



Definition of Terms: Linda Hagstrom, RN, CCRN

Phytonutrients: Phytonutrients, sometimes called Phytochemicals are ONLY found in plant food. They are plant chemicals that contain protective, disease-preventing compounds. They emerge into the fruit and vegetables as the color emerges when ripening. *The fruits and vegetables in **Juice Plus+** are picked at peak of ripeness, cleaned, juiced, H₂O is removed via cool conditions to preserve their phytonutrients (at 115 - 118 degrees Fahrenheit, we lose phytonutrients).*

Bioavailability: Biological (affecting life or living organisms) Availability (present) is something present to affect life or living organisms = Bioavailability. To be bioavailable a substance must dissolve, be transported via our blood stream and be delivered to our TARGET, which is the inside of our cells; our target is NOT our blood. Bioavailability depends also on the presence of other nutrients and the Synergy between them. **Juice Plus** is bioavailable because it is Whole Food.

Synergy: (The action of two or more substances to achieve an effect of which each is individually incapable) Do they work together? Are they present to help each other out? Ex: Calcium will not be bioavailable without vitamin D. Yes we will be able to “see” calcium in your blood but it will not affect you (your cells) unless it can get to the TARGET (inside the cell), and it can't get there without Vitamin D. Likewise fragmented vitamins such as a “C” (or any other supplement including multivitamins) don't hit the target without the other phytonutrients found in the orange or grapefruit. Well it hits one target, the toilet, because your body has to work hard to clear this now unrecognizable vitamin out of your body. Your body does the same for all the vitamins unless they are accompanied by their other friends contained in the whole food source. Then everybody hits the TARGET including Mr. Vitamin C! You know it's a real team effort called “synergy”.

Free Radicals: A free radical is a highly charged molecule that is aggressively searching for its missing electron. *We do have some good ones called macrophages which fight infection by consuming debris.* However the unregulated overproduction of free radicals is bad. They become loaded guns looking for a target, ready to harm any innocent molecule in the body that they come into contact with breaking in to steal an electron. Pg138 Ray 'From Here to Longevity' If a free radical inflicts damage on collagen the result is a wrinkle, on lymph cells, you could get lymphoma, on fat cells this changes (oxidizes) the fat into a substance that easily lays down in coronary arteries and could cause an MI (myocardial infarction = heart attack). *Consuming **Juice Plus** for 28 days shows there is a 75% reduction in Free Radicals with 1/3 of the test subjects showing NO free radicals in their blood.*

Oxidative Stress: The presence of free radicals leaves a trail of damaged molecules in the body. The body has the burden of trying to clean up those damaged molecules by producing new functioning molecules to replace the damaged ones or replacing the entire cell. This process exacts a huge toll from the body we call Oxidative Stress. Oxidative stress is now widely accepted as one of the most important contributors to aging and disease.

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Lipid Peroxides: A fat cell (called a lipid) that has taken a hit from a free radical and has been oxidized is now called a lipid peroxide. In common terms, we might think of these lipid peroxides as rancid fat molecules...ewww the fat is now changed so that it can easily lay down inside your blood vessels and cause blockages. It enables it to "stick" to things – like your blood vessels. If the lumen (inside) of your blood vessel is damaged and rough, things stick easier! Vineyard repairs the lumen of vessels. The oxidization of LDL's is the key initial event causing atherosclerosis (hardening of artery walls) and cardiovascular disease. Lipid Peroxidation is one of the prominent features of Alzheimer's disease! (Pg 141 Ray) **Juice Plus** reduces the chance of you having your fat cells turn rancid, and when they are not rancid, they can't lay down in your vessels. *Yeah!!!*

Cell Membrane Damage: The cells of our body are covered with a membrane made up of lipids (fats). These lipids that make up the cell membrane become damaged over time. This damage prompts the chromosomal DNA of that cell to split in order to replicate that cell and create new cells. Unfortunately cells cannot replicate forever. (Pg141 Ray) See DNA on the next page. *Consuming Juice Plus for 80 days shows a 66% reduction in DNA damage.*

Antioxidants: Antioxidants protect us because they have the power to donate an electron to a highly charged free radical – to disarm it! Surprise, the antioxidant becomes a free radical (now it's missing an electron) but it has a more stable personality and over the course of time, the body is able to flush these stable free radicals out along with the subdued original nasty mean free radicals. The ONLY place we can get antioxidants is through raw fruits and vegetables. *Juice Plus raises our antioxidant levels dramatically because it is made of whole raw fruits, whole raw vegetables and grains. Remember, antioxidants are ONLY found in fruits and vegetables.* Another bit of interesting trivia is that Cardiologists (heart doctors) used to ask their patients to take a vitamin supplement called "Antioxident Formula" which was vitamin C, E and A. There is no physician I know today that asks their patient to take these as they now understand because of research done that these don't work – they have no synergy to get into our TARGET ZONE the beautiful and hard working cell.

Homocysteine:

Homocysteine is an amino acid in the blood. (Amino acids are building blocks for proteins) Studies have shown that too much homocysteine is related to a higher risk of coronary heart disease, stroke and peripheral vascular disease. Homocysteine levels are strongly influenced by diet. *Juice Plus lowers homocysteine even in already healthy people (See the Australia study).* Next time you get your blood drawn, why not ask your MD to check it, and when the results come in go ahead and give her/him a Juice Plus DVD!

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DNA:

First let me say that DNA is sexy!

Our genes carry the inherited blueprint that makes us what we are. Inside the center or nucleus of every cell, the genes are located on twisted, double-stranded molecules of DNA called chromosomes. At the ends of the chromosomes are stretches of DNA called telomeres which protect our genetic data, make it possible for cells to divide and hold some secrets to how we age and get diseases. Some call this the tail of the DNA.

The chromosomal DNA as it is called has a tail called a telomere. This tail shortens every time our cells divide. This tail also can crack and fall apart, shorten coil or stretch out. (C. Saltzman, ND.)

Telomeres have been compared with the plastic tips on shoelaces because they prevent chromosome ends from fraying and sticking to each other which would scramble our genetic information and cause disease and death. Yet each time a cell divides, the telomeres get shorter. When they get too short the cell can no longer divide and it becomes senescent (inactive) or dies.

When free radicals damage the cell by “banging” into it and trying to steal an electron, cell cycling occurs – which is a rapid replication of the cell. Kind of like you working your Xerox machine too fast and it gets hot and goes crazy haywire and gets faster and faster and then oops, you’re out of paper and your machine is smokin’.....**the end**. Cells can’t replicate forever. A telomere has about 50 to 70 cell divisions and then it disappears.....the cell dies.....**the end**. When the cell has been damaged and has the genesis for cancer, this cancer replicates quickly, producing a cancerous growth. The telomeres put the ultimate limit on life expectancy.

“Oxidative stress damages membranes and increases the rate of cell cycling. In turn, there is an accompanying increase in telomere shortening and premature cell death, which results, ultimately, in a shorter lifespan. Pp142 Ray *The antioxidant protection that **Juice Plus** gives you can shield cellular DNA from free radical damage, cell cycling and early cell death. After consuming Juice Plus for 80 days researchers found a 66% protection from DNA damage among test subjects.*

Take care of your cells, eat Juice Plus!

*Yours in Health,
Lynne Page, CP7 & TCMCD*

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References:

“From Here to Longevity” by Mitra Ray, PhD. Purchase at www.nsa.promoplus – This is a great book!

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Article “Are Telomeres the Key to Aging and Cancer?”

<http://www.pnas.org/cgi/reprint/101/49/17312.pdf>

Life’s stress on telomere length and death

<http://www.abc.net.au/rn/inconversation/stories/2007/1864195.htm>

Telomere shortening, conversation interview

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