markets, HACCP is rapidly being adopted for domestic products and HACCP logos have begun to appear on labels in China, where consumers after receiving information on HACCP were willing to pay a modest price premium for HACCP-certified products, products with HACCP labels in Beijing supermarkets sold at a price premium of about 5% over products without such labels, holding other product attributes constant [20]. In Sudan several researchers reported the importance of milk in public health and that because of prevalence of some communicable diseases of milk and spoilage of this perishable product sanitary standards regulating milk production and marketing should be established for improvement of milk hygiene and quality [21, 22].Table 3.

Table-3: Consumer awareness concerning food safety measures and regulations

Item	%
Consumer pays considerable attention to product treatment after purchase (sieving, boiling etc.)	
Yes	100
No	0.0
Consumer owns enough information about processed milk production and processing	
Yes	2.0
No	48.7
To some extent	49.3
Level of consumer trust on promotional campaigns regarding processed milk quality and safety	
Yes	15.3
No	46.7
To some extent	38.0
Occurrence of health issues after milk consumption	
Had health issues	20
Didn't have medical issues	80
Type of milk that caused health issues	
Fresh milk	20.1
Processed milk	79.9
Actions taken by consumer upon encountering health issues	
Stopped consuming milk	16.7
Changed place of milk purchase	43.3
Changed type of milk purchased	40
Consumer satisfaction level considering safety and quality of Milk in Khartoum state	
Satisfied	12.0
Not satisfied	50.7
To some extent	37.3
Consumer suggestions for raising level of safety and quality of Milk in Khartoum state	
Intensifying control over Dairy farms	65.3
Setting food safety regulations	15.7
Extension campaigns that target citizens	19.0

Table-4: Chi- square values of consumer education level effect

Item2	P. value
Consumer education level	
Type of milk purchased	0.63
Place of milk purchase	0.470
Type of utensils used	0.299
Product label reading	0.891

Chi- square values were deducted to evaluate the effect of consumer education level over several parameters that could affect consumer purchasing decision. Where P.values were 0.63 for type of milk purchased; 0.47 for place of purchase; 0.2 for type of utensils used for raw milk purchase; 0.89 for processed milk product label reading; all P. values being more than 0.05 indicating non-significant effect of education level on all parameters under study. Such a result is a strong indication that food culture could be of more prominent effect on consumer purchase decision when it comes to milk. Şendur & Atabek [23] stated that consumers mostly develop perceptions regardless of their socio-demographic differences due to the mainstreaming effect of mass media; however, a cluster analysis showed that younger more educated, wealthier and regular dairy consumers have lower levels of negative perceptions about milk, cheese and yogurt. Ates and Ceylan [24] also reported that milk freshness and packaging were important factors for urban consumers with secondary and above level education and with high level of income. More recently, Konar *et al.* [25] also found similar results that urban consumers from high socio-economic status group are more informed about the health risks of street (open) milk. Table 4.

CONCLUSION

Milk is considered an important everyday consumable commodity in most Sudanese households specially being a main source of nutrient; thus more effort is to be performed in understanding consumer perceptions and preferences to enable policy makers and dairy industry players to make practical decisions that could leverage food safety awareness programs to avoid hazards and risks associated with contaminated milk and milk products consumption hence insuring a healthy society.

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