The nutritional demands of rugby union

Jane Griffin, Registered Dietitian & Sports Nutritionist

Demands of the sport

Characteristics of the sport

Rugby union is played with an oval-shaped ball, usually on grass though sometimes on sand or clay as long as the pitch is deemed safe. The pitch measures 100m in length and 70m wide. A rugby union team consists of 22 players – 15 who start the match and 7 reserves who can replace injured players or come on for tactical reasons. Players are divided into forwards and backs and very simplistically, forwards win the ball and backs run and score tries – but forwards often score tries too! A try scores 5 points and a further 2 points are added if the try is converted by a kick between the "H" shaped goalposts. Matches last for 80 minutes with 2 halves of 40 minutes. Referees can add extra time for stoppages such as an injured player receiving treatment on the pitch. A referee is assisted by 2 touch judges. In Sevens competitions, there are seven players on each team but matches are played on a full-size pitch, leading to a fast, attacking and exciting game. Men and women play rugby and children can start at a very early age playing touch rugby.

Training requirements

In the past, rugby was seen as a winter sport but now with international competitions, knock-out competitions, tours and sevens competitions the season for professional players can be almost all year long. The amateur game however is still very much a winter sport (albeit a long winter). However amateur players will use the summer break to work at fitness levels prior to pre-season training starting.

All players need to maintain fitness levels so they have enough stamina for the full 80 minutes of play, if required and not substituted. They also need strength and power to avoid tackles, make tackles, push against opposing players, run, kick and jump. Flexibility is needed to move quickly on the pitch and change direction with ball in hand. Training during the week will therefore include running, weights in the gym and skills sessions and kicking practice. Professional players can do up to 3 sessions in a day (an early run, weights and skills work out on the pitch).

Competition requirements

Matches are usually played at weekends but at the professional level, matches can also be played mid-week or Friday evenings. Many professional clubs play a second team in a lower league and such matches are often played on a Monday evening. Sevens tournaments are usually

played in the summer months. They take the form of a seeded knockout competition. Seven players (three forwards and four backs) play seven minutes each half with the winner progressing to the next round.

Physiological demands

Rugby union can both be classed as a “stop and go” sport, with activity levels going from standing still, walking or jogging to sprinting, tackling, scrummaging, jumping or kicking. Muscles therefore must respond quickly to changes in energy needs and three energy systems will be called into play at different times. One produces short term energy used in explosive movements or short bursts of activity. Another system provides energy for 2-3 minutes of high intensity activity and the last system produces energy for 2-3 minutes up to several hours and provides fuel for all activities of low to medium intensity.

Nutrition and Performance
Key nutritional issues
Energy requirements

Anybody involved in rugby training and matches on a regular basis will have increased requirements compared to their sedentary peers who do not take part in any physical activity, whether they are male or female or children, teenagers or adults. It is possible to estimate energy requirements by working out the basal metabolic rate (BMR) which is the amount of energy needed when the body is fasting and at complete rest, then calculating the energy cost of the daily activities or physical activity level (PAL)(1). Children and adolescents have higher energy requirements than adults on a weight basis (to meet the energy cost of growth and development). There is little data for children who train regularly in any sport, including rugby union. For the serious young rugby player, monitoring height, weight (and body fat in older teenagers), fitness tests and overall performance in training sessions and matches is an acceptable way of checking that energy requirements are being met.

Carbohydrate

Carbohydrate is the primary fuel for muscle contraction for endurance, strength and speed but as the body can only store carbohydrate (in muscles and the liver) in limited amounts, effective refuelling after all training sessions and matches is essential. If this is not achieved players will find it harder to recover and gain from a heavy training programme. Restoring stores of carbohydrate in the muscles is most effective in the first hour after training finishes. This can be achieved by an immediate post-training refueller such as chicken or tuna sandwiches and use of an isotonic sports drink.

Protein

Though the use of protein supplements is widespread in rugby union, players who include protein and carbohydrate at all meals, keep a steady bodyweight and have enough energy to meet the demands of training can

be reassured that their diet is providing the right amount of protein without the use of supplements. Apart from the quantity and quality of protein in the diet, timing of protein intakes is also important, particularly around weights sessions. Players working at increasing muscle mass should consider having 10-20g protein just before a resistance training session and a similar amount (together with carbohydrate) immediately afterwards. Simple ways to achieve this could again be a chicken sandwich or a tuna filled bagel and a sports drink. It is important not to include protein sources that also contain large amounts of fat (particularly saturated fat). Suitable foods therefore include lean meat, chicken or turkey, tuna in brine, prawns and milk or milk shakes.

Fat

The energy needs of a rugby player can be high but this does not mean "enjoying" a high fat intake. Fat stored in the body can be use as a source of fuel but this is only for the very lightest intensity exercise or very prolonged endurance exercise. High fat diets are associated with an increased risk of several diseases including heart disease, stroke and some forms of cancer. However there is one high fat food which does have a positive role to play – oily fish. Fish such as salmon, sardines, herring, mackerel, fresh tuna and trout should be included in the diet twice a week. These fish contain omega-3 fatty acids which not only have a positive impact on heart health but also of interest to rugby players can help in relieving stiffness and pain in joints.

Fluids

A Position Stand published by the American College of Sports Medicine (ACSM) in 2007 (2) provides an up-to-date summary of current knowledge on the role of fluids in exercise performance as well as the impact of fluid and electrolyte balances on exercise performance and the effect of imbalances on health. Sweat rates depend on a number of different factors including environmental temperature, humidity, exercise intensity, duration of training sessions and length of participation in matches as well as overall fitness level. As a player gets fitter their sweat response becomes more efficient. In other words a player will need to drink more the fitter he or she gets. Bodyweight, genetic predisposition and heat acclimatization all influence sweat rates for a given activity too. Weighing players before and after training can give a rough indication of level of dehydration (taking into account the volume of fluid consumed during training). A loss of body water corresponding to 2 per cent of body weight will start to impair performance and a player start to tire early. Dehydration affects mental functioning too and a player (or others) may well start to be aware of problems of any of the following creeping into the game – poor decision-making, slower reaction times, poor concentration, anticipation and skill delivery as well as overall inaccuracies. The ACSM Position Stand included the recommendation "Consumption of beverages containing electrolytes and carbohydrates can

help sustain fluid-electrolyte balance and exercise performance." Players who use water as their fluid of choice should consider the merits of using an isotonic sports drink. It will hydrate more effectively, replace salt lost in sweat and top-up flagging energy levels.

Supplements

The Rugby Football Union (RFU) has published a Position Statement on supplements which states that "Rugby union players are strongly advised to be extremely cautious about the use of any supplements because no guarantee can be given by ANYBODY that any particular supplement, including vitamins and minerals, ergogenic aids, and herbal remedies, is totally free from prohibited substances." (3)

References

1. Jane Griffin (2007) Food for Rugby. The Crowood Press
2. M.N.Sawka, L.M.Burke, E.R.Eichner, R.J. Maughan, S.J. Montain, N.S. Stachenfeld (2007) "Position Stand. Exercise and Fluid Replacement" Medicine and Science in Sports and Exercise, 39 (2), 377-390
3. www.rfu.com/TheGame/Antidoping/Supplements

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