

Nature's Colorful Gifts

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Consider this simple relationship for healthy nutrition through food selection: “Color = Health”.

When we think of the government advisory “Eat 5-10 a Day” – usually meaning 5-10 *servings* of fresh fruits and vegetables - we might refine this rule by purposely choosing healthy foods according to their *colors*. Yes, 5-10 foods of different colors each day.

How do colorful plants give us this health benefit?

Color Comes From Pigment Power

Pigments are natural dyes a plant uses to defend itself from perpetual sun exposure. Colors in a plant also promote regeneration by attracting pollinators to its scent and taste.

Sunshine provides the plant with light energy for photosynthesis – essential for plant growth – but also bathes plants in ultraviolet radiation that would be deadly without pigments absorbing those rays.

Whether in plants or human bodies, normal cellular metabolism constantly generates reactive oxygen species (sometimes called free radicals) that are unstable molecules having the potential to damage cell structures and initiate diseases - the definition of “oxidative stress”. Environmental factors such as pollution, tobacco, radiation, chemicals or excessive sunlight exacerbate the production of free radicals or oxidative stress.

However, Nature has provided plants with pigments having a secondary function to counteract free radicals, thereby serving as *antioxidant* sentries always on guard to counter oxidative attack. Pigment molecules also bear other beneficial properties, such as anti-pest, anti-viral, anti-bacterial, and anti-fungal effects protecting plant health.

Why is this relevant to humans?

By eating colorful plants, we provide our bodies with these same pigments and gain similar protection against free radicals, invading pathogens and diseases. Scientists now acknowledge that more than 60 human diseases – cancer, heart and vascular disorders, diabetes, inflammation, Alzheimer's and other aging disorders, to name only a few – evolve to some extent from oxidative stress.

Accordingly, let's state an important fact most people do not realize: *these diseases are not inevitable*. To a significant extent, they are deficiencies of dietary antioxidants and so are preventable via wise nutrition using pigment power!

Phytochemicals

Scientists have estimated that the world of colorful plants may include up to 10,000 different phytochemicals (from Greek, *phyton* = plant). Reasonably, 8,000 of these are antioxidants, primarily in two general classes – phenolics and carotenoids.

Among plants with antioxidant phytochemicals is one group particularly rich in phenolics or carotenoids and with great diversity of colors – Berries.

Many of these wonderful gems of summer – blueberries, cranberries, blackberries, black and red raspberries, dark grapes, all bright with blues, purples, blacks or reds – have the highest measured contents of phenolics called anthocyanins (Greek, *anthos* = flower and *kyanos* = blue). Certain Asian berry species are intensely red, orange or yellow, correspondingly with high contents of the potent antioxidant carotenoids.

The color intensities in berries are approximately proportional to overall food antioxidant strength, emphasizing the reputation berries have as Nature's #1 antioxidant food group.

Because berries contain seeds, they are the crucial “vault” for protecting the lineage of a plant. The outer berry layer – its skin – is strategic as the defensive location for most antioxidant phytochemicals. Also serving a nutritive value to berries in skin and pulp are sources of soluble fiber such as long-chain saccharides (sugars) that, when metabolized, confer additional antioxidant and immune-enhancing properties.

As with phenolics, fiber from eating berries transfers health values from the plant to the human consumer. Among benefits occurring in the large intestine are 1) enhanced mineral absorption, 2) increased absorption of cholesterol, lowering its blood levels, 3) increased intestinal acidity levels, reducing colon cancer risk and 4) immune protection.

Healthful Gems

There are many health benefits gained from eating colorful foods like berries. In addition to strong antioxidant pigmentation and fiber is significant content of more familiar nutrients like carbohydrates, vitamins, minerals, amino acids and proteins. Using colorful berries as an example, having more color-rich foods in our diets assures broad-spectrum nutrition and a stronger arsenal of phytochemical protection against onset of diseases.

This might be the most important single message we can convey to consumers today for optimal human nutrition: Choose colors from Nature's palette to define your diet. Paint a picture of health each day by eating 5-10 foods that are blue, purple, red, yellow, orange, green. Let berries be your guide.

Reading

Joseph JA, Nadeau DA, Underwood A. *The Color Code*, 2002, Hyperion, New York.

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