Appalachian
STATE UNIVERSITY

Consent to Participate in Research

Information to Consider About this Research

Influence of ASEA on performance and exercise-induced inflammation, oxidative stress, and changes in immune function in endurance athletes

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What is the purpose of this research?

ASEA beverage contains some salt (about twice as much as Gatorade) and special molecules (called redox signaling molecules) that may help protect and repair cells, restore immune function, and support improved performance, endurance, and recovery. These molecules are similar to some of those that operate as messengers for beneficial adaptations and that are produced in your body during exercise by the muscle mitochondria (i.e., energy source in cells) that operate as messengers for beneficial adaptations. The purpose of this project is to determine if drinking ASEA beverage (compared to placebo) before (one week), during, and after cycling 75-km can improve performance and help counter post-exercise inflammation, oxidative stress, and immune dysfunction. The placebo beverage will contain about the same amount of salt as the ASEA beverage, but without the redox signaling molecules.

Specifically, by doing this research, we hope to learn if drinking the ASEA beverage for one week before (one-half cup a day and then three-fourths cup just before), during (one-half cup), and immediately after (three-fourths cup) intense exercise will produce the following benefits for cyclists:

1. Improve immune function, and reduce inflammation and oxidative stress after cycling 75-km as fast as possible.
2. Improve 75-km cycling performance (time trial).

Why am I invited to take part in this research?

You are invited to take part in this research because you are a healthy male (ages 18 to 55 years) and a trained cyclist who competes in road races and can cycle 75-km at a high intensity. You also agree to train normally during the seven week period of the study (including two weeks before baseline testing, two separate weeks of supplementation, and the 3 week washout or no supplementation period), keep your weight about where it is now, and avoid the use of large-dose vitamin/mineral supplements, herbs, and medications known to affect inflammation and immune function starting two weeks before and throughout the project. You also agree to rest and prepare for each 75-km cycling trial as if you were getting ready for a race.

Are there reasons I should not take part in this research?

You should not take part in this research if you are not a healthy male 18 to 55 years of age, cannot cycle intensely for 75-km, or have a personal history of being sensitive to salt. Salt sensitivity is defined as an unusual increase in blood pressure when eating meals with high salt

content, both immediately after the meal or after eating too much salt over several weeks and months. If you have high blood pressure due to high salt intake, and have been told by your physician to limit salt in your diet, you should not take part in this study.

What will I be asked to do?

The research procedures will be conducted at the Human Performance Lab (Room 1201) at the North Carolina Research Campus in Kannapolis, NC (600 Laureate Way). You will need to come to the Human Performance Lab a total of three times during the study. The first visit will take about 60 minutes, and the second and third visits about four or five hours each. The total amount of time you will be asked to volunteer for this study is about seven weeks from early-February to the end of March.

During the study, you will train normally and record your mileage and exercise time in training logs. Your cycling performance will be tested twice using a 75-km cycling time trial (mountainous) in the lab after drinking ASEA or placebo beverages for one week (with a 3 week washout period) (see Figure). Blood and urine samples will be collected before, immediately after, and 1-h following both of the 75-km time trials. Blood and urine samples will be tested for glucose, lactate, immune function, oxidative stress, and inflammation markers.

Here is more specific information:

A. One week prior to the first 75-km time trial, you will report to the NCRC Human Performance Lab at 2:30 pm for orientation/baseline testing. You will be tested for body composition (Bod Pod) and maximal aerobic fitness (VO2max using Lode cycle ergometers).

B. You will be randomized to ASEA or placebo conditions for one week, and drink one-half cup (4 fluid ounces) per day in the morning (prior to 9 am). Store empty beverage containers and bring them to the Human Performance Lab after the supplementation period so that we can verify you have consumed the required amounts. This requirement is one method we use to document that all of the supplement has been ingested.

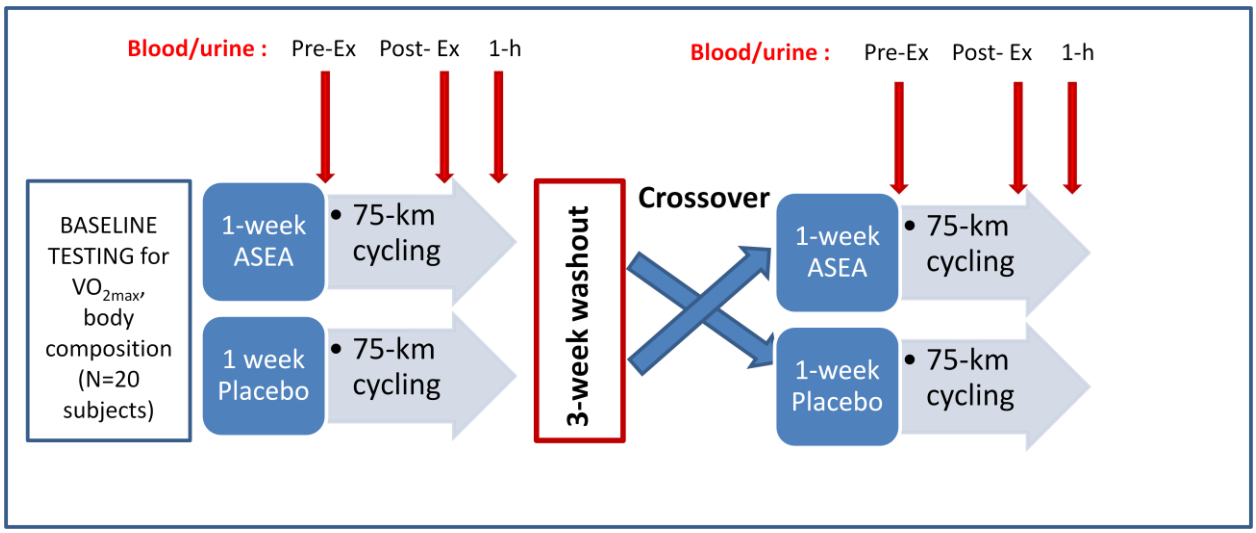
C. Prior to the first 75-km time trial session, you will consume a standardized meal at 12:00 noon using Boost Plus at 10 kcal/kg (this will be given to you at orientation/baseline testing). You will report to the lab at 2:30 pm and provide blood and urine samples. You will next drink three-fourths cup (6 fl oz) ASEA or placebo about 30 minutes prior to exercise.

D. At 3:15 pm, you will cycle on your own bicycle on a CompuTrainer for 75-km (approximately 2 to 2.75 hours) at the fastest pace possible. You will drink 4 fl oz ASEA or placebo after one hour of the cycling trial. You will consume 0.5 to 1.0 liters of water every hour of exercise to maintain adequate hydration.

E. Blood glucose and lactate, and metabolic measures (i.e., oxygen, carbon dioxide, total air) from the Cosmed Fitmate system will be taken twice during each of the 75-km cycling trials (at one and two hours). The blood glucose and lactate samples will be obtained from finger sticks while you cycle, with one drop of blood squeezed into a capillary tube.

F. Blood and urine samples will be taken again immediately following exercise (~5:15 to 5:45 pm). ASEA or placebo beverages (6 fl oz) will be consumed immediately after providing the post-exercise samples. Blood and urine samples will again be taken at 1-hour post-exercise (6:15 to 6:30 pm). (Thus 3 blood samples per test session, with approximately 30 ml collected each draw for a total of 90 ml (about 6 tablespoons); each urine sample will be 50 ml for a total of 150 ml each test session).

G. After a 3-week WASHOUT period (i.e., no use of ASEA or placebo supplements), you will switch (i.e., crossover) to the opposite beverage, and repeat all procedures exactly as described in “B” through “F”. The ASEA or placebo beverages for the second half of the study will be provided after the first 75-km cycling trial.



TIMELINE (you will pick three dates, but on same day of the week for each week):
A. BASELINE TESTING/ORIENTATION
February 15,16,17,18 (5 athletes per day; receive ASEA or placebo supplements and start supplementing one week prior to first time trial)
B. FIRST 75-km CYCLING TIME TRIAL
March 1, 2, 3, 4 (then 3-week washout, crossover and 1-week supplementation with opposite beverage)
C. SECOND 75-km CYCLING TIME TRIAL
March 29, 30, 31, April 1

What are possible harms or discomforts that I might experience during the research?

To the best of our knowledge, the risk of harm for participating in this research study is no more than you would experience in everyday life. Consuming the ASEA beverage is safe with no known side effects. There is no safety difference between drinking ASEA or other sports drinks such as Gatorade. Consuming the ASEA beverage does not generally interact with medications.

The risks of collecting a blood sample from you include the possibility of local discomfort (pinch when the needle enters your skin), minor bruising or bleeding at the site (10%), possible temporary lightheadedness, infection (<0.01%), or development of a blood clot (<0.01%). The amount of blood being withdrawn during each of the six blood collections is about 30 ml per sampling (about 2 tablespoons) or about 180 ml (12 tablespoons) for the whole study, and will not influence your ability to participate in normal daily activities. A trained and experienced individual will perform the technique and your blood will be collected in a hygienic setting with sterile materials and biohazard protection measures to minimize these risks. In the rare case of research personnel exposure to your blood or tissue, we will analyze your blood for HIV and hepatitis (a positive HIV or hepatitis test will be reported to you).

The physical fitness tests and exercise bouts included in this study are safe and have no known risks for apparently healthy adults. You will fill in a health screening questionnaire and must be classified as "low risk" to be included in this study. Several trained staff will supervise all physical fitness tests and exercise bouts. In the rare event of an injury during testing and exercise, standard emergency procedures in the Human Performance Laboratory will be followed. The ASU-NCRC Human Performance Lab is located within a few minutes of several agencies providing emergency treatment.

What are possible benefits of this research?

We do not know if you will get any benefits by taking part in this study. This research should help us learn more about whether drinking ASEA before, during, and after exercise helps counter the inflammation, oxidative stress, and negative immune changes linked to heavy exercise. You will receive personal information about your aerobic fitness and body composition.

Will I be paid for taking part in the research?

We will pay you $300 for the time you volunteer while being in this study. If you do not complete the study, compensation will be pro-rated according to the percentage of study requirements completed. For example, if you complete the first week of supplementation and 75-km cycling trial, but then drop out of the study, you will receive $150. Current University policy requires the collection of Social Security numbers (or Appalachian Banner ID numbers) if study compensation is more than $20 for a single study or $599 for participation in multiple studies in a calendar year. Since the compensation for this study is more than $20, you will need to provide your address and Social Security number (or Appalachian Banner ID number) when you complete the form for payment.

How will you keep my private information confidential?

Your information will be combined with information from other people taking part in the study. When we write up the study to share it with other researchers, we will write about the combined information. You will not be identified in any published or presented materials. To ensure that your information is kept confidential, identification numbers but not names will be used on all documents. All data entry and analysis will be conducted with statistical programs using coded identification. Your files will be stored in Dr. Nieman's office under lock and key, and identifiable information will be deleted after one year. All blood and urine samples will be coded with identification numbers only, and samples that remain after all analysis has been completed will be destroyed within two years of collection.

What if I get sick or hurt while participating in this research study?

If you need emergency care while you are at the research site, it will be provided to you. If you believe you have been hurt or if you get sick because of something that is done during the study, you should call your doctor or if it is an emergency call 911 for help. In this case, tell the doctors, the hospital or emergency room staff that you are taking part in a research study and the name of the Principal Investigator. If possible, take a copy of this consent form with you when you go. Call the Principal Investigator (Dr. David Nieman, 828-773-0056) as soon as you can (he needs to know that you are hurt or ill). In the Human Performance Lab, there are procedures in place to help attend to your injuries or provide care for you. Costs associated with this care will be billed in the ordinary manner, to you or your insurance company. However,

some insurance companies will not pay bills that are related to research costs. You should check with your insurance about this. Medical costs that result from research-related harm may also not qualify for payments through Medicare, or Medicaid. You should talk to the Principal Investigator about this, if you have concerns.

Whom can I contact if I have a question?

The people conducting this study will be available to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator at 828-773-0056. If you have questions about your rights as someone taking part in research, contact the Appalachian Institutional Review Board Administrator at 828-262-2130 (days), through email at irb@appstate.edu or at Appalachian State University, Office of Research and Sponsored Programs, IRB Administrator, Boone, NC 28608.

Do I have to participate? What else should I know?

Your participation in this research is completely voluntary. If you choose not to volunteer, there will be no penalty and you will not lose any benefits or rights you would normally have. If you decide to take part in the study you still have the right to decide at any time that you no longer want to continue. There will be no penalty and no loss of benefits or rights if you decide at any time to stop participating in the study.

This research project has been approved by the Institutional Review Board (IRB) at Appalachian State University.

This study was approved on 1-19-2011.

This approval will expire on 12-30-2011 unless the IRB renews the approval of this research.

I have decided I want to take part in this research. What should I do now?

The person obtaining informed consent will ask you to read the following and if you agree, you should sign this form:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I understand that I can stop taking part in this study at any time.
- By signing this informed consent form, I am not giving up any of my rights.
- I have been given a copy of this consent document, and it is mine to keep.

Participant's Name (PRINT) Signature Date