



A Project – Report

On

“ Sucrose Percentage In Different Fruits ”

SUBMITTED BY

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SUBMITTED TO,

**VIVEKANAND COLLEGE , KOLHAPUR
(AN EMPOWERED AUTONOMOUS INSTITUTE)**

(DEPARTMENT OF BOTANY)

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UNDER THE GUIDANCE OF

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“ Educational for knowledge science and culture”

-Shikshan Maharshi Dr.Bapuji salunkhe

‘ shri swami vivekanand shikshan sanstha’

Vivekanand college , Kolhapur

(An Empowered Autonomous Institute)

Department of Botany

Certificate

This is to certify that Shravani Amrut Sirsat & Aishwarya Baburao Patil. has satisfactorily carried out her project report as per the syllabus prescribed by the Department of botany Vivekanand college (An Empowered Autonomous Institute) for B.sc – III Botany. This project report represent her Bonafide work during academic year 2025-2026.

Place : Kolhapur

Date : 12/10/2025

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Introduction.

Sucrose in Fruit a natural disaccharide sugar made of glucose and Fructose that provide energy and sweetness. it is made some molecules as table sugar but in Fruit it comes with Fibers, vitamins and minerals which slow digestion and make it a healthier option than refined sugar. As Fruit ripen their sucrose content generally increases, although some Fruit, like banana or grapes are lower in sucrose and higher in other sugars.

What sucrose in Fruit?

- ① A disaccharide - sucrose is double sugar. made of one glucose molecule and one Fructose molecule bonded together.

THERE ARE SOME INFORMATION OF FRUIT AND THEIR SUCROSE PERCENTAGE :

① Banana →

Banana is a fruit from Musa genus known for its soft, sweet, flesh and nutritional value. rich in potassium, fiber and vit B. they are characterized by their large pseudostem and developed from a berry fruit, commonly forming in branches. they grow in bunch from a long stalk, supported by thick, turned-like pseudostem found by leaf sheaths. the fiber of banana supports a healthy sheaths. the fibers of banana support a digestion system. potassium which importance for cardiovascular.



health banana Contain high Carbohydrate.

* Classification →

Kingdom : Plantae

Division : Magnoliophyta

Class : Liliopsida

Order : Zingiberales

Family : Musaceae

Genus : Musa

Species : Musa acuminata

② Orange →

An orange is a sweet, round citrus fruit with leathery, oil skin and juice segmented pulp that grows on trees. Originated in South Asia, orange are grow worldwide in warm climates and a popular source of vit-c, dietary fiber and various other nutrient and phytochemical. the water contain the water hydration antioxidant in oranges may help combat free radical damage, which is linked to chronic disease like cancer.

* Classification →

Kingdom : Plantae

Division : Magnoliophyta

Class : Magnoliopsida

Order : Sapindales

Family : Rutaceae

Genus : Citrus

Species : Citrus sinensis



③ Dragon Fruit →

A tropical fruit from a cactus plant known for its vibrant pink or yellow skin and white or red black seeded flesh. It has a sweet, slightly acidic taste, and a soft, crunchy texture to kiwi or pear. Dragon fruit is low in calories, a good source of vit-c and fibers and contains anti-oxidant and prebiotics, which can benefit gut health and digestion. It grows on a climbing cactus, not a tree and is native to Mexico and South Africa.

* Classification →

Kingdom : plantae

Order : Caryophyllales

Family : Cactaceae

Genus : Hylocereus

Species : H. undatus

④ Guava →

A tropical fruit, native to Mexico, Central America and South America but is now grown worldwide. It is rich in nutrients like vit-c, fiber, and antioxidant and it comes in white/pink flesh varieties. Guava can be eaten raw. Its leaves also have traditional medicinal uses and culinary application such as being used to smoke meat. They have typically a green skin that contains many small, edible seeds. Sweet and tropical with a crunchy texture similar to a pear. A great source of vit-c, with some varieties containing more than orange.



A low calories snack that is filling due to its high fiber content.

• Classification →

Kingdom : plantae

Division : Magnoliophyta

class : Magnoliopsida

order : Myrtales

Family : Myrtaceae

Genus : Psidium

species : psidium guajava

⑤ Custard apple →

Tropical fruit native to central and South America, known for its sweet, creamy, custard-like flesh and a hint of pear or pineapple flavor. It has tough, scaly, green skin and contains multiple dark, inedible seeds that should be avoided. Ripe custard apples are pale green or yellow-green and will yield slightly to pressure. Like an avocado, they are rich in vitamins, minerals like potassium and magnesium and fiber, which supports heart health and digestion.

• Classification →

Kingdom : plantae

Division : Magnoliophyta

class : Magnoliopsida

order : Magnoliales

Family : Annonaceae

Genus : Annona

Species : A. squamosa



⑥ Chicoo →

is a sweet tropical fruit native to central America that is widely cultivated in India. It has a rough, brown skin and a juicy grainy or smooth pulp with flavour often compared to carnal, pear or brown sugar. rich in calories, energy, Fiber, vitamin and minerals like iron, calcium and phosphorus it is used in dessert, smoothies and shakes and its latex is used to make chewing gum.

* classification →

Kingdom : plantae

division : spermatophyta

class : Dicotyledonae.

order : Ebenales.

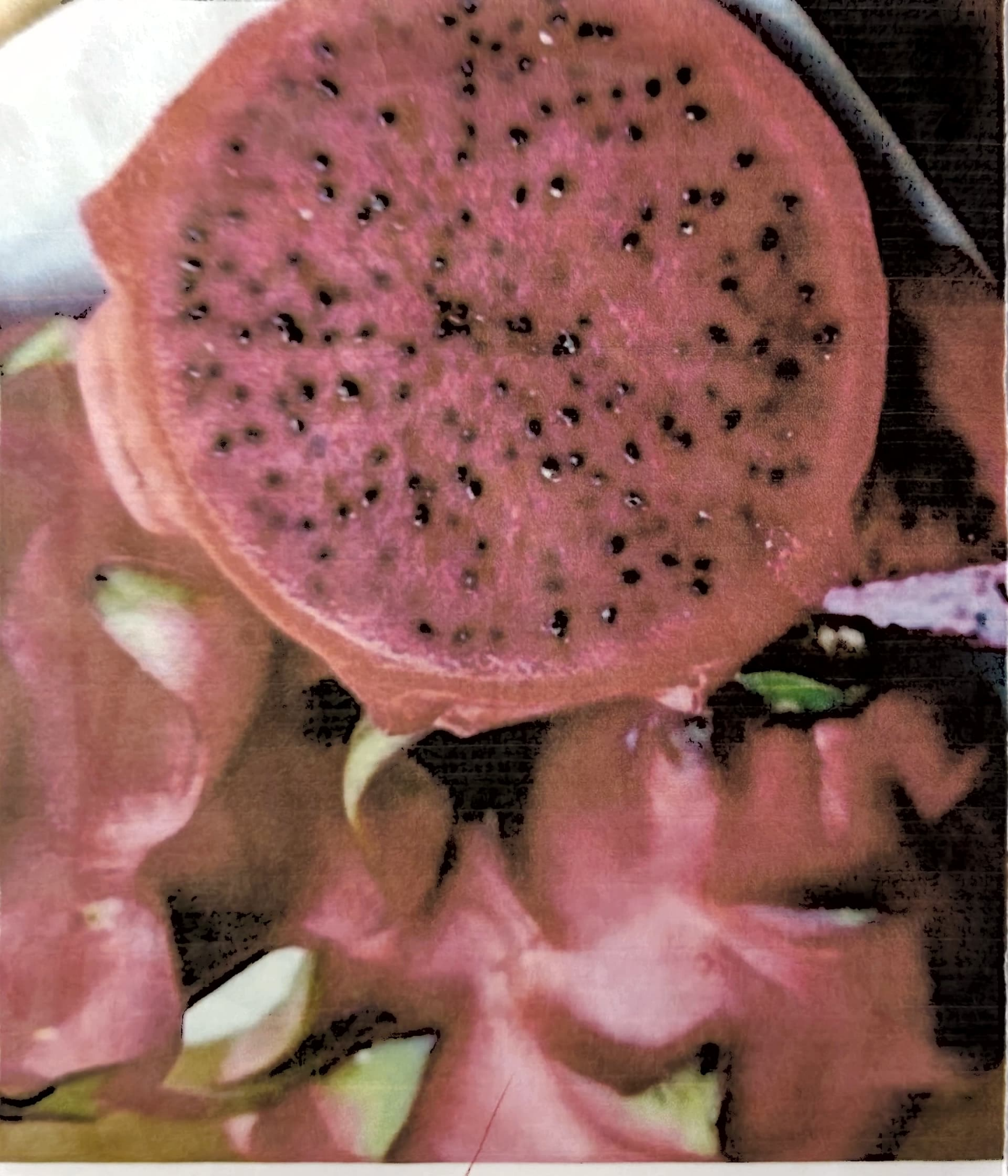
Family : Sapotaceae.

Genus : Manikara

species : M. zapota

⑦ Fig →

A fig is technically a type of fleshy, inverted flower cluster that grows on the Ficus carica tree, a member of the mulberry family native to middle East and Western Asia, it is known for its sweet taste, soft texture when fresh, and chewy, mildly sweet flavour when dried. the 'fruit' contain hundreds of tiny seed, which are actually the result of hundreds of flower that bloomed inside the structure.



* Classification →

kingdom : plantae

Family : Moraceae.

Genus : Ficus

species : Ficus carica



Sucrose Definition According to different Fruit :

1] Banana →

it is disaccharide, is a sugar composed different types of subunit.

it is produced naturally in plant and the main constituent of white sugar. it has molecular formula is $C_{12}H_{22}O_{11}$.

Different Forms of processed sucrose :

- ① sucrose → A disaccharide that is also found in table sugar.
- ② Fructose → A natural sugar that requires little to no insulin to be absorbed the body.
- ③ Glucose → A simple sugar that is the primary source of energy for your body cells.

2] Orange →

① sucrose → disaccharide formed from one glucose one fructose molecule.

② Fructose → Also known as fruit sugar.

③ Glucose → Simple sugar that is primary source of energy in blood.

3] Dragon Fruit →

① Glucose → the main sugar found in dragon.

② Fructose → another natural sugar that gives the fruit its sweet taste.

③ sorbitol → A sugar alcohol that also contributes to the fruit's sweetness.

4] Guava →

① Fructose → 1^o sugar found in guava which increases as the fruit ripens.

② Glucose → major sugar, its concentration also increases with ripening.

③ Sucrose → present in small amount compared to Fructose and glucose.

5] Custard apple →

① Fructose → 1^o sugar in custard apple, it is naturally occurring and provides sweetness.

② Glucose → Also present in the fruit.

③ Sucrose → Another natural sugar found in custard apples.

6] Chicoo →

① Sucrose → A combination of Fructose and glucose that provides the primary sweetness.

② Fructose → A simple sugar that contributes to the fruit's energy content.

③ Glucose → Another simple sugar that contributes to the fruit's energy content.

7] Fig →

① Fructose → these are simple sugars that are the main contributors to a fig's sweetness.

② sucrose → this is disaccharide that is also present, but generally.



Aim : To study the sucrose percentage in Fruits.

objectives :

1. To identify the presence of sucrose in different Fruit stages :
 - ① pre Ripning
 - ② Ripning
 - ③ post-Ripning
2. To understand the sucrose definition and its types.
3. To perform ~~scientific~~ sucrose percentage by using method. Hand Refractometer.
4. the different Fruits shows different sucrose percentage by their pre-Ripning, Ripning and overripening stage.
5. To observe the no. of sucrose and divide the number by 2.
6. To study the How many sucrose present in the all Fruits.

Materials :

1. Fruit sample [in three stage].
2. Hand refractometer.
3. beaker
4. knref
5. water.

6. Spoon

7. glass rod.

- Methods by Using Hand Refractometer For finding How many sucrose is present in different Fruits or stages.

observation table 8Reading

sr.no	Name of Fruit	Pre-ripening	ripening	post-ripening
1]	Banana	17	21	23
2]	Orange	7	10	8
3]	Dragon Fruit	9	13	12
4]	Guava	7.2	4	9
5]	Custard apple	1	10.2	11.2
6]	chikoo	8	-	18
7]	Fig	7	11	11.4

the normal number of these Fruits is above after the finding sucrose number we calculate the percentage of sucrose in that Fruit using formula $\frac{x}{2}$.

Percentage

Sr.No	Name of Fruit	Pre-Ripning	Ripning	post-Ripning
1]	Banana	8.5 %.	10.5 %.	11.5 %.
2]	orange	3.5 %.	5 %.	4 %.
3]	Dragon Fruit	4.5 %.	6.5 %.	6 %.
4]	Guava	3.6 %.	2 %.	4.5 %.
5]	custard apple	0.5 %.	5.1 %.	5.6 %.
6]	chikoo	4.1 %.	-	9.3 %.
7]	Fig	3.5 %.	5.5 %.	5.7 %.

Result :-

In the given Fruit the sucrose percentage is different according to their ripning stage.

Conclusion :-

In some Fruit or stage the sucrose percentage is different with according to their ripning stage in some fruit, the sucrose presentage more in pre-ripping stage and less in post-ripping stage. and in some Fruit the sucrose percentage is less in pre-ripping and post-ripping stage and more in Ripning stage.

Importance of sucrose in different Fruits.

1] Banana →

Sucrose is vital for plants as a transport energy source, signaling molecules and precursor for essential compounds, powering growth development and reproduction by moving from source to sink tissue via phloem. It also plays an osmoregulation under drought stress by regulating turgor pressure and serves as an indicator development process like flowering immunity against pathogens and formation of storage organs. Sucrose is the 1st form in which plants transport carbon.

2] Orange →

It contributes to the seed taste and flavour, influencing consumer preference. It serves as a major energy source for plant's development and acts as signaling molecules to regulate various growth processes. During ripening, sucrose also plays a role in the synthesis of other desirable compounds as pigments. Sucrose is the 1st form of carbon that plants use for energy. That plays a role in the synthesis of pigments like Anthocyanins or Carotenoids.

3] Dragon Fruit →

Providing it with natural sweetness and energy. It is crucial for the fruit flavour and the balance of sugar like sucrose, fructose and glucose determine the fruit's quality and taste. Additionally, sucrose acts as a stabilizer for the fruit's pigment especially the betacyanin in red varieties and is used as a stabilizing agent in processing the fruit as noted in.

4] Guava →

Sucrose is crucial in guava for its role as an energy source & signaling molecules for ripening and a determinant of the fruit's sweet taste and nutritional content. As the fruit matures, starches are converted into simple sugar like sucrose, glucose, and fructose which significantly increases the fruit's sweetness and palatability.

5] Custard apple →

Sucrose, along with other natural sugars like fructose and glucose, is important in custard apples for providing a quick sustained source of energy. The fruit's high sugar content, combined with its fiber, helps to promote satiety and control cravings. It also gives custard apples their characteristic sweetness and flavor.

6] Chikoo →

Sucrose is one of the primary natural sugars in chikoo, providing its characteristic sweetness and contributing to its rich, naturally digestible sugar profile like fructose, and sucrose, which the body can easily use for energy.

7] Fig →

For its role in fruit ripening, energy transport, acting as a precursor to the more abundant sugar glucose and fructose. It also contributes to the fig's sweetness, texture, and overall sensory quality, and is used in processing to enhance these attributes.

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