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Quantitative Estimation Of Essential Nutrients In Different Fruit Jams.

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ABSTRACT

Good health is the greatest blessing of life. Health of the country is directly or indirectly linked with the socio economic development of any country. Health of an individual is of utmost importance in terms of living a happy and healthy life. A balance diet consists of equal amounts of carbohydrates, proteins, lipids, vitamins and minerals. Carbohydrates, proteins and lipids are produced in the body and subsequently taken form the diet, however vitamins and minerals are not produced in the body and hence need to be supplied only through the diet. The project was carried out to evaluate different physico chemical parameters for a comparative study of different samples of fruit jam. The project was carried out to evaluate different physico chemical parameters for a comparative study of different samples of fruit jam, in terms of pH (3.41, 3.74, and 3.38), Electrical conductivity (241.6, 593, and 307), Moisture content (45.8, 38.2, and 56.2), Vitamin C (360.8, 369.6, and 220) amount of Potassium (7.3, 18.42, and 7.89) and Sodium (2.45, 6.32, and 3.85). Also, found concentration of Iron (4.62, 6.58, and 2.31), Magnesium (0.15, 0.55, and 0.004), and Calcium(8.63, 4.90, and 7.97). The results that found in this project when tested in three samples, sample (A) Apricot, (B) Mulberry and (C) Cherries. In the experiments, it has been found that there are only slight differences between three samples involved in the research.

Keywords: Fruit jams, Quantitative estimation, Physico-chemical parameters, Metal composition, Vitamin C,

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INTRODUCTION

The jam is increasing an important in many countries, especially in urban areas. It is made of high acid and sugar content, which is safe product. The processor decide to make jam because there is an abundant supply of raw material. A solid gel made from the pulp of single fruit or mixed fruits called jam. It must content at least 40 % of fruits and total sugar content must be no less than 68 %. The basic ingredients of jam are pectin, which is naturally present in fruits in different percentages. It is needed to make fruit set into a gel. We can found pectin in higher level in citrus peels, passion fruit and apple. Strawberries and melon contain low levels. Generally, when fruits matures increases the pectin level increases. To get better preserver of jam using pectin powder or solution with known amount to the fruit juice or pulp. We can use pectin as a light brown powder or dark liquid concentrate.

Fruit jams are a daily dose of consumption by many households, especially in the western countries. They form a daily component of our breakfast and are available in many flavours and combinations. In this project an attempt has been made to understand the role of these jams in providing nutrition and promoting health, in terms of determining the macro and micronutrient percentages present in them. Macronutrients and micronutrients play a vital role in health and metabolism of an individual.

Potassium is one of the macro minerals, we need at least 100 mg of potassium daily. Also, it is a primary function in the body is regulating fluid balance and controlling the electrical activity of heart. Sodium is an extremely important electrolyte and an essential ion present in the extracellular fluid. Also, it plays in enzyme operation and muscle contraction. Zinc plays a major role in growth and development of human body. It supports the action of the immune system. Magnesium regulates the heartbeat and prevents its flocculation. It enhances body immunity and increases its ability to resist disease. Iron is an essential part of haemoglobin and transports oxygen through our body. Calcium helps in strengthening of teeth and muscle growth

It was finally observed that both orange and pineapple have high amount of sodium ion and potassium ion than strawberry. These ions are responsible for operating the sodium potassium pump in the body for regulating electrolyte balance. There was found to be a significant variation in values of magnesium, zinc and iron in all the three types of jams the calcium content was found to be almost the same. Hence, it could be assumed that a spoonful of jam as a daily food could supply the body with all essential micro and micronutrients [1-10].

Elements of fruit jams: The two main elements present in fruit jam are pectin and citric acid. They are used to flavour, to perceive or cause the jam as certain structure. Pectin is a type of carbohydrate -specifically a polysaccharide- that is found in the cell walls of plant, especially the roots, leaves and fruits. In general, pectin is broken down by enzymes as fruit. Pectin consumption impacts blood cholesterol levels and it help regulates blood glucose levels.

It also helps remove toxins such as lead and mercury from your body. Pectin is derived from other fruits, primarily the skin apple and pears. Pectin can be made from scratch or buy from store as powder form. Also, pectin works as flour to increase thickness. Usually requires sugar to create the proper chemical reaction. Citric acid is a natural product which is a weak organic acid that is found in many fruits and vegetables. It also helps regulate the acidity or pH of food product and adds a sour or acidic taste to food.

Advantages of Vitamin C:

- It helps to repair and regenerate tissues.
- Protect against heart disease.
- Supports healthy immune function.

Sugar: Sugar is the general name for sweet, soluble carbohydrate, mane of which is used in food. There are several type of sugar derived from different sources. The simple sugar is called monosaccharide, fructose and galactose. Customarily used as food sucrose. The average person consumes about 24 kilograms of sugar each year.

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Benefits of fruit jams:

- Jams do not contribute to the cholesterol and fat content or our bodies.
- In the heating process of making jams, substance gets modified. After modified pectin helps on reducing chance of developing cancer.
- Jams are rich in sugar and a great source of energy and fiber.
- Jams are concentrated source of nutrition when made with fully ripened fruits.
- Fruit are naturally low in fat, sodium and calories and have absolutely no cholesterol and are an important source of many nutrients, including dietary fiber, vitamin C and potassium.
- Provide energy during stress and exercise.
- Improve the health of hair, skin and finger nails.
- Keep teeth and gums healthy.
- Help the body form red blood cells.

Table 1: Essential element s and their benefits

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

Analyses of Physicochemical Properties : The analyses involves the estimation of-pH, Electrical conductivity, moisture content, viscosity, carbohydrates and vitamin C, Smell and Appearance of Fruit jams were carried out in the present study.

Determination of Mineral Elements: The elements were extracted from the oil by the wet digest method. The digested sample was analyzed for the elemental composition using Atomic Absorption Spectrophotometer (AAS) and Flame Emission Spectrophotometer (FES). Fe, Mg, Mg, Na, K and Ca were determined and the concentrations of the elements were presented in mg/L.

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RESULT AND DISCUSSION

The results of Physicochemical Properties & Mineral Composition are presented in Table 2 respectively.

Table2: Physico-Chemical parameters

Parameter	Name of the sample		
	Apricot	Mulberry	Cherries
pH	3.41	3.74	3.38
Electrical conductivity (µs/cm)	241.6	593	307
Moisture content (%)	45.8	38.2	56.2
Vitamin C (mg\100g)	360.8	369.6	220
Amount of Potassium (ppm)	7.3	18.42	7.89
Amount of Sodium (ppm)	2.45	6.32	3.85
Amount of Iron (ppm)	4.62	6.58	2.31
Amount of Magnesium (ppm)	0.15	0.55	0.004
Amount of Calcium (ppm)	8.63	4.90	7.97

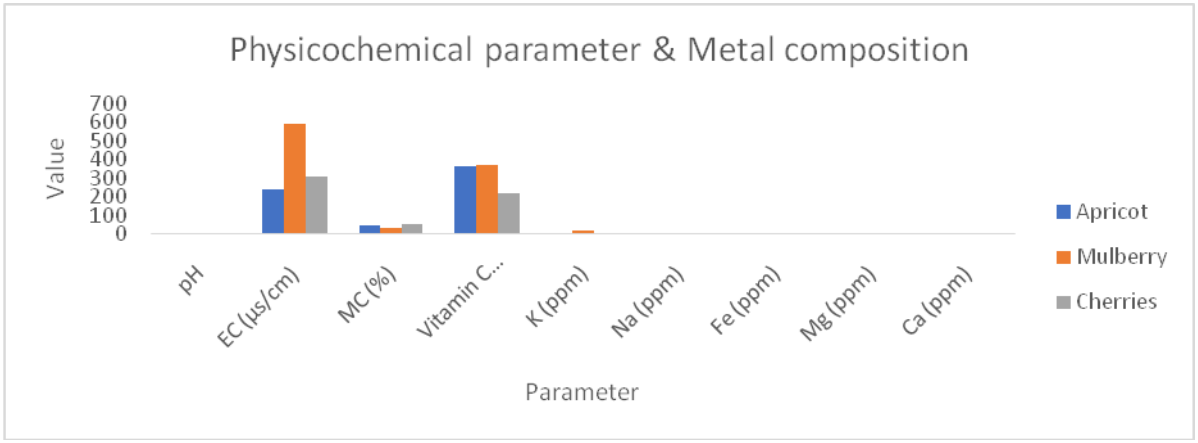

Figure: Physicochemical parameter & Metal composition

Author's contribution statement: Gopala Krishna Devisetty Planned entire study, designed the analysis and wrote the paper.Muzna Salam Al-Aamri, Raya salim Al-Amri& Noor Hamood Al-Saadi collected the data and performed the analysis.

Statistical analysis: The analysis of variance of the data obtained was done by using completely randomized design (CRD) for different studies. The analysis of variance revealed at significance of $P < 0.05$ level is mentioned wherever required.

CONCLUSION

Jams and Jellies are considered as potential source of energy owing to the presence of high carbohydrate content the current analysis of different types of fruit jams has clearly indicated that they have potential nutritional supplements. The analysis indicated that different parameters tested were well within the standard values. Jams hence are rich sources of elements like sugar, minerals, and vitamin C.the studied fruit jams are suitable for consumption in order to compliment the deficiency of the essential minerals from other food sources and improve on the overall nutritional needs of the consumer. We also recommend that those manufacturers using can materials for packaging their jams should ensure that they are well lacquered before use to avert leaching of the toxic materials of the can into the jams

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