I will discuss the importance of developing a food and beverage plan as a critical component of the serious tournament bowler’s pre-event planning. Elite bowlers can maximize their performance significantly by creating pre-competition, competition and post-competition eating and drinking plans. Without a food and beverage plan, a bowler can suffer from dehydration, heightened blood sugar, or too little glucose in the blood. Each of these situations will lead to a significant reduction in performance, due to decreased accuracy and reduced mental functioning.

In Malaysia, the National Sports Council nutritionists always prepare a food and beverage plan for all teams, including the bowling team. When these elite bowlers compete for medals at international events, such as the Asian Games or the World Championships, the bowlers maximize their performance potential by paying attention to the small stuff, including exactly what they eat and drink, and when. This attention to detail leads to improved consistency and a maximization of potential performance.

Bowling is a sport, and we need to begin taking the next steps to maximize performance through an increased focus on food and beverage in-take. So, in your tournament preparation, do sweat the small stuff in your effort to be at your best throughout. In addition to a lane play plan, develop a food and beverage plan for before, during, and after your games.

This article will provide you with a starting point. I share insights into the detrimental effects of dehydration on performance as well as having too-high or too-low glucose levels in the blood. In closing, I provide some general guidelines in preparing a plan.

**Dehydration**

As a coach, I often review research from other sports in an effort to understand how the body works and how this relates to bowling. With such a focus, we can learn a great deal about how to maximize performance on the lanes in the most important competitions.

Last year, I came across an article that I felt was extremely important for our sport. In this article, researchers found that dehydration affected target accuracy negatively, but not ball speed consistency in elite cricket players. The cricket bowlers who became dehydrated during the experiment were unable to throw on their intended line, and the consistency related to the lengths of their throws was impacted detrimentally as they became increasingly dehydrated. Yet, interestingly, at the same time, these players could continually throw at the same speed as the dehydration occurred.

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True, this research comes from another sport. But, the facts are hard to ignore. Considering such a finding, it is not a gigantic leap to claim that elite tenpin bowlers would perform more consistently if they were adequately hydrated through an entire tournament. With tenpin bowling sharing many of the same hand-eye components, this finding has important considerations in maintaining competitive consistency in tournaments, especially those with longer formats.

Other studies have found a detrimental link between dehydration and cognitive functioning or the ability to think clearly and accurately. Specifically, mild dehydration has been linked to the deterioration of mental functioning in younger adults (Wilson and Morley, 2003).

I have worked with many bowlers who appeared to be throwing with a similar ball speed, but, over time, their accuracy decreased, seemingly at an exponential rate. This finding seems to fit this profile found in the cricket research. In my coaching career, I have also heard many bowlers discuss differences in performance based on how much water intake they had consumed in various tournaments.

If you are sweating profusely or feel thirsty, it is too late. Heavy sweating is an indicator of dehydration. At such a point, moderate or mild dehydration has already set in. One way to check your level of hydration is by the color of your urine. Visit http://www.milkrecoveryzone.com/test-your-hydration.html for more details. I discuss specific water consumption recommendations further in this article.

**Glucose is a fuel**

Glucose is an important fuel for cognitive functioning. Previous research has shown that glucose is particularly important in boosting attention and memory. And, in learning tasks, glucose is depleted at a very rapid rate. So, it is important to replenish glucose during learning tasks. With high levels of focus and attention needed, observing ball motion is certainly a learning task during a tournament.

On the other side of the coin, too much glucose can impair short-term memory. A recent study in the *European Journal of Clinical Nutrition* found that spikes in blood sugar can negatively affect short-term memory. Participants drank a sugary drink and completed a short-term test immediately. In the study, researchers found those with the highest blood sugar had the worst short-term recall.

How does this relate to bowling? In short, a bowler needs glucose for thinking, paying attention during observation, as well as memory. Maintaining a constant and even blood sugar will help with all of these things. Conversely, too much blood sugar too quickly can inhibit short-term memory. Blood sugar regulation is not only healthy, but also a requirement of elite bowling.

Clearly, an elite bowler must pay attention to ball motion and lane transition. Elite athletes must observe ball reaction in an environment which does not give visual clues to the lane condition. After the bowler throws the ball, he must watch the ball motion in an effort to observe changes and reflect on what was seen. The bowler will use the short-term memory for careful reflection to make a plan for the next shot and for making rapid and quick changes. A glucose spike would not allow the bowler to clearly recall what just happened in regard to decision-making and ball reaction.

Test your short-term memory at these web sites:
http://faculty.washington.edu/chudler/stm.html
http://faculty.washington.edu/chudler/puzmatch1.html
http://ite.gsw.edu/faculty/gfisk/anim/lecture_stm.swf

**Developing a tournament plan**

We now know that too little glucose or a significantly high dose of blood sugar can both negatively affect performance. And, dehydration can lead to a decrease in target accuracy. Clearly, maintaining adequate hydration and blood sugar levels is an important component of maintaining a competitive edge. Yet, how many bowlers take the time to prepare a food and beverage plan?

In preparation for team competition, I have put much effort into preparing bowlers to have a fully articulate food and beverage plan. This enables the bowlers to be at their best every day, throughout the event. Over time, these preparations have improved. You need only to try it. Make a plan and you will become more consistent. Then, keep working to improve the plan to fit your needs.

As you reflect on this article, begin to think about developing a pre-, mid-, and post-tournament beverage and food plan. Here are some guidelines:

**Pre-tournament planning**

The goal of pre-event consumption is three-fold:
1. prevent weakness and fatigue
2. eliminate feelings of hunger during the tournament
3. guarantee optimal hydration (DeMarco & Clark, 2008).
Blood sugar fluctuates after eating a meal. Initially, it rises, flattens-off and then drops, over a three hour period. So, an athlete needs to manage this cycle.

Begin the morning by drinking 8 ounces of water, upon waking. Make an effort to eat several hours before you hit the lanes. Specifically, for a large meal, plan for a 3 to 4 hour digestion period. Medium meals require 2 to 3 hours with snacks and liquid meals 1 to 2 hours. The idea is to avoid blood sugar peaks and drop-offs during the competition.

The American College of Sports Medicine recommends hydrating regularly. Before the event, drink 12 to 16 ounces (400 – 600 ml) about 4 hours before the tournament squad. If you have not urinated two hours before, you should drink some additional water. Lack of urination is an indicator of dehydration.

Thirty minutes before the event, eat a low G.I. (glycemic index) food. Low G.I. foods reduce hunger and prolong physical endurance. Examples of low G.I. foods include: apples, oranges, pears, yogurt, low-fat milk, pasta, peanuts, museli or granola bar, etc. At the same time, you eat the food, drink 8 to 16 ounces of water.

**Mid-tournament**

During the competition, drink water throughout the event. Focus on drinking water every 15 minutes, consuming about ½ cup, each time.

In regard to maintaining a healthy level of blood sugar, eat a small amount of a low to medium G.I. food every 30 minutes. Foods such as apple slices, peach slices, grapes or cherries, as well as dried apricots would be good choices. These are easy to pack and portion for easy eating after specific games throughout the event to maintain blood sugar. At the same time, be sure to drink water to reduce the likelihood of dehydration onset.

Avoid chocolate before and during the tournament. The fat in the chocolate makes it difficult to process the glucose efficiently and delays the replenishment needed at that time.

**Post-tournament**

Immediately following your squad, consume a high G.I. food such as a tuna fish sandwich, bagel or banana. In addition, barring low sodium medical restrictions, drink an isotonic drink such as Gatorade or POWERade. High G.I. foods help refuel your body and restore blood sugar levels after exercise. This is critical to recover quickly in the event you have a qualifying squad later in the day. However, avoid these types of foods before and during competition. Consumption will lead to a spike in blood sugar and a subsequent drop-off.

**Ending note**

Visit [http://www.glycemicindex.com/](http://www.glycemicindex.com/) to help you plan for your event. You can check any food for its classification as a low, medium, or high G.I. level.

Before, during and after a tournament, stay away from soda. Beverages such as soda have approximately 12 teaspoons of sugar in a single 12 ounce can in the form of high fructose corn syrup. A recent study has also shown a link between high fructose corn syrup and diabetes. To illustrate, drinking two 12 ounce cans of soda is equivalent to consuming ½ cup of sugar. Drinking such beverages during a tournament will lead to significant spikes in the glucose levels, contributing to problems with the short-term memory discussed above.

As with any dietary change, consult your doctor. An eating and beverage plan will be individualized. To be at your best, experiment with various portions to learn what is best for you.

**REFERENCES**


