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GLUTEN-FREE DIETS FOR ATHLETIC PERFORMANCE

Elite and amateur athletes have long been manipulating their diets in an attempt to gain a competitive edge over their opponents. The trend to adopt a gluten-free diet in the absence of coeliac disease, or non-coeliac gluten sensitivity, has rapidly increased amongst the general population, with claims of improved health benefits and weight loss potential.¹ In this article, Gemma Sampson examines perceived performance enhancement of the gluten-free diet.

The increasing popularity of a gluten-free diet extends to athletes, with many high profile athletes promoting its perceived performance enhancing effects. With 11-41% of athletes reporting to currently follow a gluten-free diet 50-100% of the time, the trend for athletes following a gluten-free lifestyle is likely to only increase.²⁻⁴

A large survey exploring the popularity, experiences and beliefs surrounding gluten-free diets captured athletes from a broad range of sports and competitive levels, including 18 World and Olympic medalists.³ While gluten-free diets are followed by athletes competing in a variety of sports, including tennis, running, cycling and endurance events, endurance athletes in particular appear more likely to adopt a gluten-free diet for performance enhancement.²⁻⁵

GLUTEN-FREE DIET: PERCEIVED PERFORMANCE ENHANCEMENT

Despite a lack of clinical evidence supporting the use of a gluten-free diet to enhance performance in sport, many athletes anecdotally report that it enhances their training, recovery and gives them a competitive edge.^{2,3,5} Considering the popularity of gluten-free diets amongst athletes, little published research has thoroughly evaluated outcome measures of performance to justify these claims.

Dietary changes amongst elite athletes appear to be primarily performance driven; however, a gluten-free diet may

also be adopted by athletes to reduce gastrointestinal distress.²⁻⁵ Forty-one percent of the 910 athletes surveyed by Lis et al (2015) reported following a gluten-free diet as it provided a performance advantage.³ Of seven elite female runners, five (71%) reported either avoiding gluten exclusively or limiting their gluten intake.⁵ Three reported perceived improvements in their performance and training, while the other two stated reduced digestive distress as a result of going gluten free.⁵

To date, only one study has evaluated the short-term impact of gluten intake upon performance outcomes as part of a controlled, randomised, double-blind crossover study in endurance cyclists.² No overall effects were found on performance, gastrointestinal (GI) symptoms or wellbeing as a result of consuming 16g of wheat gluten per day. Within the study, cyclists excluded from coeliac disease with no history of irritable bowel syndrome were randomly allocated to follow a gluten-containing diet or gluten-free diet for seven days, with each intervention separated by a 10-day wash-out period. All participants were educated by a dietitian and provided with a gluten-free diet during both interventions, consuming two quinoa-based food bars that were either gluten-free made with whey protein or contained a total 16g of vital wheat gluten. These were spread across the day to represent typical gluten intake patterns.



In this study, to avoid false improvements in performance, athletes undertook a familiarisation session of the performance test before commencing the first dietary intervention. VO₂ Max was established for each participant 10 days prior to commencing the trial and results from an incremental exercise test used to prescribe the intensity of the steady-state exercise ride: 70% Wmax for 45 minutes, followed by a 15-minute Time Trial (TT) - both well measured and validated performance measures. On day seven there was no significant difference between performance measures of power, heart rate, cadence or total work completed over the 15-minute TT. Neither was any difference detected between gastrointestinal wellbeing, overall wellbeing, or inflammatory measures.²

Self-diagnosis and dietary exclusion, without support or diagnosis from a dietitian or suitable healthcare professional, is common.² Athletes experimenting with their diet perceived that a gluten-free diet increased their performance and reduced GI distress.² Athletes who avoided gluten felt that their performance was impaired whilst consuming gluten and that their improved performance after excluding gluten was possibly related to low-level inflammation.⁵ These athletes were unlikely to have been tested for coeliac disease or non-coeliac gluten sensitivity prior to making dietary changes. As reduced GI distress as a result of excluding gluten may be a valid factor resulting in improved performance, it is important to appropriately screen for and exclude any of these underlying conditions.

THE BELIEF CONCEPT

Despite the limited evidence supporting the use of a gluten-free diet to enhance performance, its popularity continues to increase. Athletes may perceive improvements in their energy, pace and other aspects of performance, even if this is not observed with test results.⁶ After excluding dietary gluten for four weeks, one athlete reported feeling an increase in energy and pace despite a lack of actual increase in pace.⁶ Three female athletes reported improvements in running times and training quality after following a gluten-free diet; however, this was not tested or confirmed.⁵ Over 56% of athletes surveyed believed that a gluten-free diet improved their performance, with 74.4% believing it improved body composition for improved sport performance.³

Belief in a novel and exciting performance-enhancing treatment can produce improvements in performance, regardless of whether a real treatment effect exists.⁷ Belief in an intervention can contribute 1-3% improvements in performance, regardless of whether there are any ergogenic mechanisms to support this.⁷ Also known as a placebo effect, the belief concept plays a complicated role in influencing outcomes, with evidence supporting that enhanced performance in athletes has a neurobiological basis which can involve psychological, social and neurological changes associated with expectation, reward, hope and reduced anxiety or stress.⁷ Athletes may follow a gluten-free diet due to perceived physiological improvements that coincide simultaneously with other positive dietary changes influencing health.³

NUTRITIONAL ADEQUACY OF THE GLUTEN-FREE DIET

Eliminating gluten from the diet may either improve or compromise an athlete's diet, depending upon baseline nutritional quality. Interestingly, 77.9% of athletes surveyed believed that following a gluten-free diet increased their conscientiousness of eating a healthy and balanced diet, prompting them to eat less processed food and eat more fruits, vegetables and gluten-free wholegrains.³ Most athletes obtain dietary information about gluten-free diets from online sources, trainers, coaches or other athletes.³ Only 14% of athletes surveyed obtained their information on the gluten-free diet from a registered dietitian/nutritionist.³ As dietary changes are often made experimentally by the athlete without the support of a dietitian or suitable health professional, this could result in nutritional inadequacies.^{2,3,5}

Prior to excluding gluten, athletes should be encouraged to test for coeliac disease, irritable bowel syndrome or non-coeliac gluten sensitivity to exclude any underlying medical conditions which may impact their performance or GI distress. Perceived performance enhancement of the gluten-free diet may result from underlying conditions, belief in the diet, or through improved dietary quality as a result of increased fruit and vegetable intake, together with lower consumption of refined carbohydrates.^{3,8} Comparison of dietary practices between those medically diagnosed or self-diagnosed with gluten sensitivity indicates that 77% of individuals reported reduced carbohydrate and sweet intake after starting a gluten-free diet and 63% increased their consumption of fruits and vegetables.⁸

A gluten-free diet has been associated with inadequate intakes of B-vitamins, thiamin, riboflavin, niacin, folate, iron and fibre.⁹ International assessment on the nutritional quality of commercially available gluten-free foods shows that, contrary to popular opinion of being healthier alternatives, gluten-free foods are frequently lower in protein, higher in carbohydrate, lower in fibre and lower in micronutrients iron, zinc and magnesium, at an increased cost.⁹⁻¹¹ Inadequate intake of any of

these nutrients could severely impact athletic performance if not adequately addressed.

While athletes may take supplements to avoid micronutrient deficiency,⁵ it is important to evaluate the overall nutritional quality of the diet to ensure it is adequate in both macronutrients and micronutrient intake. Ensuring a diverse range of gluten-free grains are consumed is important to help athletes obtain the benefits of wholegrains and avoid nutritional deficiencies.¹ A gluten-free diet can be well balanced by including adequate fruit and vegetables, legumes, suitable wholegrains and by selecting gluten-free foods with a lower energy density.

Research is emerging on the influence that dietary change and dietary restrictions have on gut bacteria populations and gut health.^{1,12} A gluten-free diet has been associated with potentially adverse changes in gut health, while a diet containing wheat has been found to improve beneficial gut bacteria populations.¹ A low-FODMAP diet used to manage irritable bowel syndrome typically excludes gluten and demonstrates negative gut bacteria changes in as little as four weeks.¹² Further research is required to determine the effects of long-term adherence to a gluten-free diet on parameters of exercise performance and gut health.^{2,3,12}

CONCLUSION

An athlete's diet plays a critical role in training adaptations and athletic performance. While there is no published evidence supporting the notion that a gluten-free diet enhances performance, many athletes perceive a beneficial effect and may wish to remove gluten to gain a competitive edge. Belief in the gluten-free diet may improve perceived performance, despite any detectable treatment effect. Nutritional considerations for athletes following gluten-free diets should focus on including a variety of gluten-free wholegrains to limit potential micronutrient deficiencies, ensure adequate fibre intake and lower glycaemic index.

As many sports supplements, foods and drinks designed for athletes competing in ultra-endurance events contain gluten and are unsuitable for someone following a gluten-free diet, advice on suitable alternatives is required.