Dr. BRR. GOVERNMENT COLLEGE, JADCHERLA, MAHABUBNAGAR (Dist.)

DEPARTMENT OF CHEMISTRY

Student Study Project

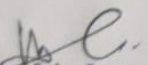### 2021 -22

Topic

CHOCOLATE ANALYSIS
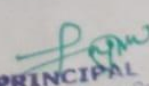
Conducted by student:

Name of the Student	Hall Ticket No.	Course
VADLANI SHIREESHA	20033006441057	MPC EM II Year
MOHAMMED SALMAN	20033006441036	MPC EM II Year
NELAKANTI MAHESH	20033006441041	MPC EM II Year
PULI ANJANEYULU	20033006441047	MPC EM II Year
MOHAMMAD SALEEMODDIN	20033006441035	MPC EM II Year

Guided By

Ch. Venkateswarlu
Asst. Prof. of Chemistry

Sign. of the Lecturer   Sign. of the HOD   Sign. of the PRINCIPAL

Introduction:

Chocolates have become one of the most popular flavours in the world of today. They form the basics ingredient in very many pastries and cake. Chocolates can alsobe used as hot and Cold Beverages. Each manufacture combines secret formulas of the different varieties of the coca sweets to develop exclusive chocolates and try to make the exotic teat. Gifts of chocolates moulded to different shapes has become traditional on certain festivals and occasions.

Chocolates are made from the seeds of COCOAtrees. Spanish mythology consider these trees were grown in the garden of the PARADISE and believed that the chocolates drink was Divine. The cocoa trees is a tropical plant, sometimes living and producing for more than 200 years. Chocolates are made from the seeds of these trees. There are many varieties cultivated today and this farming is highly profitable.

Chocolates is a highly commercialised and money making programme. In the modern factories tons of bitter cocoa beans are turned into one of the world'sfavourite's confectionary. Today chocolates are made available to us much guarded secret formula involving varying seeds,different ingredients, combinations of fermentation-roasting timings-temperatureetc. Flavours such as mint, coffee, orange, strawberryetc. are some of the add ones. Also today the chocolates can contain ingredients as peanut, different types of walnuts, dry fruits, caramels, crisped rice etc.

Usually the chocolates can be categorized into one the following group.

1. Bitter

2. Bitter sweets

3. Unsweetened

4. Dark sweetened

5. Milk chocolates

6. Cocoa powder

7. Cocoa sauce/syrup

The health effect of chocolates refer to the possible beneficial or detrimental, physiological effects of eating chocolates mainly for pleasure. For example, cocoa and chocolates may support cardiovascular health. Other effects under preliminary research includes reduce risk of cancer, coughing and heart disease .

One interpretation on the potential health effect of dietary chocolates are may be lower blood pressure improved vascular function and energetic metabolism, and reduced platelets and aggregation and adhesion.

Unconstrained consumption of large quantity of any energy-rich food, such as chocolates, without a corresponding increase in activity, increases the risk obesity. Raw chocolates is high in cocoa butter, a fat removed during chocolate refining, then added back in varying proportions during manufacturing. Manufactures may add other fats, sugar and powder milk as well.

¬ *Good effects*

Chocolate may be mild stimulant to humans cocoa has antioxidant activity. Antioxidants helps to free your body of free radicals which cause oxidative damage to the cell. Small but regular amounts of dark chocolates are associated with lower risk of heart attack. Dark chocolates contain THEOBROMINE,which has been shown to harden tooth enamel. Cocoa percent of at least 74%, significantly improves the blood flow which were tested on smokers. Some studies has also observed a modest reduction in the blood pressure and flow mediated dilation after consuming dark chocolates

daily. Eating dark chocolates may also prevent arteriosclerosis (Harding of the arteritis). Thus the best type ofchocolates that is benefit for you is dark chocolates.

¬ *Bad effects*

While chocolateshave many good effects on consuming, it also has many negative side effects. It contains too many bad ingredients including, milk fats and saturated fats caffeine, oxalates and stearic acid. And while sugar may give energy, too much of it can cause tooth decay and gum disease if eating without regular and proper teeth brushing.

Sugar plays a harmful role in tooth decay by providing bacteria in your mouth with energy. Bacteria begin to multiply faster,and plague begins to grow in size and thickness on your teeth. Bacteria can also use sugar as a glue to cling to your teeth, making it difficult to get rid of just a tooth brush. Dark chocolates contain a higher amount of caffeine than milk chocolates and this can affect your health. Too much caffeine lead to hypertension anxiety dehydration and inability to concentrate.

Our aim is to find out the presence of Proteins, Fats, Sugars, Calcium, Iron, Magnesium, Nickel in different chocolates.

Materials required

1. Sodium hydroxide (NaOH)

2. Copper sulphate (CuSO4)

3. Moliscli's Reagent C10H7OH)

4. Fehling's Solution A & B

5. Sulphuric acid (H2SO4)

6. Tollen's Reagent

7. Ammonium Chloride (NH4Cl)

8. Ammonium Hydroxide (NH4OH)

9. Sodium Phosphate (Na3PO4)

Procedure for Analysis

Organic tests and Inorganic tests done to find the presents of the different in chocolates. Tests for identification of Calcium and Magnesium (Good Substances) and also tests for identification of Lead and Nickel (Poisonous Substances) were also done.

TEST FOR PROTEIN			
	EXPERIMENT	OBSERVATION	INFERENCE
1.	5ml of each sample if chocolate taken in different test tube. Add 1 pellet of NaOH to each Add 1-2 drops of $CuSO_4$ solution to each	Appearance of violet coloration observed	Presence of **PROTEIN** in the sample

Result - All samples (darkchocolate…..chocolate cream…. Milky bar…... milk chocolate bar…..Cadburys bar) studied showed that they contain PROTEIN.

TEST FOR FAT			
	EXPERIMENT	OBSERVATION	INFERENCE
1.	Take a small sample of each chocolate on different pieces of filter paper. Fold and unfold the paper to crush the sample over a flame	Appearance of translucent spot around the sample which became larger on heating was observed	Presence of **FAT** in the sample

Result - All samples studied showed that they contain FAT.(Dark chocolate…..chocolate cream….

Milky bar…... milk chocolate bar….. Cadburys bar)

TEST FOR SUGAR

	EXPERIMENT	OBSERVATION	INFERENCE
1.	5ml of each sample if chocolate taken in different test tube. Add 1ml water to each then add few drops of moliscli's reagent (alpha naphthol in alcohol.) Then add con. H_2SO_4 drops along inner edge of the test tube.	A purple ring is formed at the top.	Presence of **SUGAR** in the sample
2.	Mix 2ml of Fehling's A & B in different test tubes. Add a pinch of the chocolate into the each test tube Then the solution in the water bath.	Red-brown precipitate was obtained.	Presence of **SUGAR** in the sample
3.	2ml of Tollen's Reagent was taken in different testube. Add a pinch of the chocolate into the each test tube. Then the solution in the water bath.	A silver mirror surface is formed.	Presence of **SUGAR** in the sample

Result - All samples studied showed that they contain REDUCING SUGAR.(Dark chocolate…..chocolate cream…. Milky bar…... milk chocolate bar….. Cadburys bar)

TEST FOR CALCIUM

	EXPIRIMENT	OBSERVATION	INFERENCE
1.	A mixture of NH_4Cl + NH_4OH+$(NH_4)_2CO_3$	A white precipitate was obtained.	Presence of **CALCIUM** in the sample
2.	With help of a glass rod each sample of chocolate solution placed on different watch glass. Add a drop of con.HCl and a paste is made on each sample. This paste from each sample is taken on the tip of new glass rod and shown to blue flame of spirit lamp.	Brick red colour flame was obtained.	Presence of **CALCIUM** in the sample

Result - All samples studied showed that they contain CALCIUM.(Dark chocolate…..chocolate cream…. Milky bar…... milk chocolate bar….. Cadburys bar)

TEST FOR IRON

	EXPERIMENT	OBSERVATION	INFERENCE
1.	A mixture of NH_4Cl + NH_4OH is made. This is added to each sample of chocolate solution taken in different test tubes.	No brown precipitate was obtained.	Absence of **IRON** the sample

Result - All samples studied showed that they do not contain IRON. (Dark chocolate…..chocolate cream…. Milky bar…... milk chocolate bar….. Cadburys bar)

TEST FOR MAGNESIUM			
	EXPERIMENT	OBSERVATION	INFERENCE
1.	A mixture of NH_4Cl + NH_4OH +$Na_3PO_4$is made. This is added to each sample of chocolate solution taken in different test tubes.	No white precipitate was obtained.	Absence of **MAGNESIUM** the sample

Result - All samples studied showed that they do not contain MAGNESIUM. (Dark chocolate…..chocolate cream…. Milky bar…... milk chocolate bar….. Cadburys bar).

TEST FOR NICKEL			
	EXPIRIMENT	OBSERVATION	INFERENCE
1.	A mixture of NH_4Cl + NH_4OH is made. This is added to each sample of chocolate solution taken in different test tubes. Pass H_2S gas through the solution.	No blackprecipitate was obtained.	Absence of **NICKEL**the sample.

Result - All samples studied showed that they do not contain NICKEL (Dark chocolate…..chocolate cream…. Milky bar…... milk chocolate bar….. Cadburys bar).

Conclusion

SI.NO	Substance	Present/Absent
1.	Proteins	Present
2.	Fats	Present
3.	Sugars	Present
4.	Calcium	Present
5.	Iron	Absent
6.	Magnesium	Absent
7.	Nickel	Absent

References:

www.foodhealthinnovation.com

www.todaysdietition.com

www.teagasc.ie/research.com