Sensory evaluation and acceptability of goat milk in Odeda Local Government Area of Ogun state

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Abstract

This study was conducted to assess the sensory characteristics and acceptability of goat milk in Odeda Local Government Area of Ogun State. A total of seventy respondents were selected randomly. Milk collected from lactating West African Dwarf goats was pasteurized at a temperature of 74°C for five minutes, cooled, packaged in small polythene and sealed with machine and refrigerated. The milk was taken to various settlements in Odeda Local Government of Ogun state for sensory evaluation. Majority of the respondents were students 54.3% only a few 12.9% were traders with a high percentage between the ages of 21-30. Also, 67.1% and 70.0% of the respondents were Christian and Yorubas, respectively. Moreover, 65.7% of respondents were married, while 34.3% were unmarried. The married had a family size of 2. Majority of the respondents (88.8%) had tertiary education. The small number of respondents 37.1% involved in ruminant production had only 2 years ruminant farming experience and kept fewer than 5 goats. About 60 % of the respondent consumed milk on weekly basis while 6% consumed milk on daily. It was observed that 100% of the respondents preferred cow milk despite the fact that 78.6% of the respondents were aware of goat milk consumption. The taste, colour, odour and flavor of goat milk were rated as Very good by 55.7%, 37.1%, 41.4% and 41.4% of respondents respectively. Majority of the respondents had a favourable disposition towards the taste (75.5%), colour (62.9%), odour (80.0%) and flavour (61.4%) when compared with other milk products in the market. Thus, goat milk could be taken as alternative to cow milk without any detrimental effect. It then become imperative for this positive perception to be explored by the government and other relevant development agencies so as to increase food supply to alleviate protein deficiency and thereby improved the economy.

Keywords: Sensory, goat milk, consumption, settlements and respondents

Introduction

Goat milk is a complete food, rich in proteins, vitamins, minerals, and small fat molecules, which makes it highly digestible compared with milk from other animal species. Goat milk is considered a good alternative to human and cow milk for various clinical conditions such as allergy, atrophy and inflammatory diseases (Jirillo *et al.*, 2010). The major proteins from cow milk are α S1- casein and α -lactalbumin,

whereas the major protein fraction of goat milk is composed of β -casein, α S2-casein, and a small amount of α S1-casein (Fisberg *et al.*, 1999). Cow milk allergy is a common condition, affecting 5.7% of Brazilian children (Binsfeld *et al.*, 2009) during the first 3 years of life and 12 to 30% of infants less than 3 month old, with frequencies as high as 20% in certain areas. The substitution of goat milk for cow milk is reported to re- solve between 30 and 40% of

problem cases (Haenlein, 2004). In spite of the nutritional advantages, the market for goat milk and its derivatives is not yet fully recognize.

They have peculiar taste and nutritional properties and also recognized as a healthy food, goat milk has received special attention by researchers and dairy industry. Some properties of goat milk are known to be advantageous compared with those of sheep milk, such as higher tolerance by allergic children, which is related to the amount of and structural differences in whey proteins (a-lactalbumin and b-lactalbumin) and the high proportion of small fat globules (1.5 mm), which provide better digestibility (Haenlein, 2004; Raynal-Ljutovac *et al.*, 2005). Furthermore, researchers have given goat milk a special attention after recognizing it as a potential functional food since it holds potential as a natural source of lactose-derived oligosaccharides, present a healthier lipid composition with increased conjugated-linoleic acid and short fatty acids content and higher vitamin (A and B complex) and calcium content (Park, 2006; Silanokove *et al.*, 2010), which means that may provide a health benefit beyond its nutritional value. Despite the availability of scientific information about the positive aspects of the consumption of goat's milk and goat dairy products, the production of this milk in some countries is scarce (such as in Nigeria), limiting the production of goat dairy. Presently, there is no information on the consumption of goat milk in Odeda Local Government, Ogun State.

Materials and methods

This research was conducted in Odeda Local Government within Ogun State. A total of 70 respondents were interviewed using a well structured questionnaires

administered to the residents of the area. Random sampling procedure was used in locations.

Experimental animals

Twenty-three (23) West African dwarf does were raised under semi-intensive management system at the Federal University of Agriculture Abeokuta, Nigeria. The goats were fed on concentrate and naturally synchronized by introducing WAD bucks into their midst hence, bringing them on heat at approximately the same time, after which they were mated. Their gestation period lasted for about 5 months. The milking process started a week after parturition. The milk was collected into a clean container and pasteurized at a temperature of 74°C for seven minutes and left for fifteen minutes to cool to a temperature of 40°C. It was packaged in small polythene, sealed and refrigerated before taken to various rural settlement in Odeda Local Government of Ogun state for sensory evaluation.

Data analysis

The data collected were analyzed using descriptive analysis such as percentages and frequency count.

Results and discussion

Socio-economic characteristics of respondent

Table 1 shows the socio-economic characteristics of the respondent chosen at random (including both male and female). Majority of the respondents were students 54.3% only a few 12.9% were traders with a high percentage between the ages of 21-30. Also, 67.1% and 70.0% of the respondents were Christian and Yorubas, respectively. Moreover, 65.7% of respondents were married, while 34.3% were unmarried. The married had a family size of 0-2. This implies that the respondents had sizeable family. Majority of the respondents

Table 1: Socio-economic factors of the respondents

Variables	Frequency	Percentage (%)
Occupation		
Farming	11	15.7
Trader	9	12.9
Civil servant	12	17.2
Student	38	54.3
Age		
<10	-	-
10-20	24	34.2
21-30	30	42.9
31-40	13	18.4
41-50	3	4.2
Religion		
Islamic	23	32.9
Christianity	47	67.1
Tribe		
Yoruba	49	70
Igbo	14	20
Hausa	1	1.4
Fulani	2	2.9
Igbira	4	5.7
Marital status		
Single	46	65.7
Married	24	34.3
Family size including children		
0-2	36	51.4
3-5	29	41.5
6-8	5	7.2
Educational level		
Secondary level	5	7.1
Secondary school uncompleted	3	4.3
Tertiary	62	88.6
Any experience on ruminant farming		
Yes	26	37.1
No	44	62.9
If yes, years of experience		
0-2	47	67.2
3-5	18	25.7
6-8	4	5.7
9-11	-	-
12-15	1	1.4
Numbers of goat kept		
0-5	64	91.4
6-10	3	4.3
11-15	-	-
16-20	1	1.4
21-25	1	1.4
26-30	1	1.4

Source: Field Survey, 2015

(88.8%) had tertiary education. High level of awareness about goat milk could be as a result of their level of education. This agrees with the findings of Adewumi *et al.* (2007) and Anosike *et al.* (2016). On the

other hand, Apata and Adewumi (2011); Adewumi *et al.* (2015) reported that lack of awareness was the major reasons for the low consumption of small ruminant milk in Ekiti State. Education is a factor that

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influences the adoption of new technologies and development. The small number of respondents 37.1% had only 2 years ruminant farming experience and kept fewer than 5 goats. These goats were kept as hobby and not for any serious business.

Table 2 shows the frequency distribution of milk consumption. A high percentage of the respondents (60 %) consumed milk on weekly basis while 6% consumed milk on daily basis. This is consistent with the report of Adewumi *et al.* (2007). This has led a lot of implication on health and standard of

living. The low intake of milk could probably be because of the high cost of available cow milk.

It was observed that 100% of the respondents preferred cow despite the fact that 62.9% of the respondent were aware of goat milk because 32.9% of the respondent believed that cow milk is readily available. Then it was observed that 78.6% of the respondents were aware that goat milk is consumable and that it can be an alternative to cow milk.

Table 2: Socio-economic factors influencing the consumption of milk

Variables	Frequency	Percentage (%)
How often do you drink milk		
Daily	6	8.6
Weekly	61	87.1
Monthly	3	4.3
Which type of animal milk are you aware of		
Cow milk	11	15.7
Goat milk	44	62.9
Sheep milk	1	1.4
Others	14	20.0
Out of the above, which one do you take		
Cow milk	70	100
Goat milk	-	-
Sheep milk	-	-
Others	-	-
Reasons for the choice		
It is readily available	23	32.9
It is cheap	2	2.9
It is more nutritious than other milk	4	5.7
I like the taste	8	11.4
I like the colour	-	-
I like the Odour	-	-
Others	33	47.1
Are you aware that goat milk is consumable and source of milk		
Yes	55	78.6
No	15	21.4

Source: Field Survey, 2015

Respondents' perception of goat milk consumption

As revealed in Table 3, it was noticed that respondents had positive perception towards the consumption of goat milk as 54.3% agreed that the colour of goat milk

was whiter than that of the cow milk while 37.1% strongly agreed. Also, 52.9% strongly disagreed that the texture of goat milk is coarse as particles while 28.6% of the respondents strongly agreed. It was observed that about 60% disagreed that goat

milk was not palatable while 32.9% strongly disagreed. A total of 47.1% strongly disagreed that the body odour of goat could discourage the consumption goat milk, however, 32.9% disagreed. It was observed from the study that 64.3% strongly disagreed to the perception that children consuming goat milk behave like animals, while 2.9% strongly agreed. It was thus clear that goat milk was well accepted by residents of Odeda Local Government. It then become imperative for this positive perception to be explored by the

government and other relevant development agencies so as to increase food supply to alleviate protein deficiency and thereby improves the economy. This finding is in agreement with that of Apata and Adewumi (2010). Furthermore, there was no cultural taboo as 61.4% strongly disagreed against the consumption of goat milk. This is consistent with the findings of Adewumi *et al.* (2001) who reported that there was no taboo to rearing of small ruminants and consumption of their milk in Ondo State.

Table 3: Respondents' perception of goat milk consumption

Perceptual statement	frequency	Percentage
The colour of a goat milk is whiter than cow's milk		
Strongly agree	26	37.1
Agree	38	54.3
Strongly disagree	-	-
Disagree	1	1.4
Undecided	5	7.1
The texture of the milk is coarse, containing particles in it		
Strongly agree	5	7.1
Agree	5	7.1
Strongly disagree	20	28.6
Disagree	37	52.9
Undecided	3	4.3
Goat milk is forbidden by the culture of the land		
Strongly agree	-	-
Agree	1	1.4
Strongly disagree	43	61.4
Disagree	24	34.3
Undecided	2	2.9
Goat milk is not palatable		
Strongly agree	2	2.9
Agree	2	2.9
Strongly disagree	23	32.9
Disagree	42	60.0
Undecided	1	1.4
Body odour of goat could discourage goat milk consumption		
Strongly agree	3	4.3
Agree	8	11.4
Strongly disagree	33	47.1
Disagree	23	32.9
Undecided	3	4.3
The colour of goat milk could be discouraging		
Strongly agree	1	1.4
Agree	1	1.4
Strongly disagree	29	41.4
Disagree	34	48.6
Undecided	5	7.1
Children consuming goat milk might be stubborn like goat		
Strongly agree	2	2.9
Agree	-	-
Strongly disagree	45	64.3
Disagree	20	28.6
Undecided	3	4.3

Source: Field Survey, 2015

Sensory evaluation of goat milk: percent distribution of respondent

Majority of the respondents had a favourable disposition towards the taste (75.5%), colour (62.9%), odour (80.0%) and flavor (61.4%) when compared with other milk products in the market (Table 4). This may be attributed to the freshness of the milk which corroborates the reports of Adewumi *et al.* (2001). This is in line with

the findings of Adewumi *et al.* 2001 who reported that respondents had positive inclination towards small ruminant milk consumption. The good flavor of goat milk in some studies was reported to have originated from some free fatty acids such as 4-methyloctanoic acid and 4-ethyloctanoic acid in goat (Morgan and Gaborit, 2001; Carunchia Whestine *et al.*, 2003).

Table 4: Respondent reaction to sensory characteristics of goat milk vs other milk products

Parameters	Frequency	Percentage
Taste		
Better than	16	22.9
Compares favourably	53	75.7
Compares unfavourably	1	1.4
Colour		
Better than	26	37.1
Compares favourably	44	62.9
Compares unfavourably	-	-
Odour		
Better than	8	11.4
Compares favourably	56	80.0
Compares unfavourably	6	8.6
Flavor		
Better than	25	35.7
Compares favourably	43	61.4
Compares unfavourably	2	2.9

Source: Field Survey, 2015

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