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The Acid Test

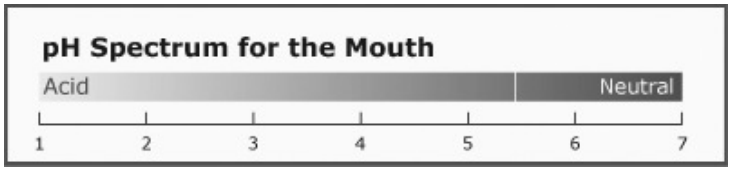
Over the last several years, medical research has increasingly demonstrated that the overall pH of our bodies can have a serious impact on our health. Certainly there are places where acid is appropriately utilized in our systems, like the stomach. For the rest of the body, however, a neutral or slightly more alkaline environment tends to promote the healthiest physical responses. This is especially true in the mouth, where an acidic environment can wreak havoc on the health of your teeth in a relatively short period of time. But how does a mouth become acidic and what can you do about it?

Most of us understand that a diet filled with excess sugar and highly refined carbohydrates will most certainly promote tooth decay, but it isn't the sugar that's eating away at your teeth. It's acid. The pathogenic bacteria that live in your mouth all the time thrive on sugar and simple carbohydrates. As they feed, they reproduce and begin to release acid as a by-product. This acid is what eats into the enamel of your teeth and promotes decay. It also contributes to overall lowering of your saliva pH. The lower the pH in your mouth, the more the bacteria thrive, releasing more and more tooth-destroying acid. Excess dietary sugar and simple carbohydrates combined with poor oral hygiene habits can destroy a mouth by creating a chronically acidic environment, but this is not the only way your mouth can become acidic.

Many processed foods and beverages on the market today are enhanced in flavor and shelf-life with additives like acetic acid, ascorbic acid, citric acid, lactic acid, and phosphoric acid. Some of these acids, like lactic and citric acid, occur naturally in many fruits, some vegetables, and in dairy products. But as food additives, these ingredients are generally more concentrated and added in larger amounts than would naturally occur in the piece of fruit or glass of milk you might have for a snack.

Consuming too many foods and beverages that contain commercially added acids on a regular basis is dangerous for your teeth on two levels: the acid itself will eventually begin to dissolve your teeth, but it will also create the perfect breeding ground for pathogenic oral bacteria to grow and produce even more acid. There are hundreds of different kinds of bacteria that live in the mouth, many of which are good for you. It just so happens that all of the bacteria that promote decay and disease in the mouth thrive in an acidic environment, and the good bacteria that can aid in digestion and help the immune system require a neutral pH in order to multiply effectively. What you choose to eat and drink can have a profound effect on the balance of these bacteria, and can often be the tipping point between health and disease in the mouth.

Understanding the pH Spectrum



The effects of acid on the teeth have been studied for many years, and it is generally agreed upon that any food or beverage at a pH of 5.5 or lower has the potential to promote enamel erosion in people whose teeth are highly susceptible to decay. Foods and beverages at a pH of 4.0 or lower will promote enamel erosion in just about everyone. Many of us consider this kind of erosion in terms of the soda, citrus juice, and sports drinks we consume. These acidic beverages are certainly a source of a great deal of dietary acid, but there are many other sources of acid exposure. For example, people who suffer from acid reflux or bulimia often show signs of accelerated enamel loss because of the teeth's regular exposure to stomach acid.

Stomach acid is of course extremely corrosive to the body anywhere outside of the stomach. The soft tissues of the throat and mouth, as well as the teeth are especially vulnerable to

Understanding the pH Spectrum (cont'd)

stomach acid exposure. If you've ever had the stomach flu, you've certainly felt the burn of stomach acid in your throat and mouth before and known instinctively that it doesn't belong there. But what many people do not know is that the rise in popularity of extremely sour candies has created foods that are not only high in sugar, but are also at or below the pH of stomach acid.

pH Values for Sour Candy*

	pH
pH at which teeth decalcify	**4.0**
Spree®	3.0
Sweetarts®	3.0
Sour Gummi Bears®	3.0
X-treme Airheads®	3.0
Sour Punch Straws®	2.5
Wonka Laffy Taffy®	2.5
Starburst®	2.4
Sweet Tarts Shock®	2.4
Lemon Heads®	2.4
Mentos Fruit Chew®	2.4
WarHeads Sour Rips Roll®	2.3
Zours®	2.2
Sour Skittles®	2.2
Stomach Acid	**2.0**
Airheads Cherry Chew®	2.0
Wonka Nerds Grape®	2.0
Now and Later Cherry Chew®	1.9
Wonka Pixy Stix Powder®	1.9
Altoids Mango Sours®	1.9
Wonka Fun Dip Powder®	1.8
Warheads Sour Spray®	1.6
Battery Acid	**1.0**

**pH data generated by John Ruby, Betsy Brown, Brandon Wesley,Stephani Momeni, and Mike Vann, Department of Pediatric Dentistry, The University of Alabama at Birmingham.*

These products pose even more danger to the teeth than a highly acidic beverage might because many of them are sticky. Gummy candies catch in the cracks and spaces between the teeth, feeding bacteria and eating away at the enamel continuously. Dried fruit and fruit leathers are similar in their sticky nature, and many are preserved with citric acid. These candies and "fruit snacks" may be tasty and lower in fat and calories than a chocolate candy, but they are far more damaging to your teeth. Adults should consume them rarely, if at all, and children should eliminate them completely.

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How to Protect Your Teeth

Acidic damage to the teeth is cumulative. Even if you do not have outright cavities from an overexposure to highly acidic foods, you will still be more susceptible to decay than someone who did not have as much exposure. Tooth enamel does not regenerate. Once a layer has dissolved, you will not get it back. But that doesn't mean you should just throw in the towel if you think you may have been eating or drinking too many highly acidic foods. As long as there is still some enamel left on your teeth, you can protect them from further acidic damage if you make these few simple adjustments to your diet and home-care regimen.

- Drink milk, water, or coconut water instead of soft drinks, sports drinks, coffee drinks, and energy drinks.
- Watch out for commercially added acids and sugars in all the processed foods and beverages you consume. Make an effort to reduce or eliminate these ingredients from your diet.
- Give up as many sweets as you can – especially the sour and sticky ones.
- Watch out for those highly refined carbohydrates found in most white breads and cereals. Replace them with whole grains, and don't be fooled by packages that proclaim "9 Whole Grains in Every Serving". Read the ingredients and decide for yourself.
- Make sure you brush and floss your teeth both regularly and correctly.

Your dentist may also have some suggestions for prescription rinses or other products that are designed to balance the pH of the mouth in cases where oral bacterial growth may be difficult to control. Committing to one or two small changes each week or month can add up to a huge difference in the health of your teeth and gums over time, and will be an important step in helping you to keep the teeth you have for the rest of your life.

Long-Term Medications and Chronically Dry Mouth

One of the most common side effects of long-term medication is dry mouth. Lack of saliva on its own will create a more acidic environment. Unfortunately, many individuals try to combat dry mouth by sucking on candy or sugar-filled mints throughout the day. This is a double-whammy for your teeth: sugar plus acid almost always equals tooth decay.

Teeth are already slightly damaged from wear or recession are at an even greater risk of decay in this situation. Once the enamel has worn away enough to expose the dentin underneath, the process of decay increases rapidly. Toothaches and infections that may necessitate root canal treatment or even tooth extraction are often the result.

If you suffer from dry mouth, make sure that any candy, mints, or gum you use to increase saliva production are sugar-free. Specifically, look for products that contain xylitol which is the only sugar alcohol clinically proven to help balance pH in the mouth and help prevent cavities.

The Acid Test at Home

You can easily test the pH of your saliva at home to determine if it might be chronically acidic. Simple and safe pH test kits are widely available online and in natural food stores. These kits may also be used to test the pH of any beverage you drink on a regular basis.

If your saliva regularly tests below 5.5 and you consume several highly acidic foods or beverages per day, you should consider making several of the dietary changes listed above, and consult your dentist about the possible need for further treatment.

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