DIABETES-SPECIFIC ORAL NUTRITIONAL SUPPLEMENT PRODUCES A BLUNTED POSTPRANDIAL BLOOD GLUCOSE RESPONSE IN ADULTS WITH TYPE 2 DIABETES

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BACKGROUND

- Diabetes affects 37.1 million US adults, including >1 in 4 over the age of 65 years old.[1]
- More than 28% of hospital stays involve a patient with a diagnosis of type 2 diabetes (T2D), indicating a high prevalence in both the hospital and community setting.[2]
- Postprandial blood glucose (PPG) levels are a critical factor in achieving glycemic targets, and a key target for dietary management strategies.
- Oral nutritional supplements (ONS) are commonly used as a nutrient-rich meal or snack to help fill nutritional gaps; understanding the PPG response can be helpful for selecting an appropriate ONS for people with T2D.

OBJECTIVES

- The primary objective of this study was to determine the PPG of a diabetes-specific ONS (DS-ONS) relative to a standard ONS in individuals with T2D.

METHODS

- This randomized, crossover clinical trial enrolled 16 adults with T2D (HbA1c<9%).
- Participants were randomized to isocaloric amounts of a standard ONS and a DS-ONS (BOOST Glucose Control® with Extra Nutrient Support Drink), consumed on separate study days, each one week apart. Products differed in macronutrient distribution, fiber content, and micronutrient profiles (**Table 1**).
- Blood glucose and serum insulin values were measured at baseline and 10, 20, 30, 60, 90, 120, 150, 180, 210 and 240 minutes after consumption and used to calculate the area under the curve (AUC) as well as peak (Cmax) blood glucose and insulin concentrations for each participant.
- Participants were instructed not to take any diabetes medications the morning of or during the 4-hour intervention visits.

Table 1. Macronutrient Profile of DS-ONS and Standard ONS

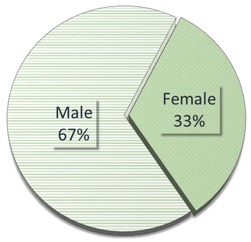
	Standard ONS	DS-ONS
Volume, mL	188	237
Calories	190	190
Protein, g	8 (17% TE)	16 (33% TE)
Carbohydrate, g	33 (69% TE)	16 (34% TE)
Sugars, g	16	4
Fiber, g	0	3
Fat, g	3 (14% TE)	7 (33% TE)

TE = total energy

RESULTS

- Of the 16 participants enrolled, 15 completed the study, with one subject withdrawn due to hyperglycemia protocol. Demographic information displayed in **Figure 1**.

Figure 1: Demographics (N=15)



	Mean (SD)
Age (years)	64 ± 8
BMI (kg/m^2)	29.0 ± 5.6

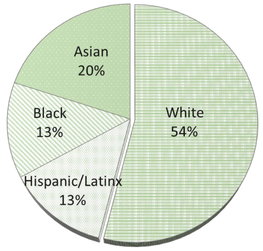
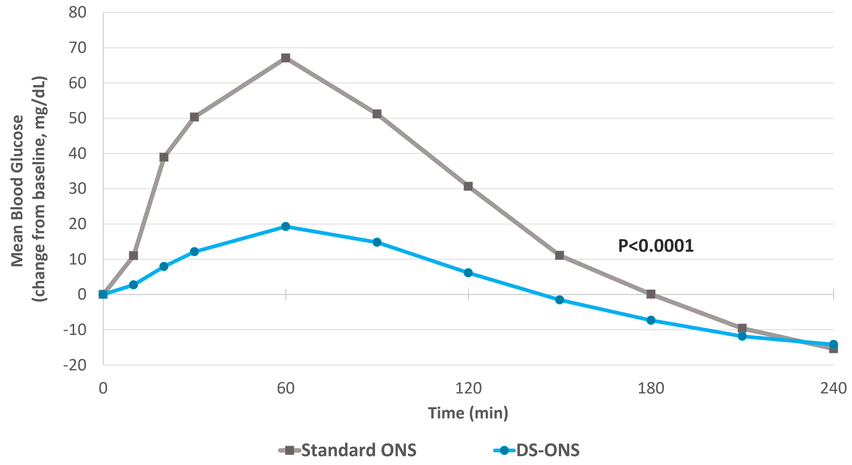


Figure 2. Mean Blood Glucose Levels Change from Baseline over 4 Hours



RESULTS

- There were no differences in blood glucose levels at baseline (p=0.35).
- As shown in **Figure 2** and **Table 2**, peak PPG (Cmax) and mean AUC for blood glucose were significantly lower following consumption of DS-ONS vs. Standard ONS (p<0.0001 for both).
- Likewise, mean AUC for serum insulin, as well as Cmax for insulin and the first-phase insulin response (AUC0-30min) were all significantly lower for DS-ONS vs. Standard ONS. There was no difference in the insulinogenic index between the two products (p=0.89).

Table 2. Postprandial Glucose and Insulin Responses for two ONS

	Standard ONS	DS-ONS
Glucose $AUC_{0\text{-}240\ min}$, mg/dL	5789±4226	**720±1609***
Glucose Cmax, mg/dL	203±30	**145±29***
Insulin $AUC_{0\text{-}240\ min}$, µIU/mL	2675±1975	**1353±1241‡**
Insulin $AUC_{0\text{-}30\ min}$, µIU/mL	266±309	**71±141‡**
Insulin Cmax, µIU/mL	45±33	**26±16‡**
Insulinogenic Index, µIU/mmol	8.3±8.3	7.7±19.3

Values are mean ± standard deviation; *p<0.0001 vs. control; ‡p<0.05 vs. control

CONCLUSION

- **DS-ONS led to a blunted rise in PPG levels over a 4-hour period and produced lower blood glucose peaks compared to a standard ONS.**
- **Incorporating DS-ONS into a balanced diet can be a useful tool in helping to achieve nutritional and glycemic goals as part of an overall diabetes management plan.**

REFERENCES

- 1. US CDC National Diabetes Statistics Report, 2021
- 2. Statistical Brief #279. HCUP. July 2021.

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