Nutritional Timing in the Athlete

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This presentation will address 5 key areas of nutrition and discuss why they are critical to performance. Most importantly, it will help you to create strategies to get your athletes eating for performance. Since this presentation is only one hour, I cannot address everything that should be covered therefore I have created this packet for the audience to use as a guide through the presentation and a continuation to understanding nutrition and peak performance.

Introduction to Today’s Athlete

Most athletes that come to me for nutritional advice already know how to eat for performance. They may not know some of the details, but as for the basic concepts, they already know them. Therefore, helping an athlete to eat for performance is more about providing personalized strategies to do the things they know they should be doing than it is about teaching them what to do. For instance ask your athletes the following questions…

- Will I perform better if I eat breakfast or skip breakfast?
- Will I perform better if my breakfast is a traditional one including cereal, fruit, milk or a typical 21st century one like a pop tart and energy drink on the ride to school?
- Will I perform better by getting the recommended amounts of fruits and vegetables and decreasing the amount of junk food or eating less fruits and vegetables and eating more junk food?
- Will I perform better if I stay hydrated throughout the day and during competition or if I am dehydrated during performance?

While all those questions sound silly, they address a few of the biggest nutritional concerns in today’s athlete’s diet, so they are questions that need to be addressed. My guess is that your athletes can answer these and many more questions about nutrition, yet they don’t do it. Therefore the real question is… “how do we get them to do it”, because most already know what they need to do. I hope to address that in this packet and the presentation.

My experience with today’s athlete is that they have lost the concept of why we eat. In surveying high school and college athletes, the most common response to why they eat is… “I eat when I feel like it”. So if they feel like eating they do, if they don’t feel like eating they don’t. This attitude means that if they are not hungry in the morning they don’t eat breakfast and if they are hungry at 11pm they eat. If it tastes good they eat it if it does not they don’t. Because of this philosophy, I find the need to remind athletes the REAL reason to eat and that is because our body needs those nutrients. Saying I don’t eat breakfast because I am not hungry in the morning is like saying I don’t feel like going to the gas station so I am not going to put gas in my tank even though it is empty. You put gas in your tank because if you don’t your car won’t run. Our body is no different. If you don’t give it the nutrition it needs it cannot perform optimally. So in my mind it is unacceptable to say I don’t eat breakfast because I am not hungry in the morning. You eat breakfast because you need it. Now we obviously should enjoy eating and that is fine for that to be one determination of whether we eat, but if that is the main reason, then athletes will never get the nutrients needed for optimal performance.
Resources

There are probably more misconceptions regarding optimal nutrition than any other area in performance and so it is essential for anyone providing ideas about nutrition to make sure they have quality resources. Below lists a few that you can trust. Because supplements are such a large part of many athletes’ nutritional plan, I listed a few resources for them as well.

- American Dietetic Association: www.eatright.org
- American Society for Nutrition: www.nutrition.org
- Center for Food Safety & Applied Nutrition: www.cfsan.fda.gov
  - Greg Biren: biren@rowan.edu

Fundamental Concepts to Optimal Nutrition

Eating for performance is NOT just about the food that you eat, it is about the WAY that you eat. It takes a plan. Just like an exercise program requires a plan so does a quality nutritional program. Most people want the magic pill, “tell me one thing I can do to perform better”. Unfortunately there is no one thing. Trying to tell an athlete just eat one food or take one supplement is like telling them they only have to do one exercise and they will achieve their fitness goals. Just like there are many exercises they need to do there are many nutritional aspects they need to address. Your athletes will not want to hear this unless you can show them how to do it easily. So what are the fundamental concepts to optimal nutrition? The following lists some of them, but not all. The first 5 will be the topic of the presentation however the others are important also.

1. Breakfast cannot be an option, it is mandatory for the athlete.
2. Hydration is not something you do an hour before a game or exercise, stay hydrated always.
3. Provide the specific nutrients your body will need hours before game time or exercise.
4. Provide immediate recovery nutrition.
5. Provide nutrients that facilitate repair of muscle damage immediately after exercise.

- Encourage three sit down meals/day
  - eat more smaller meals through the day/don’t skip meals
- Use supplements as supplements NOT meal replacements: “Food First”
- Create healthy snacks that they enjoy as an alternative to junk food.
- MINIMIZE eating out; prepare food at home

Athletes need to know that optimal nutrition…

- It is NOT about eating perfectly…
- It is NOT about eating foods you do not like...
- It is NOT about dramatically changing your eating habits…

  However,

- It IS about paying attention to your nutrition & giving it SOME PRIORITY in your life…
- It IS about having a PLAN…
- It IS about making some small but important sacrifices...
Before giving nutritional advice it is essential to determine WHY the athlete feels they are not eating optimally right now. Everyone has barriers and unless you address them, athletes won’t change. In our mind their barriers may be silly, but in their mind they are real. Therefore never discount what they say, you must recognize it and help them to create strategies to overcome each barrier. It is essential that the athlete create their own strategy not us. We can give advice but they must come up with their own strategies. This empowers them. Over the 15 years I have worked with athletes, I have found common barriers to most athletes. The following lists them.

- “it’s too hard”. Many athletes feel that optimal nutrition is hard to do and so they don’t try. In reality it is easy but they need help to know how to do it. The first thing I recommend is to take small steps over time rather than trying to do too much at once. It is also essential to have a PLAN. You need to think about what you are going to eat the day before not 5 minutes before. Most athletes create workout plans and so they need to be encouraged to create a nutritional plan. Get significant others involved. Parents or guardians, coaches, the school system, and the booster clubs can all help to support the athlete to make it easier.

- “it doesn’t taste as good”. No one would deny that many of the unhealthy foods taste great, but so do many healthy foods. We need to provide a listing of foods that taste good and provide the nutrients that they need. Please go to the following website [http://users.rowan.edu/~biren/](http://users.rowan.edu/~biren/) and read through the section entitled “Healthy Snacks” so you can learn more. But make sure the athlete makes their own list.

- “it’s too confusing to know what to do”. I agree with this one. They hear so many misconceptions about nutrition it is hard to know what is true and what is not. This is where we need to come in to educate them. Help them to understand how to be a skeptical consumer. I hope today’s presentation will help you to learn more. Please go to the following website [http://users.rowan.edu/~biren/](http://users.rowan.edu/~biren/) and read through the section entitled “Nutrition for Athletes” so you can learn more. Encourage your athletes, parents, and coaches to read more as well.

- “it’s too expensive”. Many times healthy foods are more expensive but there are strategies that athletes and their parents can use to keep the cost down. Please go to the following website [http://users.rowan.edu/~biren/](http://users.rowan.edu/~biren/) and read through the section entitled “Eating Inexpensively”

- “TIME!!!” By far the number reason athletes give for not eating well is time. Well most of us would agree this is an issue. I feel it is a misconception. I believe all of us have time to eat well IF we create strategies and have a plan. If we try to wake up and make an immediate decision it is easy to convince ourselves that we only have time to grab a bagel and run. However, if we have a plan we could have had the food set out the night before to make it fast and easy. One thing I do to make sure I eat breakfast every day is to set a bowl, cup, spoon, box of cereal and a piece of fruit out the night before. This takes about 30 seconds to do with almost no effort. When I get up in the morning I pour the milk the juice and in less than 10 minutes I am done with the dishes put away. I guarantee most athletes spend more than 10 minutes in the morning checking their texts and Facebook messages. If that is the case it is not a time problem rather a priority problem.

**Presentation Topics**
Based on my experience, there are 5 key areas to address with an athlete’s diet. While there are many more than these, this is where I begin with all athletes. Each of these areas has special importance because they deal with the TIMING of nutrition. Not just getting the nutrients but getting it at the right time. As they are able to address these areas then more can be added. Your approach in presenting these areas to the athlete for improvement is essential. You must understand that just telling them to do these things is NOT enough. They must understand why and most importantly you must help them create strategies to make these things happen.

1. **Breakfast**
   a. No other time in the day do we go 8 hours without eating or drinking creating nutritional deficiencies that must be addressed asap.
   b. Carbohydrate stores are challenged by morning so top priority is to replenish them
      i. Low carbohydrate affects blood sugar which is essential for the brain (motivation, concentration, self-discipline to exercise and eat right are challenged)
      ii. Most people are 2-3% dehydrated by morning and thus hydration must be a priority asap (as little as a 2% dehydration level impacts performance)
   c. With over 40 known nutrients required on a regular basis skipping breakfast makes it more difficult to achieve the requirements
      i. Traditional breakfasts provide many nutrients that may not be provided in other meals
         1. Tends to be a good time for whole grains, low fat dairy, fruit, and hydration
   d. Research shows more people who are obese skip breakfast than eat breakfast therefore it is not an appropriate way to lose weight
   e. Without breakfast, blood sugar is challenged causing cortisol levels to rise which facilitates muscle breakdown. Athletes need to know that skipping breakfast causes muscle loss which is in opposition to what they are trying to do when they train.
      i. Loss of muscle tissue not only decrease performance but also decreases metabolism

2. **Hydration**
   a. Athletes are regularly reinforced that hydration is essential yet most athletes fail to meet hydration requirements. In my experience one of the main reasons is because they feel the only benefit is the risk reduction for heat related illnesses. Most athletes won’t respond to that but what they do respond to is performance.
   b. As little as a 2% dehydration decreases performance while 3-4% dehydration decrease performance to 80-90% of their capacity.
   c. Thirst is typically not stimulated until 3-4% dehydration and so athletes drinking based on thirst will always fall significantly short of hydration needs.
   d. While hydration is essential there is more to it than just getting water in the body
      i. Proper hydration should supply sugar and electrolytes to allow for performance to remain optimal
      ii. Water is not enough by itself. Sugar not only supplies the energy needed to exercise but it also minimizes cortisol release which minimizes protein breakdown.
      iii. Research has demonstrated that hydration during exercise with carbohydrate and small amounts of protein enhance performance by 57% compared to water alone
   e. Guidelines for hydration
      i. STAY HYDRATED ALWAYS
      ii. 12 oz with all meals; another 4-12oz bottles throughout the day
      iii. Don’t wait to be thirsty (poor indicator of hydration)
      iv. Be aware of dark urine. Urine should be light faint yellow color.
      v. Weigh pre/post exercise
      vi. 2 cups per pound of weight loss through exercise
      vii. Carbohydrate intake causes the body to store water
viii. Consume 2-3 cups of fluid 1 hour before exercise, followed by 4-6 oz. every 15 minutes during exercise
ix. Fluids containing carbohydrates & sodium allow for faster absorption than plain water & supply required nutrients
x. Cooler temperatures, smaller amount, & flavor enhances compliance
xi. Strategy during practice and games: fill coolers with water/sports drinks to provide a certain amount (24oz?) per player. At the end of practice it must be gone or the team failed to stay hydrated. The coach MUST be a part of this process. Make coaches aware whenever the team does not consume the preplanned hydration intake.

3. Pre-Game/exercise Nutrition (much of this information comes from Ivy and Portman’s book, “Nutrient Timing”. I strongly encourage you to read this book.)
   a. Primary Nutritional Needs
      i. Maintain blood sugar
      ii. Supply carbohydrate to muscle
         1. fat & protein supplies are NOT issues at this time
      iii. Hydration
      iv. Must have maximized glycogen stores prior to exercise to achieve this
      v. Some protein & vitamins prior to exercise can spare muscle/liver glycogen, ↓ catabolic hormones (cortisol), ↓ muscle damage, & ↑ recovery
   b. It takes 2-3 days to maximize hydration and carbohydrate stores therefore a pre-game meal begins at least the day before. Athletes must understand they cannot just eat well right before the game or exercise and optimize nutrition.
   c. Ideally (if possible) nutrition the day of a game or heavy workout proper nutrition would begin 4 hours prior. At this point ideally it would include
      i. 0.5-1 gram of carbohydrate per pound (this depends on type of exercise or sport)
      ii. The carbohydrate to protein ratio should be approximately 4:1. Minimal fat but some is ok at this time.
   d. One hour prior to game or heavy exercise
      i. 0.25 grams of carbohydrate; protein and fat are not needed at this time. Small amounts of protein (3 grams) in a sports drink is fine
      ii. Within the last hour it is up to the athlete but hydration is important
   e. During Exercise/Game
      i. Activities of low intensity & lasting <1 hr, water intake is fine, assuming proper daily nutrition
      ii. When intensity is high &/or lasts >1 hr
         1. carbohydrates are needed which spares carbohydrate stores, maintains blood sugar levels (prevents fatigue; ↓ cortisol), spares muscle use for energy (minimizes dehydration/holds on to muscle)
         2. 30-60 g of carbs/hr optimal (sports drink best source)
         3. 14 grams/8 oz ideal drink (6-8% solution) (4-8 oz/15 min)
            a. note: this will NOT offset what you use during exercise it will help though

4. Post Workout/Game Nutrition
   a. One of the major nutritional weaknesses in most athletes
   b. The body’s metabolism changes post exercise from a catabolic to an anabolic state IF we provide immediate nutrients. If not it stays in a catabolic state causing continued muscle breakdown and delaying recovery and repair
c. This change lasts for approximately 45 minutes after which the body returns to its normal metabolism
i. During this time muscle cells become very sensitive to insulin, after this time they lose their sensitivity and the fat cells become more sensitive
d. By supplying an immediate source of carbohydrate and protein during this time carbohydrate stores are replenished and muscle repair is initiated.
   i. Approximately 60 grams of carbohydrate and 20 grams of protein are ideal. This depends on body size and type of exercise but can be used as a guideline (2:1 or 3:1 ratio of carbohydrates to protein)

5. Minimizing Muscle Damage and Optimizing Repair
a. Exercise produces free radicals that cause muscle tissue breakdown and interfere with muscle repair and recovery. The more intense the exercise the greater the free radical production. Because most athletes exercise at intense levels neutralizing these free radicals is essential.
b. Nutrients in foods classified as “anti-oxidants” function to neutralize these free radicals therefore creating strategies to increase the athletes’ consumption of free radicals is essential to optimal nutrition.
c. Carb/protein supplement post exercise increases glutamine levels strengthening immune system
d. Vitamin E and C act as antioxidants, minimizing muscle damage important for recovery
e. Foods that can support free radical reduction
   i. Raisins Carrots
   ii. Blueberries Broccoli
   iii. Blackberries Peppers (all colors)
   iv. Raspberries Tomatoes
   v. Plums Sweet potatoes
   vi. Oranges Brussels sprouts
   vii. Red grapes Fish (omega fatty acids)
   viii. Sunflower seeds, almonds, walnuts, beans
f. Work with athletes to increase foods in these categories. While they may not like all these foods have them identify which ones they do like or don’t mind and help them incorporate them into their diet.

Summary
1. A proper nutritional program is just as important as a proper exercise program for optimal performance.
   a. Just like conditioning, developing a proper nutritional program requires sacrifice & effort.
2. Optimal nutrition is NOT just about changing or adding one thing to the athletes’ nutrition. It is about creating a PLAN that over time provides all the nutrients they need to enhance performance.
   a. It is not about eating perfectly
3. Athletes are significantly deficient in nutrients & though they may NOT notice the effects, they are real.
   a. Webpage http://users.rowan.edu/~biren/ “Special Nutrient Concerns for Athletes”
4. FOOD FIRST (supplements 2nd)
   a. Adequate nutrition can be met with good diet
5. 5 Areas to Address
   a. Breakfast
   b. Hydration
   c. Pre-workout meal
   d. Recovery nutrition
   e. Minimizing muscle damage and enhancing repair
6. Just telling athletes what to do is not going to work, you need to help them create strategies
7. The timing of nutrition is just as important as the nutrients themselves