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Study the Physical Propertiesof DifferentTypes of Raw Milkin Alguzera Farms (Sudan)

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Abstract:*The physical properties of milk components affect the functional properties and quality attributes of foods in which they are used. Hence, knowledge of the basic physical properties of milk components is critical in determining the usefulness of milk components in food formulations and in determining quality attributes and acceptability of foods containing these components,we studyphysical properties ofraw milk of sheep, goat ,cow and camel inAlguzera FarmsSudan,Milk samples were collected from farm,and analyzed for their physical features, including,colour,viscosity, surface tension ,density,refractive index ,freezing point,and boiling point,were compared with the physic characteristics of the fresh natural milk samples from camel, cow,sheep and goat.Therefore, these elements were compared with the physico-chemical properties of fresh natural milk samples from buffalo, cow and goat. The results were also compared with reported milk quality from different countries and World Health Organization (WHO) standards. We found that all the physical properties of available milk meet the requirements of the WHO, except for viscosity that is below world standards.*
Keywords*: Milk, Physical properties, Alguzera**,**density,viscosity.*

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I. INTRODUCTION

milk is an important source of all basic nutrients required for mammals including human beings. milk from various mammals such as cow, buffalo, goat, sheep, camel, etc. is used for different nutritional purposes, e.g., feeding to young ones and preparation of some nutritional products such as milk cream, butter, yogurt, ghee, sour milk, etc. (Webb et al., 1974; Hassan, 2005).different study of physical analyses characteristics have been widely used in analyses on and have been documented in the literature, for example,Mohammad Imran, Hamayun khan, SyedShah Hassan, and Rasool khan the analyses physicochemical characteristics of various milk samples available in Pakistan, orphan definition the physical characteristics of various milk samples titratable acidity was measured by titrimetric method, and expressed as percent of lactic acid. specific gravity, conductivity and viscosity were determined by the standard methods (Mohammadimran, Hamayun khan, SyedShah Hassan, and Rasool khan (2008 ,jul).J.E.Kinsella in November 1987study the physical properties of food and milk components: research needs to expand uses we foundthe increasing formulation and fabrication of food products, the need and demand for reliable functional ingredients will expand. the food processing industry will increasingly place a premium on obtaining functional ingredients with reliable, well-defined physical and functional properties to facilitate automated formulation of food products and to ensure consistent product quality. additionally, the satisfactory substitution of ingredients or simulation of traditional foods critically depends on knowledge of the physical properties of ingredients and of foods per se. hence, there is a need for the establishment of a data bank that contains reliable information on the physical and functional properties of milk components and dairy ingredients. where reliable data are not available, the needed research should be undertaken. in order to be successful in this endeavor, reliable, standardized testing methods need to be developed to measure those physical and functional properties related to quality attributes of foods,(J.E.Kinsella, 2008) moreover, ken R. Morison, Jack p. Phelan&Chris g. Bloorein Aug. 2012 viscosity and non-Newtonian behaviour of concentrated milk show to the analysis shows that themost significant contribution to changes in the viscosity of milk concentrates is the heat treatment of the proteins. this work shows the value of using relative viscosity, and highlights the need for compositional analysis and details of heat treatment before useful interpretation of viscosity data is possible. The main focus of this article is to investigate analyzed for their physical characteristics to know would milk cheated.

II. Materials And Methods

2.1 Study Area

This study was carried out in Alguzera stateElnuba town located 50 Kg south of Khartoum, Sudan.

2.2 Raw Material

Fresh cow's milk was collectedin a sterile manner from the dairy facility at Alguzera Farms South Khartoum, SudanWas aseptically collected then it was utilized as the raw material, and it was used in experiments within 1 hour.

2.3Colour

The natural milk color ranges from white to a relative blue to yellow to gold depending on the proportion of fat and the proportion of non-fatty solids animal variety and food.

2.4Surface Tension

Milk is less superficial than water because there are substances that reduce it, such as lipoproteins ,which are concentrated around the fat granules, Milk Samples were computation and were at room temperatureat 20 ^{O}C (0.0000178-0.000058)N/m2.

2.5 Viscosity

Viscosity is the resistance to flow,Increase in temperature results in decrease in viscosity,Milk Samples were computation and were at room temperature at 20 ^{O}C(0.8-1.7)poss.

2.6 Density

Densityis the ratio of density of the substance to density of a standard substance(Water).Densityof milk is usually expressed at 20^{O}C (1.030C). Average density of milk at 20 ^{O}C ranges from(1.03 to 1.05).

2.7Refractive Index

Refractive Index is the measure of change in direction of light beam in a medium, RI is affected by protein, lactose & minerals, not by fat.Milk Samples were computation and were at room temperature20 ^{O}C is(1.35-1.38).

2.8 Freezing Point

Milk freezes at a temperature slightly lower than that of water due to the soluble constituents in milk such as lactose, minerals which lower the freezing point. The freezing point of milk ranges from (-0.42) to (-0.55) °C with average (-0.48) °C.

2.9 Boiling Point

Milk boiling point higher temperature more than water due to presence of dissolving substances,andBoiling point increases with surface tension, milk boiling point ranges from(136)to(155)°C with average (145) °C.

3.RESULTSAND DISCUSSION

3.1Estimation the value of surface tension inmilk .

Obtained results showed the analysis for four samples(cow, camel,goat,sheep) of milk used. The value for the surface tension were at room temperature (0.0000178-0.000058)N/m2 with average(0.0000397) N/m2,this value is very small compared with value in water because foundsurfactants fat portion. Most investigators agree that surface tension in milk is smaller than water (Ibrahim Bushara,2013).

Figure 1 summarizes the value surface tension in four samples(cow, camel, goat, sheep) of milk,high value linearly in cow milk, and appear decrease in goat milk and camel milk at arrangement, and low value linearly in sheep milk.

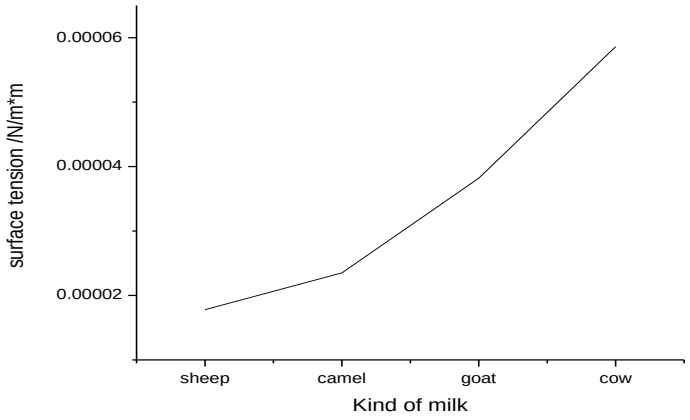

Figure1. Values of surface tension of different kinds of milks.

3.2 Estimation the value of viscosity in milk.

Obtained results showed the analysis for four samples (cow, camel, goat, sheep) of milk used. The value for the viscosity were at room temperature (0.8-1.7) poss, with average (1.25) poss, this value is bigger than compared with value in water (0.005)poss because fat materials .

Note that all liquids show a higher viscosity at low temperature but milk is different from the rest of the liquids because of his wife under certain conditions and increase under other conditions. His wife is less than his jacket, which helps to separate the cream from milk, but it increases when treated at higher temperatures such as those that are under pressure

Figure 2 summarizes the value of viscosity in four samples (cow, camels, goats, sheep) of milk, changes in high-value viscosity in goats and camels because most people drink without heating. Changes in low viscosity in cows and sheep because most people drink pasteurized.

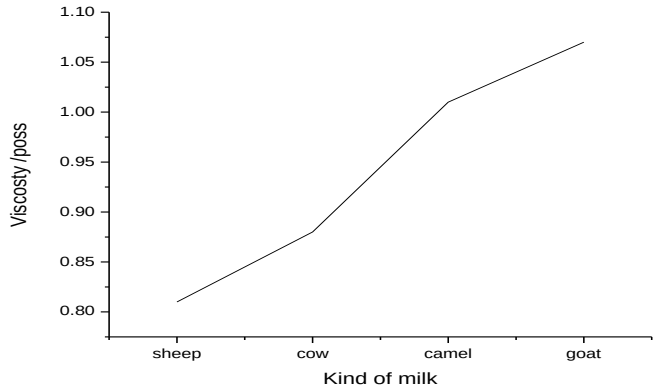

Figure2.values of viscosity of different kinds of milks.

3.3 Estimation the value of density in milk.

Obtained results showed the analysis for four samples (cow, camel, goat, sheep) of milk used. The value for the viscosity were at room temperature(1.0496-1.0584) with average(1.054),The value of milk density is greater than its value in water because milk contains substances that increase its density, also, fat reduces the specific weight. The higher the amount of fat in milk, the lower the specific weight, which leads to reduced milk density.

Figure 2 summarizes the value density in four samples (cow, camel, goat, sheep) of milk. Changes in the high value density at cow and goat because the effect solid materials in fatness.

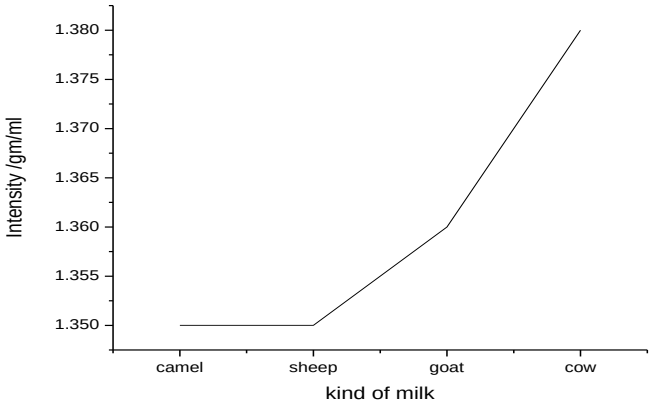

Figure3. Values of density of different kinds of milks.

Therefore, the weight of the milk is higher than the specific weight of the waterchanges at the high valuedensity at camel and sheep because the fat is lessens value of density.

3.4 Estimation the value of Refractive Index in milk.

Obtained results showed the analysis for four samples (cow, camel, goat, sheep) of milk used. The value for the Refractive Index in milk were at room temperature(1.35-1.38) with average(1.365) ,value of Refractive Index in milk big at compared with value in water .

Figure 4 summarizes the value Refractive Index in four samples (cow, camel, goat, and sheep) of milk.

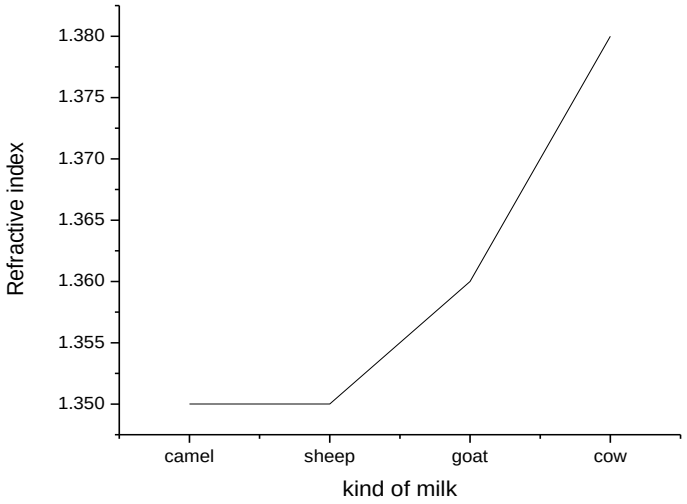

Figure4. Values of refractive index of different kinds of milks.

For changes in the high refractive index value in cow's milk and goats, and appear to dangle in camels and sheep.
Note that the addition of water in the milk leads to a decrease in the refractive index value, so the refractive index is a quick test indicator of knowledge of milk cheating.

3.5 Estimation the value of freezing point and boiling point in milk.

Obtained results showed the value for four samples (cow, camel, goat, sheep) of milk used, boilingpoint ranges from(136)to(155)°C with average (145) °C.The value of boiling point in milk is higher than water because the milk contains solid molten in liquid milk.

The freezing point in milk ranges from (-0.42) to (-0.55) centigrade with an average (-0.48) centigrade, and the milk freezes at a low point of water, because some molten metals have a low freezing point in milk.

Adding preservatives to reduce freezing and relatively high solubility, and use the experiment to estimate milk purity and cheating,

When water is added, the milk rises to the freezing point and becomes close to the freezing point.

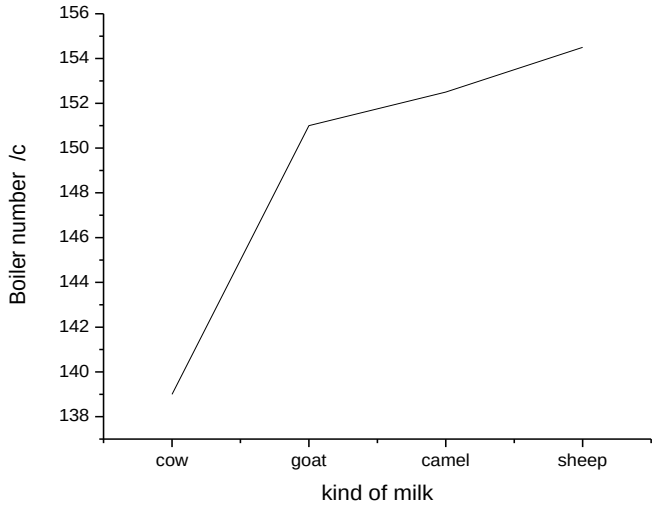

Figure5. Values of boiling point of different kinds of milks.

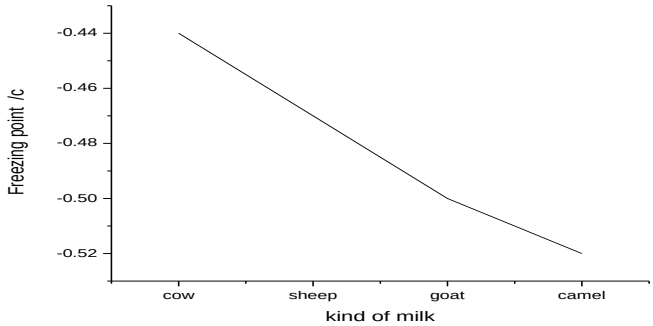

Figure6. Values of freezing point of different kinds of milks.

III. Conclusions

As a conclusion, proposed the value was successfully used to analyses by physical properties in different kinds of raw milk (cow,camel,goat, and sheep),This may be a good outcome for the quality of the standards and standards of food for milk because it was compared to the standards of global health.Some the data could be fitted within experimental milk fudge. The analysis shows that the most significant contribution to physical properties to milk in room temperature compare with water physical properties s in room temperature, This work shows the value of surface tension, viscosity,density,refractive index, freezing point and boiling point and test of color.

The using of Physical properties of thebest ways to know cheat milk and thus know the added value of water for milk**.**

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