Australian Government
Australian Research Council

EI 2018 ENGAGEMENT AND IMPACT

Engagement and Impact 2018

The University of Sydney

SYD06 (HLS) - Impact

Overview

Title

(Title of the impact study)

Glycemic index: harnessing its role in health and disease

Unit of Assessment

06 - Biological Sciences

Additional FoR codes

(Identify up to two additional two-digit FoRs that relate to the overall content of the impact study.)

11 - Medical and Health Sciences

Socio-Economic Objective (SEO) Codes

(Choose from the list of two-digit SEO codes that are relevant to the impact study.)

82 - Plant Production and Plant Primary Products
92 - Health

Australian and New Zealand Standard Industrial Classification (ANZSIC) Codes

(Choose from the list of two-digit ANZSIC codes that are relevant to the impact study.)

11 - Food Product Manufacturing
85 - Medical and Other Health Care Services

Keywords

(List up to 10 keywords related to the impact described in Part A.)

Glycemic index

Diabetes

Cardiovascular disease

Obesity

Industry

Consumers

Nutrition

Health

Media

Publishing

Sensitivities

Commercially sensitive

Yes

Culturally sensitive

No

Sensitivities description

(Please describe any sensitivities in relation to the impact study that need to be considered, including any particular instructions for ARC staff or assessors, or for the impact study to be made publicly available after EI 2018.)

Due to the contractual agreements between the University of Sydney and external partners, publication of content from the following impact case study must be restricted to the following: the title, the UoA, additional FoR codes, SEO codes, ANZSIC codes, keywords, sensitivity types, Science and Research Priorities, beneficiaries, the 'summary of the impact' and the 'summary of the approaches to impact' submitted as part of the impact study. All other sections are not to be published.

Aboriginal and Torres Strait Islander research flag

(Is this impact study associated with Aboriginal and Torres Strait Islander content?
NOTE - institutions may identify impact studies where the impact, associated research and/or approach to impact relates to Aboriginal and Torres Strait Islander peoples, nations, communities, language, place, culture and knowledges and/or is undertaken with Aboriginal and Torres Strait Islander peoples, nations, and/or communities.)

No

Science and Research Priorities

(Does this impact study fall within one or more of the Science and Research Priorities?)

Yes

Science and Research Priority	**Practical Research Challenge**
Health	Effective technologies for individuals to manage their own health care, for example, using mobile apps, remote monitoring and online access to therapies.

Impact

Summary of the impact

(Briefly describe the specific impact in simple, clear English. This will enable the general community to understand the impact of the research.)

Professor Jennie Brand-Miller's work on the role glycemic index (GI) plays in health and disease transformed the way scientists, physicians and consumers consider carbohydrate foods. She established that adverse effects of high post-meal blood glucose levels apply to diabetes, as well as obesity, cardiovascular disease and other conditions. The impact of Brand-Miller's research has helped people around the world adopt a healthier diet. Her commercial GI testing and research service, and the Glycemic Index Foundation's food labelling program, encourage healthy food choices and provide benefit to industry. An online weight loss program devised with the CSIRO helped over 25,000 people lose weight. She also published 24 successful evidence-based diet books.

Beneficiaries

(List up to 10 beneficiaries related to the impact study)

People with diabetes, obesity and/or cardiovascular disease

Subscribers to the online CSIRO Total Wellbeing Diet

Standards Australia

Health and nutrition researchers

Health professionals

Health policy makers

Food companies

Consumers

Food Standards Australia New Zealand

Diabetes Australia

Countries in which the impact occurred

(Search the list of countries and add as many as relate to the location of the impact)

Australia
New Zealand
Singapore
Malaysia
Japan
India
United States of America
Canada
England
Wales
Scotland
Germany
France
Italy
Austria
Croatia
Poland
Spain

Details of the impact

(Provide a narrative that clearly outlines the research impact. The narrative should explain the relationship between the associated research and the impact. It should also identify the contribution the research has made beyond academia, including:
- who or what has benefitted from the results of the research (this should identify relevant research end-users, or beneficiaries from industry, the community, government, wider public etc.)
- the nature or type of impact and how the research made a social, economic, cultural, and/or environmental impact
- the extent of the impact (with specific references to appropriate evidence, such as cost-benefit-analysis, quantity of those affected, reported benefits etc.)
- the dates and time period in which the impact occurred.

NOTE - the narrative must describe only impact that has occurred within the reference period, and must not make aspirational claims.)

Professor Jennie Brand-Miller's work into the role GI – which ranks carbohydrate in foods according to how they affect blood glucose levels – plays in health and disease transformed the way scientists, physicians, healthcare professionals, the food industry and consumers consider carbohydrate foods. Her research established that adverse effects of high blood glucose levels apply to diabetes, as well as obesity, cardiovascular disease and other conditions.

Translating her findings into actions, Brand-Miller's innovation and public engagement benefited the food industry and health professionals, and helped people, including those with and at risk of diabetes, adopt a healthier diet. Brand-Miller's work with industry provides a point of difference for companies wanting to market and certify products as low GI, and certainty for consumers about how low GI claims are substantiated. The Australia New Zealand Food Standards Code, for instance, requires GI testing of products making a low GI claim on packaging.

She created Sydney University GI Testing Service (SUGiRS) in 1995 and, with her team, continued to provide commercial GI testing and research services to industry. SUGiRS generated around $5 million from about 380

local and international contracts from 2011 to 2016 with local and multinational companies across the world.

Regina Karim, Danone Oceania's Senior Regulatory and Scientific Affairs Manager, credits SUGiRS' with generating benefits for the food industry: "Accredited low GI values from SUGiRS helps to raise the health credibility of the product."

In 2000, Brand-Miller created spin-off company the Glycemic Index Foundation, with the University of Sydney, Diabetes Australia and Juvenile Diabetes Research Foundation. The only not-for-profit organisation globally that manages a certification trade mark for labeling low GI products, the Foundation's low GI symbol indicates products meet local and international authoritative standards and aids healthy food choices for consumers. The Foundation employs two staff and two consultants. It certified over 200 products in 2015/16 for companies such as Sunrice and Nestle, in Australia, the US, the EU, Japan and India.

Burgen bread, owned by George Weston Foods (GWF) Ltd, was the first branded bread range certified with the GI symbol. Justine Cotter, Head of Brands and Communications, says: "GWF has invested significantly in GI testing through the University of Sydney and SUGIRs to substantiate the acute satiety benefits of consuming Burgen bread. The GI symbol continues to play a key role on Burgen packaging."

SunRice-commissioned research by Brand-Miller's team identified Doongara as a low GI variety of Australian rice, licenced with the low GI symbol since 2008. Jennie Evans, Regulatory Affairs Manager, says GI is "a useful metric for consumers", with GI values included on SunRice's low GI products in Australia, New Zealand, Hong Kong, Singapore and Taiwan, and intentions to expand their low GI range.

Brand-Miller's impact on regulatory policy is exemplified by her contribution to setting food standards and guidelines for determining and labeling the GI of foods.

She led the project which set the Australian Standard (AS 4694-2007) for determining the GI of foods and classification of high versus low GI foods. The standard was referenced by Food Standards Australia New Zealand (FSANZ) in 2013, in Amendment No. 138 to Food Standards for labeling content claims. Her research is referenced by the International Organization for Standardization (ISO 26642-2010), best-practice for food testing services provided by laboratories. Both SUGiRs and the GI Foundation apply these standards.

In 2014, her team coded GI values for the AUStralian Food and NUTrient Database (AUSNUT), a FSANZ food composition database that assists health professionals to easily assess their patients' dietary GI.
Brand-Miller's engagement with the public and health professionals raised awareness of the role a low GI diet can play in the prevention and control of lifestyle-related chronic diseases such as obesity and diabetes, and ensured free access to research findings, data and tools to support healthy food choices.
The GI Foundation's website hosts information about diabetes, managing blood glucose levels and health benefits of a low GI diet, meal plans and, since 2011, an online 'Swap It' tool that suggests low GI alternatives to high GI foods and incorporates the newest research on GI values for products.
The University's GI site hosts an international database of products and their GI and recorded over 1.2 million unique visitors that viewed over six million pages on average each year between 2012 and 2016. GI News, a monthly e-newsletter that distributes the latest GI news and research findings to health professionals and the public, had almost 100,000 subscribers with half from outside Australia.

Since 2002, Brand-Miller published 24 books drawing on her research, with global sales of around four million copies. In 2013-14, Brand-Miller and her colleagues published The World's Best Diet based on higher proteinlower
GI diets for weight maintenance and The Shoppers Guide to Low GI Values providing practical tools and GI values of foods. These are recommended by diabetes advocacy organisations such as Diabetes Australia.

In 2014, Brand-Miller and the GI Foundation partnered with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) on an online higher protein-low GI weight loss program, the CSIRO Total Wellbeing Diet. Commercial partner SP Health operates the online platform and associated marketing tools. By late 2016 there were around 26,000 paying subscribers to the 12-week weight loss program and approximately 1 million users of the online platform. Nearly 70 percent of subscribers that completed the program obtained weight loss of over five percent. Weight loss has been linked to a reduced risk of type 2 diabetes and cardiovascular disease.

Associated research

(Briefly describe the research that led to the impact presented for the UoA. The research must meet the definition of

research in Section 1.9 of the EI 2018 Submission Guidelines. The description should include details of:
- what was researched
- when the research occurred
- who conducted the research and what is the association with the institution)

Under Professor Brand-Miller's leadership, between 2002 and 2016, her team at the University of Sydney published 191 original research articles targeting effective ways of improving the dietary management of diabetes, obesity, and other chronic conditions. This included 11 randomised controlled clinical trials comparing high vs low GI diets in type 1 diabetes, type 2 diabetes, gestational diabetes and overweight/obesity. Over 34 acute studies explored mechanisms behind the adverse effects of postprandial glycaemia, including insulin resistance and inflammatory pathways.

Her team carried out 17 systematic reviews and meta-analyses aimed at determining the generating consensus and providing the evidence-base for international guidelines and regulatory frameworks. The research included analysis of the SUGiRS database of over 1000 de-identified foods, demonstrating how commercial research and basic science were mutually beneficial and pushed the science forward.

This period also included 3 separate studies on potatoes grown in Australia, providing the data behind the successful commercialisation of a low GI variety.

FoR of associated research

(Up to three two-digit FoRs that best describe the associated research)

06 - Biological Sciences
11 - Medical and Health Sciences

References (up to 10 references, 350 characters per reference)

(This section should include a list of up to 10 of the most relevant research outputs associated with the impact)

1. Brand-Miller JC, Hayne S, Petocz P, Colagiuri S. Low-glycemic index diets in the management of diabetes. A meta analysis of randomized controlled trials. Diabetes Care. 2003;26(8):2261-7.

2. Brand-Miller JC, Holt SHA, Pawlak DB, McMillan J. Glycemic index and obesity. American Journal of Clinical Nutrition. 2002;76(1):281S-5S.

3. Brand-Miller JC, Liu V, Petocz P, Baxter RC. The GI influences postprandial insulin-like growth factor-binding protein responses in lean young subjects. American Journal of Clinical Nutrition. 2005;82(2):350-4.

4. Brand-Miller, J., McMillan-Price, J., Petocz, P. Glycaemic load and cardiovascular risk. Archives of Internal Medicine. 2007, 167, 206-207.

5. Brand-Miller JC, Thomas M, Swan V, Ahmad Z, Petocz P, Colagiuri S. Physiological validation of the concept of glycemic load in lean young adults. Journal of Nutrition. 2003;133:2728-32.

6. Foster-Powell K, Holt SHA, Brand-Miller JC. International table of glycemic index and glycemic load values: 2002. American Journal of Clinical Nutrition. 2002;76(1):5-56.

7. Atkinson FS, Foster-Powell K, Brand-Miller JC. International Tables of Glycemic Index and Glycemic Load Values: 2008. Diabetes Care. 2008;31(12):2281-3

8. Louie, JCY, Flood, V.M, Atkinson, F.S., Barclay, A.W., Brand-Miller, JC. Methodology for assigning appropriate glycaemic index values to an Australian food composition database. Journal of Food Composition and Analysis. 2015; 38(March 2015): 1-6.

9. Hardy K, Brand-Miller J, Brown KD, Thomas MG, Copeland L. The importance of dietary carbohydrate in human evolution. Quarterly Review of Biology. 2015; 90(3):251-68.

10. Sheard NF, Clark NG, Brand-Miller JC, Franz MJ, Pi-Sunyer F, Mayer-Davis E, Kulkarni K, Geil P. Dietary carbohydrate (amount and type) in the prevention and management of diabetes - A statement by the American Diabetes Association. Diabetes Care. 2004;27(9):2266-71.

Additional impact indicator information

Additional impact indicator information

(Provide information about any indicators not captured above that are relevant to the impact study, for example return on investment, jobs created, improvements in quality of life years (QALYs). Additional indicators should be quantitative in nature and include:
- name of indicator (100 characters)
- data for indicator (200 characters)
- brief description of indicator and how it is calculated (300 characters).)

Name

ALTMETRICS

Indicator Data

Her 2015 paper on dietary carbohydrate and human evolution was Quarterly Review of Biology's #1 most-shared output, seen by over 800,000 Twitter followers.

Indicator Description

Altmetrics, which tracks online citations, reveals Brand-Miller's scientific papers receive "high impact attention". The paper on dietary carbohydrate and human evolution was cited in numerous news articles including the New York Times and Washington Post.