

## Where Do Free Radicals Come From?

Free radicals and oxidative processes are a natural consequence of living in an atmosphere that is nearly 21% oxygen. Everyday we are exposed to varying amounts of free radicals. We simply cannot avoid them. This information is not intended to frighten you. It just points out that free radicals are a natural part of life. That is why our bodies are equipped with antioxidants that are specifically designed to keep free radical activity at a manageable level. Under normal circumstances, our antioxidant defenses do a fine job of regulating oxidative processes to minimize oxidative damage. A problem only arises when we are in a chronic state of oxidative stress, where antioxidant defenses cannot keep up with the activity of free radicals.

## Free Radicals May Be Produced By:

- Air Pollution
- Asbestos
- Chemotherapy
- Heat
- Pesticides
- Smog
- Tobacco Smoke
- Alcohol
- Car Emissions
- Herbicides
- Physical Trauma
- Phenobarbital
- Solar Radiation
- Trapped Ozone
- Cured Meats
- Altitude
- Carcinogens
- Infection
- Stress
- X-rays

## How Is Oxidative Stress Measured?

When molecules are damaged by free radicals certain by-products are produced. The amounts of specific byproducts may be measured in biological samples, such as urine. Greater amounts of byproducts are associated with greater amounts of oxidative stress. F2-Isoprostanes are a class of such byproducts. Specifically, F2-Isoprostanes are byproducts of oxidative damage to arachidonic acid, one of the major lipid components of membranes within the human body. Essentially, F2-Isoprostanes represent the body's free radical damage report. 8-Isoprostane is one such compound and was measured in your urine sample for this test. Unlike other markers of oxidative stress, 8-Isoprostane is very stable and does not break down.

Once formed, 8-Isoprostane may diffuse into the blood stream and be filtered by the kidneys to appear in the urine, allowing for easy, non-invasive sampling.

## What Can I Do To Increase My Antioxidant Defenses?

There are tried and true methods to increase one's antioxidant defenses. The old adage of "diet and exercise" is your best bet for a healthy lifestyle. Fresh fruits and vegetables are rich sources of antioxidants. Eating a diet containing a variety of these foods can significantly increase one's antioxidant status and protect against the damaging prooxidant effects of free radicals. An appropriate antioxidant strategy is to ingest at least five servings of fresh fruits and vegetable each day. To obtain an adequate variety of these foods, pick fruits and vegetable of different colors (greens, yellows, purples, reds, etc.) to add flavor and color to your meals. This is not to suggest that you should avoid proteins or complex carbohydrates, quite the contrary. Just make sure that you have a well-balanced variety of foods at each meal.

Although a well-balanced diet is very important in maintaining good antioxidant defenses, some people may benefit from supplementation with antioxidants. Because of the ever increasing pace of life today, not all of us have the time to eat healthy every day, or to exercise regularly. For these people, nutritional supplementation may boost their antioxidant capacity. Remember, however, that supplements by definition, should be considered additional nutrients on top of a healthy diet, not as a substitute for a healthy one. In addition, foods contain numerous additional antioxidants that are not available as supplements.

There is an ever-growing body of evidence showing that regular exercise is an effective means of increasing one's antioxidant defenses. Exercise strengthens the antioxidant defense system by increasing the ability of enzymes to quench free radicals before they do damage. Regular exercise is the key to maintaining the activity of these enzymes. One should think about trying to accumulate at least 30 minutes of activity most days of the week. Take time to go for walks, ride a bike, or even mow the lawn. The combination of diet and exercise can tilt the scales in favor of antioxidant defenses and guard against excessive prooxidant effects.

*For educational and research purposes only. Because numerous factors can influence test results, e.g., what and when you last ate, physical activity before sampling, alcohol consumption, medications, etc., we encourage you to not be overly concerned with single test results. Your health care practitioner may want to do supplemental tests before offering medical advice and/or treatments. Consult your health care practitioner for questions you have relating to your general health and before initiating any lifestyle changes.*