



Sports Food Practices of Elite Tennis Players

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INTRODUCTION

What athletes take into their bodies and how it affects their play, as well as their general health, is one of the most important areas in which to be knowledgeable for anyone in the world of tennis. Do we know enough about the nutritional intake of tennis players? Can we measure the effects of different nutrients and supplements? Which nutrients should be avoided (for health as well as doping regulations)? This presentation will reveal the data available today and explore pressing needs that exist in this area. Sports nutrition practices, energy intake, metabolic needs, and eating disorders risk of specific tennis populations are critical areas for study, as they have a fundamental impact on performance and general wellness. Having conducted studies through USTA-sponsored research grants, I will share gathered information and the need for expanded data.

DISCUSSION

For example, both Love (1993) and Sinofsky (1996) collected data utilising general sports nutrition questionnaires, food frequency questionnaires, and 24-hour recalls and 5-day food records. The two researchers independently found that both professional and elite junior players have inadequate energy intakes, below predicted needs and for many micronutrients. Love found lower intakes than measured needs for energy intake (from 5-day food records) with males (n=19, age 16) averaging 2295 calories per day intake with predicted needs through indirect calorimetry at 3000 calories, and females (n= 16, age 15) averaging 1612 calories per day intake with predicted needs of 2200 calories. Love found the following nutrients lower than 2/3 RDA from the 5-day food records: calcium, magnesium, iron, zinc, Vit A, Vit E, Vit C, Vit B6 and Vit B12. Further, Sinofsky found more adequate intakes in professional players, with caloric averages (from 24-hour recall during tournament play) between 4131 and 3123 (males, n=13) and between 2490 and 2288 (females, n=7) calories per day, in professional players ranked 1-200 and 200 + respectively. Parsonage (2000) reports similar findings with junior players in the UK, with 46 players averaging 11 years of age performing 3-day food records before and after nutrition education intervention. Total energy intake for the junior players averaged 2534 calories/day intake (not separated for differences between sexes).

Research on sports supplement and sports food use (including sports beverages) is even more limited. Creatine use for tennis play was recently researched by Eijunde (2001) who found no benefit for tennis performance, but creatine as a sports supplement for improved muscle strength continues to be used in the sport. Roetert (1998) reported through anecdotal evidence that the most popular nutritional supplements for competitive tennis players are creatine, multivitamins, B-vitamins, antioxidants, and protein. Sinofsky did analyse general vitamin/mineral supplement use utilising the Willett Food Frequency Questionnaire (WFFQ), a validated general nutritional frequency



questionnaire that has been validated as a semi-quantitative measure of food and supplement intake against other measures of dietary intake (Rimm, 2000, & Willett et. al., 1987). The WFFQ is an inexpensive means of estimating food intake over a one year period. Sinofsky found that the female pro players utilised more iron supplements than males and that Vit C was the most frequently used supplement overall. Bergeron (1998) has also assessed calcium losses of active young females and found that during exercise calcium losses may be greater than previously assumed. Young females, particularly teens, are often limiting dairy-based food intake. Calcium intake for female tennis players should be more thoroughly assessed.

As an important case in point, caffeine was removed in 2004 from the ITF and IOC doping lists, possibly stimulating use of products containing caffeine. Current use of these products needs exploration. Very little is actually known about the use of different types of sport beverage choices of tennis players, much less the use of caffeine containing energy drinks currently available on the market. Vergauwen (1998) studied carbohydrate and caffeine supplementation effect on stroke performance in 13 well trained Belgium tennis players (average age 20). He concluded that carbohydrate solutions do improve stroke quality during the final stages of prolonged tennis play. Similar findings were shown by McCarthy (1998) with carbohydrate beverage benefit on endurance capacity and tennis hitting performance following a simulated tennis match. Caffeine has actually been recommended by Ferrauti (1997) in sport beverages for tennis because an improvement in glucose homeostasis was shown in competitive female players at the beginning of the tennis play and after rest. It is vital that the data be synthesised, expanded, and analysed for use in supplement recommendations to athletes.

In the last two years Love has most recently assessed nutritional intake and sports food practices of collegiate teams, USTA touring pros at camps, national zonal boys and girls 14's, and players at both US Open Junior and Erickson international tournament events using a partially validated tennis specific sports nutrition assessment tool. The current tool contains questions regarding dietary intake and hydration practices for pre-, during, and post- tennis play and was elicited anonymously at these large tennis events. After collecting data on over 150 subjects, Love has found that most players are utilising sports foods to some degree with sport beverage use and high carbohydrate energy bars being most commonly reported used products. Tour players reported the most limited use of these of because many players are now hesitant to use any packaged items or multivitamin/mineral supplement for fear of contamination. Of female tour pros assessed, 35% reported using multivitamins. None of the male pros assessed reported even using a multivitamin. In addition, of the entire sample, no players reported using herbal supplements with the exception of high caffeine drinks e.g. Red Bull. The largest sample (55 players) came from young juniors at this year's national zonal team competition. 90% of the sample reported using Gatorade sport beverage and 55% using PowerBars for pre-, during, and post- play. Additional products reported from this category of players ranged from use of recovery beverages, meal supplement drinks, gels, and protein supplements. On court eating practices were also assessed with this tool. The most common food used on court besides sport beverages was fruit – particularly bananas. Other positive findings were that average meal/snack frequency



across the entire sample was 4x per day; as well 95% of the sample reported consuming animal proteins on a daily basis.

Hydration is another area of critical importance. According to the 6-year injury study conducted at the USTA Boys Championships and reported in 1995, the most life threatening medical situation to tennis players is a heat related disorder. Silva (2003) found that muscle contractures and muscle pain and fatigue were the most common injuries needing medical attention in Brazilian junior tennis players. More adequate nutrition and hydration were recommended as preventive measures. Bergeron (1995, 1996 & 1998) researched this topic through actual laboratory measures of sweat and electrolyte losses in elite junior tennis players and found that some junior players have exorbitant fluid and sodium volume losses, losing up to 2.5 L of fluid per hour and 89.8 mmol/hr of play in the case study of a 17-year-old male. A player with a 2.0 L per hour sweat rate would need to drink a minimum of 8.5 ounces of fluid at each changeover. Current sports nutrition guidelines of replacing 4 – 8 ounces of fluid per 15 – 20 minutes of play are inadequate for the sport, replacing only 50% of expected losses. Parsonage reported low daily fluid intakes averaging less than 4 cups per day for more than half of the junior population assessed. Additionally, 25% of the players failed to take any fluid at changeovers while 40% either drank too little or an inappropriate type of drink for fluid replacement. Love found with her most recent survey tool that players chronically under-hydrate during the day with average off court hydrating fluid intake averaging 5 cups per day. There is a need to continue to look at accurately reported intakes of these two nutrient areas in a variety of tennis playing populations.

An area of great interest to Love, who works extensively not only with athletes but also with eating-disordered clients, is obsessive behaviour in diet and exercise. Sinofsky reported that 94% of the female pro players surveyed were dissatisfied with their weight, 88% of players wanted to lose weight and that 50% of players reported weighing themselves more than once per week. Harris (2000) found through using validated eating disorder diagnostic tools, but not sport specific tools, that female players and coaches ranked weight as a very pivotal issue with the majority of the research sample wanting to lose weight and 38% of the coaches surveyed having tried dangerous diet practices in the past. Love utilised the Eating Attitudes Test (EAT), a validated but not sports-specific 25-item eating disorders risk survey on her study population of elite junior players, but did not find clinical levels of eating disorders. No sports specific tools have been utilised in tennis to collect this type of data to date. During early phases of validation research on an ACSM tool for female athletes, Love (2003) utilised this sport specific tool to survey 45 female junior players. One third of this sample was trying to lose weight and weighed themselves 1x/week or more. Funding was not secure to complete the validation study of this tool, so the current tool remains invalidated. Since then, a newer validated tool, "The Female Athlete Screening Tool" (FAST), has been developed by McNulty (2001) to accurately measure athletes' reasons for engaging in atypical exercise and eating behaviours. Both collegiate athletes and non-collegiate women were used in validating this survey and comparisons were made for validity against other validated but not sport-specific diagnostic tools: the Eating Disorders Examination-Questionnaire, Eating Disorders Inventory -2 (EDI-2)



and the Bulimia Test Revised (BULIT – R). FAST is now being utilised to quickly identify athletes who need assistance with their atypical eating behaviours.

CONCLUSION

As the choices for athletes and coaches expand, while doping regulations and general dietary guidelines continue to increase in complexity, it is vital to gather and utilise data effectively for the welfare of the sport.

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