

Shippensburg University Undergraduate Research Program (Fall, 2012)

Project title: The Effects of Simple carbohydrate vs. a carbohydrate/protein supplement on glucose clearance following anaerobic exercise.

Faculty Mentor: William A. (Turi) Braun, Ph.D., FACSM

Endorsement of support: I, William Braun (Department of Exercise Science), endorse the student investigation proposed below.

*Introduction*

**Purpose:** The purpose of this study is to test the effects of a carbohydrate-only supplement versus a carbohydrate-protein supplement on the rate of glycogen repletion in the muscle and liver. The study will serve as a tool to the athletic population, and those studying the application, to show which supplement is best to use post-exercise for easiest and most efficient recovery.

**Procedure:** The study will consist of three experimental testing days. Research volunteers will be healthy, regularly exercising college students, ages 18-25 years. Each subject will perform a modified Wingate protocol on two testing days. This protocol will use a 60-90 sec cycle ergometer test that is performed at a very high workrate. It is designed to test anaerobic power and the capacity of a person to produce power anaerobically. This test was selected as the work involved should activate glucose transporters in muscle. These transporters help the muscle to take up glucose which is an important fuel for muscle. Following the cycle test, the subjects will be provided one of the two test beverages. For an hour after the protocol, the participants will be tested for their blood glucose levels using finger tip sampling at 15 minute intervals. Blood glucose levels will also be taken before the test is performed. On a third day, the subjects will not perform the anaerobic test, but will be provided with the carbohydrate beverage and sampled for glucose over an hour of rest. This will serve as the control testing day.

*Relevance and significance of the topics*

The results of this study will benefit the participants by showing them which supplement will best assist in energy replacement during recovery from exercise. This will be beneficial to this particular subject pool because they are being sought from the athletic population and normally perform exercise most days of the week. Therefore, energy replacement strategies may be important for supporting their exercise goals.

The study outcomes may also be of benefit to future research projects in providing a basis to begin studying the effects of the two different supplement strategies (CHO vs. CHO/PRO) on recovery from anaerobic exercise. It may also benefit fitness professionals who have been hired to assist in a fitness plan by giving them the information they need to best aide their clients in nutritional recovery.

*The project has been submitted for approved to the SU Committee for the Protection of Human Subjects).*

*Adequacy of design, feasibility and likelihood for success*

The experiment uses a cross-over design where each participant acts as his own control. We are aiming for fifteen research volunteers. Each subject will complete three different trials with a minimum of 48

hours between trials to insure adequate recovery. Once data are collected, they will be analyzed using analysis of variance (with repeated measures) for detection of significant effects. In some instances, where it applies, variables will be compared using a one-way anova.

### *Potential for Learning*

I believe it is important to complete the study of the post-exercise replenishment effects of a carbohydrate-protein supplement and a carbohydrate-only supplement. The results will help athletes and fitness professionals both to better their own training, and the training of their athletes, have optimal recovery time based on their knowledge of best supplementation. The study will show which supplement most quickly replenishes the blood glucose during the recovery period following an anaerobic maximum treatment. The results will benefit those athletes who train for anaerobic events.-

Our research is on the effects of simple CHO and CHO-PRO supplementation on glucose clearance following anaerobic maximum testing. The reason that we want to do this study is to see if the repletion of glucose in the body can occur at a faster rate with CHO or CHO-PRO supplementation after exercise. Studies that we have researched have mainly focused on aerobic athletes. For this reason, our group has decided to see how it affects the anaerobic athlete seeing as their blood glucose may be more prone to rapid changes than when an individual is exercising at a sub-maximal level. We need funding for several aspects of this research which include the supplementation that we will give our participants and the supplies to measure blood glucose before and following the exercise bouts and on the control day. --

I am in search of funding for a research project involving anaerobic exercise and glucose clearance during recovery. This money will go toward purchasing supplies that will be able to test our subjects as well as the supplements the subjects will be consuming during the study. Any funding we would receive would be greatly appreciated.

We propose to find the effects of simple carbohydrate and carbohydrate protein supplementation on glycogen repletion in anaerobic maximum testing. The purpose of our study is to test the effects of carbohydrate protein supplement on the rate of glycogen repletion in the muscle and liver compared to just carbohydrate supplement. I would like to study the effect of carbohydrate protein supplementation because looking at recent studies, most of them pertain to aerobic activity and the effects of carbohydrate protein supplement on recovery after endurance activity. We specifically want to study the effect following anaerobic performance. This study can help the athletic population find the best supplement for post exercise recovery. -

Our study aims to correlate the effects of simple and carbohydrate protein on glucose replenishment after anaerobic maximal testing. This study will help to increase our overall knowledge in regards to research design as well as the analysis and effects of glucose curves. The majority of the research found only touches upon carbohydrate replenishment amongst aerobic athletes which obviously differs from anaerobic athletes. This research grant will help provide us with the necessary supplies and supplementation for our experiment to be completed efficiently and effectively while allowing others the insight of our findings.

We are conducting research on the effects of carbohydrate and carbohydrate-protein supplementation on glucose response after anaerobic exercise. This study we feel is important because most studies we found on this topic were looking at the effects of these supplements on glycogen repletion after aerobic exercise. So, our research would look at another aspect of these supplements and our findings could possibly help anaerobic athletes train hard with shorter amount of rest time in between training sessions. The research will help us learn how to do statistics and improve our research skills. The reasons why we need funding is for our supplements and supplies to check blood glucose after the exercise protocols.

Project Budget

*Data collection supplies*

Glucose test strips (300 test strips)	\$150.00
Lancets (3 boxes @ 100 count)	\$75.00
Sharps Biohazard Container (1 gallon)	\$15.00
Maltodextrin/glucose (1 kg)	\$25.00
CHO/PRO powder (1 kg)	\$30.00
Gloves (3 boxes)	\$45.00

**Total Budget Request: \$340.00**

**2012-13 UNDERGRADUATE RESEARCH GRANT PROGRAM**

# IPSSP 1036

Shippensburg University of Pennsylvania

This worksheet is designed to assist you in preparing your proposal budget. Work with your faculty mentor to identify reasonable costs. Enter your information in the "pink" shaded cells. The spreadsheet includes formulas which will auto-calculate totals for you. If you prefer, you may create your own worksheet. If you do so, you are expected to use the same budget categories and to use the same layout as provided on this template. Call IPSSP for questions and/or technical assistance: 717-477-1251.

Project Title: _____					
Lead Student Name: _____					
Lead Student ID #: _____					
UGR Grant - Proposed Budget					
Supplies	Item	Example	\$/unit	#	\$
Use these lines for consumable supplies* you will need. Do not request funds for electronic equipment already available through the University.	Item 1	Glucose test strips	25	3	75
	Item 2	lancets	50	3	150
	Item 3	Sharps biohazard container	25	3	75
	Item 4	glucose powder	15	1	15
	Item 5	Carbohydrate/protein powder	25	1	25
	Item 6	Gloves	30	1	30
	Item 7	description	15	3	45
<b>TOTAL SUPPLIES</b>					<b>340</b>
\$					
<b>Printing/Posters</b>	Item 1	description			
	Item 2	description			
	Item 3	description			
<b>TOTAL PRINTING</b>					<b>0</b>
\$					
<b>Student Travel</b>	Conference registration				
	Air fare				
	Automobile miles @ 0.555/mile				
	Tolls				
	Parking				
	Hotel				
	Meals (maximum = \$25/day; itemized receipts required)				
	Other				
<b>TOTAL STUDENT TRAVEL</b>					<b>0</b>
\$					
<b>Other</b>	description				
	description				
<b>TOTAL OTHER</b>					<b>0</b>
\$					
<b>Faculty Travel</b>	Conference registration				
	Air fare				
NOTE: The maximum faculty award is \$400.	Automobile miles @ 0.555/mile				
	Tolls				
	Parking				
	Hotel				
	Meals (maximum = \$25/day; itemized receipts required)				
	Other				
<b>TOTAL FACULTY TRAVEL</b>					<b>0</b>
\$					
<b>TOTAL STUDENT REQUEST</b>					<b>340</b>
<b>TOTAL FACULTY REQUEST</b>					<b>0</b>