



Abstract

Synergistic Effect of Oat Polar Lipids and Oat Beta-Glucans on Postprandial Blood Glucose: A Randomized Controlled Crossover Study in Healthy Subjects [†]

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Background/Aim: The identification and development of high-quality, healthy foods are needed to help prevent metabolic diseases such as obesity and type 2 diabetes. The intake of oat beta-glucans (OBGs) at a dose of 4 g per 30 g of available carbohydrates decreases the postprandial glycemic response and has the potential to increase perceived satiety. The intake of oat polar lipids (OPLs) has been shown to improve cardiometabolic markers in healthy subjects [1]. This study aimed to investigate the possible synergistic effects of OBGs and OPLs on postprandial glucose metabolism and subjective appetite variables. **Methods:** One control (plain white wheat bread (WWB)) and four test products were included. The test products consisted of WWB supplemented with (a) 2 g or (b) 4 g of OBGs per 30 g of available carbohydrates, (c) WWB + 4 g of OPLs, and (d) WWB + 2 g of OBGs (as above) + 4 g of OPLs. The OPLs were provided as a spread on the bread slices. Each breakfast contained a total amount of 50 g of available carbohydrates. Blood samples for glucose measurements were collected in a fasting state and at regular time points for 3 h after the consumption of each breakfast. Subjective appetite-related parameters were measured using a visual analogue scale. **Results:** Twenty healthy, young volunteers (24 ± 2 years of age) with a normal BMI (22.9 ± 1.9 kg/m²) completed this randomized controlled crossover study. Postprandial blood glucose responses (iAUC, 0–180 min) were significantly decreased after the intake of WWB + 4 g of OBGs (124 ± 10 mmol.min/L) and WWB + 2 g of OBGs + 4 g of OPLs (130 ± 9 mmol.min/L) compared to the WWB control (198 ± 21 mmol.min/L) ($p < 0.05$). No significant glucose-lowering effect was observed after an intake of the WWB + 2 g of OBGs (162 ± 16 mmol.min/L) or WWB + 4 g of OPLs (141 ± 15 mmol.min/L) compared to the WWB control. Subjective satiety tended to decrease after the intake of the breakfast containing 4 g of OBGs compared to the control breakfast. **Conclusion:** We conclude that a low dose of OBGs (2 g) ingested together with 4 g of OPLs has a blood-glucose-lowering effect, and this effect is of the same extent as 4 g of OBGs, i.e., no synergy effect was observed.

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Data Availability Statement: The datasets analysed during this study are available from the corresponding author on reasonable request.

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Reference

1. Hossain, M.M.; Tovar, J.; Cloetens, L.; Florido, M.T.S.; Petersson, K.; Prothon, F.; Nilsson, A. Oat Polar Lipids Improve Cardiometabolic-Related Markers after Breakfast and a Subsequent Standardized Lunch: A Randomized Crossover Study in Healthy Young Adults. *Nutrients* **2021**, *13*, 988. [[CrossRef](#)] [[PubMed](#)]

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