

## Oxygen Radical Absorbance Capacity (ORAC)

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Oxygen Radical Absorbance Capacity (ORAC), it is a method of measuring antioxidant capacities of different foods. It was developed by the scientist at the National Institutes of Aging at the HIH (National Institute of Health), but it does not mean that this method is approved by the NIH. This testing system was developed to determine the effectiveness of foods and other compounds to counteract Oxygen Free Radicals in the body.

Oxygen Free Radicals are unstable molecules in the body that, if left unchecked, have a cumulative damaging affect on the body's cells and tissues contributing to inflammation, aging, as well as a wide range of other health related issues, and in my opinion it is the primary mechanism of all disease processes and therefore the #1 cause of death in the world.

Correlation between the high antioxidant capacity of fruits and vegetables, and the positive impact of diets high in fruits and vegetables, is believed to play an important role in the Free Radical theory of aging. This is well documented in the literature.

The USDA website recommends a Daily Antioxidant Intake Range of at least 3,000 to 5,000 ORAC.

A wide variety of foods have been tested using this methodology. Recently, a number of health food companies have capitalized on the ORAC rating, with dozens selling supplements that they claim to be "the number one ORAC product". Most of these values have never been published in the scientific literature so are difficult to evaluate. It's not known whether such values are accurate or how absorbable and functional these antioxidant supplements are in the human body. That's a key point because most of these ORAC values are not actually evaluated in the human body, they are determined in a test tube and tell you nothing about bioavailability once injected. Meaning, is this product absorbed into the bloodstream and reaching the cells or are you flushing it down the drain or worse yet is toxic to the body.

Another drawback of this method is the relationship between ORAC values and a health benefit has not been established, also, different foods can appear to have higher ORAC values. For example, a raisin has no more antioxidant potential than the grape from which it was dried, raisins will appear to have a higher ORAC value per gram net wet than grapes, do to their reduced water content. This could be a point of discussion regarding Juice Plus+, due to the fact that the water is removed from the fruits, vegetables and berries and could potentially have a very high ORAC rating compared to the original plant source itself. We don't want to go their because that is speculative, but what we can discuss is the University of Florida study that I will refer to in a moment.

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Another point of discussion is the fact that just because a food or supplement has a high ORAC value does not necessarily mean it is good for you in large quantities or megadoses. As we know there is a growing body of research revealing the down side of vitamin supplements. Many studies on vitamin supplements are very disappointing and reveal more harm than benefit from taking vitamin supplements. Concerning food itself, there is a comparative chart put out by the U.S. Department of Agriculture and the Journal of the American Chemical Society, (Source: Brunswick Laboratories) tells us that two of the top three ORAC rated foods is Unprocessed Cocoa Powder and Dark Chocolate. Now that sounds great to someone like me who loves chocolate, but it is not

something I would recommend to my patients as a mainstay in their diet, wouldn't you agree.

Some companies will tell that the only way to know if your food is high in Antioxidants or not is to know the ORAC value and that is absolutely wrong.

We know this from the nine published bioavailability studies performed thus far on Juice Plus+. And remember, it is extremely important to note that all of these studies have been performed on living breathing humans and not in a test tube, the researchers evaluated the bioavailability of antioxidants at the cellular level. And as we know these studies consistently showed a marked increase in antioxidant levels and have been published in peer reviewed scientific journals that were performed at independent research facilities around the world.

Also know that many companies overstate the ORAC value of their product in comparison to other competing brands by comparing different amounts. For example, they compare 1 oz of brand X to 100 oz of their product. In doing your research, make sure you compare equal amounts of each product you study and make sure that these other products actually have research that has been performed on their product. And the research must be gold standard, meaning, it must be research that is independent of the company, and that it is double blind, placebo controlled, randomized studies that have been published in peer-reviewed scientific journals.

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And of course Juice Plus+ is the most thoroughly researched whole food nutritional product in the world. Now, specific to ORAC values and Juice Plus+. The University of Florida study published in the Journal of Nutrition 2006, this was the study involving the University of Florida law school students. This study did show an increased plasma Oxygen Radical Absorbance Capacity (ORAC) of 50%, indicating functional enhancement of antioxidant status, which is great, but more important and more specifically, it showed increased plasma levels of beta-carotene, lutein, lycopene, and vitamin C in the Juice Plus+ demonstrating once again, bioavailability in young adults. (1 of 9 published bioavailability studies performed thus far on Juice Plus+). It also showed a 30% increase in gamma delta T cells, these cells play a role in protecting the body from microbes, demonstrating support of normal, healthy immune function (1 of 3 published immune studies). The Florida study also showed a trend toward fewer illness symptom days in the Juice Plus+ group compared to the placebo group. And last but not least, the Florida study showed a 40% decrease in DNA damage (strand breaks) compared to baseline in the Juice Plus+ group (1 of 2 published DNA studies).

And this is just one study I'm discussing, we have 13 published studies, 22 past and present research locations for the completed and on going investigations. The depth and breadth of research is so powerful and so convincing. There really is nothing comparable out there.

In summary, yes eating Juice Plus+ does increase your ORAC value as seen in the University of Florida study, which is great. But when you are discussing ORAC ratings, A ORAC rating by itself does not give you the whole picture. It tells you very little about what is actually happening at the cellular level.

Juice Plus+ is the essence of 26 fruits, vegetables, berries, and whole grains in a capsule. IT IS FOOD! And the preponderance of evidence lends it so much more credibility than just a ORAC value/rating!