

Final Report

Nuts for Life – Educating health professionals

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Delivery partner:

Australian Nut Industry Council

Project code:

HN17002

Project:

Nuts for Life – Educating health professionals (HN17002)

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Contents

Summary	4
Keywords	6
Introduction	6
Methodology	7
Outputs	14
Outcomes	17
Monitoring and evaluation	21
Recommendations	34
Refereed scientific publications	36
References	37
Intellectual property, commercialisation and confidentiality	38
Acknowledgements	39
Appendices	40

Summary

The Nuts for Life Program

Nuts for Life is a credible and well recognised scientific program that is focused on education, and the collation, interpretation and dissemination of research pertaining to nuts, their positive role in a healthy diet and for health.

Opportunity to address

Scientific research spanning over two decades recommends a 30g serve of nuts per day, to promote good health and to help prevent many chronic diseases. Yet despite this, research shows a lack of translation into Australian eating habits. Nut industry data shows an average intake of around 7g of nuts per day, and a re-analysis of Australian Bureau of Statistics (ABS) data revealed that only 2% of Australians met the 30g a day target. Therefore, there is clearly a need to find ways of enabling shifts in these consumption patterns to help reduce this gap.

What Nuts for Life set out to achieve?

The three-year project (HN17002), aimed to reduce the gap between Australian's current daily nut consumption, and the recommended consumption – a target of 5% pa compound growth - to ultimately deliver better health outcomes for Australians. We aimed to do this via correcting misinformation, addressing barriers to nut consumption and disseminating research to key influencers including public health bodies, health professionals and health media.

Target audience and activities

The channel by which Nuts for Life educated and disseminated scientific information remained via health professional audiences – primarily dietitians with their wide sphere of influence in the food and health space, as well as nurses, general practitioners (GPs) and diabetes educators. The key activities undertaken to reach these health professional groups included:

- Collating and distributing scientific research and literature via: newsletters, scientific reports, social and traditional media, presentations at conferences and events and the Nuts for life website
- Partnering with key individuals (including ambassadors), organisations and health agencies to share and leverage knowledge and information
- Sub-contracting the University of Wollongong to 1) update the evidence substantiating the nuts and heart health general level health claim, and 2) re-analyse the ABS Australian Health Survey to accurately quantify nut consumption in Australia and to explore the differences in health outcomes of nut consumption vs non-nut consumption.
- Collating and interpreting science and research to assist industry in responding to requests for information from public health initiatives, policies and strategies including Health Star Ratings (HSR) review, Food Standards Australian and New Zealand (FSANZ) Plain English Allergen Labelling submissions etc.

The key outputs generated:

New and/or updated resources (~40), electronic newsletters, webinars (x2), scientific summary reports (x2), social and traditional media posts, radio interviews, systematic literature review (x1), research manuscript and publication in peer reviewed journal, recipes (at least 45), Food Standards Code (FSANZ) and Healthy Star Ratings technical submissions, partnerships and collaborations with Nutrition Australia, Allergy and Anaphylaxis Australia,

Primary Industries Education Foundation Australia (PIEFA), attendance and presentation at conferences (~15), market research tracking reports (x2), a new and updated website.

Outcomes and recommendations:

Overall, Nuts for Life successfully delivered against our target to increase nut consumption by 5% pa compound growth - a value worth \$760 million and 62,000 tonnes to the industry. With the focus remaining on educating health professionals, we continued to promote the significant health benefits associated with nut consumption to subsequently increase awareness and knowledge amongst dietitians, GPs and diabetes educators. We strengthened the link between nuts and heart health via the development and promotion of a nuts and heart general level health claim. Finally, we continued to successfully disseminate and share credible scientific information pertaining to nuts and health, including our re-analysis of the ABS data. The sharing of credible information, together with the correction of misinformation continues to strengthen the overall credibility of the Nuts for Life program.

In the future, Nuts for Life will continue to focus on educating health professionals – primarily dietitians, GPs and fitness professionals as we evolve to meet the changing needs of savvy health and planet conscious consumers. A critical part of this is ensuring nuts are at the forefront of plant-based healthy eating messages.

Our goals for the future are:

- Develop a high-level health claim for nuts and heart health
- Increase the prominence of nuts in the next revision of the Australian Dietary Guidelines, and
- Reported energy content on packs to be reduced in line with new research.

Keywords

Nuts; tree nuts; nutrition; health; disease prevention; healthy handful; 30g/day

Introduction

Nuts for Life was established in 2003, with a mission to promote regular nut consumption by collating the latest evidence-based information, and informing Australians about the positive impact regular nut consumption can have on their health. The project is facilitated by the Australian Nut Industry Council in collaboration with Australian tree nut industry members.

Historically, nuts were considered a ‘dietary no-no’ due to their high fat content, and therefore their supposed impact on promoting weight gain and increasing the risk of chronic health conditions. But that sentiment began to be challenged following the publication of large population studies nearly 25 years ago. The first of these, the Seventh Day Adventist Study, revealed that those who ate 30g of nuts more than five times per week had a significantly reduced risk of heart disease [1].

Despite this research, the overall perception and the perceived healthiness of nuts for preventing chronic disease was low amongst GPs, dietitians (18% and 46% respectively, agreed with the statement) and consumers in 2003 (15-24% agreed with the statement) based on market research conducted at the time (Consumer Insights, 2003). More recent research proves that Nuts for Life has strongly influenced these perceptions, with dramatically improved perceptions, particularly amongst dietitians, with an overall agreement to the statement now at 86%. In an environment where there is so much nutrition ‘noise’, it’s imperative that nutrition education continues amongst health professional groups.

The nut industry has benefitted from the increase in perceived healthiness and awareness, with apparent nut consumption nearly doubling in volume and tripling in value from 2003 to 2018/19. Whilst several factors have led to this growth, it is well accepted worldwide that education of the health attributes of nuts is a key driver of increasing nut consumption.

Despite the change in the perceived healthiness of nuts, and the growth in the industry, there is still a long way to go. Instead of the suggested target of 30g per day, industry data shows Australians are consuming an average of around 7g of nuts per day, with ABS data revealing only 2% are meeting the 30g a day target [2]. A report from the Australian Institute of Health and Welfare: Australian Burden of Disease Study, indicated nuts are just as, if not more important than other plant foods, such as fruits and vegetables in terms of risk factors for total disease burden [3]. Yet public health awareness and education campaigns often promote *only* fruits and vegetables as an essential part of a healthy diet, given that consumption of these foods are below recommended intakes.

Nuts for Life aimed to continue to reduce the gap between Australia’s current consumption and the recommended consumption target of 30g per day. The program aimed to position tree nuts in the minds of key health influencers (dietitians, GPs, nurses etc.) as an important component of a healthy diet through the development and delivery of scientifically substantiated messages that reinforce the importance of nuts in a healthy diet and for chronic disease risk reduction.

Methodology

To deliver upon the objectives identified by Hort for this project, Nuts for Life operated under five key areas of activity, each with a specific focus:

1. Scientific research

Ensure credible, scientific information is collated and generated. The research also informed much of the content, health messages and subsequent resources disseminated throughout the program.

Maintain a database of nut health research publications, research and literature on the health benefits of nuts

- Conducted a monthly search of the literature, with new research findings adding to the body of evidence supporting nut health benefits. This information is also used to generate new resources, new content on the website, position papers and media etc. as well as for updating existing assets.

Monitor ongoing and emerging trends in relation to nuts and effects on health

- Conducted a weekly review of traditional and online media to provide material and content for use on our social channels, as well as ensuring we're aware of perceptions, beliefs and myths which may need additional education.

Maintain relationships with Australian nut researchers and where possible international nut researchers (including NREF and INC)

- Regular contact maintained with local and international researchers e.g. from University of Wollongong, University of South Australia, and the University of Otago (NZ). We shared and disseminated research findings, assisted with sourcing nuts for research and assisted with recruiting subjects for research.
- Maintained strong relationships with the INC Scientific Committee to ensure access to their research studies and results.

Sub-contracted the University of Wollongong to re-analyse the Australian Health Survey (AHS) data to explore the relationship of nut consumption vs. non-nut consumption on health, nutrient intakes and anthropometric measures.

- A nut specific database was first established; and subsequently published in a peer reviewed journal. The nut database was applied to dietary intake data with the findings summarised into a 24-page report for dissemination; the research was also published in a peer reviewed scientific journal and media was generated.

Sub-contracted the University of Wollongong to update the research substantiating the nut heart health General Level Health Claim (GLHC)

- The 2015 systematic literature review was updated, and was to include a meta-analysis to determine the recommended serve size for weight management.

Annual collation of wholesales sales data to measure our goal of 5% pa growth.

Health Outcomes Scientific Research

- Sub-contracted Nutrition Research Australia to review the scientific literature on thirteen health outcomes, with a view to update our Fact sheets.
- The research was used to update/create four fact sheets: heart health, weight, diabetes and health effects summary.

2. Health professional education

Building and maintaining health professional knowledge of the health benefits of increased nut consumption (dietitians, diabetes educators, GPs, fitness professionals)

Attended conferences and events

- Dietitians Association of Australia (DAA) Conference – exhibit (May 2018)
- Lifestyle Medicine Conference (ASLM) Conference – exhibit (August 2018)
- Dietitians Association of Australia conference – exhibit, poster presentation, oral presentation (August 2019)
- Australasian Diabetes Congress (ADC) – exhibit (August 2019)
- Australian New Zealand Obesity Society Conference (ANZOS) – exhibit and oral presentation (October 2019)
- Royal Australian College of General Practitioners Conference (RACGP) – exhibit (October 2019)
- NSW Diabetes update day – presentation (December 2019)
 - Reached over 5,000 health professionals (dietitians, GPs, nutritionists, researchers, nurses, diabetes educators etc.)
 - Promoted and disseminated new resources (e.g. fact sheets), upcoming events (e.g. webinars), promotions (e.g. Nuts3030) and research (e.g. AHS report)
 - Added to our database of health care professionals who receive our quarterly e-newsletters (Nut e-News)
 - Post conference: sent e-newsletter thanking delegates for attending our exhibit, shared links to our resources and provided answers to the top questions we were asked.
 - Presentations: AHS re-analysis results; Nuts and diabetes.

Hosted events

- Brain health - webinar (May 2018)
- AHS and health outcomes - webinar (Nov 2019)
 - Reached over 7,000 health professionals
 - Advertised via DAA conference, DAA e-newsletter, Nut e-news e-newsletter, N4L contributor e-newsletter, and social media channels
 - Resources developed to support the webinars
 - Follow-up alert e-newsletter sent to highlight key messages and to include resources.

AHS Breakfast event (September 2019)

- Official launch of the key messaging from the AHS results, particularly around consumption and weight (presented by Elizabeth Neale, University of Wollongong), and to provide a thorough briefing ahead of the paper's publication.
- 18 HCP guests in attendance
- While the priority was on education, the event drove immediate social media coverage with many guests sharing snippets and slides from the two presentations.

Education campaigns

GP Education Campaign (February and June 2020)

- Via Samples Plus, we targeted GPs with resources to educate them on the benefits of nut consumption. The resource packs included:
 - Cover letter
 - Plant-based eating tear off pad

- Health benefits summary fact sheet
- Nut nutrient composition leaflet
- Nut and health handbook

Events cancelled/postponed due to COVID

NB. These were committed to financially

- Dietitians Unite Conference – satchel insert, (May 2020)
- Australasian Society of Lifestyle Medicine Conference - exhibit (May 2020)

Newsletters (Health Professional HP)

NutENews

- Quarterly e-newsletter (until Dec 2019); then monthly (from Jan 2020) to a database of around 3,000 health professionals to educate on new research, feature articles, events etc.
- Alert e-newsletters are sent in addition to the scheduled newsletters to inform subscribers of upcoming events (e.g. webinars), new research (e.g. AHS publication), and as follow ups from conferences.

NutEResearch

- Launched in August 2018, to approximately ~3,000 subscribers
- Monthly newsletter dedicated entirely to new nut and health scientific literature

HP E-newsletter subscriber survey - September 2019

- Survey conducted to subscribers to gather feedback for future improvement.
- Based on results, from Jan 2020 we moved to one monthly e-newsletter covering all types of content.

Resources

New look website (Aug 2019)

- Launched in August 2019, the new look website houses all the relevant information, but in a more visually appealing and user-friendly format.
- Every page of the website was updated and/or revised and edited; every FAQ (over 100) was updated and edited and resources updated or rescinded to ensure up to date, accurate and scientifically backed information.
- E-Alerts were sent to both contributors and health professionals.

All the following resources can be located in the resource library section of the Nuts for Life website:

<https://www.nutsforlife.com.au/resource-library/?1&nut=&article-type=>

Fact sheets

New fact sheets were developed in January 2019, as well as updates and supporting materials.

Aimed at Healthcare professionals:

- Nuts and Weight
- Nuts and Diabetes
- Nuts and Heart Health
- Summary of health effects
- Brain health

Aimed at consumers:

- Nuts and Weight
- Nuts and Diabetes
- Nuts and Heart Health

- Top 10 nut FAQs
- Nuts – health benefits and facts
- What does a 30g serve of nuts look like

Infographics

Brain health

Reports

- Nuts and heart health – summary of the evidence (2019 edition) – based on the updated systematic literature review on nuts and heart health.
- Nut consumption, Nutrients and Better Health – summary of the AHS research as well as an update of current and emerging evidence on nuts and their health benefits

eBook (January 2019 and February 2020)

- Reference booklet highlighting successes of the previous years', including research, recipes, latest resources, five most asked questions and summarises the benefits of regular nut consumption
- Launched January/February, and advertised via the DAA e-newsletter, Dietitian Connection e-newsletter, NUTrition Ambassadors, NutENews etc.

Media

NUTrition Ambassadors (July 2018 – June 2020)

- Two dietitian ambassadors were sub-contracted to help educate and inspire about the health benefits of nuts via their social media channels (i.e. Instagram, blog posts, Facebook and eDM)
 - Rebecca Gawthorne: @nourish_naturally
 - Leanne Ward: @the_fitness_dietitian
- Activities and posts included: myth busting, Q&A, meal plans, recipe development, resource development, health benefits, new research dissemination, quizzes etc.

Media Bureau (March 2019 – June 2020)

- Objective is to leverage new tree nut research published in peer reviewed journals, as a cost-effective way to generate high-impact media coverage.
- Media/news releases were issued to media dietitians (approx. 150 with strong media and social media profiles), health media on news outlets, women's magazines, health writers and health professionals who act as spokespeople in the media.

Media Campaign (AHS)

- A media launch supported the March 2020 publication of the research in the journal, Public Health Nutrition.

Market research

Market research of health professionals approx. every 2 years, to measure attitudes and behaviours in relation to key issues pertaining to the nutrition reputation of nuts.

The objectives of the research:

- To understand the perceptions, attitudes and knowledge of nuts with respect to their health and nutrition benefits
- Identify any nutrition-related barriers to regular nut consumption (e.g. fat or fattening)
- Identify any nutrition-related barriers to promoting and /or advocating for regular nut consumption
- To understand the role that nuts play in the diet (e.g. add fibre, reduce cholesterol)

- Determine understanding of the recommendations for nut consumption (e.g. 30g handful, Australian Dietary Guidelines).

Nuts for Life sub-contracted the 'Consumer Insights research agency in July 2018 and in May 2020 (results of the 2020 research were pending at time of preparing this report).

3. Public Health and regulatory affairs

Monitor the food regulatory environment in Australia and overseas for issues relevant to the nut industry and provide assistance, disseminate scientific evidence and develop submissions on behalf of the nut industry, to organisations and regulators.

Primary Industries Education Foundation Australia (PIEFA) - Resource development

- Partnership to develop high-school resources (in line with Australian curriculum) to communicate and educate on nutrition and health benefits of regular tree nut consumption
- 2x resources developed: Go Nuts (years 7-8), and Let's Nut this out (years 9-10)

Allergy Awareness

Baby recipe booklet (Aug 2018)

- Partnership with Allergy & Anaphylaxis Australia (AAA) and Australasian Society of Clinical Immunology and Allergy (ASCI), to develop a recipe booklet as part of the National Allergy Strategy Food Allergy Prevention Project. The campaign sought to educate health care professionals and consumers about the importance of introducing allergenic foods within first year of life
- Included development and production of recipes incorporating nuts aimed at infants 6-8 months into a downloadable booklet, available on National Allergy Strategy Food Allergy Prevention Project www.preventallergies.org.au website

Nut awareness fact sheets (Feb 2020)

- Partnership with AAA to develop a series of fact sheets for those with tree nut allergies as a tool to help recognise a specific tree nuts in its various forms.
- Promoted on social media (AAA and Nuts for Life) and in eDMs, and reside on both AAA website (allergyfacts.org.au) and nutsforlife.com.au.

Engagement on regulatory and public health issues

Health Star Rating (HSR) Submissions

- Produced three submissions in response to the Five-Year Review of Health Star Rating System:
 - August 2017 – Submission to the Five-Year review
 - December 2018 – Options for system enhancement
 - March 2019 – Five Year review
- Consulted with contributors and the wider nut industry, as well as providing input into the Dietitians Association of Australia submission.

Plain English Allergen Labelling (PEAL) FSANZ submissions

- Produced two submissions in response to FSANZ's Proposal P1044.
 - April 2018 – Proposal P1044
 - February 2020 – Second call for PEAL

Relationships and partnerships with public health organisations

Nuts for Life has maintained relationships and partnerships with the following organisations and bodies:

- Nutrition Australia – update to Nut FAQ fact sheet, which includes tips, allergy information, and what constitutes a healthy handful <https://nutritionaustralia.org/fact-sheets/nuts-health-and-kids/>
- Primary Food Alliance – Meetings/phone calls continue to occur with Grains and Legumes Nutrition Council (GLNC), Dairy Australia, Australia Eggs, Cobram Estate.
- Diabetes Australia – regularly provide recipes, updates and satchel inserts at events and update days.
- Victorian Healthy Eating Enterprise – regularly attend the meetings. Presented at a ‘primary industry panel discussion’ (February 2018).
- Public Health Association of Australia – membership held.

4. Industry education and support

Support contributors and create educational materials to encourage them to promote the nutrition benefits on packaging and promotional activities

Nut Heart Health General Level Health Claim (GLHC)

- In 2015 and again in 2018, we sub-contracted the University of Wollongong to conduct a systematic literature review to provide the substantiation for a ‘Nuts support heart health’, general level health claim.
- A License Agreement, allowing contributors access to the evidence, and use the claim was finalised in October 2017, together with a User Guide to assist contributors with the steps required to legally make the claim.
- In May 2020, Nuts for Life launched a logo to support the Nuts and heart health GLHC. The logo was developed to represent the nuts heart health general level health claim in a visual way.

Attend conferences and events

- **Australian Nut Conference – exhibit and presentation (March 2019)**
- **Pecan Industry conference – presentation (August 2019)**
 - Showcase new resources, upcoming new Nuts for Life website
 - Presentations:
 - Connecting with health professionals in a relevant way to deliver health messages.
 - The place of health messaging in consumer campaigns
 - Health and nutrition value of pecans and the Nuts for Life program
 - Contributed to the pecan industry’s ‘Growers Guide’ reference book, via writing a chapter on nuts and health. This was reviewed by Professor Linda Tapsell, University of Wollongong.

Labelling manuals

- The labelling guide summarises information from Food Standards Australia and New Zealand (FSANZ) Food Standard codes, particularly Standards 1.2.7 Nutrient, Health and Related Claims, and 1.2.8 Nutrition Information Requirements.
- A simplified and more user-friendly version was developed and launched to contributors in September 2018, and updated in March 2020.

Newsletters

Contributor eDMs

- Scheduled quarterly e-newsletter sent to a database of around 250 contributors; together with alert e-newsletters to inform contributors of upcoming events (e.g. AHS research launch, webinars), news (e.g. Nuts and Immunity during COVID, GLHC logo launch).

- The platform for delivery changed in July 2018 from an email to Mailchimp format - allowing open and click through rates to be tracked. This changed again in early 2020 and brought in-house. This could be achieved due to the website update, which allowed for e-newsletters to be sent.

Monthly content wrap

- Introduced in April 2020 to share content with contributors for them to use on their own websites, social media platforms etc., including specific articles, research and information on health days.

Contributor E-newsletter subscriber survey - September 2019

The purpose of this activity was to gather broad feedback about the efficacy and value of Nuts for Life from all current contributors. The short survey was distributed to 243 contributor contacts via EDM, and incentivised with a \$50 supermarket voucher. It achieved an open rate of 31% (average for our list) and 11.6% of recipients clicked through to the survey. Only 12 survey responses were received (4.9% response rate).

Industry Publications

Australian Nutgrower (quarterly newsletter)

- Industry update: September and December 2018; March, June, September and December 2019; March and June 2020.
- Feature story: December 2018, March and December 2019, June 2020
- Nuts for Life introduced a Research Review feature in June 2019; has featured in all editions since.

International Nutfruit magazine (3 issues per year)

Industry article: November 2018; July and November 2019 and July 2020.

Collation of wholesales sales statistics

5. Consumer education (unmatched)

NB. Consumer education falls outside the Hort co-funded project. It has been included as an appendix (Appendix 6.) to highlight the impact of the Nuts for Life program across the consumer space.

Outputs

Outputs generated over the duration of the program:

Database of nut and health research publications – available on website

<https://www.nutsforlife.com.au/resource/childrens-health-research/>
<https://www.nutsforlife.com.au/resource/weight-management-research/>
<https://www.nutsforlife.com.au/resource/pregnancy-and-fertility-research/>
<https://www.nutsforlife.com.au/resource/heart-health-research/>
<https://www.nutsforlife.com.au/resource/gut-health-research/>
<https://www.nutsforlife.com.au/resource/general-health-research/>
<https://www.nutsforlife.com.au/resource/eye-health-research/>
<https://www.nutsforlife.com.au/resource/diabetes-research/>
<https://www.nutsforlife.com.au/resource/cancer-research/>
<https://www.nutsforlife.com.au/resource/brain-health-research/>
<https://www.nutsforlife.com.au/resource/allergy-research/>

Sub-contracted Research publications

- Nikodijevic, C. et al. Development of a database for estimation of the nut content of Australian single-ingredient and multi-ingredient foods. *J Food Comp and Analysis*, 2019. 82 (September 2019).
<https://www.sciencedirect.com/science/article/abs/pii/S0889157518313346>
- Nikodijevic C. et al. Nut consumption in a representative survey of Australians: a secondary analysis of the 2011–2012 National Nutrition and Physical Activity Survey. *Public Health Nutrition*, March 2020 <https://doi.org/10.1017/S1368980019004117>

Industry/HP Publications

- Diabetes Management Journal (November 2019 edition)
- Nutgrower articles x 16
- NutFruit articles x 4
- Annual reports x 2
- Prospectus

eNewsletters

- Contributor quarterly newsletters and alerts x 25
- Contributor e-newsletter survey results - 2019
- HP quarterly newsletters, research and alerts x 33
- HP e-newsletter survey results – 2017 and 2019

Research Reports

Nuts and Heart Health – a summary of the evidence (2019 edition)

<https://www.nutsforlife.com.au/resource/nuts-and-heart-health-a-summary-of-the-evidence/>

Nut consumption, nutrients and better health.

<https://www.nutsforlife.com.au/resource/nut-consumption-nutrients-and-better-health/>

Research dossiers

- The effect of nut consumption on heart health: an updated systematic review of the literature, December 2018. University of Wollongong.
- A summary of the health effects of nuts – literature review of recent review papers, November 2018. Nutrition Research Australia.

Market research reports

Health professional market research

October 2018 - Full report available in contributors' section of the website.

June 2020 – report available July 2020

Apparent tree nut consumption – wholesale nut statistics data

2017/2018

2018/2019

Conference/event evaluation reports

- Dietitians Association of Australia (DAA) conference – 2018 and 2019
- Webinars
 - Brain health
 - Australian Health Survey and Health outcomes summary
- Australian Society of Lifestyle Medicine conference
- Australasian Diabetes Congress
- Australian Health Survey – breakfast launch
- Australian and New Zealand Obesity Society conference
- Royal Australian College of General Practitioners conference
- NUTrition ambassador evaluations

Presentations

- Connecting with healthcare professionals – presented at Australian Nut conference
- Australian Health Survey Poster presentation – presented at DAA conference 2019
- Pecans: health and nutrition – presented at Pecan Conference
- Health benefits, and Addressing barriers and concerns – presented at NSW Diabetes update day

Resources (available from nutsforlife.com.au unless indicated)

- Health and Nutrition chapter in Pecan Growers Guide (refer appendix)
- Plant food tear off pad (100-page notepad) – used for GP Samples Plus education campaign (refer appendix)
- Labelling manual
- Website (updated and revised)
- Health Fact Sheets x 12
- Allergy awareness Fact Sheets x 9
- Infographic – Brain health x 1
- Nutrient Composition of Nuts x 2 (2018 and 2020 editions)
- Nutrition and health e-book x 2 (2019 and 2020 editions)
- Baby recipe booklet – developed for Allergy Prevention Project
- Nuts and Heart health GLHC User Guide – for contributors only
- License Agreement for GLHC – for contributors only
- Nuts and heart health GLHC Logo – for contributors only
- Health Professional market research report – for contributors only
- PIEFA School resources lesson plans x 2
- Exhibition banners x 3 (refer appendix)
- Recipes – at least 45 new recipes
- Webinars
 - Brain health
 - Australian Health survey and health outcomes summary

Media

- Media Bureau evaluation
- Media campaign (AHS) evaluation
- Media Releases/pitches x 5
- Social media channels and posts – Instagram, Facebook and Twitter

Technical submissions – available on contributors' section of the website

- Health Star Rating submissions x 3
- Plain English Allergen Labelling x 2

Outcomes

1. Increased nut consumption closer to the daily target of 30g per day.

Nuts for Life continues to collate tree nut industry wholesale sales statistics, on an annual basis as a measure of domestic apparent tree nut consumption, and as one metric to evaluate the Nuts for Life program.

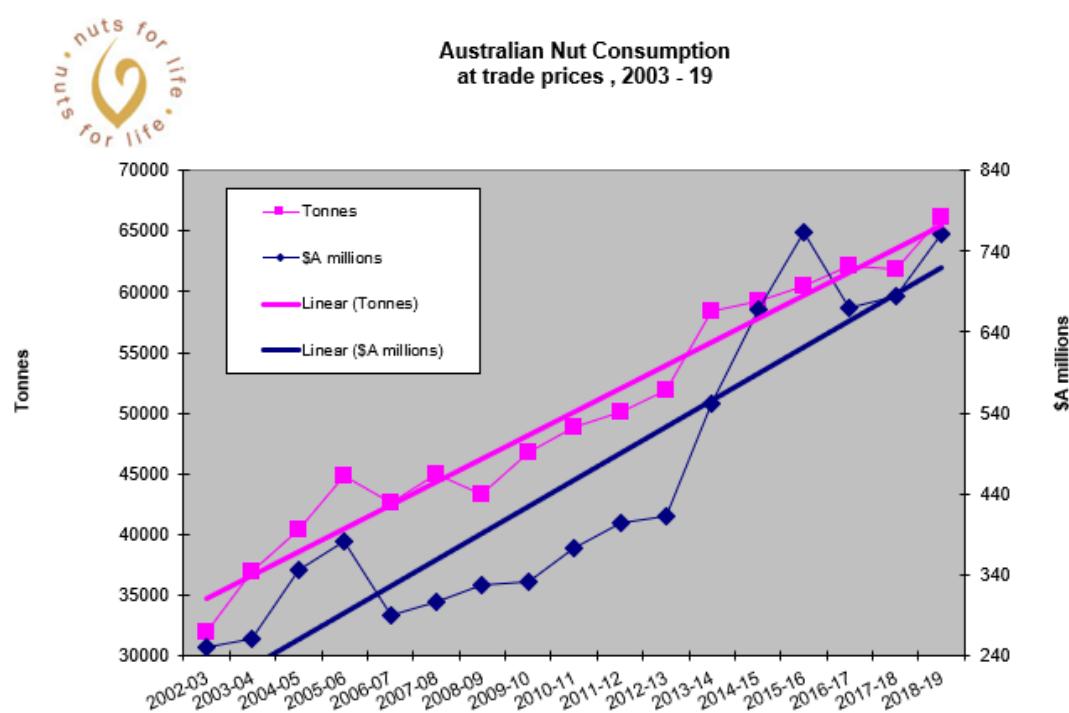
Annual compound growth for all nuts since 2003 to 2019 has been in line with the N4L KPI of 5% pa compound growth.

Volume: 4.6% per annum - from 32k tonnes in 2003 to 62k tonnes in 2019

Value: 7.2% per annum - from \$251m in 2003 to \$760m in 2019.

These results are about double the population growth and double the inflation rate over the last five years. The figure below highlights Australian tree nut consumption since 2003.

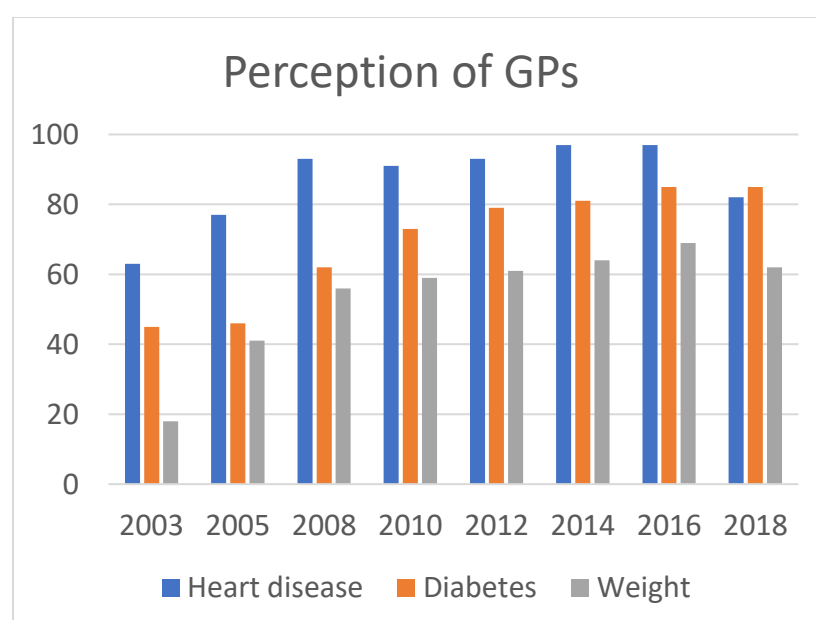
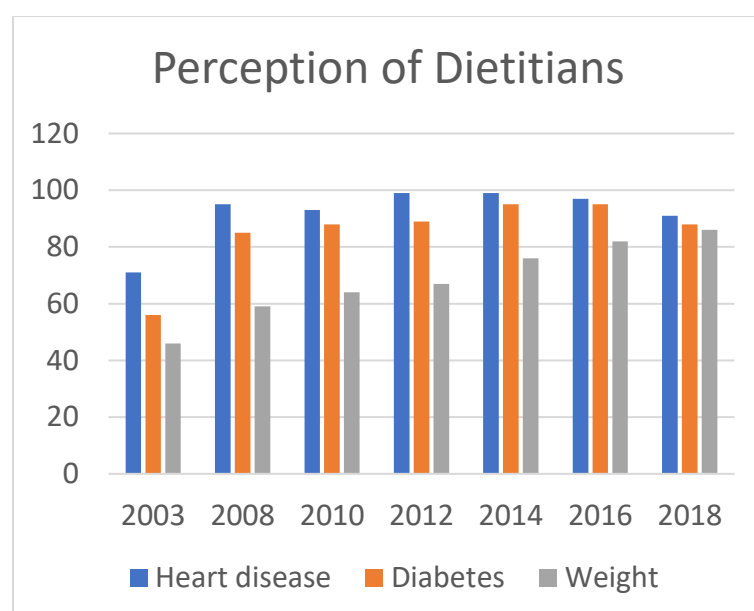
NB. 2019/2020 data was not available at the time of reporting.



Outcome: Nuts for Life is meeting its goal of increasing apparent tree nut consumption by 5% p.a.

2. Demonstrated change in knowledge and attitude and increased awareness of the health benefits of nuts amongst professionals

Nuts for Life has undertaken regular market research surveys to understand the attitudes and knowledge of nuts held by health professionals (GPs, dietitians, diabetes educators and fitness professionals), approximately every 2-3 years. It's important to note that whilst we have attempted to draw comparisons between previous surveys, the 2018 and 2020 research methodology is substantially different to previous surveys. Nevertheless, the trend is heading in a positive direction.



Results of the 2018 Market Research

	Practice Nurses	GPs	Pharmacists	Dietitian (new)	Dietitian (exp)	Fitness Professionals
% of those who agreed that the role of nuts was 'very important'						
Nuts and managing cholesterol	21	24	19	34	39	29
Nuts and preventing heart disease	24	46	22	48	59	38
Nuts and positive gut health	24	24	18	31	41	22
Nuts and preventing T2DM	22	49	18	38	54	36
Nuts and weight management	19	23	17	43	49	27
Nuts and weight loss	-	-	-	-	-	18
Nuts and muscle growth	-	-	-	-	-	18
Nuts and positive mental health	14	16	12	36	34	-
% of those stating 'frequently' or 'sometimes'						
Frequency of recommending nuts	43	50	25	83	93	60
% agreeing they 'should be included'						
Role of nuts in a healthy diet	54	68	56	83	93	59

In addition to market research, we have also continued to educate health professionals on the benefits of nuts via conferences and events, e-newsletters, social media, resources and our website. These activities are aimed at keeping health professionals abreast of research and continually remind them of their benefits.

Outcome: Nuts for Life is continuing to educate health professionals and improve their knowledge and understanding of the benefits of nuts.

3. Correct misinformation and address barriers to consumption

We have a good understanding of the major barriers that exist to increasing nut consumption, and have continued to address these throughout the program:

- Allergy
 - Baby Recipe Booklet (Partnership with Allergy and Anaphylaxis Australia as part of the Food Allergy Prevention Project)
 - Awareness Fact sheets series (Partnership with Allergy and Anaphylaxis Australia)
- Weight
 - Dissemination of Australian Health Survey Re-analysis
 - Development of Nut myths fact sheet
 - Webinar – AHS survey results
 - Development of general level health claim: Nuts support heart health without weight gain, which has been adopted and used by various nut industry stakeholders.
- Activation
 - media release of new research
 - development of Nut myths fact sheet
- Unfamiliarity/ uncertainty of incorporating nuts into diet
 - developed over 45 new recipes
 - What a 30g serve looks like fact sheet

Outcome: Nuts for Life has continued to address and correct misconceptions on nuts

4. Disseminate research to key influencers

Research is continually disseminated to key influencers via a number of channels including: resources at conferences and events; e-newsletters; social media platforms; NUTrition ambassadors social media platforms; traditional media; website; media dietitian database outreach. Research includes Nuts for Life initiated research e.g. Australian Health Survey results, as well as that published in credible scientific journals.

Outcome: Nuts for Life continues to disseminate research to key influencers

5. Evidence to support improving the positioning of nuts in public health nutrition policies

We have made five technical submissions on behalf of the nut industry, including for the five-year review of Health Star Ratings, and FSANZ Plain English Allergen Labelling. Both of these have provided an opportunity to ensure nuts remain top of mind and relevant in the public health nutrition space.

We have also attended/ presented and/or played a part in various public health initiatives including NSW School Canteen Guidelines, Victorian Healthy Eating Enterprise, Growcom's Eat yourself to Health campaign etc.

Outcome: Nuts for Life continues to support improving the positioning of nuts in policies.

6. Strengthened relationships with health professionals, research agencies as a credible source of information etc.

Throughout this project, we have continued to work with research agencies (e.g. University of Wollongong and University of South Australia, INC etc.), established relationships with additional research agencies (e.g. University of Otago, Nutrition Research Australia) and maintained relationships with health professionals (dietitians, GPs, diabetes educators etc.). We remain a credible source of information by collating the latest scientific research to ensure our resources and information are factual and up to date.

Outcome: Nuts for Life remains the credible source of information on tree nuts and health

7. Increased awareness of the heart health benefits of nuts

The nuts and heart health general level health claim was officially launched at the Australian Nut Conference in March 2017, with the associated License Agreement and supporting documentation finalised in October 2017. Since its release, the claim has been adopted by eight contributors of Nuts for Life, with pending interest from at least one more and two major retailers at the time of preparing this report.

The scientific support for the claim was further strengthened, with the findings disseminated to the nut industry and to health professionals following the completion of the systematic literature review by the University of Wollongong in 2018.

Our market research of health professionals in 2018, showed that of all the positive responses received, the questions that elicited the highest 'very important' responses was related to preventing heart disease (and preventing T2 Diabetes).

Outcome: Awareness of the heart health benefits of nuts is increasing amongst health professionals, the nut industry and consumers.

Monitoring and evaluation

Nuts for Life has been a highly successful collaboration of around 25-30 Australian tree nut industry companies and organisations for many years. The very fact that these companies voluntarily fund Nuts for Life year after year is testament to the value they place on the service and results Nuts for Life provides and generates.

Apparent increase in Australian tree nut consumption

Nuts for Life has met its goal of increasing apparent tree consumption by 5% pa. However, this data equates to an average intake of around 7g of nuts per day per person based on an Australian population of 25.5 million. Additionally, research funded by Nuts for Life, a re-analysis of the Australian Health Survey data, revealed only 2% of Australians are meeting the 30g a day target. Therefore, considering the significant health benefits of nuts occurs when consumption reaches 30g per day, there is still a lack of translation into Australian's eating habits and therefore still clearly a need to find ways of enabling a shift to increase consumption.

M&E Dashboards

An M&E dashboard was developed and finalised in September 2018. The intention of the dashboard is to map how the program goals are tracking against four key pillars, presented in a visual format. The four pillars are:

1. Public health
2. Health Professionals
3. Industry, and
4. Consumers.

The dashboards are updated and presented to the Management Committee twice a year.

1. Public Health

Public health

Area	Priority	Current	Aim (end 2020)	Tracking
Australian Guide to Health Eating (AGHE)	Moderate	<div>1 2 3 4</div> <ul style="list-style-type: none"> Part of protein food group No review/ update of AGHE on NHMRC agenda One of the major objectives for next 3-year plan 	<div>1 2 3 4</div> <ul style="list-style-type: none"> Remain protein food group, plus vegetable group To be considered essential to health, not just animal alternative 	Pending
Health Star Ratings	Low	<div>1 2 3 4</div> <ul style="list-style-type: none"> Scored under category 2 (protein group); receiving 4-5 stars Following 5-year review: all nuts continue to score 4-5 stars 	<div>1 2 3 4</div> <ul style="list-style-type: none"> All unsalted nuts exempt from the HSR scoring algorithm or to receive automatic 5 star rating 	Complete
Nuts and heart health General Level Health Claim (GLHC)	Low	<div>1 2 3 4</div> <ul style="list-style-type: none"> Contributors using claim remains consistent at 7 Logo developed and launched May 2020 Ongoing discussions with retailers (Coles/WW) HLHC: one of the major objectives for next 3-year plan 	<div>1 2 3 4</div> <ul style="list-style-type: none"> Increase uptake of GLHC Promote uptake of GLHC amongst retailers 	On track
Nuts and Allergies – awareness and policies	Low	<div>1 2 3 4</div> <ul style="list-style-type: none"> No references to 'nuts' in (NSW) School canteen policy documents Partnership with AAA – Baby recipe booklet - the most commonly downloaded resource on the NipBub website, averaging 168 	<div>1 2 3 4</div> <ul style="list-style-type: none"> Recognition of nuts as an important and essential component of a healthy diet in canteen policy documents 	On track

Nuts for Life: nutritional reputation dashboard

page 1

Nutritional reputation dashboard

Updated June 2020

	downloads/month; Nut Awareness FS developed April 2020, showing high engagement to date.		
	Partnership with PIEFA – resources (x2) tracking above average		



Public Health – supporting information

Australian Guide to Healthy Eating/Australian Dietary Guidelines (ADG)

- Nuts are part of the protein group in the ADG, and sit alongside lean meats and poultry, fish, eggs, tofu, and legumes/beans.
- In general, the foods in this group are a good source of many nutrients including, protein, iron, zinc and other vitamins and minerals.
- Nuts and seeds are rich in energy and nutrients. In addition to protein and fibre, they contain significant levels of unsaturated fatty acids and are rich in polyphenols, phytosterols, and micronutrients including folate, vitamin E, selenium, magnesium and other minerals.
- Servings are smaller due to their concentrated kJ content.
- Whole nuts and seeds are not recommended for children 3 and under because of potential choking. Pastes can be included after 6 months of age.
- Serve = 30g nuts, seeds or nut butters (no added salt or sugars) – which provides 500-600kJ, but only to be used occasionally as a substitute for other foods in the group

Health Evidence

- Associated with reduction in cholesterol – grade C
- Reduced risk of heart disease
- Not associated with weight gain (65-100g/day)
- Nut consumption provides benefits by enhancing anti-inflammatory processes

Information on updates to ADG (from correspondence received Sep 2018)

I can confirm that National Health and Medical Research Council's (NHMRC) 2013 Australian Dietary Guidelines and associated Eat for Health Program (www.eatforhealth.gov.au) are still considered current and reflective of the best available evidence.

Given the guidelines were released over five years ago, we are currently working with the Australian Government Department of Health to consider revision requirements and available resourcing.

Opportunities

- Nuts to be represented in vegetable section (due to benefits of plant-based eating)
- Remove references to limiting consumption and remove references to 'only to be used occasionally'
- Daily consumption
- Add/strengthen health evidence benefits
- One of the major objectives in the next 3-year N4L plan is for nuts to be featured more prominently in the next revision of the ADGs

Health Star Ratings

Outcome of the 5-year review based on consultations in October 2018 and February 2019:

- No changes to the algorithm to calculate HSR for nuts, therefore status quo for nuts
 - Nuts are scored based on the algorithm applied to category 2 foods
 - All nuts continue to score between 4-5 stars

Opportunities

No immediate opportunities in the near future.

Health Claims

Currently, Nuts and Heart Health GLHC is a self-substantiated claim via systematic literature review. The results of the updated SLR continue to support and strengthen the claim. Uni Wollongong advised that an update is not required for at least 5 years, or unless evidence refuting the claim is published. (Meta-analysis results were too small to be able to make specific weight claim).

Opportunities and/or next steps

- Promote and encourage use of the newly developed GLHC logo
- Promote uptake of GLHC amongst retailers
- High level health claim: Nuts reduced risk of heart disease and/or reduce cholesterol one of the major objectives for next 3-year plan.

Allergy awareness and school/government policies**Allergy Awareness****Baby Recipe Booklet**

In partnership with Allergy Anaphylaxis Australia and Australasian Society of Clinical Immunology and Allergy (ASCIA), Nuts for Life developed a recipe booklet as part of National Allergy Strategy Food Allergy Prevention Project - guidelines to encourage feeding the most common food allergens (including peanuts and tree nut pastes/flours) to babies within the first year of life.

The recipe booklet is the most commonly downloaded resource on the NipBub website.

Event label →	2019 05	2019 06	2019 07	2019 08	2019 09	2019 10	2019 11	2019 12	2020 01	2020 02	2020 03	2020 04
Baby_Food_Recipes_With_Nuts.pdf	83	268	173	221	151	153	164	123	165	163	153	193

Nut Awareness fact sheets

In partnership with Allergy & Anaphylaxis Australia (AAA), Nuts for Life developed a series of fact sheets which can be used by those with tree nut allergies as a tool to help recognise a specific tree nut in its various forms. They are currently housed on both AAA and Nuts for Life website and have been promoted on social media and eDMs.

Results to date:

N4L website - Current stats show high engagement with 199 views; #23 in top pages; and average time on page 2.08 mins (average 1.39) (data based on stats 15 March – 31 May 2020);

AAA results: viewed 1,372. AAA Facebook results for March and June have a combined reach of over 23,000, with 56 shares.

School and government policy

Despite nuts being part of the protein group in the AGHE, nuts have been omitted from the protein group in the background information policy documents.

PIEFA resources

PIEFA resources finalised early 2019

- Year 7-8 resource (Go Nuts)
 - 18/19 FY - downloaded 556 times
 - 19/20 FY – downloaded 957 times (as at 1.6.20)
- Year 9-10 resource (Lets Nut this Out)
 - 18/19 FY – downloaded 614 times
 - 19/20 FY – downloaded 985 times (as at 01.06.20)

The numbers for the current FY are above the average for resource access based on the figures from the last financial year.

2. Health Professionals

Health professionals

Area	Priority	Current	Aim (end 2020)	Tracking
Dietitians	High	<div>1 2 3 4</div> <ul style="list-style-type: none"> • Very strong awareness of health benefits • Actively recommending and promoting in spheres of influence (e.g. clients, media) • Tracking research currently underway • eDMs open rate 25.7%; click through rate 6.7% 	<div>1 2 3 4</div> <ul style="list-style-type: none"> • Maintain very strong awareness and grow awareness of effects on weight • Maintain active recommendations/promotions • Maintain eDM engagement 	On track
GPs	Medium	<div>1 2 3 4</div> <ul style="list-style-type: none"> • Moderate-strong awareness of health benefits (less with weight) • Moderately recommending/promoting to clients/patients • Tracking research currently underway 	<div>1 2 3 4</div> <ul style="list-style-type: none"> • Improve overall health benefit awareness, particularly awareness of effects on weight • Maintain current level of recommendations/promotion to patients 	On track
Fitness Professionals	Low	<div>1 2 3 4</div> <ul style="list-style-type: none"> • Strong awareness of health benefits (less with weight) • Moderately recommending/promoting to clients/patients • No targeted campaigns to FP this year – one of the major target groups for next 3-year plan 	<div>1 2 3 4</div> <ul style="list-style-type: none"> • Maintain strong awareness and grow awareness of effects on weight • Maintain current level of recommendations/promotion to patients 	Pending
Other HCPs	Medium	<div>1 2 3 4</div>	<div>1 2 3 4</div>	On track

Nuts for Life: nutritional reputation dashboard

page 3

Nutritional reputation dashboard

Updated June 2020

i.e. Pharmacy, GP nurses, diabetes educators	<ul style="list-style-type: none"> • moderate awareness of health benefits (less with weight) • Moderately recommending/promoting to clients/patients 	<ul style="list-style-type: none"> • Improve overall health benefit awareness and grow awareness of effects on weight • Improve current level of recommendations/promotion to patients
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Health Professionals – supporting information

HP NutENews e-newsletter metrics

Industry average - Open rate: 16.7%; click rate: 1.8%

Current N4L average - open rate 25.7%; click rate: 6.7%

Subscriber rate has increased from 2,887 (November 2017) to 3,477 (May 2020).

Metric	Open rate (%)	Click rate (%)	Unsubscribe	Total Subscribers	Popular link
Oct 2017	29.1	1	31	3271	Nuts weight
Dec 2017	22.8	1	27	2925	Brainwave
March 2018	24	1.4	21	2887	Recipe
June 2018	29.3	2.1	20	2985	Brain FS
Sep 2018	29.2	6.3	27	3064	activated
Dec 2018	27.6	4.8	30	3045	Recipe - tart
Jan 2019	28.6	11.3	17	3009	Dietitian eBook
April 2019	27.1	6.8	25	2987	AHS report
June 2019	22.4	5.8	34	2953	FAQ roasted nuts
Aug 2019	19.3	5	19	2882	New website

Nov 2019					
Changed to monthly eDM with new format (based on survey conducted September 2019)					
Jan 2020	20.2	4.2	0.5	3781	Nut infographics
Feb 2020	27.5	9.5	0.6	3712	HP eBook
March 2020	27.1	6.8	0.5	3632	Nuts and immunity
Alert (March)	25.2	3.2	0.4	3657	AHS summary
April 2020	28.3	9.9	0.6	3501	Updated RR

NutEResearch e-newsletter metrics (commenced Aug 2018)

Average open rate of 28.3% and click rate of 4.4%.

Metric	Open rate (%)	Click rate (%)	Unsubscribe	Total Subscribers	Popular link
Aug 2018	44.8	6.7	0	225 (new)	PREDIMED republication
Sep 2018	23.8	3.6	15	3029	Weight/glucose
Nov 2018	28.1	4.3	18	3011	Walnuts comp
Dec 2018	22.8	3.6	14	2986	Activating almonds
Feb 2019	22.2	3.8	11	2965	Mediterranean – best diet
April 2019	25.5	4.1	21	2938	Nuts and glycaemic control Cashews and energy value
May 2019	26.7	2.7	21	2889	Walnuts and BP Maternal nut intake
July 2019	21.4	3.5	25	2831	Almonds and CVD Nuts and NAFLD
Oct 2019	18.1	3.2	15	2774	Plant-based eating & T2DM Nuts and weight change
Ceased due to new format (based on survey conducted September 2019)					

HP e-Newsletter survey

In September 2019, we conducted an evaluation of our e-newsletters, and sent it via Survey Monkey to both our NutENews and NutEResearch databases – a total of 2,936 subscribers.

Open: 850 (open rate 18.9%)

Clicked: 186 (click rate 5.6%)

Questions:

1. What is your profession
2. Why did you sign up to receive eNewsletters?
3. What kind of articles do you find the most valuable?
4. What do you usually do with the information once you have read it?
5. How often would you like to receive eNewsletters?
6. How likely is it that you would recommend eNewsletters to a client or a colleague?

Summary

- Nearly a third of respondents were nutritionists/dietitians
- Most respondents were positive about the newsletters and signed up to generally stay up to date with nut health and nutrition information.
- 90% are likely or extremely likely to recommend the newsletters
- The articles of most value (NB. respondents could give more than one answer)
 - General information on nuts and health 78%
 - Research summaries 58%

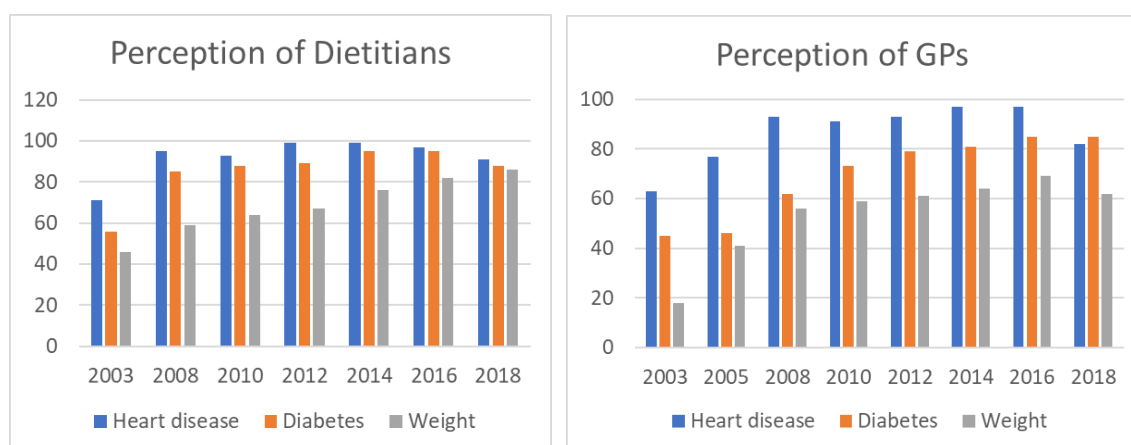
- Recipes 54%
- Disease specific information 52%
- The majority of respondents (64%) would prefer monthly frequency; followed by quarterly (20%).
- The split of what subscribers want to see in the newsletters was relatively even:
 - 31% frequently asked questions
 - 52% disease specific information
 - 78% general nut and health information
 - 46% bite sized content e.g. infographics, myth busting
 - 58% new research
 - 54% recipes
 - 17% Nuts for Life activities

Recommendations

- Combine NutENews and NutEResearch into one newsletter
- Newsletter to incorporate general information, recipes and research summaries primarily
- Newsletters to be sent ~monthly

Market Research Tracking

- May 2020 – new tracking research in progress for dietitians and GPs only (not available at time of reporting).
- It's important to note that whilst we have attempted to draw comparisons between previous surveys, the 2018 and 2020 research methodology is substantially different to previous surveys. Despite these differences, the trend is heading in a positive direction.



2018 research – Summary of results

- The research used a combination of quantitative and qualitative methods
- The set of questions asked changed slightly with more targeted questions relating to major health outcomes only.
- Audiences:
 - Primary audience – dietitians (newly graduated ‘new’ and experienced ‘exp’)
 - Secondary audiences – GPs, Practice nurses, pharmacists, fitness professionals

	Practice Nurses	GPs	Pharmacists	Dietitian (new)	Dietitian (exp)	Fitness Professionals
	% of those who agreed that the role of nuts was ‘very important’					
Nuts and managing cholesterol	21	24	19	34	39	29

Nuts and preventing heart disease	24	46	22	48	59	38
Nuts and positive gut health	24	24	18	31	41	22
Nuts and preventing T2DM	22	49	18	38	54	36
Nuts and weight management	19	23	17	43	49	27
Nuts and weight loss	-	-	-	-	-	18
Nuts and muscle growth	-	-	-	-	-	18
Nuts and positive mental health	14	16	12	36	34	-
% of those stating 'frequently' or 'sometimes'						
Frequency of recommending nuts	43	50	25	83	93	60
% agreeing they 'should be included'						
Role of nuts in a healthy diet	54	68	56	83	93	59

*There were slight differences between previous research and the 2018 research; including adding the pharmacy sector (given the increased demands on the General Practice, this group could become part of the solution to delivering patient care); looking at the differences between new graduate dietitians and more experienced dietitians, and finally the GP arm was expanded to include both doctors and GP nurses.

Metrics (2016 cf. 2018)	GPs	GPs	Diet	Diet	Fitness	Fitness	Diabetes Ed	Pharma
% who agreed/somewhat agreed w the statement	2016	2018	2016	2018	2016	2018	2016	2018
There is a role of nuts in a healthy daily diet	78	68	93	93	68	59	81	56
Nuts can help manage blood cholesterol	79	73	92	90	72	68	83	55
Nuts are important for prevention of CHD	97	82	97	91	85	74	91	61
Nuts have a positive effect on weight	69	62	82	86	64	63	74	46
Nuts prevent diabetes	85	85	95	88	78	67	90	50

Opportunities

- Harder edge health messaging, focussing on the big three health outcomes:
 - Nuts and heart health
 - Nuts and weight
 - Nuts and diabetes
- Continue program with dietitians
- Consider more specific GP targeted program
- Investigate strategies to connect with pharmacy sector
- Ambassador program to include specialists e.g. cardiologists

Media Bureau

Given the program is based on reactive media opportunities, and relies on the strength of independent scientific research, it is impossible to set key performance indicators. It achieved a total of 34 earned media (print, online and radio) and social media clips and over 7 million opportunities to see, at a cost per opportunity to see of \$0.05 cents.

Media Campaign (AHS)

The campaign generated more than 300 traditional and social media clips, creating 12.5 million opportunities to see.

3. Industry

Industry

Area	Priority	Current	Aim (end 2020)	Tracking
Contributor support	Medium	<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> </div> <ul style="list-style-type: none"> 31 financial contributors (as at Sept2018); decreased to 24 (as at May2020). Quarterly eDM: av 39.7% open rate, 9.2% click through rate (maintained strong metrics) New monthly eDM showing early strong engagement 	<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> </div> <ul style="list-style-type: none"> Increase the number of financial contributors Maintain strong eDM metrics 	<div>On track</div>
Take up of on pack health claims	High	<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> </div> <ul style="list-style-type: none"> Heart health GLHC – high recognition and moderate uptake (currently 7); slight confusion around process Interest from retailers Healthy Handful message – logo use has decreased since introduction of HSRs 	<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> </div> <ul style="list-style-type: none"> Heart Health GLHC – improved recognition and uptake Healthy handful – increased use of message HSR – maintain 	<div>On track</div>
Funding partner relationships (Hort Innovation)	Medium	<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> </div> <ul style="list-style-type: none"> Successfully secured 3-year co-funding arrangement (2017-2020) Final milestone report in progress Application for 2020-2023 funding in progress; with funding thereafter unlikely 	<div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> </div> <ul style="list-style-type: none"> Maintain relationship and continue co-funding arrangement Continue delivering milestone reports 	<div>High risk</div>

Industry – supporting information

Contributors quarterly e-newsletter performance

The platform for delivery of the newsletters changed in July 2018 from an email to a Mailchimp format, which allowed open and click through rates to be tracked. The platform changed again in early 2020 and brought in-house. This could be achieved due to the website update, which allowed for e-newsletters to be sent.

- Open rates in 2018/2019 averaged 38%, and click through rates averaged 7.9%
- Open rates in 2019/2020 were maintained with click through rates increasing slightly to 8.2%.

Contributor monthly content wrap e-newsletter performance

These e-newsletters were introduced in April 2020 to share content with contributors for them to use on their own websites, social media platforms etc.

- They include specific articles, research and information on health days.
- Early indications are very strong for this communication, with an average open rate of 38% and average click through rate of 7%. These statistics are consistent with rates for quarterly contributor updates.

	Open rate (average)	Click through rate
Quarterly eDMs	39.7%	9.2%
Monthly wrap up eDMs	38% (new for April 2020)	7% (new for April 2020)

Contributor survey 2019

The short survey was distributed to 243 contributor contacts via EDM, and incentivised with a \$50 supermarket voucher to encourage completion. The survey EDM achieved an open rate of 31% (average for our list) and 11.6% of recipients clicked through to the survey. Only 12 survey responses were received (4.9% response rate), which indicated the limited active engagement from our contributors.

Results:

- Part A: Current work of Nuts for Life
 - Respondents were generally satisfied with the current program of work
- Part B: Working with Nuts for Life
 - The majority of respondents indicated email/newsletters were their preferred communication method (67%), followed by industry conferences (25%). No respondents indicated that direct contact (e.g. via phone) was their preferred method.
 - Respondents were generally satisfied with our current communication channels and the content provided to them.
- Part C: The future of the Nuts for Life program
 - The direction endorsed by the Management Committee for our 2020-23 plan would fulfil their expectations.

Claims and logos

	Heart Health GLHC	Healthy handful logo	Health Star Ratings
Use at launch	2 (Oct 2017)	Unknown in 2014	Unknown in 2014
Use at Aug 2018	3	10	NA
Use at Feb 2019	4	NA	NA
Use at June 2020	8	NA	NA

Number of financial contributors

- September 2018 - 31 financial contributors
- February 2019 – 27 financial contributors
 - New: Murray River Organics
 - Debtors: Trutaste and Yummy Snacks
 - Advised no longer contributing: COT Foods and Nut Stand Co.
- June 2020 – 24 contributors.
 - Advised no longer contributing: Chestnuts Australia, Murray River Organics, Carroll Partners, Maxwell Foods

4. Consumers

Consumers

Area	Priority	Current	Aim (end 2020)	Tracking
Women 30-45 years with children <18 years	High	<div>1 2 3 4</div> <ul style="list-style-type: none"> Higher than average eating handful of nuts, however lower than av. eating each day. 56% think nuts are necessary or optional to babies/children's diet. 10% not sure. New resources now available on website. Average ~200K monthly impressions and 13% engagement on owned social channels. Website: ~10K monthly page views. Average users increasing. 	<div>1 2 3 4</div> <ul style="list-style-type: none"> Increase proportion eating nuts daily Increase knowledge about role in babies/children's diets. Increase social engagement Maintain website engagement 	On track
Men and women 50+ years	Medium	<div>1 2 3 4</div> <ul style="list-style-type: none"> Higher than average eating nuts every day and eating 1-2 handfuls. Average ~101K monthly impressions and 11% engagement on Facebook. Website: ~10K monthly page views. Average users increasing. 	<div>1 2 3 4</div> <ul style="list-style-type: none"> Maintain proportion eating nuts daily. Maintain proportion eating nuts as healthier snack alternative. Maintain social and website engagement. 	On track

Note: the consumer marketing program was effectively defunded in 2019, severely restricting our ability to deliver activities and reach the project objectives.

Consumers – supporting information

Social media metrics

Despite the main target audience being healthy mums and health overhaulers, health professionals (particularly dietitians) are increasingly using social media as a platform for educating and influencing.

2018-2019 results

2018-2019 Audience	Instagram	Facebook
Location	80% live in metro areas	93% live in metro areas
Age	Millennials and gen-X 60% aged 25-44 years	Trans-generational fans, however 67% of engagements are from 55+
Gender	90% female	85% female

Overall, the activity created 2.8 million opportunities to see.

2018-2019 Key performance indicators	Instagram		Facebook	
	Target	Result	Target	Result
Impressions	300,000	1,231,519	500,000	1,549,549
Cost per impression (total)	\$0.05	\$0.03	\$0.03	\$0.01
media budget only	-	\$0.003	-	\$0.004
Engagement rate	10%	12%	5%	8%
Total engagements (incl. video)	30,000	84,018	-	-
Cost per engagement (total)	\$1.00	\$0.43	\$0.70	\$0.35
media budget only	-	\$0.05	n/a	\$0.09
Saves	-	2,714	-	-

2019-2020 results (NB. Not all results received at time of preparing this report).

Key performance indicator	Target (end June 2020)	Current (April 2020)
---------------------------	------------------------	----------------------

Instagram		
Impressions (total)	1,000,000	1,003,032
Cost per impression	< \$0.01	\$0.02 (average to date)
Engagement rate	11%	14% (average to date)
Engagements (total)	91,000	82,293
Cost per engagement	\$0.06	\$0.13 (average to date)
Saves	3,000	3,169
Facebook		
Impressions (total)	390,000	1,015,538
Cost per impression	< \$0.01	\$0.01 (average to date)
Engagement rate	8%	11% (average to date)
Engagements (total)	19,500	25,009
Cost per engagement	\$0.12	\$0.13 (average to date)

Website metrics

- Statistics to date show an increased number of users (2,962 in Jan 2018 to 6,688 in May 2020) and unique page views (5,186 in Jan 2018 to 10,097 in May 2020).
- Our bounce rate remains steady, which when coupled with a strong time on page, indicates people are finding what they need on our website.

Metric	Results to end April 2020
Users	40,100
Sessions	45,498
Page views	103,782
Pages / session	2.5 (average)
Average session duration	0:01:01
Bounce rate	48.71%

External research (July 2018)

Health overhaulers (men and women 50+ with a health condition)

- 19.2% eat nuts daily (higher than general population 14.6%)
- 55% eating 1 or 2 handfuls at a time (on par with 58% general population)
- 88.7% say nuts are important for providing essential daily nutrients (on par with 87.5% general population)
- 57.4% eat nuts as a healthier snack alternative (higher than 52.4% general population)

Opportunities

- 60.8% have not been recommended to eat a daily handful of nuts (higher than 57.9% general population)
- 18.9% say eating nuts has a negative impact on blood cholesterol levels (higher than 15% general population)
- Almost 10% believe nuts should be avoided if you're trying to lose weight (on par with general population)
- Less than 20% eat nuts in snacks or meals they make
- 14.2% say nuts are a discretionary food (higher than 13.6% general population)

Healthy mums (women 30-45 with a child)

- 64.7% eating 1 or 2 handfuls at a time (higher than 58.6% general population)
- 52.2% eat nuts as a healthier snack alternative (on par with 52.4% general population)
- 56% say nuts should be included or are optional for babies and children's everyday diet (higher than 46.2% general population)

- 88.4% say nuts are important for providing essential daily nutrients (on par with 87.5% general population)

Opportunities

- 12.4% eat nuts every day (lower than 14.6% general population)
- Generally eating nuts as part of purchased meals or snacks, rather than alone (67.4%, lower than 75.2% general population) or in meals or snacks they make.
- 15% say nuts are a discretionary food (higher than 13.6% general population)
- 30.8% say nuts should be included in a healthy everyday diet (lower than 36.2% general population)
- 17.4% say nuts should not be included in babies or children's diets (higher than 14.8% general population).
- 10.6% aren't sure if babies and children should eat nuts
- 45.4% say they don't eat nuts because they're too expensive (higher than 36.6% general population)

Recommendations

- Nuts for Life is a highly valued collaborative program of the Australian tree nut industry, with worldwide respect. It is the desire of the industry for it to continue. In doing so, Nuts for Life will also explore and develop a strategy for the future of the program – which will include a plan for it to become a self-funded program.
- Nuts for Life should proceed with the evolution of the scientific program which underpins the activity and provides the evidence for educating health professional audiences.
- Nuts for Life must evolve to meet the needs of a changing Australian market and savvy, health- and planet conscious consumers.
 - There is a wider global trend and movement towards a plant-based diet and its benefits to the health of individuals. This trend is also linked very heavily to consumer choice in relation to climate change and a reduction in greenhouse gases, and is a motivational factor for many consumers.
 - Tree nuts are one of the few plant-based protein foods, and one with significant published health benefits. As this trend towards plant-based diets continues, the Nuts for Life program is in a unique position to build on its previous health messages and brand awareness and to link into this world-wide trend to the benefit of the industry and the health of consumers.
- Nuts for Life will leverage itself further on the existing assets of the program to strengthen its impact. i.e. building on the nuts and heart health general level health claim to develop a high-level health claim dossier for nuts and heart health. These activities have a direct and positive impact to the nut industry.
- As its current core activity Nuts for Life will continue to focus on the education of health professionals due to the continued growth of the industry and the crowded nutrition space. The nut health message needs to be top of mind. The reason I have shifted this around slightly was to pick up on the fact that the core of the current program is Educating Health Professionals but there will be new and emerging core activities introduced within the next round. Change back if you don't believe this to be relevant.
- Nuts for Life will continue to prioritise dietitians as their primary target audience, together with GPs and fitness professionals as the secondary audiences. These audiences combined, represent some 70,000 health professionals with a reach of millions of Australians. As unhealthy diets and lifestyles remain a growing risk to population health, they are perfectly placed to offer dietary-related consultations and advice.
- Nuts for Life needs to continue to look for opportunities to conduct and own scientific research. The success of the AHS re-analysis project throughout this project has highlighted the opportunities that can arise, the significant return on investment and consequently the impact it achieves.
- Continued and strengthened collaboration with INC and other similar nut research bodies and institutions to assist with sharing and disseminating key messages.

- Consider the establishment of a scientific advisory committee, which may include:
 - Food regulatory/public health expert
 - Academic researcher
 - Marketing expert

Refereed scientific publications

Journal articles

Nikodijevic, C., Neale, E., et al. 2019. Development of a database for estimation of the nut content of Australian single-ingredient and multi-ingredient foods. *J Food Comp and Analysis* **82**, September 2019, 103276.

Nikodijevic, C., Probst, Y., et al. 2020. Nut consumption in a representative survey of Australians: a secondary analysis of the 2011-2012 National Nutrition and Physical Activity Survey. *Public Health Nutr* 2020 Mar 10:1-11.

Chapter in a book

Neville, B., Tapsell, L. 2020. Health and Nutrition. In: Pecan Industry Association, Pecan Growers Guide (not yet published).

Paper in conference

Probst, Y. 2019. Nut Consumption and Health: A secondary analysis of the Australian Health Survey. In: ANZOS-ASLM-ICCR 2019 conference. Concurrent - Public Health Submitted Abstracts.

References

1. Fraser, G.E., et al., A possible protective effect of nut consumption on risk of coronary heart disease. The Adventist Health Study. *Arch Intern Med*, 1992. **152**(7): p. 1416-24.
2. Nikodijevic, C.J., et al., Nut consumption in a representative survey of Australians: a secondary analysis of the 2011-2012 National Nutrition and Physical Activity Survey. *Public Health Nutr*, 2020: p. 1-11.
3. Australian Institute of Health and Welfare AIHW. Australian Burden of Disease Study: Impact and causes of illness and death in Australia 2011. Australian Burden of Disease Study series no. 3. BOD 4. Canberra, AIHW. 2016.

Intellectual property, commercialisation and confidentiality

The Australian tree nut industry (ANIC) and Hort Innovation jointly share the IP of this project.

Acknowledgements

Nuts for Life would like to thank and acknowledge the contributing companies and organisations that have voluntarily funded the Nuts for Life program continuously for the last 17 years.

Thanks also to the Nuts for Life Management Committee members for their ongoing support, direction and advice.

Chris Joyce – chair, Nuts for Life (2003 – Oct 2019). Director Australian Pioneer Pistachio Company

Michael Waring – Chair, Nuts for Life (from Jan 2020). Chairman and Managing Director Waring Group and MWT Foods. Chairman International Nut and Dried Fruit Foundation (INC).

Gerard Brunton - Vice Chair, Nuts for Life (from Jan 2020) and Managing Director, GB Commtrade.

Declan Dart - Vice Chair, Nuts for Life (from Jan 2020) and Managing Director, Trumps. INC Ambassador to Australia.

Joseph Ebbage – Market Development Manager, Almond Board of Australia. Director, Consumer Insights.

Michael Scalzo – (from Nov 2019) Managing Director, Scalzo Food Industries.

Jonathan Swane – (until Nov 2019) Marketing Manager, Scalzo Food Industries.

Lynne Ziehlke – Market Development Manager, Australian Macadamia Society.

Australian Nut Industry Council representative:

Cathy Beaton – (from Nov 2019) Executive Officer, Australian Nut Industry Council.

Eric Siegers – (until June 2019) Executive Office, Australian Nut Industry Council

The commitment by and dedication of the Nuts for Life team of Belinda Neville and Claudia Higgins during this project must also be acknowledged.

Finally, we would like to thank all our sub-contractors who have assisted in helping to make this three-year project a great success.

Appendices

1. Media Campaigns – Examples of media coverage
2. Pecan Chapter – Nuts and Nutrition
3. Nutgrower articles – June 2020 edition
4. GP Education resource
5. Diabetes Management Journal article
6. Consumer education

APPENDIX 1 – Media campaigns (examples of coverage)

OUTLET: Dr. Joanna McMillan
TYPE: Online
DATE: 4 February 2020
REACH: N/A
URL: <https://drjoanna.com.au/blog/nuts-help-to-keep-the-kilos-off-blog-1106/?fbclid=IwAR3CO4q8VL85e1FF8jJfK7ies8epnONoLhmsYtcp8lyMIN40H9vcQJ/Pm3ERXj129yHbE8.facebook>



OUTLET: Rebecca Gawthorne
TYPE: Facebook
DATE: 13 May 2020
REACH: 2,450
URL: <https://www.facebook.com/RebeccaGawthorne.DietitianNutritionist/posts/3070635779665169>



OUTLET: Rebecca Gawthorne (Nourish Naturally)
TYPE: Instagram Story
DATE: 2 June 2020
REACH: 150,000



OUTLET: The Project
TYPE: TV
DATE: 15 March 2020
REACH: 523,000



OUTLET: The Australian
TYPE: Online
DATE: 11 March 2020
UWB: 500,000

THE AUSTRALIAN

'Fat phobias' keeping nut consumption low



© News

By Chris Reed

11:01 AM 2020 3:20 AM

Subscriber only



AUSTRALIANS need to increase their consumption of nuts six-fold - or the equivalent of eating an extra nine kilograms a year - to help lower the risk of cardiovascular disease, some types of cancer and type 2 diabetes, new research shows.

The University of Wollongong study, published in *Public Health Nutrition*, found no links between eating nuts and weight gain, however, researchers believe fat phobias may be keeping nut consumption alarmingly low.

Just two per cent of Australians were found to eat the recommended 30 grams of nuts a day - about a handful - while 60 per cent did not report eating any nuts.

Lead researcher Dr Elisabeth Neale said the low level of nut consumption was concerning, with the average amount eaten being just 4.6g.

OUTLET: Dr. Joanna McMillan Blog
 TYPE: Online
 DATE: 11 March 2020
 UMB: TBC
 URL: <https://drjoanna.com.au/blog/australians-need-to-eat-more-nuts-blog-1108/>

Australians Need to Eat More Nuts!



New research shows that many Australians need to increase their nut intake to help, if they're to gain the significant health benefits associated with regularly eating nuts (1-3).

The University of Wollongong study, published in *Public Health Nutrition*, is the first to analyse nut consumption in Australia, including whole nuts, as well as nuts incorporated into other foods, including breakfast cereal and sweet bars.

The study revealed just 2% of Australians ate the recommended 30g of nuts a day (about a handful) and 68% of Australians did not report eating any nuts. Among all Australians, the average amount of nuts eaten was 4.6g a day, 9% increased to 11.6g of nuts a day when the analysis focused on nut consumers.

The researchers also found Australians who ate more nuts had significantly higher intakes of key nutrients including fibre, vitamin E, iron, magnesium and phosphorus, that consumption was not associated with increased weight, BMI or weight gain/loss.

Lead researcher, University of Wollongong's Dr Elizabeth Neale said the low level of nut consumption was concerning.

"The body of scientific evidence shows that, as part of a healthy diet, eating approximately 30 grams of nuts a day is associated with lower risk of cardiovascular disease, some types of cancer and type 2 diabetes," said Dr Neale.

OUTLET: 2GB Sydney
 TYPE: Radio
 DATE: 11 March 2020
 AUDIENCE: 212,000

A new study has found there is 2% of Australians eating the recommended 30 grammes of nuts every day while 68% d...
 By Newsreader

2GB, Sydney, 87.30 Hours at 87.33

11 Mar 2020 1:30 AM

A new study has found there is 2% of Australians eating the recommended 30 grammes of nuts every day while 68% do not eat any at all.

2GB

News ID: 10200310239
 Audience: 212,000 (94.8%)
 Sample Size: 118,000 (94.8%)
 RDS: 5714.81
 Location: Sydney
 Region: NSW
 Duration: 30 mins 00 secs
 Type: Audio

OUTLET: ABC Radio Adelaide
TYPE: Radio
DATE: 11 March 2020
AUDIENCE: 7,000



OUTLET: Jacqueline Alwill – Brown Paper Nutrition
TYPE: Instagram Stories
DATE: 11 March 2020
REACH: 84,300
URL: <https://www.instagram.com/brownpapernutrition/?hl=en>



OUTLET: Nutrition Research Australia
TYPE: Facebook
DATE: 7 May 2020
REACH: 617
URL: <https://www.facebook.com/nutritionresearchaus/photos/s.2636394406440272/2974886252591084/?type=3&theater>



OUTLET:
TYPE:
DATE:
REACH:
URL:

Nicole Senior
Facebook
17 September 2019
269
<https://www.facebook.com/photo.php?fbid=10156888739057013&set=p.10156888739057013&type=3&theatre>



OUTLET:
TYPE:
DATE:
REACH:
URL:

Zoe Bingley-Pullin
Facebook
17 September 2019
19,037
<https://www.facebook.com/nutritionaledge/photos/a.250638581659162/2518335561556108/?type=3&theatre>



OUTLET:
TYPE:
DATE:
REACH:
URL:

Anika Rouf
Instagram Stories
17 September 2019
4,320
<https://www.instagram.com/shenanigansofadietitian/?hl=en>

OUTLET:
TYPE:
DATE:
REACH:
URL:

Amy Darcy
Instagram Stories
17 September 2019
20,900
<https://www.instagram.com/estrayworkout/?hl=en>



APPENDIX 2 – Pecan Chapter – Nuts and Nutrition

PECAN HEALTH AND NUTRITION

Authors Belinda Neville. Professor Linda Tapsell

Belinda Neville is the Program Manager at Nuts for Life – the leading health education initiative of the Australian Nut Industry, responsible for raising the awareness of the health benefits of tree nuts.

Belinda is an Accredited Practising Dietitian (APD) with over fifteen years' experience working in the food industry sector, specialising in regulatory affairs and in preparing relevant and effective nutrition and health communications.

Professor Linda Tapsell, Senior Professor in Health and Nutrition from the School of Medicine, University of Wollongong, Australia.

For over 30 years, she has conducted ongoing clinical trials manipulating the macronutrient content of diets, testing the impact of individual foods on health outcomes and evaluating the efficacy of healthy dietary patterns in lifestyle interventions. She has over 200 scientific publications and earlier this year, was presented with the Award for Excellence in Research by the International Nut and Dried Fruit Council (INC).



The Nutrition and Health chapter is a comprehensive summary of the current and emerging scientific evidence on nuts and their associated health benefits.

INTRODUCTION

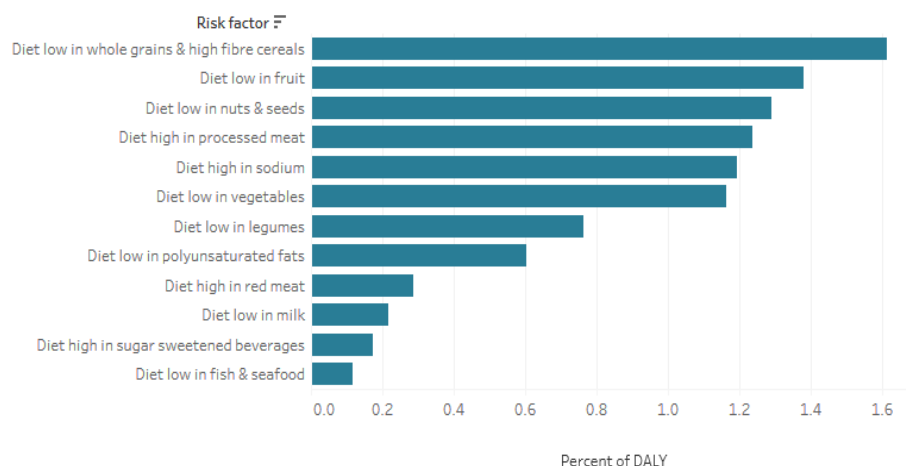
Nutrition research has continued to document evidence demonstrating the impact of diet on health. Different patterns of food consumption can favourably influence population health, or they can adversely increase the risk of disease. Evidence is sought through systematic reviews of the scientific literature and meta-analyses of data from multiple studies. In the case of nut consumption, decades of both observational studies and controlled trials have consistently demonstrated benefits, highlighting the important position of nuts as a core food in a healthy diet.

Regular nut consumption has been shown to be associated with a range of cardio-metabolic benefits, including reduced risk of cardiovascular disease and type 2 diabetes alongside weight management. Emerging research points to reduced overall mortality and cancer risk, and better health in areas from improved sperm quality to factors relating to cognition. Future research will continue to provide us with more detail on the impact of nut consumption on health.

BACKGROUND

Unhealthy diets pose a significant risk to population health. In 2017, one in five (11 million) deaths were associated with poor diet, with cardiovascular disease being the biggest contributor, followed by cancers and type 2 diabetes [4]. Global consumption for foods such as nuts and seeds, milk and whole grains were less than ideal whilst sugary drinks, processed meat and sodium were overconsumed [4]. A report from the Australian Institute of Health and Welfare (AIHW): Australian Burden of Disease Study 2015, placed 'diets low in wholegrains', 'diets low in fruit', and 'diets low in nuts and seeds' as the top three risk factors for total disease burden, with a diet high in processed meat coming in as the fourth highest risk factor for total disease burden [5] (Figure 1).

Figure 1. Dietary Risk Factors, by ranking AIHW, 2015



Source: AIHW Australian Burden of Disease Database. <http://www.aihw.gov.au>

In terms of specific disease burden, the AIHW study showed that a 'diet low in nuts and seeds' accounted for:

- 16% of coronary heart disease burden - higher than 'diets low in whole grains and high fibre cereals' (14.1%), 'diets low in fruit' (8.2%) and 'diets low in vegetables' (13.8%)
- 8.5% of type 2 diabetes burden (up from 7.4% in 2011) - compared with 'diets low in whole grains and high fibre cereals' (14%) and 'diets low in fruit' (7.4%).

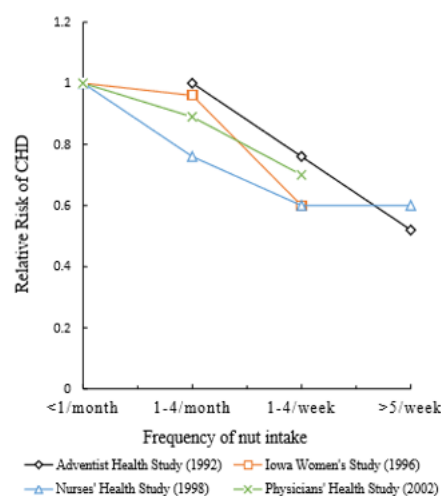
HEALTH BENEFITS OF NUTS

Heart health

The body of evidence on nut consumption and heart health has been established by decades of research. In the early days, four large population studies: the Adventist Health Study, Iowa Women's Health Study, Nurse's Health Study and the Physicians' Health Study [1, 6-8], all found inverse associations between nut consumption and the risk of coronary heart disease (CHD). The combined results of these studies were summarised in a 2006 review, showing that the risk of CHD was 37% lower for those consuming nuts more than four times per week, compared to those who never or seldom consumed nuts [9]. Since then, the evidence has continued to grow, with greater emphasis on serve size and type of heart disease. A systematic literature review (SLR) and meta-

analysis published in 2016 showed that a one ounce serving of nuts a day (28g) was associated with a 29% reduction in the relative risk of CHD and a 21% reduction in the relative risk of cardiovascular disease (CVD) [10].

Figure 2. Risk of CHD death by frequency of nut consumption



As studies continue to be done, Nuts for Life has supported ongoing SLRs and these continue to show heart health benefits [11, 12]. Academics from the University of Wollongong were commissioned to conduct SLRs to examine the evidence base in 2014 [12], and again in 2018, which when combined with the original literature review, included almost 150 studies [11]. The body of evidence suggested a regular intake of nuts is associated with more desirable levels of several heart health indicators including total cholesterol, LDL cholesterol and LDL: HDL cholesterol ratio. The consistency of this evidence in the 2018 report was the same or greater than previously found in the 2014 review. Nut consumption continues to be associated with reduced risk of heart disease (CVD and CHD). Bearing in mind that being overweight is also a risk factor for CVD, it is important to note that the intake of nuts was not associated with weight gain or unfavourable changes in weight measures including BMI, fat mass and weight circumference. The findings

can support a general level health claim that nuts contribute to heart health, when eaten as part of a healthy diet, without weight gain.

From a public health perspective, the impact can be substantial, the significance of which is reflected in the inclusion of nuts in dietary recommendations.

Mortality

As a naturally occurring nutrient dense food, the benefits of nut consumption in a healthy diet are not likely to be limited to heart health. An SLR and meta-analysis showed that total nut consumption was inversely associated with the risk of all-cause mortality [10]. The researchers stated that most of the reduction in risk was observed at intakes of about 15-20g of total nuts a day [10]. They also calculated that a total of 4.4 million deaths might be attributable to a nut intake of less than 20g a day, presumably at a level when diets were shifting over to poor quality food choices.

The significance of consuming a balanced diet has extended to our understanding of the significance of balance in the environment. There has been a growing focus on the importance of consumers adopting more plant-based diets for the sake of the planet, triggering a rise in plant-based eating. The EAT-Lancet Commission report published in January 2019 [13], argued that approximately 11 million deaths worldwide could be prevented if our current diet moves towards a more plant-based diet, including increasing nut consumption and decreasing less healthy foods. The report states:

“Transformation to healthy diets by 2050 will require substantial dietary shifts. Global consumption of fruits, vegetables, nuts and legumes will have to double, and consumption of foods such as red meat and sugar will have to be reduced by more than 50%. A diet rich in plant-based foods and with fewer animal source foods confers both improved health and environmental benefits”.



Diabetes

Overall health is also implicated in the development of lifestyle related conditions such as type 2 diabetes. Not surprisingly, research has shown that diet plays an important role in the prevention of type 2 diabetes, managing existing diabetes, and preventing or reducing the progression of diabetes-related complications. One of the first studies to show an association with developing type 2 diabetes found that a 30g handful of nuts five or more times a week resulted in a 27% reduced risk [14]. An SLR and meta-analysis, published in 2014, showed that consuming a 30g handful of nuts, four times a week, was associated with a 13% reduction in the risk of type 2 diabetes [15].

The mechanisms by which nuts help reduce the risk have been explored. Nut consumption can improve insulin sensitivity [14], and may help lower the Glycaemic Index (GI) of a meal [16]. In addition, nuts contain many nutrients that may benefit metabolic health, including unsaturated fatty acids, protein, fibre, minerals, antioxidants and phytochemicals. The low carbohydrate and high unsaturated fat content of nuts produces lower postprandial glucose and insulin responses, which is thought to be important for reducing diabetes risk over time [15].

Weight management

Consumption of nuts, when incorporated into a healthy diet, does not result in weight gain. The re-analysis of the Australian Health Survey (refer page x for more information) data also concluded the same – that increased nut consumption was not associated with greater body weight or BMI - aligning with the broader body of evidence. Results from an SLR and meta-analysis of cohort studies and 62 randomised trials, showed that nuts were associated with reduced risk of overweight and obesity [17], and that nut consumption was associated with lower body weight, BMI and waist circumference [11, 17]. However, there is a need to better understand the factors that may influence this relationship, such as the amount and type of nuts, time period, and the comparator diet.

There are several possible explanations for why nuts do not seem to lead to weight gain. This has been examined in scientific research conducted over more than twenty years:

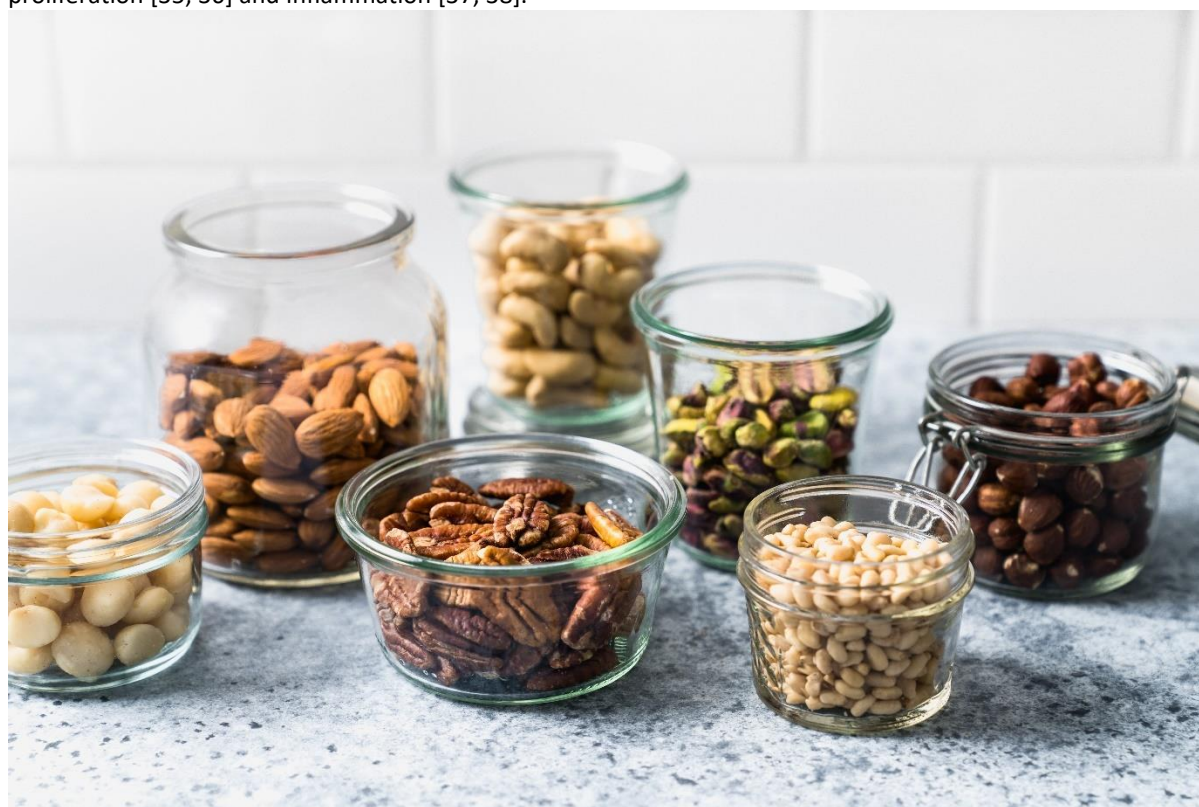
1. Not all the fat in nuts may be absorbed – the fat in nuts is located in cell walls which, depending on the degree of mastication, may not be fully accessible to absorption by the body. This means that a proportion of the fat (and therefore energy) is instead excreted in the faeces [18, 19]. It has been estimated that the number of calories absorbed can be up to 30% lower than previously thought [20, 21].
2. Eating nuts can slightly increase the amount of energy burned by the body, possibly due to the protein content [22].
3. Consuming nuts can enable people to feel fuller for longer. They are high in protein and fibre which act to satisfy hunger and reduce appetite [23, 24]. The fats in nuts also help to release satiety hormones,

sending signals of fullness [25, 26]. Feeling full can also affect subsequent meals, meaning less may be eaten during later meals.

Cancer

The link between lifestyle factors and the development of certain cancers is now also recognised. Foods may contain compounds that relate to pathways involved in cancer inhibition. Several reviews have investigated the association between nut consumption and the risk of cancer, as well as cancer mortality [10, 27, 28]. A 2016 SLR and meta-analysis of 31 observational studies (19 case-control and 12 cohort studies), found that nut consumption was associated with a 15% reduced risk of overall cancer and inversely associated with colorectal cancer, endometrial cancer and pancreatic cancer, but not other cancer types [10]. This may reflect the areas on which lifestyle has the greater impact, as well as the number of studies that are available for review. The result concurs with a study from the Mayo Clinic in the USA, also reporting significant associations between nut consumption and colorectal, endometrial and pancreatic cancers [28], and another systematic review and meta-analysis showing that nut consumption was associated with reduced risk of cancer mortality [27]. Importantly, the available evidence on individual cancer types is limited and more research, particularly from prospective cohort studies is required to better understand these associations.

Nuts contain a number of nutrients that can be cancer protective, including compounds with antioxidant qualities such as Vitamin E, selenium, quercetin, resveratrol and polyphenols, as well as folic acid, fibre and oleic acid. In addition, studies have shown reduced levels of endothelial dysfunction [29], lipid peroxidation [30], and insulin resistance [31] with a higher intake of nuts. Oxidative damage and insulin resistance are important pathogenic drivers of cancer [32]. Nuts, particularly walnuts and pecans have a high antioxidant content [33], and may contribute to cancer prevention by reducing oxidative DNA damage [34], cell proliferation [35, 36] and inflammation [37, 38].



Cognition

Cognitive performance is another function that can be affected by pathways linked to nutrition. Research has shown nut consumption to be associated with better cognitive performance, with greater benefits observed in those with higher, long-term total nut intake [39, 40] and in those with the highest consumption of nuts. The PREDIMED trial tested dietary patterns among elderly participants at high cardiovascular risk. The researchers found that participants who consumed a Mediterranean diet (supplemented with either extra virgin olive oil or 30g mixed nuts a day) had improved cognitive ability compared to those who had consumed a low fat diet [41, 42].

The issue may also be relevant to younger age groups. For example, a Spanish study led by the Barcelona Institute for Global Health (which included more than 2,200 mothers and their children) found children whose

mothers ate more nuts during the first trimester of pregnancy (a weekly average of around three 30g servings) achieved the best results in tests measuring cognitive function, attention capacity and working memory [43]. Associations with nuts and memory have also been found in older adults [44].

Depression

Specific links between diet and mental health are now also being exposed. A few studies have begun to investigate the association between nut consumption and depression. A recent cross-sectional study conducted in more than 13,000 Chinese adults showed that nut consumption was independently associated with depressive symptoms [45]. The researchers suggested that nut consumption may help to prevent depressive symptoms.

The SMILES intervention trial was a 12-week randomised controlled trial in adults with major depression [46]. The dietary intervention comprised of a *ModiMedDiet* – based on a Mediterranean style diet which included one serve of nuts a day. The researchers found improvements in rating of depression after 12 weeks of dietary modification [46]. This will be an interesting area for future research.

Fertility

Fertility is a new area for investigation, but is not surprising given the better appreciation of the chemical nature of food and human function. The Spanish FERTINUTS study found a 60g portion of nuts a day (including almonds, hazelnuts and walnuts) increased sperm count in healthy young men by an average of 16% compared to those eating no nuts [47]. The randomised controlled trial of healthy men showed modest improvements in the proportion of living sperm, their shape and their swimming prowess. The researchers suggested that the improvements in sperm quality could be linked to a diet rich in nutrients including polyunsaturated fats such as omega-3, antioxidants including vitamins C and E, selenium and zinc, and folate - all of which are abundant in nuts.

Gut health and inflammation

The gut microbiome is an expanding area of research as it is now hypothesised to have an impact on the development of chronic diseases, such as obesity. Research has shown that consuming nuts can influence the amount and diversity of bacteria [48-51]. Nuts are foods (prebiotics) for the bacteria (probiotics). Nut skins, in particular, appear to play an important role as they are rich in fibre and polyphenols, with antioxidant and anti-inflammatory properties [52]. In a small randomised controlled study, researchers found that the consumption of almonds and pistachios had positive effects on gut microbiota, as well as increasing the number of beneficial butyrate-producing bacteria [51].

A recent randomised cross-over study, of 18 healthy men and women [53], showed that walnut consumption affected the composition and function of the human gastrointestinal microbiota. Specifically, the addition of 42g of walnuts a day increased the relative abundance of Firmicutes species in the Clostridium clusters XIVa and IV, including *Faecalibacterium*, *Roseburia*, and *Clostridium*. The study also found that walnuts reduced microbially derived, proinflammatory secondary bile acids and LDL cholesterol, both of which are implicated in chronic disease.

While our understanding of the gut microbiota is still in its infancy, this new area of study offers promising results for the overall beneficial effects of nuts on gut health.

AUSTRALIAN HEALTH SURVEY RE-ANALYSIS

In 2018, Nuts for Life commissioned academics at the University of Wollongong to undertake a secondary analysis of the Australian Bureau of Statistics (ABS) 2011-2013 Australian Health Survey (AHS), National Nutrition and Physical Activity Survey (NNPAS) [54]. The AHS is the largest and most comprehensive health survey ever conducted in Australia [55].

The overarching aim of the research was to explore the relationship between nut consumption (vs. nut avoidance) on nutrient intakes and anthropometric measures (including weight, waist circumference and body mass index (BMI)) among Australians aged two years and older.

Specifically:

- To apply the nut specific database (developed previously) [56] to dietary intake data.
- To quantify nut consumption in Australia.
- To determine the contributions of nuts to intakes of key nutrients.
- To identify associations between nut intake and anthropometric and blood pressure measurements.



Results

Australians are not eating enough nuts

- Only 2% of Australians are eating the recommended 30g of nuts a day.
- Among all Australians, the mean intake of nuts was 4.6g a day.
- Of those who were eating nuts i.e. 'nut consumers', the mean intake was 11.75g a day.

Nut consumption is lowest among children

- Of those who were eating nuts, children had the lowest mean intake (7.7g a day) - almost half that of adults (adults 18-64 years mean intake 12.8g a day).

- A similar proportion of males and females reported eating nuts (20.1% of females and 19.1% of males).

Most nuts are consumed as part of core foods

- Most nuts were consumed as whole nuts or as part of core foods, based on AUSNUT 2011-13 major and sub-major food groups.
- Just 11.75% of nuts consumed were from discretionary products such as confectionary, cakes and muffins.

Eating nuts is associated with significantly higher intake of key nutrients

- Greater nut consumption was associated with significantly higher intakes of key nutrients including fibre, vitamin E, iron, magnesium and phosphorus.

- Whole nuts alone contributed more than 10% of the amount of selenium, linoleic acid, polyunsaturated and monounsaturated fat consumed.

Eating nuts was not associated with higher body weight

- Nut consumption was not associated with higher weight, BMI or waist circumference

For the first time, this re-analysis reports on nut consumption in a representative sample of Australians, based on the application of a novel nut database to the 2011-12 NNPAS. The research provides a more accurate insight into nut consumption in Australia, as well as associations between intakes of key nutrients and health measures such as weight and blood pressure.

The analysis showed the mean nut intake among the Australian population was 4.6g a day. The results of this new analysis showed slightly lower figures than those reported in 2011-13 NNPAS, estimated to be 5.2g a day. However, this figure (i.e. 5.2g) represented the whole of the 'Nut and nut products' food group, which includes peanuts, tree nuts, nut products, coconut and coconut products, and seeds – thereby over-estimating actual nut consumption. In addition, the NNPAS original figure was based on only one day of 24-hour recall data, which may not reflect usual intake since nuts are often consumed more sporadically. Even considering apparent nut consumption, using wholesales data from the nut industry, Australians appear to be consuming around 7g per person [57].

Taken together, the average nut consumption for Australians emerged at around 6g per day, which is considerably lower than recommendations of 30g a day. This is concerning as the literature indicates that the risk of cardiovascular diseases, cancer and type 2 diabetes is lowered when nut consumption reaches 30g a day [10, 58-60]. These results suggest that substantial increases in nut consumption are required in Australia in order to reach the intake level associated with improved health outcomes.

Differing patterns of nut consumption were observed across age groups. Of interest is that children represented the lowest proportion of 'Nut consumers', and had the lowest intake of nuts. Possible reasons for this pattern of consumption in children could be due to concerns over the risk of choking, nut allergy and schools adopting 'nut free' policies. The latter two issues present challenges. For example, a recent New Zealand study found nut allergy was a reason for low nut consumption [61], but current allergy management guidelines recommend introducing allergenic foods, including nuts, to all infants (in their first year of life) in an attempt to reduce the risk of developing allergies [62]. A recent theory of allergy development relates to the importance of the gut microbiome, with emerging evidence suggesting how products of good bacteria (such as short-chain fatty acids) are immunologically active and could shape immune responses [63]. Nut consumption, resulting in increased short chain fatty acids, may increase the growth of beneficial bacteria [50, 51], so the way forward for nuts in the diet is yet to be sorted out.

In this analysis of NNPAS data, it was found that almost 90% of nut consumption came from core food groups such as meat alternatives or vegetables and legumes. This is reassuring given the Australian Dietary Guidelines recommend limiting the consumption of discretionary (non-core) foods. About one-third of the energy intake of Australians comes from discretionary foods, with the proportion even higher for teenagers aged 14–18 years, at 41% [64]. Only a small proportion of nuts appear to be consumed from discretionary foods (such as ice-creams, chocolate coated nuts and muesli bars), but this pattern of consumption remains a concern, particularly given the relationship between diets high in discretionary foods and chronic disease.

Nut consumption is consistently associated with favourable dietary patterns. There is also emerging evidence from intervention studies that nut consumption facilitates the development of a higher quality diet [65, 66]. This NNPAS analysis aligns with these findings. Consumption of nuts was associated with significantly higher intakes of key nutrients including fibre, vitamin E, iron, magnesium and phosphorous. Nuts were also found to contribute substantial amounts of fatty acids, selenium, vitamin E and magnesium. Possible reasons for this include:

- nuts themselves contribute to overall nutrient intakes;
- nuts may be consumed as a component of a healthier diet overall; and
- consuming nuts may facilitate the consumption of other core foods and may help to lower the consumption of discretionary (or non-core) foods.

Nuts are energy dense foods. Both consumers and health professionals report concern for a possible impact on body weight [61, 67, 68]. This NNPAS analysis observed that increased nut consumption was not associated with greater body weight, BMI or waist circumference. These results are consistent with the body of evidence [17, 69], showing that those who include nuts in their diets tend to be a healthier weight and that nut consumption is generally not associated with weight gain. This may be because those consuming nuts tend to have healthier diets and lifestyles. Whilst confounding factors such as energy intake, age, sex and other physical activity levels were considered in the analysis, it is possible that other confounding factors may have played a role. Either way, the position of nuts in a healthy diet appears strong.

PECANS AND HEALTH

In addition to the health benefits that all tree nuts provide, more specific research has indicated that pecans have been associated with:

- A highly consistent favourable effect for total cholesterol, LDL cholesterol, HDL cholesterol and triglycerides [11].
- Clinically significant reductions in insulin resistance and fasting insulin in overweight or obese adults with a 45g serve daily for 4 weeks [70].
- A reduction in total cholesterol and LDL cholesterol in both those with normal blood lipids and those with elevated blood lipids, when compared with controlled diets without nuts [71]
- A reduction in LDL cholesterol, when comparing Western and lower fat diets with low saturated fat diets containing tree nuts (including walnuts, almonds, macadamias, pecans, pistachios and hazelnuts) [72].

<insert pecan image>

What makes pecans unique

- Pecans are one of the few plant sources of omega-3 fats (along with walnuts, hazelnuts and macadamias). Plant omega-3 known as alpha linolenic acid (ALA) plays an important role in heart health.
- Pecans are rich in polyphenols, a diverse group of compounds that act as powerful antioxidants, protecting the body's tissues from damage caused by oxidation.
 - Pecans have the highest total flavonoid content among nuts at 34 mg/100 g, consisting mostly of flavan-3-ols and anthocyanins [73].



Pecan nutrient information

	Nutrient	Per 100g	Per 30g
Macronutrients	Energy (kJ)	2973	892
	Protein (g)	9.8	2.94
	Total fat (g)	71.9	21.57
	Saturated fat (g)	4.5	1.35
	Monounsaturated fat (g)	39.3	11.79
	Polyunsaturated fat (g)	25.0	7.5
	Omega 3 ALA (mg)**	620	186
	Carbohydrate (g)	4.9	1.47
	Sugars (g)	4.3	1.29
	Dietary fibre (g)	8.4	2.52
Minerals	Calcium (mg)	51	15.3
	Copper (mg)	0.4	0.12
	Iron (mg)	2.4	0.72
	Magnesium (mg)	110	33
	Manganese (mg)	5.1	1.53
	Phosphorous (mg)	290	87
	Potassium (mg)	500	150
	Selenium (µg)	2.0	0.6
	Sodium (mg)	3.0	0.9
	Zinc (mg)	3.9	1.17
Vitamins	Thiamin (mg)	0.4	0.12
	Riboflavin (mg)	0.2	0.06
	Niacin (mg eq.)	2.9	0.87
	Folate DFE (µg)	25	7.5
	Vitamin B6 (mg)	0.3	0.09
	Vitamin E (mg)	5.6	1.68
Other	Arginine (g)	1.2	0.36
	Plant sterols (mg)	159	47.7
	Polyphenols (mg)	2016	604.8

Nutrition Content claims

(Indicate the presence or absence of a nutrient or substance in the food and in some cases, they can also indicate the amount).

The table below shows that nutrient content claims that can be made for a 30g serve of unsalted pecans.

Nutrient	Pecans - Nutrient Content Claims (per 30g serve)
Fat	Low proportion of saturated fat of the total fat Source of monounsaturated fat
Dietary fibre	Source of fibre
Sugar	Low in sugar
Sodium	Low in sodium
Potassium	Contains potassium
Vitamins	Source of thiamin (B1) Source of vitamin E
Minerals	Source of magnesium Source of zinc Good source of/high in manganese
Other	Contains plant sterols Contains antioxidants

Health claims

General level health claims

(Claims referring to the effect of a nutrient or substance in a food on a health function. They do not refer to a serious disease or to a biomarker of a serious disease)

- Can be based on one of the 200+ pre-approved claims in the Food standards Code. Refer to schedule 4 of the Code for a complete list of general level health claims that can be made.
e.g. Pecans are high in manganese which contributes to normal energy metabolism
- Can be made via self-substantiation by process of systematic literature review
*e.g. A regular 30g handful of nuts, such as pecans, contributes to heart health**
*(*Full claim: regular 30g handful of nuts, such as pecans, when eaten as part of a healthy diet contributes to heart health)^.*

For more information on the Nuts and heart health general level health claim, contact Nuts for Life.

Health Star Ratings (HSR)

The Health Star Rating is currently a voluntary front-of-pack labelling system that rates the overall nutritional profile of packaged food and assigns it a rating from ½ to 5 stars.

If using the FSANZ Australian Food Composition Database (January 2019), raw/natural unsalted pecans score 4 ½ stars.

Nuts for Life has developed the Health Star Rating artwork for pecans using the data from our ready reckoner, available from the contributors' section of the Nuts for life website www.nutsforlife.com.au.



To calculate an HSR, enter the data into the HSR calculator which can be accessed from the Health Star Rating website:

<http://www.healthstarrating.gov.au/internet/healthstarrating/publishing.nsf/Content/calculator>

CONCLUSION

Nuts are nutrient dense foods, containing high amounts of protein and fat, primarily unsaturated fats. They are also rich in a variety of other nutrients and provide dietary fibre, vitamins and minerals, as well as many bio-active constituents including antioxidants, phytosterols and other phytochemicals. Scientific research over the last two decades or so has identified the extent of the health effects of nut consumption. Nuts have been associated with a range of cardio-metabolic benefits, and unlike many other foods, they are not linked with weight gain. As a result, nuts are now considered an important component of a healthy diet. Australians need to increase their consumption of nuts to have access to these significant benefits. Everyone should enjoy a 30g handful of nuts, every day, for good health.



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References

1. Fraser, G.E., et al., A possible protective effect of nut consumption on risk of coronary heart disease. The Adventist Health Study. *Arch Intern Med*, 1992. **152**(7): p. 1416-24.
2. Nikodijevic, C.J., et al., Nut consumption in a representative survey of Australians: a secondary analysis of the 2011-2012 National Nutrition and Physical Activity Survey. *Public Health Nutr*, 2020: p. 1-11.
3. Australian Institute of Health and Welfare AIHW. Australian Burden of Disease Study: Impact and causes of illness and death in Australia 2011. Australian Burden of Disease Study series no. 3. BOD 4. Canberra, AIHW. 2016.
4. Murray, C.J.L., Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*, 2019. **393**: p. 1958-72.
5. Australian Institute of Health and Welfare 2019. Australian Burden of Disease Study 2015: Interactive data on risk factor burden. Cat. no. BOD 24. Canberra: AIHW.
6. Ellsworth, J.L., L.H. Kushi, and A.R. Folsom, Frequent nut intake and risk of death from coronary heart disease and all causes in postmenopausal women: the Iowa Women's Health Study. *Nutr Metab Cardiovasc Dis*, 2001. **11**(6): p. 372-7.
7. Hu, F.B., et al., Frequent nut consumption and risk of coronary heart disease in women: prospective cohort study. *BMJ*, 1998. **317**(7169): p. 1341-5.
8. Albert, C.M., et al., Nut consumption and decreased risk of sudden cardiac death in the Physicians' Health Study. *Arch Intern Med*, 2002. **162**(12): p. 1382-7.
9. Kelly, J.H., Jr. and J. Sabate, Nuts and coronary heart disease: an epidemiological perspective. *Br J Nutr*, 2006. **96 Suppl 2**: p. S61-7.
10. Aune, D., et al., Nut consumption and risk of cardiovascular disease, total cancer, all-cause and cause-specific mortality: a systematic review and dose-response meta-analysis of prospective studies. *BMC Med*, 2016. **14**(1): p. 207.
11. Neale, E., et al., *The effect of nut consumption on heart health: an updated systematic review of the literature*. 2018. Commissioned report for Nuts for Life, University of Wollongong.
12. Neale, E., D. Nolan-Clark, and L. Tapsell, *The effect of nut consumption on heart health: a systematic literature review*. 2015. Commissioned report for Nuts for Life, University of Wollongong.
13. Willett, W., et al., Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 2019. **393**(10170): p. 447-492.

14. Jiang, R., et al., Nut and peanut butter consumption and risk of type 2 diabetes in women. *JAMA*, 2002. **288**(20): p. 2554-60.
15. Afshin, A., et al., Consumption of nuts and legumes and risk of incident ischemic heart disease, stroke, and diabetes: a systematic review and meta-analysis. *Am J Clin Nutr*, 2014. **100**(1): p. 278-88.
16. Kendall, C.W., et al., The glycemic effect of nut-enriched meals in healthy and diabetic subjects. *Nutr Metab Cardiovasc Dis*, 2011. **21 Suppl 1**: p. S34-9.
17. Li, H., et al., Nut consumption and risk of metabolic syndrome and overweight/obesity: a meta-analysis of prospective cohort studies and randomized trials. *Nutr Metab (Lond)*, 2018. **15**: p. 46.
18. Mandalari, G., et al., The effects of processing and mastication on almond lipid bioaccessibility using novel methods of in vitro digestion modelling and micro-structural analysis. *Br J Nutr*, 2014. **112**(9): p. 1521-9.
19. Ellis, P.R., et al., Role of cell walls in the bioaccessibility of lipids in almond seeds. *Am J Clin Nutr*, 2004. **80**(3): p. 604-13.
20. Baer, D.J., S.K. Gebauer, and J.A. Novotny, Walnuts Consumed by Healthy Adults Provide Less Available Energy than Predicted by the Atwater Factors. *J Nutr*, 2016. **146**(1): p. 9-13.
21. Novotny, J.A., S.K. Gebauer, and D.J. Baer, Discrepancy between the Atwater factor predicted and empirically measured energy values of almonds in human diets. *Am J Clin Nutr*, 2012. **96**(2): p. 296-301.
22. Mattes, R.D., The energetics of nut consumption. *Asia Pac J Clin Nutr*, 2008. **17 Suppl 1**: p. 337-9.
23. Noakes, M., The role of protein in weight management. *Asia Pac J Clin Nutr*, 2008. **17 Suppl 1**: p. 169-71.
24. Pereira, M.A. and D.S. Ludwig, Dietary fiber and body-weight regulation. Observations and mechanisms. *Pediatr Clin North Am*, 2001. **48**(4): p. 969-80.
25. Cassady, B.A., et al., Mastication of almonds: effects of lipid bioaccessibility, appetite, and hormone response. *Am J Clin Nutr*, 2009. **89**(3): p. 794-800.
26. Paman, W.J., et al., The effect of Korean pine nut oil on in vitro CCK release, on appetite sensations and on gut hormones in post-menopausal overweight women. *Lipids Health Dis*, 2008. **7**: p. 10.
27. Grosso, G., et al., Nut consumption on all-cause, cardiovascular, and cancer mortality risk: a systematic review and meta-analysis of epidemiologic studies. *Am J Clin Nutr*, 2015. **101**(4): p. 783-93.
28. Wu, L., et al., Nut consumption and risk of cancer and type 2 diabetes: a systematic review and meta-analysis. *Nutr Rev*, 2015. **73**(7): p. 409-25.
29. Neale, E.P., et al., The effect of nut consumption on markers of inflammation and endothelial function: a systematic review and meta-analysis of randomised controlled trials. *BMJ Open*, 2017. **7**(11): p. e016863.
30. Jenkins, D.J., et al., Almonds reduce biomarkers of lipid peroxidation in older hyperlipidemic subjects. *J Nutr*, 2008. **138**(5): p. 908-13.
31. Jenkins, D.J., et al., Effect of almonds on insulin secretion and insulin resistance in nondiabetic hyperlipidemic subjects: a randomized controlled crossover trial. *Metabolism*, 2008. **57**(7): p. 882-7.
32. Klaunig, J.E., L.M. Kamendulis, and B.A. Hoocevar, Oxidative stress and oxidative damage in carcinogenesis. *Toxicol Pathol*, 2010. **38**(1): p. 96-109.
33. Carlsen, M.H., et al., The total antioxidant content of more than 3100 foods, beverages, spices, herbs and supplements used worldwide.
34. Falasca, M., I. Casari, and T. Maffucci, Cancer chemoprevention with nuts. *J Natl Cancer Inst*, 2014. **106**(9).
35. Chen, H.S., et al., Ellagic acid induces cell cycle arrest and apoptosis through TGF-beta/Smad3 signaling pathway in human breast cancer MCF-7 cells. *Int J Oncol*, 2015. **46**(4): p. 1730-8.
36. Vanden Heuvel, J.P., et al., Mechanistic examination of walnuts in prevention of breast cancer. *Nutr Cancer*, 2012. **64**(7): p. 1078-86.
37. Paur, I., et al., Extract of oregano, coffee, thyme, clove, and walnuts inhibits NF-kappaB in monocytes and in transgenic reporter mice. *Cancer Prev Res (Phila)*, 2010. **3**(5): p. 653-63.
38. Colpo, E., et al., Brazilian nut consumption by healthy volunteers improves inflammatory parameters. *Nutrition*, 2014. **30**(4): p. 459-65.
39. O'Brien, J., et al., Long-term intake of nuts in relation to cognitive function in older women. *J Nutr Health Aging*, 2014. **18**(5): p. 496-502.
40. Koyama, A.K., et al., Evaluation of a Self-Administered Computerized Cognitive Battery in an Older Population. *Neuroepidemiology*, 2015. **45**(4): p. 264-72.

41. Valls-Pedret, C., et al., Mediterranean Diet and Age-Related Cognitive Decline: A Randomized Clinical Trial. *JAMA Intern Med*, 2015. **175**(7): p. 1094-103.
42. Martinez-Lapiscina, E.H., et al., Mediterranean diet improves cognition: the PREDIMED-NAVARRA randomised trial. *J Neurol Neurosurg Psychiatry*, 2013. **84**(12): p. 1318-25.
43. Gignac, F., et al., Maternal nut intake in pregnancy and child neuropsychological development up to 8 years old: a population-based cohort study in Spain. *Eur J Epidemiol*, 2019.
44. Rita Cardoso, B., et al., Effects of Brazil nut consumption on selenium status and cognitive performance in older adults with mild cognitive impairment: a randomized controlled pilot trial. *Eur J Nutr*, 2016. **55**(1): p. 107-16.
45. Su, Q., et al., Nut consumption is associated with depressive symptoms among Chinese adults. *Depress Anxiety*, 2016.
46. Jacka, F.N., et al., A randomised controlled trial of dietary improvement for adults with major depression (the 'SMILES' trial). *BMC Med*, 2017. **15**(1): p. 23.
47. Salas-Huetos, A., et al., Effect of nut consumption on semen quality and functionality in healthy men consuming a Western-style diet: a randomized controlled trial. *Am J Clin Nutr*, 2018. **108**(5): p. 953-962.
48. Liu, Z., et al., In vitro and in vivo evaluation of the prebiotic effect of raw and roasted almonds (*Prunus amygdalus*). *J Sci Food Agric*, 2016. **96**(5): p. 1836-43.
49. Mandalari, G., et al., Potential prebiotic properties of almond (*Amygdalus communis* L.) seeds. *Appl Environ Microbiol*, 2008. **74**(14): p. 4264-70.
50. Liu, Z., et al., Prebiotic effects of almonds and almond skins on intestinal microbiota in healthy adult humans. *Anaerobe*, 2014. **26**: p. 1-6.
51. Ukhanova, M., et al., Effects of almond and pistachio consumption on gut microbiota composition in a randomised cross-over human feeding study. *Br J Nutr*, 2014. **111**(12): p. 2146-52.
52. Lamuel-Raventos, R.M. and M.S. Onge, Prebiotic nut compounds and human microbiota. *Crit Rev Food Sci Nutr*, 2017. **57**(14): p. 3154-3163.
53. Holscher, H.D., et al., Walnut Consumption Alters the Gastrointestinal Microbiota, Microbially Derived Secondary Bile Acids, and Health Markers in Healthy Adults: A Randomized Controlled Trial. *J Nutr*, 2018. **148**(6): p. 861-867.
54. Nikodijevic, C., et al., Nut consumption in a representative survey of Australians: a secondary analysis of the 2011-2012 National Nutrition and Physical Activity Survey. 2019. Commissioned report for Nuts for Life, University of Wollongong.
55. ABS 4364.0.55.007 - Australian Health Survey: Nutrition First Results - Food and Nutrients, 2011-12 <http://www.abs.gov.au/ausstats/abs@.nsf/detailspage/4364.0.55.0072011-12>.
56. Nikodijevic, C., et al., Development of a database for estimation of the nut content of Australian single-ingredient and multi-ingredient foods *J Food Comp and Analysis*, 2019. **82**(September 2019).
57. Nuts for Life. Australian Nut Industry Statistics 2018/19. 2019.
58. Luo, C., et al., Nut consumption and risk of type 2 diabetes, cardiovascular disease, and all-cause mortality: a systematic review and meta-analysis. *Am J Clin Nutr*, 2014. **100**(1): p. 256-69.
59. de Souza, R.G.M., et al., Nuts and Human Health Outcomes: A Systematic Review. *Nutrients*, 2017. **9**(12).
60. Sabate, J., K. Oda, and E. Ros, Nut consumption and blood lipid levels: a pooled analysis of 25 intervention trials. *Arch Intern Med*, 2010. **170**(9): p. 821-7.
61. Yong, L.C., et al., Barriers to and facilitators and perceptions of nut consumption among the general population in New Zealand. *Public Health Nutr*, 2017: p. 1-17.
62. ASCIA. Guidelines: Infant feeding and allergy prevention. ASCIA 2016. <http://www.allergy.org.au/patients/allergy-prevention/ascia-guidelines-for-infant-feeding-and-allergy-prevention>.
63. Lazar, V., et al., Aspects of Gut Microbiota and Immune System Interactions in Infectious Diseases, Immunopathology, and Cancer. *Front Immunol*, 2018. **9**: p. 1830.
64. Australian Institute of Health and Welfare. AIHW. Nutrition across the life stages. Cat. no: PHE 227. 2018.
65. O'Neil, C.E., et al., Tree nut consumption improves nutrient intake and diet quality in US adults: an analysis of National Health and Nutrition Examination Survey (NHANES) 1999-2004. *Asia Pac J Clin Nutr*, 2010. **19**(1): p. 142-50.

66. O'Neil, C.E., T.A. Nicklas, and V.L. Fulgoni, 3rd, Tree nut consumption is associated with better nutrient adequacy and diet quality in adults: National Health and Nutrition Examination Survey 2005-2010. *Nutrients*, 2015. **7**(1): p. 595-607.
67. Brown, R.C., et al., A comparison of perceptions of nuts between the general public, dietitians, general practitioners, and nurses. *PeerJ*, 2018. **6**: p. e5500.
68. Brown, R.C., et al., Perceptions and Knowledge of Nuts amongst Health Professionals in New Zealand. *Nutrients*, 2017. **9**(3).
69. Flores-Mateo, G., et al., Nut intake and adiposity: meta-analysis of clinical trials. *Am J Clin Nutr*, 2013. **97**(6): p. 1346-55.
70. McKay, D.L., et al., A Pecan-Rich Diet Improves Cardiometabolic Risk Factors in Overweight and Obese Adults: A Randomized Controlled Trial. *Nutrients*, 2018. **10**(3).
71. Mukuddem-Petersen, J., W. Oosthuizen, and J.C. Jerling, A systematic review of the effects of nuts on blood lipid profiles in humans. *J Nutr*, 2005. **135**(9): p. 2082-9.
72. Griel, A.E. and P.M. Kris-Etherton, Tree nuts and the lipid profile: a review of clinical studies. *Br J Nutr*, 2006. **96 Suppl 2**: p. S68-78.
73. Bolling, B.W., et al., Tree nut phytochemicals: composition, antioxidant capacity, bioactivity, impact factors. A systematic review of almonds, Brazils, cashews, hazelnuts, macadamias, pecans, pine nuts, pistachios and walnuts. *Nutr Res Rev*, 2011. **24**(2): p. 244-75.

APPENDIX 3 – Nutgrower articles



Health Research Update



MORE POSITIVE RESULTS ABOUT NUTS

Nut consumption in a representative survey of Australians: a secondary analysis of the 2011-2012 National Nutrition and Physical Activity Survey. (2020).
 Nikodijevic CJ, Neale E. et al.
<https://www.ncbi.nlm.nih.gov/pubmed/32151295>
 The analysis is the first to explore nut consumption in a representative Australian sample which accounts for nuts from all sources. The results indicate that both the Australian population overall, and 'nut consumers' as a sub-group in that population, are not consuming the recommendation of 30g of nuts per day.

Mean nut intake was 4-61g/d, with only 5.6% of nut consumers consuming the target of 30g of nuts per day. Higher nut consumption was not adversely associated with higher body weight, aligning with the current evidence.

Given the current levels of nut consumption in Australia and the significant health benefits from regular consumption, strategies to increase nut intake to recommended levels are required.
 NB. This research was funded by Nuts for Life

Tree nut snack consumption is associated with better diet quality and CVD risk in the UK adult population: National Diet and Nutrition Survey (NDNS) 2008-2014. (2020).
 Vita Dikariyanto, Sarah E Berry, et al.
<https://doi.org/10.1017/S1368980019003914>
 Researchers examined the association of tree nut snack consumption with diet quality and cardiovascular disease (CVD) risk in UK adults from the National Diet and Nutrition Survey. Tree nut snack consumers reported better dietary quality and consumption was associated with lower CVD risk factors.

Encouraging replacement of less healthy snacks with tree nuts should be encouraged as part of general dietary guidelines.

Does 'activating' nuts affect nutrient bioavailability? (2020)
 Kumari S. et al.
<https://www.ncbi.nlm.nih.gov/pubmed/32199146>
 This study assessed the effects of different soaking regimes on phytate and mineral concentrations of whole and chopped almonds, hazelnuts, peanuts, and walnuts. The treatments were: 1. Raw; 2. soaked for 12 h in salt solution; 3. soaked for 4 h in salt solution; 4. soaked for 12 h in water.

Although there were some statistically significant differences in phytate concentrations between treatments, no soaking treatment reduced phytate concentrations to a level that would result in clinically meaningful improvements in the bioavailability of minerals.

In summary, the authors found no evidence that soaking is an effective strategy to reduce phytate concentrations and improve the nutrient bioavailability of almonds, hazelnuts, peanuts and walnuts.

Nut Consumption and Risk of Cancer: A Meta-analysis of Prospective Studies. (2020)
 Jieyi Long et al.
<https://cebp.aacrjournals.org/content/early/2020/02/09/1055-9965.EPI-19-1167>
 This meta-analysis evaluated the relationship between nut consumption and risk of cancer. Thirty-three studies, that included more than 50,000 cancer cases were analysed. When comparing the highest with the lowest category of nut intake, high consumption of nuts was significantly associated with decreased risk of overall cancer (RR = 0.90; 95% CI, 0.85-0.95).

The protective effect of nut consumption was especially apparent against cancers from the digestive system (RR = 0.83; 95% CI, 0.77-0.89). The authors also observed a linear dose-response relationship between nut consumption and cancer.

The results offer compelling evidence about the association between nut intake and the risk of cancer; with significant protective effects found at 9g/day and the risk of cancer decreasing by 10% for every 20g/day increase.

... continued overleaf

AUSTRALIAN NUTGROWER WINTER 2020



NUTS FOR LIFE

Highly successful media campaign following publication of Nuts for Life commissioned research

Following the publication of the research investigating nut consumption amongst Australians, we launched our mainstream media activity. The media activity, which is part of the grant we received from the INC, was on hold until publication of the paper, which despite being accepted by Public Health Nutrition in September 2019, was delayed until March 2020. To date, the campaign has created 11.1 million opportunities to see, via 299 media clips. This is an amazing result given the study was published on March 10 amid growing concern about COVID-19 and news services dedicating almost all coverage to COVID-19. (For the full story, see p22)

Nuts and immunity

As the coronavirus pandemic sweeps the world, you've probably read a lot of articles and social media posts about diet and immunity. It's important to remember that people's immune systems vary widely according to their genetics, environment, day-to-day diet, and lifestyle.

A healthy diet is critical to keeping our immune system (and, indeed, whole body) functioning at its best. However, because immune system function is based on the interaction of all these factors, dietary change alone cannot boost our immune system. In other words, there is no diet, nutrient, or supplement alone that can prevent or reduce our chance of catching the virus.

Which nutrients support immunity?

Copper, iron, selenium, zinc, folate, and vitamins A, B6, B12, C and D, are listed in Schedule 4 of the Food Standards Code as necessary for normal immune system function, and therefore support immunity.

What can we say about nuts and immunity?

Nuts for Life recommends that you can make statements about the nutrients nuts contain that are known to contribute to normal immune system function.

e.g. Eating a healthy balanced diet can help to keep your immune system functioning at its best. Nuts are an important part of a balanced diet and contain many essential nutrients.

What can't we say about nuts and immunity?

There is no science to support that eating certain foods or certain nutrients will boost or improve immunity. We strongly advise against making these types of claims.

(Refer to the Nuts for Life website for more information and see feature article on healthy lifestyles on page 40.)

Coming up... A new approach to delivering education to health professionals

As the world adapts to social distancing and remote learning, Nuts for Life is changing the way we interact with and educate health professionals. We'll soon be launching a series of online masterclasses and other resources to help dietitians, GPs, and fitness professionals upskill and learn more about nuts and health.

Contact us

You can reach Nuts for Life on 02 9460 0111,
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Nuts for Life is a nutrition and health education initiative established for the Australian tree nut industry to provide information about the nutrition and health benefits of tree nuts.

Nuts for Life is funded by voluntary financial contribution and by Horticulture Innovation Australia Limited with co-investment from members of the Australian Tree Nut Industry and funds from the Australian Government.

Management Committee:

Michael Hwang – Chair, Nuts for Life and Chief Executive Officer, MWT Foods
Geord Burston – Vice Chair, Nuts for Life and Managing Director, GB Commodities
Darlan Diet – Vice Chair, Nuts for Life and Managing Director, Trumps
Lizzy Barton – Executive Officer, Australian Nut Industry Council
Joseph Hobbage – Marketing Manager, Almond Board of Australia
Michael Sobolev – Managing Director, Soles Food Industries
Lyndie Zetser – Market Development Manager, Australian Macadamia Society



More nuts in our diet says national media

In previous issues of Nutgrower, summaries of the key results from the re-analysis of the Australian Health Survey have been published as well as news that the research was accepted for publication in Public Health Nutrition. Just as our Autumn issue of Nutgrower was being distributed, the paper was published, supported by a very successful media campaign as Belinda Neville and Claudia Higgins from Nuts for Life report...

Disseminating the research findings – final stage
Nuts for Life received a grant from INC to assist with disseminating the key findings of the research. Our final dissemination activity was a mainstream media launch to coincide with the study's publication. The media activity was on hold until publication of the paper, which despite being accepted by Public Health Nutrition in September 2019, was delayed until March 2020. The objective of the activity was to amplify key messages on nut consumption and their health benefits to health professionals and consumers.

Working in partnership with our agency, Bite Communications, all media materials were prepared in advance. We also worked in closely with the editor of the Public Health Nutrition journal to establish a clear publication date. This enabled embargoed media pitching to be undertaken, including outreach to key national print media, breakfast TV and radio talkbacks.

Embargoed updates were also provided to key media dietitians who had already been briefed as part of the health care professional breakfast launch event (refer to previous edition for details). Tailored emails with links to the published paper and summary report were sent to an additional 150 health professionals, including key public health authorities, NGOs, academics, dietitians, and nutritionists.

On the day of publication (10 March 2020), we distributed media releases to wider mainstream news media including additional online news outlets, regional publications and radio programs. The radio release was issued with grabs downloaded and used nationally. We also worked with journalists to create a national health story that ran in print across five News Corporation metropolitan papers and was also syndicated to 14 metro and regional online news sites.

Results of the media campaign
To date, the campaign has created more than 11.1 million opportunities to see and hear, at a very efficient 0.5 cent per opportunity. This is particularly impressive as the launch date coincided with massive growth in COVID-19 stories, essentially obliterating all other health or major news.

This campaign created over 11 million opportunities to see and hear, via 299 media clips.

Key highlights include:

- 8 national television coverage stories including Sunrise, Weekend Sunrise and Channel 9 News,
- 5 print newspaper stories including The Daily Telegraph, Courier Mail and The Advertiser,
- Online syndication across 34 metro and regional News Corp news sites,
- Radio talkback interviews in all 5 states and 200+ radio news stories.
- Strong support from leading media dietitians, such as Dr Joanna McMillan and Kathleen Alleaume, both at the breakfast launch event and at the time of publication.

At the time of preparing this article, lifestyle pitching is still generating coverage with a further four stories still expected to be published, generating an estimated additional 1.9 million opportunities to see.

For further information on these activities contact:
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APPENDIX 4 – GP education resource

PLANT-BASED EATING

For a healthy body and healthy planet, research increasingly suggests we should eat a more plant-based diet.

Fill most of your plate with vegetables, fruits, wholegrains, nuts, and legumes.

Reduce or eliminate refined grains, processed meats and processed foods.

Include smaller amounts of lean meat, chicken, fish, eggs, and dairy foods.

More about nuts

Nuts are rich in essential vitamins, minerals, healthy fats, and other nutrients.

Eating nuts isn't associated with weight gain. Our bodies can't absorb all the kilojoules, while the fibre and protein help you feel fuller for longer.

Eating nuts helps prevent and manage many chronic diseases, including heart disease, diabetes and cancer.

Tree nuts are naturally gluten-free, low in sodium, and contain no added sugar.

Notes

Hort Innovation Nuts for Life is funded by the Hort Frontiers Healthy Food Fund, with co-investment from the Australian tree nut industry and contributions from the Australian Government. Published 2020

Enjoy a healthy handful of nuts every day. www.nutsforlife.com.au

APPENDIX 5 – Diabetes Management Journal article



THE HEALTH BENEFITS *we're all missing*

New research¹ shows that most Australians need to increase their nut intake **six-fold** if they're to gain the significant health benefits associated with regular nut consumption.^{2,3}

The University of Wollongong study, accepted for publication in *Public Health Nutrition*, is the first to analyse nut consumption in Australia, including both whole nuts and nuts incorporated into other foods.

Despite a body of evidence consistently showing that nuts belong in a healthy diet, this new analysis shows that Australian eating habits are not nutty enough. Only 2% of Australians are eating the recommended 30g a day (about a handful). The average intake is only 4.8g of nuts a day.

The researchers found that those eating more nuts had significantly higher intakes of key nutrients, including fibre, vitamin E, iron, magnesium and phosphorus. And importantly, the analysis showed nut consumption was not associated with increased weight, BMI or waist circumference, which aligns with the broader body of evidence.^{4,5}

A 30g handful of nuts most days of the week is associated with:

- 29% reduced risk of CHD⁶
- 21% reduced risk of CVD⁶
- 13% reduced risk of type 2 diabetes⁶
- Reduced all-cause mortality⁷
- Weight management^{8,9}
- 15% reduced risk of total cancer¹⁰

NUTS AND DIABETES - HOW A HEALTHY HANDFUL EVERY DAY HELPS

- While nuts are not low GI (they don't have enough carbohydrate), they have a GI lowering effect, meaning that they reduce the overall GI of a meal.¹¹
- Nuts contain mainly healthy unsaturated fats (mono- and polyunsaturated fats), and are low in saturated fats. Replacing saturated and trans fats with unsaturated fats improves insulin sensitivity and reduces T2DM risk.¹²
- Nuts are a great source of fibre. Diets high in fibre have been shown to help manage diabetes and metabolic syndrome, and can reduce the risk of developing diabetes.^{13,14}
- Most nuts are a rich source of magnesium, which can reduce the risk of developing type 2 diabetes. Magnesium also improves fasting blood glucose and blood lipid levels in people with diabetes.¹⁵

Supported by the NCI International Nut and Oil Profit Council





PECAN, BROCCOLINI & SALMON GRAIN BOWL

10 MINS
PREP TIME

10 MINS
COOK TIME

SERVES 2
PEOPLE

46g NUTS
PER SERVE

INGREDIENTS

- 2 x 100g salmon fillets
- 1 tsp olive oil
- 1/2 cup pecans, lightly toasted (80g)
- 1 bunch broccolini (83g)

- 4 radishes, sliced
- 1 orange, peeled and sliced
- 1 cup cooked brown rice
- 1 spring onion, sliced

DRESSING

- 2 tbsp almond butter
- 2 tsp tamari or soy sauce
- 1 tsp miso paste

- 1 tsp maple syrup
- 2 tbsp lime juice

METHOD

1. Whisk together almond butter, soy sauce, miso paste, and syrup. Whisk in lime juice until smooth. Dressing will thicken as it sits, thin with water if desired.
2. Preheat a skillet over medium heat. Drizzle salmon with oil and cook approximately 3 minutes per side, or until cooked to your liking. Remove salmon from pan and set aside to rest. Roughly flake when cool enough to handle.
3. Wipe skillet, fill about half way with water and return to heat. Add broccolini and simmer for a few minutes, until bright green and tender-crisp. Refresh under cold water.
4. Roughly chop half the pecans and stir through rice, divide into two bowls. Top rice with salmon, broccolini, orange, radish, and remaining pecans. Drizzle with dressing, sprinkle with sliced spring onion.

NUTRIENTS PER SERVE			
Energy	2056kJ	Carbohydrate	41g
Protein	32.8g	Sugars	11g
Fat	48g	Dietary fibre	6.7g
Saturated fat	6.3g	Sodium	465mg

REFERENCES

1. Mittleman, B. et al. Nut consumption in a representative survey of Australians: a secondary analysis of the 2011-12 National Nutrition and Physical Activity Survey (accepted for publication 20th September 2018, *Public Health Nutrition*).
2. Jiang, P. et al. Nut consumption and risk of cardiovascular disease, total cancer, all-cause and cause-specific mortality: a systematic review and dose-response meta-analysis of prospective studies. *BMC Med*, 2018, 16(1): p. 207.
3. Johnson, A. et al. Consumption of nuts and legumes and risk of incident ischemic heart disease, stroke, and diabetes: a systematic review and meta-analysis. *Am J Clin Nutr*, 2014, 100(1): p. 218-40.
4. Nwosu, E. et al. The effect of nut consumption on heart health: an updated systematic review of the literature. 2018, *Nuts for Life*, unpublished.
5. Li, H. et al. Nut consumption and risk of metabolic syndrome and overweight/obesity: a meta-analysis of prospective cohort studies and randomized trials. *Nutr Metab (Lond)*, 2018, 15: p. 18.
6. Knekt, P. et al. The glycaemic effect of nut-enriched meals in healthy and diabetic subjects. *Nutri Metab Cardiovasc Dis*, 2011, 21 Suppl 1: p. S34-9.
7. Knekt, P., W.C. Willett, and T.S. Hu. Dietary fats and prevention of type 2 diabetes. *Prog Lipid Res*, 2009, 48(1): p. 44-51.
8. Salonen, J. et al. Dietary fiber, glycemic load, and risk of NIDDM in men. *Diabetes Care*, 1997, 20(4): p. 545-50.
9. Salonen, J. et al. Dietary fiber, glycemic load, and risk of non-insulin-dependent diabetes mellitus in women. *Jama*, 1997, 277(9): p. 472-7.
10. Dong, J.Y. et al. Magnesium intake and risk of type 2 diabetes: meta-analysis of prospective cohort studies. *Diabetes Care*, 2011, 34(9): p. 2176-22.

APPENDIX 6 – Consumer Education

Consumer education (unmatched)

NB. Consumer education falls outside the Hort co-funded project, but has been included in the Appendix to highlight the impact of the Nuts for Life program across the consumer space.

Amplify key health messages to educate and provide consumers with health reasons to consume nuts and to dispel any barriers to increasing consumption.

Nuts 30 days 30 ways (2018)

Nuts 30 Days 30 Ways is Nuts for Life's flagship campaign, aimed at educating consumers on the benefits of nuts, inspiring purchase, and keeping nuts top of mind as an easy, healthy snack. This year's campaign reached 14.9 million people via a successful media outreach campaign, strong influencer relationships, new, inspiring and desirable content, and greater investment in social media.

Through our owned channels we created 1.1 million opportunities to see. Instagram was the home for this year's campaign, featuring daily recipes and ideas. In this channel we achieved a 7.4% engagement rate, and brought in 2,619 new fans (89% increase) with a 100% retention rate. Campaign engagements indicated a strong intent to purchase, with 600 saves or bookmarks of recipes and ideas.

Traditional media outreach delivered 13.8 million opportunities to see via 324 clips. A combination of research news, expert advice from Nuts for Life dietitian, Belinda Neville, new recipes, and media-attracting influencers, helped us achieve this result.

Exclusive new content was created for this campaign, including 10 new recipes and ideas featuring each tree nut. Fresh, new content is critical to bringing our health messaging to life, inspiring our audience, and keeping them – and influencers, including media and dietitians – interested in our message.

Five ambassadors and influencers were engaged for this campaign, developing exclusive new recipes which supported our media outreach and delivered 4.4 million opportunities to see. These influencers also posted 25 times on their social channels and published six blog posts, generating 1.9 million opportunities to see.

Christmas consumer activity – December 2019

The Christmas campaign was a new activity for Nuts for Life, run to test if we could make a space for ourselves in the crowded Christmas market. We partnered with recipe developers to create four new festive ideas and recipes, which were then promoted via owned and earned channels. Pure health messaging was downplayed (to reflect the attitude of the season), instead we focused on the versatility of nuts for various diets (e.g. vegetarian, gluten-free), which represent a growing trend in Australia.

We achieved 1 million opportunities to see at a cost of \$0.01 per opportunity. Our strongest results were in owned social channels, delivering 426,208 opportunities to see with very high engagement rates (8% on Facebook, and 12% on Instagram). The quick time to market for this campaign limited our opportunities in the earned media space, with major titles having locked in their content earlier than anticipated. The use of a high-profile influencer to develop a recipe helped moderate this impact, creating 444,115 opportunities to see via minor media titles, and an additional 180,700 reach via influencer blog posts.

Overall, the Christmas campaign was very successful. We continued to grow and engage our target audiences in our owned social channels, and gained greater insight to how best to leverage content in earned media during Christmas and other periods. The high level of interest and engagement in festive nut content indicates we are able to create a space for ourselves in this market and further educate, inspire and remind consumers to eat nuts at Christmas time.

Autumn/winter consumer activity – April-June 2019

The objective of this activity was to boost awareness of nuts via a short-term media campaign, maximising coverage and delivering nutritional messaging. The activity used the concept ‘comfort eating doesn’t have to weigh you down’ to target healthy mums, health overhaulers, and dietitians.

Media release (“Five reasons to go nuts this winter”) included nutrition messages about weight, immunity, heart health, and GI. Influencers were commissioned to create a variety of exclusive new recipes which provided a ‘healthy twist’ on winter comfort food.

Activity generated 4.6 million opportunities to see across traditional and social media, at a cost of \$0.002 per opportunity. Health messaging appeared in 83% of coverage, increasing to 92% for traditional media coverage only

Social media platforms – Instagram and Facebook

These activities are funded from a combination of industry funds and funds from the macadamia industry marketing levy. Despite the main target audience being healthy mums and health overhaulers, health professionals (particularly dietitians) are increasingly using social media as a platform for educating and influencing.

2018-19 was the first year of strategic and targeted social media activity, with the main concept ‘comfort eating doesn’t have to weigh you down’ to target healthy mums, health overhaulers, and dietitians.

2018-2019 Audience	Instagram	Facebook
Location	80% live in metro areas	93% live in metro areas
Age	Millennials and gen-X 60% aged 25-44 years	Trans-generational fans, however 67% of engagements are from 55+
Gender	90% female	85% female

Overall, the activity created 2.8 million opportunities to see.

2018-2019 Key performance indicators	Instagram		Facebook	
	Target	Result	Target	Result
Impressions	300,000	1,231,519	500,000	1,549,549
Cost per impression (total)	\$0.05	\$0.03	\$0.03	\$0.01
media budget only	-	\$0.003	-	\$0.004
Engagement rate	10%	12%	5%	8%
Total engagements (incl. video)	30,000	84,018	-	-
Cost per engagement (total)	\$1.00	\$0.43	\$0.70	\$0.35
media budget only	-	\$0.05	n/a	\$0.09
Saves	-	2,714	-	-

At the time of preparing this report, results for 2019/2020 were not yet available.