

# Understanding antioxidants: using various arsenals to impact the oral environment

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## Introduction

Antioxidants are prolific in our diets, being present in spices, herbs, fruits, vegetables, nuts, legumes, grains, and certain beverages. At a cellular level the body also produces natural antioxidants, and there are many supplements that either contain antioxidants or enhance the body's ability to produce antioxidants. Studies have revealed a correlation between measurably low antioxidant levels with many inflammatory oral soft tissue conditions and diseases.<sup>1,2</sup> Recently, antioxidant products have been introduced in the marketplace that allow for immediate absorption into the oral cavity. Dental professionals should have a keen interest in understanding the role of antioxidants, the impact of oxidative stress, and some of the arsenals available to positively impact the oral environment.

Naturally occurring within the oral cavity are numerous antioxidant enzymes that help to maintain the homeostasis. Antioxidants can be measured directly from the saliva with specific assays or from the plasma as a measurement of total antioxidant capacity (TAC). Studies evaluating antioxidant levels have revealed a correlation between measurably low antioxidants or elevated oxidative stress with periodontal disease,<sup>16</sup> lichen planus,<sup>17</sup> oral cancer,<sup>18</sup> recurring aphthous stomatitis,<sup>1</sup> and dental caries.<sup>19</sup> The right types of antioxidants and their bioabsorption can positively influence this unseen and unfelt interplay of cellular events in which oxidative stress could be either causative in nature or increases as a result of disease progression.

One novel supplement has emerged onto the marketplace that is distinctly different from other antioxidants in how it works. **Protandim** (LifeVantage) is made up of 5 antioxidants: milk thistle extract, bacopa extract, ashwagandha, tumeric extract and green tea extract. The synergistic effect of these antioxidants together activate the protein messenger NrF2 which in essence works at a cellular level to destroy free radicals, and increase the body's own production of natural

antioxidant enzymes such as superoxide dismutase, catalase, glutathione and others. Nrf2 is also capable of turning down the production of proinflammatory and profibrotic genes, which holds potential benefit for patients with many types of chronic inflammatory conditions in which elevated oxidative stress is detrimental, including those with periodontal diseases.