

Both Potatoes and Beans Reduced Insulin Resistance, Weight in Controlled Study

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December 01, 2022

Low energy–density diets that are based either on potatoes or beans similarly reduced [insulin resistance](#) in adults with poor blood glucose control, according to a controlled feeding study in 36 individuals.

Potatoes have gotten a bad rap for their high glycemic index, but they have little fat and a low energy density, wrote the study investigators. In fact, "cooling of gelatinized potatoes generates appreciable levels of slowly digested starch (resistant starch type 3) and substantially lowers the blood glucose response that potatoes elicit."

"There is a view that potatoes are a less healthy plant food, but there is very little empirical data from randomized trials to support this view," senior investigator John P. Kirwan, PhD, said in an interview.

Dry beans and peas (known as pulses) also contain resistant starch that improves [insulin](#) sensitivity and glucose tolerance, and multiple studies support pulses as part of a low-glycemic diet to improve glucose control in adults, the researchers explained, but because the density of food often guides how much people eat, they hypothesized that potatoes could substitute for beans and provide similar glucose control benefits.

In a study [published](#) in the Journal of Medicinal Food, the researchers randomized 36 adults aged 18–60 years with insulin resistance to 8 weeks of a low energy–density diet (1 kcal/g) high in either potatoes or beans. The baseline body mass index ranged from 25 to 40 kg/m². Insulin resistance was defined using the homeostatic model assessment of insulin resistance (HOMA-IR) with a score greater than 2.

The controlled diet consisted of 50%–55% carbohydrates, 30%–35% fats, and 15%–20% protein. Each meal in the potato group included a side of potatoes, and each meal in the bean group included a side of beans.

The primary outcome was the mean change in blood glucose concentration; the researchers also assessed weight loss.

A total of 14 individuals in the potato group and 17 in the bean group completed the study; but data from the 18 individuals in each group were included in an intent-to-treat analysis.

Among study completers, HOMA-IR in the bean group showed an average decrease of 1.4 from baseline ($P = .02$); a similar decrease of 1.3 occurred in the potato group ($P < .05$) with no significant difference between the two diets.

Overall compliance with both diets was roughly 88%. Body weight reductions were similar in both groups and significantly reduced from baseline over the study period, with average reductions in intent-to-treat analysis of 5.82 kg in the potato group and 4.0 kg in the bean group. BMI also was significantly reduced from baseline in both potato and bean groups (2.04 kg/m² and 1.35 kg/m², respectively). Although baseline differences were not significant, "BMI at baseline was higher and the reduction in response to the treatment was significantly greater in the potato diet compared with the bean diet," the researchers noted. The effect on blood glucose response was not significantly different between the two groups or from baseline, they said.

The findings were limited by several factors including the small size, relatively short study period, and controlled nature of the study diet, the researchers noted. "The addition of a typical Western diet would have enhanced our understanding of the effect of low energy–dense diets on metabolic outcomes," they noted in their discussion.

However, both diets led to a reduction in body weight, and the low energy density of both potato and bean diets promoted weight loss without affecting appetite or requiring calorie restriction, the researchers explained. Therefore, "this weight loss if sustained over time could have a substantial impact on body weight," they said.

"We hypothesized that there would be equivalence between the potato and bean diet and this hypothesis proved to be correct," said Kirwan, of the Pennington Biomedical Research Center, Baton Rouge, La., in an interview.

The take-home message for clinicians is that, though small, the study was very well-controlled, Kirwan emphasized. "Clinicians ought to consider the health benefits of the potato when it is cooked and served appropriately."

Looking ahead, larger randomized controlled trials with additional control arms, longer time of at least 12 weeks, and different patient populations are needed, Kirwan added.

Findings Mitigate Food Myths

The debate continues about whether there are foods that are "good" or "evil," or foods that one "should not eat" or "should eat," said Amy Rothberg, MD, associate professor of internal medicine and of nutritional sciences at the University of Michigan, Ann Arbor, in an interview.

"This study dispels the myth that incorporating a small portion of potato into the diet (although these are not potatoes that are fried, or are topped with cheese, bacon, sour cream, etc.) results in deleterious metabolic outcomes when compared to a diet that is comprised of beans (pulses) as part of a low energy–dense diet," she explained.

"The diet in both groups was of low energy density, which has been shown to result in fewer calories consumed, weight loss, and improvement in insulin resistance," so the similarity in results was not so surprising, said Rothberg.

For the clinical takeaway, Rothberg agreed with the study authors: "Clinicians may counsel their patients that they can still consume a small potato (with the caveat above regarding cooking methods and toppings) as part of a balanced meal so long as they are keeping their overall calories low and not exceeding their metabolic requirements based on body weight/BMI," she said.

As for additional research, studies with a longer time frame and a larger and more diverse study population are needed, including populations with common insulin resistance comorbidities such as [type 2 diabetes](#), [fatty liver](#) disease, and cardiovascular disease, Rothberg noted.

Consumer Considerations, With Caveats

The key message for consumers is that, "based on this very small study of short duration, consuming a small portion of potato as part of an overall balanced, low-energy diet did not produce adverse effects on glucose or insulin when compared to a diet of pulses known to have favorable effects on glucose and insulin," Rothberg told this news organization. However, "consumers should note that, although the results from this small study are encouraging, it would be premature to extrapolate the findings from this study to other populations," she said. Also, keep in mind that the study was supported in part by the Alliance for Potato Research, although the authors stated that none of the funders (Alliance for Potato Research and Education and the National Institutes of Health) had any role in the design, analysis, or writing of the article, she added.

The study was supported in part by the Alliance for Potato Research and Education and the National Institutes of Health, which funds the Louisiana Clinical and Translational Science Center. The researchers and Rothberg had no financial conflicts to disclose.

This article originally appeared on [MDedge.com](#), part of the Medscape Professional Network.

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Cite this: Both Potatoes and Beans Reduced Insulin Resistance, Weight in Controlled Study - *Medscape* - Dec 01, 2022.