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Abstract 1- ESS 113

McKenney A, Miller K, Dela J, Garden-Robinson J, Rhee Y. Plasma and electrolyte changes in exercising humans after ingestion of multiple boluses of pickle juice. *J Athl Train*. 2015;50(2):141-146.

Context: Pickle juice is a commonly used substance to treat acute cramping of competing athletes. *Objective:* The purpose of the study was to determine the short term effects that pickle juice has on the human body; by testing zero, one and two boluses; also to determine whether pickle juice has an immediate positive effect on the body of a harmful effect such as hyperkalemia. *Design:* The design of this experiment was a crossover study of controlled substances being placed in the body to observe the effects over a three-day period. *Setting:* The setting of this study was a laboratory. *Subjects and Other Participants:* Nine euhydrated men that had no signs or history of heat illness (age = 23 ± 4 years, height = 180.9 ± 5.8 cm, mass = 80.7 ± 13.8 kg) participated. The authors had relevant exclusion criteria, which were: diabetes, anemia, food allergies to pickles, musculoskeletal disease, cardiovascular disease, bloodborne disease, neurological disease, or lower limb injury and history of lower limb injury. *Interventions:* Participants fasted for 12 hours prior to start date of experiment, also restraining from strenuous activities for 48 hours prior and avoiding caffeine and alcohol for 24 hours. They were then tested at the same time for three consecutive days. First, urine samples were taken to ensure participants were euhydrated. Participants were then weighed and rested for 30 minutes to ensure fluid equilibrium. Following this the participants gave a 5 mL blood sample to be tested. Participants then ingested 0, 1 or 2 boluses of Pickle juice, entered the heated training area, and biked at 80-85% their maximal heart rates. Blood was then taken again directly after their cooldown. The participants were then put into a climate controlled room where they sat and had blood samples taken at the 95-minute mark and the 125-minute mark. *Main Outcome Measures:* The authors tested each blood sample several times to ensure accurate results. They tested for plasma sodium concentrate (Na^+), plasma potassium concentrate (K^+), plasma osmolality, and changes in plasma volume. *Results:* The authors determined that the number of pickle juice boluses did not affect any of the areas being tested (plasma sodium concentrate, plasma potassium concentrate, plasma osmolality, and changes in plasma volume). The various tests that were used made the data very reliable, such as: cyanomethemoglobin technique, Dill and Costill Equation, Greenleaf et al Equations, and an ion-selective electrode system. *Conclusions:* Ingesting multiple small boluses of pickle juice makes no changes in blood variables, such as: plasma sodium concentrate, plasma potassium concentrate, plasma osmolality, or changes in plasma volume, although ingesting two or more boluses returned sodium levels back to normal faster than any other way tested. Hyperkalemia is not a concern when ingesting this small amount of pickle juice. *My interpretations:* I found this study to be reliable and relevant. Cramping is an everyday occurrence in the athletic world and any steps forward in dealing with these supposedly “unavoidable” occurrences in some situations is very helpful.

Key Words: Euhydrated, Hyperkalemia, Osmolality, Potassium, Sodium

Word Count: 500