



Pre-event Nutrition & Hydration

MUS Athletics

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Introduction

- Hydration and nutrition status before and during a game or practice has a direct impact on an athlete's ability to physically and mentally perform to their maximum ability.
- Everything an athlete consumes, and the amount of rest they get in the days leading up to competition will affect game day performance.
- Maintaining proper hydration/electrolyte status is also critical on game day, as well as during competition.
- ***MUS athletes and parents are encouraged to direct specific questions and concerns regarding pre-event hydration and nutrition to an MUS athletic trainer, family physician, or registered dietitian.***



The basics on hydration

- The human body is composed of 55-65% water, and muscle alone is made of approximately 70% water.
- A 1% decrease in body weight from sweat loss can decrease athletic performance.
- ***Sweat loss of 2-4% body weight can cut strength capacity and cardiovascular power by as much as 20%, as well as decrease mental concentration.***
- By the time you become thirsty, the dehydration process has already begun.

Dehydration and athletic performance

- Athletic performance is greatly affected by even a slight change in hydration status.
- Decreases in performance due to dehydration occur in *decision-making, reaction time, speed, power, and endurance.*
- Muscle cramping is an extreme consequence of inadequate hydration, and is **preventable** in most cases.





How Do You Know if You Are Dehydrated?

- The easiest way to determine hydration status is to check your urine color.
- If you are dehydrated, your urine will appear darker-closer to the color of apple juice.
- If you are properly hydrated, your urine will appear light yellow to clear.



Something to think about

- It is not uncommon for high school football players to have muscle cramps during a football game.
- The average football game has 125 plays.
- Each play lasts an average of 7 seconds.
- This means, on average, a one-way football player playing all four quarters is involved in approximately 7-8 minutes of game action.
 - (63 plays x 7 sec/play)
- ***So, then...***

...how do these athletes do it?



- A full, Ironman Triathlon takes 8-17 *hours* to complete
- A Tour de France participant cycles a total of 2272 miles over the course of 23 days, including only two rest days.
- **These athletes are physically trained for these specific events, just like a football player is for his sport.**
- **These highly trained athletes pay extremely close attention to their nutrition and hydration, otherwise it would be impossible for them to perform at an elite level for the entire duration of their events.**



Prevention of dehydration prior to game day

- **Start a couple of days prior to the game (for a Friday game, start pre-game nutrition on Wednesday).**
- **Don't miss meals (this includes *breakfast*).**
- **Meals should consist of lean meats, fruits and vegetables, whole grains, and low fat dairy products.**
- **Lightly salt foods. The main reason dehydration affects performance is because of electrolyte (salt) losses along with water through sweating.**
- **If eating fast food is unavoidable, eat in moderation and try to make healthy choices. Most restaurants now have healthy menu options.**



Dehydration prevention continued

- **Get on a hydration schedule. Athletes should consume a *minimum* of 8 cups of fluid (sports drinks, water, juices) throughout the day.**
- **Weigh yourself before and after practice. For every pound lost during practice, at least 16 oz of fluid (sports drink or water) should be consumed within 30 minutes after practice.**
- **Get adequate sleep (7-8 hours). This allows your body to recover from workouts.**
- **Limit consumption of beverages containing caffeine (coffee, tea, sodas, energy drinks, etc). Caffeine is a diuretic, which means it accelerates fluid loss through urination.**
- **If using creatine, do not consume more than 5g/day.**



Sources of energy used at different activity intensities

- **At rest**
 - Carbohydrate: 40%
 - Protein: trace
 - Fat: 60%
- **Endurance-Mild Intensity**
 - Carbohydrate: 50%
 - Protein: trace
 - Fat: 50%
- **Endurance-High Intensity**
 - Carbohydrate: 75%
 - Protein: 5-8%
 - Fat: 20%
- **Short duration-high intensity (i.e. football)**
 - Carbohydrate: 95%
 - Protein: trace
 - Fat: 5%

GAME DAY NUTRITION



- Don't skip meals (***eat breakfast***). A well-balanced breakfast should be high in carbohydrates (55-60%), moderate protein (20-25%), and low in fat (20-25%).
- Eat what you are used to. Don't experiment with new foods on game day.
- Consume 200-300 calories 2-3 hours before a game.



GAME DAY HYDRATION

- **Drink fluids throughout the day, starting with breakfast.**
- **2-3 hours before a game:**
 - Consume 18-20 oz of non-caffeinated sports drink.
- **15-20 minutes pre-game:**
 - 8-10 oz of sports drink
- **During a game:**
 - 8-10 oz every 10-20 minutes
- **Post-game:**
 - Replace every pound of sweat loss with 16 oz fluid, preferably a sports drink.



Post-game/workout Recovery

- Many commercial products claim to speed physical recovery if consumed after intense activity. These products typically have a combination of protein and carbohydrate content.
- Scientific studies have concluded that optimal recovery occurs if a product containing a carbohydrate to protein ratio of 3-4:1 is consumed within 15-30 minutes following exhaustive exercise. (example: 40g carbohydrate, 10-15g high quality protein).
- The proper ratio of nutritional content for post-exercise recovery can be achieved through regular food sources as easily as can be achieved by consuming commercial supplements that have the above mentioned nutritional content.

More on recovery

- ***At least one study has concluded that low fat chocolate milk can be effective in reducing recovery time after exhaustive exercise (1). This is due to it's content of the carbohydrate to protein ratio mentioned on the previous slide.***

1) Karp JR, Johnston JD, Tecklenburg S, Mickleborough TD, Fly AD, Stager JM (2006) Chocolate milk as a post-exercise recovery aid. *Int J Sport Nutr Exerc Metab.* **16 (1):** 78-91.





More on recovery

- Most post-exercise nutrition studies involve intense exercise protocols of 90 minutes or more in duration. Thus, it should not be assumed that immediate post-exercise nutrition is as critical following light and/or short workouts.

- A guideline for post-workout recovery nutrition:
 - Beverage (or solid food consumed with water) containing approximately one half gram carbohydrate per pound of body weight (1-1.2g/kg bw), and approximately one-third to one-fourth of that quantity in protein content. ***Below is an example of what a 180 lb. athlete would consume:***
 - Carbohydrate intake: $180 \text{ lb.} \times .5\text{g} = \mathbf{90\text{g carbohydrate}}$
 - Protein: $90\text{g} / 3 = 30\text{g}$, or $90\text{g} / 4 = 22.5\text{g}$; **between 22.5-30g protein**

 - Should be consumed within 15-30 minutes after exercise.

In Conclusion

- **Proper hydration and nutrition will improve physical and mental performance during practices and games.**
- **For more specific information on making good nutrition decisions, see one of the MUS athletic trainers, or consult a registered dietician.**

