

Ouachita Baptist University

Scholarly Commons @ Ouachita

Scholars Day Conference

Virtual Scholars Day 2020

May 1st, 12:00 AM

Acute Ingestion of a Ketone Ester Beverage and Its Impact Upon Glycaemic Control, Appetite, and Food Intake

Beau Pennington

Ouachita Baptist University

Richard Webb

Liverpool Hope University, UK

Follow this and additional works at: https://scholarlycommons.obu.edu/scholars_day_conference



Part of the [Endocrinology, Diabetes, and Metabolism Commons](#)

Pennington, Beau and Webb, Richard, "Acute Ingestion of a Ketone Ester Beverage and Its Impact Upon Glycaemic Control, Appetite, and Food Intake" (2020). *Scholars Day Conference*. 8.

https://scholarlycommons.obu.edu/scholars_day_conference/2020/natural_sciences/8

This Poster is brought to you for free and open access by the Carl Goodson Honors Program at Scholarly Commons @ Ouachita. It has been accepted for inclusion in Scholars Day Conference by an authorized administrator of Scholarly Commons @ Ouachita. For more information, please contact mortensona@obu.edu.



Acute Ingestion of a Ketone Ester Beverage and Its Impact Upon Glycaemic Control, Appetite, and Food Intake

Beau T. Pennington & Dr. Richard Webb

Liverpool Hope University, Liverpool, England Ouachita Baptist University, Arkadelphia, AR

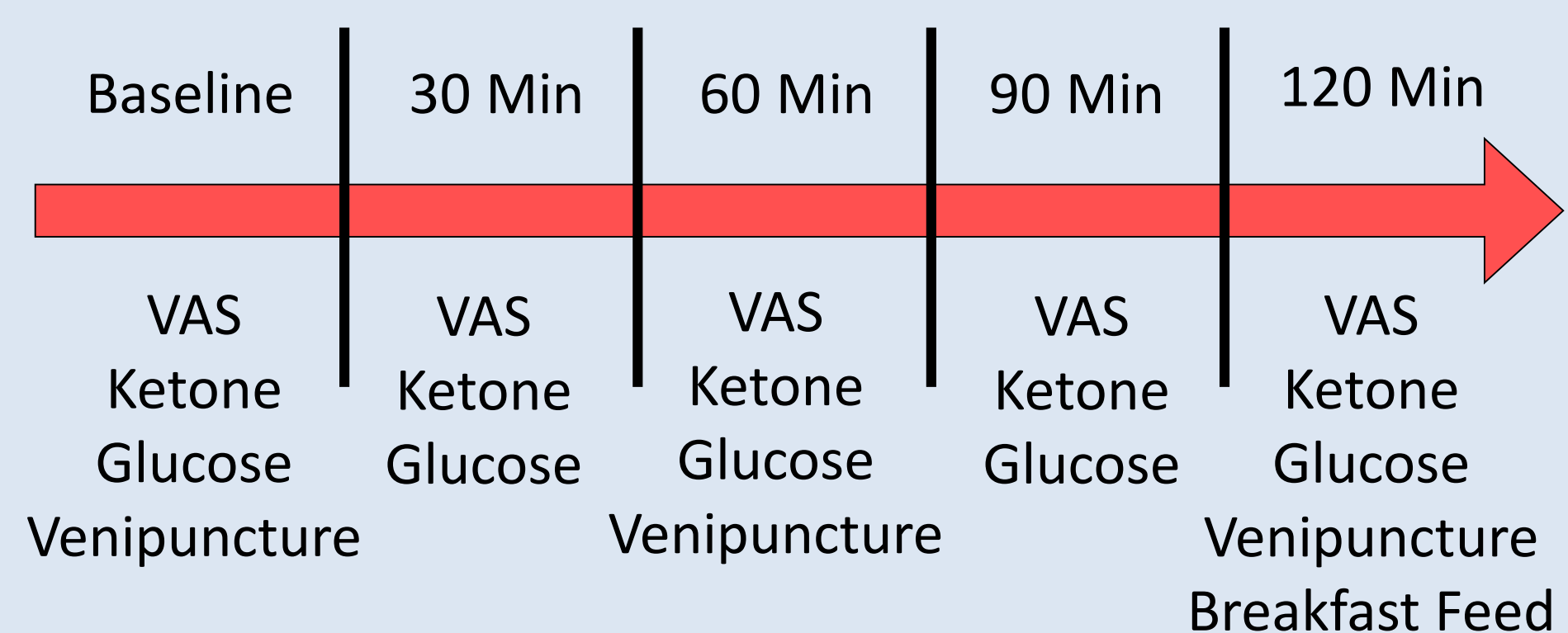


Abstract

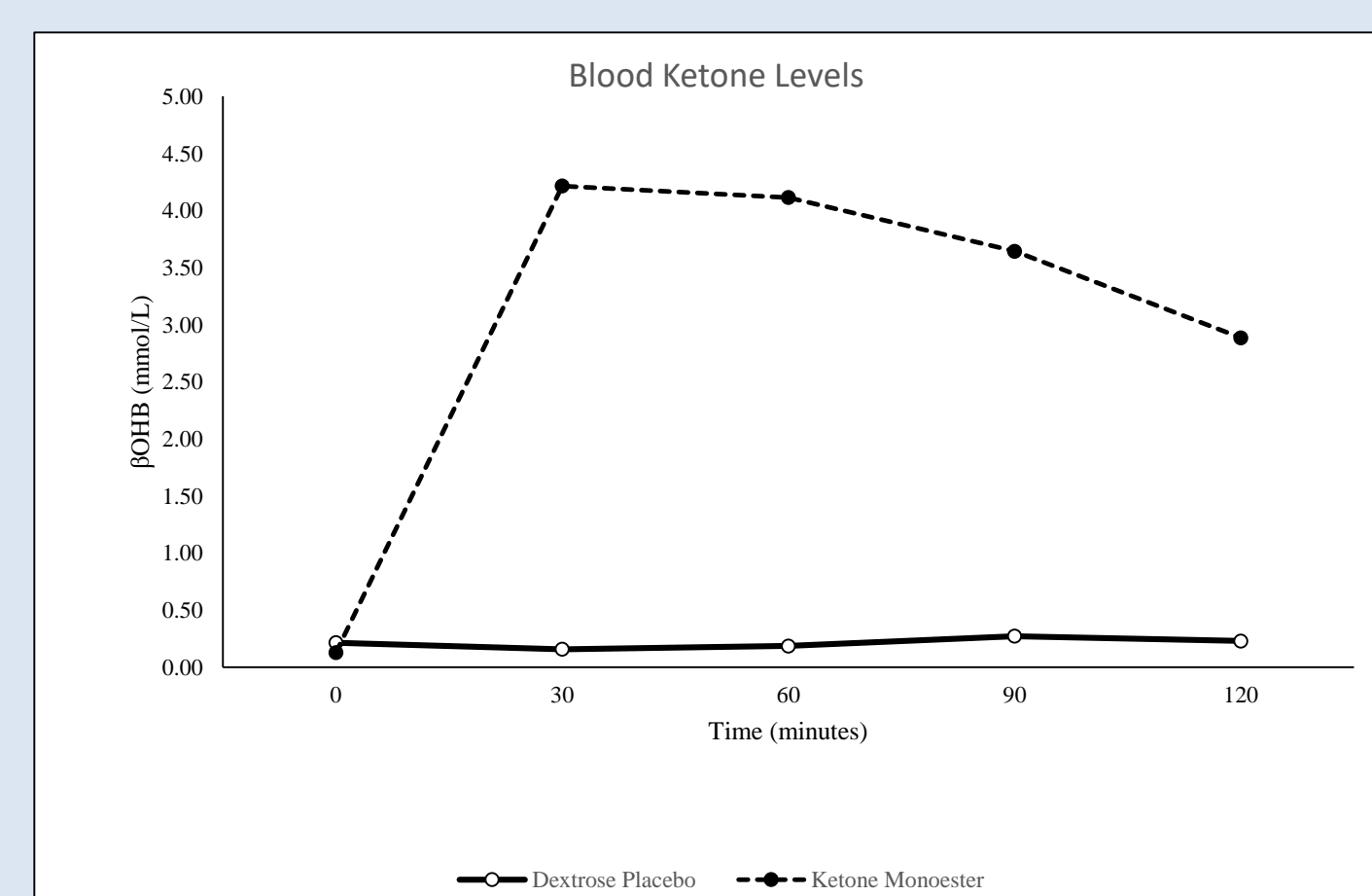
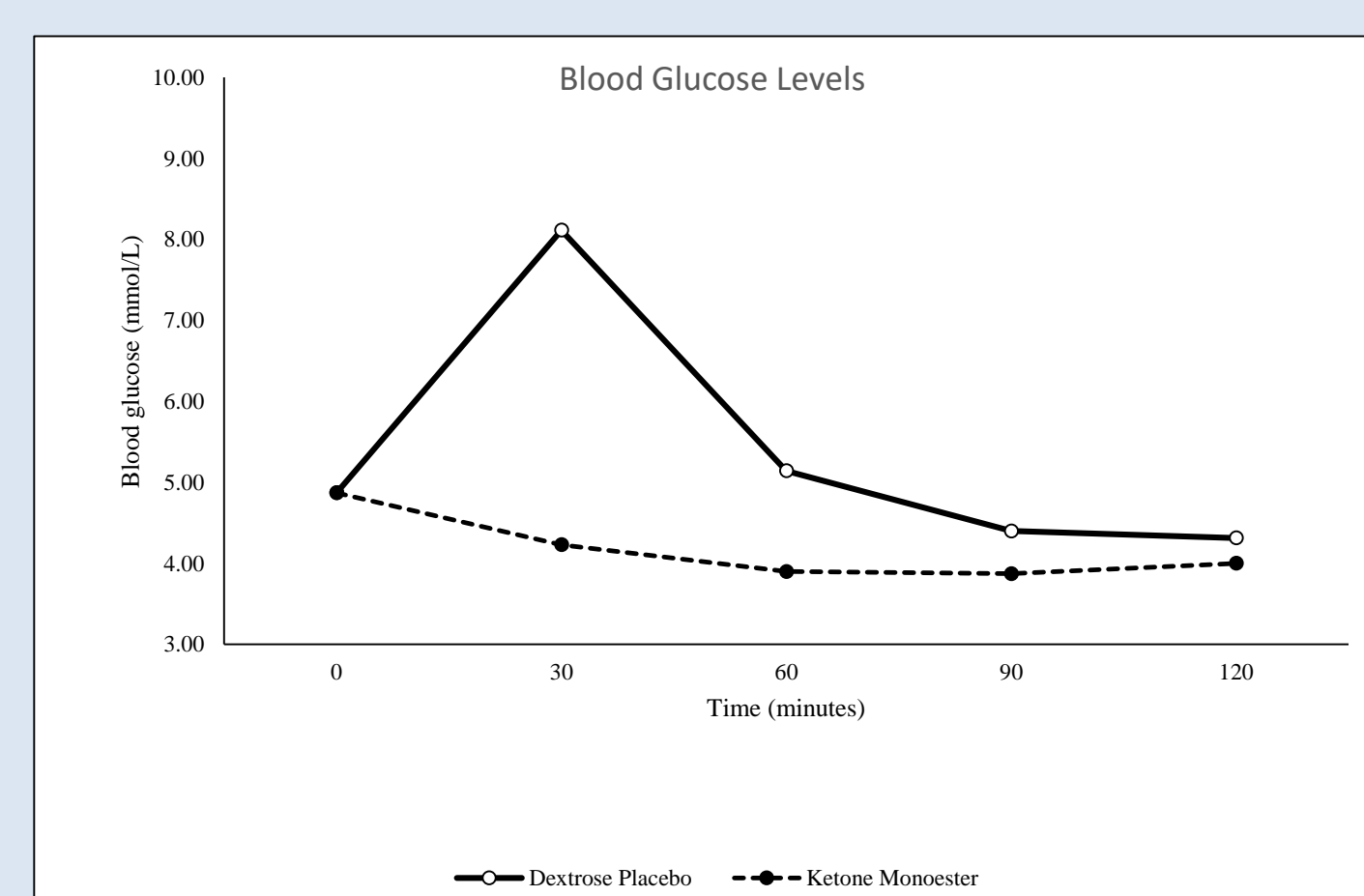
Ketosis is a state in which ketone bodies are hepatically produced, which can lead to weight loss, appetite suppression, and improved glycaemic control. Reaching a state of ketosis can be difficult to attain and can be induced by fasting or restricting dietary carbohydrates. Exogenous ketones in the form of ketone monoesters have been shown to efficiently induce a state of ketosis. Ketone monoesters are synthetic molecules. The aim of the study was to determine the impact of the acute ingestion of a ketone ester beverage upon appetite, food intake, and glycaemic control. Participants ingested the ketone ester beverage and measurements were taken to gauge perceived appetite, food intake, related peripheral hormones, glycaemic control, and blood ketone levels. The results of the study showed that the ketone monoester beverage caused an increase in blood ketone levels and resulted in appetite suppression and improved glycaemic control. The ingestion of a ketone ester beverage may offer therapeutic use for the prevention and treatment of chronic, nutritionally mediated diseases, such as obesity and Type 2 diabetes.

Methods

- Crossover study consisting of two lab visits
- Consumption of either dextrose or ketone ester beverage. Isocaloric- 1.9 kcal/kg body weight (0.385 g β OHB/kg body weight)
- Measurement of appetite, blood glucose, and blood ketone each 30 minutes
- Venipuncture to measure specific hormone levels each hour
- Meal of cornflakes and milk (ad libitum) to measure food consumption

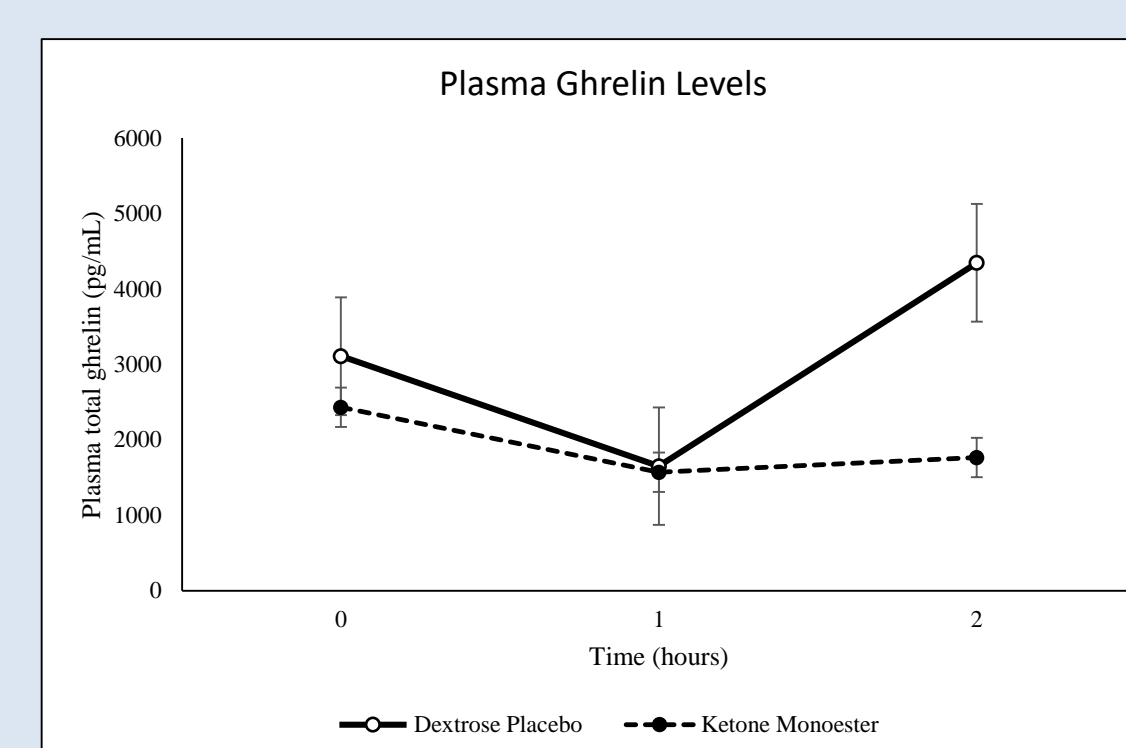
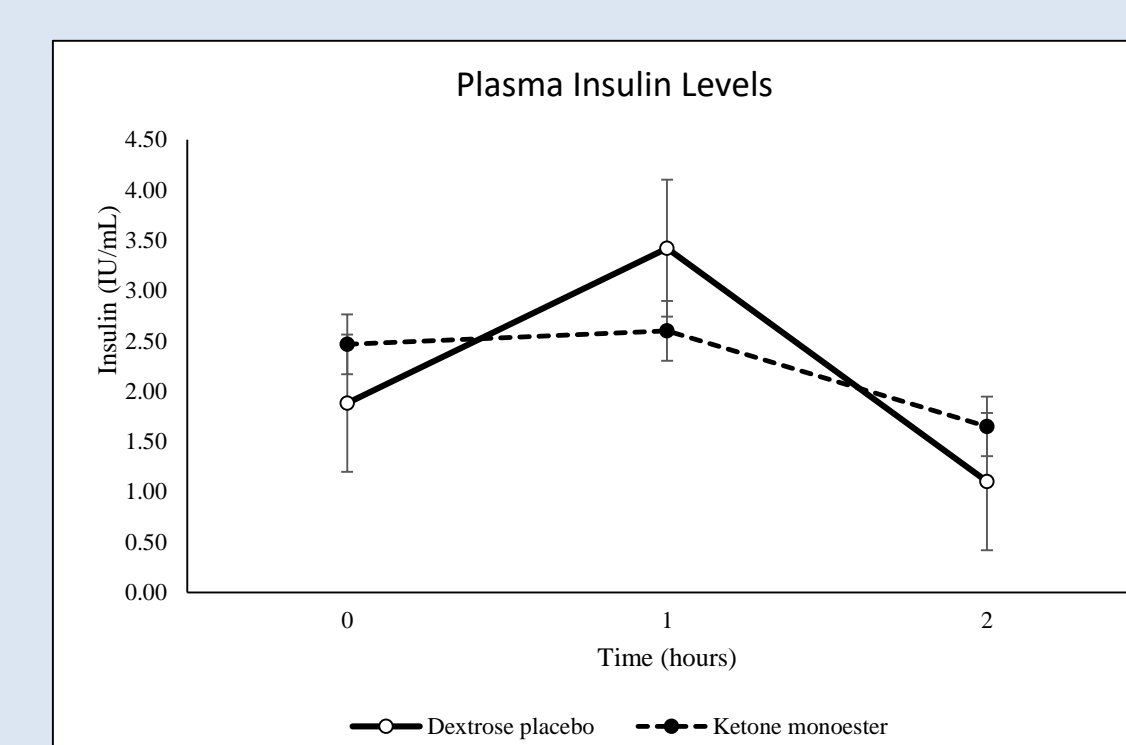
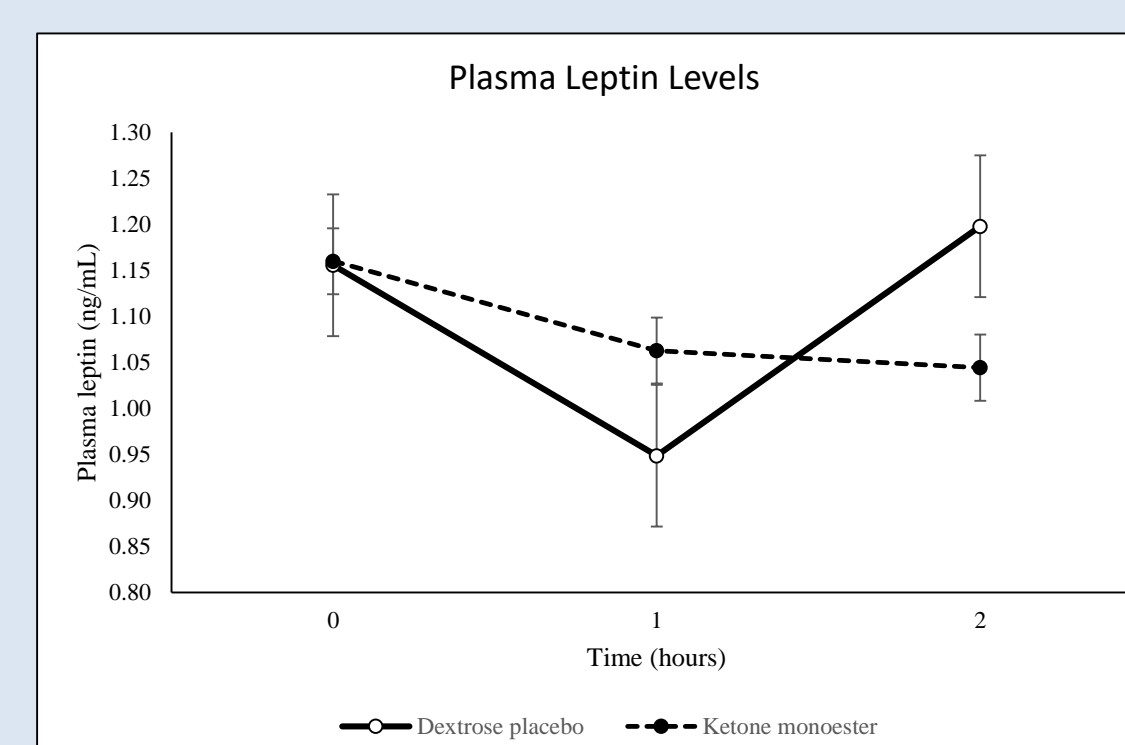


Glucose & Ketone Levels



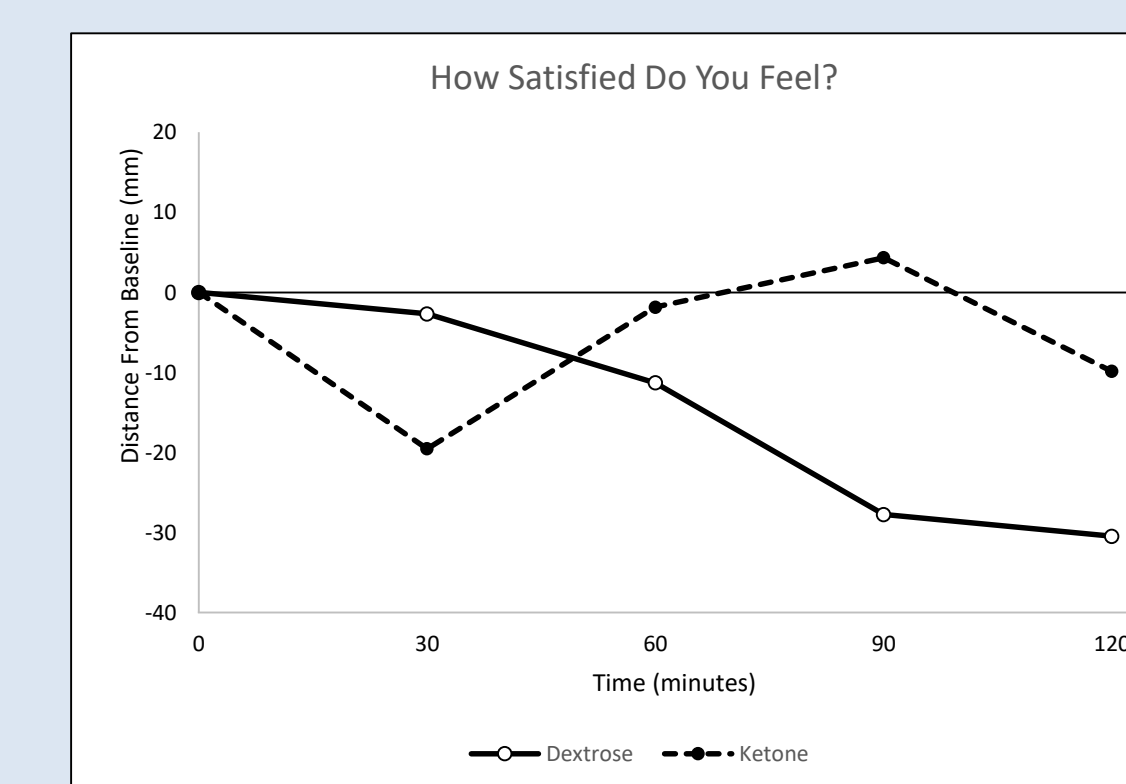
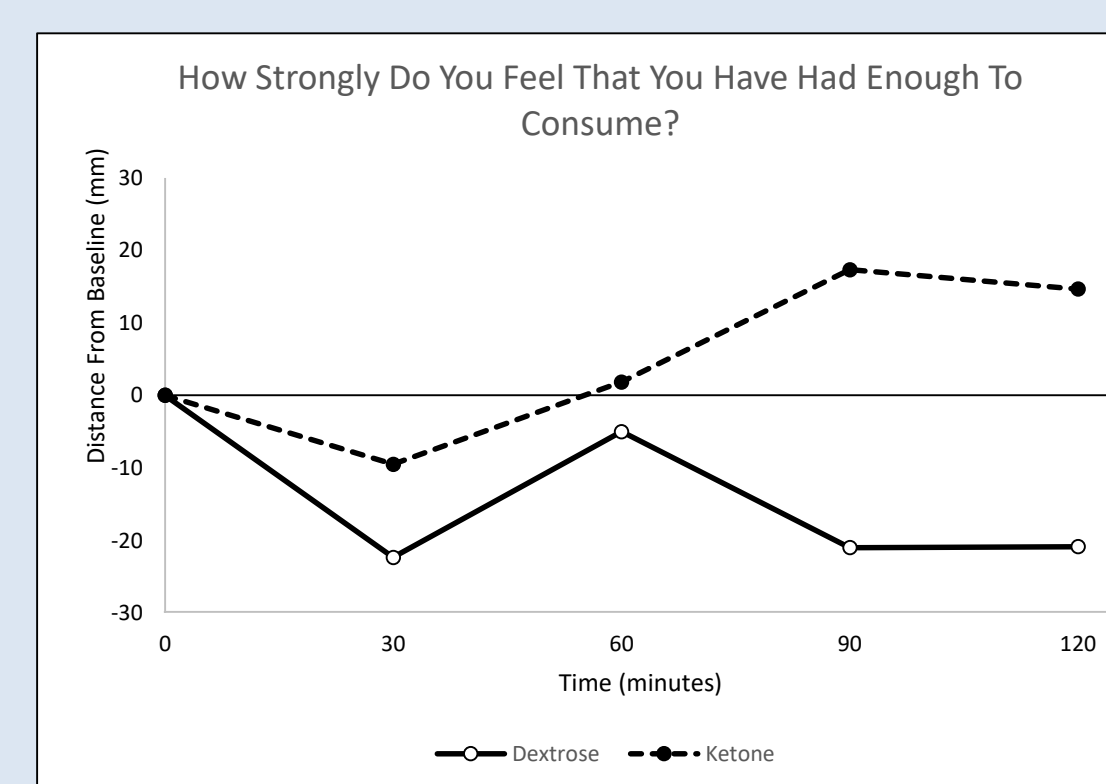
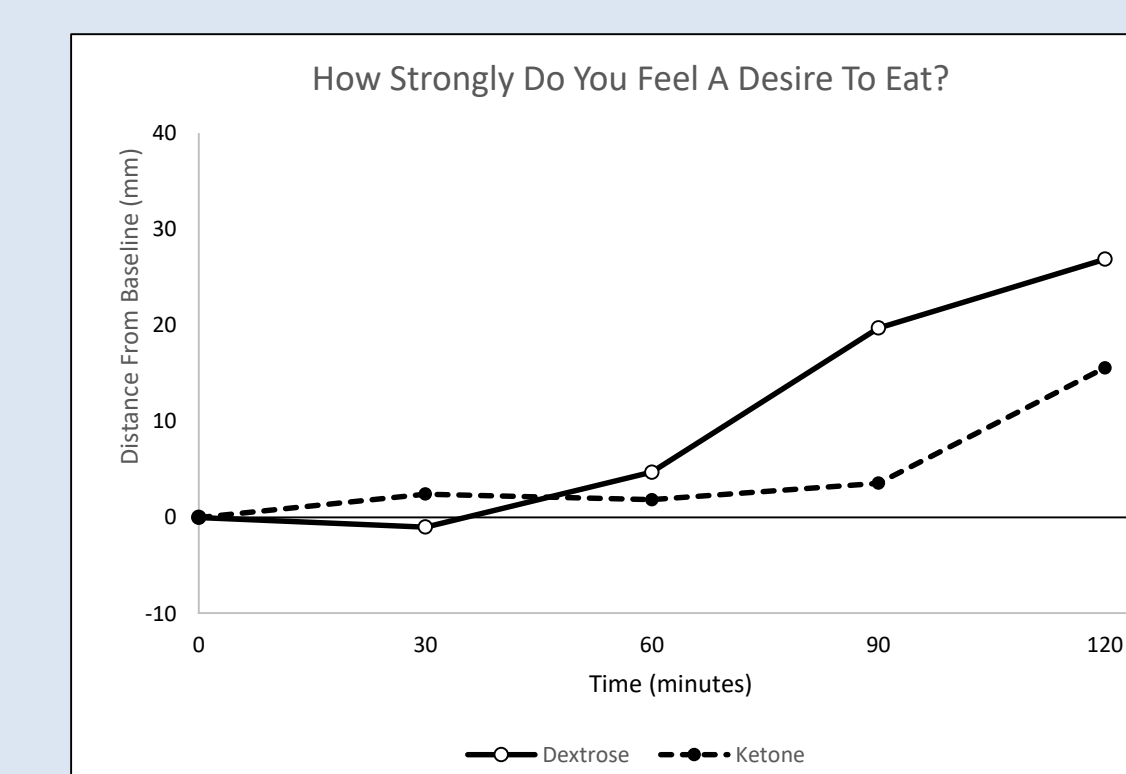
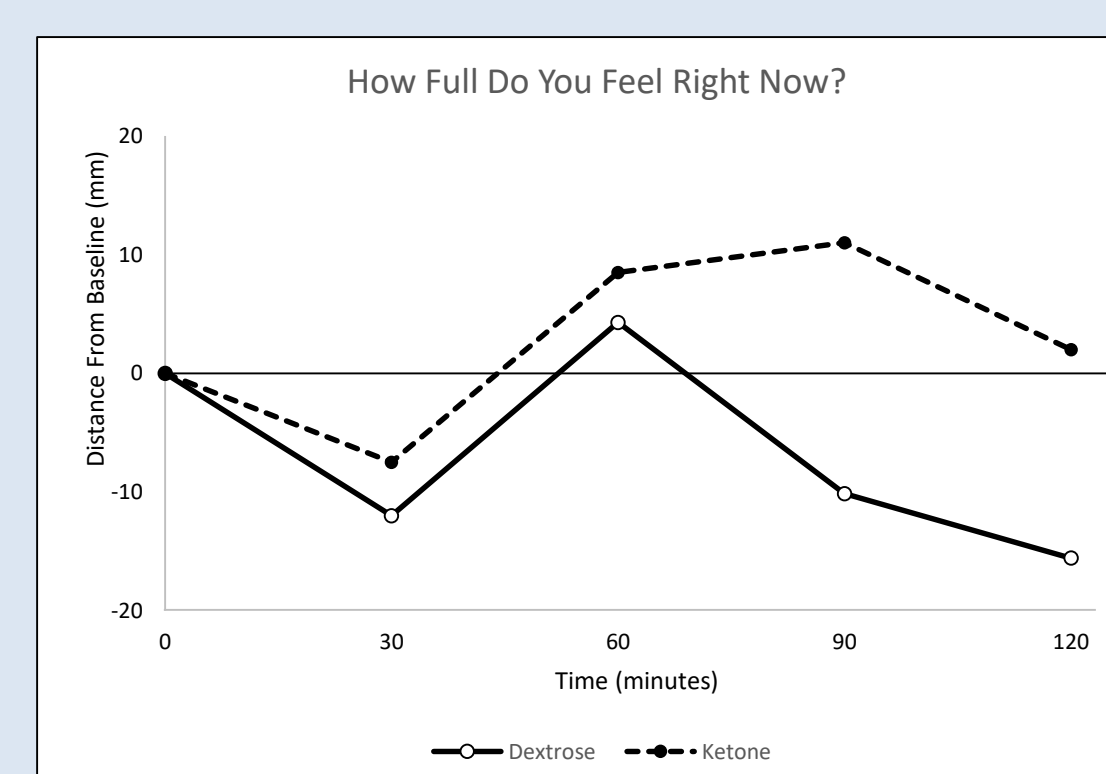
Blood glucose and ketone levels were determined from a finger prick and using a hand-held glucose/ketone monitoring device.

Hormone Levels



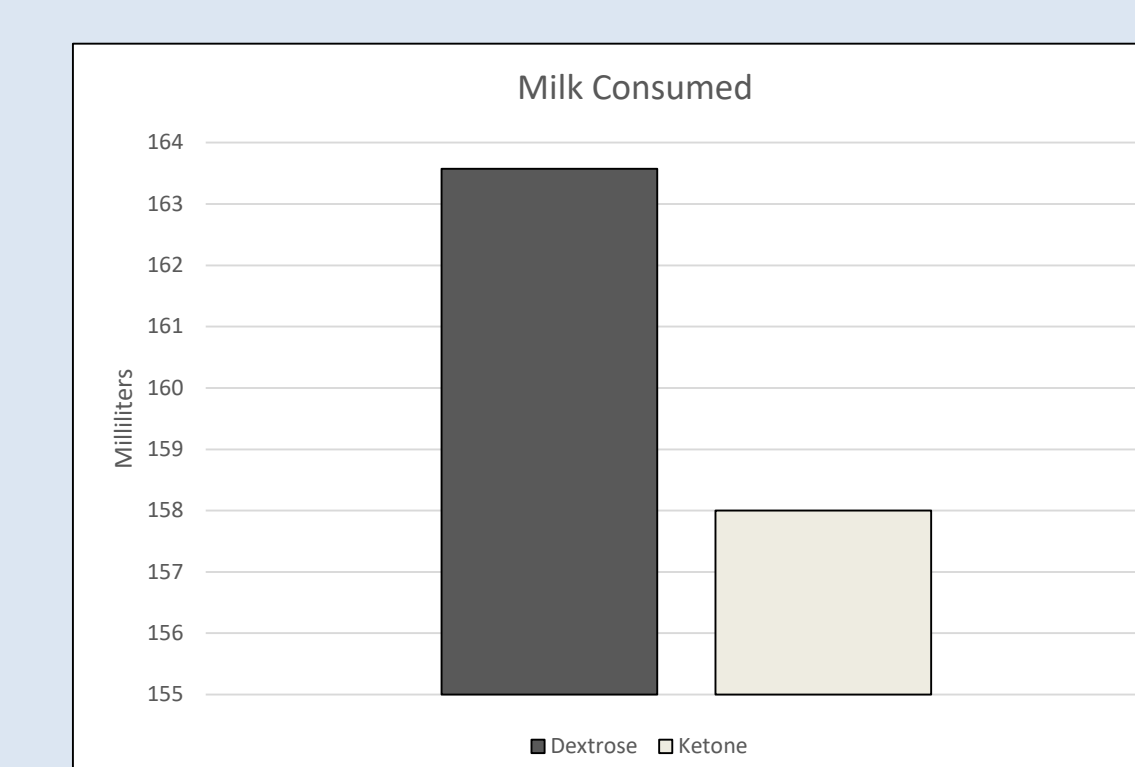
Analysis was ran to determine insulin, leptin and ghrelin plasma levels over a two hour period. Insulin is a hormone involved with glycaemic control. Leptin and ghrelin are both linked to perceiving appetite.

Appetite

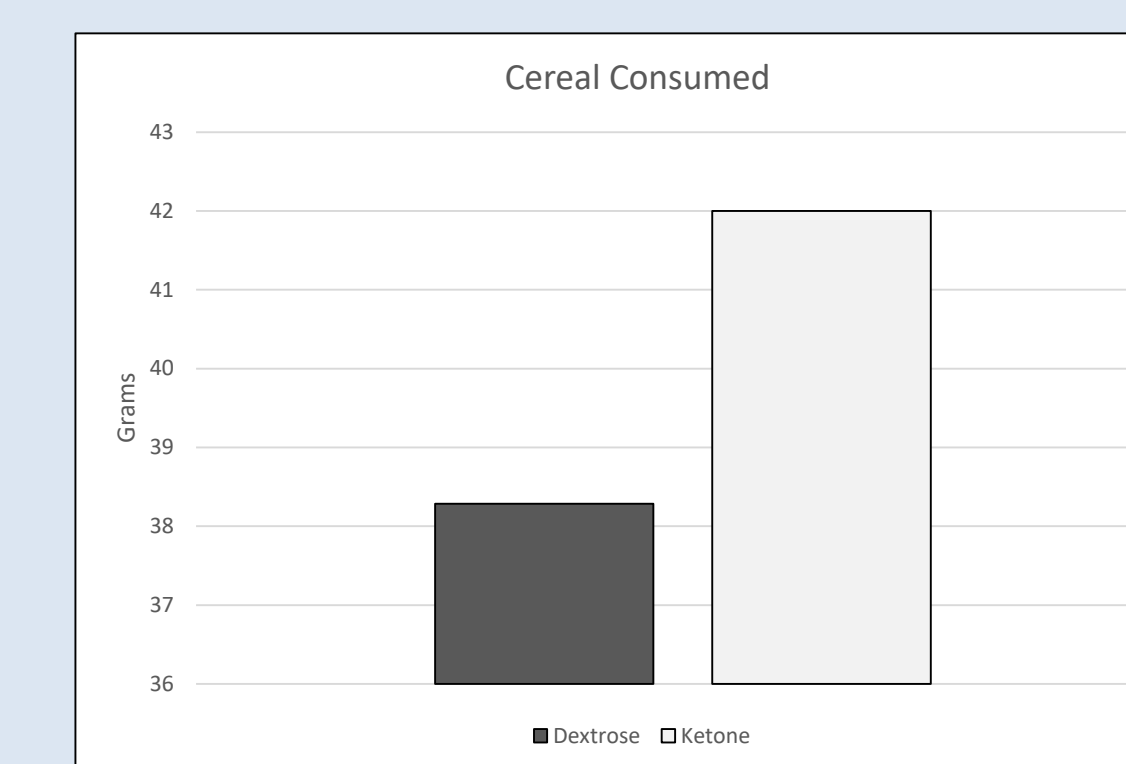


A questionnaire and visual-analog-scales were used to determine perceived appetite and satiety throughout the experiment. Measurements were based off the difference in baseline measurement.

Food Intake



The amount of milk and cereal consumed was measured by weighing the milk and cereal before and after the meal.



Results

- Successfully induces a state of ketosis
- Decreases plasma ghrelin concentration
- Lower levels of hunger and increase feeling of satiety
- Not a large effect on food consumption

Conclusions

The HVMN ketone ester beverage was capable of inducing a state of ketosis for a period of at least two hours. Since the ketone ester beverage was capable of increasing blood ketone levels without increasing blood glucose, then it could possibly be used as a fuel source for people with Type 2 diabetes or obesity.

Future Direction

More research needs to be done in order to determine the effects of a ketone ester beverage on people with Type 2 diabetes or obesity.

Acknowledgements

- Dr. J. D. Patterson Summer Research Program
- Ms. Georgia Gray
- Mr. Jack Greenbank
- Liverpool Hope University
- Ouachita Baptist University



Goal

To evaluate the effect of a ketone ester beverage on self-reported appetite and associated biochemical markers and investigate the impact on glycaemic control and blood ketone levels.

Introduction

Ketones

- Ketosis= ketone levels >3 mM
- Beta-hydroxybutyrate (β OHB) is most common form of ketone body
- Ketones can be used as an efficient fuel source in periods of low glucose levels.

Ketone Esters

- Produced by transesterifying ethyl (R)-3-hydroxybutyrate with (R)-1,3-butanediol
- Used HVMN ketone ester beverage (0.385g β OHB/mL)

