Using nutrigenomics for health and disease management

Foods and diets tailored to your genes

A diabetic selects a product without sugar.

A dietician crafts a diet for a middle-aged man with high cholesterol.

A marathon runner checks ingredients of an energy drink.

We do this today, but we are on the cusp of a far more strategic way of eating. One that will have a major role in good health and in disease prevention, reduction and control.

Nutrigenomics is unveiling new levels of understanding about food and its impact on health and illness, prevention and recovery, and performance and ageing.

It is revealing how individual elements in foods react to an individual’s own genetic makeup. Food producers looking for market development are being shown a new way to look at food and food extracts.

We are seeing the emergence of a new food market – from customised foods and diets to off-the-shelf products. Nutrigenomics can identify both needs and opportunities, from foods with the potential to negate high-risk illnesses to those that will boost sporting performance, or overcome allergies and intolerances.

Food producers who understand the importance of this new consumer segment will commit to research-based product development and give themselves a competitive edge.

Leading the way

UniServices brings together researchers from different disciplines and faculties of The University of Auckland to collaborate on nutrigenomics.

It offers a full suite of nutrigenomics services, from genetics research, population testing and human nutrition to bioinformatics, efficacy testing, claim validation and food/health state connections.

The University also partners with Crown Research Institutes that have direct expertise in food development and offer animal model studies that can predict effects in humans.

The University, together with these CRIs, make up the Nutrigenomics New Zealand collaboration.

The idea for a food or food extract may come from research or a food marketer. The science that will show whether it has a health benefit will come from The University of Auckland.

Professor Lynn Ferguson

Lynn is the Director of Nutrigenomics New Zealand, a strategic collaboration between AgResearch, The University of Auckland, and Plant & Food Research. Nutrigenomics New Zealand is a scientific program addressing the key areas of nutrigenomics. The group performs high-quality research and knowledge transfer in an international context. Lynn is also Head of Nutrition at the University’s School of Medical Sciences and the Director of Mutagen Testing in association with the Auckland Cancer Society Research Centre (ACSRC).

Nutrigenomics: Using information about human genes and their interactions with the food we eat, to help optimise physical and mental performance and manage health. In the future new foods will be developed to meet the unique needs dictated by our genetics.
More than individual foods, we are heading towards complete diets tailored to people with susceptibility to specific diseases, and tailored diets for wellness and anti-ageing.

Crohn’s research unveiling answers
This inflammatory bowel disease is an ideal test ground for food/health interactions. For example:

- Curcumin (the yellow component of turmeric) can help reduce inflammation in model systems of Crohn’s.
- There’s a link between people with a gene variant sometimes associated with Crohn’s and mushroom intolerance.

To date, the New Zealand Crohn’s team has tested 280 common foods including fruit, vegetables, cereals, herbs and teas to determine if any minimise the disease’s inflammatory actions.

Nutrigenomics New Zealand
This is a collaboration between:

- The University of Auckland - medical science and research support systems
- Plant & Food Research - grain, fruit and vegetable expertise, data management
- AgResearch - dairy and livestock expertise, and bioinformatics

The group focuses on multidisciplinary collaborative research aimed at developing gene specific foods targeted to preventing, ameliorating and curing diseases. It is also interested in foods which could improve mood, memory, cognitive functions and vision.

Nutrigenomics - key market implications

- No single wonder food but customised foods and food extracts to optimise health and minimise disease risks.
- People with specific issues such as obesity, diabetes, cardiovascular disease and cancer will need medical foods and dietary advice tailored to their genetic profile.
- Foods that reduce the risk of allergy and intolerance
- New foods to re-set nutrition switches
- Personalised functional foods
- Wellness and performance foods that enhance normal physiological processes
- Foods that enhance sports performance
- Mood foods

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