What’s New in Sports Nutrition? – 10 Key Facts

1. The focus on nutrition in elite sport is firmly centred on improving the performance of the athlete. Sports nutrition must, therefore, consider nutrition from a “performance backwards, not nutrition upwards” approach. Nutritionists in elite sport must first develop a good understanding of performance goals and needs and subsequently, identify the nutrition interventions needed to support that performance. Nutrition interventions can be used to maximise adaptation to training, improve competition performance and help prevent injury and illness, minimising losses in training time.

2. In order to effectively implement a nutrition intervention for an athlete, a sports nutritionist needs to build a good relationship with the support team, including for example the strength and conditioning coaches and physiotherapists, and match the nutrition intervention to the training programme, so the team are working towards the same goal. Engaging the athlete through performance related nutrition education, with food as the focus, is the key element of a successful nutrition intervention. Developing the athlete’s meal planning and cooking skills can also be important.

3. Bone overuse injuries, such as stress fractures, are relatively common in both athlete and military recruit populations, with stress fracture incidence being as high as 25% in some cases. Stress fractures are caused by an accumulation of microdamage in the bone as a result of repeated mechanical loading. These injuries can cause pain and discomfort and contribute to a significant loss of training time, and as such, there is developing interest in potential strategies to prevent bone overuse injuries. Given that bone seems to be a nutritionally modulated tissue, one such strategy centres on the feeding practices of athletes during training.

4. Nutrition strategies that promote bone formation and minimise bone loss (resorption) may help to reduce the risk of stress fracture. Diets featuring high intakes of calcium and vitamin D, either through supplementation or food, have been shown to lower risk of stress fractures in athlete and military populations. Energy availability also appears to influence the bone metabolic response to exercise. The negative impact of a high protein intake on bone, by increasing acid load and resulting in calcium loss from bone as a buffer, has been hypothesised, but studies do not show this consistently. Certainly when calcium intake is adequate, higher protein diets do not seem to have short-term negative effects on bone. More research is required to understand the effect of different nutrition strategies employed before, during and after exercise on bone health.

5. Strenuous or prolonged exercise can cause transient disturbances in immune function, particularly in endurance athletes, contributing to a higher occurrence of infection which can negatively impact upon training and competition. Gastrointestinal (GI) symptoms are also highly prevalent in endurance athletes, with an increase in gut permeability implicated as a possible mechanism. Interventions that can legitimately enhance immune function and improve gut symptoms will be of benefit to the athlete.
6. Bovine colostrum (COL) supplementation has been investigated as a possible nutritional strategy, with some research suggesting that it can increase markers of immune function, reduce the risk of upper respiratory tract infection by 30-65% and limit exercise-induced increases in gut permeability. The potential role of COL in reducing GI complaints needs further investigation. Some concerns have been raised over the IGF-1 content of COL, as IGF-1 is prohibited by the World Anti-Doping Agency. Colostrum is not a banned substance and the balance of current evidence suggests that COL is unlikely to increase IGF-1 levels in vivo, but caution must be advised.

7. Individual variation can impact upon the main biological mechanisms that underpin the states of sleep and wakefulness (the circadian rhythm and the sleep homeostat). There is a complex relationship between chronotype (our endogenous preference for the timing of sleep and activity), sleep, nutrition and human performance. Sleep is important for the performance and recovery for athletes, yet athletes tend to exhibit a higher prevalence of sleep disturbance and sleep onset latency and have shorter total sleep time compared to the normal population.

8. Nutrition can play a role in maintaining and maximising the balance between sleep and human performance. For example, there is some evidence in certain populations that foods or supplements containing tryptophan may improve sleep outcomes, including increasing total sleep time and sleep efficiency, through the amino acid’s role in the metabolism of melatonin. In addition, some small studies have shown that tart cherry products with a high melatonin level may increase sleep efficiency. Consumption of a meal with a high glycaemic index may also reduce sleep onset latency. More objective studies with the athlete population are required to understand how nutrition can improve sleep and performance.

9. It is well established that carbohydrate availability has a profound effect on the capacity of skeletal muscle to perform exhaustive exercise; however the role of carbohydrate in muscle adaptation to exercise training is less clear. Studies have suggested that carbohydrate feeding may blunt fundamental exercise adaptations, therefore practical exercise/nutritional strategies that lower carbohydrate availability may enhance the post-exercise adaptive response.

10. Interventions that involve performing exercise in a fasted or glycogen depleted state have been shown to promote skeletal muscle remodeling in favour of fatty acid utilization, enhancing muscle adaptation to exercise. However, a trade-off of glycogen depletion is an impaired ability to perform at peak power output, therefore such a strategy may only be appropriate in certain exercise settings or if used periodically for specific goals through the training programme.
Notes: This is a summary from the British Nutrition Foundation meeting, held on 9th June 2014 chaired by Dr Kevin Currell (English Institute of Sport). Dr Currell also presented at the event. Other speakers included Dr Craig Sale (Nottingham Trent University), Dr Glen Davison (University of Kent); Professor Jason Ellis (Northumbria Centre for Sleep Research), and Dr Andy Philp (University of Birmingham).

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