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# Sweet Tooth Cookies

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A with Honors Research Project

DHG 233 - Dietary Analysis  
and Preventive Counseling

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## Sweet Tooth Cookies

Everyone has a passion for different things, and most people have multiple passions. For a long time now, people have joked with me and said that two of mine conflict with each other, but I disagree. You see, I love to bake. Many people find baking difficult and stressful, but I find it therapeutic and wonderful. I can spend hours baking something intricate and thoroughly enjoy the process, and I find it relieves my stress. The fact that at the end I have something yummy to eat and share with others is just



Original Toll House Chocolate Chip Cookies

an added bonus. One of my other passions deals with teeth and having a healthy mouth. I spent most of my undergraduate career planning to become a dentist, and in the end made a slight direction change towards becoming a dental hygienist. I did this because I felt that dental hygienists were able to focus more on prevention and public health which I loved. So, here I am wanting to spread the word about keeping your teeth healthy and the fact that eating sugar can give you cavities, and yet I absolutely love baking these sugary treats. I always tell people that as long as you brush and floss your teeth, get your fluoride, and drink water after you have dessert you'll be fine, but even still the conflicting interests made me think. Could you have a dessert that's good for your teeth? There are certain foods which people say are good for your teeth (at least in comparison to others), but could you make a sweet dessert? It would be a challenge, but it was one that I was up for.

First I analyzed a traditional cookie. Though there are many varieties of cookies, I chose to use the classic Nestle Toll House recipe as my example as it is very well known, has been around for many years, and is often made at home.

The classic Nestle recipe includes 10 different ingredients: all-purpose flour, baking soda, salt, butter, granulated white sugar, brown sugar, vanilla extract, eggs, semi-sweet chocolate chip morsels, and chopped nuts. These ten ingredients are combined to become a cookie that is considered wonderful by so many, but also one that is universally considered unhealthy. The terms healthy and unhealthy are very broad terms, and often subjective. Some people may be more concerned with an item's fat content more than its sugar content, while others worry about

the amount of sodium or vitamins and minerals. One thing that I am concerned with, is whether or not a food item is healthy for the teeth.

Now, let's get something straight. Very few foods are completely good for your teeth. Even if a food is systemically good (providing calcium, fluoride, or other beneficial nutrients), it may be harmful while in the oral cavity. Many foods and drinks cause the oral pH to drop, and if it drops too low the enamel of the teeth will begin to demineralize. Sugary foods are some of the worst, as the bacteria in the oral cavity feed on them and produce acid, which in turn lowers the pH.

Knowing this, I knew I would first have to eliminate sugar. There are many sugar



alternatives used in baking today. Several are non-caloric options for those who are worried about having too many calories throughout the day, and they are also perfect for diabetics. I would be using a very special sweetener, called xylitol. Xylitol is becoming well known and is being used in certain gums and candies because it has been found to be good for your teeth. Xylitol inhibits mutans streptococci, reduces plaque formation and bacterial adherence, and inhibits demineralization. All of these benefits reduce the risk for caries (dental term for tooth decay), which is very important since caries is the number one disease found in children.

Using xylitol is already a big improvement, but I didn't want to stop there. I wanted to see if any of the other ingredients could be changed to make this new cookie even more beneficial. The baking soda can stay. Baking soda will actually help produce a more alkaline product, which is exactly what we want. It should be noted that some people use baking powder rather than baking soda in their recipes. Baking powder is baking soda with cream of tartar added. Baking powder tends to make baked goods fluffier, which is great, but since cream of tartar is acidic, we will be sticking with baking soda. I would also be keeping the salt. Salt has a neutral pH and should not affect the overall pH of the cookie. Many people worry about getting too much salt in their diet, but the amount of salt in the recipe is reasonable and could always be eliminated if it was a real concern. I also kept the vanilla extract. Made from vanilla beans and alcohol (which will evaporate out when cooking), there are no real benefits or drawbacks that I

could see from keeping it in the recipe. It adds so much nice flavor that I really didn't want to take it out.

This left me with five ingredients left to evaluate; flour, butter, eggs, chocolate chips, and chopped nuts. Chopped nuts are actually great. They are considered a good snack in general, and also good in regard to the teeth specifically. Because of this, I will actually be increasing the amount of nuts in the recipe. Also, the recipe is vague and simply says "nuts" rather than denoting a specific type. I will be using almonds and walnuts as that is where I believe we will see the most benefit. Almonds contain (among other things) calcium, magnesium, phosphorus, and manganese, all of which are good for building strong teeth. Walnuts contain magnesium and phosphorus, and even more manganese. Both nuts also contain a good amount of protein, which is used by the body for growth, maintenance, and repair of tissues.

Chocolate chips couldn't be good. After all, they have sugar in them. However, one company (that I have found in stores) makes sugar free chocolate chips! While chocolate chips aren't essential, they add a very appealing gooey factor to a dessert, and I was so excited to be able to include the sugar-free chocolate chips in order to increase the chances that people will like these cookies. The chocolate chips do not contain xylitol, but a different sugar alcohol which does not contribute to tooth decay. If you cannot find sugar free chocolate chips but you still wanted to include chocolate chips, you could look for a dark chocolate chip which should contain less sugar than a milk chocolate or semi-sweet. You always have to read the labels!



Cocoa powder was something I knew I wanted to add from the beginning, having discovered its benefits. While it is not in my example recipe (the Nestle Toll House cookies), it is often used to make double chocolate cookie varieties. Cocoa contains tannins, polyphenols, and flavonoids which all benefit the teeth by affecting the activity of the bacteria which cause decay. By including the cocoa powder, we will have a very intense chocolate-y taste, which will actually help provide a balance to the sweetness from the chocolate chips and the xylitol. One thing I learned about cocoa powder, while conducting my research, is that there are two types of cocoa powder; natural and dutch processed. This turned out to be important because the whole point of dutch processing is to make the product more alkaline, as cocoa powder is natural acidic.

One downside to dutch processing is that the process removes antioxidants (a major benefit in using natural processed cocoa). Also, when using dutch processed cocoa powder to make a baked good, you may have a different result as it will not react with the baking soda. Baking soda needs an acid in order for the leavening action to occur. However, leavening was not a main concern of mine, and in most recipes there are other forms of acid with which the baking soda can react. I ended up using a combination cocoa powder which contained both types. This way, I was making a more alkaline product, but I still had some of the antioxidants which would not only inhibit the production of plaque, but also reduce inflammation in the body and work to prevent periodontal disease.

Eggs are kind of a mixed bag. They are packed with protein and other nutrients, but they also contain cholesterol which is a big concern for those with a history of cardiovascular issues. I ended up substituting some of the egg ingredient with milk. By keeping some egg involved, I maintained some of the benefits, but decreased the drawbacks. Also, milk contains calcium and phosphorus which we need for strong teeth and bones, so I figured why not add that benefit? After further baking experimentation, I found that the egg and milk could be eliminated (giving a vegan option), but the texture was altered and less like a traditional cookie.

Eliminating butter is tricky, and since we are focusing on the health of the teeth I probably could have left it in the recipe without too many negative effects. Butter makes baked goods have such a wonderfully addictive texture, but it is full of fat and cholesterol which is bad for the body. I decided to go for an overall healthier cookie, and leave out the butter. Knowing that I would need a fat to make this cookie a cookie, I decided to replace the butter with peanut butter. Peanut butter has a different kind of fat which is better than the fat in butter, and it also contains protein and other good nutrients which butter does not have. I personally like peanut butter by itself and in cookies, but for those who don't, the cocoa powder and chocolate chips make the peanut butter flavor difficult to detect. One thing to note about the peanut butter is that I made sure to find a natural variety which contained no added sugar.



Last, there was the flour. Replacing the flour was not something I initially intended to do, but I managed to find a really great substitution. It requires a little open-mindedness, and due to this substitution I do not tell people what is in the cookies until after they taste them. I

substituted the flour with black beans. Black beans have been used in brownie recipes for several years now in an attempt to make them a little healthier. They contain calcium, phosphorus, magnesium, and manganese like the nuts, but they also contain a large amount of molybdenum. I could not find a lot of information on molybdenum, but I did learn that it is present in tooth enamel and thus its consumption may help prevent tooth decay by strengthening the tooth. There is also thought that molybdenum may increase fluoride uptake. I also included a small amount of whole wheat flour in the recipe, just to add a little whole grain to the cookie. If a person was very opposed to black beans, they could simply use all whole wheat flour.

There you have it! All ingredients replaced or eliminated. The end result was a cookie that was very moist, full of chocolate-y flavor, and surprisingly good for your teeth and your whole body.

My goal with this project was to change the way some people look at desserts and the art of baking. If you are open-minded and willing to do some research and experimenting, your favorite desserts can become much better for you. You have to be flexible. They may not taste exactly the same, and they may go in a different direction, but why not try? If you like the end result, great! If you don't, go back to what you've always done. In the end you have to decide if you're willing to sacrifice tradition, and maybe a specific flavor, for the health of your body. In this case, I focused on the health of my teeth, and though my end cookie is different than the one I started with, it's worth the change to me. So, next time I have a party to go to, I will not be taking traditional chocolate chip cookies. I will be taking Double Chocolate Triple Nut Cookies, and no one will even know how good they are for them and their teeth until they ask what's in them.



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