Popular Sweeteners

and Their Health Effects

Interactive Qualifying Project Report

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Abstract

Perceived health risks of artificial sweeteners are a controversial topic often supported solely by anecdotal evidence and distorted media hype. The aim of this study was to examine popular sweeteners and their health effects based upon valid scientific data. Information was gathered through a sweetener taste panel, interviews with doctors, and an on-line survey. The survey revealed the public's lack of appreciation for sweeteners. It was observed that artificial sweeteners can serve as a low-risk alternative to natural sweeteners.

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Acknowledgements

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1.0 Introduction

Sweeteners are food additives that are used to improve the taste of everyday foods. Natural sweeteners are sweet-tasting compounds with some nutritional value; the major ingredient of natural sweeteners is either mono- or disaccharides. Artificial sweeteners, on the other hand, are compounds that have very little or no nutritional value. This is possible because artificial sweeteners are synthesized compounds that have high-intensities of sweetness, meaning less of the compound is necessary to achieve the same amount of sweetness. Artificial sweeteners are used in products used to limit caloric intake or prevent dental cavities. Sugar alcohols are natural compounds with varying degrees of sweetness which are often added to boost or fine tune flavors of products while increasing their sweetness. They are often used in conjuncture with natural or artificial sweeteners in order to achieve a desired degree of sweetness, taste or texture. Sugar alcohols typically provide some amount of nutrition but have other benefits such as not affecting insulin response or promoting tooth decay which makes them a popular sweetening choice.

The purpose of this project is to gain knowledge about the different kinds of existing sweeteners and their composition. It will be important to understand, based on data from scientific research, how artificial sweeteners are metabolized within the human body and their effects on human health. In order to make this possible, published scientific research papers will be used to gain data on the effect that artificial sweeteners have on health. The health effect of artificial sweeteners will be analyzed based on this data. Also, a survey will be used to gain understanding of the general public's knowledge of artificial sweeteners.

This project aims to provide concrete information based on valid research into the effects sweeteners have on human health. Much anecdotal information is available in circulation concerning the effects that natural and artificial sweeteners have on human health; this information

is often misleading or invalid. A proper understanding of the health effects of artificial sweeteners and the differences between natural sweeteners and artificial sweeteners will help readers to construct a healthy diet plan and make educated decisions when using products containing sweeteners.

2.0 Objectives

The main objectives of this project were:

- To gain knowledge of common commercially-available sweetening compounds
- To understand the manufacturing and production of sweeteners
- To understand sweetener metabolism within the human body
- To gain knowledge of the health effects of artificial sweeteners based on scientific data
- To understand the general public's knowledge of artificial sweeteners and their respective health effects

3.0 Methodologies

- Review of Scientific Articles
    - Database search engines were used to find articles, many of which were peer-reviewed, based on concrete scientific research. These articles were used to gain knowledge on the metabolism, health effects, production process, chemical structure, chemical properties, usage trends and concerns regarding artificial sweeteners. The following sources were used for the analysis:
        - Journal of Toxicology and Nutrition
        - Nature
        - Behavioral Neuroscience
        - Elsevier
        - Journal of Nutrition
        - Food and Chemical Toxicology
        - Regulatory Toxicology and Pharmacology
        - Journal of Clinical Endocrinology & Metabolism
        - American Journal of Clinical Nutrition
        - INCHEM
        - American Chemical Society
        - American Dietary Association
        - Food and Drug Administration
        - American Journal of Clinical Nutrition
        - Journal of Toxicological Sciences
        - Annals of Oncology
        - The New York Times
        - Journal of Toxicology and Environmental Health
        - Neuron
        - Trends in Biochemical Sciences

        - Lancet
        - Applied Science
        - United States Food and Drug Administration
        - United States Department of Agriculture
        - Center for Disease Control
        - National Institute of Health
        - American Cancer Society
        - American Dietetic Association

- Artificial Sweeteners In Use

    - Three apple pies were baked, each containing one of three different kinds of popular artificial sweeteners, *Sweet 'N Low*, *Splenda*, and *Equal*. An informal taste test involving 10 passive volunteers was performed asking the participants to rate the sweetness on a scale of 1-10, the aftertaste on a scale of 1-10 as well as provide a description of the aftertaste experienced.

        - The following recipe was used for the pies:

            - Ingredients:
                1 (9 in.) pie shell, unbaked
                1 c. sugar
                1 tsp. ground cinnamon
                6-8 lg. apples, McIntosh or Granny Smith
                1/2 c. all-purpose flour
                1/3 c. butter, softened
            - Cooking Instructions:
                - Preheat oven to 375 degrees.
                - Mix 1/2 cup of the sugar with the cinnamon. Peel, core, and thinly slice the apples. Arrange the apples in layers in the pie shell, sprinkling with the cinnamon-sugar mixture as you layer it. Mound the apples quite high in the pie shell, as they will cook down.
                - In a small mixing bowl combine the flour, and remaining 1/2 cup sugar; cut in the butter until crumbly. Pat this mixture by large spoonfuls evenly over the apples, forming a crust, as you place large spoonfuls over the apples. Seal at the edges. Bake for 50-60 minutes or until golden brown.

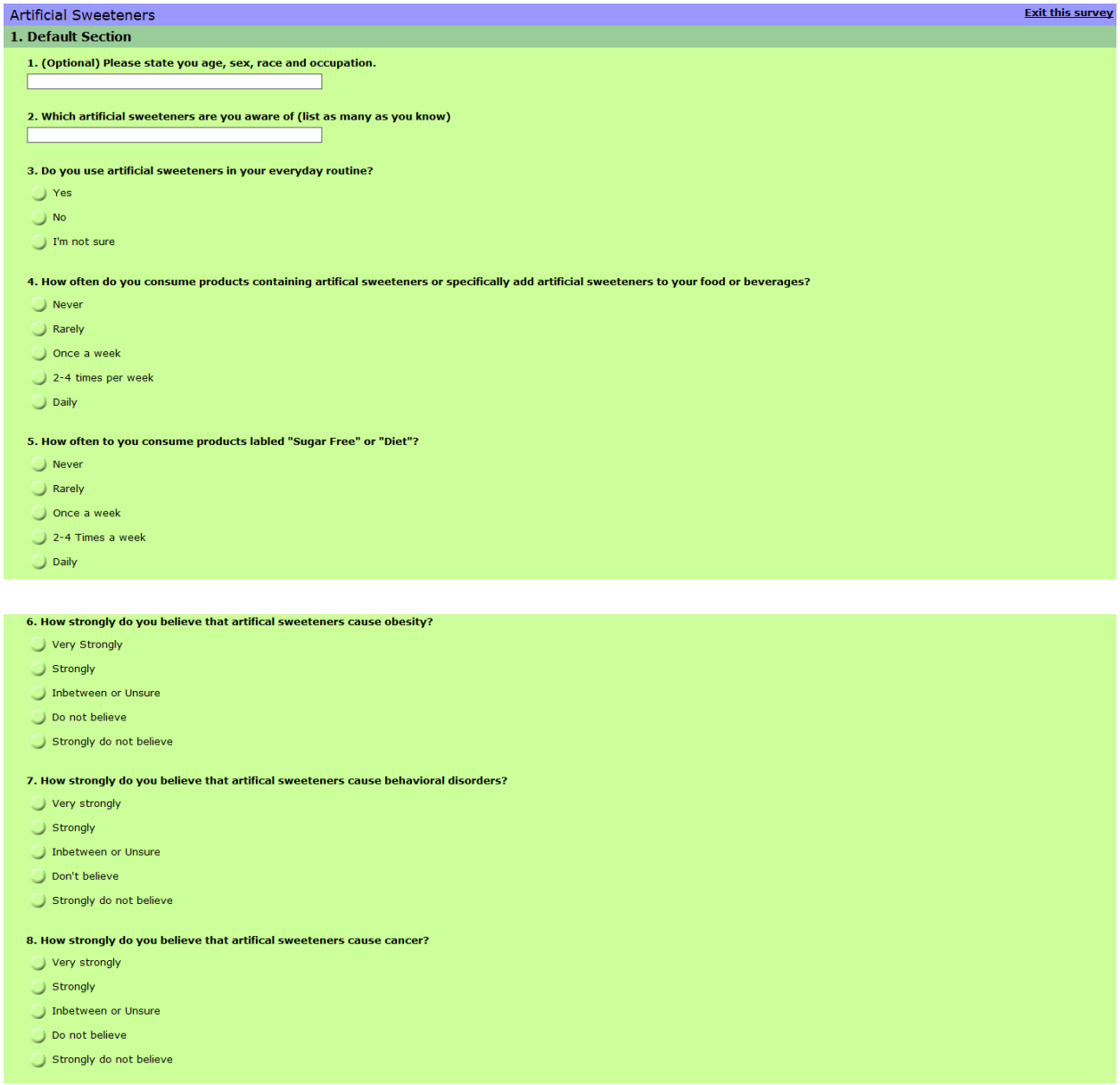
- The following table was used to record participant responses:

Participant	Sweetness Rating (1-10)	Aftertaste Rating (1-10)	Aftertaste Description
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

- Survey
    - A survey was done using the website program SurveyMonkey to gain knowledge on the general public's understanding of, concerns with and preference for artificial sweeteners. The survey received 840 responses between the dates of November 11, 2009 and December 11, 2009. Raw data is included in Appendix A1.
        - The survey contained the following questions:
            - (Optional) State your age, sex, race and occupation
            - Which artificial sweeteners are you aware of?
            - Do you use artificial sweeteners in your everyday routine?
            - How often to you consume products containing artificial sweeteners or specifically add artificial sweeteners to your food or beverages?
            - How often to you consume products labeled "Sugar Free" or "Diet"?
            - How strongly do you believe that artificial sweeteners cause obesity?
            - How strongly do you believe that artificial sweeteners cause behavioral disorders?
            - How strongly do you believe that artificial sweeteners cause cancer?

- If you were certain that artificial sweeteners have no adverse health effects and were in fact beneficial to your health, would you use them more?
- Would you be interested in participating in a brief "taste panel" of different artificial sweeteners? If so, where would you like this taste panel to be held (Campus Center, Quad, Fountain, Wedge, etc.)?

  - The following is a screenshot of the survey from SurveyMonkey at the following URL: <http://www.surveymonkey.com/s/JVM75FH>



Artificial Sweeteners — Exit this survey

1. Default Section

1. (Optional) Please state you age, sex, race and occupation.

2. Which artificial sweeteners are you aware of (list as many as you know)

3. Do you use artificial sweeteners in your everyday routine?

- Yes
- No
- I'm not sure

4. How often do you consume products containing artifical sweeteners or specifically add artificial sweeteners to your food or beverages?

- Never
- Rarely
- Once a week
- 2-4 times per week
- Daily

5. How often to you consume products labled "Sugar Free" or "Diet"?

- Never
- Rarely
- Once a week
- 2-4 Times a week
- Daily

6. How strongly do you believe that artifical sweeteners cause obesity?

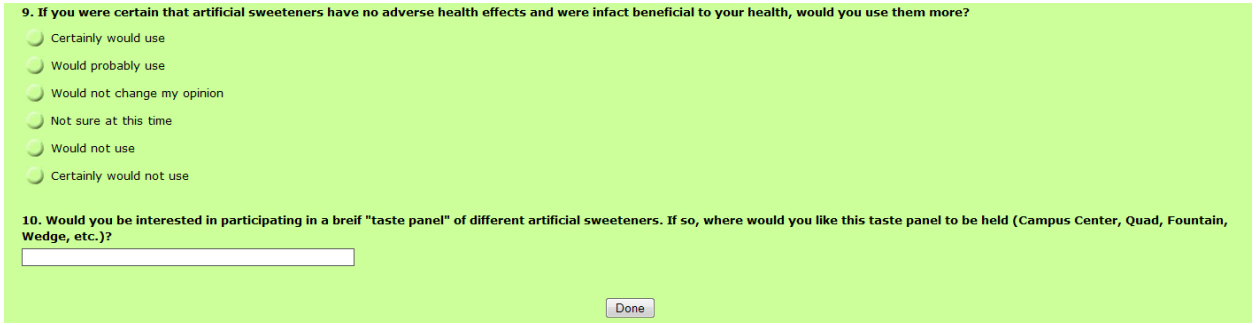
- Very Strongly
- Strongly
- Inbetween or Unsure
- Do not believe
- Strongly do not believe

7. How strongly do you believe that artifical sweeteners cause behavioral disorders?

- Very strongly
- Strongly
- Inbetween or Unsure
- Don't believe
- Strongly do not believe

8. How strongly do you believe that artifical sweeteners cause cancer?

- Very strongly
- Strongly
- Inbetween or Unsure
- Do not believe
- Strongly do not believe



- Professional Opinions
    - Two doctors from NYU Langone Medical Center were informally interviewed to gain knowledge of the concerns of professionals in the medical field. The doctors wished to remain unnamed for the purposes of this report but had no reservations in sharing their backgrounds and opinions.
        - Doctor one is a sports medicine doctor who has previous background in physical therapy. Her primary concern was the unpredictability of artificial sweeteners on a case-by-case basis.
        - Doctor two is an endocrinologist who has previous experience working with diabetes during her residency and other research experiences. Her primary concern was the difficulty in tracking sweetener intake as well as the results of consuming more than the FDA recommended daily intakes of sweeteners.

4.0 Common Sweeteners and Their Production

A sugar substitute is a food additive that duplicates the effect of sugar in taste, but usually has less food energy. Some sugar substitutes are natural and some are synthetic. Those that are not natural are referred to as artificial sweeteners [6]. An important class of sugar substitutes is known as high-intensity sweeteners. These are compounds with sweetness that is many times that of sucrose, common table sugar. As a result, much less sweetener is required, and energy contribution often negligible. The sensation of sweetness caused by these compounds is sometimes notably different from sucrose, so they are often used in complex mixtures that achieve the most natural sweet sensation. This may be seen in soft drinks labeled as "diet" or "light," which contain artificial sweeteners and often have notably different mouth feel. In the United States, six intensely-sweet sugar substitutes have been approved for use [6]. They are saccharin, aspartame, sucralose, neotame, acesulfame potassium, and stevia. The US Food and Drug Administration regulates artificial sweeteners as food additives. The majority of sugar substitutes approved for food use are artificially-synthesized compounds [6]. However, some bulk natural sugar substitutes are known, including sorbitol and xylitol, which are found in berries, fruit, vegetables, and mushrooms. Some non-sugar sweeteners are polyols, also known as "sugar alcohols." These are, in general, less sweet than sucrose, but have similar bulk properties and can be used in a wide range of food products. Sometimes the sweetness profile is 'fine-tuned' by mixing high-intensity sweeteners. As with all food products, the development of a formulation to replace sucrose is a complex proprietary process. In the following section, the structure and production of popular sweeteners will be discussed.

4.1 Natural Sweeteners

Natural sweeteners are sweeteners that are extracted from natural products without any chemical modifications during the production or extraction process. Some of these sweeteners have been in use for decades while other for centuries. Natural sweeteners are well known and their production process has been perfected over time making their cost low and leaving their demand high.

4.1.1 Honey

Honey is a sweet food made by certain insects using nectar from flowers. The variety produced by honey bees is the one most commonly referred to and is the type of honey collected by beekeepers and consumed by humans. Honey produced by other bees and insects has distinctly different properties. Honey bees form nectar into honey by a process of regurgitation and store it as a food source in wax honeycombs inside the beehive [68]. Beekeeping practices encourage overproduction of honey so that the excess can be taken without endangering the bee colony. Honey gets its sweetness from the monosaccharides fructose and glucose and has approximately the same relative sweetness as that of granulated sugar (74% of the sweetness of sucrose, a disaccharide)[68]. It has attractive chemical properties for baking, and a distinctive flavor which leads some people to prefer it over sugar and other sweeteners. Most micro-organisms do not grow in honey because of its low water activity of 0.6. The main uses of honey are in cooking, baking, as a spread on breads, and as an addition to various beverages such as tea and as a sweetener in some commercial beverages. Honey is also used as an adjunct in beer. Its glycemic index ranges from 31 to 78, depending on the variety.

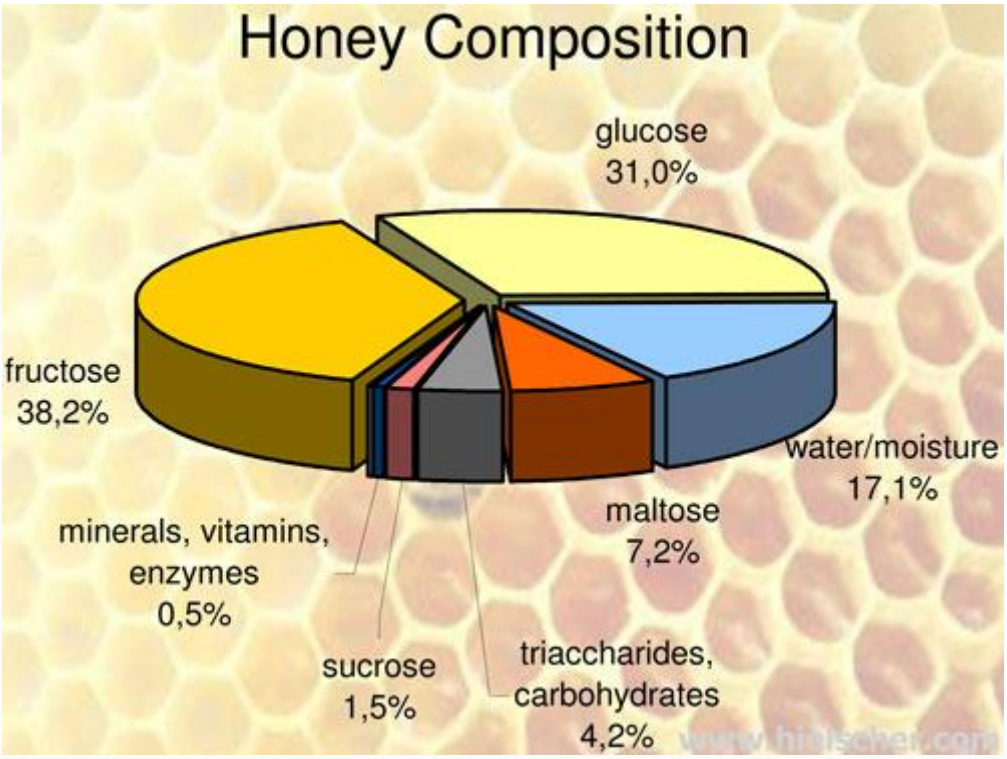


Figure 1: Composition of Honey [68]

Honey is a mixture of sugars and other compounds, as seen in Figure 1 above. With respect to carbohydrates, honey is mainly fructose (about 38.2%) and glucose (about 31.0%) [68]. Honey's remaining carbohydrates include maltose, sucrose, and other complex carbohydrates. Honey contains trace amounts of several vitamins and minerals. As with all nutritive sweeteners, honey is mostly sugars and is not a significant source of vitamins or minerals. Honey also contains tiny amounts of several compounds thought to function as antioxidants, including chrysin, pinobanksin, vitamin C, catalase, and pinocembrin. The specific composition of any batch of honey depends on the flowers available to the bees that produced the honey. A typical honey analysis goes as follows: Fructose: 38.2%, Glucose: 31.0%, Sucrose: 1.5%, Maltose: 7.2%, Water: 17.1%, Higher sugars: 1.5%, Ash: 0.2%, Other/undetermined: 3.2%. Honey has a density of about 1.36 kg/L (36% denser than water) [68]. The pH of honey is commonly between 3.2 and 4.5. This relatively acidic pH level prevents the growth of many bacteria.

Many varieties of processing exist for honey. Crystallized honey is honey in which some of the glucose content has spontaneously crystallized from solution as the monohydrate [68]. Also called "granulated honey." Pasteurized honey is honey that has been heated in a pasteurization process. Pasteurization in honey reduces the moisture level, destroys yeast cells, and liquefies crystals in the honey. While this process sterilizes the honey and improves shelf-life, it has some disadvantages. Excessive heat-exposure affects appearance, taste, and fragrance. Heat processing can also darken the natural honey color (browning). Raw honey is honey as it exists in the beehive or as obtained by extraction, settling or straining without adding heat (although some honey that has been "minimally processed" is often labeled as raw honey). Raw honey contains some pollen and may contain small particles of wax. Ultra filtered honey is honey processed by very fine filtration under high pressure to remove all extraneous solids and pollen grains. The process typically heats honey to 65-77 °C to more easily pass through the fine filter. Ultra filtered honey is very clear and has a longer shelf life, because it crystallizes more slowly because of the high temperatures breaking down any sugar seed crystals, making it preferred by the supermarket trade. The heating process degrades certain qualities of the honey similar to the aforementioned pasteurization process.

4.1.2 Maple Syrup

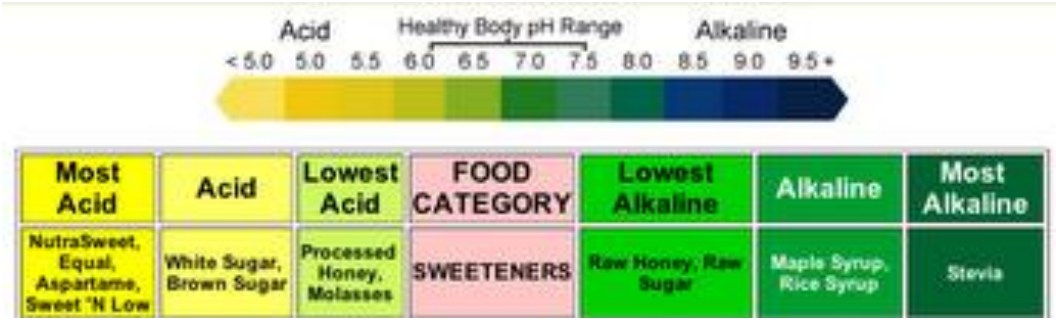


Figure 2: Sweetener pH Levels [69]

Maple syrup is a sweetener made from the sap of some maple trees. In cold climate areas, these trees store sugar in their roots before the winter and the sap which rises in the spring can be tapped and concentrated [69]. This sap has only 3% to 5% total solids, consisting mainly of sucrose.

Other components include organic acids (primarily malic acid), minerals (primarily potassium and calcium), phenoliccompounds (aroma), amino compounds (trace) and vitamins (trace). Maple Syrup has about the same 50 cal/tbsp as white cane sugar. However, it also contains significant amounts of potassium (35 mg/tbsp), calcium (21 mg/tbsp), small amounts of iron and phosphorus, and trace amounts of B-vitamins. Its sodium content is a low 2 mg/tbsp. The sugar content of sap averages 2.5% and the sugar content of syrup averages 66.5%.

In maple syrup at 66.0° Brix the sugar is completely in solution and it is a stable solution [70]. When you continue to cook syrup, the concentration of sugar in the syrup continues to increase as temperature increases and as water is lost. The sugar remains in solution at the higher temperature even though much of the water boils away. When the syrup reaches the desired temperature for a particular confection and begins cooling, there is more sugar than can remain in solution at lower temperatures. The solution is said to be super-saturated. Agitation or stirring of any kind can cause the sugar to crystallize and come out of solution until the sugar in solution reaches a stable concentration for its temperature. The fact that sugar solidifies into crystals is extremely important in making confections. The amount of sugar that can be in solution in a given volume of water varies with the temperature of the solution. Hot solutions can contain more sugar and cool solutions less sugar. This is why accurate measurement of the temperature of heated syrup is so important.

Canada makes more than 80 % of the world's maple syrup, producing about 26,500,000 L in 2005[69]. The vast majority of this comes from Quebec: the province is by far the world's largest producer, with about 75 % of the world production (24,660,000 L in 2005). Production in Quebec is controlled through a supply-management system, with producers receiving quota allotments from the Fédération des producteurs acéricoles du Québec. The province also maintains it own "strategic reserves" of maple syrup, which reached its highest point in 2004, when it totaled

17,030,000 L. Vermont is the biggest U.S. producer, with 3,500,000 L in 2009, followed by Maine with 1,500,000 L and New York with, 370,000 L.

Traditionally, maple syrup was harvested by tapping a maple tree through the bark and into the wood, then letting the sap run into a bucket, which required daily collecting; less labor-intensive methods such as the use of continuous plastic pipelines have since superseded this, in all but cottage-scale production [69]. Production is concentrated in February, March, and April, depending on local weather conditions. Freezing nights and warm days are needed to induce sap flows. The change in temperature from above to below freezing causes water uptake from the soil, and temperatures above freezing cause a stem pressure to develop, which, along with gravity, causes sap to flow out of tap holes or other wounds in the stem or branches. To collect the sap, holes are bored into the maple trees and tubes are inserted. Sap flows through the spouts into buckets or into plastic tubing. Modern use of plastic tubing with a partial vacuum has enabled increased production. A hole must be drilled in a new location each year, as the old hole will produce sap for only one season due to the natural healing process of the tree. Maple sap is collected from the buckets and taken to the sugar house; if plastic tubing and pipelines are used, then the pipelines are arranged so that the sap will flow by gravity into the sugar house, or if that is not possible, into holding tanks from which the sap is pumped or transported by tanker truck to the sugar house. It takes approximately 40 L of sap to be boiled down to 1 L of syrup. A mature sugar maple produces about 40 L of sap during the 4 to 6 week sugaring season. Trees are not tapped until they have a diameter of 25 cm at chest-height and the tree is at least 40 years old. If the tree is more than 45 cm it can be tapped twice on opposite sides. It is recommended that the drilled tap hole have a width of 8 mm and a depth of 25 to 40 mm. During cooking, the sap is fed automatically by pipe from a storage tank to a long and narrow ridged pan called the evaporator. The evaporator is usually divided into two sections, the front pan and the back pan. As the sap boils, the water evaporates; it becomes denser and sweeter. As the density of the sap increases, it works its way

from the rear of the back evaporator pan to the front evaporator pan. The syrup is boiled until it reaches the correct density of maple syrup, 1333 kg/m^3. The proper density of at least 66% sugar is reached when the boiling sap reached a temperature of 104 °C. The density is tested with a hydrometer. If the density is too low the syrup will not be sweet enough and the syrup will spoil. If the density is too high the syrup will crystallize in bottles. When the syrup has reached the proper density, it is drawn off, filtered and bottled while hot. Starting in the 1970s, some maple syrup producers started using reverse osmosis to remove water from sap before being further boiled down to syrup. The use of reverse osmosis allows approximately 75 to 80% of the water to be removed from the sap prior to boiling, reducing energy consumption and exposure of the syrup to high temperatures. Microbial contamination and degradation of the membranes has to be monitored.

4.1.3 Molasses

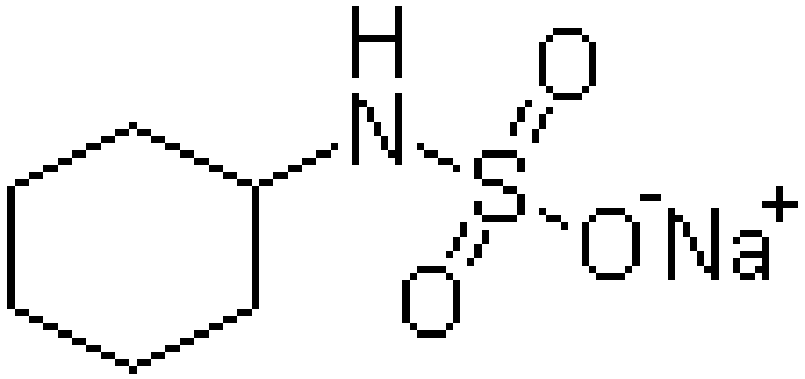


Figure 3: Chemical Structure of Molasses [71]

Molasses is a viscous byproduct of the processing of sugar cane or sugar beets into sugar. The quality of molasses depends on the maturity of the sugar cane or sugar beet, the amount of sugar extracted, and the method of extraction [72]. Molasses has the molecular formula $C_6H_{12}NNaO_3S$, a molecular weight of 201.22 g/mol, and a density of 1.41 g/cm^3 [71]. A typical composition of molasses contains the following substances: sucrose 35.9 %, fructose 5.6 %,

nitrogen 1.01 %, reducing substances 11.5 %, glucose 2.6 %, and sulfur 0.78 % [73].

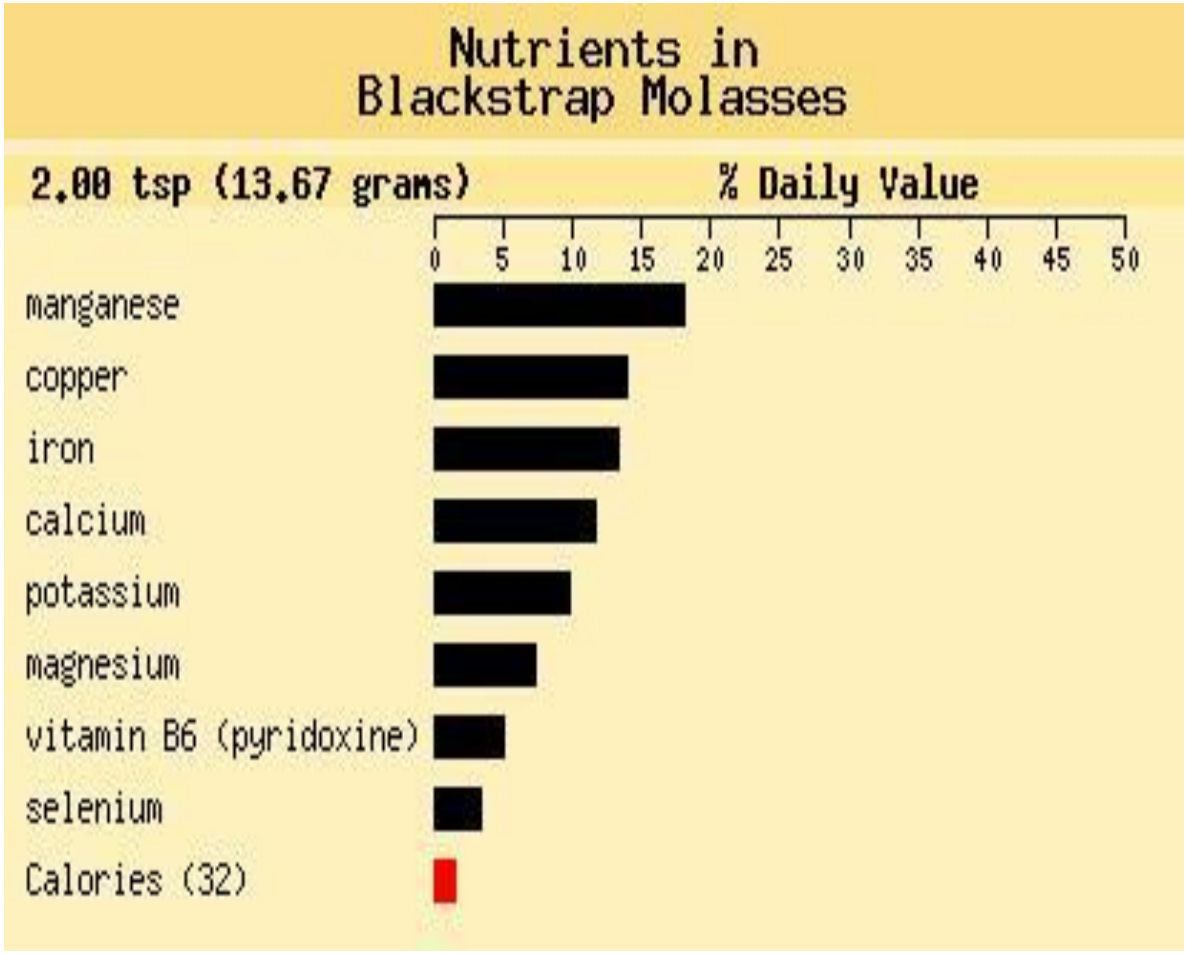


Figure 4: Nutrients in Blackstrap Molasses [73]

Sulphured molasses is made from young sugar cane [72]. Sulphur dioxide, which acts as a preservative, is added during the sugar extraction process. Unsulphured molasses is made from mature sugar cane, which does not require treatment with sulphur. There are three grades of molasses: mild, dark, and blackstrap. These grades may be sulphured or unsulphured.

To make molasses, the sugar cane plant is harvested and stripped of its leaves [72]. Its juice is extracted from the canes, usually by crushing or mashing; it can also be removed by cutting. The juice is boiled to concentrate it, which promotes the crystallization of the sugar. The result of this first boiling and removal of the sugar crystals is mild molasses, which has the highest sugar content

because comparatively little sugar has been extracted from the source. Dark molasses is created from a second boiling and sugar extraction, and has a slight bitter tinge to its taste.

The third boiling of the sugar syrup makes blackstrap molasses [72]. The majority of sucrose from the original juice has been crystallized, but blackstrap molasses is still mostly sugar by calories. However, unlike refined sugars, it contains significant amounts of vitamins and minerals. Blackstrap molasses is a source of calcium, magnesium, potassium, and iron; 15 mL provides up to 20% of the daily value of each of those nutrients. Blackstrap, often sold as a health supplement, is also used in the manufacture of cattle feed and for other industrial uses.

Molasses that comes from the sugar beet is different from cane molasses [72]. Only the syrup left from the final crystallization stage is called molasses; intermediate syrups are referred to as high green and low green, and these are recycled within the crystallization plant to maximize extraction. Beet molasses is about 50% sugar by dry weight, predominantly sucrose, but also contains significant amounts of glucose and fructose. Beet molasses is limited in biotin (Vitamin H or B7) for cell growth; hence, it may need to be supplemented with a biotin source. The non-sugar content includes many salts, such as calcium, potassium, oxalate, and chloride. These are either as a result of concentration from the original plant material or as a result of chemicals used in the processing. As such, it is unpalatable, and is mainly used as an additive to animal feed.

It is possible to extract additional sugar from beet molasses through a process known as molasses desugarisation [72]. This technique exploits industrial-scale chromatography to separate sucrose from nonsugar components. The technique is economically viable in trade-protected areas, where the price of sugar is supported above the world market price. As such, it is practiced in the U.S. and parts of Europe.

4.1.4 Stevia

Stevia is one of the newest sweeteners available in the market. It has been known of since 1899 for its sweet taste and has been cultivated in Japan since 1970. It was not until recently that a safe and successful extraction of glycosides (the chemical in the Stevia plant which gives it a sweet taste) allowed for the FDA to approve Stevia as a general sweetener (2008) [30]. Stevia can also be known under its trade name as *TruVia* and *PureVia* which were patented by *Coca Cola* and *Pepsi*. Many different forms of Stevia as a sweeteners exist such as: Reb A, Reb B, Reb C, Reb D, *Rebiana*, *Stevioside*, *SunCrystals* and *Enliten*. Each has a small variation in the manufacturing process or how it is used. *SunCrystals*, *TruVia* and *PureVia* for example combine Stevia with an emulsifier to make a white, crystalline powder used as a tabletop sweetener, while *Rebiana* typically does not contain an emulsifier and is in a white powder form similar to the consistency of powdered sugar. Liquid forms of Stevia exist but are typically mixed with other sugar alcohols for a particular desired effect.

Stevia is an all natural sweetener because it is extracted from the Stevia plant and undergoes no chemical changes in the manufacturing process. This makes it very desirable to many consumers looking for healthy alternatives to sucrose sugar. Currently the FDA approves Stevia for general use with the exclusion of meat and poultry use due to a lack of research material. An important distinction needs to me made about the FDA approval in that the Stevia plant in-of-itself cannot be used as a food additive where the extracts from the plant can be.

Certain individuals have noted a “black licorice” aftertaste which seems to be more relevant at high sweetener concentrations but it does not seem to be very present during everyday use. Stevia has quite high heat resistance and can be used in most cooking applications. It is relatively stable under a fairly wide range of pHs and can be stored for a relatively long period of time.

Stevia is a general term referring to a plant, Stevia rebaudiana (Bertoni), native to Paraguay. The plant contains a number of diterpene glycosides that taste sweet; the main ones are Stevioside and rebaudioside A. These glycosides are 200 and 300 times’ sweeter then sucrose respectively [6].

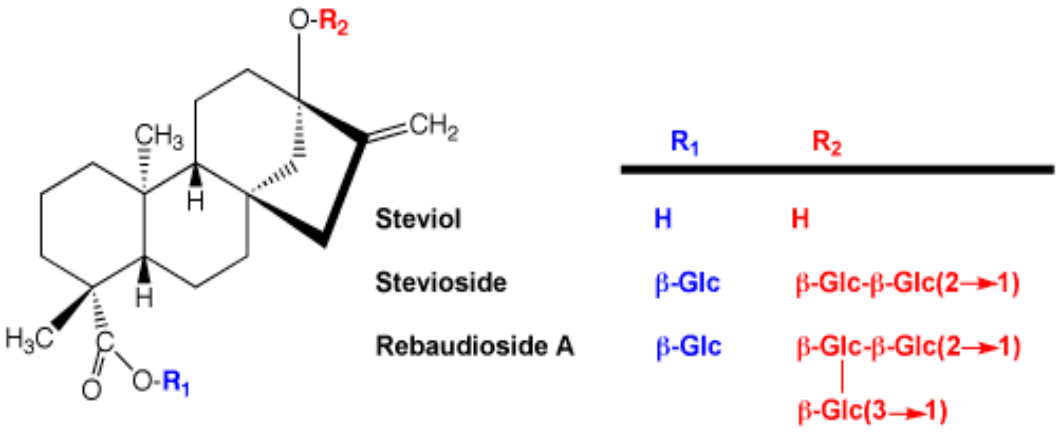


Figure 5: Chemical Structure of Stevia (6)

Stevioside and rebaudioside A are diterpene glycosides--the plant product steviol, with 3 or 4 glucose molecules attached. Stevioside and rebaudioside A are quite stable to heat, except in acid at pH less than 2[6].

4.1.5 Sucrose

Sucrose (table sugar) is a disaccharide, formed from the monosaccharides glucose and fructose. It has the molecular formula $C_{12}H_{22}O_{11}$ and a molecular weight of 342.30 g/mol. Its solubility is as follows: 1 g. in 0.5 mL water; 1 g. in 0.2 mL boiling water. In sucrose, the component sugars glucose and fructose are linked via an α (alpha) 1 on the glucose, to a β (beta) 2 on the fructose glycosidic linkage (seen in Figure 6) [4].

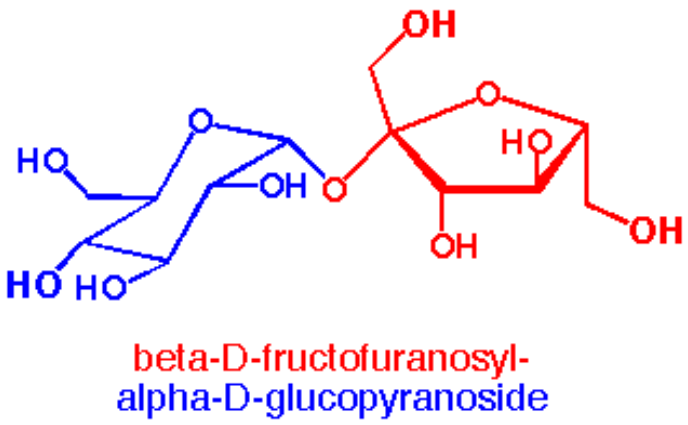
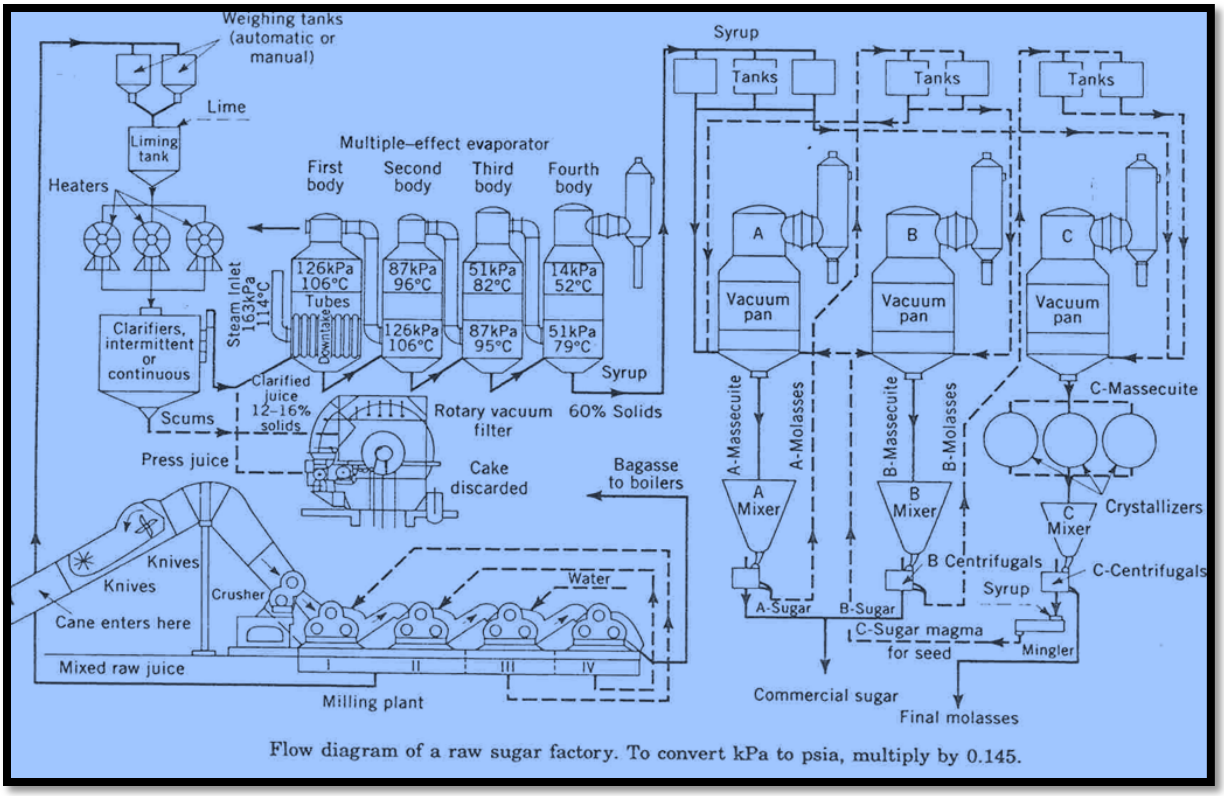


Figure 6: Chemical Structure of Sucrose [6]

Like other carbohydrates, sucrose has hydrogen to oxygen ratio of 2:1. It consists of two monosaccharides, α-glucose and fructose, joined by a glycosidic bond between carbon atom 1 of the glucose unit and carbon atom 2 of the fructose unit. What is notable about sucrose is that unlike most disaccharides, the glycosidic bond is formed between the reducing ends of both glucose and fructose, and not between the reducing end of one and the non-reducing end of the other. This linkage inhibits further bonding to other saccharide units. Sucrose melts and decomposes at 186 °C to form caramel. Like other carbohydrates, it combusts to carbon dioxide and water [4].

Sugar cane is grown in over 110 countries with an estimated total production of 1,591 million metric tons in 2007, more than six times the output of sugar beet. In 2005, the world's largest producer of sugar cane was Brazil, followed by India. Sugar consumption varies by country depending on the cultural traditions. Brazil has the highest per capita production and India has the highest per-country consumption [9]. The European Union, the United States, and Russia are the world's three largest sugar beet producers, although only the European Union and Ukraine are significant exporters of sugar from beets. The U.S. harvested 4,065 km^2 of sugar beets in 2008 alone. Beet sugar accounts for 30% of the world's sugar production [10].

Sugarcane processing is practiced in many variations, but the essential process consists of the following steps: extraction of the cane juice by milling or diffusion, clarification of the juice, concentration of the juice to syrup by evaporation, crystallization of sugar from the syrup, and separation and drying of the crystals[72].



Flow diagram of a raw sugar factory. To convert kPa to psia, multiply by 0.145.

Figure 7: Sugar Production Flow Chart [72]

After weighing, sugarcane is loaded by hand or crane onto a moving table. The table carries the cane into one or two sets of revolving knives, which chop the cane into chips in order to expose the tissue and open the cell structure, thus readying the material for efficient extraction of the juice. Frequently, knives are followed by a shredder, which breaks the chips into shreds for finer cane preparation [72]. The shredded cane then goes through the crusher, a set of roller mills in which the cane cells are crushed and juice extracted. As the crushed cane proceeds through a series of up to eight four-roll mills, it is forced against a countercurrent of water known as water of maceration or imbibition. Streams of juice extracted from the cane, mixed with maceration water from all mills, are combined into a mixed juice called dilute juice. Juice from the last mill in the series is called residual juice. The alternative to extraction by milling is extraction by diffusion. In this process, cane prepared by rotating knives and a shredder is moved through a multicell, countercurrent diffuser. Extraction of sugar is higher by diffusion (an average rate of 93 %, compared with 85–90

% by milling), but extraction of nonsugars is also higher. Diffusion, therefore, is most used where cane quality is highest, for example, South Africa, Australia, and Hawaii [72].

Mixed juice from the extraction mills or diffuser is purified by addition of heat, lime, and flocculation aids. The lime is a suspension of calcium hydroxide, often in a sucrose solution, which forms a calcium saccharate compound [9]. The heat and lime kill enzymes in the juice and increase pH from a natural acid level of 5.0–6.5 to a neutral pH. Control of pH is important throughout sugar manufacture because sucrose inverts, or hydrolyzes, to its components glucose and fructose at acid pH (less than 7.0), and all three sugars decompose quickly at high pH (greater than 11.5). Heated to 99°–104° C, the neutralized juice is inoculated, if necessary, with flocculants such as polyacrylamides and pumped to a continuous clarification vessel, a large, enclosed, heated tank in which clear juice flows off the upper part while muds settle below [11]. This settling and separation process is known as defecation. Muds are pumped to rotary vacuum filters, where residual sucrose is washed out with a water spray on a rotating filter. Clarified juice, meanwhile, is pumped to a series of three to five multiple-effect evaporators.

In the multiple-effect system, developed for the American sugar industry in 1843, steam is used to heat the first of a series of evaporators [14]. The juice is boiled and drawn to the next evaporator, which is heated by vapor from the first evaporator. The process continues through the series until the clarified juice, which consists of 10–15 % sucrose, is concentrated to evaporator syrup, consisting of 55–59 % sucrose and 60–65 % by weight total solids. Nonsugars deposit on the walls and tubes of the evaporators, creating scale deposits and reducing the efficiency of heat transfer.

Syrup from the evaporators is sent to vacuum pans, where it is further evaporated, under vacuum, to supersaturation [72]. Fine seed crystals are added, and the sugar “mother liquor” yields a

solid precipitate of about 50 % by weight crystalline sugar. Crystallization is a serial process. The first crystallization, yielding A sugar or A strike, leaves residual mother liquor known as A molasses. The A molasses is concentrated to yield a B strike, and the low-grade B molasses is concentrated to yield C sugar and final molasses, or blackstrap. Blackstrap contains approximately 25 % sucrose and 20 % invert (glucose and fructose); at these levels the sugar cannot be removed economically by crystallization [72].

Crystals and mother liquor are separated in basket-type centrifuges. Continuous machines are used for C and sometimes B sugars, but batch machines are best for A sugars because of the crystal breakage that takes place in continuous centrifuges [72]. Mother liquor is spun off the crystals, and a fine jet of water is sprayed on the sugar pressed against the wall of the centrifugal basket, reducing the syrup coating on each crystal. In modern factories, the washing process is quite extensive in an effort to produce high-purity raw sugar. Overall recovery of sugar from cane juice averages between 70 and 80 %. The washed sugar, dumped from the baskets onto moving belts, dries and cools on the belts as it moves to bulk storage. At this point it is pale brown to golden yellow, with a sucrose content of 97–99 % and a moisture content of 0.5 %[13].

Sugar refining is the production of high-quality sugars from remelted raw cane sugars [72]. ("Refining" is also used in beet sugar factories to describe the remelting and recrystallization processes by which high-quality white sugars are made from lower-grade beet syrups.) At sugar refineries, the raw sugar is affined (washed), melted (dissolved), sent through processes of clarification and decolorization, and crystallized. Sugar products are then dried, packaged, and stored.

Affination is the mingling of raw sugar with warm, heavy syrup, which removes the molasses coating from the sugar crystal. The syrup and crystals are separated in a spinning

centrifugal basket, and the crystals are further "washed" by a water spray. Washed raw sugar is fed by screw conveyor to a melter, where it is dissolved at 65° C in hot, sweet water with some fresh, hot water added to obtain a raw liquor containing about 65 % dissolved solids[9].

Melt syrup is clarified either by phosphatation, in which phosphoric acid and lime are added to form calcium phosphates, which are removed by surface scraping in a flotation clarifier, or by carbonatation, in which carbon dioxide gas and lime form calcium carbonate, which is filtered off[72]. Color precipitants are added to each process. The carbonated liquors are filtered in pressure leaf filters with the use of diatomaceous earth, a filter aid invented for sugar processing. The resultant yellow to light brown liquor is further decolorized by carbon adsorbents, such as granular activated carbon or bone charcoal, or by ion-exchange resins of acrylic or styrenic materials. Decolorization is conducted in columns in various serial or parallel conformations.

Fine clarified liquor is boiled to white sugar in a series of vacuum pans similar to those used in sugarcane processing. The boiling system is complicated because the purity of the fine liquor is more than 98 %, and at least six or seven stages of boiling are necessary before the molasses is exhausted [14]. The first three or four strikes are blended to make commercial white sugar. Special large-grain sugar (for bakery and confectionery) is boiled separately. Fine grains (sanding or fruit sugars) are usually made by sieving products of mixed grain size. Powdered icing sugar, or confectioners' sugar, results when white granulated sugar is finely ground, sieved, and mixed with small quantities (3 %) of starch or calcium phosphate to keep it dry. Brown sugars (light to dark) are either crystallized from a mixture of brown and yellow syrups (with caramel added for darkest color) or made by coating white crystals with a brown-sugar syrup.

Beet sugar factories generally produce only white sugar from sugar beets [72]. Brown sugars are made with the use of cane molasses as a mother liquor component or as a crystal coating. When

harvested sugar beets are off-loaded at the factory, they are washed in a flume to remove rocks and dirt and then fed by gravity through a hopper to the slicing machine. There the roots are cut into V-shaped strips, 3 by 4 to 7 cm in size in order to offer maximum surface area for extraction. Sugar extraction takes place in a multicell countercurrent diffuser. In order to minimize microbial growth and the use of biocide, temperatures are maintained above 75° C. Some 98 % of the sugar is extracted to form what is known as diffusion juice, or raw juice. Remaining beet pulp, discharged at over 90 % moisture content, is pressed and dried. Pulp driers are a major energy consumer at the beet factory, which must purchase fuel since pulp cannot be burned and has a high market value as feed [(14)].

Raw juice (containing 10 to 14 % sucrose) is purified in a series of liming and carbonation steps, often with filtration or thickening being conducted between the first and second carbonation [(72)]. After carbonation, sulfur dioxide is pumped through the juice in order to lower the pH level and reduce the color. Beet processing is generally at pH levels slightly above 7. At low pH, invert sugar would form and react with nitrogen compounds to form color, and, at high pH, alkaline destruction of sucrose and monosaccharides would occur.

After purification, the juice, now called clear or thin juice, is pumped to multiple-effect evaporators similar to those used in raw cane sugar manufacture [(72)]. In the evaporators the juice is concentrated to thick juice (60–65 % dissolved solids), which is mixed with remelted lower grades of sugar to form standard liquor. From this standard liquor, sugar is crystallized, usually in three stages. In all boiling systems, sugar obtained from the first stage is processed as a final product, while sugar from the second and third stages is remelted and recycled into another batch of thick juice. Sugar is separated from mother liquor in basket centrifuges, and it is dried in either rotary louvered driers or fluidized-bed dryer-coolers. Before packing, it is important that all sugar be cooled below 45° C [(11)]. At higher temperatures it hardens in the bag or silo and can develop color.

Beet sugar factories store white sugar in silos during production and pack sugar year-round to meet the current market.

4.2 Artificial Sweeteners

Chemical Name	Trade Names	Sweetness	Uses
Acesulfame	Sweet One® Sunett®	200 times sweeter than sugar	Found in more than 4,000 products including candies, tabletop sweeteners, chewing gums, beverages, dessert and dairy product mixes, baked goods, alcoholic beverages, syrups, refrigerated and frozen desserts, and sweet sauces and toppings.
Aspartame	Equal® NutraSweet® NatraTaste®	180-200 times sweeter than sugar	Found in more than 6,000 products including carbonated and powdered soft drinks, chewing gum, confections, gelatins, dessert mixes, puddings and fillings, frozen desserts, yogurt, tabletop sweeteners, and some pharmaceuticals
Neotame	None yet	8,000-13,000 times sweeter than sugar	Approved for use in beverages, dairy products, frozen desserts, baked goods, and gums.
Saccharin	Sweet 'N Low®	300-700 times sweeter than sugar	Fountain Diet Coke® and Pepsi®, Tab®, and often mixed with aspartame.
Sucralose	Splenda®	600 times sweeter than sugar	Found in everything from frozen desserts, cookies, gum, sodas, candies. Can also be used for baking.

Figure 8: Uses for Common Artificial Sweeteners [75]

Artificial sweeteners are sweeteners that are derived from a chemical synthesis of organic compounds which may or may not be found in nature. Artificial sweeteners are relatively new and their uses are being researched and extended every day. Much controversy surrounds artificial sweeteners and their health effects as artificial sweeteners may break down into harmful chemical sub-compounds. New artificial sweeteners are always being researched and due to their low cost and ease of production, they will likely become the primary sweetening compounds in the future.

4.2.1 Ace-K

Acesulfame potassium is a calorie-free artificial sweetener commonly known as *Sunett* and *Sweet One*. It was discovered by a German chemist, Karl Clauss, in 1967. It has a white crystalline structure and is about 180-200 times sweeter than sucrose. At high concentrations, it tends to have a very bitter aftertaste but less so as lower concentrations. *Kraft Foods* patented the use of sodium ferulate to mask this bitter aftertaste. The US FDA approved the use of Ace-K along with the *Kraft Food* patented version in 2003 [16]. Much controversy revolves around Ace-K and its possibility of being carcinogenic but the FDA has dismissed all such claims to date.

Ace-K, unlike its popular rival sweetener aspartame, is stable in high-heat situations and is therefore often used in baked products [16]. Currently it can be found in many tabletop sweeteners, desserts, puddings, baked goods, soft drinks, candies (including breath mints, cough drops and lozenges), dairy products, canned foods and alcoholic beverages. Ace-K has an extraordinarily long shelf life and because of this is ideal for use in candies, canned foods and alcoholic beverages. Another important aspect of Ace-K is its ability to remain stable and retain its sweetness under pasteurizing conditions which often exposes dairy products to a wide variety of temperatures and pH values. Ace-K does not promote tooth decay making it an ideal candidate for 'sugar free' candies and diet drinks.

Considering Ace-K's bitter aftertaste, it is frequently used along with another sweetener in most products. Typically aspartame or sucralose are used in order to balance the aftertaste. Common products which contain solely Ace-K or a combination of Ace-K and another sweetener are: *Diet Rite Cola*, *Pepsi One*/*Pepsi Max*, *Coca-Cola Zero*, *Diet Coke* with *Splenda*, *Trident* gum, and sugar-free *Jell-O* .

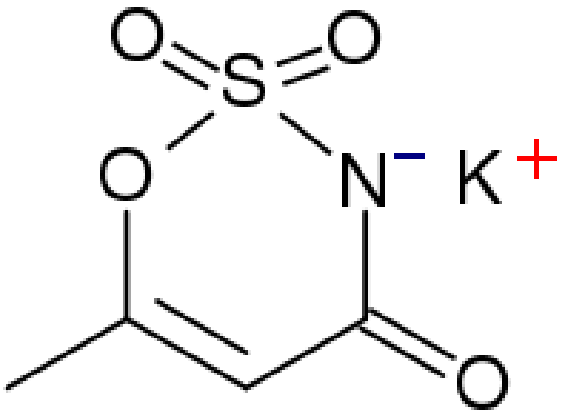


Figure 9: Chemical Structure of Ace-K [4]

Acesulfame potassium (Ace-K) is a white crystalline powder with molecular formula $C_4H_4KNO_4S$, molecular weight of 201.24 g/mol, and a density of 1.81 g/cm^3. It is stable under heated conditions and has a structural likeness to that of saccharin [3].

4.2.2 Aspartame

Aspartame was discovered accidentally by chemist James M. Schlatter in 1965 when he licked his finger which happened to have gotten contaminated by a chemical he synthesized while trying to develop an anti-ulcer drug [19]. Aspartame was not immediately approved by the US FDA when a large study showed a direct connection between aspartame and bladder cancer in rats. In 1980 there were no further conclusive studies correlating aspartame to cancer or brain damage and it was then approved as a general sweetener. In 1983 it was further approved for use in carbonated beverages then further again in 1996 when it was allowed for use in other beverages, baked goods and confections. In 1996, the FDA removed all restrictions from aspartame use. Between its discovery and today, aspartame has become one of the most studies artificial sweeteners in the world.

Aspartame has practically no aftertaste allowing it to be used in many products as a sugar alternative. It is a non-nutritive sweetener which makes it very popular among people looking to watch calories, stay in better overall health or simply enjoy many of the low- or reduced-calories products available today [18]. Several aspects of aspartame make it a very desirable sweetener in fruit-flavored products, especially gum, because aspartame has an ability to 'extend' flavors making them seem sweeter and given them a more full-bodied taste.

One downfall of aspartame is its low operating temperature. Since it loses sweetness in high-heat or high-pressure situations, it is somewhat limited, on its own, for use in baking products. This problem can be resolved with using additional sweeteners in the initial baking process such as Ace-K or sucralose then adding aspartame at a later stage. Similarly, aspartame can be used for baking for its flavor while another sweetener can be used for its sweetness (such as Ace-K). Aspartame is often used to preserve or intensify taste in a product but typically relies on another source of sweetness if the produce is to be baked or boiled [18].

Aspartame can be found in over 6,000 products, including carbonated soft drinks, powdered soft drinks, chewing gum, confections, gelatins, dessert mixes, puddings and fillings, frozen desserts, yogurt, tabletop sweeteners, and some pharmaceuticals such as vitamins and sugar-free cough drops [18].

Aspartame (N-L-alpha-Aspartyl-L-phenylalanine 1-methyl ester) is the methyl ester of the dipeptide of the natural amino acids L-aspartic acid and L-phenylalanine. It hydrolyzes, or breaks down, into its amino acids when heated to high temperatures, thus losing its sweetness. Aspartame is composed of 57.1% carbon, 6.2% hydrogen, 9.5% nitrogen, and 27.2% oxygen [5]. It has the

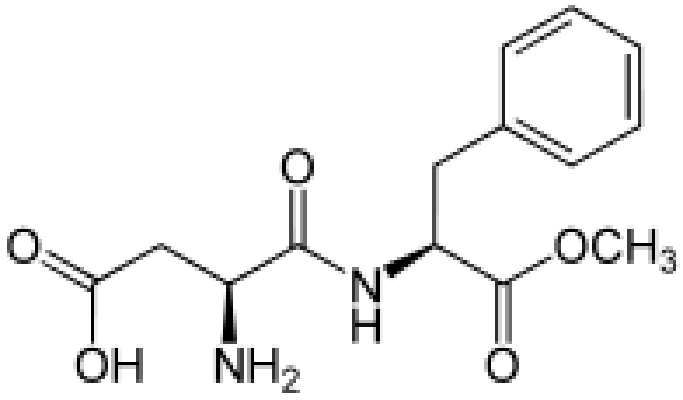


Figure 10: Chemical Structure of Aspartame [6]

chemical formula $C_{14}H_{18}N_2O$, a molar mass of 294.3 g/mol, and a density of 1.3 g/cm^3. Aspartames three components (seen in Figure 11) are aspartic acid, phenylalanine, and methanol [4].

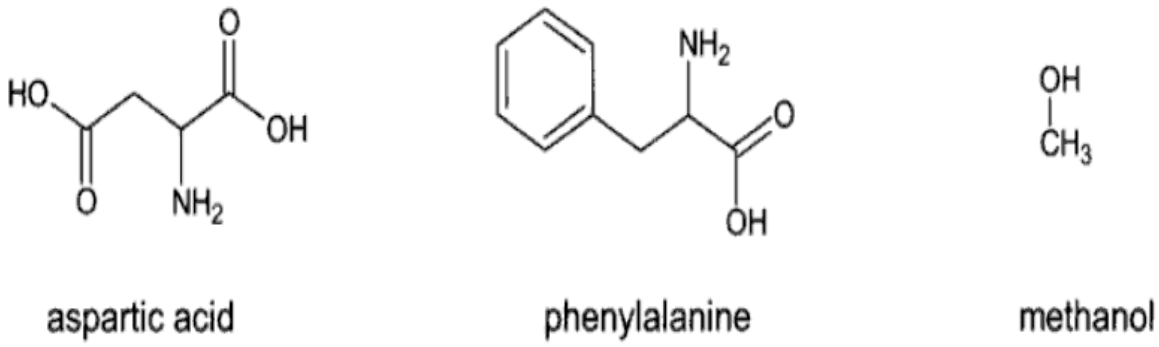


Figure 11: The Three Components of Aspartame [6]

Aspartame is synthesized beginning with the L enantiomer of phenylalanine. This enantiomer is separated from the D enantiomer by a reaction with acetic anhydride ($(CH_3CO)_2O$) and sodium hydroxide. After this reaction the product is treated with the enzyme porcine kidney acylase. Through organic extraction with acid leaves the L enantiomer in the aqueous layer and the D enantiomer in the organic layer. The L-phenylalanine is then reacted with methanol and hydrochloric acid to esterify the COOH group on phenylalanine [3].

Aspartames' components, aspartic acid, phenylalanine, and methanol, occur naturally in foods, but aspartame itself does not and must be manufactured. Aspartame is made through a fermentation and synthesis processes.

Direct fermentation produces the starting amino acids needed for the manufacture of aspartame. In this process, specific types of bacteria which have the ability to produce certain amino acids are raised in large quantities. Over the course of about three days, the amino acids are harvested and the bacteria are destroyed. To start the fermentation process, a sample from a pure culture of bacteria is put into a test tube containing the nutrients necessary for its growth. After this initial inoculation the bacteria begin to multiply. When their population is large enough, they are transferred to a seed tank. The bacterial strains used to make L-aspartic acid and L-phenylalanine are B. flavum and C. glutamicum respectively. The seed tank provides an ideal environment for growing more bacteria. It is filled with the things bacteria need to thrive, including warm water and carbohydrate foods like cane molasses, glucose, or sucrose. It also has carbon sources like acetic acid, alcohols or hydrocarbons, and nitrogen sources such as liquid ammonia or urea. These are required for the bacteria to synthesize large quantities of the desired amino acid. Other growth factors such as vitamins, amino acids, and minor nutrients round out seed tank contents. The seed tank is equipped with a mixer, which keeps the growth medium moving, and a pump, which delivers filtered, compressed air. When enough bacterial growth is present, the contents from the seed tank are pumped to the fermentation tank. The fermentation tank is essentially a larger version of the seed tank. It is filled with the same growth media found in the seed tank and also provides a perfect environment for bacterial growth. Here the bacteria are allowed to grow and produce large quantities of amino acids. Since pH control is vital for optimal growth, ammonia water is added to the tank as necessary. When enough amino acid is present, the contents of the fermentation tank are transferred out so isolation can begin. This process starts with a centrifugal separator, which isolates a large portion of the bacterial amino acids. The desired amino acid is

further segregated and purified in an ion-exchange column. From this column, the amino acids are pumped to a crystallizing tank and then to a crystal separator. They are then dried and readied for the synthesis phase of aspartame production [7].

Aspartame can be made by various synthetic chemical pathways. In general, phenylalanine is modified by a reaction with methanol and then combined with a slightly modified aspartic acid which eventually forms aspartame. The quality of the compounds is checked regularly during the manufacturing process. Of particular importance are frequent checks of the bacterial culture during fermentation. Also, various physical and chemical properties of the finished product are checked, such as pH level, melting point, and moisture content [7].

4.2.3 Cyclamate

Cyclamate, like aspartame, was discovered accidentally. In 1937, Michael Sveda carelessly placed a cigarette into a white power and when he placed the cigarette back into his mouth, he found a sweet and pleasant taste waiting. Cyclamate was approved by the FDA in 1958 but then banned in 1969 following multiple studies linking cyclamate to cancer [21]. As of date, a fierce campaign is being driven by cyclamate producers to reapprove the sweetener in the United States.

Some individuals find that cyclamate has a bitter aftertaste but less than that of Ace-K. Frequently cyclamate is used along with other sweeteners, particularly sucralose in a ratio of 10 parts cyclamate to 1 part sucralose, in order to mask its 'off-taste' and aftertaste. This synergistic effect often surprises researchers in that the resultant sweetness is significantly higher than what would be expected of two sweeteners combined [20].

Cyclamate has a very long shelf life and a wide operating temperature allowing for it to be heated and frozen without any effect on sweetness or stability [20]. It is used as a tabletop

sweetener, in diet beverages, and in other low-calorie foods. Also, cyclamate is useful as a flavor enhancer as well as a good flavoring agent for many pharmaceuticals and toiletries.

Cyclamate (Cyclohexylsulfamic acid) is the sodium or calcium salt of cyclamic acid. It is prepared by the sulfonation of cyclohexylamine (seen in Figure 12); this can be accomplished by reacting cyclohexylamine with either sulfamic acid or sulfur trioxide. The sodium salt has the molecular formula $C_6H_{12}NNaO_3S$ and a molecular weight of 201.22 g/mol [5].

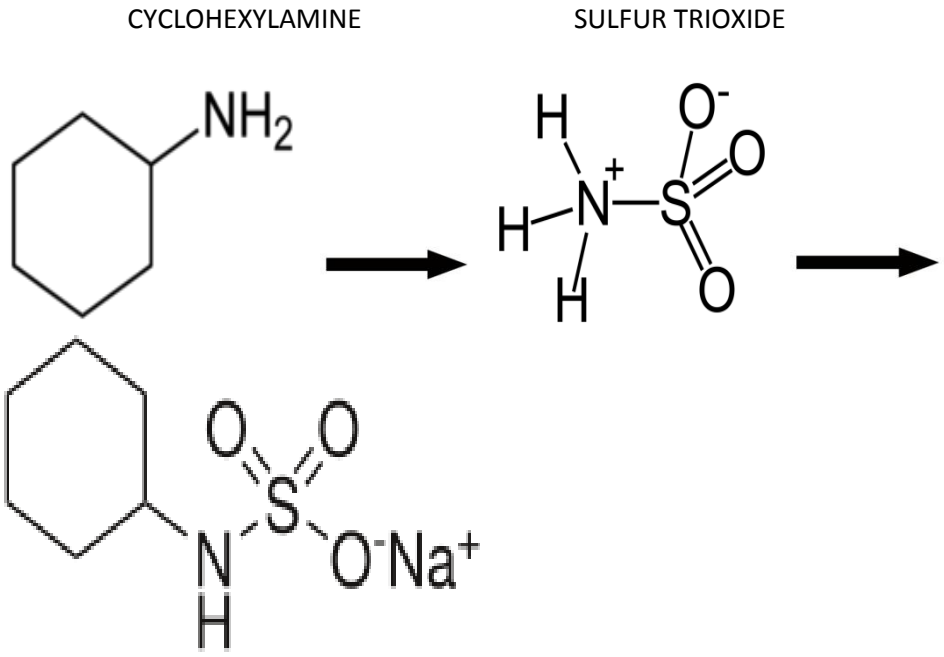
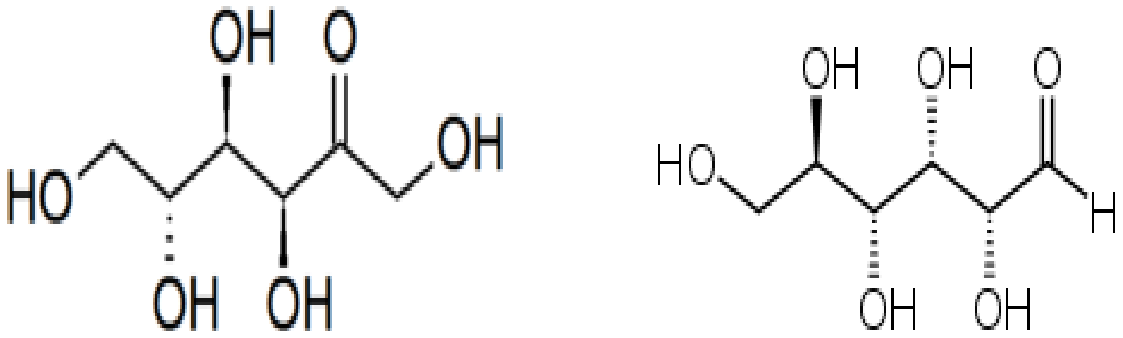


Figure 12: Preparation of Cyclamate [4]

Cyclamate is 30–50 times sweeter than sugar (depending on concentration), making it the least potent of the commercially used artificial sweeteners. It is often used synergistically with other artificial sweeteners, especially saccharin; the mixture of 10 parts cyclamate to 1 part saccharin is common and masks the off-tastes of both sweeteners. Cyclamate is stable under heating, making it ideal for baking. Cyclamic acid is very sparingly soluble in water, and is slowly hydrolyzed in hot water. Sodium cyclamate and calcium cyclamate are both freely soluble in water [6].

4.2.4 HFCS

High fructose Corn Syrup (HFCS 55, Isoglucose) contains both fructose and glucose, commonly in a ratio of 55% fructose to 45% glucose. Fructose and glucose both have the molecular formula $C_6H_{12}O_6$, although the atoms are in different arrangements (seen in Figure 13). High fructose corn syrup is a viscous liquid. Because of the fructose content, high fructose corn syrup does not tend to form crystals, as sucrose syrups do. The level of sweetness depends on the extent to which glucose has been converted to fructose: glucose is less sweet than sucrose (table sugar), and fructose is sweeter. The 55:45 ratio creates a sweetness that is about equal to that of sucrose [1].



FRUCTOSE GLUCOSE

Figure 13: The Chemical Structures of Fructose and Glucose [2]

High fructose corn syrup is produced from corn starch. Starch is a polymer made of glucose molecules linked into long chains. Corn starch is first treated with the enzymes alpha-amylase and glucoamylase. These break the starch down to glucose. The glucose is then treated with another enzyme, glucose isomerase that can reversibly convert glucose to fructose. At the end of this step, the mixture usually contains about 42% fructose and 58% glucose. A separation step produces a

syrup containing about 90% fructose, and this can be blended with the 42% fructose material to make the 55% fructose syrup that is widely used in beverage manufacture[5].

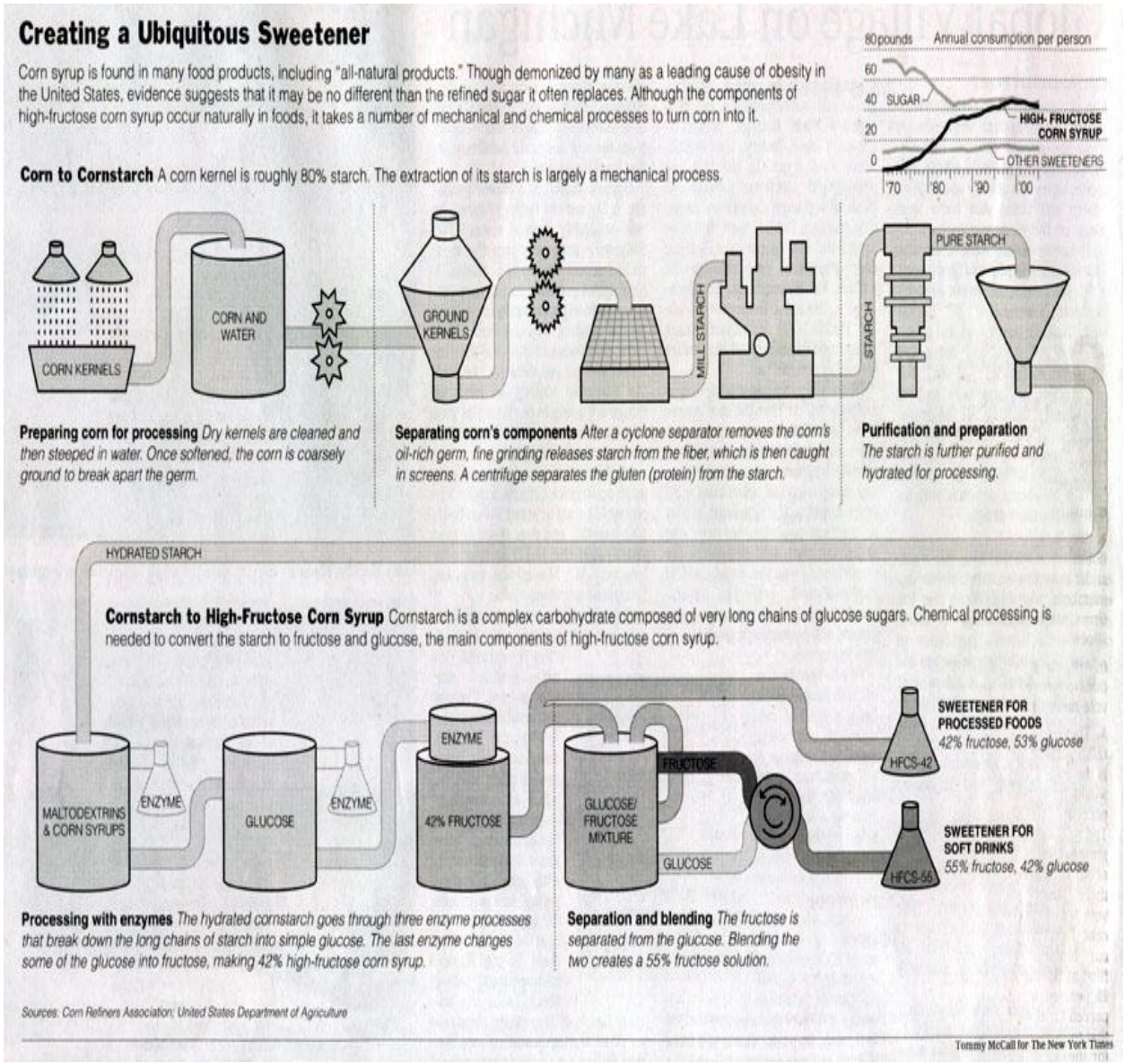


Figure 14: Production Flowchart for HFCS [15]

Corn syrup is produced in processing plants known as wet corn mills, described in Figure 14[15]. In addition to corn syrup, these mills produce many other corn products including corn oil, corn starch, dextrose, soap stock, animal feed, and several chemicals used in other industrial processes. Corn starch is converted into ordinary corn syrup through a process called acid

hydrolysis. In this process, the wet starch is mixed with a weak solution of hydrochloric acid and is heated under pressure. The hydrochloric acid and heat break down the starch molecules and convert them into a sugar. The hydrolysis can be interrupted at different key points to produce corn syrups of varying sweetness. The longer the process is allowed to proceed, the sweeter the resulting syrup. To improve the sweetness of ordinary corn syrup, it undergoes a further process called enzyme conversion. In this process, the dextrose sugars in the syrup are converted into sweeter fructose sugars by the action of an enzyme in a series of steps under carefully controlled temperatures, pressures, and acidity. This produces a high fructose corn syrup with 42% fructose content. To produce corn syrups with a fructose level above 50%, syrups the 42% fructose syrup is passed through a series of fractionation columns, which separate and hold the fructose content. The separated portion is about 80-90% fructose and is flushed from the columns with deionized water. A portion of this is retained and sold for use in "light" foods where only a small amount of liquid sweetener is needed. The remainder is blended with other 42% fructose syrup to produce 55% fructose syrup, which is used in soft drinks, ice cream, and frozen desserts. Powdered high fructose corn syrups can be produced by evaporating the water from the syrup and then encapsulating the powder grains to prevent them from reabsorbing moisture. Pure fructose crystals may be obtained by further processing the 80-90% fructose syrup. It is used in cake mixes and other food products where a highly concentrated, dry sweetener is desired [15].

Corn syrup is primarily used as a food product. In the United States, its production and use falls under the control of the federal Food and Drug Administration (FDA), which sets rigid quality standards. The corn refiners, working through the Corn Refiners Association, have developed comprehensive analytical procedures for testing the properties of corn products, including corn syrup. Some of the important properties of corn syrup are dextrose or fructose content, carbohydrate composition, solids content, sweetness, solubility, viscosity, and acidity. In addition to monitoring the materials and processes used to make corn syrup, manufacturers also take frequent

samples of the finished product for analysis. A pilot study reported that some high-fructose corn syrup manufactured in the U.S. in 2005 contained trace amounts of mercury. The mercury appeared to come from caustic soda and hydrochloric acid, two chemicals used in the manufacture of high-fructose corn syrup. It has been found that caustic soda used by HFCS has been produced in industrial chlorine chlor-alkali plants using the mercury cell Castner-Kellner process, and can contain traces of mercury. Mercury concentrations in the samples testing positive ranged from 0.012 μg/g to 0.570 μg. Of 55 major brands with high fructose corn syrup as a main ingredient, 1 in 3 tested positive for mercury. With the average U.S. citizen consuming 28.5 kg of HFCS annually, health effects are an obvious concern [15].

4.2.5 Neotame

Neotame is chemically very similar to aspartame but is much more stable and much more potent. Aspartame is about 200 times sweeter than sucrose sugar while Neotame is between 7000 and 13000 times sweeter than sucrose sugar [24].

Neotame is used in foods and beverages, including chewing gum, carbonated soft drinks, ready-to-drink beverages, tabletop sweeteners, frozen desserts and novelties, puddings and fillings, dairy products (such as yogurt), baked goods and candies. It can also be used in both cooking and baking applications because of its good heat resistance.

Neotame, along with many other artificial sweeteners, is often used in combination with other sweeteners. It does not have a particularly strong aftertaste and because of its high potency, is often used alone or with sweeteners such as aspartame or Ace-K. Also, because of its potency, it is very desirable by mass manufacturers of food products because large amounts can be produced, cheaply and not very large amounts are needed for sufficient sweetening purposes [25].

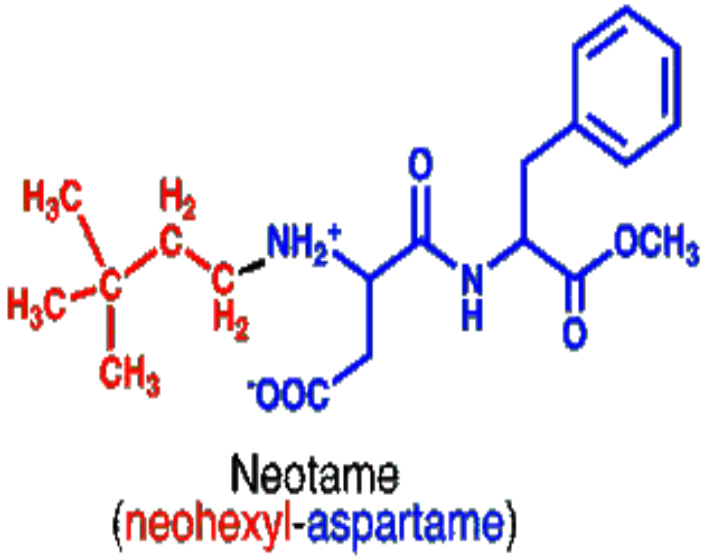


Figure 15: Chemical Structure of Neotame [6]

Neotame (N-[N-(3, 3-dimethylbutyl)-L-alpha-aspartyl]-L-phenylalanine 1-methyl ester) is a more stable sweetener molecule made from aspartame. It has a temperature and heat dependent stability but is still useful in baking applications. Its' chemical formula is $C_20H_{24}N_2O_5$ and it has a molar mass of 378.46 g/mol. Neotame is produced by adding a 6-carbon (neohexyl) group to the amine nitrogen of aspartame. Peptidases, which would typically break the peptide bond between the aspartic acid and phenylalanine moieties, are effectively blocked by the presence of the 3, 3-dimethylbutyl moiety, thus reducing the production of phenylalanine, thereby making its consumption by those who suffer from phenylketonuria safe[3].

4.2.6 Saccharin

Saccharin is one of the oldest artificial sweeteners. It was developed by a John Hopkins University graduate student in 1879. It was originally used as a preservative and antiseptic but became a very popular sweetener during the first and second World Wars [27]. It found a very tumultuous relationship with the FDA but inevitably was banned in 1977.

Saccharin is unstable when heated but it does not react chemically with other foods [26]. This restricts it significantly in cooking applications but some sweetness is retained and no health risks have been seen upon saccharin's breakdown. Saccharin does have a very noticeable metallic aftertaste which many people find unpleasant.

Saccharin had countless everyday uses in beverages and foods. In times of sugar shortages, saccharin was often rationed in tablet form considering it is 200-700 times sweeter than sugar. Today it is very heavily regulated due to its controversial health effects. In the United States, the FDA requires that any products produced with or utilizing saccharin as a sweetener have a clearly visible warning label.

Saccharin (benzoic sulfimide) is a very stable organic acid with a pKa of 1.6 and chemical formula $C_7H_5NO_3S$. Its' chemical composition is 45.9% carbon, 2.7% hydrogen, 7.7% nitrogen, 26.2% oxygen, and 17.5% sulfur. It has a molar mass of 183.2 g/mol and a density of 0.83 g/cm^3 [6]. In acid

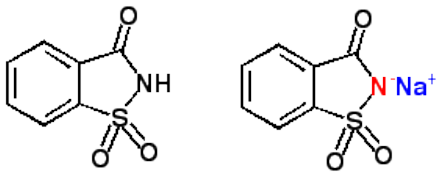


Figure 16: The Chemical Structure of Saccharin [6]

form saccharin is not water soluble. Therefore, the form used as an artificial sweetener is its sodium salt (seen in Figure 16). Saccharin can be synthesized using the Remsen-Fahlberg and Maumee or Sherwin-Williams method. In the Remsen Fahlberg method (seen in Figure 17) the process begins by reacting toluene with chlorosulfonic acid to give ortho and para forms of toluene-sulfonic acid. The acid is then converted to sulfonyl chlorides through treatment with phosphorus pentachloride. The ortho form,

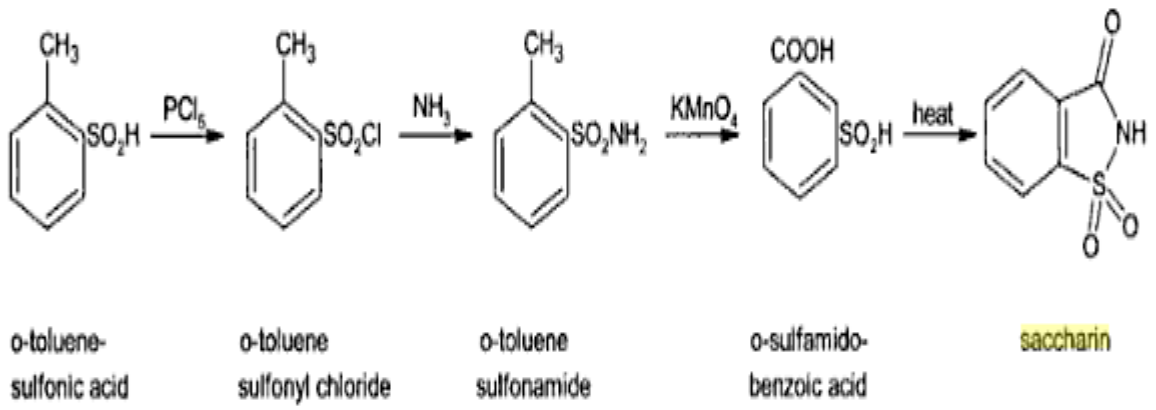


Figure 17: The Synthesis of Saccharin by the Remsen Fahlberg Method [4]

o-toluene-sulfonyl chloride is then treated with the compound ammonia to produce o-toluene-sulfonamide. This compound is then oxidized with potassium permanganate to produce o-sulfimide-benzoic acid. This is then heated to produce the desired product, saccharin. The Maumee method of synthesis, now called the Sherwin-Williams process, is also used. This process starts with phthalic anhydride and then converts this to anthranilic acid. The acid is reacted with nitrous acid, sulfur dioxide, chlorine, and ammonia, thus producing saccharin [4].

4.4.7 Sucralose

Sucralose was discovered in 1976 and received FDA approval in 1998. It is one of the newer sweeteners available in today's market which manufacturers are finding difficult to satisfy. The demand for sucralose, commonly known as *Splenda*, is very high while the manufacturing of sucralose is relatively time consuming and expensive causing prices of sucralose to be significantly higher than those of its competitors [29].

Sucralose is one of the most stable artificial sweeteners available in today's market and can be used in nearly every application sugar is used. Sucralose is derived from sugar and is therefore very similar to it in its chemical structure and reactivity. Sucralose is significantly more stable than aspartame thereby allowing it a significantly longer shelf life without loss of sweetness [28].

Essentially, sucralose is used on its own because of its similarity to sugar but in some occasions is used to improve the taste or properties of a particular food or beverage containing other artificial sweeteners. Sucralose can also be used along with sugar alcohols which are often in liquid form. Sucralose is very soluble in many different types of liquids making it one of the most versatile artificial sweeteners today.

Sucralose (1', 4, 6'-Trichloro-galactosucrose) is a chlorinated sugar with chemical formula $C_{12}H_{19}Cl_3O_8$ and a molar mass of 397.64 g/mol [6]. Sucralose is a stable molecule that maintains its sweetness property when exposed to high temperatures, making it suitable for use in baking. Its' synthesis is carried out by the selective chlorination of sucrose (table sugar), which converts three of the hydroxyl groups to chlorides. The selective chlorination is achieved by selective protection of the primary alcohol groups followed by acetylation and then deprotection of the primary alcohol groups.

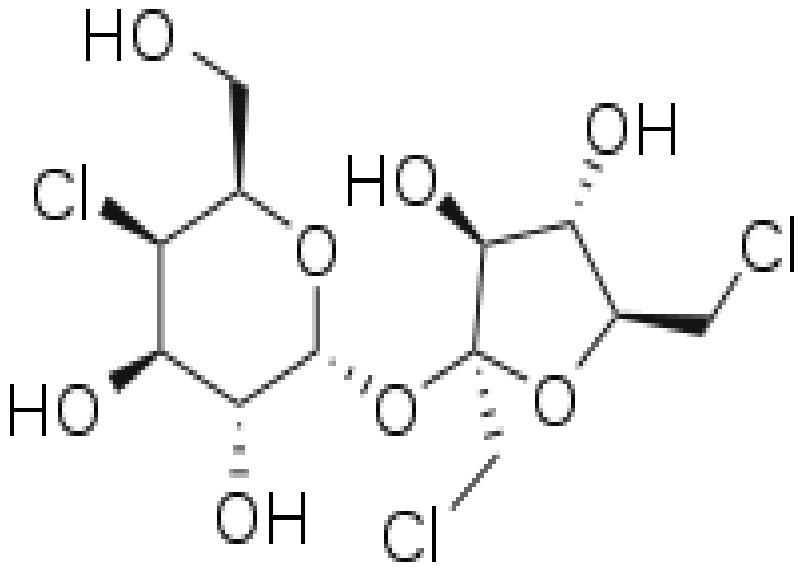
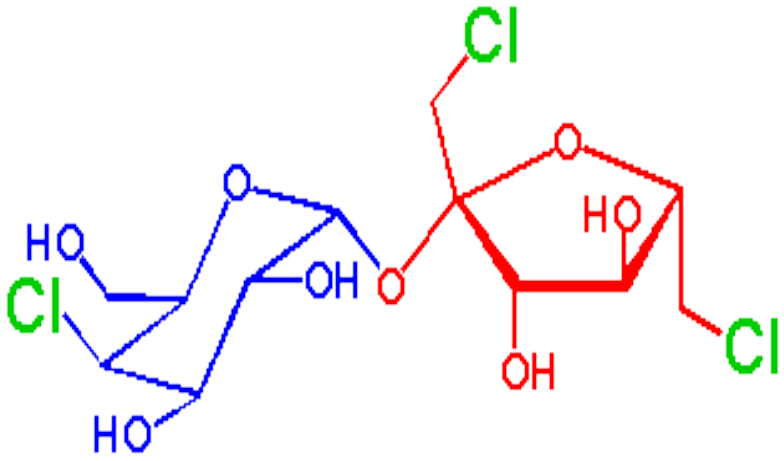


Figure 18: The Chemical Structure of Sucralose [4]

In the course of the chlorination, the stereochemistry at position 4 of the glucose ring gets inverted, so it becomes a derivative of galacto-sucrose [6].



1,6-dichloro-1,6-dideoxy-
beta-D-fructofuranosyl-
4-chloro-4-deoxy-
alpha-D-galactopyranoside

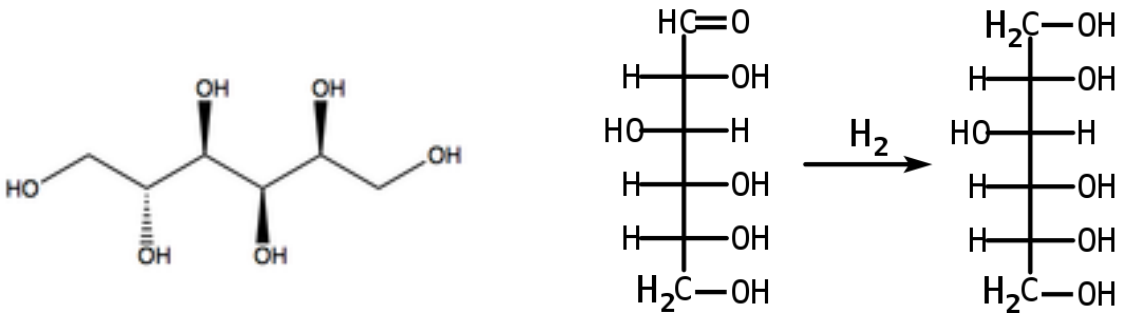
Figure 19: The Chlorination of Sucralose [6]

Following an induced acetyl migration on one of the hydroxyl groups, the partially acetylated sugar is then chlorinated with a chlorinating agent such as phosphorus oxychloride, followed by removal of the acetyl groups to give sucralose[6].

4.3 Sugar Alcohols

4.3.1 Sorbitol

Sorbitol, also known as glucitol, is a sugar alcohol that the human body metabolizes slowly. It is obtained by reduction of glucose changing the aldehyde group to an additional hydroxyl group (seen in Figure 20). Its molecular formula is $C_6H_{14}O_6$. It also has a molar mass of 182.17 g/mol and a density of 1.489 g/cm^3. Sorbitol is approximately 60 % as sweet as sucrose [6].



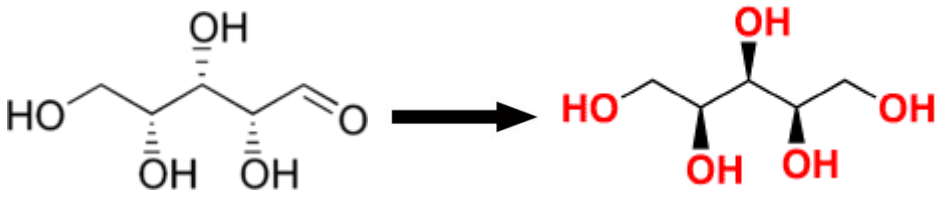
SORBITOL GLUCOSE SORBITOL

Figure 20: The Chemical Structure and Synthesis of Sorbitol [2]

Sorbitol behaves much like sucrose in food systems, with respect to providing bulk and interacting with other components to produce suitable texture. It is particularly good at binding moisture (humectants activity). Sorbitol and the other polyols generally do not participate in browning reactions that provide characteristic color to baked goods [1].

4.3.2 Xylitol

Xylitol (1,2,3,4,5-pentanol) is an organic compound with the chemical formula $(CHOH)_3(CH_2OH)_2$. It has a molar mass of 152.15 g/mol and a density of 1.52 g/cm^3. Xylitol is about equal in sweetness to sucrose. This sugar alcohol is used as a naturally occurring sugar substitute found in the fibers of many fruits and vegetables. Xylitol is a sugar alcohol (or polyol)--a substance that has many hydroxyl (alcohol) groups, as carbohydrates do. Xylitol is stable over the range of pH found in foods. It is also heat-stable. It is highly soluble in water (64.2 g/100 mL) [4].



XYLOSE XYLITOL

Figure 21: The Synthesis of Xylitol [3]

Xylitol is produced by hydrogenation of xylose, which converts the sugar (an aldehyde) into a primary alcohol. Xylitol (Finnish ksylitoli) was first derived from birch trees in Finland [6].

In this section, natural and artificial sweeteners have been analyzed through there chemical properties and production methods. Upon conclusion of this analysis, no significant differences were found between natural and artificial sweeteners that would indicate any health concerns. In the next section, the way these sweeteners metabolize in the human body will discussed.

5.0 Sweetener Metabolism

The metabolism of sweeteners can be divided into two main categories—the metabolism of natural sweeteners and the metabolism of artificial sweeteners. The major difference that separates these two categories comes from the fact that natural sweeteners contain some form of carbohydrate (sugar) while artificial sweeteners do not. For this reason, natural sweeteners such as table sugar (sucrose), honey, and fruit sugar (fructose) induce pathways that result in the production of ATP. On the other hand, artificial sweeteners have little or no nutritional value to the human body. Research shows that for most artificial sweeteners, more than 90% of the initial compound can be found in feces and urine unprocessed. This section provides information on the two major metabolic pathways that natural sweeteners are processed by along with data from scientific experiments that show the fate of different artificial sweeteners once they are consumed.

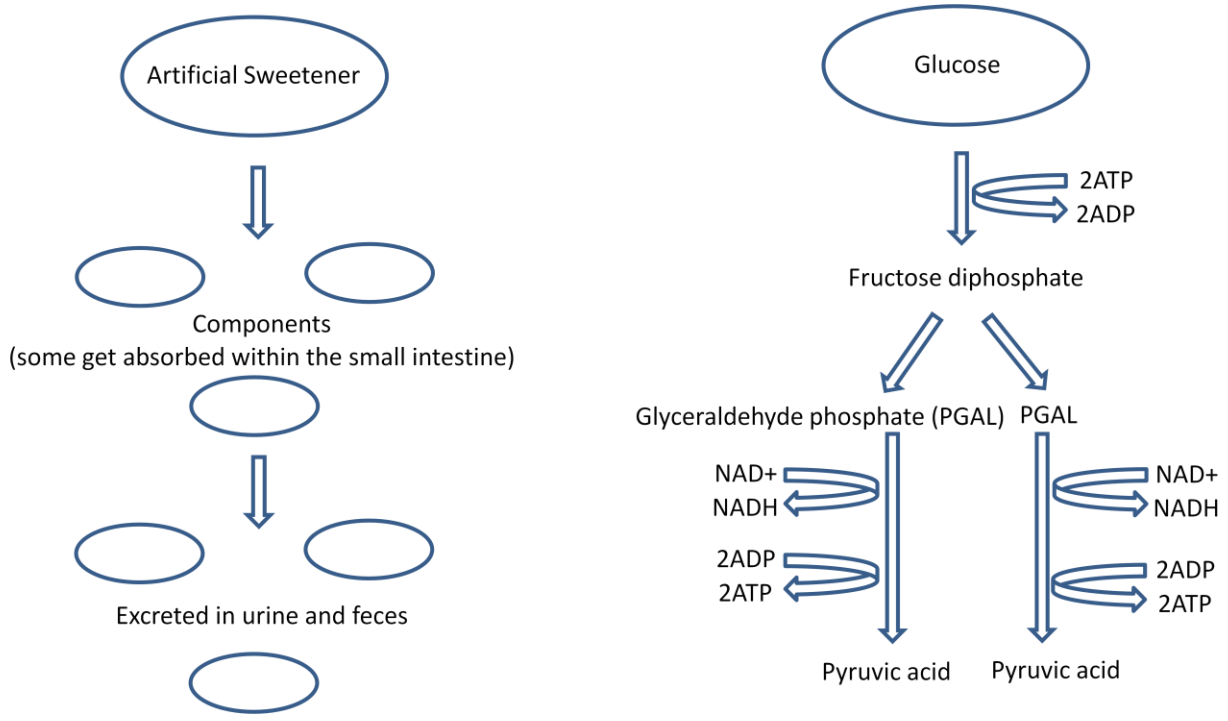


Figure 22: Comparison of Metabolism Between Artificial Sweetener and Glucose

5.1. Biological Pathways for Metabolism of Natural Sweeteners

5.1.1. Glycolysis

Glycolysis is an anaerobic process in which glucose ($C_6H_{12}O_6$) is converted into two molecules of pyruvate to form two net molecules of ATP [47]. The overall reaction of glycolysis is $C_6H_{12}O_6 + 2NAD^+ + 2ADP + 2P \rightarrow$ 2 pyruvate + 2ATP + 2NADH + $2H^+$. The 2 pyruvate molecules that are produced during glycolysis enter the mitochondrion to produce energy via oxidative respiration. Maintenance of blood glucose levels within the bloodstream is accomplished by insulin and glucagon. Both are secreted from the pancreas; glucagon is released during low blood glucose levels to induce the liver to release glucose into the bloodstream; insulin is released during high blood glucose levels to induce fat cells to absorb glucose from the bloodstream [48].

5.1.2. Fructolysis

Fructose is metabolized in the liver. It enters liver cells with the help of GLUT5, which is a fructose transporter. Within the liver, the enzyme fructokinase phosphorylates fructose and the resulting compounds go through some more chemical manipulations to form two different compounds—dihydroxyacetone and glyceralehyde. Research done by the University of Texas Medical Center shows that consuming fructose significantly increases lipogenesis, the process used to convert sugars into body fat. During this research, six healthy individuals were given fructose-containing sweet drinks and had their fat synthesis measured immediately after the beverages were consumed. Results from this experiment indicate that lipogenesis greatly increases after fructose consumption, which also affects the metabolism of meals that may follow—the body is more prone to convert more carbohydrates into fat for storage [49]. This research is backed up by a study done by the University of Pennsylvania School of Medicine. In this study, blood triglyceride levels of 17 obese men and women were measured after they had a meal with either fructose-

sweetened beverages or glucose-sweetened beverages. The total amount of triglycerides was observed to be almost 200 percent higher for subjects who consumed fructose-sweetened beverages [40].

5.2. Metabolism of Artificial Sweeteners

For the most part, artificial sweeteners pass through the body unprocessed. Many experiments have been performed trying to recover consumed artificial sweeteners from feces and urine of animals and humans and found that most of consumed artificial sweetener can be recovered. Following are some examples of artificial sweeteners and research that has been done on their metabolism.

Acesulfame potassium, also known as Ace-K, is an intense non-nutritive sweetener that can be dissolved in bulk sweetener syrups and easily be homogeneously distributed in foods or beverages together with the bulk sweeteners. Ace-K is commonly used to remove or mask the bitter aftertaste of aspartame and can be found in *NutraSweet* products. In a book edited by D.G. Mayer and F.H. Kemper by the title "Acesulfame-K", the study of the metabolism of Ace-K is shown. Figure.23 and 24 show that a majority of the Ace-K that was orally administered to mice and dogs was not found in the blood (or milk, in lactating mice) within 48 hours. [51]

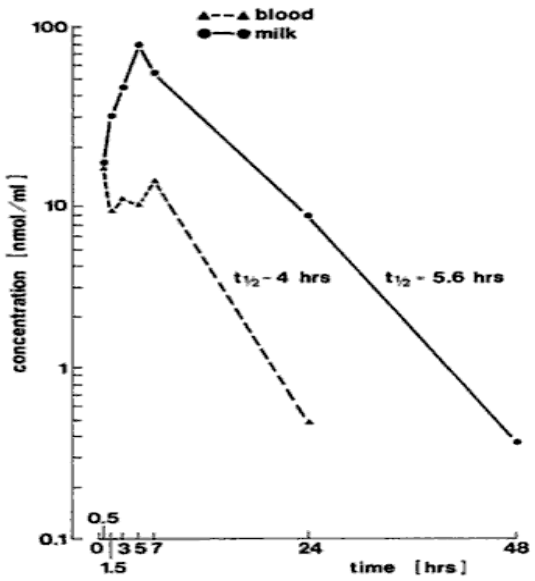


Figure 23 : Difference in Ace-K Concentration between Blood and Milk for Lactating Mice [51]

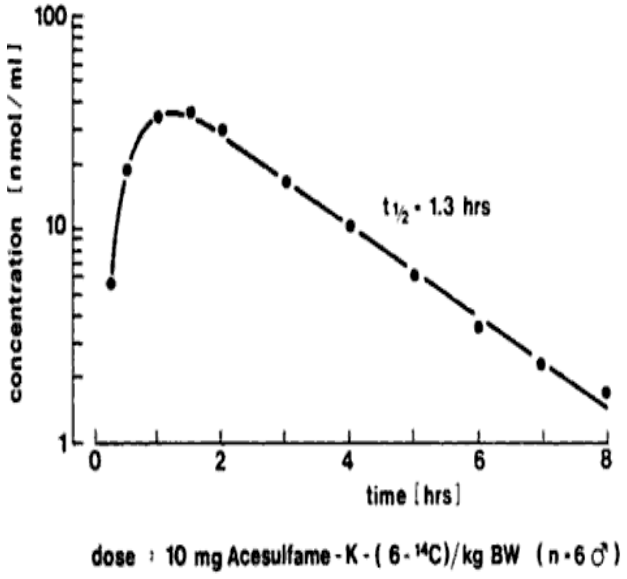


Figure 24 : Decrease in Concentration of Ace-K over Time in Dogs [51]

[Figure.26] shows the structure of aspartame. Aspartame is an artificial, non-saccharide sweetener. It is the methyl ester of the dipeptide of L-aspartic acid and L-phenylalanine. [Figure.27] shows the metabolism (hydrolysis) of aspartame in the intestine. Hydrolysis of aspartame occurs in both the intestinal lumen and mucosal cells by proteolytic and hydrolytic enzymes. The byproducts, aspartate, phenylalanine, and methanol are released into the portal blood. Since grossly elevated plasma phenylalanine concentrations are associated with mental retardation (as is found in children with phenylketonuria), its metabolism is of primary concern. [Figure.28] shows the postprandial plasma phenylalanine levels of subjects after being administered lactose (black data points), 34mg/kg body weight aspartame, and 50mg/kg body weight aspartame (white data points). As seen in [Figure.28], plasma phenylalanine levels return to normal (the same level as when subjects were administered lactose) within 4 hours of eating aspartame. [Figure.29] shows the difference between phenylalanine levels of subjects who were administered aspartame sweetened beverages and those who were administered unsweetened beverages. The graph shows that phenylalanine levels of individuals who were administered aspartame sweetened beverages

drops back within 2 hours to the level of phenylalanine observed in subjects who were administered unsweetened beverages.[52] Aspartame metabolism is mainly characterized by its rapid hydrolyzation within the gut[1]. Within the gut, aspartame is subject to the action of protein-metabolizing enzymes such as esterases and peptidases[2]. Studies indicate that aspartame is hydrolyzed by gastric secretions or is transported and hydrolyzed by mucosal cells. Intact aspartame was not detected within the blood of tested animals such as rats, dogs, rabbits, and monkeys. The same results were found for humans as well. [Figure. 25] shows a depiction of the metabolism of aspartame within the body.

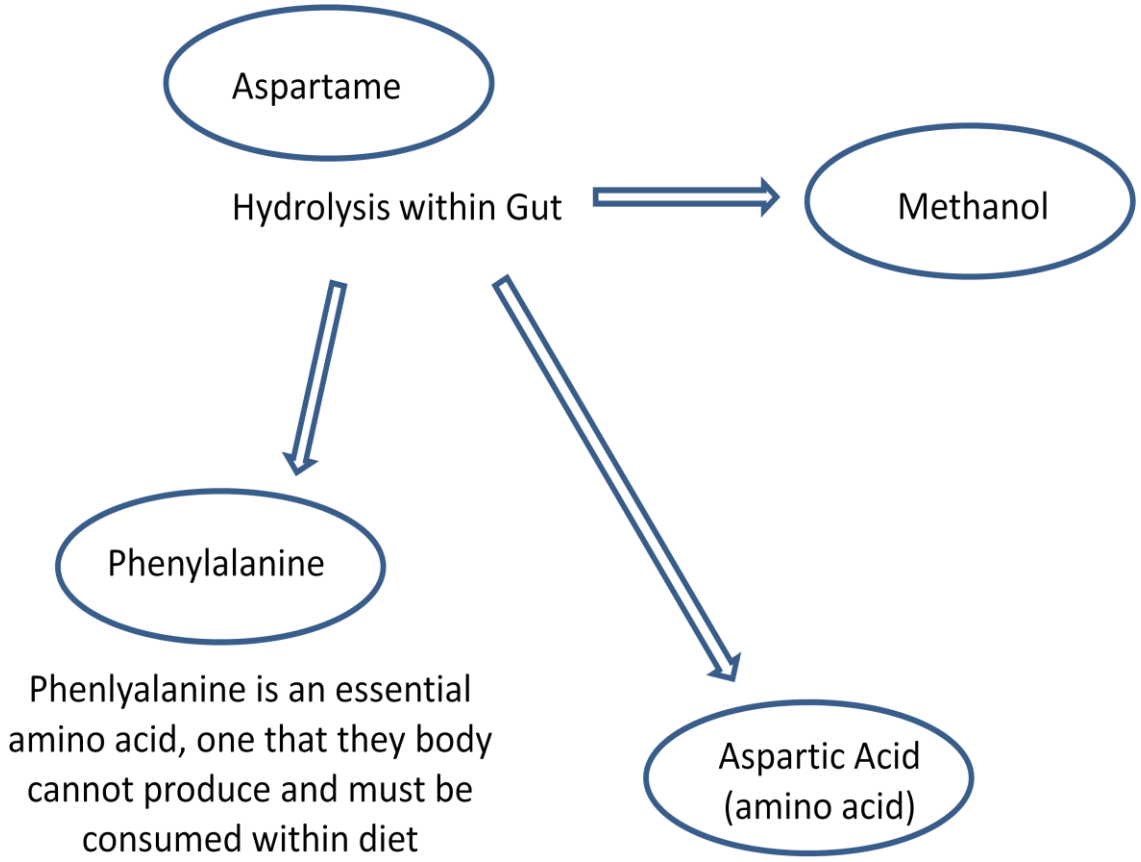


Figure 25 : The Metabolism of Aspartame

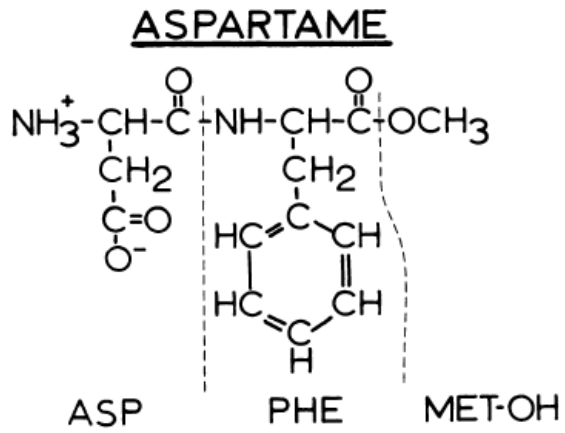


Figure 26 : The Structure of Aspartame[52]

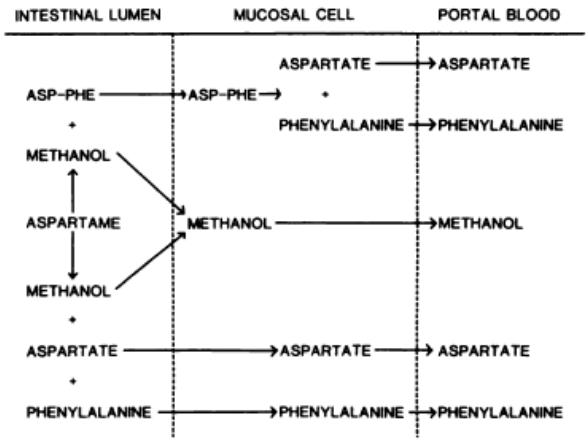


Figure 27 : The Metabolism of Aspartame in Intestines[52]

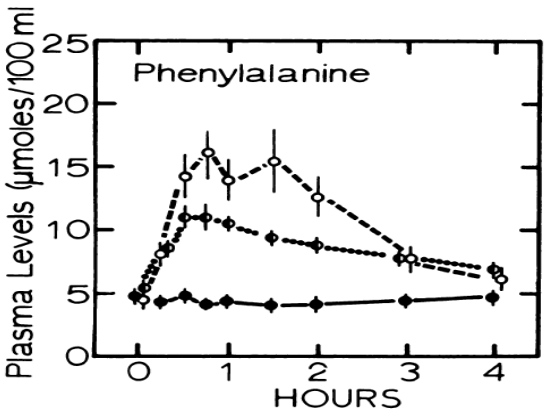


Figure 28 : Postprandial Plasma Phenylalanine Level of Subjects Administered with Lactose or Aspartame[52]

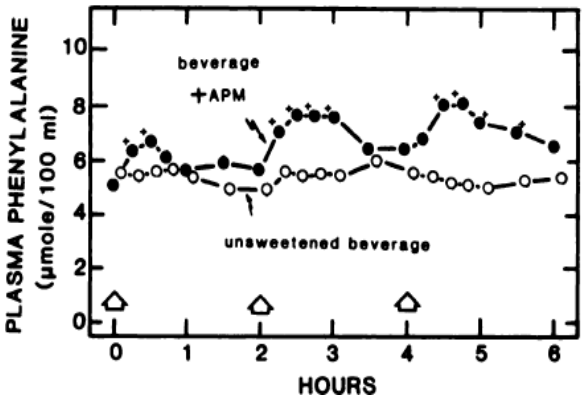


Figure 29 : Difference Between Phenylalanine Levels of Subjects Administered Aspartame-Sweetened Beverages and Unsweetened Beverages[52]

Neotame is a high-potency non-nutritive sweetener 6,000 times sweeter than sucrose. In humans, approximately half of the ingested neotame is eliminated through the feces as 3,3-dimethylbutylaspartylphenylalanine (DMB-Asp-Phe), and roughly half is absorbed in the body as unaltered neotame—which is hydrolyzed into DMB-Asp-Phe and MeOH. DMB-Asp-Phe is eliminated in the urine without significant retention in any tissues, and a minor part is metabolized through the oxidation of the 3,3-dimethylbutyl moiety into 3,3-dimethylbutyric acid, which is eliminated in the urine as a carnitine ester in humans.

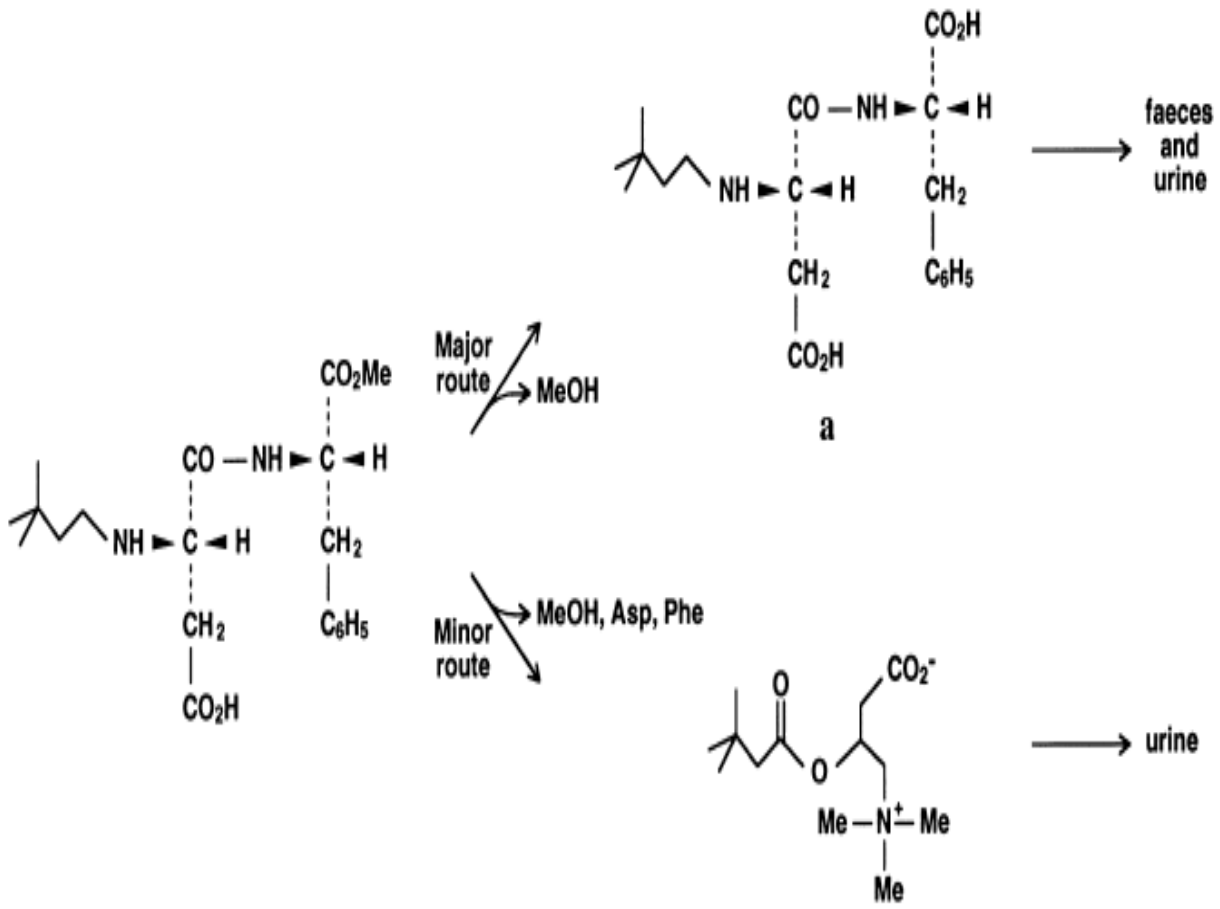


Figure 30 : Metabolic Conversion of Neotame[53]

[Table.1] below shows the result of an experiment performed by Roberts et al., which used thin-layer chromatography to detect the amount of sucralose in the urine and feces of human subjects after consuming sucralose. The mean weight of the 8 subjects was 79kg while the mean age was 39years. After being administered 1mg/kg bodyweight of sucralose, each subject had his urine and feces tested for detection of sucralose. An average of 92.7% of the administered sucralose was detected to have left the body unchanged [54]. This shows that most of the sucralose that enters the human body is neither retained nor modified within the body.

Table 1 : Thin Layer Chromatography Detection of Sucralose in Urine and Feces of Human Subjects after Consuming Sucralose [54]

	Subject								
Time (hr)	1	2	3	4	5	6	7	8	Mean ± SD
Urine									
0–3	1.48	4.67	2.36	3.99	3.47	6.99	4.05	8.55	4.45 ± 2.32
3–6	1.76	5.16	3.02	3.33	3.10	4.41	3.94	6.40	3.89 ± 1.44
6–12	2.34	3.68	2.19	1.87	2.73	2.49	3.02	2.57	2.61 ± 0.55
12–24	1.07	1.67	1.81	0.98	1.53	1.76	1.85	2.24	1.61 ± 0.42
24–36	0.91	0.79	0.67	0.53	0.53	0.52	1.18	0.67	0.73 ± 0.23
36–48	0.46	0.50	0.60	0.15	0.23	0.28	0.68	0.47	0.42 ± 0.18
48–72	0.49	0.68	0.59	0.17	0.13	0.23	0.50	0.48	0.41 ± 0.20
72–96	0.16	0.46	0.12	0.08	0.08	0.10	0.16	0.21	0.17 ± 0.13
96–120	0.10	0.32	0.06	(0.04	0.10	0.06	0.10	0.07	0.11 ± 0.09
Total 0–120	8.77	17.93	11.42	11.14	11.97	16.84	15.48	21.66	14.40 ± 4.30
Faeces									
0–24	—	—	18.3	—	23.7	63.4	30.1	8.2	N/A
24–48	16.1	0.0	34.0	79.2	49.4	—	29.7	39.5	N/A
48–72	63.3	0.0	23.5	2.0	2.1	12.0	5.1	13.2	N/A
72–96	—	39.8	3.4	0.3	0.4	0.6	7.0	6.8	N/A
96–120	10.2	41.5	0.6	0.0	0.2	0.5	0.7	1.7	N/A
Total 0–120	89.6	81.3	79.8	81.5	75.8	76.5	72.6	69.4	78.3 ± 6.2
No. of samples	3	5	6	6	10	5	10	8	N/A
Total excreted in urine and faeces	98.4	99.2	91.2	92.6	87.8	93.3	88.1	91.1	92.7 ± 4.2

— = no sample; SD = standard deviation; N/A = not applicable. The results are given as the % of the administered dose.

Cyclamate metabolism depends on the individual's ability to convert cyclamate into cyclohexylamine [2]. Studies on the metabolism of cyclamate show that the compound is rapidly excreted in the urine unchanged. For example, in rats given a single oral dose of cyclamate, the compound rapidly appears in the urine and is followed by a slow and steady excretion over the next 40 hours. Some humans, rats, and rabbits, however, have the ability to convert cyclamate into cyclohexylamine. The mechanism of cyclamate conversion into cyclohexylamine was studied by first observing the excretion of cyclamate when digested through diet and comparing it to the excretion of cyclamate when injected subcutaneously. Results of this study showed fluctuations in the amount of cyclamate excreted when digested, but a great increase in excreted cyclamate within urine when injected subcutaneously. More interesting was the observation that the amount of cyclamate excreted in feces decreased dramatically when cyclamate was injected subcutaneously.

The importance the ability to convert cyclamate to cyclohexylamine lies in the fact that cyclohexylamine is a pharmacologically active compound that causes a rise in blood pressure via the release of norepinephrine. [Figure. 31] shows a depiction of the metabolism of cyclamate within the body.

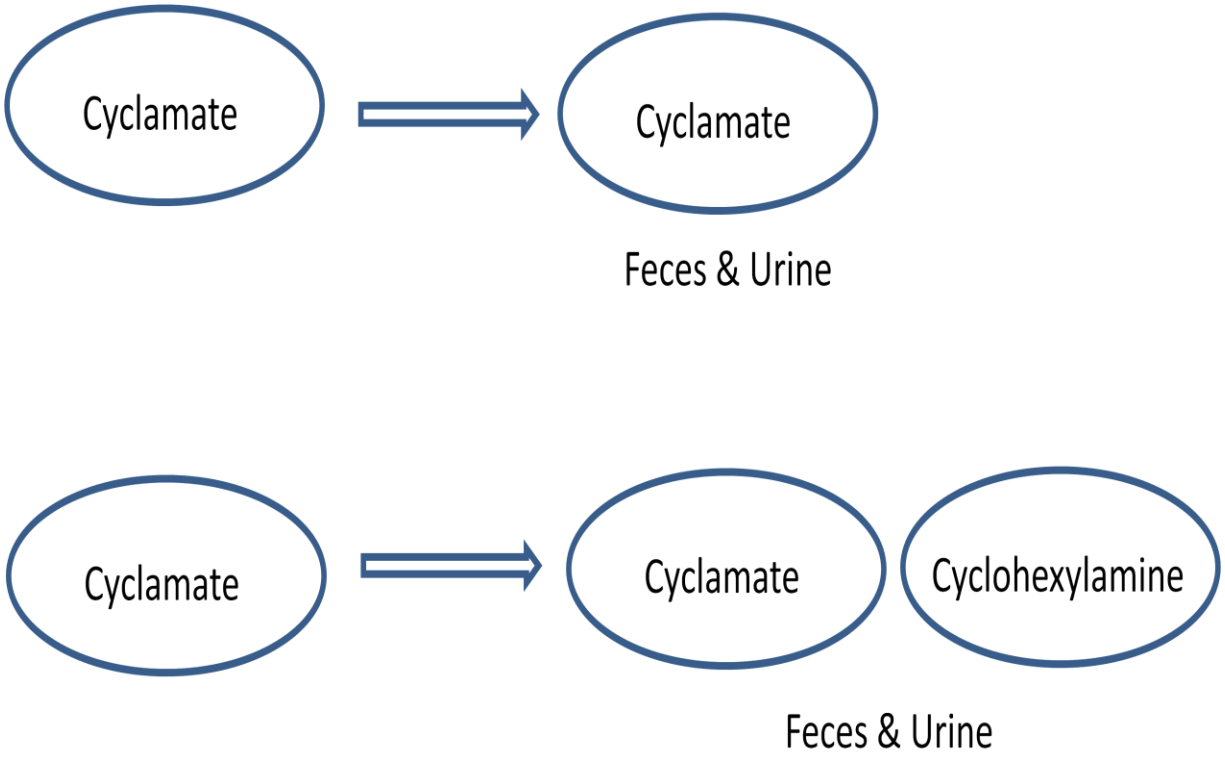


Figure 31 : The Metabolism of Cyclamate

Under normal dietary use, saccharin goes through very little metabolic conversion. An experiment with young female rhesus monkeys involving orally administering ring-labeled saccharin and measuring recovery in urine, more than 98% radioactivity was recovered within 96 hours. A very small amount of hydrolytic products of saccharin were detected in urinary extracts [3]. In humans, orally administered saccharin was detected in urine within half an hour of dosage and was completely eliminated from the body unchanged in 16 to 18 hours. Thus, it is believed that saccharin is not metabolized in the human body.

6.0 Health Effects of Artificial Sweeteners

There is a great deal of anecdotal evidence not yet scientifically evaluated concerning the potential harmful health effects of artificial sweeteners ranging from causing cancer to brain damage. Scientific literature, which is based on scientific research, published and commonly read by the scientific community (peer-reviewed), stand behind the claim that there is no clear evidence of an FDA approved artificial sweetener having harmful effects on human health. This section explores journal articles based upon valid scientific research that has been done concerning the health effects of artificial sweeteners.

6.1 Cancer

Cancer is likely the primary disease that different artificial sweeteners have been accused of causing. However, even scientific papers that have been published linking cancer and artificial sweeteners have been proven to be faulty or inconclusive. For example, a study that links the introduction of the artificial sweetener aspartame to the American diet in 1981 and the increase of brain cancer incidents during the 1980s has been criticized for committing ecological fallacy by observing two different events at an ecological level without examining individual data [55]. An investigation performed by Unhee Lim from the National Cancer Institute; 285,079 men and 188,905 women of ages 50 to 71 years were given a questionnaire that queried consumption of four different aspartame-containing beverages over the period of one year. The paper states that higher levels of aspartame intake were not associated with the risk of overall hematopoietic cancer, glioma, or their subtypes in either men or women. As another example, saccharin has been the center of controversies regarding its potential for causing bladder cancer. This notion was started by a study in which rats were administered high dosages of saccharin and developed cancer. This study was disproved first because of the unreasonably high dosages of saccharin that rats were given, and secondly because differences in the mechanism in which saccharin produced bladder

cancer in rats were revealed [56]. Sodium saccharin, unlike typical carcinogens, does not interact with DNA to cause cancer. Instead, it leads to an increase in cell proliferation in urothelium, and because this is saccharin's only target tissue, the possibility of causing cancer is limited to the urinary milieu, and according to a study done by Ellwein & Cohen from Stanford University, it is very unlikely that saccharin has an effect on the human urothelium even at the highest levels of possible human saccharin consumption [56]. Genotoxicity studies done on different artificial sweeteners also prove the same point. For example, [Table.2] shows the results from many different genotoxicity studies done on neotame. Here, the results for three different *in vitro* experiments and one *in vivo* experiment are shown. In these tests, done on subjects ranging from bacterial strains to mice bone-marrow, show that neotame has not shown genotoxicity. [57]

Table 2 : Results of Genotoxicity Studies on Neotame [57]

Endpoint	Test object	Concentration/ dose	Results	Reference
In vitro				
Reverse mutation	*S. typhimurium* strains TA1535, TA1537, TA1538, TA98, TA100. *E. coli* strain WP2 *uvrA*	312–10 000 mg/ plate ±S9[a]	Negative	Riccio (1994)
Reverse mutation	Mouse lymphoma L5178Y cells	100–1 000 mg/ ml ±S9[a]	Negative	Rudd (1994)
Chromosomal aberration	Chinese hamster ovary cells	62.5–500 mg/ ml S9; 250 to 1 000 mg/ml +S9[a]	Negative	Winegar (1994)
In vivo				
Micronucleus formation	CD-1 mice bone-marrow	500, 1 000 or 2 000 mg/kg bw by oral gavage	Negative	Garrett et al. (1997)

6.2 Obesity

Obesity is one of the most serious problems that Americans face today. An obese lifestyle leads to many other health complications such as diabetes, high blood pressure, cancer, gallbladder disease, metabolic syndrome, osteoarthritis, heart disease, and depression [86]. According to the American Heart Association, Americans consume 22 teaspoons of sugar each day, which accounts for 355 calories, while the recommended intake is 100 calories of added sugar for women and 150 calories for men [85]. [Figure.33] shows how the usage of white sugar has been decreasing in the US since 1970 but the lower limit of the decreased amount is still approximately 200 calories, which is about double that of the FDA recommended intake for women. Paired with this high amount of white sugar intake, the consumption of HFCS has been increasing drastically. [Figure.31] and [Figure.32] show the distribution of obese adults in America between 2004 and 2007. It can be easily seen that the area represented by brown regions (within which 27.1 ~ 30.7% adults are obese) has increased dramatically in 3 years. Though it may not account for 100% of the reasons behind obesity in America, the increased use of sugar and artificial sweeteners would indeed be one of the major reasons for this trend. As an example, sweeteners such as high fructose corn syrup (HFCS) contain large amounts of fructose, which is known to increase lipogenesis within the liver when consumed, leading to easier depositing of fat within the body. [Figure.33] shows the statistics signifying an increase in American HFCS use beginning in the 1970s. The decrease in white sugar but increase in HFCS shows that HFCS has been taking place of white sugar as the primary sweetener for Americans over the years.

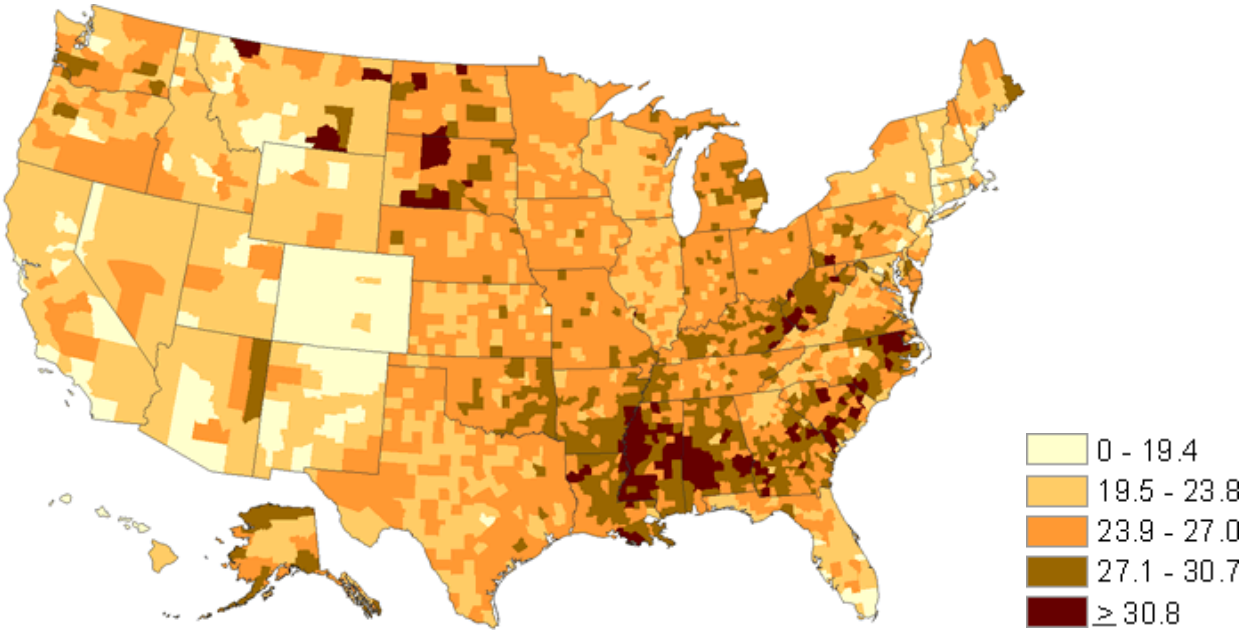


Figure 32 : 2004 Estimate of Percentage of Adults who are Obese [83]

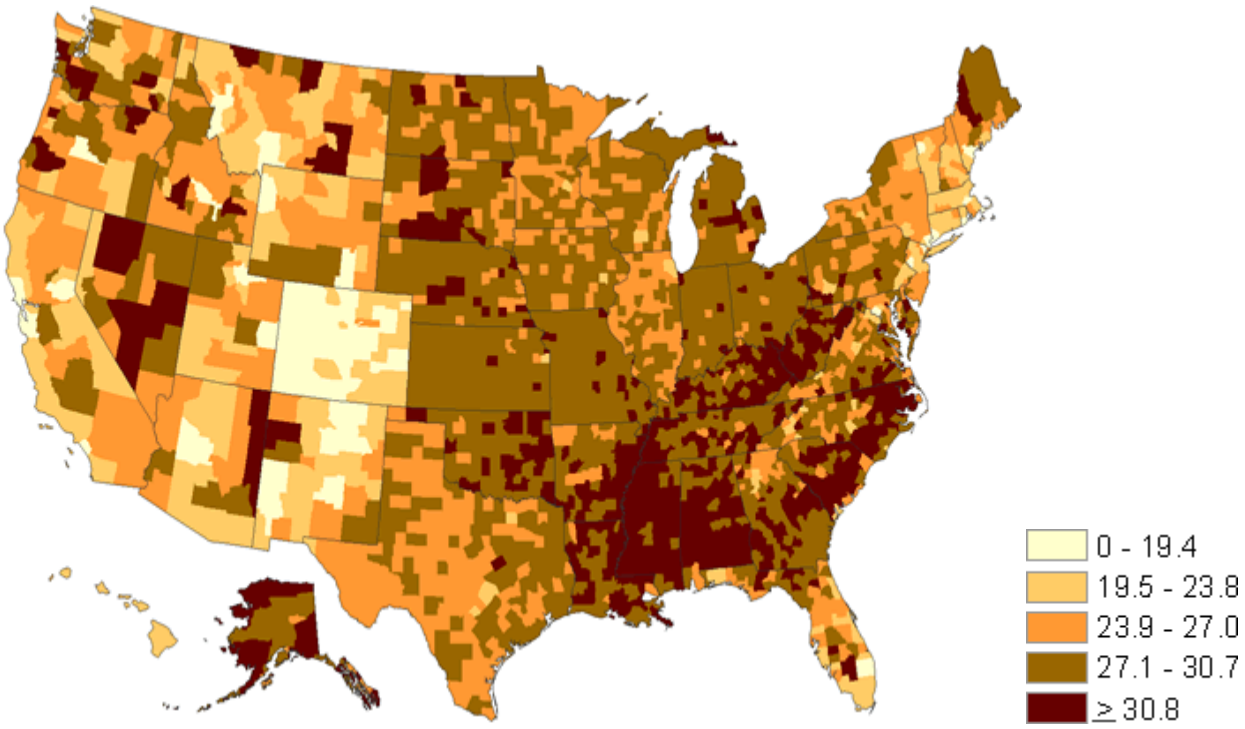


Figure 33 : 2007 Estimate of Percentage of Adults who are Obese [83]

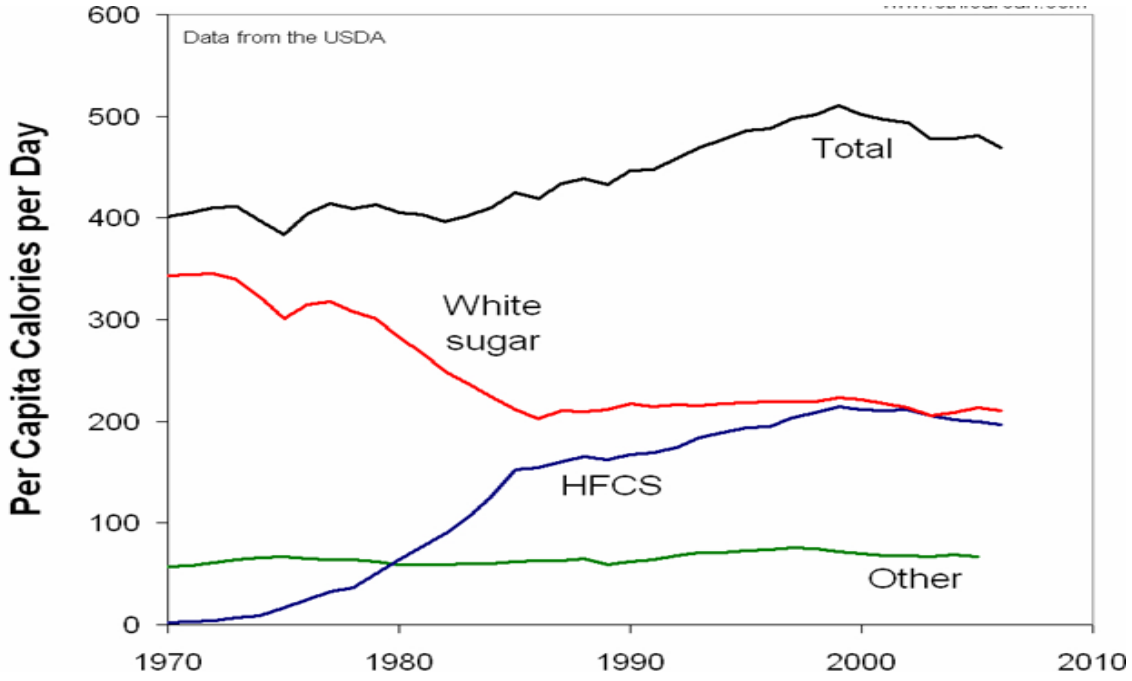


Figure 34 : Per Capita Calories Consumed by Adults by Different Kinds of Sweeteners

A potential link between increased HFCS usage and increase in obesity is explained through the following experiments. The effect of drinking soda sweetened with aspartame or HFCS on food intake and body weight was tested by taking human subjects in their 20s (9 females, 21 males) and measuring their change in weight when given no soda, 1,150g of aspartame sweetened soda, and 1,150g of HFCS sweetened soda every day for 3 weeks each [58]; results are shown in the two figures below. [Figure.34] shows the changes in bodyweight during each 3-week period. For the time periods within which the subjects drank aspartame sweetened soda, decrease in bodyweight was observed in both male and female subjects; but when subjects drank HFCS sweetened soda, both male and female subjects experience an increase in bodyweight by more than 0.5kg. [Figure.35] shows what the subjects chose on average as their source of sugar during each 3-week period. It is clear that during the period while subjects were drinking HFCS sweetened soda; both male and female subjects decided to intake more of the HFCS sweetened sugar as their sugar source. This suggests that HFCS causes more consumption of HFCS, resulting in higher calorie intake [58].

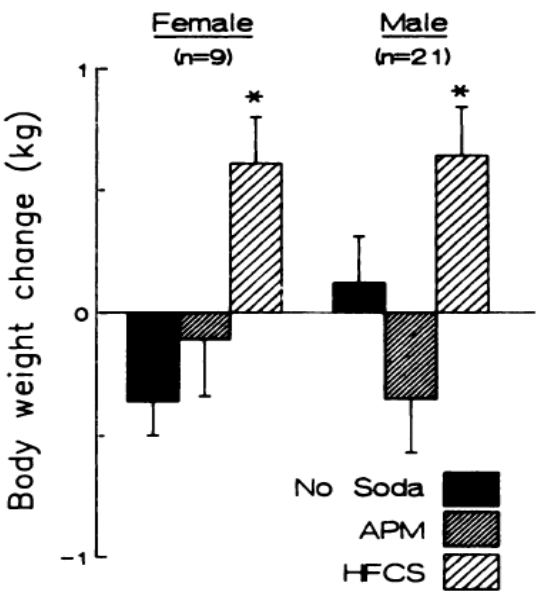


Figure 35 : Changes in Bodyweight of Subjects During Each 3-Week Period When Administered Aspartame, HFCS, or no Sweetener[58]

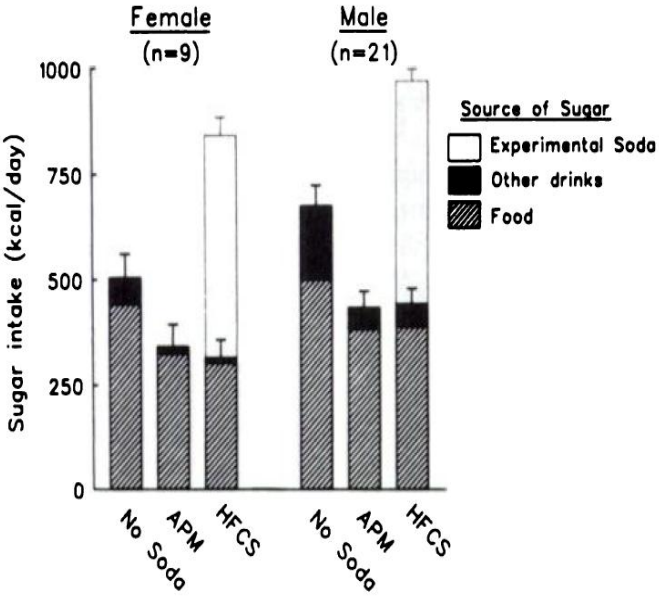


Figure 36 : Average Intake and Source of Sugar During Each 3-Week Period When Administered Aspartame, HFCS, or no Sweetener [58]

In an experiment conducted by Teff et al[58], human subjects (young, normal-weight women) were used for testing the effect of fructose on appetite. Subjects maintained their normal dietary intake and level of exercise until they were asked to come in for a two-night stay at the research center which was comprised of a 24-hour period during which dietary intake was controlled and a 12-hour period during which subjects consumed either glucose or fructose-sweetened beverages. In figure 37, presented below, one of the results of this experiment can be seen. Here, the level plasma insulin and plasma leptin levels observed in the subjects are depicted. It is clear that the level of either insulin or leptin is significantly low in subjects who were administered fructose-sweetened beverages. Thus, this report shows that consuming fructose-sweetened beverages results in lower levels of circulating insulin or leptin concentrations; and because insulin and leptin function as key signals to the central nervous system (CNS) in energy regulation and suppression of appetite, prolonged intake of fructose may lead to increased caloric intake and contribute to weight gain[59].

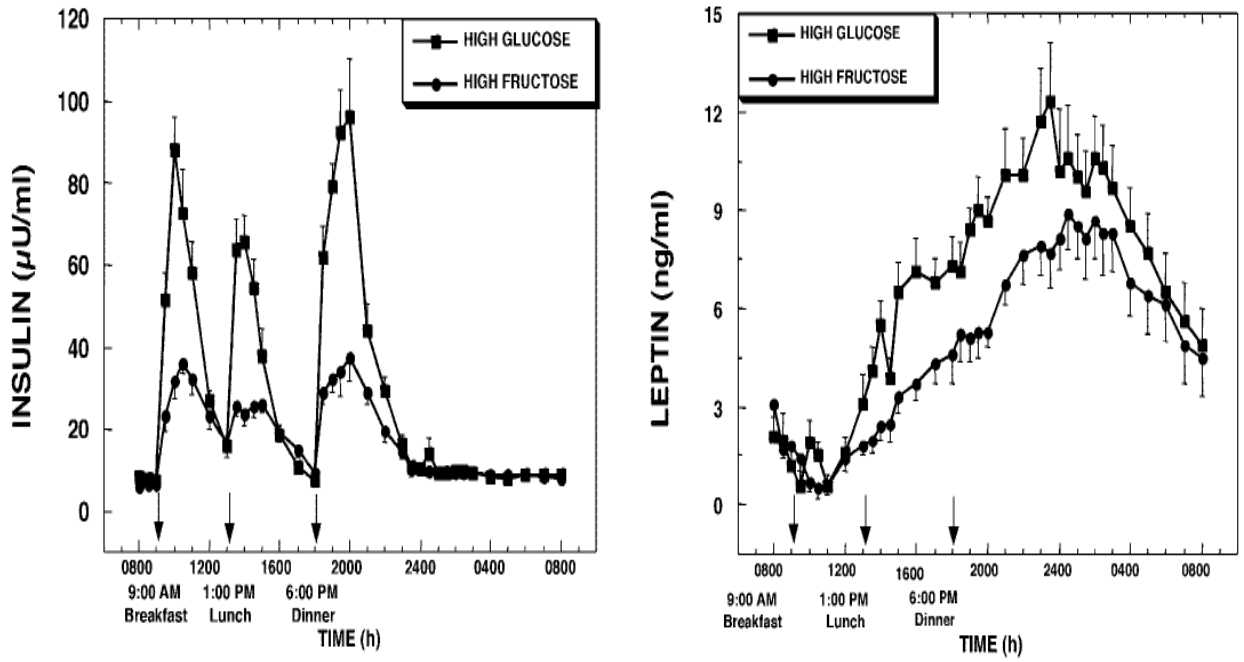


Figure 37 : Comparison of Change in Insulin and Leptin Levels in Subjects Administered Either Glucose or Fructose [59]

In an experiment by Melanson et al [60], the effect of HFCS and sucrose consumption on circulating insulin and leptin was tested. Subjects were non-smoking women 20 to 60 years of age. Subjects maintained their normal dietary intake and level of exercise until they were asked to come in for a two-night stay at the research center which comprised of a 24-hour period during which dietary intake was controlled and a 12-hour period during which subjects consumed either HFCS or sucrose-sweetened beverages [60]. Results show, as seen in [Figure.37] and [Figure.38], almost no difference in either insulin or leptin levels between time periods when subjects were given HFCS and when subjects were given sucrose. [Figure.39] and [Figure.40] show that there was no difference in the rate of desire to eat either. This study suggests that HFCS does not have a significant difference in contribution to appetite and obesity as compared to sucrose.

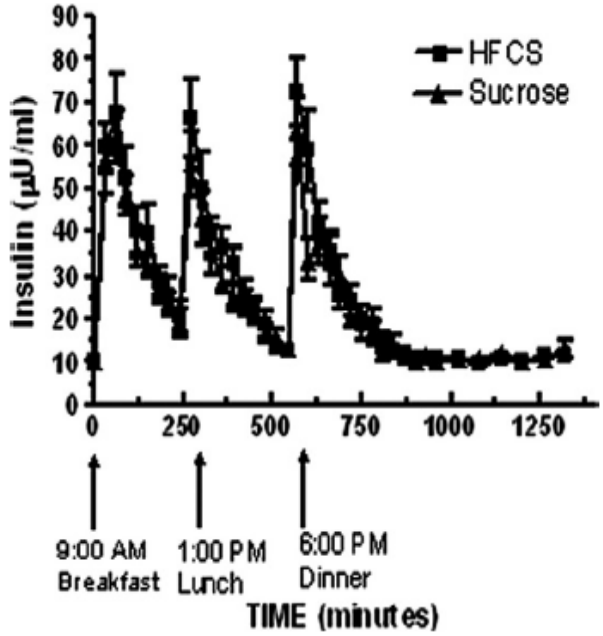


Figure 38 : Change in Insulin Levels According to HFCS or Sucrose Consumption[60]

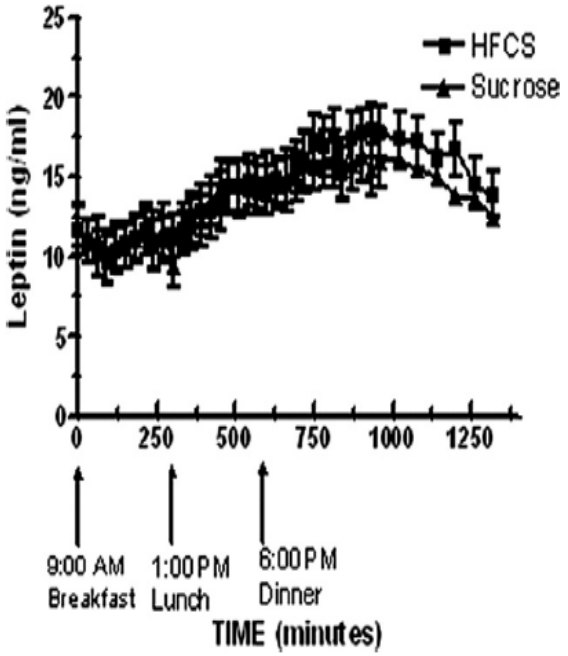


Figure 39 : Change in Leptin Levels According to HFCS or Sucrose Consumption[60]

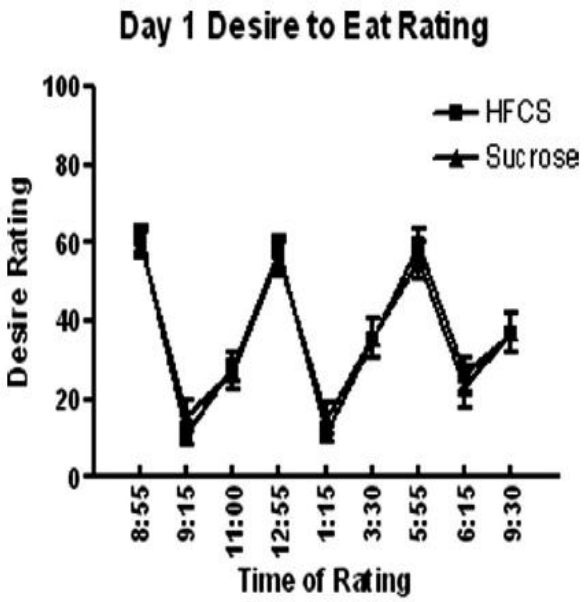


Figure 40 : Rating of Desire to Eat During Day1 Between Patients Given HFCS and Sucrose[60]

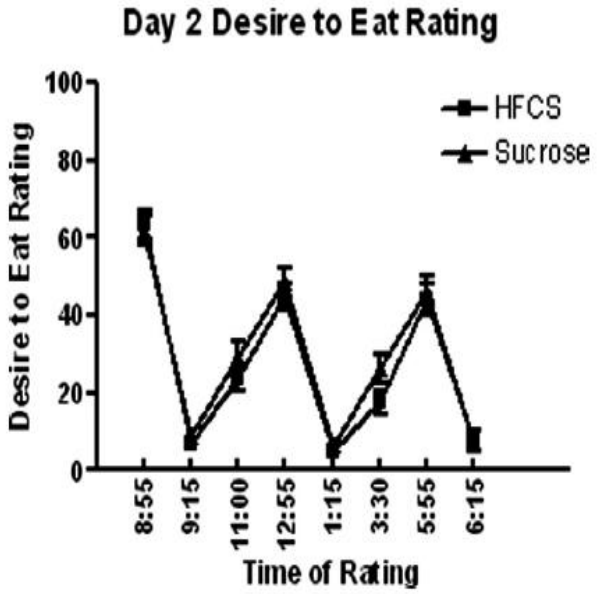


Figure 41 : Rating of Desire to Eat During Day2 Between Patients Given HFCS and Sucrose[60]

The results from the two experiments introduced above show that the use of HFCS does not result in a proper insulin increase within the body, suggesting that fructose consumption (HFCS) causes most of the energy consumed to be changed to fat. The comparison between sucrose (glucose + fructose) and fructose in the experiment by Melanson et al. shows no significant

difference in desire to eat between subjects given sucrose and subjects given HFCS. The implication from these two experiments is that while HFCS does not result in an increased desire to eat compared to sucrose, the metabolic processing of fructose within the body results in a higher possibility of being obese.

The introduction of artificial sweeteners to the American diet seemed to be offering a method to control caloric intake without compromising the sweetness of foods, but it has been shown that the consumption of artificial sweeteners may impair the body's ability to "count" its caloric intake based on the sweetness profile of food, so that when that individual eats foods sweetened with high-caloric natural sweeteners, he/she tends to eat more. A study by Professor Terry Davidson's team from Purdue University provides an explanation for this [77]. Their study suggests that the consumption of artificial sweeteners may disrupt the body's ability to "count" calories based on the sweetness profile of a food. The body has an innate ability to determine the amount of calories present in a food product based on the sweetness of the food. Behavioral neuroscience studies show that artificial sweeteners weaken this ability, and the body can no longer determine, based on the sweetness of a food, how much of the food is required to meet its caloric needs [77]. This study was done by giving two groups of rats two different sweet-flavored liquids—one of the groups received liquids with high-caloric sweeteners while the other group received liquids sweetened artificially (low caloric count). After 10 days of such exposure, rats that had experienced inconsistent relationship between sweet taste and calories were found to be less capable of controlling their diet and seemed to eat more of the sweet, high calorie chocolate snack given to them. [Figure.41] provides a visual representation of this experiment.

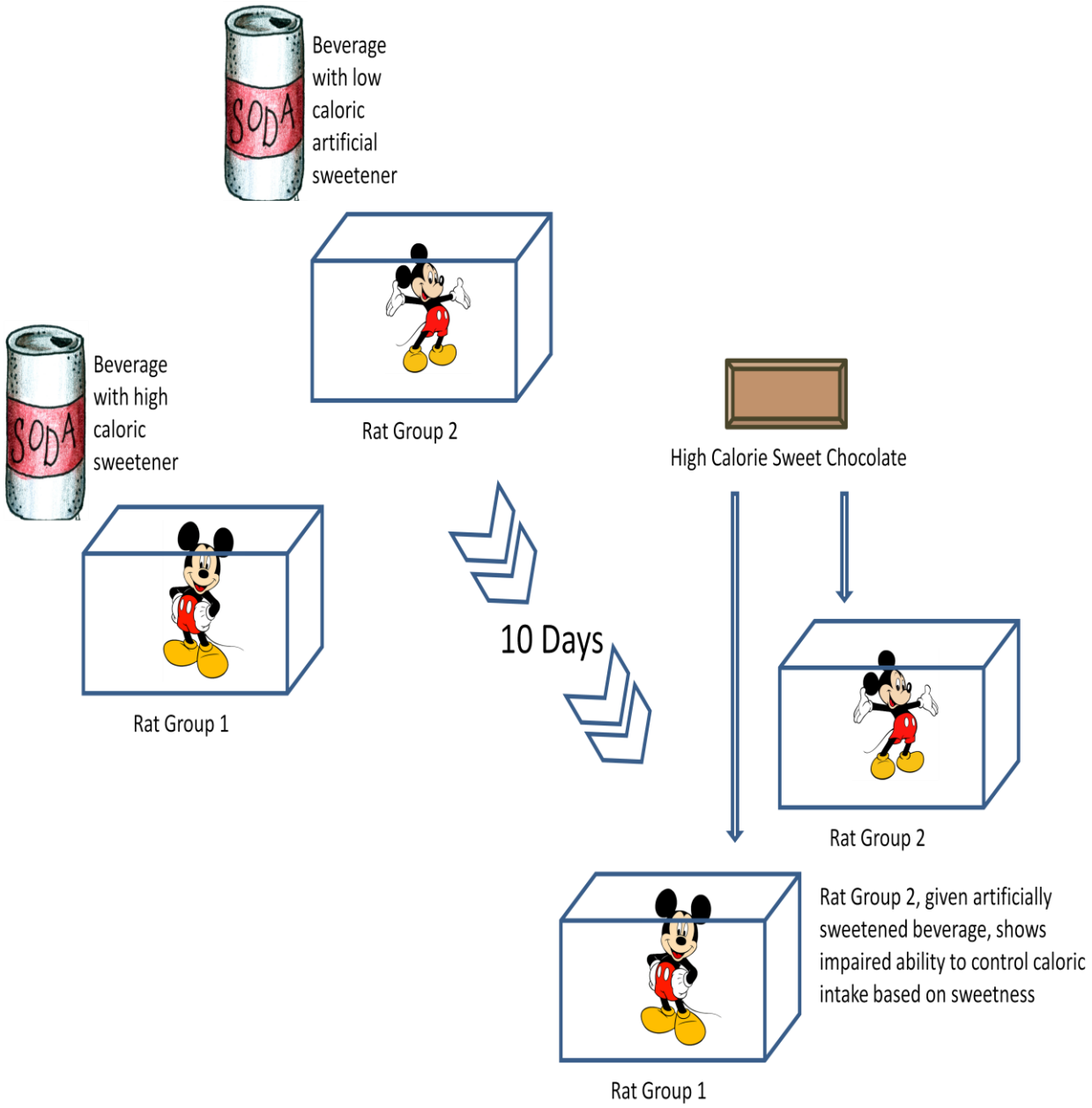


Figure 42 : Effect of low calorie, artificial sweeteners on ability to control caloric intake based on sweetness of food (77)

This experiment shows how the consumption of artificial sweeteners may cause the brain to underestimate the amount of calories in foods based on sweetness and result in overeating.

The consumption of artificial sweeteners does decrease the caloric intake of a consumer, but it impairs the brain's ability to estimate caloric intake based on sweetness. Excess HFCS or sucrose consumption through soda and other sweetened products leads to obesity because increased fructose consumption induces lipogenesis (a fat depositing mechanism).

6.3 Gastrointestinal Tract

Anecdotal evidence of bloating and irregular bowel movements are common in the use of artificial sweeteners. The effect that artificial sweeteners have on the gastrointestinal tract mostly has to do with their interaction with the microbial flora. The human gut harbors a very diverse community of microbial organisms which play important roles in the digestion of food. The human intestine, for example, harbors an approximate of 100 trillion micro-organisms of at least 1000 different species [80]. This section reviews scientific journal articles about the interaction of different artificial sweeteners with bacteria within the gastrointestinal tract.

Sucralose is a high-potency sweetening compound that is essentially a chlorinated disaccharide. In an experiment done by the Duke University Medical Center [82], Sprague-Dawley rats were given the commercial artificial sweetener *Splenda* (main ingredient sucralose) at different concentrations. The major results are shown below in [Figure.41] and [Table.3]. In conclusion the results of this study indicate that sucralose suppresses some beneficial bacteria. Also, sucralose induces elevated expression of P-gp and CYP proteins which essentially play the role of letting drugs and toxicants bypass the body's metabolism system and render them less bioavailable.

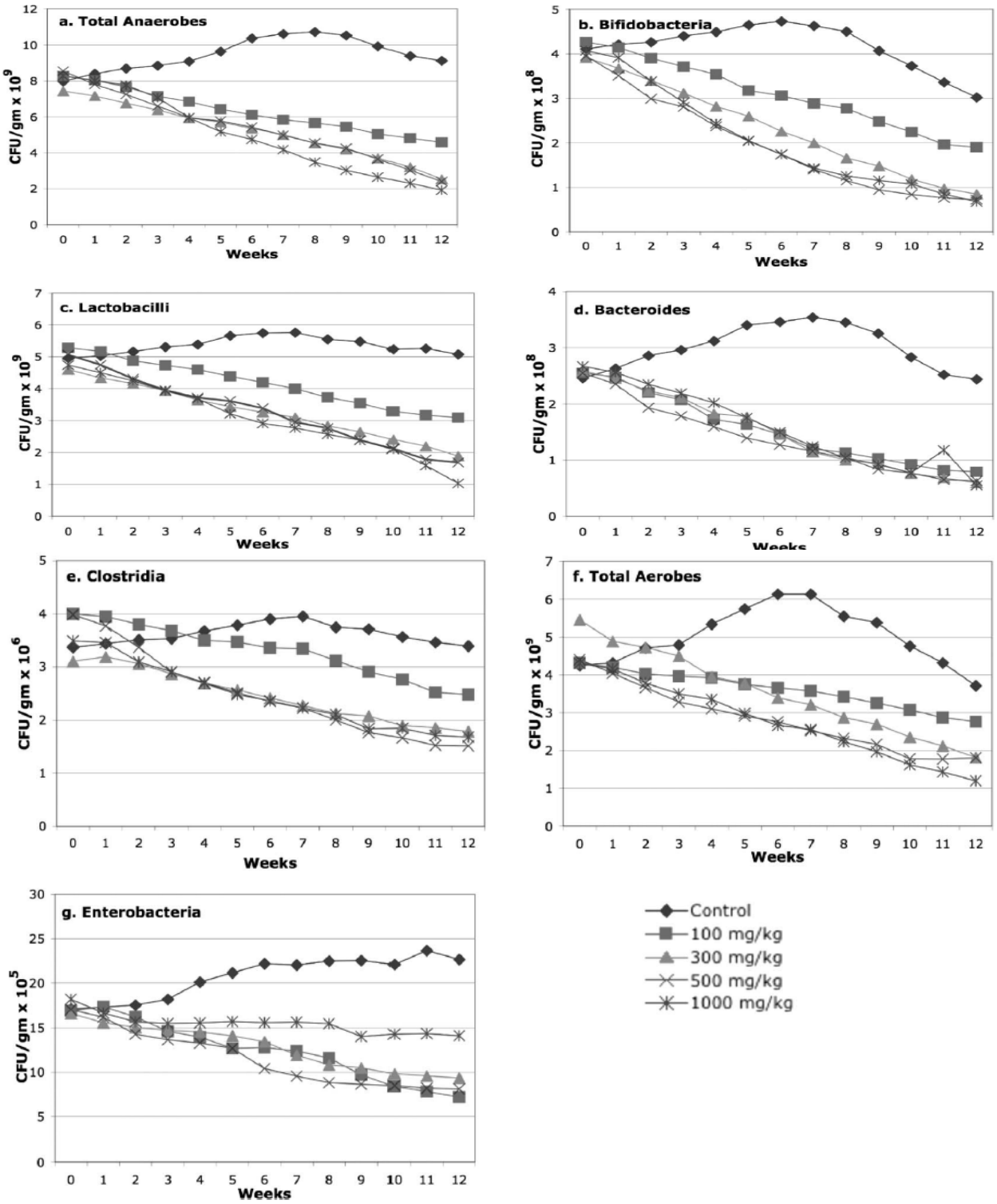


Figure 43 : Bacterial Viable Counts in Sprague-Dawley Rats Feces Determined After Discontinuation of Splenda (Sucralose) Treatment for 12 Weeks [82]

The figure above shows that the number of viable bacteria in experimental rat feces after consumption of sucralose decreased as the amount of sucralose consumption increased.

Table 3 : Summary of Effects of Splenda at End of Experiment [82]

Dosage of Splenda (mg/kg/d)	Sucralose (mg/kg/d)[a]	Effects	
		After 12-wk treatment	After 12-wk recovery
100	1.1	Decrease of beneficial intestinal bacteria; increased fecal pH; increased body weight	Total anaerobic bacteria remained suppressed; body weight remained elevated
300	3.3	Decrease of beneficial intestinal bacteria; increased fecal pH; histopathological changes in the gut[b]; increased P-gp, CYP3A4, and CYP2D1	Total anaerobes and bifidobacteria remained suppressed; fecal pH remained elevated; P-gp remained slightly elevated
500	5.5	Decrease of beneficial intestinal bacteria; increased fecal pH; histopathological changes in the gut; increased P-gp, CYP3A4, and CYP2D1	Total anaerobes and bifidobacteria remained suppressed; fecal pH remained elevated; body weight increased; P-gp and CYP2D1 remained elevated
1000	11	Decrease of beneficial intestinal bacteria; increased fecal pH; histopathological changes in the gut; decreased P-gp, increased CYP3A4 and CYP2D1	Total anaerobes remained suppressed; fecal pH remained elevated; P-gp rebounded beyond control; CYP3A4 and CYP2D1 remained elevated

Aspartame hydrolyzes into its component molecules (L-aspartic acid, L-phenylalanine, and methanol) within the gut and the increase of these components within the gut were considered a possibility for gastrointestinal problems caused by aspartame. A study performed on rats by Bianchi et al tested rats by administering 200mg/kg body weight of aspartame intragastrically and observing for appetite suppression, inhibition or stimulation of gastric/acid secretion, and proteolytic activity. No aspartame related effects were found in this study.

Xylitol's effect on the quantity and quality of the microflora of Wistar albino rats, CD-1 mice and healthy humans was studied by the University of Helsinki, Finland. No major changes in the numbers of total aerobic or anaerobic bacteria were observed, while xylitol feeding caused a clear shift in rodent fecal microbial population from Gram-negative to Gram-positive bacteria [81]. Similar shifts were observed in human subjects. A study done in Australia in rats, however, shows different

results. Here, rats were fed different concentrations of xylitol for periods ranging from 1 to 14 days. Caecal distention, gas production, appearance of a fluffy layer in the centrified specimens of caecal contents, and diarrhea were the symptoms observed from these rats [80]. The analysis of this experiment suggested that dietary xylitol causes an adaptation within the gut microflora which leads to the increased ability of gut microflora to utilize xylitol. This, in turn, results in less caecal osmosis, and diarrhea.

Artificial sweeteners, while they are low caloric and are not metabolized much within the human body; do seem to have significant effects on the microflora within the gastrointestinal system. Specifically sucralose and xylitol have been proved through scientific experimentation to cause decrease in beneficial micro-organisms (sucralose) or diarrhea (xylitol).

6.4 Brain Damage

Anecdotal evidence suggests that artificial sweeteners have negative effects on the central nervous system, causing difficulty to concentrate and carry out mental operations. This section explores scientific research that has been done on the effect of artificial sweeteners on the central nervous system (CNS).

Aspartame has been thought to cause brain damage because of one of its component molecules, phenylalanine. Phenylalanine causes brain damage and dysfunction in people who have a genetic disease (homozygous phenylketonuria) that renders them unable to metabolize phenylalanine. Aspartame's incorporation into the general public's diet raised the issue that the population would be exposed to consuming unnecessarily high doses of phenylalanine, resulting in possible brain damage even in individuals who do not have homozygous phenylketonuria. An interesting experiment was done on 13 pilots [78] to test the effect that aspartame has on mental operation ability. They were given either 50mg/kg bodyweight aspartame, placebo, or ethyl alcohol and performance levels were measured for aviation-relevant tasks that require perceptual-motor

abilities, spatial abilities, working memory, attention performance, risk taking, processing flexibility, planning, and sequencing ability. Aspartame did not have deleterious effects on any of these abilities during the experiment while on the other hand, ethanol conditions showed decrements in psychomotor and spatial abilities [79].

7.0 Results

In an effort to better understand the public's perception of sweetener products, a survey was conducted, sweeteners were used in food products then tested for sweetness and aftertaste profiles, and two doctors were asked to share their professional opinions with regard to artificial sweetener safety.

7.1 Public Knowledge

In an effort to better understand what the general population knows about artificial sweeteners as well as their concerns regarding artificial sweeteners, a survey was constructed to gather this information. The survey consisted of the following questions:

- (Optional) State your age, sex, race and occupation
- Which artificial sweeteners are you aware of?
- Do you use artificial sweeteners in your everyday routine?
- How often to you consume products containing artificial sweeteners or specifically add artificial sweeteners to your food or beverages?
- How often to you consume products labeled "Sugar Free" or "Diet"?
- How strongly do you believe that artificial sweeteners cause obesity?
- How strongly do you believe that artificial sweeteners cause behavioral disorders?
- How strongly do you believe that artificial sweeteners cause cancer?
- If you were certain that artificial sweeteners have no adverse health effects and were in fact beneficial to your health, would you use them more?
- Would you be interested in participating in a brief "taste panel" of different artificial sweeteners? If so, where would you like this taste panel to be held (Campus Center, Quad, Fountain, Wedge, etc.)?

The survey received 840 responses over the period of 70 days. The majority of respondents were students enrolled at WPI and the remaining individuals consisted of WPI faculty and staff. The original answers and data can be found in Appendix B.

Results showed that 65.9% of 837 respondents do not use artificial sweeteners in their everyday routine while 24% did and 10% were unsure. Figure 43 shows this data:

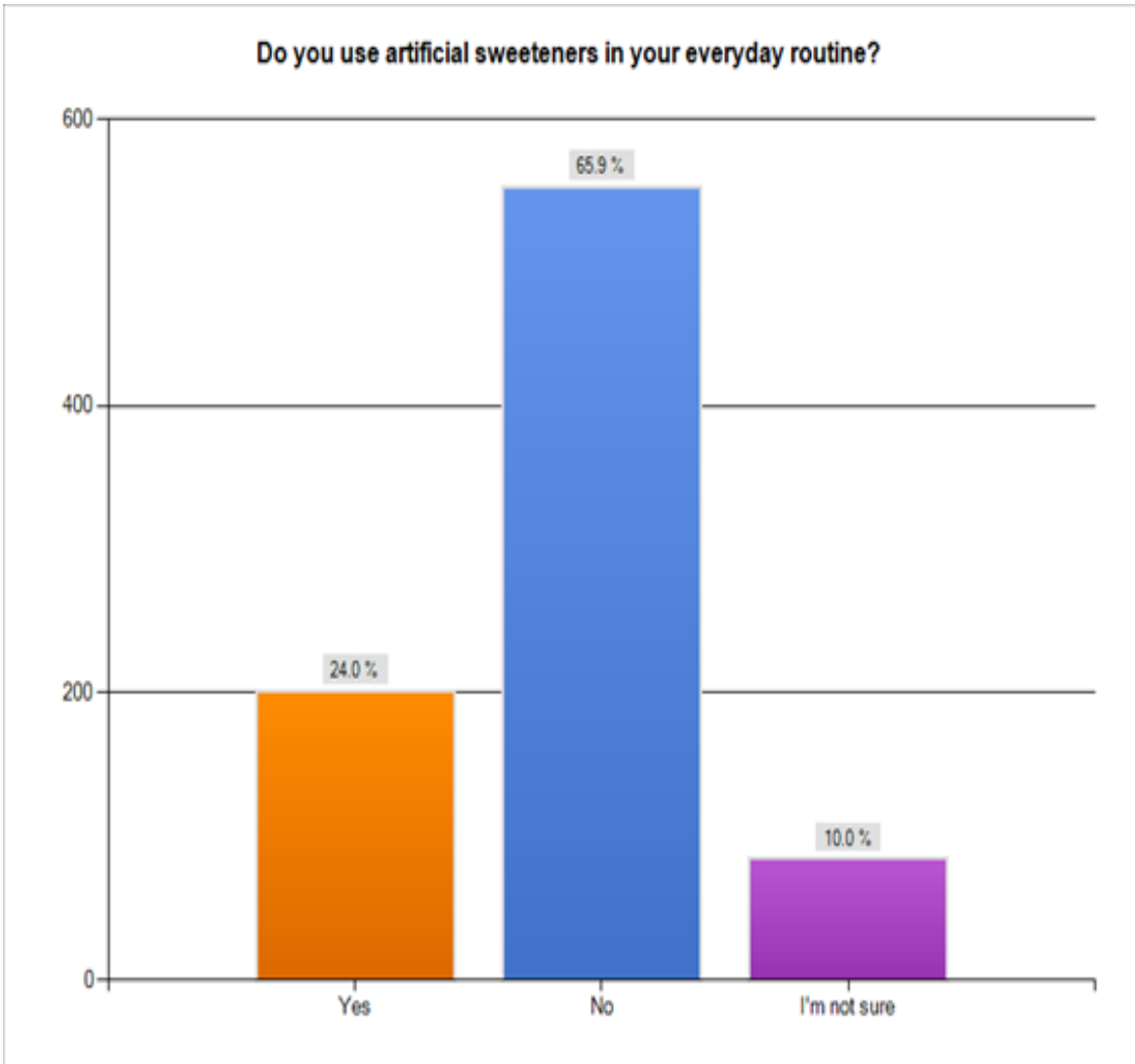


Figure 44: Survey Question #3 responses

When asked how often the respondents consumed products containing artificial sweeteners or specifically add artificial sweeteners to their food or beverages, 34.8% of 836 respondents said

that they rarely consume or add them. 16.9% said they never do, 10.8% said they do once a week, 17.2% said they do so 2-4 times a week and 20.3% said they do so daily. Figure 44 presents this data:

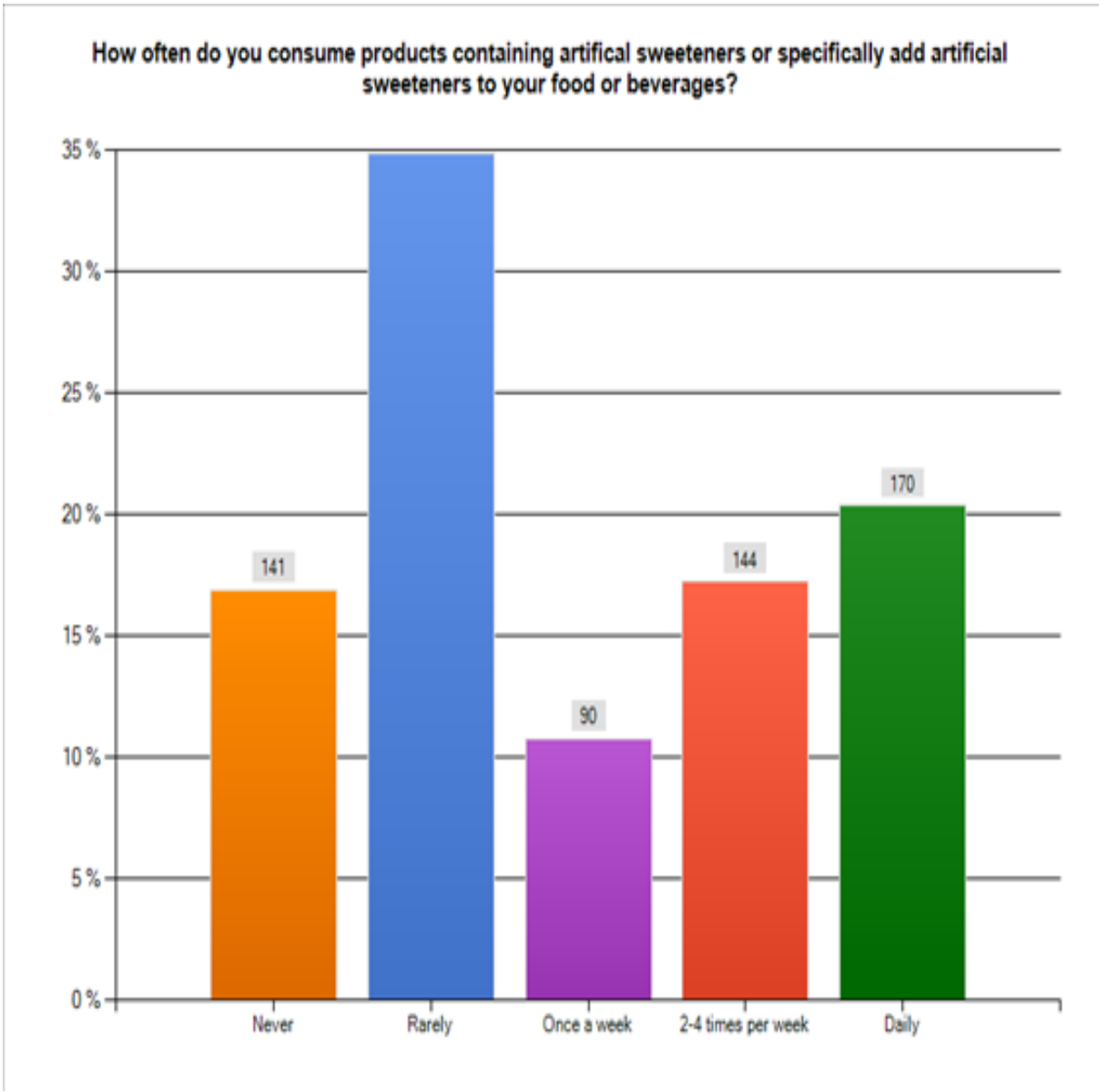


Figure 45: Survey Question #4 responses

Participants were then asked how often they consume products labeled "Sugar Free" or "Diet". 36.1% of 834 respondents answered that they rarely consume such products; 24.8% said

they never consume them, 9.6% do so once a week, 16.3% do so 2-4 times a week and 13.2% do so daily. The results can be seen in figure 45:

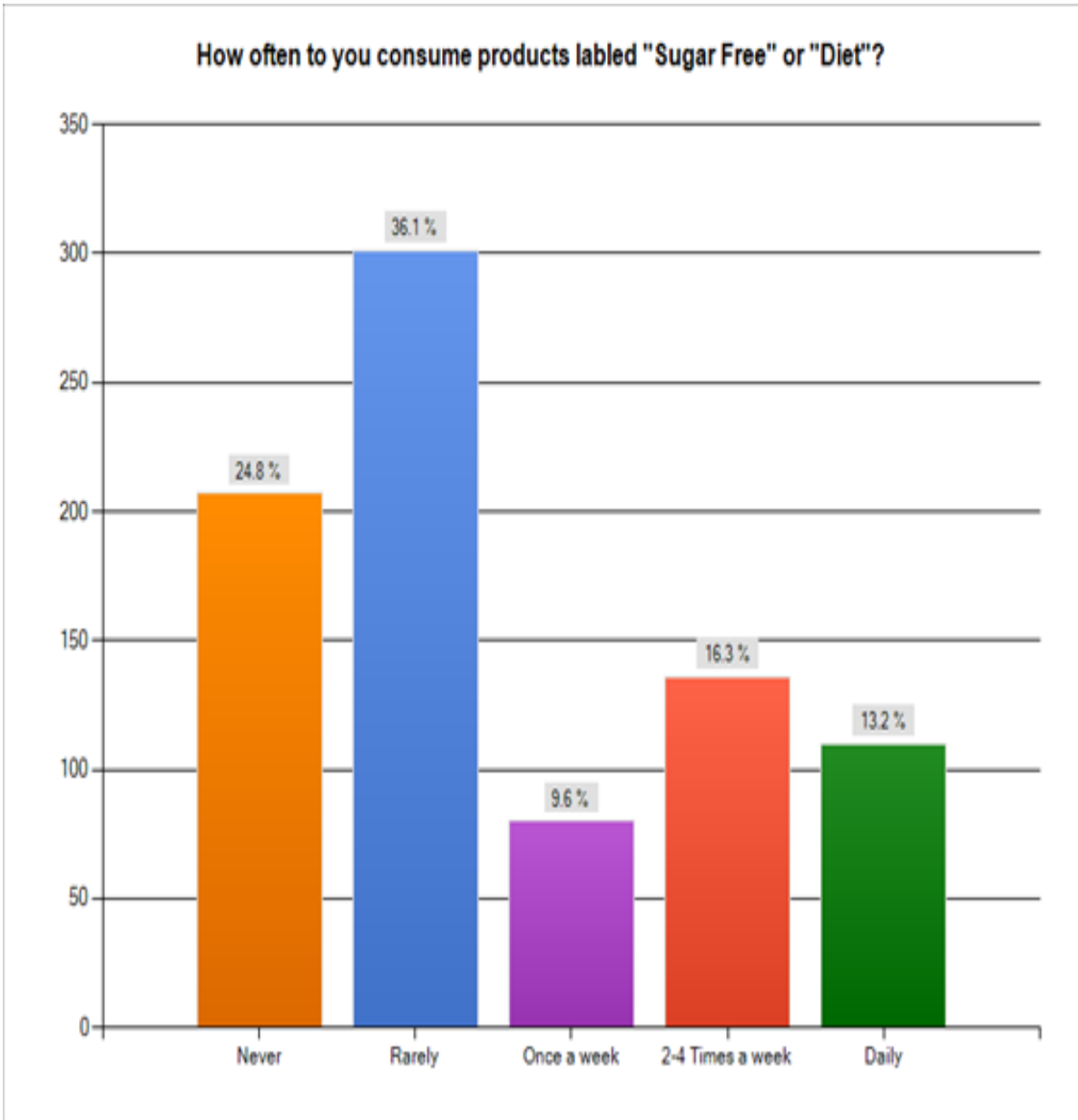


Figure 46: Survey Question #5 responses

Question #6 asked the participants how strongly they believe artificial sweeteners cause obesity. 52.7% of 830 respondents were in-between or unsure, 2.9% very strongly believed that they did, 13.3% strongly believed artificial sweeteners cause obesity, 25.4% did not believe that

artificial sweeteners cause obesity and 5.8% strongly believed that artificial sweeteners did not cause obesity. The data can be seen in figure 46:

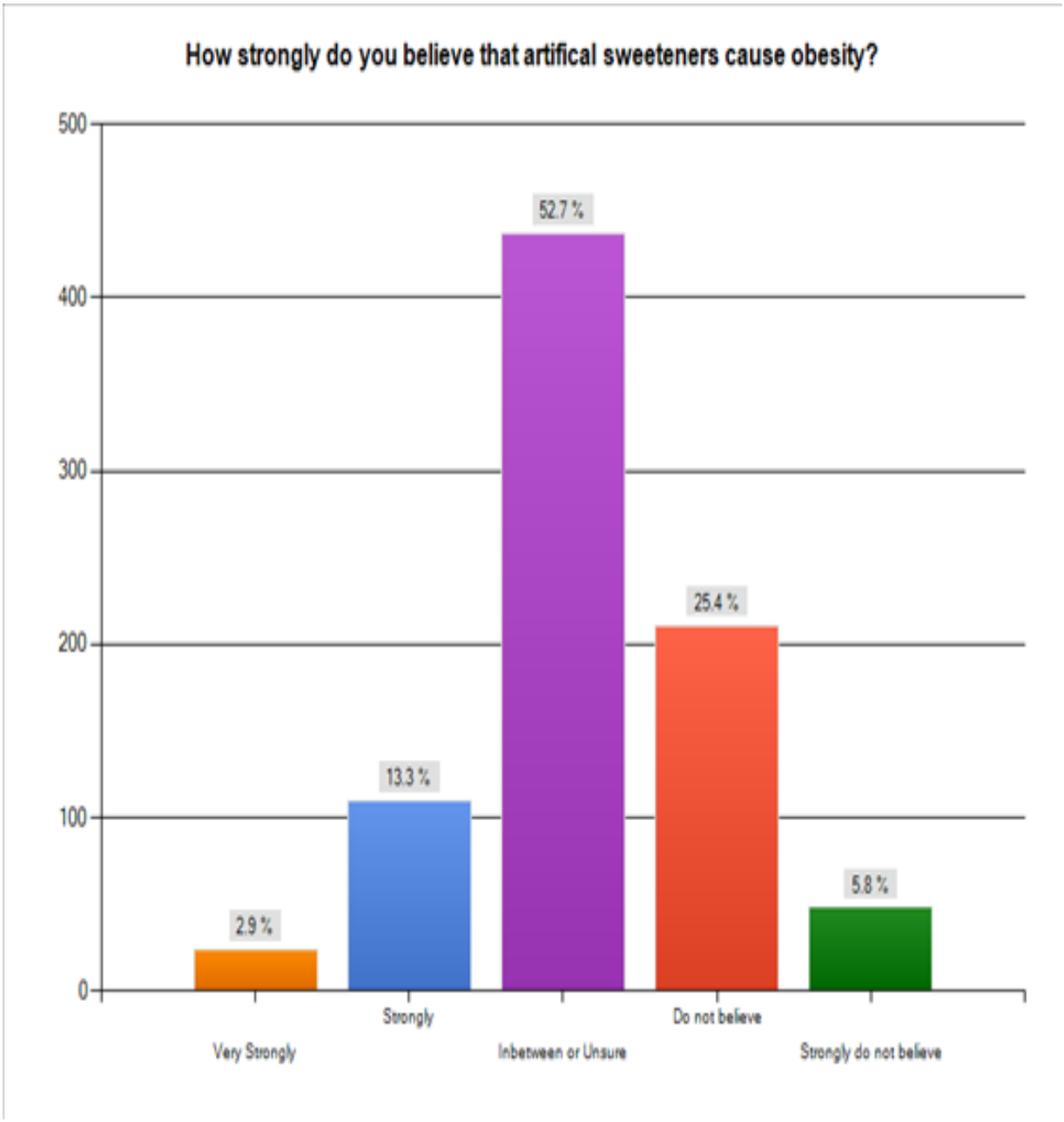


Figure 47: Survey question #6 responses

The following question asked how strongly participants believed that artificial sweeteners caused behavioral disorders. 49.8% of 830 respondents were in-between or unsure, 1.7% very strongly believed artificial sweeteners caused behavioral disorders, 6.4% strongly believed, 34.3%

strongly did not believe and 7.8% very strongly believed artificial sweeteners did not cause behavioral disorders. The data can be seen in figure 47:

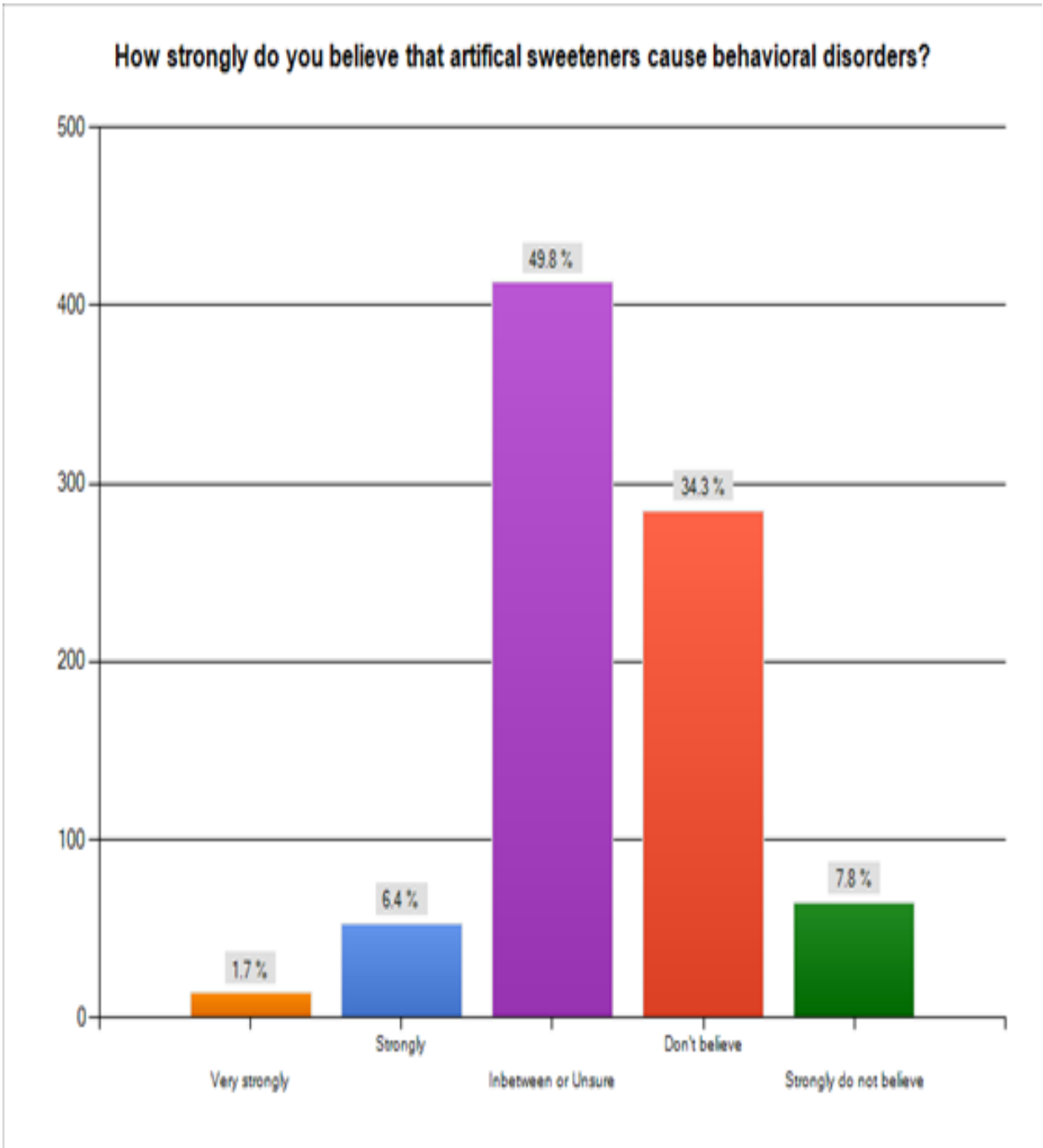


Figure 48: Survey Question #7 responses

The 8th question asked participants how strongly they believed artificial sweeteners cause cancer. Of 834 responses, 50.2% were in-between or unsure, 6.4% very strongly believed they do,

22.1% strongly believed they do, 18.2% strongly believed they do not and 3.1% very strongly believed artificial sweeteners do no cause cancer. The data can be seen in figure 48:

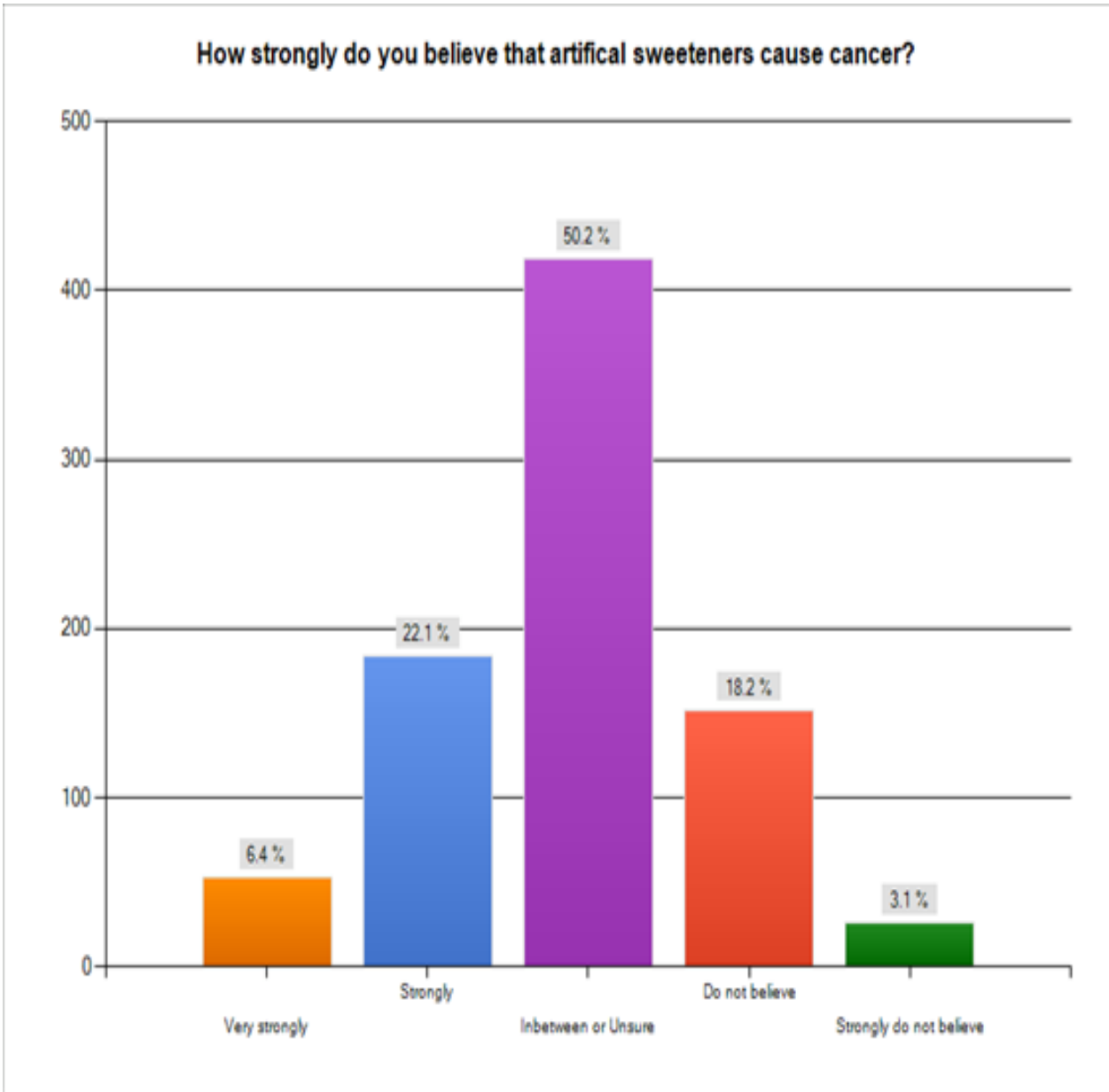


Figure 49: Survey Question #8 responses

The final question for analysis asked participants that if they found out artificial sweeteners had no adverse effects would they use artificial sweeteners more. There were 834 responses of which 34.8% would not change their opinion. 15.9% said they certainly would use them more, 22.7% said they would probably use them more, 7.4% were unsure at the time of response, 10.7%

would not use artificial sweeteners and 8.5% would certainly not use artificial sweeteners more. The data can be seen in figure 49:

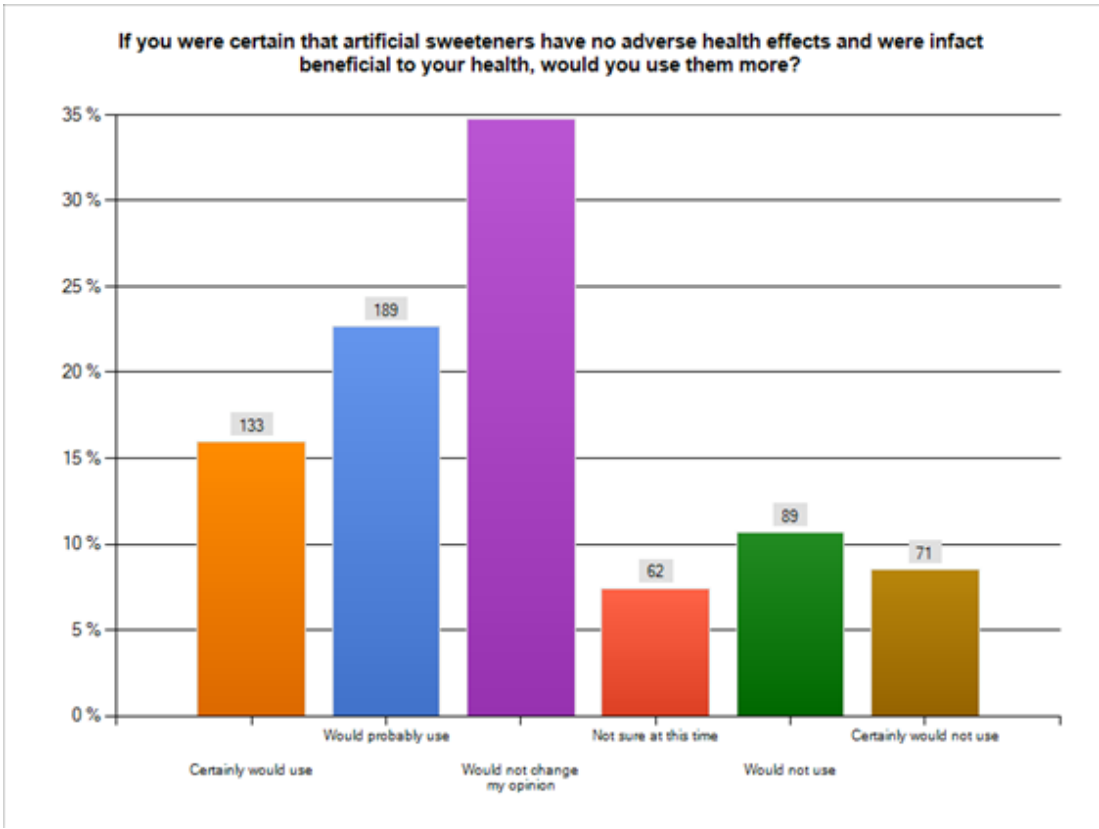


Figure 50: Survey Question #9 responses

This survey helped understand the general public opinion of artificial sweeteners and their concerns. The survey mostly addressed artificial sweeteners on their own so a follow-up experiment was performed involving artificial sweeteners in use.

7.2 Applied Artificial Sweeteners

To help understand how different sweeteners perform in use, three of the most popular artificial sweeteners were chosen to be baked into an apple pie. Apple pie was chosen due to its popularity as a dessert and high sugar concentrations (see images in Appendix A). The following

recipe from cooks.com was chosen due to its low cost to make, few ingredients and low baking time:

Ingredients:

1 (9 in.) pie shell, unbaked

1 c. sugar

1 tsp. ground cinnamon

6-8 lg. apples, McIntosh or Granny Smith

1/2 c. all-purpose flour

1/3 c. butter, softened

Cooking instructions:

Preheat oven to 375 degrees.

Mix 1/2 cup of the sugar with the cinnamon. Peel, core, and thinly slice the apples. Arrange the apples in layers in the pie shell, sprinkling with the cinnamon-sugar mixture as you layer it. Mound the apples quite high in the pie shell, as they will cook down.

In a small mixing bowl combine the flour, and remaining 1/2 cup sugar; cut in the butter until crumbly. Pat this mixture by large spoonfuls evenly over the apples, forming a crust, as you place large spoonfuls over the apples. Seal at the edges. Bake for 50-60 minutes or until golden brown.

Three pies were made with *Sweet n Low* brand sweetener (active sweetener – saccharin), *Splenda* brand sweetener (active sweetener – sucralose) and *Equal* brand sweetener (active sweetener – aspartame/dextrose blend) were taken to a project meeting and sampled by the group members as well as project advisor. Several individuals were drawn by the apple pie scent and also sampled the pies. In order to help understand how various sweeteners affected the taste of the

apple pie, a brief questionnaire was constructed asking participants to rate the sweetness of the pie on a scale of 1-10 with 10 being the sweetest, the presence of an aftertaste on a scale of 1-10 with 10 being the most noticeable after taste and a brief description of the aftertaste. An ANOVA test on the aftertaste values provided a p-value of 6.17×10^{-6} between sweetener groups signifying that the results are statistically significant. Similarly, an ANOVA test on the sweetness profile values provided a p-value of 8.2×10^{-13} signifying that the results are also, statistically significant. Table 3 shows individual responses regarding the relative degree of aftertaste in each apple pie with its respective sweetener. Figure 50 shows the same data but with each participant's response plotted against the relative scale 1-10 (1 being the lowest, 10 being the highest).

Sweetener Aftertaste Profile (1-10 scale) in Apple Pie			
Participant Number	*Sweet-n-Low*	*Equal*	*Splenda*
1	8.5	2.5	5.5
2	6.5	3.5	5.5
3	0.0	3.0	6.5
4	7.5	3.5	6.0
5	9.0	2.0	5.5
6	9.0	1.5	5.0
7	9.5	4.0	6.5
8	8.0	2.0	6.5
9	8.5	2.5	5.5
10	7.5	3.5	6.0
Average	7.40	2.80	5.85
Standard Deviation	2.75	0.82	0.53

Table 4: Apple Pie Aftertaste Results

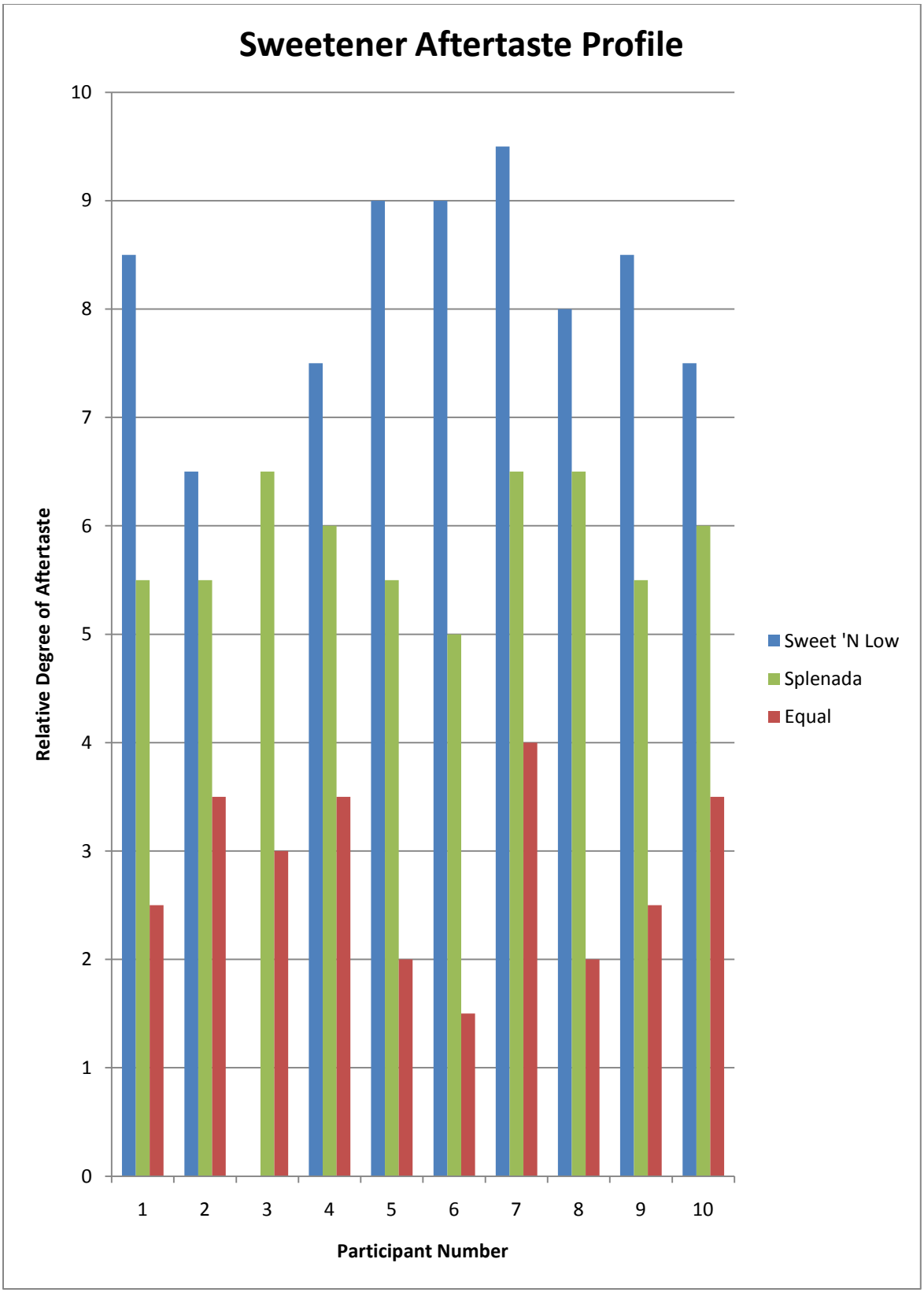


Figure 51: Sweetener Aftertaste Profile

Sweetener 'Sweetness' Profile (1-10 scale) in Apple Pie			
Participant Number	*Sweet-n-Low* Sweetness	*Equal* Sweetness	*Splenda* Sweetness
1	3.0	3.0	7.5
2	4.0	5.0	8.5
3	3.5	4.5	7.0
4	4.5	4.0	9.0
5	5.0	3.0	8.5
6	2.5	2.5	8.5
7	4.0	3.5	8.0
8	3.5	3.0	7.5
9	5.5	5.0	9.0
10	3.5	4.0	8.5
Average	3.90	3.75	8.20
Standard Deviation	0.91	0.89	0.67

Table 5: Apple Pie Sweetness Results

Figure 51 represents the data shown in table 4. Here each participant's responses are plotted along a relative scale of 1-10 rating the degree of sweetness each apple pie had (1 being the lowest, 10 being the highest). Table 5 contains each participant's description of the aftertaste.

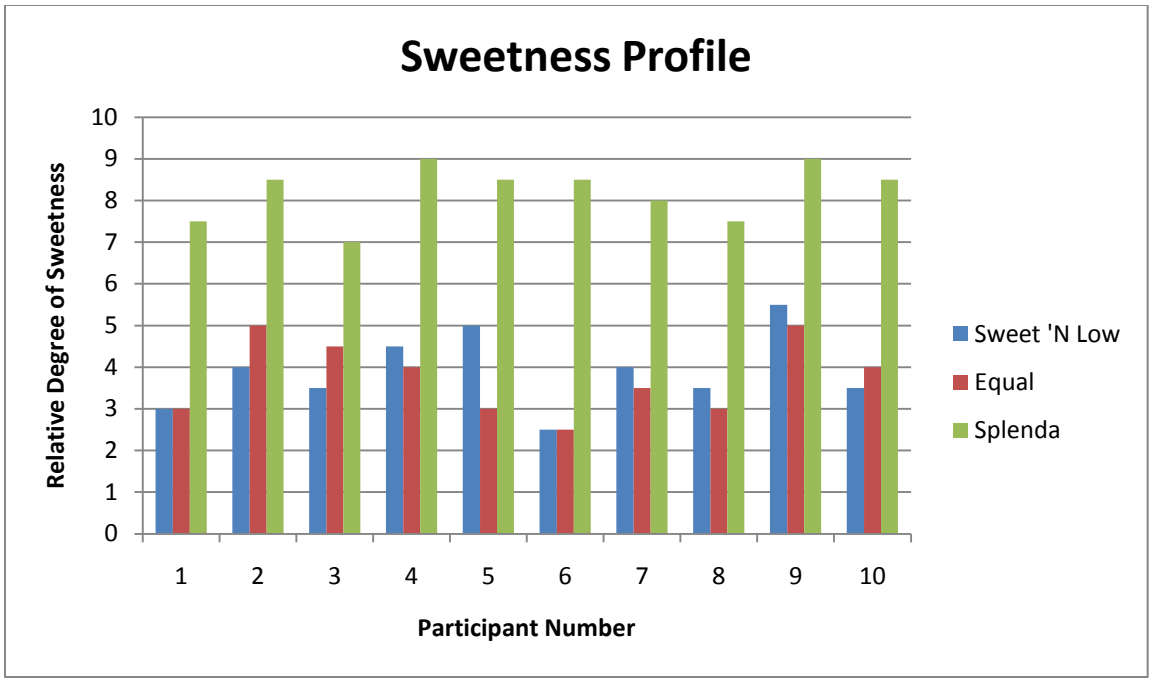


Figure 52: Sweetness Profile

Sweetener Aftertaste Description in Apple Pie			
Participant Number	*Sweet-n-Low*	*Equal*	*Splenda*
1	Bitter, very dry	Light metallic	Bitter
2	Bitter, alcoholic	Pungent	Chemical Residue
3	Metallic	Dry, light metallic	Chemical Residue
4	Metallic	Metallic	Chemical Residue
5	Bitter, alcoholic	Light metallic	Bitter
6	Metallic, dry	Very Dry	Very bitter
7	Metallic, dry, bitter	None	None
8	Bitter, dry, metallic	Light Metallic	Bitter
9	Metallic	Bitter	Chemical Residue
10	Metallic	None	Bitter

Table 6: Apple Pie Aftertaste Description

7.3 Health Practitioners' Concerns

To get a better grasp on the problem at hand, two doctors were spoken with in regard to their concerns with artificial sweeteners. The conversation took place in an informal setting at NYU Langone Medical Center with the doctors simply telling their take on artificial sweeteners followed by their concerns regarding their use. The doctors, who wish to remain unnamed, both had very different takes on the subject.

Doctor one's primary concerns laid within the fact that while artificial sweeteners are fairly well researched and studied in human subjects, each individual is different and the manner in which they will respond to a particular sweetener may be very different than another individual. Doctor one is a sports medicine doctor who has previous background in physical therapy. She brought to light the case study of US Olympic diver Justin Dumais who was experiencing a drastic decrease in energy such that he could not even shower without aid [84]. After some time, Justin went to a doctor who noticed an excessive white blood cell count then diagnosed Justin with Graves' Disease. Graves' Disease is an autoimmune disease which affects women between 5 and 10 times more often than men thereby making it an unlikely diagnosis for a young, male athlete. He went on to perform well as the US trials, perplexing doctors. Following this diagnosis and still taking his medication, he went to see a nutritionist who suggested he limit his intake of aspartame from diet sodas. He did so and a few months later stopped taking his medication, stopped consuming aspartame and has difficulty believing whether or not he truly has Graves' disease. In her words, his diagnosis was taken back and he is now a healthy individual with no signs of Graves' disease.

Her professional suggestion was to be cautious whenever consuming any kind of chemically synthesized compounds and not to consume too much, regardless of how much the recommended daily intake allows, until it is certain that there will be no unanticipated side effects.

Doctor two agreed with the suggestion of the first doctor but her primary concern was that many difficulties arise in managing the amount of sweetener consumed on a daily basis. Doctor two is an endocrinologist but has had extensive experience with diabetic patients from her residency and previous research experience. She explained that artificial sweeteners are found in countless products which many people may not expect to find them in. If an individual is adding sweeteners to their foods or beverages in addition to eating commercial products containing these sweeteners, they may find themselves approaching or exceeding the recommended daily intakes put forth by the FDA. This is frequently not the case for younger, healthy individuals but for the older generation and those afflicted with diabetes this becomes a serious concern. Similarly, the effects of various sweeteners become unpredictable beyond the FDA regulated recommended daily intake. Upon crossing that threshold, diagnosis of any problems occurring becomes difficult as sweeteners are not often easily associated with the given problems.

The essential message she wanted to bring across to concerned individuals was that they should carefully watch how much sweetener they take in and they should always leave extra space because without a doubt, everyone is consuming more sweetener than they are aware of.

8.0 Discussion

These following sections are focused on comparing the data found throughout the course of this report with existing, published data. A large amount of data was acquired through a survey, apple pie taste test and various forms of research which will be made relevant to everyday living.

8.1 Inquiry Into the General Public

In an effort to better understand what the general public knows and thinks about artificial sweeteners, a survey was produced which provided a valuable insight into consumers' preferences. This data was compared to data published in literature and it was found, in general, that the two data are very similar. Original data from the survey can be found in Appendix B.

The third question in the survey asked respondents if they used artificial sweeteners in their everyday routine. Only 24% of respondents said that they did, 10% were unsure and the remainder did not. A recent article published in the New York Times suggests that only 15% of Americans regularly consume beverages containing artificial sweeteners [76]. This published number is much closer to the survey's fourth question which asked "How often do you consume products containing artificial sweeteners or specifically add them to your food or beverages." In this question, 20.3% said they do so daily and 17.2% did so 2-4 times per week. Finally, question 5 in the survey asked "How often do you consume products labeled Sugar Free or Diet' to which only 13.2% of respondents did so daily. While these percentages found in the survey are not at exactly 15% as the NY Times article suggests, they are rather similar in their magnitudes. It is fair to say that the majority of Americans do not regularly consume artificial sweeteners which brings up the question; why is the obesity rate still going up and why is this increase so commonly attributed to artificial sweeteners while the majority of Americans are not consuming artificial sweeteners? One answer may lie in the possibility that the article does not have accurate statistics. A more plausible

explanation is that the average consumer is unaware of exactly how many everyday products contain artificial sweeteners. A simple stroll through the supermarket revealed that store-brand frozen and marinated chicken patties contained neotame, toothpaste contained Xylitol, MiracleWhip mayonnaise contained HFCS and FiberOne brand cereal contained aspartame. With so many products containing artificial sweeteners, it is unlikely that only 15% of Americans regularly consume products with artificial sweeteners in them. It is possible that the article meant only 15% of Americans specifically add sweeteners to their foods and beverages, but due to the lack of explanation it is difficult to determine for certain.

Question 9 in the survey asked participants if they were certain that artificial sweeteners have adverse health effects and were in fact beneficial to their health, would they use them more. Surprisingly 15.9% of respondents said they would certainly be willing to use them more, 22.7% would probably use them more while 34.8% would not change their opinion and 7.4% were unsure at the time of question. This suggests that the individuals are not educated well enough with regard to artificial sweeteners, their safety and use. Today's media-driven society provides an endless stream of information which is often not backed up or scientifically proven, individuals are likely to become misled or misinformed when it comes to making wise dietary choices. Of course it is not only the media to blame, manufacturers of sweeteners are often making claims about their products which can be 'too good to be true'. Frequently there is fine text which may contain valuable information with regard to proper use of the product in question which consumers do not pay any mind to. Similarly, consumers must make an effort to follow up with FDA recommendations for all products they eat or drink. The FDA must approve all products for use in edible and drinkable products therefore it is up to the consumer to make sure that the product they are using is safe for the given purpose. Certain types of sweeteners are only approved for use in beverages while others only in edible products and further products may not be approved for applications

such as baking or freezing. Not following the FDA guidelines may lead to certain undesirable health effects which could easily be avoided through careful research and proper planning.

Currently, no scientific evidence has found a direct link between the artificial sweeteners evaluated in this report and cancer. It is surprising to learn from the survey (question 8) that 6.4% of participants very strongly believe that artificial sweeteners do cause cancer, 22.1% strongly believe that they cause cancer and half of the participants (50.2%) are unsure. This can likely be attributed to popular media 'hype' which makes frequent allegations of sweeteners causing cancer when provided with incomplete or inconclusive scientific data. This is particularly well known in the aspartame controversy where a research paper found a direct link between aspartame and bladder cancer in rats (see section 6.1). What was found was that the research conducted did not translate from the animal model into humans and the amounts of aspartame given to the rats would be unrealistic for humans to consume. This led to the FDA putting a more conservative 'acceptable daily intake' value on aspartame and how much of it could be added to foods and beverages. A similar controversy is currently brewing around cyclamates which are currently being reevaluated by the FDA for approval in the US sweetener markets.

Question 7 of the survey conducted asked participants how strongly they believed that artificial sweeteners cause behavioral disorders. 49.8% of respondents said they were in-between or unsure, only 6.4% believed that they did and a mere 1.7% strongly believed that artificial sweeteners led to behavioral disorders.

One of the most debated topics surrounding artificial sweeteners is that regarding their link to obesity. Question 6 in the conducted survey asked participants how strongly they believed that artificial sweeteners cause obesity. Only 2.9% strongly believed that artificial sweeteners cause obesity, 6.4% did believe so and 49.8% were in-between or unsure. The research performed suggested that artificial sweeteners do and do not cause obesity. HFCS (high-fructose corn syrup)

undisputedly causes obesity in all genders, ages and demographics. As can be seen in section 6.2, the fructose in HFCS induces the human body to undergo lipogenesis (generation of fat). If an individual has a more than the recommended daily intake of HFCS and consumes a regular amount of carbohydrates through their normal diet, a large percentage of those carbohydrates will be converted into fat rather than be used for energy. HFCS, similarly to sucrose, does not cause a feeling of satiety (feeling of being full) which may cause an individual to consume more HFCS or other foods in excess indirectly leading to obesity. Other artificial sweeteners lead to obesity in a similar indirect manner, they cause an individual to 'lose count of their calories' which in turn leads them to consume more foods and beverages thereby increasing their caloric intake.

8.2 Artificial Sweeteners In Use

Although the apple pie experiment had a relatively small participant group in an informal setting, it helped verify existing consumer preference data. Comparing data to the information found on ConsumerReports.org where several artificial sweeteners were added to lemonade, the aftertaste descriptions closely resembled what was found in the apple pie experiment [74]. The results of the apple pie experiment showed that *Equal* tended to have the mildest aftertaste; *Splenda* had a moderate but lingering and bitter aftertaste while *Sweet 'N Low* had a very obvious artificial flavor aftertaste to it. This is, in essence, the same as the information found on Consumer Reports. Statistical analysis of the degree of aftertaste values obtained from the apple pie experiment provided a p-value of less than 0.01 which shows that there was a statistical difference among the degrees of aftertaste in the various sweetener groups.

One of the other important factors of the apple pie experiment was the degree of sweetness each pie presented. On average, the sweetness of *Splenda* was much higher than that of *Sweet 'N Low* and *Equal*. The difference between *Sweet 'N Low* and *Equal* was not very large, with *Sweet 'N*

Low being slightly sweeter, but an ANOVA test concluded that the results were statistically significant because the resulting p-value was less than 0.01 among the sweetener groups. *Splenda* is relatively 600 times as sweet as sugar while *Sweet 'N Low* is about 400 times sweeter than sugar and *Equal* is about 200 times as sweet as sugar. It is very likely that these values play a large role in the resulting sweetness of the apple pie. Considering the apples as well as the crust and toppings absorb much of the sweetener, the sweeter *Splenda* will be more concentrated in various parts of the pie leading to the higher sweetness rating.

Improvements on this experiment would certainly include expanding the test group as well as the number of sweeteners cooked with to give a better distribution of results. Similarly, other products could be tried with artificial sweeteners such as beverages, other baked goods or simply a taste test of the sweetener in its raw form. Further variations on the experiment can also involve baking the pie at different temperatures and for different durations in order to see if the time cooked or temperature plays a role in degrading the sweetener or integrating it into the apple pie.

Images of the apple pies can be seen in Appendix A.

8.3 Doctors' Advice

The advice that both interviewed doctors have given seems to be very fitting in consideration of the information analyzed throughout the course of this report. While many skeptics exist who will continue to claim that sweeteners, artificial or natural, are bad for consumption, the general trend seems to show that there is no harm in consuming sweeteners within moderation. Section 6 went in-depth regarding the health effects of sweeteners and for each section, it was generally concluded that there exists no valid scientific evidence linking the sweeteners analyzed in this report with cancer or behavioral disorders. Obesity remains a topic of debate considering HFCS undoubtedly contributes to obesity but other natural and artificial

sweeteners do not have a clear or distinct involvement in the increase of obesity. Similarly, various artificial sweeteners such as Xylitol and Sucralose may cause temporary gastrointestinal discomfort through mild gastrointestinal microflora irritation. This may cause an individual to experience a bloated feeling, diarrhea or excess gas for a short period of time. No severe gastrointestinal risks have been report though it is important to remember that everything must be considered on a case-by-case basis; certain predisposed individuals may have severe and unpredictable reactions to which the general public is not at risk for. There is no direct link between FDA approved sweeteners and frequent 'hypes' which arise with claims that artificial sweeteners cause gastrointestinal degrade, cancer or disease. It must be made clear here that when used in moderation and as according to the FDA recommended maximum daily intakes, sweeteners will not cause damage, lead to disease or be a danger to healthy individuals' gastrointestinal system.

Again, it is important to keep in mind that individual cases may vary and as can be seen from the case study presented by the first interviewed doctor. Certain individuals may be predisposed to unpleasant side effects from various sweeteners. Section 8.2 helped show how versatile and delicious sweeteners may be, making them hard to resist considering their diabetic-friendly status as well as potential dietary benefits. What is important is to make sure that consumers take the initiative to research the use and potential side effects of sweeteners prior to consuming them. Consumers must also make a conscious effort to monitor their sweetener intake and make sure that they do not consume too much sweetener. Similarly, consumers must make sure that if they are predisposed to certain reactions with sweeteners, they must monitor the products they consume to make sure they do not accidentally come into contact with something they may react poorly with.

9.0 Conclusions

Health effects related to the consumption of artificial sweeteners were analyzed through a review of scientific literature and examination of sweetener manufacturing processes. The analyses were compared to information acquired from a survey and interviews with medical professionals. An assessment of artificial sweetener aftertaste and sweetness profiles when applied to food products was also performed through an unofficial taste panel; three apple pies were baked each separately containing the artificial sweeteners, *Equal, Sweet N' Low* and *Splenda*. The sweeteners chosen to be put into the apple pies were analyzed in detail throughout the course of this report. Survey results revealed a general uncertainty and cautiousness concerning artificial sweeteners. Medical professionals shared their concerns surrounding the health issues of cancer, behavioral disorder, obesity and gastrointestinal problems commonly attributed to uncontrolled artificial sweetener consumption. Survey results and the professional concerns expressed were compared to published scientific literature. This paper concludes that sweetener consumption within FDA approved guidelines appears to be a safe way for individuals to enjoy a diet high in sweetness yet low in calories with reduced risk of detrimental health effects.

Based solely on the analysis of the chemical structures and production methods of popular sweeteners, no significant differences between natural and artificial sweeteners were found that would indicate any health concerns. It can be generally concluded that the sweeteners themselves are not composed of any harmful chemicals and are unlikely to pose a major threat to human health. However, the manufacturing and production processes that these sweeteners undergo need to be carefully regulated. As artificial sweeteners are used in thousands of common products, the safety of the public is at risk to possible health hazards that may occur as a result of loose inspections of the manufacturing process. Final products need to be thoroughly tested on a regular

basis and production methods need to be inspected and kept up to regulation standards. For example, a pilot study reported that some high-fructose corn syrup manufactured in the U.S. in 2005 contained trace amounts of mercury [15]. The mercury appeared to come from caustic soda and hydrochloric acid, two chemicals used in the manufacture of high-fructose corn syrup. It has been found that caustic soda used by HFCS has been produced in industrial chlorine chlor-alkali plants using the mercury cell Castner-Kellner process, and can contain traces of mercury. Mercury concentrations in the samples testing positive ranged from 0.012 μg/g to 0.570 μg. Of 55 major brands with high fructose corn syrup as a main ingredient, 1 in 3 tested positive for mercury. With the average U.S. citizen consuming 28.5 kg of HFCS annually, health effects are an obvious concern [15]. For the most part however, production methods are safe and are not of serious concern.

Review of many scientific journal articles on the health effects of artificial sweeteners has shown that while artificial sweeteners may not be linked to cancer, they certainly do have an effect on obesity and the microflora of the human gastrointestinal tract. Also, it has been found that while scientific studies have not yet been able to find links to behavioral disorder or brain damage caused by artificial sweeteners (especially aspartame), anecdotal evidence and case studies show that aspartame may, depending on the individual and on the amount of aspartame consumed by the individual, have adverse impact on the neurological system.

Saccharin and aspartame have been the major artificial sweeteners accused of being carcinogenic, but the studies done on these sweeteners, as explained in Section 6.1, were disputed for faulty analysis (observing two different events at an ecological level without examining individual results) or experimental procedure (feeding rats unreasonably excessive amounts of saccharin). Research shows that artificial sweeteners do, however, have an effect on obesity. Though they do not directly cause obesity (obviously because they are low in calories), consuming artificial sweeteners has been shown to impair the brain's ability to "count" calories based on the

sweetness profile of food. HFCS and sucrose (white sugar) certainly cause obesity because they both contain fructose, and fructose induces lipogenesis (the fat deposit mechanism) within the liver. Added sugar in the diet is empty calories and should be avoided by an individual who wishes to avoid obesity. Sucralose and xylitol have been shown through scientific research to have adverse effects on the microflora within the human gastrointestinal tract. While they are low caloric and are not metabolized much within the human body, do seem to have significant effects on the microflora within the gastrointestinal system. Specifically sucralose and xylitol have been proved through scientific experimentation to cause decrease in beneficial micro-organisms (sucralose) or diarrhea (xylitol). Aspartame, has been thought to cause brain damage because of one of its component molecules, phenylalanine. Phenylalanine causes brain damage and dysfunction in people who have a genetic disease (homozygous phenylketonuria) that renders them unable to metabolize phenylalanine. Aspartame's incorporation into the general public's diet raised the issue that the population would be exposed to consuming unnecessarily high doses of phenylalanine, resulting in possible brain damage even in individuals who do not have homozygous phenylketonuria. While the average person may not be able to consume excessively high amounts of aspartame—enough to cause brain damage, some individuals with a more sedentary, diet beverage-dependent lifestyle, or individuals who rely heavily on artificial sweeteners in any way may consume excess phenylalanine and experience neurological disorders.

Through the comparison of survey results with published literature, it is fair to say that the public is in need of more thorough education with regard to artificial sweeteners and their health effects. The constant media hype must be taken skeptically and concerned individuals must make an effort to learn the true facts behind sweeteners safety through valid scientific research. Similarly, the intake of sweeteners must be carefully monitored on an individual basis as was recommended by the doctors interviewed. When trying new products, consumers must be wary of any

unanticipated reactions and should always limit themselves with an extra margin for error to make sure they are not consuming sweeteners or sweetener containing products in excess.

In general, artificial sweeteners, when used in moderation are an acceptable substitute to natural sweeteners. They appear to be a healthy and pleasant way to enrich food sweetness, taste, and texture while keeping major health risks low.

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Appendicies

Appendix A1

The following images are from the sweeteners-in-use taste trial.

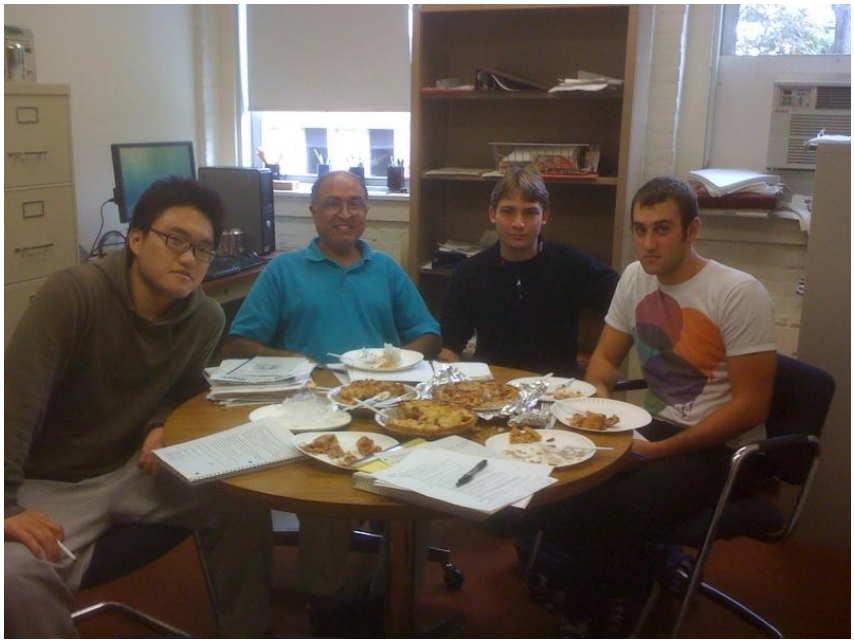

Figure 53: The IQP Group During Sweetener Taste Trial

Figure 54: Apple Pie Containing Equal

Figure 55: Apple Pie Containing Sweet N' Low

Appendix A2

Included in this appendix are all individual responses from the conducted survey. The questions were as follows:

- Q1 – (Optional) Please state you age, sex, race and occupation
- Q2 – Which artificial sweeteners are you aware of (list as many as you know)
- Q3 – Do you use artificial sweeteners in your everyday routine?
- Q4 – How often do you consume products containing artificial sweeteners or specifically add artificial sweeteners to your food or beverages?
- Q5 – How often to you consume products labeled "Sugar Free" or "Diet"?
- Q6 – How strongly do you believe that artificial sweeteners cause obesity?
- Q7 – How strongly do you believe that artificial sweeteners cause behavioral disorders?
- Q8 – How strongly do you believe that artificial sweeteners cause cancer?
- Q9 – If you were certain that artificial sweeteners have no adverse health effects and were in fact beneficial to your health, would you use them more?
- Q10 – Would you be interested in participating in a brief "taste panel" of different artificial sweeteners. If so, where would you like this taste panel to be held (Campus Center, Quad, Fountain, Wedge, etc.)?

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
18,female,student	equal,splenda,sweet n low, nutra sweet, sweet one, sunette	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	no thanks !
	splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not use	
22, female, veterinary technician	Splenda	No	Rarely	2-4 Times a week	Inbetween or Unsure		Inbetween or Unsure	Not sure at this time	
		No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Not sure at this time	
		No	Rarely	Never	Very Strongly	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
50, M, Hispanic, Software Engineer	Saccharin, Aspartame, Sucralose, xylitol and other sugar alcohols, stevia	No	Never	Never	Strongly	Inbetween or Unsure	Strongly	Not sure at this time	Hmm. Maybe.
22, Male, Caucasian, Student	Splenda, Aspertain	No	Never	Rarely	Do not believe	Inbetween or Unsure	Strongly	Would not change my opinion	campus center
26, male, caucasian, sales	sweet 'n low, equal, nutrasweet, splenda, truvia	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	No
31 year-old white female	splenda, equal, sweet 'n' low	No	Rarely	Rarely	Do not believe	Don't believe	Strongly	Would not change my opinion	no thanks!
19, female, Black, student	splenda	No	Never	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	
21, Male, White, IT Support	Splenda, Equal, Sweet-n-low	No	Never	Never	Inbetween or Unsure	Don't believe	Do not believe	Would not use	
50, F, W, staff assistant	Splenda, Equal, Sweet & Low, Sun Crystals	Yes	Daily	2-4 Times a week	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	Wedge
		No	2-4 times per week	Once a week	Very Strongly	Inbetween or Unsure	Do not believe	Would probably use	No
28, male, white, full-time student	saccharin, maltodextrin, nutrasweet, splenda	No	Once a week	Never	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would probably use	campus center
36, female, white, professor	aspartame	No	Never	Never	Inbetween or Unsure	Strongly	Very strongly	Would not change my opinion	no
44, Male, white, professor	Splenda, equal, sweet and low, nutra sweet, truvia. sugar twin	Yes	Daily	Never	Do not believe	Don't believe	Strongly	Would not	yes

								use	
36, F, W, Associate Director of Athletics	Equal, Splenda, Nutraweet, Sweet N' Low,	Yes	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	
36, Male, White, College Athletics	Splenda, Equal, Sweet and Lo	Yes	Daily	2-4 Times a week	Do not believe	Don't believe	Do not believe	Would probably use	Yes
21, Male, Student	Splenda	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Sure, Campus Center
56, M, White, Graduate Student	Nutra Sweet, Splenda,	No	Rarely	Rarely	Do not believe	Don't believe	Do not believe	Would probably use	I have mobility issues, so I would rather not.
38 yr. old white female - in marketing communications	aspertame, saccharin, splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	no
19, Male, White, Student	High fructose corn syrup	Yes	Daily	Never	Do not believe	Don't believe	Strongly	Certainly would not use	I'm sick and wouldn't be able to taste, so no thanks.
	Splenda	Yes	2-4 times per week	Once a week	Do not believe	Don't believe	Do not believe	Certainly would use	Campus Center
21, female, asian, student	aspartame, sucralose	No	Rarely	Rarely	Do not believe	Don't believe	Very strongly	Certainly would not use	Yes, Campus Center
	splenda, equal, saccarin	Yes	Daily	Daily	Do not believe	Don't believe	Do not believe	Certainly would use	
18, female, white, student	HFCS, Sweet n Low	Yes	2-4 times per week	Never	Inbetween or Unsure	Strongly	Strongly	Would probably use	
19, m, caucasian, student	splenda, sweet and low	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Campus Center
	apertame, splenda	No	Once a week	Never	Strongly	Inbetween or Unsure	Strongly	Would not change my opinion	Campus Center
18, Male, Caucasian, Student	Splenda, Equal	No	2-4 times per week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	No thank you.
19, female, student	sweet and low, splenda	No	Rarely	Rarely	Strongly	Strongly	Very strongly	Not sure at this time	fountain
19, male, white, student	Sweet & Low, Equal, Splenda, Asperatame	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would probably use	CC
	splenda, sweet and low	Yes	Daily	Daily	Inbetween or	Inbetween or	Inbetween or	Certainly	no

					Unsure	Unsure	Unsure	would use	
30, male, caucasian, engineer	splenda, sweet and low, aspartame, sucralose	Yes	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Strongly	Would not change my opinion	
23, M, WHITE, Environmental Engineer	Aspartame, Sweet N' Low, Stevia, Splenda	Yes	Daily	Daily	Do not believe	Inbetween or Unsure	Strongly do not believe	Would not change my opinion	no
22, M, Caucasian, Student	diet soday sweeteners, equal, sweet and low	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	no thanks
25, F, Library Assistant	Nutrasweet, Domino, Splenda, Equal	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not use	Campus Center-I think it gets the most foot traffic
	Aspartame, Xilitol, Splenda	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	yes- CC
23, F, white, Environmental Engineer	splenda, sweet and low, equal	No	2-4 times per week	Daily	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	Would but I'm part of the distance learning program and am not on campus
25, M, White, Grad-student	equal, sweet-n-low	No	Never	Never	Do not believe	Don't believe	Inbetween or Unsure	Certainly would not use	No
27, f, caucasian, student	sweet n low, splenda, truvia, stevia,	Yes	Daily	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	campus center
49, F, White	Sweet N Low, Splenda	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	
26, M, White, Engineer	Splenda, Sweet and Low,	No	Once a week	Rarely	Strongly	Strongly	Inbetween or Unsure	Certainly would use	No
20,Female, White	Splenda,Sweet'N Low, Equal,	No	Never	Rarely	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Would not change my opinion	Campus Center
29, M, programmer	splenda, nutrasweet, equal	No	Rarely	Never	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would probably use	Yes. Anywhere is fine.
22, woman, half white -half hispanic, full time BS Civil Engineering	aspartame, sucralose, sucrose, stevia leaf	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	No
37 Female white Administrative assistant	sweet and low, splenda	No	Rarely	2-4 Times a week	Do not believe	Don't believe	Do not believe	Would probably use	Campus Center
18 make white student	sweet and low, splenda	No	Once a week	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my	no

								opinion	
19, F, American Indian, Student	Sweet n Low, Equal, Splenda	No	Once a week	2-4 Times a week	Do not believe	Don't believe	Do not believe	Would not change my opinion	Yes, Campus Center
		No	Rarely	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	
Female, 21, student	Aspartame, Saccharine, Stevia	Yes	Daily	Daily	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	Fountain
		I'm not sure	2-4 times per week	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Certainly would use	Campus center
22, female, white, student	sweet n low, splenda, equal	No	2-4 times per week	Once a week	Inbetween or Unsure	Don't believe	Strongly	Would not use	no
18,female.student	splenda	I'm not sure	2-4 times per week	Rarely	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would probably use	
20, male, white, student	equal, sweet n low, spleda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	sure, campus center
		I'm not sure	Daily	2-4 Times a week	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
19, male, caucasion, student	none	No	Daily	Never	Do not believe	Don't believe	Do not believe	Would probably use	QUAD!!!!
21, Female, White, Student	Sweet and Lo	No	Never	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Sure, Campus Center
20, M, W, Student	Splenda, Sweetnlow	Yes	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	
19, F, White, Student	splenda, anything that comes in a package	I'm not sure	Once a week	Rarely	Strongly	Strongly	Inbetween or Unsure	Would not change my opinion	Probably not
20, Female, Caucasian, Student/Part-time Sales Associate	Splenda, Stevia, Sweet&Low, Equal	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center/Fountain
18, female, native american, student	aspertame, neotame	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Not sure at this time	
		I'm not sur	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would	Yes! Fountain, but would

		e						use	come anywhere
	Splenda, Sweet n' Low, Equal, Nutrasweet	No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Do not believe	Certainly would not use	
23, Male, White-caucasian, Student/Full-time engineer	Aspartame, sac(c)harin (sp?), sucralose	No	Never	Daily	Very Strongly	Strongly	Strongly	Certainly would not use	CC
45, F, engineer	aspartame, sucralose		Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Certainly would use	
50,female,native american,clergy	aspartame,sucralose,sacharinne	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	quad
19, M, caucasian, student	aspartame	No	2-4 times per week	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	
21, Male, White, Student	aspertane, guara	I'm not sure	Daily	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	no thanks
21, male, white, student	Sweet and Low, Splenda	No	Rarely	Never	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not use	
43, m, w, manager	aspartame/NutraSweet, saccharin/Sweet & Low, Splenda,	Yes	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Do not believe	Would not change my opinion	no
26 Male Caucasian Teacher	Saccharin, Aspartame, Sucralose, Stevia	Yes	Daily	2-4 Times a week	Strongly do not believe	Strongly do not believe	Strongly do not believe	Certainly would use	No.
19 year old male computer science student	splenda, sweet n low, equal	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	No thanks :P
		No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	
20, Female, Caucasian, Student	Sweet 'n Low, Splenda	Yes	2-4 times per week	2-4 Times a week	Strongly do not believe	Inbetween or Unsure	Do not believe	Would not change my opinion	Campus Center
	Splenda, Equal	No	Daily	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	Yes, Campus Center
19, female, white, student	splenda, sweet'N low	No	Once a week	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	yes, campus center
68 F caucasian librarian	equal stevia aspertame	No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Strongly	Not sure at this time	Campus center
18, male, caucasion, student, restaurant host, welder	splenda	No	Rarely	Rarely	Inbetween or	Inbetween or	Inbetween or	Would proba	CC

					Unsure	Unsure	Unsure	bly use	
22, male, white, student	aspartame	No	Rarely	Never	Do not believe	Don't believe	Strongly	Would not change my opinion	Yes
27 M Engineer	Splenda, Aspartame	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	No Thanks
31, F, white, engineer	steevia, aspartame, splenda, equal, sweetnlow	No	Daily	Daily	Do not believe	Don't believe	Do not believe	Would probably use	
	sweet and low, equal	Yes	2-4 times per week	2-4 Times a week	Do not believe	Inbetween or Unsure	Do not believe	Would not change my opinion	
20, male, white, student	Splenda, Sweat and Low, equal	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Very strongly	Would not change my opinion	Campus Center
age:19, sex:male, race:caucasian, occupation: undergrad student		No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	yes, fountain
21, yes please, student	fake sugar	No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	hell yes
22, M, white, student	aspartame, splenda	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Strongly	Would not use	No
44,f,w,staff	sweet n low and splenda	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	campus center
22, M, White, Student	Splenda, Sweet n Low	No	Rarely	Never	Do not believe	Don't believe	Do not believe	Would not change my opinion	No
21, F, Mixed, Student	Equal	No	Never	Never	Do not believe	Don't believe	Do not believe	Certainly would not use	Would not be interested
18, Male, White, Student	Equal, Sweet'N Low, NutraSweet, Splenda,	No	Rarely	Never	Inbetween or Unsure	Very strongly	Very strongly	Would not change my opinion	Wedge
35, F, Caucasian, Librarian	nutrasweet, sweet and low, splenda, saccharine	No	Once a week	Once a week	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	Campus Center or Fountain
42, F, white and health systems engineer	aspartame, saccharin, sucralose	No	Never	Never	Strongly	Strongly	Very strongly	Not sure at this time	Anywhere is fine
19, Female, White	Splenda, Equal, Sweet n Low	No	Never	Never	Strongly	Inbetween or Unsure	Strongly	Would probably use	
21, male, european, undergrad	splenda, sweet n low	No	Rarely	Never	Do not believe	Don't believe	Do not believe	Not sure at	Not particularly

								this time	
54,female,white,administrator	aspartame	No	Daily	Daily	Do not believe	Strongly do not believe	Strongly do not believe	Would not change my opinion	
18, Female, White, Student	Splenda, Sweet n Low	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	Wedge
20 male caucasian student	sucrose dextrose nutrasweet	Yes	2-4 times per week	2-4 Times a week	Strongly do not believe	Strongly do not believe	Strongly do not believe	Certainly would use	Campus Center
17, Male, White, Student	Sweet 'n Low, Splenda	No	Once a week	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would use	Wedge
29, Female	Equal, Splenda, Sweet'n'low, Stevia	Yes	Daily	2-4 Times a week	Inbetween or Unsure	Don't believe	Do not believe	Would probably use	Yes, Campus Center/Fountain
35. Female. White. Administrator	Asparatame, Sacharine, Nutrasweet, splenda	No	Daily	Daily	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not use	
53, female, caucasion, Customer Services Coord.	nutrasweet, sweet & low, equal, splenda, truvia	Yes	2-4 times per week	2-4 Times a week	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would probably use	no thank you
Female, age 47, white, admin assistant	sweet/low, splenda, equal	No	2-4 times per week	2-4 Times a week	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center
19, F, white, student	splenda	No	Once a week	Rarely	Strongly	Don't believe	Very strongly	Would not change my opinion	
19, Male, Asian, Student	Splenda	No	Once a week	Once a week	Inbetween or Unsure	Don't believe	Do not believe	Certainly would use	Yes and in the Campus Center
58, female, faculty	Splenda, Equal, Sweet N Low	No	Never	Never	Do not believe	Don't believe	Do not believe	Would not use	
56, f, caucasian, librarian	sweet & low, equal, sweet	No	Once a week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	
19, female, caucasian, student	splenda, aspartame	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Very strongly	Certainly would not use	no
27, F, caucasin, athletic trainer	equal, splenda, sweet n low	No	2-4 times per week	Once a week	Inbetween or Unsure	Don't believe	Strongly	Not sure at this time	no
21, Male, Caucasian, Student	Diet Soda Stuff, Aspartame, Splenda	Yes	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	
	Sweet n Low and Splenda	I'm not sure	Daily	Rarely	Do not believe	Don't believe	Do not believe	Would not change my opinion	Yes and Campus Center

18, male, student	splenda, equal	No	Once a week	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would probably use	yes, campus center
	aspartame, sucralose, saccharine	No	Never	Never	Do not believe	Don't believe	Inbetween or Unsure	Would not use	No
39, M, White, atheltic trainer	sweet and low, splenda	I'm not sure	Never	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	yes
18 Male White Student	Sweet n Low, Splenda	No	Never	Rarely	Strongly	Inbetween or Unsure	Strongly	Would not use	Nope =*
61, white, professor, male	about 5- use mostly splenda	Yes	Daily	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Not sure at this time	No- at my age I am more worried about wieght issues.
36, Female, Caucasion, Higher Ed Administrator	splenda, equal,	No	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Very strongly	Certainly would use	Sure. Anywhere on campus.
	splenda, equal, sweetnlow, stevia, sugar	No	2-4 times per week	Rarely	Do not believe	Don't believe	Do not believe	Not sure at this time	yes
22,male,white,student	equal,sweet n low, splenda	No	Rarely	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	no
19, female, caucasian, student/lifeguard		I'm not sure	Daily	Daily	Strongly	Strongly	Strongly	Would probably use	sure. the wedge.
29, Male, Middle East, Defense industry (Engineer/Manager)	Stevia, Sucralose, Aspertame, Saccharin	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	No. I am a distance student and cannot come to campus.
		No	2-4 times per week	2-4 Times a week	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
29, female, student	splenda, sweet'n low?, there are more, don't remember names...	No	Never	Never	Do not believe	Don't believe	Inbetween or Unsure	Would not use	no
18F, white, student	Splenda	No	Never	Rarely	Inbetween or Unsure	Don't believe	Do not believe	Would probably use	no
19, Male, White, Student	Aspartame, Splenda	No	Rarely	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Not interested (in my experience, they all taste bad...).
22, M, Caucasian, Fire Protection Engineer	Ingredient: Aspartame, Sacharrin, Sucralose; Consumer Products: Equal, Splenda, Sweet n Low	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would not use	
20,female, Chinese, student	splenda, things in diet soft drinks, any other sugar substitute	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would not use	no
46, female, causasian, executive assistant	equal, sweet n low	No	Never	Never	Very Strongl	Inbetween or	Inbetween or	Would not	No thank you. I

					y	Unsure	Unsure	change my opinion	dislike the after taste.
27, Female, White, Engineer	Sweet & Low, Splenda	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would not use	
		No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	no
30, female, fundraiser	sweet n low, splenda, pure sugar?	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	Campus Center
22, Male, White, Student	Sweet and Low, Equal, Splenda	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	No
	splenda, aspartamine, saccarin	Yes	Daily	Daily		Strongly do not believe	Strongly do not believe	Would not change my opinion	campus center
	Splenda, Sweet n Low	I'm not sure	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center
Hispanic, male, 20, student	Splenda, nutrasweet	I'm not sure	2-4 times per week		Inbetween or Unsure	Inbetween or Unsure	Do not believe	Would probably use	No
22, male, BSMS student (Math major)	aspertame	No	Never	Never	Strongly	Strongly	Strongly	Would probably use	No way.
	Sweet n Low, Equal, Splenda	No	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	
	Splenta, Equal	No	2-4 times per week	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	
18 Female, White, Swim Instructor/ student	Splenda, Sweet and Low, Equal	No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Strongly	Certainly would not use	Quad
21; F; white; student	aspartame	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not use	No
20, female, white, student & cell bio researcher	sucralose, aspartame, saccharin	Yes	Daily	Daily	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	no
18, Male, caucasian, student	splenda	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	no
21, female, white, student		I'm not sure	Once a week	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would probably use	
41, Female, Caucasian, Admin. Assistant	Sweet-n-Low, Equal, Twin, Stevia, Splenda, Nutrasweet	Yes	2-4 times per	2-4 Times a	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Certainly would	Yes. Campus Center. I'm

			week	week				use	diabetic so I have to use them most of the time.
18, female, caucasian, bartender	Splenda, Truvia, Sweet&Low	Yes	Daily	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	Campus Center, 1st floor.
62-F-Caucasian-Administrative Assistant	nutra-sweet, saccharin, equal, splenda	Yes	Daily	Daily	Do not believe	Don't believe	Do not believe	Would not change my opinion	
21, Male, Caucasian, Student	Pretty much just Nutrisweet, and splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	No thank you
18, Female, White, Student	Spenlda, Sweet N Low	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	Wedge
	splenda	I'm not sure	Daily	Rarely	Strongly	Inbetween or Unsure	Strongly	Would not change my opinion	
19, male, white, unemployed		No	Rarely	Rarely	Do not believe	Don't believe	Do not believe	Would not change my opinion	No. You forgot a question mark
19, female, human, student	splenda? I don't know others by name.	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	no - artificial sweeteners give me headaches
	Splenda	No	2-4 times per week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Would not change my opinion	
21, female, white, student	Sweet 'n' Low, can't think of others at the moment	No	Rarely	Once a week	Strongly	Strongly	Strongly	Certainly would use	no
19, female, caucasian, student	aspartame, sorbitol, splenda, (I usually read a list of ingredients and can recognize them, I can't think of them off the top of my head)	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	Sure, it'd be interesting to see if there is one I don't find disgusting. Campus Center is best
	aspartame, sucralose	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
21, Male, Caucasian, Cook/Track and Field Coach	Splenda, others I can't put my finger on	No	Never	Rarely	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would probably use	I could certainly do that, and I would not care where.
28, female	sweet&low	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Would not use	

32, M, white, professor	saccarin, splenda	No	Rarely	Rarely		Inbetween or Unsure	Strongly	Would probably use	No
19, male, caucasian, student	aspartame, sucralose	Yes	2-4 times per week	2-4 Times a week	Strongly do not believe	Don't believe	Do not believe	Certainly would use	
47 female white teacher	nutrasweet	No	Never	Never	Do not believe	Inbetween or Unsure	Very strongly	Would probably use	
61, Male, White, Health Physicist	Aspartame, Sacharin, Sucralose	No	Never	Rarely	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not use	No
18, male,	splenda	Yes	Daily	Daily	Inbetween or Unsure	Don't believe	Strongly	Would not change my opinion	quad
55 male white	aspertain	No	Rarely	Rarely	Strongly	Strongly	Strongly	Would probably use	no
	Aspartame, Sacharin, Sucralose	No	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Do not believe	Certainly would use	CC
		No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would probably use	
	Splenda, Equal, Sweetnlow	No	Rarely	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	Campus Center
		No	Rarely	Once a week	Strongly	Don't believe	Inbetween or Unsure	Would probably use	
	Splenda, Sweet & Low, Equal	Yes	Daily	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Certainly would use	Campus Center or Fountain
18, female, caucasian, student	Not aware of specific names but I know they are in a lot of food products.	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	
49 female caucas professor	nutrasweet equal	No	Never	Never	Strongly	Inbetween or Unsure	Strongly	Not sure at this time	no- they are not good for you!
18, female, indian, student	splenda and aspartame	Yes	Daily	Once a week	Inbetween or Unsure	Strongly	Strongly	Would not change my opinion	wedge, outside of daka
18, male, student		I'm not sure	2-4 times per week	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	
31,male,white,student	equal,splenda,sweet and low,	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	campus center
		No	Never	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Would not chang	

								e my opinion	
22, male, white, engineer	aspertame, succrose	Yes	Never	Daily	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	No
22, male, white, education	Sweet & Low	No	Once a week	Rarely	Strongly	Strongly	Inbetween or Unsure	Would not use	Campus Center
		No	Rarely	Rarely	Inbetween or Unsure	Very strongly	Very strongly	Would not use	
18 years, female, caucasian, student	truvia, splenda, sweet n low, equal	No	Rarely	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	yes, campus center
		Yes	Daily	Daily	Do not believe	Don't believe	Do not believe	Certainly would use	
18, female, white, student	Splenda, Sweet n Low	No	Once a week	Once a week	Do not believe	Strongly do not believe	Do not believe	Would not change my opinion	No thanks
20, Female, Hispanic, Student	Sweet and low, estevia, splenda, equal	No	Rarely	2-4 Times a week	Inbetween or Unsure	Don't believe	Strongly	Would not change my opinion	maybe, fountain.
81,male,Caucasian,Retired Professor	Sucaryl, saccharin, Equal	Yes	Daily	Daily		Strongly	Do not believe	Certainly would use	No
47, F, white	nutrasweet, equal, sweet and low, splenda	Yes	2-4 times per week	Once a week	Do not believe	Inbetween or Unsure	Strongly	Would probably use	
21, male, white, student	aspartame, splenda	Yes	Daily	2-4 Times a week	Strongly do not believe	Strongly do not believe	Strongly do not believe	Would not change my opinion	no
18, female, white, student	aspartame, dextrose, saccharin, sucralose	No	Once a week	Once a week	Strongly	Strongly	Very strongly	Would probably use	no thanks
19, M, Asian, Student	Splenda	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Do not believe	Would probably use	Nope
24, M, W, student	sweet n lo, nutrasweet, aspertame, sucralose, high fructose corn syrup	No	Rarely	Never	Strongly	Inbetween or Unsure	Strongly	Would not change my opinion	
20, male, white, student	corn syrup, hydrogenated corn syrup, corn starch	Yes	2-4 times per week	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would probably use	
21,F,caucasian,student/Mech Eng/pizza delivery driver		No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Goat's Head, CC or Wedge
21, male, white, student	Sucralose, Aspartame, Saccharin	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would	campus center

								not use	
19, male, white, student	splenda,	No	Rarely	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	campus center
	None	No	Never	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	No
20, Female, Student	sweet and low, splenda	No	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Yes, Campus Center
46, Female, white, Administrator	Equal, Nutrasweet, Splenda, Truvia	Yes	Daily	Daily	Strongly	Don't believe	Do not believe		No
42, Caucasian, White	Aspertaine, Sweet and Low, Nutrasweet	No	Once a week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	No
		No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	
	sucralose	Yes	Once a week	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	
		I'm not sure	Daily	Rarely	Inbetween or Unsure	Strongly	Inbetween or Unsure	Would not change my opinion	Campus Center
18, Student	splenda, equal, sweet n' low	No	Once a week	Once a week	Strongly	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	no thankyou
30 years, Female, White, Executive Assistant	Splenda, Equal, Stevia, Sweet 'n' Low, Sucralose, Aspartame	No	Never	Rarely	Inbetween or Unsure	Strongly	Strongly	Would not use	not interested in participating
37, Female, White		Yes	Daily	Daily	Do not believe	Don't believe	Do not believe	Would not change my opinion	Campus Center
22, Female, White	aspertame	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	No
white female age 42 high school college counselor	Equal, Sweet-N-Low, Splenda	Yes	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	
57, female, caucasian higher education	sweet & low, sprevia, splenda,	No	2-4 times per week	Rarely	Inbetween or Unsure	Strongly do not believe	Do not believe	Would not change my opinion	Campus Center
24, male, caucasian, student	aspritane, sweet-n-low, splenda	No	Once a week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
18, female, white	splenda, sweet-n-low	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Strongly do not believe	Inbetween or Unsure	Would not change my opinio	No

								n	
	splenda, sweet n low	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	no
	Aspartame, sucralose, saccharin	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	
20, M, White, Student	Aspartame, Acesulfame-K, Saccharin, Sucralose, Alitame, Cyclamate, lead acetate,dulcin, glucin, neohesperidin dihydrochalcone, neotame, P-4000	Yes	Daily	Rarely	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Certainly would use	campus center
18, female, caucasian, student	sweet and low, splenda	I'm not sure	Daily	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	No
Female, caucasion, Admin. Assistant	Splenda, Nutra-Sweet, Sweet n' Low	Yes	Daily	Daily		Don't believe	Inbetween or Unsure	Would not change my opinion	Yes
31, F, caucasion	Splenda, Aspartame, Stevia, Sweet 'n Low	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Strongly	Not sure at this time	No thank you.
19, female, student	sweet n low, splenda, equal	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Certainly would use	yes
32,m,c,student	splenda, sweet and low,	Yes	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	quad
21, Female, White, Student	Splenda, Sweet-n-Low, Equal	Yes	Daily	2-4 Times a week	Strongly do not believe	Strongly do not believe	Inbetween or Unsure	Certainly would use	No
23, M, white, student	splenda, high fructose corn syrup	I'm not sure	Daily	Rarely	Strongly	Inbetween or Unsure	Strongly	Not sure at this time	no thank you, but I recommend the campus center
	Splenda, Sweet and Low, Equal, corn syrup?	No	Once a week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
45, female, Events Coordinator	Sweet & Low, equal, spleder	Yes	Daily	Rarely	Do not believe	Don't believe	Do not believe	Would probably use	I don't so ~ Best of luck
60, M, cauc, prof	aspartame, saccharin, sucralose	No	Once a week	Never	Do not believe	Don't believe	Do not believe	Would not change my opinion	sure
	nutrasweet	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Not sure at this time	
21, female, caucasian, student	aspartame	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would probably use	no thanks.
		No	Rarely	Never	Inbetween or	Inbetween or	Inbetween or	Would not	No

					Unsure	Unsure	Unsure	use	
41, female, white, adminstrative assistant	equal, sweet 'n low	Yes	Daily	Daily	Strongly do not believe	Strongly do not believe	Strongly do not believe	Certainly would use	No, by the way brief is spelt incorrectly
18, Female, White, Student	the majority of commonly used sweeteners, I did a paper on them	No	Rarely	Once a week	Strongly	Inbetween or Unsure	Strongly	Not sure at this time	
	splenda, sweet and low, equal, nutrasweet	I'm not sure	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	fountain
49,F,White, Manager	splenda, nutrisweet, Sweet n Low, truvia	Yes	Daily	Daily		Don't believe	Inbetween or Unsure	Certainly would use	campus center
21, male, white, student	sweet&low	No	Rarely	Never	Inbetween or Unsure	Don't believe	Strongly	Would not change my opinion	sure, campus center
49, female white , secretary	splenda	Yes	Daily	2-4 Times a week	Do not believe	Don't believe		Would not change my opinion	campus center
36, f, caucasion, admin assistant	splenda, sweet & low, equal, stevia	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	campus center
21, Male, white, student	aspartane	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	No
55, male, writer	saccharine, aspartame, sucralose	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	
34, Female, causasian, administration	Splenda, Equal, Sweet n Low, Truvia, Stevia	Yes	Daily	Daily	Strongly do not believe	Strongly do not believe	Inbetween or Unsure	Certainly would use	
47, female, white, assistant		No	Never	Rarely	Very Strongly	Very strongly	Very strongly	Certainly would not use	
52, Female, Caucasion, Admin. Asst.	Splenda, Sweet n Low,	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	No
26, Female, White, Analyst	Sweet & Low, Splenda,	No	Daily	Daily	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	
20, female, white, student	splenda	I'm not sure	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Would not change my opinion	no
	Nutrasweet	No	Rarely	Never	Do not believe	Don't believe	Do not believe	Not sure at this time	no

	sacharin, aspertaime	I'm not sure	Daily	Daily		Inbetween or Unsure		Would not change my opinion	
51, male, white, professor	aspertame, saccharine	No	Once a week	Once a week	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	
30-female-caucasian-admissions	nutrasweet sweet-n-low aspartame saccharine	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	no thanks
F, white, Office Coordinator	Splenda, Equal, Sweet'N Low, Stevia, NutraSweet	No	Once a week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	no
		No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	No. sugar free candy upsets my stomach.
47, female, white , administrative assistant	saccharin, Nutrasweet (?), Splenda, aspartame, sorbitol	No	Rarely	2-4 Times a week	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
53, female, Caucasian, administrative assistant	aspertame, saccharin, Equal, Sweet 'n' Low, Splenda	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would use	no, thank you
26, Female, Caucasian	Sweet and Low, Splenda, Generic Brands	No	Once a week	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	Sure - campus center
20, Female, Amerasian, Student	Splenda, Nutrasweet, that all natural one...	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Strongly	Would not change my opinion	No, thank-you.
37, f, white	blue, pink, yellow packets	No	Never	Rarely	Inbetween or Unsure	Very strongly	Strongly	Not sure at this time	no
24,M,Black,Student	fructose, splenda	No	2-4 times per week	Once a week	Strongly do not believe	Strongly do not believe	Inbetween or Unsure	Would probably use	Campus Center
24,m,grad student	splenda, aspertane, sweet&low	Yes	Daily	Daily	Do not believe	Don't believe	Do not believe	Would not change my opinion	no
54, female, admin.	sweet n' low, splenda	Yes	Once a week	Daily	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	campus center
	saccharin, aspertame	No	Rarely	Rarely	Strongly	Strongly	Inbetween or Unsure	Would not change my opinion	no
39, Caucasian	Splenda, Sweet-n-Low, Steva	No	2-4 time	2-4 Tim	Strongly	Don't believe	Do not believe	Would not	

			s per week	es a week				change my opinion	
25, male, white, accountant	equal, sweet and low, aspartame	Yes	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	No, I'm in the online program
20, Female, Student		No	Rarely	Never	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not use	
30, Female, Caucasion, Accountant	splenda, sweet & Low, equal	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Certainly would use	Campus Center
18, male, white, student	sweet-n-low, splenda,	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	no
50 white female	Splenda, Equal, Sweet N Low, Truvia	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	No
44, male, white, scientist	aspertame, saccharine, sucralose	No	Never	Never	Do not believe	Don't believe	Inbetween or Unsure	Certainly would not use	absolutely not, they have no purpose in our diet
56, female, caucasian, clerical worker	aspartame, equal,	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Very strongly	Would not change my opinion	Campus center or the Fountain
		No	Once a week	Once a week	Do not believe	Don't believe	Do not believe	Not sure at this time	
46, M, caucasian, executive director	nutrasweet	Yes	Daily	Daily	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Not sure at this time	no
Age 52, White, Male, Manager	Spendor, Equal, Nutrasweet	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Strongly	Certainly would not use	
36, female, white, communications professional	sweet and low/saccharine, splenda, purevia, aspartame, nutrasweet	No	Never	Never		Don't believe	Inbetween or Unsure	Not sure at this time	I am pregnant right now and cannot consume artificial sweeteners
57, F, white, Systems Analyst	Splenda, Certa	Yes	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	Campus Center
65, male, white, college administrator	Splenda, Equal, Sweet and Low	Yes	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	not interested
	sucralose	I'm not sure	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	
63, female, Caucasian, administrative assistnat	Aspertame, Stevia, Equal, Splenda	Yes	Daily	Daily	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Certainly would	no

								use	
59, female, white	aspertane, I don't pay attention to the various types	Yes	Daily	Daily	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	no
61, female, white, college counselor	aspartame, equal, sweet&lo	Yes		Daily	Strongly do not believe		Strongly do not believe	Would not change my opinion	campus center is easiest
51,f,white,Accountant	sweet and lo, equal, splender	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Not sure at this time	no
35, female, white, development and alumni relations	sweet&low, splenda, equal	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center
54 - F -white - admin asst	nutra sweet, sweet n low, equal,	No	Never	Never	Do not believe	Don't believe	Strongly	Certainly would not use	no
		No	Rarely	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Not sure at this time	
57, female, caucasian, adm. ass't.	Splendor, Equal are the two most popular	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Not really, I tend to stay away from a.s. because they make my legs ache.
20, male, white, sales	splenda, sweet n low, stevia, equal	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	no, good luck with your survey though!
28, F, Hispanic, Mgf Engineer	splenda, sweet and low	No	Never	Rarely	Inbetween or Unsure	Strongly do not believe	Inbetween or Unsure	Would not use	no
Female, White	Sweet&Low,Splenda,Equal	Yes	Daily	Daily	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Certainly would use	Campus Center
	soluble saccharin	No	2-4 times per week	2-4 Times a week	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not use	no
33, F, W, Staff	nutrisweet, Saccharin, sucralose, Aspartame	No	Rarely	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	
age 49 female white lab manager	Splenda, aspartame	Yes	Daily		Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would probably use	yes, inside would be best if it is cold outside
58; m; w; mechanic.	aspertane?,saccarine	No	Never	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	campus center
52,Male,Black, admin	sweet&low, Splenda, Nurasweet	Yes	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	No
		No	2-4 times per week	2-4 Times a week	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	no
	sweet &low, equal, splenda, truvia	Yes	Daily	Once a	Do not believe	Don't believe	Do not believe		campus center

				week					
43, Female, White, Sales	Splenda, Sweet and Low, Nutra Sweet	Yes	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	N/A
39, male,	sweet and low, spenda, truvia(sp), sacrin (sp)	Yes	2-4 times per week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Certainly would use	campus center
18 years old, male, Armenian and Scandinavian, Student	High Fructose Corn Syrup, MSG, Aspartame, Saccharin, Sucrulose - Splenda, dextrose, fructose, sucrose, zrbital,	No	Daily	Rarely	Very Strongly	Very strongly	Very strongly	Would not change my opinion	no
24, f, white, laboratory technician	splenda, sweet n low, equal	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Would not use	
31, male, caucasian, software developer	saccrine, aspertame, sucralose	No	Rarely	Never	Inbetween or Unsure	Don't believe	Do not believe	Would not use	no
45, female, executive assistant	splenda, nutrasweet	No	2-4 times per week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	Campus Center
34, female, white, admin	sweet n low, equal, splenda, truvia	Yes	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	campus center
female, 25		No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Don't believe	Do not believe	Would probably use	
46, F, W, Exempt Staff	Sweet N Low, Splenda	Yes	Daily	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	No
50, female, administrative assistant	Saccahrine, Nutrasweet, aspartame	Yes	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Strongly do not believe	Would not change my opinion	No
56, F, W and clerical	Splenda, Equate, Sweet and Low	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	no
25, female, caucasian, student	nutrasweet, aspartame, sucralose, splenda, equal, sweet and low	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	No.
32, male, white/hispanic, software engineer	splenda; nutrasweet + equal (aspertaine)	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	no thank you
53, female, caucasian, administrative assistant	stevia, aspartame,	Yes	2-4 times per week	2-4 Times a week	Strongly do not believe	Strongly do not believe	Inbetween or Unsure	Would not change my opinion	
55, female, white and administrative	equal, sweet and low. splenda	I'm not sure	Never	Never	Strongly	Inbetween or Unsure	Very strongly	Would not change my opinion	campus center

	sucralose, aspartame, xylitol, sorbitol, saccharin	No	Never	Rarely	Strongly	Inbetween or Unsure	Very strongly	Not sure at this time	no
50, female,caucasian, admin. assistant	equal and splenda	Yes	Daily	Daily	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	campus center
	splenda, sachrin, aspertame	No	Never	Never	Strongly	Strongly	Very strongly	Certainly would not use	no
24, Male, Caucasian, Software Engineer	Nutrasweet, Sweet n Low, Splenda	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	No
18, female, white, student	splenda, equal	No	Once a week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	campus center
	sucralose, aspartame k	No	Once a week	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
18, Female, Caucasian, Student	Splenda, Equal, Sweet & Low	No	Once a week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Would not change my opinion	no
58, female, mixed, business manager	Equal, Splenda, Sweet-N Low, Sachrin	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	no thank you
20, male, caucasian, student	aspartame, splenda, sweet n' low, stevia, truvia	No	Rarely	Never	Inbetween or Unsure	Strongly do not believe	Inbetween or Unsure	Would probably use	Quad.
20, Male, Caucasian, Student	Splenda, other stuff thats supposed to cause cancer	No	Never	Rarely	Strongly	Strongly	Very strongly	Would not change my opinion	Maybe
45, Female White	Aspartame, Sweet n Low	Yes	Daily	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	Campus Center
48, Female, Caucasian, Admin Assistant	Sucralose, Aspartame, Truvia, Saccharine	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	NO. They give me Migraines!
24 female student	aspartame, stevia	No	Never	Rarely	Strongly do not believe	Strongly do not believe	Strongly do not believe	Certainly would use	campus center
20, female, student	aspartame, acesulfame potassium,	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
	aspartame	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not use	No, thank you I never would
20, F, Asian and student/work at subway part time	sweetnol	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	no
40, female, caucasian,	Aspartame, saccharin, sucralose	No	Nev	Nev	Very	Strongl	Very	Certai	no

administration			er	er	Strongly	y	strongly	nly would not use	
56, Female, Caucasian, PR Coordinator	Splenda, Sweet & Lo,	No	Rarely	Once a week	Strongly	Don't believe	Inbetween or Unsure	Certainly would use	No
49 Male Mostly Irish! educator/consulant	aspartame, saccahrin	No	Daily	2-4 Times a week	Very Strongly	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	no
30, male, white, engineer	sucralose, aspartame	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Very strongly	Certainly would not use	no
20, male, caucasian, student	splenda	No	Once a week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	no
		No	Daily	Rarely	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Certainly would use	
	splenda, equal, sweet & low	Yes	Daily	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	no
18,m,student	aspartame, splenda	Yes	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	possibly
51, F, white, professor	sweet-n-low	No	Rarely	Never	Do not believe	Inbetween or Unsure	Do not believe	Would not use	no
21, F, Caucasian, Student	aspartame	Yes	Daily	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	campus center
	Aspertame, splenda,	Yes	Once a week	Once a week	Do not believe	Don't believe	Do not believe	Would not change my opinion	Goat's Head
21, female, caucasion, student	splenda, aspartame, nutrisweet	No	Once a week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Very strongly	Certainly would use	yes. campus center
60, f, caucasian, educator	saccharin, aspartame, ace-k, stevia, truvia, splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	no. I have reactions, such headaches, from these.
	saccharine, nutrasweet, sweet n low,	No	Never	Rarely	Do not believe	Inbetween or Unsure	Strongly do not believe	Would probably use	sure i would participate.... if it was held in metropolis
18, male, latino, college	Aspartame, Sucralose, Saccharin	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not use	wedge
35, M, white, professor	splenda, saccharine, stevia, nutrasweet, aspartame	No	Never	Never	Do not believe	Don't believe	Strongly	Would not use	no
18, female, white, student	splenda, sweet n low	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	Campus Center
19, Male, Hispanic, Student	Splenda	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not	

								use	
20, male, Dan, your mom	sweet 'n low, splenda, equal	I'm not sure	2-4 times per week	Rarely	Do not believe	Don't believe	Strongly	Would not change my opinion	yes and at the Fountain
18, Male, White, None	Cannot recall specific brand names	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would probably use	Yes; any of those listed work but the Wedge is best.
21, male, white, student/TA	Aspartame, Sucralose	No	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	
22,female,Chinese,Graduate Student	Xylitol	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Certainly would use	Yes. Campus Center
18, male, hispanic, student	splenda, equate, aspartamen,	No	Daily	Daily	Strongly	Inbetween or Unsure	Very strongly	Would not change my opinion	wedge
18, female, white, student	Sweet 'n' Low, Splenda	No	2-4 times per week	Once a week	Strongly	Strongly	Inbetween or Unsure	Would not change my opinion	Wedge
21, female, white, student	surcalose, aspartame, saccharin	No	Never	Never	Inbetween or Unsure	Don't believe	Very strongly	Certainly would not use	No
26,M,Asian,Student	Sweet N Low	No	Rarely	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Campus Center
22, Female,Caucasian, student	aspartame, saccharin, sucralose	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	
20 years old, female, caucasian, full-time student	Aspartame...	I'm not sure	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	Off-campus...so no thank you
Male, unknown race, student	aspartame, HFCS, sucralose, splenda etcetc	Yes	Once a week	2-4 Times a week	Very Strongly	Inbetween or Unsure	Strongly	Not sure at this time	Yes, Campus Center (its gonna be winter soon after all)
21, female, black/hispanic, student	aspertame, sucralose	No	Rarely	Never	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	No, thank you.
		No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Strongly		
18, male, hispanic, student	splenda	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not use	yes Wedge
	sacharin aspartame	I'm not sure	Rarely	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	wedge
Me age is 22. male, white, grad student.	Aspartame, stevia, sucralose, phenylalanine...	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would	If it were brief, campus

								use	center or fountain.
21, female, student	splenda, equal	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Very strongly	Certainly would not use	no
20, M, white, student	Aspartame, Saccarine, Sucralose	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would use	probably yes, anywhere
	splenda, sweet n low,	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would use	no
19, Female, african american, student	equal, sweet and low, splenda	No	2-4 times per week		Do not believe	Don't believe	Do not believe	Would not change my opinion	yes, fountain
18, Male, Student	High Fructose Corn Syrup	Yes	Rarely	Never	Very Strongly	Inbetween or Unsure	Strongly	Would not change my opinion	Campus Center or Wedge
20,male,white,student	sweet'n low, equal, splenda	No	2-4 times per week	Once a week	Strongly do not believe	Strongly do not believe	Inbetween or Unsure	Would probably use	
19, female, asian, student	splenda, sweet and low	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	NO
18, female, caucasian, student	splenda, truvia, sweetnlow, equal	No	Rarely	Rarely	Strongly	Don't believe	Strongly	Would probably use	yes, wedge
hello	how are you	I'm not sure	Never	Never	Strongly do not believe	Strongly do not believe	Very strongly	Certainly would not use	fine thankyou
19 male white construction/excavation	splenda, equal, sweet and low	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Wedge
21,Male, Hispanic, student	sweet n low, esplenda, fruvia	No	Rarely	Once a week	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	No
19 male white student (rbe)	splenda	No	Rarely	Once a week	Strongly	Inbetween or Unsure	Strongly	Would probably use	cc
	splenda	No	Once a week	2-4 Times a week	Inbetween or Unsure	Strongly	Strongly	Would probably use	no
21, F, White, Student	Sucralose, Aspartame, Sugar Alcohols	No	Once a week	Once a week	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would probably use	
21, M, Caucasian, Student	Equal, Nutrasweet, Sweet 'N Low, Sunette, Splenda	No	Rarely	Once a week	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	Campus Center, perhaps the Octowedge
18, male, white, student	None	No	Daily	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably	

								use	
23,male,white,student	splenda	No	Rarely	Rarely	Do not believe	Don't believe	Do not believe	Would probably use	
20, female, caucasian, full time student	sugar, syrup, corn starch	No	Once a week	Daily		Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	wedge, but doesn't matter
18, female, Hispanic, Student	Splenda	No	Rarely	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Certainly would use	
18 Male White Caucasian	corn syrup.....	No	Rarely	Rarely	Strongly do not believe	Don't believe	Do not believe	Would probably use	No thanks
	Splenda	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Strongly	Would probably use	Probably
21, F, Multiracial, student	Splenda, Sweet'n'Low	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Campus Center
		I'm not sure		Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
21 male caucasian student	neutrasweet and miracle fruit with acidity	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Strongly	Would not change my opinion	no
22, Male, White, Student	Sucralose,	No	2-4 times per week	Never	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	Wedge
26,male,asian,service	equal, splender	Yes	Daily	Daily	Do not believe	Don't believe	Do not believe	Certainly would not use	
19, male, white, student	sucralose, aspartame, saccharin	No	Never	Never	Strongly do not believe	Strongly	Strongly	Would probably use	no
19, male, white, student	Sweet and Low	No	2-4 times per week	Never	Strongly	Don't believe	Do not believe	Certainly would use	
22, Male, White, Grad Student and Software Engineer	Equal, Sweet n Low, Splenda	No	Never	Never	Inbetween or Unsure	Don't believe	Do not believe	Would not use	Campus Center
60, M, caucasian, professor	Saccharin, aspartame, sucralose	Yes	Daily	Rarely	Strongly do not believe	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	No thank you.
20 male white	stevia sacharin aspartame	No	Never	Never	Do not believe	Don't believe	Do not believe	Would not change my opinion	fountain, everyone walks through it and will do it on the way by
21, female, white, student	aspartame, splenda	Yes	2-4 times per	2-4 Times a	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably	Campus Center

			week	week				use	
18, Female, white	splenda, sweet and low, equal	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	
		Yes	Daily	2-4 Times a week	Inbetween or Unsure	Strongly	Strongly	Not sure at this time	
18, female, caucasian, student	sweet 'n' low, equal, splenda	Yes	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	Fountain
20, Male, white, student	splenda, equal	No	Rarely	Once a week	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	Yes, Wedge, outside daka
19, female, white, student	equal, splenda,	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Not sure at this time	not really
20, Male, caucasian, Student	Splenda, Sweet & low, NutraSweet	No	Never	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would probably use	no
19, Male, White, Student	Sugar	No	2-4 times per week	Once a week	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Yes, Wedge.
18,male,white,student	nutrisweet	I'm not sure	Rarely	Rarely	Do not believe	Don't believe	Strongly	Certainly would use	yes, fountain
22,female, white, student	Splenda, equal, sweet and low	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	Yes, campus center
21, Female, caucasian, student	splenda, sweet 'n low, equal	No	Once a week	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would probably use	No thanks
22, F, White, Student	saccharin, aspartame, acesulfame-k, sucralose, neotame, stevia	No	2-4 times per week	Once a week	Strongly	Don't believe	Inbetween or Unsure	Certainly would use	No, and you spelled brief wrong
18, female, white	splenda, equal, sweet n' low	No	2-4 times per week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	wedge, meeting room
19, male, White/Caucasian, student	Sweet'N'Low, Splenda	No	Never	Once a week	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	No
	splenda, high fructose corn syrup	No	Rarely	Never	Strongly	Don't believe	Strongly	Would probably use	no
21, male, white, grad student	aspartame, sucralose, saccharin	No	Never	Never	Strongly	Don't believe	Strongly	Would not change my opinion	No thanks

18, Male, White, Student	Sucrolose, Aspertame	Yes	Daily	Daily	Inbetween or Unsure	Strongly do not believe	Strongly do not believe	Certainly would use	Sure, Quad
21, male, white, student	splenda, sweet n low, truvia,	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	no
20,Male,Caucasian,Student	Saccharin,Asparatame,Splenda	I'm not sure	Rarely	Never	Strongly	Don't believe	Strongly	Would not change my opinion	No
18, female, Caucasian, student	Corn syrup	Yes	Daily	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	Wedge
20 Male Caucasian Student	Splenda	No	Daily	Daily	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Certainly would use	
18, Male, Caucasian, Student	Splenda	No		Rarely	Do not believe	Don't believe	Do not believe	Would not change my opinion	Campus Center
21, male, white, student	splenda, equal	No	Rarely	Never	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Certainly would use	Possibly, campus center.
18, Male, White, Full Time Student	Equal, Sweet and Low	No	Never	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would not use	Quad
18, female, white, student	sucralose, splenda, sweet'n'low	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	campus center
18, female, white, student	equal, sweet n low	Yes	2-4 times per week	Daily	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	No.
21, Male, White	Saccharin, Aspartame, Sucralose, Xylitol, Acesulfame K	No	Rarely	Never	Inbetween or Unsure	Very strongly	Inbetween or Unsure	Would probably use	Not really. I stay away from them.
18,male,white,student	splenda	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	Campus Center
20 Female white student	splenda, equal, sweet and low, high fructose corn syrup	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	campus center
20, M, White, Student	Splenda	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	No
19,female,caucasian,student	splenda	I'm not sure	Rarely	Rarely	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would probably use	no
20, male, white, student	aspartame, high fructose corn syrup, corn syrup	No	Rarely	Rarely	Very Strongl	Strongly	Inbetween or	Would proba	Possibly

					y		Unsure	bly use	
19, male, caucasian, student	equal, sweet and low, splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	Wedge/campus center, quad if it is warm outside
23, F, Indian, Engineer	Splenda, Sweet & Low	No	Once a week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	
21, female, caucasian, student	sweet n' low, splenda, stevia	No	Never	Rarely	Do not believe	Inbetween or Unsure	Strongly	Would not use	No
46, Male, White, Professor	Nutrasweet, Saccharine, Splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would use	Campus Center
24, M, W, Graduate student	...	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	no thanks
32,f,white,gardener	aspertaine,high fructose corn syrup	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	
	Splenda, Extra, Truvia	No	Rarely	Never	Strongly	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	Campus Center
19, Male, White, Student	Splenda, Equal, Sugar in the RAW, Sweet n' Low	No	Once a week	2-4 Times a week	Inbetween or Unsure	Strongly	Strongly	Not sure at this time	Fountain
		No	Rarely	Never	Inbetween or Unsure	Strongly do not believe	Do not believe	Would probably use	
21, Male, American/White	Spenda, Equal, Sweet & Low	Yes	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	Fountain
20,m,student		No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	no
18, Male, Caucasian, Student	I dont know them by name.	I'm not sure	Never	Once a week	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Not sure at this time	Campus Center
20, male, student	high fructose corn syrup	I'm not sure	Daily	Rarely	Strongly	Strongly	Strongly	Would not use	Campus center
		I'm not sure	Rarely	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Not sure at this time	
18, m, white, student	msg, taurine, guamine	I'm not sure	2-4 times per week	Rarely	Inbetween or Unsure	Don't believe	Do not believe	Would probably use	no
	brand name or chemical name?	Yes	Daily	Daily	Do not believe	Don't believe	Do not believe	Would probably use	no
19, Female, African American, Studen	equal, sweet'n low, splenda	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	

		No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	NO
21 Male Caucasian Student	Aspartame Saccharin Sucralose	No	Never	Rarely	Strongly	Strongly do not believe	Inbetween or Unsure	Would not use	If I was around; CC
20 male student	HFCS, Splenda	No	Rarely	Never	Very Strongly	Strongly	Strongly	Would not use	Fountain
21, female, white, cook	equal, splenda, sweet n low, the pink one...	No	Once a week	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	fountain
19, female, white/caucasian, student	Aspartam	No	Rarely	Once a week	Strongly	Strongly	Very strongly	Would not change my opinion	Wedge
25, male, white, student	none	No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Strongly	Would not change my opinion	Fountain
	aspartame	Yes	Daily	Daily	Inbetween or Unsure	Strongly do not believe	Inbetween or Unsure	Would not change my opinion	yes, the wedge
Male, 21, Student	Saccarine, Aspartame	No	Never	Never	Strongly	Inbetween or Unsure	Strongly	Not sure at this time	Probably not
20, female, caucasian, student	high fructose cornsyrup, splenda, aspartame	No	Daily	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not use	Wedge
20, M, Student	Aspartame	No	Rarely	Rarely	Inbetween or Unsure	Strongly	Inbetween or Unsure	Would probably use	CC
24, male, white, student/biomed/brand manager	splenda, nutrasweet, equal, aspartime	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	anywhere. artificial sweeteners are gross though.
22, Male, white, student	aspartamine, sucrolose,	No	Rarely	Rarely	Inbetween or Unsure	Strongly	Strongly	Would not change my opinion	CC, wedge by daka
	aspartame, acesulfame K, sucralose	No	Rarely	Never	Do not believe	Strongly	Strongly	Would probably use	no thanks, but good luck!
20, female, white, student	splenda, equal, sweet and low, truvia	No	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	CC
18, Female, Caucasian, Student (bio)	splenda, sweet n' low	No	Never	Rarely	Strongly	Inbetween or Unsure	Strongly	Certainly would use	Campus Center (DD uses splenda)
19, female, caucasion, student	splenda, equal, sweet n low	No	Rarely	Never	Inbetween or Unsure		Do not believe	Would not change my opinion	no
Female, 57, white	aspartame, splenda,	No	Rarely	Rarely	Inbetween or	Inbetween or	Inbetween or	Would not	no

					Unsure	Unsure	Unsure	use	
18,male,white,student	Aspartame	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would probably use	No
	Nutri-sweet	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	no
	sucrolose, aspartame, stevia, saccharine	Yes	Daily	Daily	Strongly do not believe	Strongly do not believe	Strongly do not believe	Would not change my opinion	Yes I'm interested and I'd like it hosted in San Diego. Thank you!
18, male, white, student	Equal, Sweet and Low, Splenda, Nutrasweet	No	Once a week	2-4 Times a week	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Yes, campus center
18, male,	splenda	No	Rarely	Once a week	Do not believe	Don't believe	Do not believe	Would not change my opinion	I don't think so.
18, female, caucasion, student	spelda, neotame, stevia	No	Never	Once a week	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	no thankyou
18, female, mexican american, student	aspartame, saccharin, sucralose,	No	Once a week	Rarely	Strongly	Inbetween or Unsure	Strongly	Would probably use	Quad
20, Male, White, College Student	splenda	No	Never	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	i would prefer to have it in my apartment
		No	Rarely	Never	Inbetween or Unsure	Don't believe	Do not believe	Would probably use	campus center
21, female, white, student	Equal, Splenda, Sweet and Low, truvia	No	Rarely	Rarely	Strongly do not believe	Strongly do not believe	Inbetween or Unsure	Would probably use	yes, fountain
60, F, scientist	Sweet N low, equal	No	Never	Never	Strongly	Inbetween or Unsure	Do not believe	Would not use	no I dont' like how they taste!
18, male, white, college student	Splenda, Naturally Sweet	No	Never	Never	Inbetween or Unsure	Strongly	Very strongly	Certainly would not use	No thanks
20, Fem, Caucasian	Aspartame, Splenda,Sorbitol, Truvia	Yes	Daily	Daily	Do not believe	Don't believe	Strongly	Would not change my opinion	Yes, CC
19/M/White/Student	Aspartame, Sucralose, Splenda, Nutrasweet,	No	Rarely	Never	Inbetween or Unsure		Inbetween or Unsure	Would not use	No
Caucasion Male Student of 18 years.	Aspartame, Splenda, Sucralose	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would not use	No, and it should be "brief."
22, Male, Caucasian (Italian), Full-time MBA Student	Aspartame, High Fructose Corn Syrup	No	Rarely	Never	Strongly	Strongly	Inbetween or Unsure	Would not use	Campus Center

20, Female, Caucasian, Student	Splenda, Sweet n Low	No	Never	Never	Strongly	Inbetween or Unsure	Strongly	Certainly would not use	I do not like artificial sweeteners.
		No	Once a week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
18, Male, White, Student	Splenda, the stuff in the pink paper bags	I'm not sure	Rarely	Rarely	Do not believe	Strongly do not believe	Do not believe	Would not use	Nope
16, Male, White, Student	Aspartame, Sucralose, Splenda (?)	No	Rarely	Never	Strongly	Inbetween or Unsure	Strongly	Would probably use	Yes, Campus Center
20, Female, White, Student	Equal, Sweet n' low, Splenda, truvia	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Don't believe	Do not believe	Certainly would use	Yes, The Campus Center
19, female, caucasian, student	sweet n low, equal, splenda	Yes	Daily	Daily	Strongly do not believe	Strongly do not believe	Do not believe	Certainly would use	no thanks
20, female, white, student	aspartame, splenda	I'm not sure	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	no
20, M, White, student	splenda, sweet and low, equal	No	Once a week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	breif?
	SPLENDA	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center
18, male		No	Daily	Never	Strongly	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	fountain
23, female, hispanic, student	Splenda, equal, sweet & low, truvia	Yes	Daily	Daily	Strongly do not believe	Strongly do not believe	Do not believe	Certainly would use	no
19, female, caucasian/asian, student	sweet-n-low, splenda, aspartane	Yes	2-4 times per week	Once a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would probably use	campus center
	nutrasweet, sweet and low, splenda	No	Once a week	Once a week	Strongly do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	
18, female, caucasion, student	Splenda, Half and Half	No	2-4 times per week	Rarely	Inbetween or Unsure	Strongly do not believe	Inbetween or Unsure	Would not change my opinion	No thank you
19, female, Caucasian, student	splenda, aspartame	Yes	Daily	2-4 Times a week	Strongly	Strongly	Very strongly	Certainly would use	No, because they are clearly bad for you.
18, female, white, student		Yes	Once a wee	2-4 Times a	Do not believe	Strongly do not believe	Strongly do not believe	Certainly would	

			k	week				use	
	Phenylalanine, Splenda	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	no
18, female, white, student									
20, F, white, math teacher on the weekends/lab in the summer	i know there are lots, but don't remember their names	No	Rarely		Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	fountain
20, Female, white, student	sweet and low, splenda, equal	No	Once a week	Once a week	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would probably use	campus center
19, female , white, idk student?	sweet and low, splenda	I'm not sure	Rarely	Rarely	Very Strongly	Inbetween or Unsure	Strongly	Would probably use	no thanks
	sweet and low	No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Strongly	Would probably use	Campus Center
18,male,white, student	splenda, aspartame	No	Never	Never	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	no
20, female, asian indian, student	Splenda, Equal	Yes	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center, Wedge
21, Male, student (0bviously)	sucralose, sweet n low, aspartame, equal.....vaginas	No	Rarely	Rarely	Do not believe	Don't believe	Do not believe	Would not use	
	aspartame	I'm not sure	Once a week	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	
	Splenda	I'm not sure	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	no
21, female, caucasian, student	aspritame, sucralose, saccharin, stevia	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Campus Center
18, female, white, student	sweet and low, equal, splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	yes, wedge
18, male, mixed race, student	splenda, sweet n low	I'm not sure	Once a week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	yes, location doesnt matter
21, male, junior in college	aspartame, high fructose corn syrup,	No	2-4 times per week	Rarely	Strongly	Very strongly	Inbetween or Unsure	Would probably use	It would depend on when, but the campus center would probably be the best choice
45, female, instructor	aspartame, sweet n low, equal,	No	Never	Never	Strongly	Very strongly	Very strongly	Would not change my opinio	no

								n	
18, female, caucasian,	aspertame, sucralose	I'm not sure	2-4 times per week	Never	Inbetween or Unsure		Inbetween or Unsure	Would probably use	Yes, Quad, Fountain, or Wedge.
20, male, white, student	high fructose corn syrup	Yes	Daily	Rarely	Do not believe	Strongly	Inbetween or Unsure	Would not change my opinion	no thanks
21, M, W, Student	ASpartame, Splenda, Crystaline fructose, High fructose corn syrup	No	Rarely	Never	Very Strongly	Inbetween or Unsure	Very strongly	Certainly would not use	
	splenda, nutrisweet	No	Never	Rarely	Do not believe	Don't believe	Strongly do not believe	Certainly would not use	campus center
18, Male, White, Student	Splenda, Sweet N' Low	No	Rarely	Never	Strongly	Inbetween or Unsure	Strongly	Certainly would use	No
26 female	saccharin	No	Never	Rarely	Inbetween or Unsure	Don't believe	Strongly	Would not change my opinion	
18, male, warehouse	spenda, equal, sweet and low, artificial mango	No	Once a week	2-4 Times a week	Strongly	Strongly	Strongly	Would not change my opinion	sure. and quad sounds good.
21, F, white, student	spenda, equal, sweet and low	No	Daily	Daily	Strongly	Don't believe	Inbetween or Unsure	Would not change my opinion	no
18, white, full time student and lover	splenda, sweet and low, truvia	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Strongly do not believe	Do not believe	Would not change my opinion	hmmm...you could do it while people wait in line at DAKA
17, male white	phyenurics sacarrin	Yes	2-4 times per week	2-4 Times a week	Strongly do not believe	Strongly do not believe	Strongly do not believe	Would not change my opinion	no
18, Male, White, Student		I'm not sure	Rarely	Rarely	Inbetween or Unsure	Don't believe	Strongly do not believe	Would probably use	Quad, Fountain
18, female, white, student		No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	sure; campus center or wedge
18,M,Asian,Student	none	I'm not sure	Once a week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	Campus Center
19, female		No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	

	Splenda	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Do not believe	Would probably use	
	aspartame, sucralose, sacharin	I'm not sure	Once a week	Once a week	Do not believe	Don't believe	Do not believe	Would probably use	
22, m, white, student	aspartame, fructose	No	Never	Never	Strongly	Strongly	Very strongly	Certainly would not use	sure dkelly@wpi.edu
	corn syrup, high fructose corn syrup, splenda	Yes	Once a week	Rarely	Inbetween or Unsure	Strongly	Inbetween or Unsure	Would probably use	
18, male, white, student	splenda, sweet and low, equal, truvia	No	Once a week	Rarely	Strongly	Inbetween or Unsure	Very strongly	Certainly would use	yes, wedge
	Splenda	No	Rarely	Never	Strongly	Strongly	Very strongly	Certainly would not use	nope
20 M Hispanic Student	Splenda, Sweet-n-Low, Equal	I'm not sure	2-4 times per week	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	Wedge or CC
	Splenda	No	Never	Rarely	Do not believe	Don't believe	Do not believe	Would probably use	
21,female,	sucralose (splenda), asprtame	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	no
19, Male, White, Student	none... splenda maybe?	I'm not sure	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Maybe, I would assume the Campus Center would be the best spot
20, Female, White, Student	Sweet and Low, Aspartame?	No	Once a week	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	Campus Center
18, Male, White, Student	high fructose corn syrup, splenda	No	2-4 times per week	Never	Strongly	Don't believe	Inbetween or Unsure	Would not change my opinion	I would be interested, I would prefer the wedge.
	Sweet n Low, Splenda	No	2-4 times per week	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	No
20,M,Caucasion,student	none	No	Never	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Yes
19, male, white, student	most	I'm not sure	Daily	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	
	aspertame, sucralose, saccharin	No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Do not believe	Would not use	

15, Male	Splenda	No	Once a week	Daily	Strongly	Inbetween or Unsure	Strongly	Would not use	if i get time
20, female, student	splenda	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would not use	no
		No	Rarely	Never	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	
22, Female, White, Student	Splenda, Sweet and Low, Equal	No	Rarely	Rarely	Strongly	Don't believe	Strongly	Would not use	Campus Center
19, Female, White, Student	aspertame	No	Rarely	Never	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
18, male, white, student	aspartame, saccharine	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	wedge
24, M, Engineer		Yes	Daily	Daily	Do not believe	Strongly do not believe	Do not believe	Certainly would use	
19, female, caucasian, student	splenda, sweet n low, equal	No	Never	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	Wedge
18, femal, cuban, student	splenda, high fructose corn syrup?	No	2-4 times per week	Rarely	Inbetween or Unsure	Strongly do not believe	Inbetween or Unsure	Would not change my opinion	yes, anywhere
18, F, White, N/A	Equal, Sweet and Low, Splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	No thank you.
18 female white none		No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would probably use	Probably not
Male, Caucasian, Student	aspartame, sucralose, saccharine, neotame, stevia	Yes	2-4 times per week	Never	Inbetween or Unsure	Inbetween or Unsure	Very strongly	Certainly would use	No, since I just said that I felt strongly that they caused cancer.
22, Male, Grad Student	Splenda	No	Never	Never	Do not believe	Don't believe	Strongly	Not sure at this time	I would not be
20, M	Aspartame	No	Rarely	Rarely	Inbetween or Unsure		Strongly	Certainly would not use	CC or Wedge
18, male, white, student	sweet and low, splenda	No	Never	Rarely	Do not believe	Strongly do not believe	Do not believe	Would not use	Yes, Wedge
19/f/caucasian/student	sweet n low	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinio	

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20, male, caucasian, web development	sweet and low	No	Never	Rarely	Very Strongly	Inbetween or Unsure	Very strongly	Certainly would use	Library, Founders, Fountain
20, Female, Latino	Equal, Sweet and Low, Aspartame	No	Once a week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Very strongly	Not sure at this time	Yes
18, female, caucasian, student	splenda, equal, sweet & low	I'm not sure	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	no
39 Male Engineer (Caucasian)	Splenda, Sweet n' Low, Equal	Yes	Daily	Daily	Do not believe	Don't believe	Do not believe	Would not change my opinion	No, no longer near campus
21,male,caucasian, student		No	Rarely	Daily	Strongly	Don't believe	Inbetween or Unsure	Would probably use	Campus Center
19 male asian student	the little splenda	No	Never	Never	Inbetween or Unsure	Don't believe	Strongly	Certainly would use	
	saccharin, sucralose, aspertain	No	Never	Never	Do not believe	Don't believe	Inbetween or Unsure	Not sure at this time	I would not be intirested
	None	I'm not sure	2-4 times per week	2-4 Times a week	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would probably use	no
19, Male, Caucasian, Student	Aspartame, Maltodextrin, Sucralose, Dextrose, Saccharrin	Yes	Daily	Daily	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Fountain
19, F, Student	Equal, Sweet n low, Corn starch, Splenda	No	Daily	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Would not use	
	aspartame	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Certainly would use	Campus Center
22,F	sucralose	No	Rarely	Never	Inbetween or Unsure	Don't believe	Very strongly	Certainly would not use	
19, Male, Hispanic, student	sucralose (Splenda)	No	Never	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	
	sucralose, aspartame	No	Never	Never	Very Strongly	Inbetween or Unsure	Very strongly	Would not change my opinion	
18 male white student	splenda sweetnlow aspartame	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would not use	fountain
20, M, White, Student	Splenda, Nutrasweet, Equal	Yes	2-4 times per week	Rarely	Strongly do not believe	Inbetween or Unsure	Strongly	Would probably use	Nope

18, male, white	Splenda, corn syrup	No	Rarely	Never	Strongly	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	Yes, wedge.
20, F, White, Student	Splenda, Equal	No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Strongly	Would probably use	Campus Center
19,Female,White(non-hispanic), Student	Splenda, Sweet N' Low, Equal, Truevia, Aspartame, Sucralose	Yes	Daily	Daily	Do not believe	Don't believe	Do not believe	Would not change my opinion	Campus Center
21, female, white, cashier & student	splenda, sweet'n'low	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would not use	
20, female, caucasian, student	sweet and low, splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center. Goodluck with your IQP!! :)
19, female, white, student	splenda, sweet and low, truvia	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	Campus Center
19, gemale, white student	splenda xylatol xorbitol other thing i can't spell	I'm not sure	Daily	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Would not use	
19, gemale, white student	splenda xylatol xorbitol other thing i can't spell	I'm not sure	Daily	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Would not use	
20, F, Caucasion, Student	none...	I'm not sure	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	No thanks
21, White, Student	aspertane, truvia	Yes	Once a week	Once a week	Do not believe	Don't believe	Do not believe	Would not change my opinion	CC
20, female, white, student	splenda, nutrasweet, aspratame, sucralose	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Very strongly	Would not change my opinion	campus center or fountain
	splenda, sweet n low, agave	Yes	Once a week	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	Yes, campus center
21, Female, Caucasian, Student	Asphertame	Yes	Daily	Daily	Inbetween or Unsure	Don't believe	Strongly	Certainly would use	
19, Male, Asian, Student	Splenda	I'm not sure	Rarely	2-4 Times a week	Inbetween or Unsure	Don't believe	Do not believe	Not sure at this time	Campus Center
18, female, white, student	Splenda, sweet and low,	No	Daily	Daily	Strongly	Inbetween or Unsure	Strongly	Certainly would use	campus centre
18, White, Student	Splenda	Yes	Daily	Daily	Do not believe	Don't believe	Do not believe	Certainly would use	Wedge
	sorbitol, splenda, sweet n' low, equal	No	Once a	Rarely	Inbetween or	Don't believe	Do not believe	Would not	Yes, Quad.

			week		Unsure			use	
20, female, white, student	splenda, equal, sweat and low, truvia	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	CC or fountain
	Splenda, Sacrin, Surca Low	No	Rarely	Never	Inbetween or Unsure	Strongly	Strongly	Would not change my opinion	Wedge
18, female, white, student	Splenda	No	2-4 times per week	Rarely	Inbetween or Unsure	Don't believe	Strongly do not believe	Would not use	No
20, Female, Causcasian (Non Hispanic), Student/Retail Worker	Splenda, Nutra Taste, Sweet and Low	No	Once a week	Never	Strongly do not believe	Don't believe	Strongly do not believe	Would not change my opinion	Sure, Campus Center
21, Female, white, student	splenda, sweet 'n low, truvia	No	Once a week	2-4 Times a week	Strongly do not believe	Strongly do not believe	Strongly do not believe	Would not change my opinion	yes, campus center
21, male, white, IT	splenta, equal, sweet and low	No	Rarely	Never	Strongly	Strongly	Strongly	Certainly would not use	They all taste awful, no way, sorry.
21 male white student	saccharin	I'm not sure	2-4 times per week	Rarely	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	no
19, female, caucasian, student	splenda, sweet n low, and that stuff in fuit 2 0	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	Campus Center; as long as you prove they aren't bad for us
23,M,White,IT	Splenda,Equal,	Yes	Daily	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	no, long distance student
19,male, student	sugars, drinks, gum, candy	No	Daily	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	campus center
19, female, white, student	splenda,	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	
21, Male, Caucasian, Student	Sucrose, aspartame	No	Once a week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	yes, campus center
21, Female, Caucasian, student	asparatame, high fructose corn syrup, stevia, etc	No	Rarely	Rarely	Inbetween or Unsure	Strongly	Inbetween or Unsure	Not sure at this time	No, I don't want to eat them. Period. It's not about taste.
19, F, Caucasian, Student	equal, sweet n low, splenda	Yes	Daily	Daily	Strongly do not believe	Strongly do not believe	Do not believe	Certainly would use	campus center

20, Male, White, Student	Aspertame	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not use	
		Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	Yes. Wedge
21, male, caucasian	sugar	No	Never	Rarely	Strongly	Inbetween or Unsure	Do not believe	Would probably use	No
18, Male, Student	Aspartame Saccarin	No	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	no
19, Female, bi-racial (Cape Verdean & Italian), Student	Splenda, Equal	I'm not sure	Once a week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would use	Campus Center
22, M,Caucasian	Splenda?	I'm not sure	Rarely	Rarely	Do not believe	Don't believe	Do not believe	Would not change my opinion	
22, female, caucasian, student	Splenda, Sweet & Low	No	Rarely	Once a week	Strongly	Don't believe	Very strongly	Would probably use	can't - i graduate in Dec.
21, Female, Caucasian	Aspartame, Saccrin,	No	Rarely	Never	Do not believe	Don't believe	Strongly	Would probably use	Campus Center
	Equal	No	2-4 times per week	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	
18, Male, White, Student/Admissions Work Study	Sweet n' Low, Splenda, Equal	No	Rarely	Once a week	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Certainly would use	Campus Center
25, Male, Student	Sweet n Low, Splenda	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	Fountain
20, female, white, student	I don't think I know any	I'm not sure	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	Yes, Campus Center
18,female,asian,student	Saccharin	I'm not sure	Once a week	Daily	Strongly	Don't believe	Inbetween or Unsure	Would probably use	no
	aspartame, sucralose	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	CC
21, female, caucasian, student	splenda, aspartame, xylitol, phenylalkaline	No	Never	Never	Strongly	Inbetween or Unsure	Very strongly	Would probably use	no
18, male, caucasian, student	Splenda...	I'm not sure	Rarely	Once a week	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Would not change my opinion	No, thank you.
18; female; caucasian; student	sweet 'n low, splenda	No	Rarely	Rarely	Inbetween or	Inbetween or	Strongly	Would not	no

					Unsure	Unsure		change my opinion	
	Splenda, Nutrasweet	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	
18, male, caucasian, college student	sucralose, sugar alcohol	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	Quad
	Sacharine, Sucralose, Aspartame, Acesulfame	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	
22, F, White, Student	Splenda, nutrasweet, aspertaime, saccharin	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center
	nutrasweet sweetnlow splenda	No	Rarely	Rarely	Do not believe	Don't believe	Do not believe	Would not use	probably not the aftertase is gross
	Splenda, Equal, the pink one	Yes	Daily	Daily	Strongly do not believe	Don't believe	Do not believe	Would not change my opinion	Your choices should include a "no opinion" option
20. female, student	sucralose, aspartame, saccharin	Yes	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	Depends on the time of year, around now CC would be the best.
20, male, white American, student	Sweet N Low, Splenda	No	Once a week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Campus Center, probably
19, Female, Caucasian	Splenda, Nutrasweet, Sweet'n low	Yes	Daily	Daily	Do not believe	Strongly do not believe	Do not believe	Would not change my opinion	No
18, female, white, student	Splenda, sweet n low, truvia, equal	Yes	Daily	Daily	Do not believe	Don't believe	Do not believe	Would probably use	yes, fountain or quad
	Splenda	No	Once a week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	campus center
21, F, Caucasian, Student	Splenda, SweetnLow, Equal	Yes	2-4 times per week	2-4 Times a week	Strongly	Strongly do not believe	Inbetween or Unsure	Certainly would use	Yes, CC or Fountain
23, Male, White, Graduate Student	Not good with names... Splenda, the one that always comes in pink packets in restaurants, and the one that's in all the diet sodas.	No	Rarely	Never	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would not use	Not interested, thanks.
21, male, student	Sucralose, Aspartame, Splenda (not sure if this is a new one), Saccharin	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	not interested in panel
18, female, white, student	aspartame	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Do not believe	Would probably use	no.
18,femal,white,student	splenda, sweet and low, equal	No	2-4 times per wee	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	possibly, wedge or campus center

			k						
		No	Once a week	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
Age 20, Female, Caucasion, Student	splenda, aspertame	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Strongly	Would not change my opinion	I would prefer either the Campus Center or the Fountain
20, M, Asian, student	Aspartame	No	Rarely	Rarely	Inbetween or Unsure	Strongly	Very strongly	Would not change my opinion	No
19, male, caucasian, student	splenda, sweet and low, mostly coffee sweeteners	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	Fountain
21 female white student	aspartame, sucralose,saccharin	No	Never	Never	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not use	
21, south asian female, student-undergraduate	splenda, sweet and low	No	Rarely	Once a week	Very Strongly	Very strongly	Inbetween or Unsure	Not sure at this time	
48 Male Caucasian Retired	Don't know; I avoid them, using only sugar, corn syrup,etc. etc.	No	Never	Never	Do not believe	Don't believe	Do not believe	Certainly would not use	No thanks
20,m,white,student	spenda, equal, nutrasweet, sweet'n low	I'm not sure	Rarely	Rarely	Inbetween or Unsure	Strongly	Inbetween or Unsure	Certainly would use	no
19, female, white/hispanic, full-time student/part-time cafe employee	splenda and extra	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Strongly	Would not use	sure
20, female, white, student	xylitol, splenda?	I'm not sure	2-4 times per week	Daily	Inbetween or Unsure	Inbetween or Unsure		Would not use	not interested
19, female, white, student	?	I'm not sure	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Do not believe	Would probably use	n/a
19, male, white, part time at movie theater	splenda, sweet n' low	No	Never	Never	Inbetween or Unsure	Strongly do not believe	Do not believe	Would probably use	yes, campus center
20, male, caucasian, student	Splenda, Sweet 'N Low, Equal	No	Rarely	2-4 Times a week	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	Campus Center
18, female, white, student	equal, sweet n lo, splenda,	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	wedge or quad
19, M, White, none	splenda	No	2-4 times per week	Once a week	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	campus center
21, Male, White, Student	xorbitol, sweet 'n low, splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would	Yes, campus center, it's cold out

								use	now
24, male, Hispanic, student	Splenda, sweet n low, equal	No	2-4 times per week	Daily	Do not believe	Don't believe	Do not believe	Would not change my opinion	Campus center
18 yr old female, white, student	splenda, sweet n low	No	Rarely	Never	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	no
20, F,	splenda	No	2-4 times per week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	no
21, male, white, student	aspartame, saccharin	Yes	2-4 times per week	2-4 Times a week	Strongly do not believe	Strongly do not believe	Do not believe	Certainly would use	Yes
23, female, white, student	splenda, equal, aspertame, sweet and low	Yes	Daily	Daily	Strongly do not believe	Don't believe	Do not believe	Would not change my opinion	Campus Center
23, F, caucasian, biology student	sucralose, aspartame, xylitol, stevia	No	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	no thanks
29, F, White ,Student	steevia, sweet and low, equal, splenda	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would not use	Sure. Gateway or campus center
44, white male engineer	sucralose, saccharin, aspartame	No	Once a week	Once a week	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	No
	equal, splenda	No	Rarely	Once a week	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	no
21, male, white, student	sweet and low	No	Rarely	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	CC
18, female, White, student	equal, splenda, sweet and low...	Yes	Daily	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Quad or Wedge
	splenda, aspartame, sweet and low, sorbitol	No	Once a week	Once a week	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	campus center
25, Female, White, Software Engineer	equal, sweet and low, and the one in the yellow packet	Yes	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	
19, Male, White, Student	Splenda, Sweet n Low, NutraSweet, Equal	No	Once a week	Once a week	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	Campus Center
20,F,Black,student	saccharin, aspartame	I'm not sure	Rarely	Never	Inbetween or Unsure	Don't believe	Strongly	Would probably use	no
19, male, white, student	splenda	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	

18, female, white, student	Splenda, Equal	Yes	Once a week	2-4 Times a week	Do not believe	Strongly do not believe	Strongly do not believe	Certainly would use	Campus Center
22, Male, Caucasian, Software Engineer	Sweet n low,	No	Daily	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	No
20, Female, Asian, Student	Sugar	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center
20, male, white, student	aspartame, sweet and low stuff	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Strongly	Would probably use	yes. fountain
19, male, caucasian, student		No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
20, M, Multiracial, Software Developer	Aspartame, Acesulfame-K, Saccharin,Sucralose,Cyclamate,Neotame,Glucin	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center
	saccharine, aspartame, splenda, sugar (!)	No	Never	Never	Inbetween or Unsure	Very strongly	Very strongly	Certainly would not use	No, but please correct your spelling of the word "brief".
Male, 30, White, Student	nutrasweet	No	Rarely	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	campus center
19,M,White,Full-Time Student	Aspartame	Yes	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Wedge or Campus Center
23 grad student	aspertame, splenda, sucralose,	No	Rarely	Rarely	Strongly	Don't believe	Inbetween or Unsure	Would probably use	Campus Center
19, female, white, student	splenda, sweet&Low	I'm not sure	Once a week	Once a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	no
22, mail, cockasian,	Splenda, equal, sweet and low, sugar,	No	Never	Never	Do not believe	Don't believe	Very strongly	Certainly would not use	It's spelled brief
21 Male Black	Aspartame, Sucralose, Saccharin	Yes	Daily	Daily	Strongly do not believe	Strongly do not believe	Strongly do not believe	Certainly would use	I will only come if I can bring home lots of sweeteners.
18, female, white, student	equal, splenda, sweet and low	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	maybe, campus center
		No	Rarely	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would use	

23, male, white, student	aspertame, sucralose	No	Rarely	Never	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would not use	no
18, Male, Caucasian,	aspartmae, saccharin, sucralose	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Strongly	Would probably use	No
24, F, white, student		No	Never	Never	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would probably use	
24, F, white, Consulting Engineer	splenda, sweet and low, equal, phenylalanine (spelling ?)	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Strongly	Certainly would use	no
20, Male, Caucasian, Student	Splenda, Sweet and Low	No	Never	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	No
22, F,White, Student/Bartender	Splenda, Sweet and Low, Equal, they all have aspartame mostly	Yes	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	Sure, Campus Center
18, Male, White, Student	High Fructose Corn Syrup, Maltodextrin, Sacrin	I'm not sure	Daily	Daily	Do not believe	Strongly do not believe	Do not believe	Certainly would use	Wedge
19, male, white, ME student	artificial sugar	I'm not sure	Rarely	Never	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	yes, on the Quad
25 student	splenda	No	Never	Rarely	Strongly do not believe	Don't believe	Do not believe	Would probably use	no
21, male, white, student	sweet and low	No	Rarely	Rarely	Strongly	Strongly	Inbetween or Unsure	Would not change my opinion	quad
20, M	aspartame	No	Rarely	Rarely	Strongly	Inbetween or Unsure	Strongly	Would not use	Campus Center
30, male, white, middle-management	Sweet&Lo? Not sure. I won't cheat and look them up.	No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not use	Sorry, not in town anymore.
21, m	aspartame	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	quad
23, female, Graduate Student	high fructose corn syrup, saccharine, sweet n' low, splenda	Yes	Daily	Rarely	Do not believe	Strongly do not believe	Do not believe	Would not change my opinion	
		No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	No
	Splenda, Sweet and Low	No	Never	Rarely	Strongly	Inbetween or Unsure	Strongly	Would not change my opinion	Campus Center
	many	No	2-4 times per wee	Rarely	Strongly do not believe	Strongly do not believe	Strongly	Would not use	no

			k						
19, female, american, student	sweet and low, splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	fountain
21, Male, White, Student	Equal, Sweet and Low, Splenda	No	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	No
28,M,White,Student	Saccrine,Splenda	Yes	Daily	Daily	Strongly	Strongly do not believe		Certainly would use	Yes, Center
	aspartame, saccharin, splenda	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	Campus Center
22,male,american, student	sweet n low, equal	Yes	Daily	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	
20, F, Systems Engineer	Nutrasweet, Sweet n Low, Splenda	No	Rarely	Rarely	Do not believe	Don't believe	Strongly	Would not use	No
white 21 female	aspartame?	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
20, M, White, Student	splenda, sweet + low	No	Once a week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	no
19, male, unknown/white, student	splenda, sweet-n-low, Nutrasweet, equal,	No	Rarely	Rarely	Strongly do not believe	Strongly do not believe	Inbetween or Unsure	Would not change my opinion	no
18,m,asian, student		Yes	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would use	
19, female, caucasian, student	Sucralose, aspertame, sweet and low,	No	Rarely	Never	Strongly	Strongly	Strongly	Certainly would not use	No
18, female, caucasian, student		No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	No
19,m,white,student	splenda, equal, sweet and low	No	Never	Rarely	Strongly	Inbetween or Unsure	Very strongly	Not sure at this time	quad
18, Female, Caucasion and student.	Sweet n' Low, and Splenda	No	Once a week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Do not believe		Wedge
21,male,student	sweet n low, splenda, xylitol?, sugar alcohol?	I'm not sure	Once a week	Once a week	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Campus Center
21, male, asian, student	none	I'm not sure	Daily	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Not sure at this time	Campus Center

21, male, caucasian	saccharin, aspartame, sucralose, xylitol	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	no
19, male, white, student	aspertaine	No	Rarely	Never	Inbetween or Unsure	Strongly do not believe	Inbetween or Unsure	Would not use	no
20, female, hispanic, student	high fructose corn syrup, splenda, aspartamine	Yes	2-4 times per week	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center
20, M, Caucasian, Student	Aspartame, Sucralose, (Equal, Splenda) - Not sure which sweeteners are those	No	Never	Never	Very Strongly	Inbetween or Unsure	Strongly	Would not use	CC or Fountain
20, Female, White, Editor	sorbitol, saccharine, aspartame	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Not in the US this term, sorry.
22, m, white, student	splenda	No	Once a week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Question 10: Fountain
	Splenda	No	Rarely	Rarely	Do not believe	Don't believe	Do not believe	Would not use	Sure, in the campus center.
18, Male, White, Student	HIgh Fructose corn syrup, dextrose, maltodextrose, anything with an -ose	I'm not sure	Once a week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Fountain or CC
20, female, white, student	asperteme	Yes	Daily	Never	Inbetween or Unsure	Strongly do not believe	Do not believe	Would not change my opinion	no
19, male, multi-racial, student	aspartame, saccharin	No	Once a week	Never	Strongly	Inbetween or Unsure	Do not believe	Would not change my opinion	campus center
	equal, sweet and low, truvia, splenda	Yes	Daily	Rarely	Do not believe	Strongly do not believe	Inbetween or Unsure	Would not change my opinion	
21, female, white, student	nutrasweet, splenda,	No	Rarely	Never	Do not believe	Don't believe	Strongly	Not sure at this time	campus center
21, male, white, currently unemployed	nutrasweet, sweet n low, splenda, aspartame	No	Rarely	Rarely	Do not believe	Strongly do not believe	Strongly do not believe	Would not change my opinion	no
21 Male Student	Splenda, Phenylketonurics	I'm not sure	Once a week	Never	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not use	
21, F, caucasian, student	splenda, sweet n low, equal, nutrisweet	No	Rarely	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	maybe - CC
22, Male	aspartame, saccharine	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinio	

								n	
19, male, Student	Aspartame, Xylitol, Sorbitol, mannitol, sucralose	No	Daily	Once a week	Do not believe	Strongly do not believe	Do not believe	Would not change my opinion	Wedge
19, female, caucasion, student	Splenda, NutraSweet, Sweet n Low, Equal	Yes	Daily	Daily	Inbetween or Unsure	Strongly	Strongly	Would not change my opinion	yes
18, M, Latino, Student		I'm not sure	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
20, Female, -, full-time student	aspartame	I'm not sure	Daily	2-4 Times a week	Strongly do not believe	Strongly do not believe	Inbetween or Unsure	Would not change my opinion	yes, Campus Center
25, male, white, mechanical/manufacturing engineer	aspartame, sodium saccharine, lead acetate...	No	Never	Never	Strongly	Inbetween or Unsure	Strongly	Certainly would not use	There are few things I'd less like to taste several of.
22, female, white, student	splenda, sweet n low, equal	Yes	2-4 times per week	Rarely	Do not believe	Don't believe	Inbetween or Unsure	Would probably use	no
19, yes please, white, student	sweet & low, equal, splenda, your mom	No	Never	Never	Do not believe	Don't believe	Strongly	Would not use	no thanks, i'd rather you pour some sugger on me babe!!!
21, white, student	splenda	No	Rarely	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would probably use	yes, fountain
20,male,white, civil engineer	sweet and low, equal, splenda,	Yes	Daily	2-4 Times a week	Strongly do not believe	Strongly do not believe	Inbetween or Unsure	Would not change my opinion	yes, campus center or quad, or fountain
		No	Once a week	Never	Do not believe	Don't believe	Do not believe	Would not change my opinion	no
18, Female, student	aspertain, splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would not change my opinion	no
	Splenda, Sweet'n'Low, Aspartame	No	Never	Never	Do not believe	Inbetween or Unsure	Strongly	Certainly would use	Campus Center
20, Caucasian, Student	Aspartame	No	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	No
21, M, White	Splenda, Sweet n Low, High-fructose corn syrup	No	Rarely	Once a wee	Strongly	Inbetween or Unsure	Inbetween or Unsure	Would probably	no

				k				use	
19, F, white, student	high fructose corn syrup, sucralose	I'm not sure	Rarely	Rarely	Strongly	Don't believe	Strongly	Would probably use	Yes- Wedge
18, female	Splenda, Equal, Sweet 'n Low,	No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not use	Quad
Caucasion/Hispanic female student	splenda, sweet and low, nutrasweet, stevia	Yes	Daily	2-4 Times a week	Do not believe	Strongly do not believe	Inbetween or Unsure	Would not change my opinion	campus center
19, Female, White, Student	Splenda	No	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	Campus Center
20, female, white, student	aspartame(sp), splenda, truvia, sweet and low	Yes	Rarely	Once a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	no
23, male, software engineer	miracle fruit, splenda, aspartame, saccharine, phenylalanine	No	Never	Never	Inbetween or Unsure	Strongly	Inbetween or Unsure	Would not change my opinion	
19, m, black, student	sorbitol	Yes	Once a week	Never	Strongly do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	cc
	sweetNlow splenda	I'm not sure	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	campus center
19 make white construction/student	high fructose corn syrup, citric acid,	Yes	Daily	2-4 Times a week	Inbetween or Unsure	Don't believe	Do not believe	Would probably use	sure why not
19, Female, Hispanic, Student	Splenda, Sweet n Low	I'm not sure	2-4 times per week	Rarely	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Would probably use	nah
20, female, student	sweet and low, spledna	Yes	Daily	Daily	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	sure, campus center
21, M, white, student	HFCS.....	Yes	Daily	Once a week	Very Strongly	Don't believe	Inbetween or Unsure	Would not change my opinion	Campus Center
18, Female, Indian, Student	splenda and the stuff they put in diet carbonated drinks	No	Rarely	Rarely	Very Strongly	Very strongly	Very strongly	Certainly would not use	Sure
18, female, caucasian, student	sorbitol, saccharine, splenda, I can't remember the name of another one	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Wedge if it's cold, quad if it's not.
24, female, caucasian, student	aspertime	No	Once a wee	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not chang	No, there's only one artificial

			k					e my opinio n	sweetener I like.
19, female, white, student	Splenda, sweet n low, equate, aspartame	Ye s	Dail y	2-4 Tim es a wee k	Strongl y do not believe	Strongl y do not believe	Strongl y do not believe	Certai nly would use	Yes! Campus center or fountain
		I'm not sur e	Nev er	Nev er	Inbetw een or Unsure	Strongl y do not believe	Strongl y	Would not chang e my opinio n	no
20,f, white, student	splenda, aspartame	I'm not sur e	Rare ly	2-4 Tim es a wee k	Inbetw een or Unsure	Don't believe	Strongl y	Certai nly would use	cc
19-year-old male; white; student.	Nutrasweet, Splenda, aspartame, sucralose	Ye s	2-4 time s per wee k	2-4 Tim es a wee k	Do not believe	Inbetw een or Unsure	Inbetw een or Unsure	Certai nly would use	no
18, female, white, student	sweet 'n low, equal	No	Rare ly	2-4 Tim es a wee k	Inbetw een or Unsure		Inbetw een or Unsure	Would not chang e my opinio n	wedge or campus center
17,male,caucasian,student	splenda	No	Dail y	Rare ly	Inbetw een or Unsure	Inbetw een or Unsure	Inbetw een or Unsure	Would proba bly use	
17, female, caucasian, student	corn syrup (?)	I'm not sur e	2-4 time s per wee k	Once a wee k	Inbetw een or Unsure	Inbetw een or Unsure	Inbetw een or Unsure	Would not use	no
19, male, white, student	Sweet and Low, Splenda	No	2-4 time s per wee k	Rare ly	Inbetw een or Unsure	Don't believe	Inbetw een or Unsure	Would proba bly use	
18,F,white,student	Splenda	No	Rare ly	2-4 Tim es a wee k	Inbetw een or Unsure	Inbetw een or Unsure	Do not believe	Not sure at this time	
20, male, white, student	Splenda	No	Rare ly	Nev er	Inbetw een or Unsure	Inbetw een or Unsure	Inbetw een or Unsure	Would proba bly use	
19,M,Internet Superhero	Aspartame, Sucralose, Sodium Sacharinn	Ye s	Rare ly	Nev er	Inbetw een or Unsure	Inbetw een or Unsure	Inbetw een or Unsure	Would not chang e my opinio n	Fountain
22, MALE, CAUCASIAN, STUDENT	http://en.wikipedia.org/wiki/Swee tener DID YOU DO THIS? DID IT HELP??	No	Dail y	Rare ly	Do not believe	Don't believe	Strongl y	Would not chang e my opinio n	YES, AT WPI
19, male, while, student	corn syrup	Ye s	2-4 time s per wee k	Nev er	Inbetw een or Unsure	Inbetw een or Unsure	Inbetw een or Unsure	Would not chang e my opinio n	CC
	Equal, Splenda, sacchrine, aspertame	I'm not sur e	Once a wee k	Rare ly	Inbetw een or Unsure	Inbetw een or Unsure	Inbetw een or Unsure	Not sure at this time	no
18, f, caucasian, student	splenda, sweet n low	No	Rare ly	Rare ly	Strongl y	Inbetw een or	Inbetw een or	Certai nly	quad

						Unsure	Unsure	would use	
21, female, white, student	Aspartame (Nutra-sweet), sucralose (Splenda), sweet and low,	No	Never	Never	Do not believe	Don't believe	Do not believe	Would not change my opinion	No. Artificial sweeteners cause me to have an upset stomach.
18, male, indian, student	aspartame, stevia, splenda, sucralose	No	Rarely	Never	Inbetween or Unsure	Strongly	Very strongly	Would not change my opinion	yes, fountain or campus center with advanced notice
21,Male,White,Full-time student	Splenda	No	Rarely	Daily	Do not believe	Strongly do not believe	Inbetween or Unsure	Would not change my opinion	Campus Center
	aspartame, saccharin	No	Never	Never	Inbetween or Unsure	Very strongly	Strongly	Certainly would not use	DAKA
		I'm not sure	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Do not believe	Would probably use	
		No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	no
21, F, Caucasian, student	spelenda, equal, truvia, nutrasweet, sweet and low	Yes	Daily	Daily	Inbetween or Unsure	Strongly do not believe	Inbetween or Unsure	Would not change my opinion	No Thanks
19, female, white, student	aspertame, sucralose, spelenda	Yes	Daily	Daily	Inbetween or Unsure	Don't believe	Do not believe	Would probably use	wedge dinner time
19,male,white,student	Aspartame, splenda	Yes	Daily	2-4 Times a week	Do not believe	Inbetween or Unsure	Strongly	Would not change my opinion	no, but campus center is most convenient
19, male, student	splenda, sweet&low	Yes	Daily	Rarely	Inbetween or Unsure	Don't believe	Strongly	Would not change my opinion	sure, anywhere on campus
19, Female, White, Student	Sucralose, Aspartame	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would use	No thank you.
19, female, white, student	sweet & low, splenda, truvia,	No	Never	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Would probably use	
18,male,white,student	splenda	I'm not sure	Rarely	Never	Inbetween or Unsure	Inbetween or Unsure	Very strongly	Certainly would use	no
19,male,student athlete	in diet sodas	No	2-4 times per week	Rarely	Do not believe	Don't believe	Very strongly	Would not change my opinion	no
21, male, student	splenda	No	Rare	Nev	Inbetw	Inbetw	Inbetw	Would	NO

			ly	er	een or Unsure	een or Unsure	een or Unsure	not chang e my opinio n	
23, yes, none of your business	red#4	I'm not sur e	Rare ly	Rare ly	Inbetw een or Unsure	Inbetw een or Unsure	Strongl y	Would not chang e my opinio n	no
20, F, white, student	sweet'n'low, equal	No	Rare ly	Nev er	Inbetw een or Unsure	Inbetw een or Unsure	Strongl y	Would proba bly use	No
22, Asian, Student		Ye s	2-4 time s per wee k	2-4 Tim es a wee k	Do not believe	Strongl y do not believe	Do not believe	Would proba bly use	
18, Male, White, Full Time Student	Splenda, Equal, sweet n low	No	Nev er	Nev er	Inbetw een or Unsure	Don't believe	Strongl y	Certai nly would not use	Yes Campus Center
19, male, white, student	Nutrasweet, Sweet N' Low, Splenda	Ye s	Dail y	Rare ly	Inbetw een or Unsure	Don't believe	Inbetw een or Unsure	Would not chang e my opinio n	
james rehberger, male, white, student	sweetnlow	No	Once a wee k	Rare ly	Do not believe	Don't believe	Inbetw een or Unsure	Would not chang e my opinio n	no
18, female, white, student	Splenda	No	Rare ly	Once a wee k	Inbetw een or Unsure	Don't believe	Inbetw een or Unsure	Not sure at this time	No
21, male, white, student	aspartame	No	Rare ly	Rare ly	Inbetw een or Unsure	Inbetw een or Unsure	Inbetw een or Unsure	Certai nly would not use	
21, Female, caucasion	splenda, zero calories	No	Nev er	Rare ly	Strongl y	Strongl y	Strongl y	Would not chang e my opinio n	Campus center
21, male, white, student	sucralose? (i think)	No	Rare ly	Rare ly	Inbetw een or Unsure	Inbetw een or Unsure	Inbetw een or Unsure	Would not chang e my opinio n	no interest
		No	Rare ly	Nev er	Very Strongl y		Very strongl y	Would proba bly use	No I dont want to risk reprogramm ing my body.
20, female, caucasian, student	splenda, sweet and low	No	Rare ly	Rare ly	Inbetw een or Unsure	Inbetw een or Unsure	Inbetw een or Unsure	Would proba bly use	sure, campus center
21, female, student		No	Rare ly	Rare ly	Do not believe	Don't believe	Inbetw een or Unsure	Would proba bly use	no
	Aspertame	No	Dail y	Dail y	Strongl y do not believe	Strongl y do not believe	Do not believe	Certai nly would use	Campus Center
19, male, human, person	...	I'm not sur	Rare ly	Nev er	Inbetw een or Unsure	Inbetw een or Unsure	Strongl y	Would proba bly	no thank you =)

		e						use	
22, Male, White, Student	Splenda and Equal	Yes	Daily	Daily	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Yes, Campus Center
22, M, white	aspartine	No	Rarely	Rarely	Very Strongly	Very strongly	Very strongly	Certainly would not use	artificial sweetners taste bad
18, Male, Asian, Student	Splenda, aspartame,	No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	DAKA
19, male, south asian, student	splenda	Yes	Rarely	Rarely	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would probably use	
21,M, Indian, Student	Splenda	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	Campus Center
44, male, professor	saccharin, nutrasweet, equal,	Yes	Once a week	2-4 Times a week	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
	nutrasweet, splenda, sweet & low	Yes	Daily	Daily	Do not believe	Don't believe	Inbetween or Unsure	Certainly would use	campus center
	sweet n low, aspartame,	No	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	
female, age 44, white, dept. head at WPI	sweet and low, splenda, equal,	Yes	Daily	Once a week	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Would not change my opinion	yes, campus center
65, male, white, WPI prof	none	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	no
55 male caucasion Facility manger	Splenda, Sweet & low, Stevia	No	Never	Rarely	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not use	In the wedge.
59, M, Caucasion, Marketing and Communications	Splenda, Sweet 'N Low	No	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Would probably use	Not interested
33, M, Educator	NutraSweet, High Fructose Corn Syrup, Splenda	No	Rarely	Never	Very Strongly	Strongly	Inbetween or Unsure	Would not use	No
34, M, Caucasion	Splenda, NutraSweet, Equal, Truvia, Sweet and Low, Sunett	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Not sure at this time	Campus Center
		Yes	Daily	Daily	Strongly do not believe	Strongly do not believe	Strongly do not believe	Would not change my opinion	
		Yes	Daily						

	splenda, nutrisweet	No	Rarely	Rarely	Do not believe	Don't believe	Do not believe	Not sure at this time	campus center
48, female, caucasian, professor	aspartame, saccharine,	No	Never	Never	Strongly do not believe	Don't believe	Do not believe	Certainly would not use	No
50+, Male, Professor	saccharin, aspartame,		Rarely	Rarely	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	
48 - female - white - staff/clerical	equal - nutrasweet -	Yes	Daily	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	no thankyou
55, f, w, professor	aspartame	Yes	2-4 times per week	2-4 Times a week	Strongly do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	no
49, male, white dude, professor	the pink stuff and the blue stuff	No	Never	Never	Do not believe	Don't believe	Do not believe	Certainly would not use	no
63,M,W,consultant	aspartame, saccharin	Yes	Daily	2-4 Times a week	Inbetween or Unsure	Don't believe	Do not believe	Would not change my opinion	Don't work on site
19 female white student	surcose, honey, fructose	Yes	Daily	Daily	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would probably use	yes, campus center
58, M, White, Prof.	Sweet & Low, Splenda	Yes	Daily	Daily	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center
18, male, white	splenda	Yes	2-4 times per week	Daily	Strongly do not believe	Strongly do not believe	Do not believe	Certainly would use	Fountain
24, Female, White, Fundraiser	Splenda, sweet n low, equal, aspartame (used in sweetners I mentioned as well as other food and drink)	Yes	Daily	Daily	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	Yes, Campus Center
17, Female, Caucasian	Saccharin, Aspartame,	I'm not sure	2-4 times per week	2-4 Times a week	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	
female	splenda	No	Rarely	Rarely	Inbetween or Unsure	Inbetween or Unsure	Very strongly	Certainly would not use	no
23, female, engineer	aspartame (sweet n low) and sucralose (splenda)	Yes	Daily	2-4 Times a week	Strongly do not believe	Strongly do not believe	Do not believe	Would not change my opinion	no thank you
	aspartame	Yes	Daily	Daily	Do not believe	Inbetween or	Do not believe	Would not	no

						Unsure		change my opinion	
46 Male Caucasion Management	Sweet & Low Saccharin Equal Splenda	No	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Do not believe	Would not change my opinion	Campus Center
17, female, caucasian, Library page	Domino, Sweet & Low, Splenda	No	Once a week	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	Campus Center or Wedge
31, male, white, professor	saccharin, splenda, aspartame	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	campus center
	splenda, equal, sweet and low, aspartame	Yes	Daily	Daily	Do not believe	Don't believe	Do not believe	Certainly would use	
63, male, professor	aspartame, splenda, and a bunch of others whose names I forget	No	Never	Rarely	Inbetween or Unsure	Inbetween or Unsure	Strongly	Certainly would not use	No
	diet coke, coffee sweetener	Yes	2-4 times per week	2-4 Times a week	Strongly do not believe	Strongly do not believe	Do not believe	Would not change my opinion	no
	nutrasweet,equal, splenda, sweet & low	Yes	Daily	Once a week	Do not believe	Don't believe	Inbetween or Unsure	Would not change my opinion	No
62, female, professor	stevia, aspartame, Equal, Sweet n Low	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Certainly would not use	No - I won't eat them. Sorry.
29, male, white, professor	splenda - sucralose	No	Rarely	Rarely	Strongly do not believe	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center
49, female, white, office worker	Cyclamates, saccharine, nutrasweet, stevia, splenda	Yes	2-4 times per week	Rarely	Very Strongly	Very strongly	Inbetween or Unsure	Would not use	No thanks...
54, female, caucasian, administrative assistant	sweet 'n low, nutrasweet	No	Rarely	Rarely	Do not believe	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	
	splenda, sweet & low, equal	No	Once a week	Rarely	Inbetween or Unsure	Don't believe	Do not believe	Would probably use	Gateway
31, M, White, Postdoctoral researcher	Equal, Steriva, Sweet 'n' Low, Splenda, Saccherin	Yes	2-4 times per week	2-4 Times a week	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Would not change my opinion	Campus Center or Gateway Park
22, female, grad student	aspartame	No	Rarely	Rarely	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Not sure at this time	

57, male, white / caucasian, computer scientist	Saccharin, cyclamates, aspartame / Nutrasweet, Splenda	Yes	Daily	Daily	Strongly do not believe	Don't believe	Strongly do not believe	Would not change my opinion	Campus Center
37, male, white, professor	saccharin, splenda, ace-k, aspartame, cyclamates,	No	Never	Never	Strongly	Don't believe	Do not believe	Not sure at this time	
52, M, White, Professor	Nutrasweet, Sweet N Low, Aspartame, Cyclamate, Splenda	No	Never	Never	Strongly do not believe	Don't believe	Inbetween or Unsure	Not sure at this time	no
Male, 20, White, Student	Equal, TruVia, Aspartame, Cyclamate, PureVia, Splenda	No	Rarely	2-4 Times a week	Inbetween or Unsure	Don't believe	Strongly	Would probably use	Yes, campus center.
26 female caucasian engineer	splenda, equal, astevia, sweet and low	No	Never	Never	Inbetween or Unsure	Inbetween or Unsure	Inbetween or Unsure	Not sure at this time	
Age 38; female; caucasian; higher ed administration	Saccharine, stevia, aspartame, sucralose	Yes	Daily	Daily	Inbetween or Unsure	Don't believe	Inbetween or Unsure	Would not change my opinion	Campus Center