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Blood Glucose Levels and High Intensity Exercise with Respect to Meal Timing

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**METHODS**

<table>
<thead>
<tr>
<th>Participants</th>
<th>Fasting (before/After exercise blood glucose level)</th>
<th>30 minutes before (before exercise blood glucose level)</th>
<th>Eating 1 hour before exercise (After exercise blood glucose level)</th>
<th>Eating 2 hours before exercise (after exercise blood glucose level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female 27</td>
<td>84/102</td>
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<td>Male 28</td>
<td>80/100</td>
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<td>Male 19</td>
<td>110/182</td>
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<td>Male 18</td>
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<td>114/12</td>
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</table>

Four students who were enrolled in KIN 288 participated in a 12 week blood glucose study where they had a meal of 50-60g of carbohydrates, eating at four different times; fasting, 30 minutes before, 1 hour before, and 2 hours before a 50 minute high intensity workout. This study was broken up into a 3 month span where the participants measured their blood glucose levels any day of their choosing at 8am. Students who participated in the high intensity agility workouts did so in Parklands Fitness Center. The target ranges of fasting blood glucose are 100-126mg/dl and the resting blood glucose ranges are 140-200mg/dl. Shown below is the data collected from the 12 week study.

**RESULTS**

Four out of five students from Kinesiology 288 that partook in the study, successfully completed the experiment. (Due to technical difficulties involving one of the blood glucose monitors, one of the subjects was unable to complete the experiment.) Using four different meal times prior to exercise to determine how these levels changed from before to after exercise—we were able to determine, which times before exercise would raise blood glucose levels most significantly following a fifty minute duration of high intensity exercise.

Our results revealed that blood glucose levels increased using all four meal timing schemes prior to exercise, but increased most significantly when eating 120 minutes before exercise and when fasting. In improving this study for the future, students should ensure that all blood glucose monitors function properly before the experiment begins. Instructions on usage of these monitors should be clearly defined as well. Also, several monitors could be used on one person (for one given measurement) to determine the accuracy of the monitors to prevent the data from being skewed by any incorrect values reported by faulty equipment.

**CONCLUSIONS**

With proper meal time, prior to high intensity cardiovascular exercise the desired increase in blood glucose levels can be achieved. Though it may be difficult to discern this change in blood glucose levels based off of different foods consumed, we were still able to conclude that when consuming roughly fifty carbohydrates at specific times prior to cardiovascular exercise that eating either two hours before the exercise session, or when fasting the largest increases in blood glucose would occur. Using our experiment we were able to identify a specific meal’s effect on pre and post- exercise blood glucose levels. Similar experiments to this one are easy to administer and require only a few days to complete, given that all the data from the blood glucose monitors reads accurately.

Through the inclusion of eating at different times before exercise and by eating different amounts of carbohydrates following these bouts of exercise, a clear effect of food and exercise effects of blood glucose levels can be measured. Previous data concluded that with 2 bouts of low to moderate intensity yielded a lowering of blood glucose while fasting (1), and with higher intensity, the blood glucose raised significantly (2). Going forward, future studies could use similar meal times and similar carbohydrates intakes to measure the change to blood glucose levels before and after resistance training, opposed to cardiovascular training. By studying the effect that cardiovascular training has on blood glucose levels the groundwork has been laid for future studies to look into the way that blood glucose levels are affected by other training modalities.

**REFERENCES**
