

Concurrent Session 1: Selenium and Health

The relevance of selenium to immunity and upper respiratory tract infections

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Selenium (Se), an essential trace element, is of fundamental importance to optimal human health. It exerts its biological effects (such as antioxidant and anti-inflammatory) through a wide array of selenoproteins/enzymes and some low-molecular weight Se compounds. Low Se status is linked with reduced immune competence and increased risk of viral infections, cardiovascular disease and some cancers. In addition, Se deficiency has been shown to increase the virulence of RNA viruses such as influenza, and induce the progression of HIV to AIDS.

Ageing is associated with increased risk of nutrient deficiencies, impaired functioning of the immune system and increased disease susceptibility. Upper respiratory tract infections (URTI), especially influenza, are significant causes of morbidity and mortality in the elderly due to reduced immune competence. Supplementation with Se, above recommended levels, has been found to be effective in improving immune responsiveness and reducing the incidence of URTI such as influenza in the elderly. However, different forms of Se differ in their bioavailability, with organic being superior to inorganic forms. Thus, food sources that are enriched with Se (organic form) appear to be an ideal Se deliver system to benefit health.

Research at the Department of Primary Industries Victoria has led to the development of on-farm feeding technologies for producing a Se-enriched dairy protein (Tatura BioSe, Tatura Milk Industries, Tatura, Victoria). This Se-rich dairy protein has been found to be superior to other sources of Se with regard to its bioavailability and chemopreventive effect against chemically induced cancers in animal models. In humans, supplementation with Se-rich dairy protein has been found to reduce the occurrence and severity of URTI and modulate immune function. The presentation will discuss possible mechanisms by which Se-rich dairy protein may mediate its immunomodulatory and anti-infection effects and its implications for public health.