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Evaluation Of Physico-Chemical Characteristics And Sensory Profile Of Tomato Ketchups.

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ABSTRACT

Fruits and vegetables belong to an important class of foods that supply human diet with nutritive requirements including vitamins and minerals which are essential for normal body health and function. The study was performed to compare the macro and micro nutrient elements, heavy metal contents and microbiological quality of ten different types of ketchups. Physicochemical properties, vitamin, minerals, and heavy metals concentration and microbiological quality were determined for all the samples. The results of this study suggest that the selected sauces and ketchups are good source of nutrient, antioxidant like vitamin C and energy. The results of this study were compared with existing results and recommendations which will be helpful for consumers to consider the nutritional quality and safety of sauces and ketchups.

Keywords: Tomato ketchup, Physico-chemical parameters, sensory profile

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INTRODUCTION

Tomato ketchup is an important product used in households, restaurants, canteens etc. It is used with sandwiches, snack food items and while cooking many vegetarian and non – vegetarian dishes Tomatoes are not available throughout the year and their prices shoot –up during lean season. Further, tomato cannot de conveniently utilized on or with certain products whereas tomato sauce, ketchup and puree can. Tomatoes are perishable but ketchup has shelf life of 10-12 months .hence, this product has become very popular and is used in large quantity.

INGREDIENTS

Tomato ketchup contains tomato concentrate from red ripe tomatoes, distilled vinegar, high fructose corn syrup, corn syrup, salt, spice, onion powder, and natural flavoring. Tomato concentrate from red ripe tomatoes is the first ingredient on the list, which means it has the highest percentage of weight within the final product. Tomatoes have a complex composition of sugars, starch, pectin, ascorbic acids, organic acids, amino acids, steroids, carotenoids, lipids, free fatty acids, and volatiles. The second ingredient listed is distilled vinegar .Next is high fructose corn syrup, which is made up of 42% fructose, 53% glucose, and 5% other polysaccharides and sugars. Salt is the next ingredient listed and is composed of sodium and chloride ions. Spice, onion powder.

Table 1: Elements of Tomato ketchup

Minerals	Benefits
Potassium	Essential to your cells' ability to function, helping them to produce energy
Calcium	Maintaining your skeleton It helps in bound, teeth and muscle growth. It protects against cancer. It treats of high blood pressure.
Iron	Iron is an essential part of haemoglobin; that transports oxygen through our bodies. It responsible for producing energy. It protects renal failure.
Zinc	Acts as an antioxidant, building up the body's immune system It helps stimulate the activity of at least 100 different enzymes. It plays a major role in growth and development of human body. It supports the action of the immune system.
Magnesium	Helping to create essential enzymes for building bones. It regulates the heartbeat and prevents its flocculation. It protects against weak bound. Enhances body immunity and increases its ability to resist disease.
Copper	Essential for healthy blood, bones and brains.
Sodium	**Water balance:** it helps to regulate fluid levels in the human body. Channels are what pump water into the cell and regulate the amount of extra cellular fluid in the body. **Brain function:** the brain is very sensitive to change in sodium levels of the body. Eliminates excess carbon dioxide: sodium removes any excess carbon dioxide. Regulate glucose absorption: it helps in transportation of nutrients in the body cell membranes.

MATERIALS AND METHODS

pHis a term used universally to express the intensity of the acid or alkaline condition of a solution. It measures the level of acidity or alkalinity of the water sample. The pH is indicated by the concentration of hydrogen ion present. It is expressed on a scale of 0-14 where 7 is neutral, below 7 is acidic and above 7 is basic. Practically, every phase of water treatment such as softening, precipitation, coagulation, disinfection and corrosion are pH dependent. Natural water has pH values in the range 4 to 9 and most are slightly basic due to the presence of bicarbonate and carbonates of alkali and alkaline earth metals.

The pH was expressed in pH unit, and it is a measure of the hydrogen ion concentration (H^+) as pH = -log (H^+)

EC: (Electrical Conductivity) Conductivity shows significant correlation with ten parameters such as temperature, pH value, alkalinity, total hardness, calcium, total solids, total dissolved solids, chemical oxygen demand, chloride and iron concentration of water.

Moisture content: Moisture refers to presence of a liquid, especially water, often in trace amount, small amount of water may be found for example in the air, in foods and in various commercial products. Moisture also refers to the amount of water vapor present in the air.

Density: is defined as its mass per unit volume. It is essentially, a measurement of how tightly maters are crammed together.

Vitamin C:is determined by a redox titration using iodine. Vitamin C, is called ascorbic acid, is an essential antioxidant needed by the human body. As the iodine is added during the titration, the ascorbic acid is oxidised to dehydroascorbic acid, while the iodine is reduce to iodide ions.

Ash content: Ash refers to the inorganic residue remaining after either ignition or complete oxidation of organic matter in a food sample. Determining the ash content of a food is part of proximate analysis for nutritional evaluation and it is an important quality attribute for some food ingredients.

Viscosity: The viscosity of a fluid is a measure of its resistance to gradual deformation by shear stress or tensile stress. For liquids, it corresponds to the informal concept of "thickness". For example, honey has a much higher viscosity than water.

Table 2: Physico-Chemical parameters

Parameter	Sample 1	Sample 2	Sample 3
pH	3.97	3.96	4.10
Electrical Conductivity (µs/cm)	995	1060	487
Moisture Content (%)	72.5	73	74.8
Viscosity (%)	17	20	28
Total Carbohydrates (g)	0.0922	0.0654	0.1279
Vitamin C (mg/100 g)	0.2332	0.2956	0.6296
Ash content (%)	1.98	2.98	2.78
Sodium (ppm)	2.3	3	1
Potassium (ppm)	10.6	11.3	8.5
Iron (ppm)	4.3×10^{-3}	2.2×10^{-3}	2.4×10^{-3}
Calcium (ppm)	10.13	12.8	12.5
Magnesium (ppm)	0.065	0.084	0.0496

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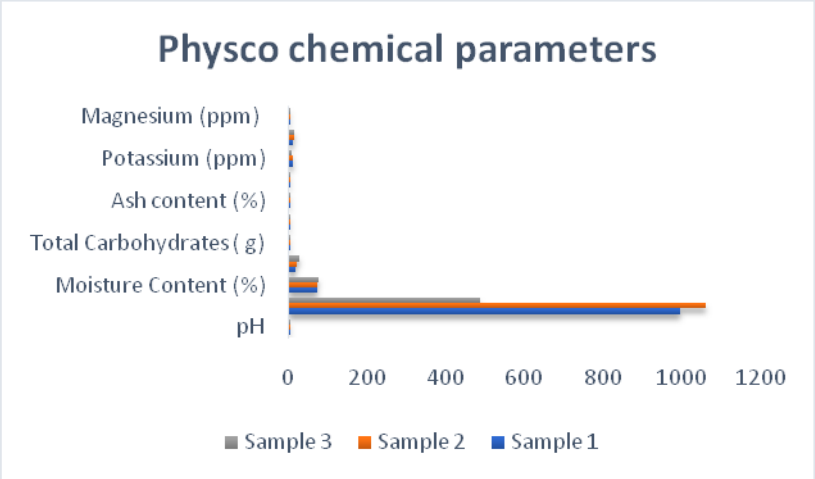

CONCLUSION

Present study has shown that the locally available ketchup and sauces contain safe levels of nutritional and microbial elements for human consumption and free from heavy metals contamination. The study also indicates that the sauces and ketchups are rich source of some minerals and nutrients.

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REFERENCES

[1] Doyle M.P., L.R. Beuchat& T.J. Montville. Food Microbiology. Washington DC: American Society for Microbiology, ASM Press 2001.
[2] Gundogdu, M. and H. Yilmaz. Organic acid, phenolic profile and antioxidant capacities of pomegranate (Punicagranatum L.) cultivars and selected genotypes. ScientiaHorticulturae, 2012; 143: 38-42.
[3] Corina Costescu, D. Pârvu, A. Riviş, 2006. The determination of some physical-chemical Characteristics for orange, grapefruit and tomato juices, Journal of Agro alimentary Processes and Technologies, Volume XII, No. 2, 2006; 429-432,
[4] Iordanescu,O., Alexa E., Micu R. and Poiana M.A. Bioactive compounds and antioxidant properties at different maturity stages of apple cultivars fromRomania, Journal of Food, Agriculture &Environment, 2012; 10(1): 147-151
[5] Plackett R.L., G.A. Barnard 'Student': A Statistical Biography of William SealeyGosset: Based On Writings ByE.S. Pearson. Oxford University Press 1990.
[6] WissaneeSupraditareporn, and RenuPinthong, 2007. Physical, Chemical andMicrobiological Changes during Storage of Orange Juices cv. Sai Nam Pung and cv. KhieoWaan in Northern Thailan. International Journal of Agriculture &Biology15608530/2007; 09–5–726–730.
[7] Saadia R., Tariq, H. Munir, N. Shah, A. Shaheen, S. Khalique, M. Manzoor, &Jaffar (2005). Multivariate analysis of trace metal levels in tannery effluents in relation to soil and water: Acase study from Peshawar, Pakistan. Journal of environmental management.
[8] Lachman, J., Šulc M., Sus J., PavlíkováO.Polyphenol content and antiradical activity in Different apple varieties. Hort. Sci. (Prague), 2006; 33(3): 95–102.
[9] AOAC, 1995. Official Method of analysis ofAOAC International, 16th edition. The UnitedStates of America