



AVOCADO'S ROLE IN MANAGEMENT OF TYPE 2 DIABETES

More than half of adults in the US today have one or more diet-related chronic diseases, including 37.3 million living with diabetes and 96 million living with prediabetes. Most Americans do not follow the recommended healthy dietary pattern associated with the reduction of diet-related chronic diseases, such as type 2 diabetes.

A shift to eating more nutrient-dense foods, like fruits and vegetables, can help promote optimal health and reduce the risk of disease.



RESEARCH RELATED TO **NUTRIENTS FOUND IN AVOCADO** AND TYPE 2 DIABETES



Scientific studies investigating specific nutrients and food sources of these nutrients, as well as their relationship to improvements in blood markers associated with glycemic control and insulin resistance, continue to grow.

A cross-sectional study of 2,719 men and women reported higher intake of vitamin K was associated with greater insulin sensitivity and glycemic status, as measured by 2-hr oral glucose tolerance test although intake was not associated with fasting insulin, glucose, HOMA-IR or HbA1c. Although adjustments for many factors were made, it's possible that vitamin K is simply a surrogate marker for better diet quality. One serving of avocado provides a good source of vitamin K.

A systematic review of studies including more than 10,000 adults with diabetes or prediabetes reported increased fiber intake reduced glycated hbA1c, fasting plasma glucose, insulin, insulin resistance, and other markers of metabolic health including lipids, body weight, BMI, and c-reactive protein when compared to low fiber diets. One serving of avocado is a good source of fiber.

A 30-year study of 4,704 young adults reported that intake of folate, but not vitamin B6 or B12, was associated with a reduced incidence of diabetes. One serving of avocado is a good source of folate.

While data limitations may exist (e.g., findings do not demonstrate cause-and-effect, are limited by study and/or population heterogeneity, and may be affected by confounding variables) – the recommendation to consume higher intakes of fruits and vegetables to build healthy dietary patterns that have beneficial outcomes on diet-related conditions, such as diabetes, is well-supported.



RESEARCH EVALUATING DIABETES MARKERS AND **FRESH AVOCADO**

Several clinical trials, supported by the Avocado Nutrition Center, explore meals containing avocado and improvement of blood markers associated with diabetes.

A randomized, controlled, three-arm, six-hour postprandial, cross-over study, avocado replaced carbohydrate energy in a breakfast meal for 31 adults with overweight or obesity, and scientists found that including a half or whole avocado at breakfast decreased participants' glucose and insulin when compared to the control breakfast.

Researchers counseled 93 adults with insulin resistance to exchange carbohydrate foods in their usual diet for avocado or a low-fat, low-fiber energy-matched control for 12 weeks. Total dietary intake of unsaturated fat, fiber, and vegetables increased, and c-reactive protein (CRP) was significantly lower in the avocado group. They found no changes in body weight or composition, insulin sensitivity index, hbA1c, glucose, or lipids.

A study of 26 participants showed that when approximately one-half of a fresh avocado was added to a lunch consisting of a salad with Italian dressing, a baguette, and cookies, participants felt more satisfied and had less desire to eat following the meal. The participants also had a lower immediate rise in insulin levels than when the same lunch was eaten without the avocado; however, there was no significant difference in insulin levels over the three hours.

An Australian study involving 2,736 participants revealed that individuals who consumed avocados exhibited lower BMI, waist circumference, plasma glucose levels, HbA1c, and higher HDL cholesterol than non-consumers. On average, participants had a daily avocado intake of 25 grams.

While none of these studies can be generalized to all populations, study length, or different amounts of avocado, there is alignment with a growing body of evidence supporting avocado's role in glucose regulation, its beneficial role in a type 2 diabetes diet, and managing inflammation in an insulin resistant population. The epidemiology studies cannot prove causation and are limited by self-reported data and unknown confounders.



RESEARCH EVALUATING DIABETES MARKERS AND **FRESH AVOCADO** (CONT.)



An analysis of over 14,000 Hispanics revealed that consuming avocados is associated with better insulin responses in those with normal blood sugar. In people with type 2 diabetes, avocado consumption was linked to lower average blood sugar and better insulin-related measures. However, no notable connections were observed for those with prediabetes. Study limitations include self-reported diet data, difficulty interpreting effect size, inability to differentiate between diabetes drug use, and the observational nature hindering causal conclusions.

An observational study of over 6,000 adults in the Hispanic Community Health Study/Study of Latinos found that regular avocado intake is associated with a 28% reduction in the risk of developing diabetes for the overall study population.

Data from an observational study of 6,224 adults revealed that certain metabolomic features were strongly linked to avocado intake and formed a reliable biomarker. That biomarker exhibited significant correlations with lower fasting glucose, insulin, and a reduced risk of type 2 diabetes.

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FRESH AVOCADO AND DIABETES MANAGEMENT

Healthy eating, including greater intake of fruits and vegetables, is a cornerstone of diabetes prevention and management. Unlike most other fruits, **avocado contains zero grams of naturally occurring sugar** per serving and does not affect the glycemic response.

One serving of avocado (1/3 of a medium avocado) contains 4 grams of carbohydrate and is a good source of fiber, folate, and vitamin K.



Have your patients try these recipes - avocado can be a great way to kick off their day!



Mexicali Egg on an Avocado “Bun”

Who needs a bun when you have an avo-bun? You won't miss the bread with this Mexican inspired take on the classic egg and cheese sandwich.

LoveOneToday.com/AvocadoBun



Superfood Berry Avocado Immunity Bowl

Blend up a refreshing and vibrant bowl of goodness packed with flavor and immune supporting nutrients from ingredients like fresh avocados and berries.

LoveOneToday.com/ImmunityBowl



Fiesta Stuffed Avocado

Brighten up your snack selection with some fresh, fiesta flavor.

LoveOneToday.com/FiestaAvocado