

AUTUMN 2021



NUTRITION BULLETIN IN THE LATEST EDITION **OF THE ALMOND BOARD NUTRITION BULLETIN:**

Welcome to the new bulletin and the start of autumn - time to get back to school and work with almonds by your side! Our bulletin features new research about prediabetes in young adults as we mark World Diabetes Day and share some fantastic Almond Academy resources: one guide about emerging almond research areas and a new handout for understanding sustainable nutrition. Plus, enjoy a warming breakfast recipe that is perfect to get you ready for chilly mornings!

DIABETES Spotlight



World Diabetes Day is 14th November and unfortunately the numbers are going in the wrong direction. According to the most recent 2019 report from the International Diabetes Federation, more than 463 million adults globally were living with diabetes, and by 2045, that number is expected to increase to 700 million.¹ However, as health professionals, you can share dietary strategies to help manage diabetes and to mitigate the progression of prediabetes to diabetes. Almonds provide fibre (12.5 / 3.5 g per 100g / 30g serving) and 15 essential nutrients including (per 100g / 30g serving): magnesium (270 / 81 mg), potassium (733 / 220 mg), and vitamin E (25.6 / 7.7 mg), making them a perfect nutrient-rich snack for those with impaired glucose tolerance or type 2 diabetes.

STUDY AT A GLANCE:

A new study² showed that almond snacking helped improve glucose metabolism in adolescents and young adults in India with prediabetes. It's the first almond study to examine younger adults with prediabetes and was funded by the Almond Board of California. Improving blood sugar levels at the prediabetes stage may help prevent or delay the development of diabetes.



This randomized controlled clinical trial aimed to determine the effect of almond consumption on factors of metabolic dysfunction including blood glucose, lipids, insulin, and selected inflammatory markers in adolescents and young adults (aged 16-25 years old) with prediabetes, who resided in Mumbai, India. The study was a randomized, parallel trial of 275 participants (59 male, 216 female) with impaired glucose metabolism (prediabetes). At the start of the study, participants' weight, height, and waist and hip circumferences were measured and fasting blood samples were taken. Participants also underwent a glucose tolerance test and their lipid profiles were assessed.

The almond group (n=107) ate 56 grams (~340 calories) of unroasted almonds every day for three months and the control group (n=112) consumed a savoury snack with the same number of calories. The consumption of almonds as snacks was tested in the almond group, while the control group consumed a savoury snack that is commonly consumed by this age group in India. Both the almond and savoury snacks accounted for ~20% of participants' total calorie intake.

Throughout the duration of the study, participants were monitored to ensure they were compliant in eating their snacks. At the end of the study, participants completed dietary intake assessments and the same measurements and blood tests were performed again.



In the almond group, HbA1c decreased significantly compared to the control group. Improving blood sugar levels at the pre-diabetes stage may help prevent or delay the development of diabetes. Additionally, almond consumption reduced total cholesterol and "bad" LDL-cholesterol

significantly compared to the control group, while maintaining "good" HDL-cholesterol levels.

There were no changes in measures of

weight, height, waist or hip circumferences or biochemical markers nor macronutrient intake between the almond group and the control from the start to post-intervention. Inflammatory markers (TNF-A and IL-6) decreased in the almond group and increased in the control group, but this was not a statistically significant result. Fasting blood glucose levels were significantly reduced in the control group compared to the almond group post-intervention. In the almond group, FG:FI ratio (fasting glucose: fasting insulin) decreased while it increased in the control group but was not statistically significant.

Limitations of the study include that participants could not be blinded. Further, nutritional intervention studies can also trigger behavioural changes in both groups as the participants are made aware of their risk during the recruitment process. Further research is needed to investigate the effects of almond consumption on the same measures in other age groups and of different ethnicities.

STUDY CONCLUSION:

Almonds were shown to have an effect on glucose metabolism by reducing HbA1c levels in adolescents and young adults in India at risk for developing diabetes in just 12 weeks. When included as a snack, almonds also helped manage dyslipidemia by reducing total cholesterol and "bad" LDL-cholesterol, while maintaining "good" HDL-cholesterol levels. Almonds can be a nutritious snack that can replace regular snack choices and can be part of a foodbased strategy to help prevent or delay the development of diabetes, particularly in a younger population. Read the full study here.

This research joins another study³ funded by the Almond Board of California investigating the potential role of almond consumption in younger people. Researchers at the University of California - Merced, demonstrated that for those college students who skip breakfast, a morning snack of almonds can be a smart option. Among predominantly breakfast-skipping college freshmen (73 males and females, 18 to 19 years old), including a morning snack either of almonds or graham crackers - reduced total cholesterol and improved fasting blood sugar levels, but the benefits were greater with almonds. Those who snacked on almonds better preserved "good" HDL-cholesterol levels and improved measures of blood sugar regulation over the 8-week study. Read the full study here.



- 1 IDF Diabetes Atlas, 9th edition. 2019. https://www.diabetesatlas.org/en. Accessed July 14, 2021.
- 2 Madan J, Desai S, Moitra P, Salis S, Agashe S, Battalwar R, Mehta A, Kamble R, Kalita S, Phatak AG, Udipi SA, Vaidya RA and Vaidya AB (2021) Effect of Almond Consumption on Metabolic Risk Factors-Glucose Metabolism, Hyperinsulinemia, Selected Markers of Inflammation: A Randomized Controlled Trial in Adolescents and Young Adults. Front. Nutrients. 8:668622. doi: 10.3389/ fnut.2021.66862.
- 3 Dhillon J, Thorwald M, de la Cruz N, Vu E, Asghar SA, Kuse Q, Rios LKD, Ortiz RM. Glucoregulatory and cardiometabolic profiles of almond vs. cracker snacking for 8 weeks in young adults: A randomized controlled trial. Nutrients 2018; 10(8): 960. https://doi. org/10.3390/nu10080960.

RESEARCH UPDATE - WEIGHT, METABOLISM AND GUT MICROBIOTA

Dreher ML. A Comprehensive Review of Almond Clinical Trials on Weight Measures, Metabolic Health Biomarkers and Outcomes, and the Gut Microbiota. Nutrients. 2021; 13(6):1968. https://doi. org/10.3390/nu13061968.

STUDY AT A GLANCE:

This new comprehensive review paper³ looked at 64 randomized controlled trials (RCTs) and 14 systematic reviews to assess the impact of eating almonds on weight management and satiety, cardiovascular disease and metabolic disease including diabetes and gut health. For emerging research areas, the reviewer notes that recent RCTs suggest possible health benefits for almonds such as enhanced cognitive performance and reduced rate of facia skin aging from exposure to ultraviolet UVB radiation.



As this peer-reviewed paper is expansive, the author separated the review into three categories. Outlined here are the key findings from each section to act as signposts to the research reviewed.

WEIGHT MEASURES:

The first section focuses on the effect of almonds on weight measures, including the following search terms: almonds, tree nuts, total nuts, body mass, weight gain, weight loss, adiposity, overweight, obesity, body fat, central obesity, visceral fat, waist circumference (WC), appetite, hunger, satiety, satiation, metabolizable energy (ME), energy density (ED), lowcalorie diets (LCDs), and weight control mechanisms.

The review author outlines the following conclusions:

- Almonds are a higher energy-dense (ED) food that acts like a lower ED food when consumed as evidenced by calorie bioaccessibility studies.
- Recent systematic reviews and meta-analyses of nut RCTs showed that almonds were the only nut that had a small but significant decrease in both mean body mass and fat mass, compared to control diets.
- Displacement of other foods, decreased macronutrient bioavailability for a lower net metabolizable energy (ME), upregulation of acute signals for reduced hunger, and elevated satiety and increased resting energy expenditure were identified as the mechanisms for weight control with almond consumption.

METABOLIC HEALTH BIOMARKERS:

Next, the review focuses on the effect of almonds on metabolic health biomarkers and outcomes, including the following search terms: chronic diseases, cardiovascular disease (CVD), type 2 (T2) diabetes, metabolic syndrome, blood lipids, glycaemic control, insulin sensitivity, oxidative and inflammatory stress, blood pressure (BP), vascular reactivity, cognitive performance, and facial ultraviolet (UV) B radiation protection. The reviewer wrote, "two of the most important nutritional attributes of almonds associated with the reduced risk and better management of CVD and T2 diabetes are the healthy unsaturated lipids and low glycaemic index (GI) and glycaemic load (GL)."

The review paper explains the following CVD conclusions based on studies reviewed:

- The intake of 42.5 g/day of almonds significantly lowered low-density lipoprotein cholesterol (LDL-C), 10-year Framingham estimated coronary heart disease (CHD) risk (a score to determine probability of developing heart disease) and even associated cardiovascular disease (CVD) medical expenditures.
- Diastolic blood pressure (BP) was modestly but significantly lowered when almonds were consumed at >42.5 g/day or for >6 weeks.

MICROBIOME :

The final section focuses on the microbiome with the following search terms: colonic microbiota, almonds, nuts, colonic health, short-chain fatty acids, and diversity. The review included the following conclusion about the microbiota from eight RCTs:

- Almonds can support colonic microbiota health by promoting microflora richness and diversity, increasing the ratio of symbiotic to pathogenic microflora, and concentrations of health-promoting colonic bioactives.
- The paper explains the potential dietary mechanism as follows, "There is a growing body of RCTs that are emerging to support almond's role in promoting a healthy microbiota. The colonic microbiota appears to play a major role in human metabolic health, and it is primarily controlled by the nutritional quality of the diet. Colonic microbiota can be modulated positively or negatively by different lifestyle and dietary factors and impact the risk of developing obesity, chronic diseases (e.g. diabetes, CVD, and metabolic syndrome features), and infectious diseases."

Limitations of the study include that most of the almond RCTs have a relatively small number of subjects and are of short duration, which may lead to excessive heterogeneity and mask some other metabolic outcomes. Also, this review did not score the quality of each study or provide a quantitative, scientific synthesis of all RCTs into a statistical overall mean or analysis of subgroups, effect sizes, and heterogeneity, independently of what was provided by the specific RCTs reviewed. You can read the full study here.





Visit Us at EFAD Congress 2021:

The Almond Board of California is a sponsor of the European Federation of the Associations of Dietitians (EFAD) Congress 2021. Visit our virtual booth to say hello, discover our range of health professional resources and get your hands on a handy almond portion control tin. We'd love to meet you there!

TWO NEW ALMOND ACADEMY RESOURCES:

Sustainable Nutrition in Practice Guide:

Emerging Research Handout:

Sustainable nutrition is growing in importance as it's a factor in helping shape national dietary guidelines and clients want to know more about how their food is grown. As part of the Almond Academy, we've developed a new guide on how to communicate about sustainability and to learn how almonds are grown to preserve our farms for future generations.

This new Almond Academy handout

provides a summary of the latest almond nutrition research areas to be aware of for media interviews and to update your clients: understanding diet quality measures, vascular health measures including flow-mediated dilation and the new connections between eating almonds and skin health (wrinkles, skin tone UVB protection).

Want to learn more about almond farming practices?

Watch our Orchard Tour video for a deep dive into how we grow.

RECIPE INSPIRATION



ALMOND MODE OATS:

Mornings can be a time crunch so you want your breakfast to count and last throughout a busy morning. This almond porridge recipe has all the element of delivering sustained energy: healthy unsaturated fats, fibre and protein.

Please note: $\frac{3}{4}$ cup rolled oats = 65g and 2 cups of almond milk = 235ml

Click here to learn how to make and share the recipe.

Visit our **<u>Recipe Centre</u>** for full recipe details and an opportunity to browse through a delicious catalogue of easy recipes.

NEW: SHARE IT ON SOCIAL!

After getting yourself ready for the day, take a quick photo of your breakfast to share with your peers and inspire your clients.

Suggested post:

Enjoying a delicious porridge of almonds and oats, the perfect combo of protein and healthy fats to conquer the rest of today! #almonds



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