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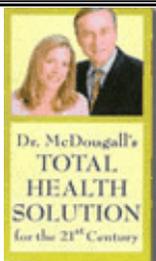
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January, 2002 Vol. 1 No.1

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Dr. John McDougall, MD

Halitosis Is More Than Bad Breath

This article begins a series exploring the health of your intestinal tract. Consider the strongest contact with the world around you is through your food, processed and absorbed by your intestine.

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Featured Recipes

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Spicy Vegetable Bean Dip
Vegetable Salad

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Halitosis is More Than Bad Breath

This article begins a series exploring the health of your intestinal tract. Consider the strongest contact with the world around you is through your food, processed and absorbed by your intestine.

Halitosis, also known as oral malodor and bad breath, is a common and distressing condition in which objectionable odors are present in mouth air. Between 50% and 60% of the people in Western countries suffer from this chronic condition. It is usually due to bacteria decomposing proteins in the mouth and the large intestine, a process called microbial putrefaction, generating malodorous *gaseous sulfur compounds*, which contain *dihydrogen sulphide* (H₂S) and *methyl mercaptan* (CH₃SH). These sulfur compounds are major members of a family of gases known to be offensive in very low concentrations.¹ Although most patients perceive this condition as primarily a cosmetic problem, an increasing amount of evidence shows that extremely low concentrations of many of these compounds are highly toxic to tissues. These sulfur gases, especially methyl mercaptan, play a role in causing inflammatory conditions such as periodontitis (inflammation of the tissues surrounding and supporting the teeth).² Periodontal disease has been associated with other serious illness, including heart disease.³ These sulfur gases are also involved in inflammation of other cells lining the intestinal tract causing colitis, and occasionally, a life-threatening condition, known as ulcerative colitis.⁴

The Source of Stinking Sulfur

So what is the primary source of all of these gaseous sulfur compounds generated from decomposing proteins? They come from our food -- and primarily foods of animal origin. Of the 20 amino acids that make up all the proteins in nature, only two contain sulfur: *methionine* and *cysteine*. Proteins with the highest content of sulfur-containing amino acids are found in red meats, poultry, cheeses and all other animal-derived foods. For example, based on calories, beef provides 4 times more methionine than pinto beans, eggs have 4 times more than corn, cheddar cheese has 5 times more than white potatoes, and chicken provides 7 times more than rice.⁵ If you want to drastically cut down on your sulfur intake and improve your breath odor, then the most basic step for you to take is to change your diet to one based on starches, vegetables and fruits (without garlic and onions) – and minimize your intake of animal proteins.

Classification and Causes of Halitosis

Bodily origins of breath odor are classified as being from either the mouth and nose, or other parts of the body, referred to as a *systemic origin*.

Further classifications of halitosis include: *genuine halitosis*, sub-classified as *physiologic halitosis* (found in healthy people) or *pathologic halitosis* (the result of a disease). Physiologic halitosis may be due to food and beverage consumption, alcohol and tobacco use, unclean dentures, or from bacteria found in the mouth and other parts of the intestinal tract. Many foods can cause bad breath, especially garlic, onions, and certain spices (like curry and chili powders that contain onion and garlic).

Causes of pathologic halitosis in the mouth and nose areas are: sinusitis, gum disease (gingivitis, periodontitis), an abscessed tooth, food impaction, or a foreign body in the nose (in the case of a child). Causes of halitosis from diseases that affect the rest of the system include: kidney failure, liver failure, bowel obstruction, diabetes, and a metabolic condition known as fish-odor syndrome (trimethylaminuria).

If halitosis does not exist but the patient believes that he or she has oral malodor, the diagnosis would be *pseudo-halitosis*.

Diagnosing Halitosis

Testing for sulfur gases in the mouth using a gas chromatography is the most accurate method to make the diagnosis of halitosis. This is a large and expensive machine found in clinical and research laboratories. There is also a portable sulfide monitor, called a *Halimeter*, that some dentists use in their

office practice to measure the levels of sulfur compounds in a patient's breath. More commonly the diagnosis is made by the unsophisticated method of the doctor or dentist smelling the person's exhaled breath. An informal diagnosis might also be made by close friends. However, it is difficult for a person to smell his or her own breath because we become used to our own personal odors.

Origin of the Mouth-Produced Odors

In the mouth, bacteria feeding on various substances release airborne compounds that cause bad breath. These are primarily *anaerobic bacteria*, which means they prefer to live without oxygen. The greatest concentration of these bacteria is on the back part of the top of the tongue.

Another common breeding ground for these anaerobic odor-producing bacteria is in the infection and inflammation of the gums and tissues surrounding the teeth -- conditions known as gingivitis and periodontitis (pyorrhea). These diseases are usually painless but swelling, bleeding, halitosis and foul taste are common. Pus and debris can be expressed from the pockets and the teeth may be loose.

Treatment of Mouth-Produced Odors

Because much of the malodor comes from the tongue's surface, cleaning the tongue is more important than rinsing the mouth. The tongue coating consists of dead and dying epithelial cells, blood cells and bacteria. More than 100 bacteria may be attached to a single epithelial cell on the top of the tongue, whereas only about 25 bacteria are attached to each cell in other areas of the oral cavity.⁶ Hence, cleaning the tongue is a very effective measure for improving physiologic halitosis.⁶ An infant toothbrush or a tongue scraper works best for this purpose.

You can buy tongue scrapers for \$2 to \$23. Here are some sites where you can look for tongue scrapers:

<http://toothandgum.com/>

<http://www.sakool.com/products.htm>

<http://www.orasweet.com/scraper.html>

<http://www.orasweet.com/scraper.html>

Mouthwashes mostly cover up odor and result in a temporary solution at best. Most products have only the manufacturer's claim to support their efficacy. Research suggests mouthwashes containing zinc, chlorhexidine, and hydrogen peroxide are effective in reducing mouth odor. However, the side effects of chlorhexidine mouthwash include tooth stains and allergic reactions, and the oxidative activity of hydrogen peroxide might be harmful to the mouth's soft tissues. Therefore, a mouthwash containing zinc would be preferable.⁶ Zinc inhibits odor by attaching to and neutralizing sulfur compounds.

The most effective oral health care mouthwashes contain substances that have the ability to directly oxidize gaseous sulfur compounds to non-malodorous products. Two such agents are *chlorite anion* and *chlorine dioxide*, and the latter is also a powerful killer of odor-producing bacteria.⁷ Examples of this type of mouthwash are:

CloSYSII Mouthwash at \$24.95 per bottle, which may be ordered at

<http://www.saveyoursmile.com/products/fb/kit.html>

or call (888) 309-1326, and

DioxiRinse Mouthwash at \$16.95 a bottle at

<http://frontierpharm.com/ushop/>

or call (800) 767-3486.

Disease conditions in the mouth must also be treated to remove odors. Leaking and broken fillings must be repaired (I recommend porcelain and plastic rather than mercury amalgams). Periodontal disease needs to be cured with visits to the dental hygienist every 3 to 4 months, meticulous flossing and a healthy plant-based diet. I have seen people change their pockets from 6mm to 2 mm depths in less than 4 months by using all three of these recommendations.

Morning breath is a particularly bothersome problem for most people. This may be because the bacteria that cause the odors like to live without oxygen (anaerobic), so with the mouth closed during sleep, these bacteria thrive. A recent study evaluated these techniques: no treatment, brushing the teeth with toothpaste, brushing the tongue, rinsing with 5 ml of 3% hydrogen peroxide, eating breakfast, or swallowing two BreathAsure capsules for morning breath.⁸ The breath air samples were analyzed for sulfur-containing gases with gas chromatography. Brushing the teeth or ingestion of BreathAsure had no influence on the sulfur gases. Ingestion of breakfast and tongue brushing resulted in strong trends toward decreased sulfur gases. Hydrogen peroxide significantly reduced the sulfur gas concentrations for eight hours.

Large Intestine-Produced Mouth Odors:

Bad breath also comes from the putrefaction of food proteins into sulfur gases in your large intestine.⁹ These gases are absorbed through the intestinal wall into the blood stream where they circulate until they reach the lungs and are eliminated into the breath. An investigation of the "gut versus mouth" origin of odoriferous breath gases was recently performed utilizing the sulfur-containing gases of garlic to identify the source of these substances.¹⁰ Five individuals each ingested 6 grams of garlic, and sulfur gases in mouth, lung air, and urine samples were measured. They found that breath odor after garlic ingestion initially originates from the mouth and subsequently from the gut.

There is abundant evidence that gases produced by the microflora of the gut, such as hydrogen and methane, are efficiently absorbed into the blood flow that drains the intestine and are then excreted into the expired air.¹¹ Cleaning of the oral cavity would not be expected to reduce the breath concentration of gases derived from the gut. The only way to reduce this source of sulfur gas is to decrease your intake of sulfur-containing amino acids, which means avoiding animal products and a few plant foods, like garlic and onions. (Garlic and onions do not produce the highly toxic methyl mercaptan, and would not be expected to cause tissue damage.¹⁰)

Eliminating Halitosis

Now you understand the causes of bad breath and you can remedy your situation by making changes which are free, easy, and without side-effects.

10 Steps to Fresher Breath:

- 1) Change to a starch-based diet
- 2) Minimize intake of animal products (high sulfur)
- 3) Avoid garlic, onions and strong spices
- 4) Avoid use of tobacco, coffee and alcohol
- 5) Use a tongue brush or scraper daily
- 6) Floss teeth at least daily
- 7) Brush teeth frequently
- 8) See your dentist to repair teeth
- 9) See your hygienist every 3 to 6 months for a cleaning

10) As a last resort, use a chlorine dioxide mouthwash

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Vegetarians Live Longer

In a study titled **Ten Years of Life. Is It a Matter of Choice?** By Gray Fraser in the July 9, 2001 issue of the *Archives of Internal Medicine* found that Seventh Day Adventists, who overall have healthier habits, have a longer life expectancy at the age of 30 years than does the average American.¹ Men lived 7.28 years and women 4.42 years longer. This gives Adventists a higher life expectancy than any other formally described population. Diet, body weight, exercise, cigarette smoking and hormone replacement therapy (HRT) all play a part in these benefits.

The study looked at 34,192 non-Hispanic white Adventists of at least 30 years of age. The dietary breakdown of the group showed 27.5% of men and 30.9% of women were vegetarians (meat less than 1 time a month); 19.3% of men and 22.9% of women were semivegetarians (meat less than once per week) and 53.2% of men and 46.2% of women were non-vegetarians. A history of past cigarette smoking was found in 32.4% of men and 13.1% of women. About half the women used HRT.

The vegetarian men and women had some of the best results with an expected age of death at 83.3 and 85.7 years, respectively. That is 9.5 and 6.1 years longer than the average Californian lives.

COMMENT: Lifestyle choices will make a difference. Unfortunately, we seldom realize this until we have lived to a respectable age. I have often heard, "If I would have known that I was going to live this long, I would have taken better care of myself." In addition to living longer there is documentation that these Adventists live healthier – they have fewer chronic diseases, fewer hospital stays, and take less medication. There is nothing genetically special about these people, and they are exposed to similar levels of pollution and risks of infection as other Americans. Therefore, the simple answer is to practice what most of us already know as true – a healthy diet and lifestyle.

I am not an Adventist, but I have worked at Adventist hospitals all of my medical career. I now run the McDougall Program at St. Helena hospital, an Adventist Hospital, in Deer Park, California. My experience has led me to believe that these people are, overall, healthier and happier than the general population. Many have fallen away from the dietary practices taught by their founder, Ellen G. White, and it shows. However, most know what the truth is about vegetarian diets and they are generally very receptive to the McDougall message on healthy eating.

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Immediate Harm From One Fatty Meal

A study titled **Post-prandial remnant lipids impair arterial compliance** by Paul J. Nestel in the February 2001 issue *Journal of the American College of Cardiology* found a 27% decrease in arterial compliance after a single meal consisting of 67% of the calories as fat.¹ The study fed 16 subjects (with various initial cholesterol and triglyceride levels) a meal consisting of a ham and cheese sandwich, buttered bread, whole milk, and ice cream.

Their results were compared to 20 subjects who ate a diet containing 10% of the calories as fat (breads, breakfast cereal, fruit, low-fat milk, and spreads). No impairment on arterial wall compliance was seen with the low-fat feeding. The compliance was determined by ultrasound measurements over the ascending aorta (large artery leading from the heart) and the right carotid artery (neck). This single meal caused no significant change in average blood cholesterol (total, LDL, or HDL).

COMMENT: Compliance of the blood vessel is the ease with which the vessel wall expands with the change in blood pressure in the artery as the heart beats. Stiff arteries cause the blood pressure to rise and act as one mechanism causing hypertension. The top number in a blood pressure reading (systolic pressure) is affected more with impaired compliance than the bottom (diastolic) number. Decreased compliance may also lead to permanent damage to the structural components of the artery wall (fractures of the elastic lamellae). Impaired compliance of the artery walls also predicts a greater risk of carotid artery closure, stroke, and death from all causes.

By coincidence, that same amount of fat (67% of the calories) was fed to people in different experiments in the early 1950s.² These researchers found that fat caused the circulation to sludge. Before the fat feeding, blood cells flowed easily through the blood vessels because their cell surfaces naturally repelled each other. After the meal, the cell surfaces became coated with fat, sticking the cells together and sludging the blood to a halt. This resulted in a decrease in the oxygen content of the blood by 20%.³ These overall changes raise blood pressure, cause chest pain in people with narrowed heart arteries, and produce post-meal fatigue. Thus, here are two profound and immediate adverse effects of a typical American meal on your blood vessels and circulation. This news should make everyone pause and rethink before planning a meal in or out of the home.

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Featured Recipes

White Beans Mexicali

Preparation Time: 15 Minutes

Cooking Time: 35 Minutes

Serves: 4

1 small onion, chopped
 1 stalk celery, chopped
 1 carrot, chopped
 ¾ cup water
 ½ teaspoon minced fresh garlic
 3 – 15 oz. cans white cannellini beans, drained and rinsed
 1 – 15 oz. can chopped tomatoes
 3 tablespoons chopped green chilies
 ¾ cup vegetable broth
 1 teaspoon chili powder
 ½ teaspoon ground cumin
 1/8 teaspoon crushed red pepper
 2 cups chopped fresh spinach
 hot sauce to taste (optional)

Place onion, celery, carrot, water and garlic in a medium sauce pot. Cook over medium heat for 10 minutes. Stir occasionally. Add beans, tomatoes, green chilies, vegetable broth, chile powder, cumin and crushed red pepper. Cook over low heat for 20 minutes, partially covered. Add spinach and cook for 3 minutes. Season with hot sauce to taste. Serve over rice.

Hint: This freezes well and reheats easily in a microwave.

Spicy Vegetable Bean Dip

Preparation Time: 20 minutes

Chilling Time: 1 hour or more

Serves: 6-8

Mix sauce:

2 tablespoons red wine vinegar
 2 teaspoons Tabasco Sauce
 ½ teaspoon bottled minced garlic
 Several twists of freshly ground pepper

Mix in large bowl:

1 avocado, peeled and chunked
 1 – 15 oz. can pinto beans, drained and rinsed
 1 ½ cups frozen corn kernels, thawed
 3 green onions, chopped (1/2 cup)
 1 tomato, chopped
 1/3 cup chopped fresh cilantro

Fat-free tortilla chips

Pour sauce over beans and vegetables – mix well. Serve with chips.

Hint: You can also use other kinds of beans such as white beans, kidney beans and/or garbanzo beans. This dish needs to be served the same day it is made.

Vegetable Salad

Preparation Time: 20 minutes

Serves: 4

4 cups torn lettuce leaves
1 tomato, chopped
1 stalk celery, chopped
1 green onion, chopped
½ cup chopped English cucumber
1 small avocado, peeled and chopped (optional)
3 radishes, finely chopped
3 tablespoons orange juice
1 tablespoon lime juice
¼ teaspoon chili powder
¼ teaspoon ground cumin
2 tablespoons finely chopped cilantro
4 ounces smoked, baked tofu, chopped

Combine vegetables in a large bowl.

Mix juices together, whisk in chili powder and cumin. Add cilantro and mix again. Add tofu to vegetables, pour dressing over and toss to mix. Let rest 2 minutes, toss again and serve.

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