

EVALUATION OF QUALITY OF YOGHURT PROCESSED FROM SOYMILK AND COW MILK

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Abstract: Cow milk and soymilk samples were processed at the National Animal Production Research Institute (NAPRI), Ahmadu Bello University, Zaria, Nigeria. The samples were used in investigating the shelf life of fresh and pasteurized soy milk and cow milk as well as evaluating quality of yoghurt processed from them. Sensory evaluation was done on the yoghurt produced from the soy milk and cow milk using different flavours and included vanilla flavoured soy milk yoghurt (VFSMY), strawberry flavoured soy milk yoghurt (SFSMY), pineapple flavoured soymilk yoghurt (PFSMY), banana flavoured soymilk yoghurt (BFSMY) and unflavoured soy milk and cow milk yoghurt (UFSMY) & (UFCMY). There was no significant differences in the general acceptability of all the yoghurts, all the sensory properties have similar value of 3.33. There was also no any significant difference in all the yoghurts for their flavor, appearance and taste all having similar value of 3.33 except in their colour and aroma. For aroma, there was no significant difference in all the other yoghurts except in an unflavoured soymilk yoghurt which differ with 3.44 in this quality property. And for colour, there was no significant difference in all the other yoghurts except in the strawberry flavoured soymilk yoghurt which differ with 3.00 in this sensorial property. However in order to know the significant differences in proximate composition of yoghurt made from soy milk and cow milk more days for storing soymilk yoghurt should be employed in order to determine if it would affect its proximate composition.

• Introduction

Yoghurt is a fermented milk product and is one of the famous fermented milk preparations Milk is a nutrient-rich, white liquid food produced by the mammary glands of mammals. It is the primary source of nutrition for infant mammals before they are able to digest other types of food (Pehrsson *et al.*, 2000). Yoghurt is a fermented milk product and is one of the famous fermented milk preparations. The health promoting properties of live lactic acid bacteria in yoghurt include protection against gastrointestinal upsets, enhancing digestion of lactose by maldigesters, decreasing risk of cancer, lowering blood cholesterol and improving immune response and helping the body to assimilate protein, calcium and iron (Sanful, 2009). Yoghurt has traditionally been made from animal milk especially cow milk. However, over the years, milk from other sources has been used to make yoghurt reported by Haenlein (1996). This development has been necessitated by a wide range of reasons such as allergies and affordability by consumers. Soymilk yoghurt has been adopted as substitute to cow's milk yoghurt especially by the low income earners due to its cheap raw materials as protein supplement at household level (Farinde, 2010). Yoghurt can also be made by making blends from different sources as reported by Makanjola (2012) who concluded that yoghurt can be produced from blends of soymilk and cow milk using various substitution levels.

• Material and method

The study was conducted at the National Animal Production Research Institute (NAPRI) Ahmadu Bello University Zaria, the Department of Animal Science Faculty of Agriculture. The ingredients and materials used for the preparation of soy milk and cow milk yoghurt include: 1.5 tier of soybean, flavors (banana, strawberry, vanilla & pineapple), starter culture, sugar, bottles (10mls), cello tape, 4L of cow milk and sugar. The soy bean and other materials used for the processing and sensory evaluation were sourced from an open market. Samples of freshly prepared cow milk was collected from the NAPRI farm of Ahmadu Bello University, Zaria.

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The soy bean was washed to remove the chaff from the bean and was sun dried for 24 hours then blended. To get the soy milk the same procedure was used for both soy milk and cow milk, the only difference is that the soy milk was heated for 20 minutes at 75°C to reduce the raw taste of the soy milk. *Sampling of yoghurt: Six (6) samples were made one (1) from the cow milk yoghurt and five (5) from the soy milk yoghurt in which it was labeled from A to F in a 10ml plastic bottles each.*

Flavoring: *Four yoghurt flavors were produced which include the vanilla flavor, strawberry flavor, pine apple flavor and banana flavor and two unflavored. Sample A was control of unflavored soymilk yoghurt (UFSMY), sample B strawberry flavored soymilk yoghurt (SFSMY), sample C vanilla flavored soymilk yoghurt (VFSMY), sample D pineapple flavored soymilk yoghurt (PFSMY), sample E banana flavored soymilk yoghurt (BFSMY) and sample F control of unflavored cow milk yoghurt (UFCMY). Sensory evaluation trained:*

A 30-member panel of sensory judges familiar with quality attributes of yoghurt was constituted. Each panelist rated each yoghurt flavors for taste, flavor, color, aroma, appearance, and acceptability using a nine point Hedonic scale 9 representing "like extremely" to 1 representing "dislike extremely". Data were classified based on taste, flavor, appearance, color, aroma and acceptability for both unflavored and flavored yoghurt.

The data collected were subjected to analysis using SAS and means were compared using Duncan Multiple Range Test of SAS package.

• Results and discussions

Parameter (%)	Unflavored Soymilk	Unflavored Cow Milk
	Yoghurt	Yoghurt
Moisture	61.29	51.35
Total solids	13.07	17.25
Solid non fats	12.57	14.15
Fat	0.50	3.10
Protein	3.44	2.81
Lactose	8.93	10.92
Ash	0.20	0.42

Parameters	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆	SEM
Colour	3.33	3.33	3.00	3.33	3.33	3.33	3.576
Appearance	3.33	3.33	3.33	3.33	3.33	3.33	3.651
Aroma	3.44	3.33	3.33	3.33	3.33	3.33	2.916
Taste	3.33	3.33	3.33	3.33	3.33	3.33	2.669
Flavour	3.33	3.33	3.33	3.33	3.33	3.33	3.329
Acceptability	3.33	3.33	3.33	3.33	3.33	3.33	3.188

T₁= Unflavoured soymilk yoghurt, T₂= Vanilla flavoured soymilk yoghurt, T₃= Strawberry flavoured soymilk yoghurt, T₄= Pineapple flavoured soymilk yoghurt, T₅= Banana flavoured soymilk yoghurt, T₆= Unflavoured cow milk yoghurt, SEM = Standard Error of Mean

The results of the proximate analysis of the composition of cow milk/soymilk yoghurt shows that the mean values of protein and fat are significantly different (P<0.05) in the two samples analyzed. Soymilk yoghurt has the highest protein of 3.44% while cow milk yoghurt has the least value of 2.81%. The samples have moisture content of above 61.29% for soymilk yoghurt and 51.35% for cow milk yoghurt though they were significantly different at P<0.05. Ash content was very minute. This shows that yoghurts need to be fortified with minerals for body maintenance. There is significant difference (P<0.05) between the lactose contents of soymilk yoghurt i.e. 8.93% and the values for cow milk yoghurt 10.92%. The high lactose value for soymilk yoghurt is because of its plant origin and also the lactose of cow milk of fermented more by the microbes. The values obtained in this study for protein and fat falls within the range obtained by Osundahunsi *et al.* (2007). Ash fall within the range obtained by Amanze, (2011) for cow milk yoghurt.

The results shows that there is no significant difference (P<0.05) in general acceptability with similar value of 3.33. There was also no significant difference in their flavour, appearance and taste with similar value of 3.33. Although there was significant difference (P<0.05) in their colour and aroma. But for aroma, there was no significant differences in all the other yoghurt except unflavoured soymilk yoghurt which differ with 3.44 in this quality property from the panelists, Means in the same row with the same superscript are not significantly different at P<0.05. The mean score for colour for strawberry flavoured soymilk yoghurt has the less value with 3.00 in this sensorial property. This has got to show that with time, soy milk can be a complement or substitute for nations that cannot afford cow milk for yoghurt production. The sensory attributes obtained here is similar to that of Amanze (2011).

• Conclusions

It was concluded from this study that there was no difference in the acceptability of yoghurt made from soymilk and cow milk. There was also no significant difference in the proximate composition of yoghurt made from cow milk and soymilk.