



phytochemicals and health group

research capabilities

The aim of the Phytochemicals & Health Group is to understand how food and food components are used within the body and to apply this knowledge to enhance health. We offer a diverse range of analytical capabilities and have experienced and skilled personnel. Our group uses the latest technology and internationally recognised methods to help food and nutraceutical industries design new or improved food and health products with added benefits.

Products we work with include:

- fruits
- vegetables
- cereal grains
- nuts
- oils
- herbs and medicinal crops
- supplements and nutraceuticals
- food ingredients
- processed foods
- beverages

Compounds we analyse include:

- phenolics, including flavonoids
- carotenoids
- chlorophyll
- vitamins
- glucosinolates and isothiocyanates
- antinutritional factors
- nutrients

Better health from plant-based foods

Today's consumers want healthy nutritious foods that enhance their health and well-being, help prevent disease, and minimise the effects of stress and aging. We analyse fresh produce, food ingredients and processed foods to help industry produce high quality products with optimum health benefits.

Phytochemicals are natural plant-based (*phyto*) compounds (*chemicals*). These often-coloured compounds may offer a variety of health benefits such as antioxidant, antibacterial, anti-inflammatory or anticancer activity. Evidence suggests that these properties may play a role in reducing the risk of diseases, including heart disease, cancer, diabetes and other problems associated with stress and aging. Our research focuses on understanding the link between phytochemicals and these diseases to help improve health.

Our group is involved in identifying and quantifying individual antioxidants and other phytochemicals in addition to basic nutrients. For example, we analyse components in fruit, vegetables, foods and beverages, such as anthocyanins in

blackcurrants and blueberries, lycopene in tomato products and glucosinolates in broccoli. We can determine how processing or storage may affect a food or food component.

We assess various activities (e.g. antioxidant activity) of phytochemicals, including their bioavailability and effects on the body when consumed, and ways they can be enhanced for better health.

This information can be used to provide nutritional and phytochemical information for labelling and promotional purposes, to assist with product development, or to assess the dietary response in the body. We help industry develop innovative, tailor-made products to optimise phytochemical potential and maximise the delivery of health benefits.



Transforming ideas into opportunities

By linking scientific excellence with business management, we can add value to your business. We use our knowledge and research capabilities to identify appropriate research, analyse and develop tailor-made products, interpret results and provide relevant information for product promotion.

ANALYTICAL CAPABILITIES

- Working with diverse materials, from fresh produce to processed extracts
- Identifying and quantifying individual and total phytochemicals using leading-edge technologies such as HPLC and LC-MS
- Measuring *in vitro* efficacy
 - quantifying antioxidant activity using a suite of internationally recognised assays
 - measuring anticancer enzyme response using cell cultures
- Determining *in vivo* efficacy
 - measuring dietary response in humans and animals
 - undertaking small animal studies, including bioavailability studies
 - assessing plasma antioxidant status and lipid oxidation products
 - collaborating in human clinical trials
- Developing and implementing new methodology
- Organising analysis of a range of nutrients

PRODUCT DEVELOPMENT

- Developing new products or reformulating existing ones to provide added benefits to a food by:
 - selecting or substituting ingredients to optimise health benefits (e.g. enhancing absorption)
 - considering the total product
- Determining the effects of processing and storage (e.g. stability testing)
- Quantifying cultivar and environmental variation
- Utilising waste streams

INFORMATION AND INTERPRETATION

- Interpreting and presenting nutritional and phytochemical information for marketing purposes, nutrient information panels, and content and health claims
- Providing certificates of analysis and confidential reports
- Providing information appropriate to target audiences
- Accessing global databases, scientific literature and up to date information

contacts

PHYTOCHEMICALS AND HEALTH GROUP

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INTEGRATED APPROACH

- We have a strong research base. Our current collaborative government-funded programmes include Wellness Foods, Healthful Berries, Foods for *Helicobacter pylori* and Nutrigenomics (Genotype-Specific Foods).
- By linking with other teams at Crop & Food Research, we can offer a “paddock to plate” approach. This allows us to understand and provide research capabilities on all aspects of the food chain, from crop breeding through to food development and health.
- We also have links and collaborations with agricultural, horticultural, medical and academic research institutes and universities, both nationally and internationally, including:
 - Free Radical Research Group, Christchurch School of Medicine, University of Otago
 - Lincoln University
 - Department of Primary Industries, Victoria, Australia
 - Johns Hopkins Medical School, Baltimore, Maryland, USA
 - University of Glasgow, Scotland
- We can act in a project management role, assisting in writing funding proposals, offering student fellowships and sourcing funding.
- A confidential and ethical approach is assured.

