

The Rugby League  
Coach Education Programme

# The Think Coaching E-Link



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## Introduction

This issue is put over to an article by Chrissey Foster who the RFL are currently employing to do a research project at Chester University. The project is looking at the conditioning benefits of small sided games. On concluding the research the RFL will be in the position of being able to produce a resource for coaches to use that will inform them on how to structure games in such a way as to derive a conditioning benefit.

## Coach Development

A number of coach development initiatives will be happening over the coming months these include the following:

- Coach Development Camp
- National League / Academy Coaches Conference (North West)
- National League / Academy Coaches Conference (Yorkshire)
- Women's Coaching Conference
- Cumbria Coaching Conference
- UKCC Level 3 (Pilot) Rugby League Coaching Course

For further details on any of the above contact the Coach Development team on 0113 237 5010



# The Science of Small-Sided Games in Rugby League

By Chrissie Foster

## **Aerobic Conditioning for Rugby League**

Rugby league involves periods of low intensity activity interspersed with frequent bouts of high intensity work, performed over a relatively prolonged period of time (i.e. up to 80 minutes). This places a huge demand upon the aerobic energy system, and requires players to have a good level of aerobic fitness. Therefore, in order to resist fatigue and maintain performance during competition, it is important for rugby league players to perform aerobic conditioning as part of their training routine.

Given the above, interval training provides an appropriate method of aerobic conditioning for coaches to use in order to improve aerobic fitness. Furthermore, in an attempt to enhance training specificity, small-sided games can be used as an effective interval training method and are highly time efficient and effective in training the aerobic system. They are adaptable depending on skill development requirements and capable of producing rugby specific endurance practices, providing both a physiological and technical training stimulus. Small-sided games also increase motivation more than traditional endurance running methods, as they simulate rugby specific movements and involve ball play.

## **Do Small-sided games work when compared to traditional conditioning?**

This will no doubt be an important question asked by many coaches, particularly those who are limited for time and access to players (e.g. part-time, amateur coaches), wishing to combine fitness and technical elements of training. Furthermore, coaches also need to be aware that skill development must also be practiced at exercise intensities comparable to those experienced during competition.

Work in Australia has shown that using small-sided games within pre-season aerobic conditioning programmes twice per week, for 14 weeks, in junior and senior sub-elite rugby league players was as effective as traditional conditioning in improving aerobic fitness (Gabbett, 2006). Similarly, a 9 week pre-season programme of small-sided games in senior professional rugby union players has demonstrated the same effect (Gamble, 2004). Therefore, it appears that small-sided games are an effective training method for improving aerobic fitness. However, there is limited evidence of this for use in rugby league and more information to inform coaches is necessary.

## **Controlling exercise intensity of Small-sided games**

Small-sided games can be adapted to increase the intensity of the games, and therefore the physiological stress placed on players and the level of aerobic conditioning. There are various ways in which the intensity of small-sided games can be altered, including changing the type of small-sided game, the number of players, the playing area size, the time the ball is in play, the rules or conditions of the games.

The intensity of small-sided games can be monitored through the use of heart rate monitors, with intensity worked out as a percentage of a player's maximum heart rate (HRmax). Studies analysing the intensity of rugby league matches have suggested the following heart rate zones; low intensity

(<70% HRmax), moderate intensity (70-85% HRmax) and high intensity (>85% HRmax) (Estell et al., 1996; Coutts et al., 2003). Therefore, it is suggested that small-sided games need to be in the high intensity heart rate zone (>85%) to have an aerobic conditioning effect.

### **Technical Analysis**

Beyond the fitness benefits, it is important to analyse the effects of changing variables of small-sided games on skill development and performance. Studies in football have found decreasing the number of players increased the number of technical skills performed, although changing playing area size appeared to have no effect on skill performance (Owen et al., 2004). This is important information for the coach, as they need to ensure that as well as providing the optimal physiological stimulus, players are also taxed appropriately from a skill perspective. Again, there is limited information available for coaches on the technical demands associated with rugby league small-sided games.

### **Where next?**

Coaches would benefit from understanding how small-sided games can be used effectively as part of their training programme to improve aerobic fitness. Therefore, future articles in this series will outline how manipulating various variables within small-sided games, such as playing area size, number of players and motivation, affect how they can be used for aerobic conditioning and skill development. This should hopefully provide a useful resource for coaches that can be used to improve the delivery of small-sided games.

### **Recommended Reading**

Coutts, A., Reaburn, P., & Abt, G. (2003). Heart rate, blood lactate concentration and estimated energy expenditure in a semi-professional rugby league team during a match: a case study. *J.Sports Sci.*, 21, 97-103.

Estell, J., Lord, P., Barnsley, L., Shenstone, B., & Kannangara, S. (1996). The physiological demands of rugby league - abstract. In *Australian Conference of Science and Medicine in Sport*.

Gabbett, T. J. (2006). Performance changes following a field conditioning program in junior and senior rugby league players. *J.Strength.Cond.Res.*, 20, 215-221.

Gamble, P. (2004). A skill-based conditioning games approach to metabolic conditioning for elite rugby football players. *J.Strength.Cond.Res.*, 18, 491-497.

Owen, A., Twist, C., & Ford, P. (2004). Small-sided games: The physiological and technical effect of altering pitch size and player numbers. *Insight*, 7, 50-53.

### **Definitions for:**

**Aerobic energy system:** The system within the body which produces energy in prolonged exercise (e.g. an 80 minute rugby game) and in the recovery from high intensity rapid movements (e.g. tackling, a short sprint).

**Aerobic fitness:** the ability to produce energy via the aerobic energy system.

**Fatigue:** Tiredness within muscles, due to exercise, which can be detrimental to performance.

**Interval training:** Repeated bouts of exercise with short recovery periods between bouts.

**Exercise intensity:** How hard the work load of an exercise is.

**HRmax** – (maximal heart rate) The highest heart rate an athlete can achieve in maximal exercise. HRmax can be estimated using the equation  $HR_{max} = 220 - age$ .

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Drop us a line at [haydn.walker@rfl.uk.com](mailto:haydn.walker@rfl.uk.com)

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