

DARK CHOCOLATE AND GLUCOSE CONTROL IN PEOPLE WITH DIABETES

BACKGROUND



Chocolate consumption has been on the rise in recent years with wider availability of products. The focus of research on dark chocolate has been primarily on the effect on cardiovascular risk with several studies suggesting positive effects on markers of cardiovascular health. People with diabetes are at elevated risk of cardiovascular disease and therefore could benefit from increased consumption of dark chocolate. However, increasing chocolate consumption can raise concerns among people with diabetes because chocolate typically contains sugar that can spike blood glucose levels. Research on the effects of dark chocolate consumption on glucose metabolism is lacking. Studying how different types of chocolate affect glucose levels could help identify what kind of chocolate is the healthiest choice for people with diabetes.

OBJECTIVE

The objective of this study was to measure the blood glucose response to consumption of Ross Chocolates sugar-free dark chocolate compared to conventional dark chocolate in people with diabetes. The knowledge gained from this study will help to identify what type of chocolate may be best to promote health while maintaining good blood glucose control for people with diabetes.

METHODS

A randomized double-blinded crossover feeding trial was performed. The study was approved by the Clinical Research Ethics Board of the University of British Columbia (H20-02122, 24 November 2020) and registered on ClinicalTrials.gov (NCT04847999, 19 April 2021). Participants completed two experimental trials at the same time of day, separated by ~1 week:

- 1) Consumption of 1 bar (34 g) of **Ross Chocolates sugar-free dark chocolate** (66% cocoa)
- 2) Consumption of 1 bar (34 g) of **conventional dark chocolate** (70% cocoa)

Both chocolate bars were provided in identical packaging. Participants registered glucose levels before and for 120 minutes after eating the chocolate bars with a OneTouch Verio IQ® glucometer (Figure 1).



Figure 1. Study design

RESULTS

Thirteen participants with diabetes (10 females and 3 males; 6 with type 1 diabetes & 7 with type 2 diabetes; 51 ± 14 years old, HbA1c of $7.3 \pm 0.5\%$) completed the study. Initial analysis revealed that **glucose values over two hours after consumption of the conventional dark chocolate rose significantly more** ($P = 0.03$) when compared to consumption of the Ross Chocolates sugar-free dark chocolate (Figure 2A). The primary outcome, **incremental area under the curve (iAUC) for glucose was lower after consumption of the Ross Chocolates sugar-free dark chocolate** (-65%, $P = 0.04$) compared to the conventional dark chocolate (Figure 2B and 2C).

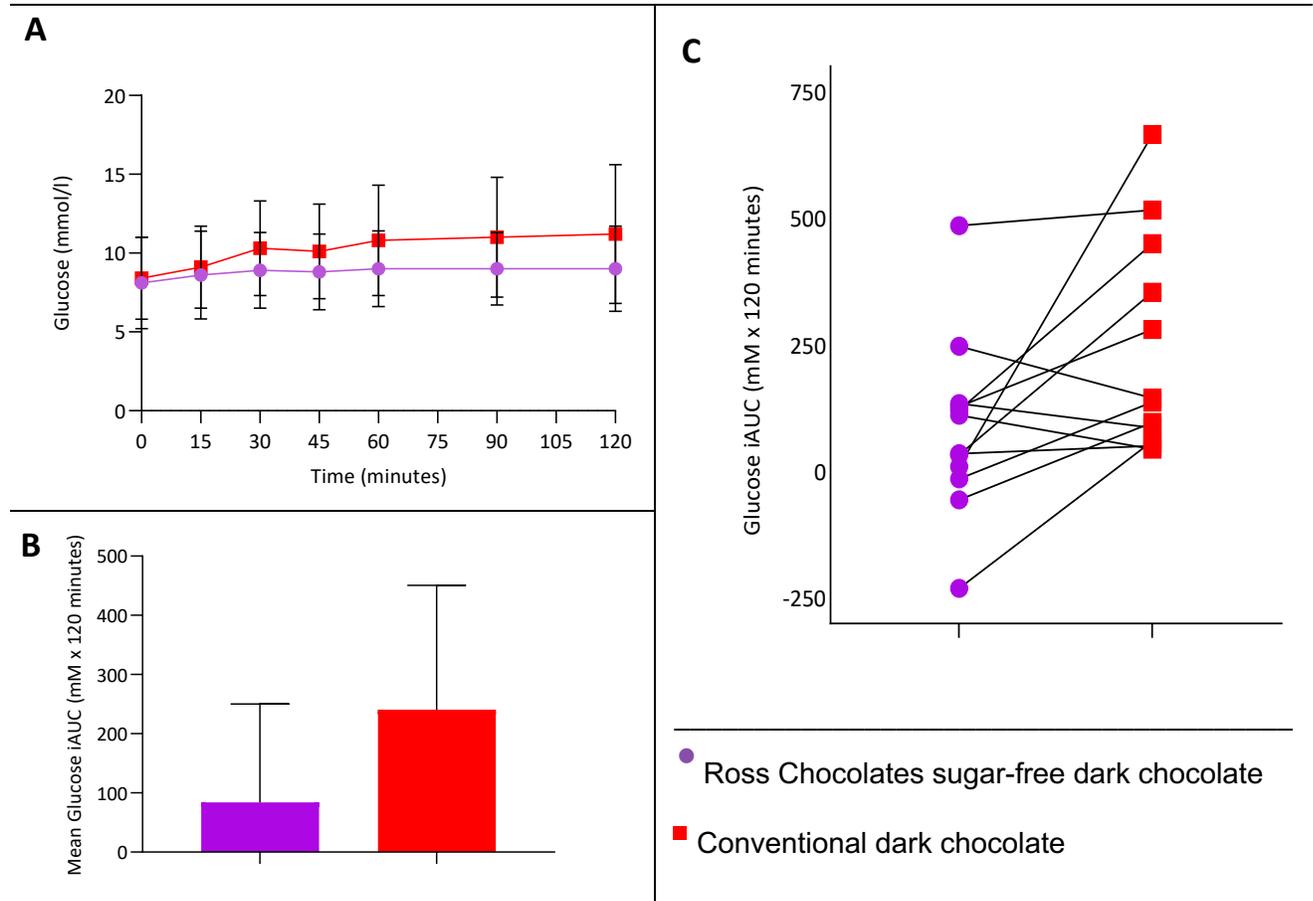


Figure 2 - Blood glucose levels following consumption of both chocolate bars. A) Blood glucose rose after consumption of conventional dark chocolate (red squares) whereas it remained stable after consumption of Ross Chocolates sugar-free dark chocolate (purple circles; condition X time interaction, $P = 0.03$). **B)** Blood glucose incremental area under the curve (iAUC; above baseline) was significantly higher after conventional dark chocolate vs. Ross Chocolates sugar-free dark chocolate (paired t-test, $P = 0.04$). **C)** Individual participant values for glucose iAUC. All data are based on N=13 participants with diabetes.

CONCLUSION

Ross Chocolates sugar-free dark chocolate sweetened with stevia, erythritol, and inulin, led to a lower spike in blood glucose when compared to a conventional dark chocolate bar. It appears that **Ross Chocolates sugar-free dark chocolate bar does not spike glucose**, providing evidence that this type of chocolate could be consumed without compromising blood glucose control in people with diabetes.