

The Fact Sheet (series no.13) – Nitrate Dietry nitrate in man: friend or foe?

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Abstract : Based on the premise that dietary nitrate is detrimental to human health, increasingly stringent regulations are being instituted to lower nitrate levels in food and water. Not only does this pose a financial challenge to water boards and a threat to vegetable production in Northern Europe, but also many be eliminating an important non-immune mechanism for host defence.

Until recently nitrate was perceived as a purely harmful dietary component which causes infantile methaemoglobinaemia, carcinogenesis and possibly even teratogenesis. Epidemiological studies have failed to substantiate this.

It has been shown that dietary nitrate undergoes enterosalivary circulation. It is recirculated in the blood, concentrated by the salivary glands and reduced to nitrite by facultative Grampositive anaerobes (*Staphylococcus sciuri* and *S. Intermedius*) on the tongue. Salivary nitrite is swallowed into the acidic stomach, where it is reduced to large quantities of NO and other oxides of N and conceivably, also contributes to the formation of systemic S-nitrothiols.

NO and solutions of acidified nitrite, mimicking gastric conditions, have been shown to have antimicrobial activity against a wide range of organisms. In particular, acidified nitrite is bactericidal for a variety of gastrointestinal pathogens such as *Yersinia* and *Salmonella*.

NO is known to have vasodilator properties and to modulate platelet function, as are S-nitrosothiols. Thus, nitrate in the diet, which determines reactive nitrogen oxide species production in the stomach (McKnight et al. 1997), is emerging as an effective host defence against gastrointestinal pathogens, as a modulator of platelet activity and possibly even of gastrointestinal motility and microcirculation.

Therefore dietary nitrate may have an important therapeutic role to play, not least in the immunocompromised and in refugees who are at particular risk of contracting gastro-enteritis.

If you wish to protect yourself and your family from a wide range of undesirable substances commonly found in tap water, you should select point-of-use ceramic water filtration.

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