Lucozade Sport – Fuelling UKA

‘From Mouth to Muscle – Fuelling Performance’

Partnership with UKA to provide nutritional support and advice

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Lucozade Sport – Fuelling UKA

- Lucozade Sport Science Team work with athletics clubs to provide education and support for athletes of all levels
- Nutritional Advice
- Performance Testing

‘From Mouth to Muscle’

NEED FOR FLUID
- Palatability
- Suitability (Tonicity)
- Volume

NEED FOR FUEL
- Energy Systems
- Multiple Carbohydrates
- Guidelines

THE MUSCLE
- Why is recovery important?
- Protein Needs

Fluid Needs - Hydration

‘Dehydration by as little as 2% can negatively affect both mental and physical performance, especially during endurance-based events’
Fluid Needs - Hydration

- Decreased plasma volume
- Increased core temperature
- Reduced peripheral blood flow
- Increased heart rate
- Decreased sweat rate

Need for Fluid - Palatability

- Beverage palatability is known to influence fluid consumption during exercise
- Sports Drinks Vs Water?

Need for Fluid - Palatability

- BEVERAGE CHOICE - Lightly flavoured hypotonic carbohydrate-electrolyte drink promoted greater voluntary fluid intake and was more effective than water in maintaining fluid balance (Peacock, Stokes & Thompson, 2008).
- AVOIDING DEHYDRATION; VOLUNTARY FLUID INTAKE - Ad libitum consumption of a CHO-E drink may be more effective than water in minimising fluid deficits and mean core temperature responses (Bergeson, Wake & Manns, 2009; Shiff, 2003)
- WATER - Low intensity sessions <60mins/<45 min high intensity

Need for Fluid - Suitability

- SUITABILITY – Tonicity
  
  Tonicity is a measure of the osmotic pressure gradient of two solutions separated by a semi-permeable membrane

Need for Fluid - Monitoring Your Athlete

- "Approximately 40% of athletes turn up to training and competition dehydrated"

Hypotonic
Fluid & Electrolytes

Isotonic
6-8% CHO, fluid & Electrolytes

Hypertonic
Carbohydrate

HYDRATION
FUEL & HYDRATION
FUEL

PRE EXERCISE
DURING EXERCISE
AFTER EXERCISE

(1 kg of BM loss = 1L of sweat loss)
**Need for Fluid - Volume**

- **PRE EXERCISE**
  - 5.7ml/kgBM* 3-4 hours prior
  - Monitor urine colour

- **DURING EXERCISE**
  - 100-150ml every 10-15 min
  - Match sweat and urine loss Between Events

- **POST EXERCISE**
  - 150% fluid replenishment (Weighing Method) Electrolytes

*millilitres per kilogram of body mass

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**Summary – Fluid Needs**

- Dehydration can affect an athlete’s performance
- The palatability and suitability of a drink will affect an athlete’s fluid intake
- Fluid intake strategies should be specific to the athlete and scenario

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**Need for Fuel**

- Carbohydrate is the body’s main source of fuel for the brain, central nervous system and working muscles
- Carbohydrate is crucial to ensure an athlete meets their training demands and fuels their performance
- 3 energy systems, 2 rely upon glucose

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**Energy Requirements – Daily Needs**

**Table 1 - Carbohydrate Requirements**

<table>
<thead>
<tr>
<th>Training Level</th>
<th>Carbohydrate (g/kg/d)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular levels of activity (3-5 hrs/week)</td>
<td>4-5</td>
</tr>
<tr>
<td>Moderate duration/low intensity training (1-2 hrs/day)</td>
<td>5-7</td>
</tr>
<tr>
<td>Moderate to heavy endurance training (2-4 hrs/day)</td>
<td>7-12</td>
</tr>
<tr>
<td>Extreme exercise programme (4-6+ hrs/day)</td>
<td>10-12</td>
</tr>
</tbody>
</table>

*grams per kilogram of body mass per day

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**Need for Fuel - Carbohydrates**

- **Complex**
  - e.g. Starch
  - Maltodextrin

- **Simple**
  - e.g. sugars
  - Sucrose
  - Glucose

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**‘From Mouth to Muscle’**

NEED FOR FUEL
- Energy Systems
- Multiple Carbohydrates
- Guidelines
Need For Fuel – Energy Systems

SYSTEM – PCr
ENERGY SOURCE - ATP

SYSTEM – Anaerobic
ENERGY SOURCE – Blood glucose, muscle & liver glycogen

SYSTEM – Aerobic
ENERGY SOURCE - Blood glucose, muscle & liver glycogen, fatty acids

Energy Requirements - During

- Glucose ~1g/min
- For exercise lasting > 60mins
- Multi events/heats within and between
- Recommendation 30-60g per hour (endurance)

Need for Fuel – Multiple Carbohydrates

- Multiple carbohydrates e.g. Fructose and glucose ~1.5 g/min
- Endurance lasting > 90 min
- Endurance Athletes

Need for Fuel - Summary

- Carbohydrate is crucial to ensure an athlete meets their training demands and fuels their performance
- Guidelines should be tailored to meet the athlete’s needs
- For endurance events >60 min, CHO should be consumed and multiple CHO’s may be of benefit

‘From Mouth to Muscle’

- Why is recovery important?
- Protein Needs
The Need for Protein:
- Proteins are the building blocks of muscle.
- The rate of muscle protein breakdown is increased during exercise.
- The rate of muscle protein synthesis is increased during the recovery phase.

Protein following exercise:
- 'Window of Opportunity'
- 15-20 g optimum
- 2 hours

The Muscle – Recovery Needs

Summary - Recovery
- Proteins are the building blocks of muscle.
- The rate of muscle protein breakdown is increased during exercise.
- Protein should be consumed as soon as possible after exercise.
- 25-20g protein is an optimum amount; there is no benefit to taking more than 20g.

Table 2 Protein Requirements

<table>
<thead>
<tr>
<th>Activity Level</th>
<th>Protein Intake (g/kg/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Levels Activity (non sporting)</td>
<td>0.75</td>
</tr>
<tr>
<td>Regular Activity (more than 1 hour per day)</td>
<td>1.0-1.2</td>
</tr>
<tr>
<td>Middle Distance/Endurance Athletes</td>
<td>1.2-1.4</td>
</tr>
<tr>
<td>Strength/Power/Speed Athletes</td>
<td>1.2-1.7</td>
</tr>
</tbody>
</table>

References