

The Recipe for Success Nutrition and Sport

Christine Dziedzic APD
Sports Dietitian



Presentation Outline

- Basics of energy balance
- Eating to train
- Eating to compete
- Hydration
- Kids, food and sport



Why is nutrition important?

- Provide energy and nutrients required for body function
- Support growth and development
- Optimal gains from training program
- Enhanced recovery between training sessions and competition
- Maintain appropriate hydration levels
- Achievement and maintenance of an ideal body weight and physique
- Reduce the risk of injury and illness



Variety and Enjoyment



Nutrient needs found in wide range of foods

Priority remains 'nutrient-rich' foods

Mixing and matching to improve nutritional value and enjoyment

Where is the balance?



ENERGY IN

Carbs 16 kJ/g
Protein 17 kJ/g
Fat 37 kJ/g
Alcohol 29 kJ/g

ENERGY OUT

BMR 60 - 80%
THF ~10%
Exercise 15 - 30%

Meeting your requirements

- Total energy requirements of athletes depend on:
 - Age, height, weight
 - Sport played
 - Position on field
 - Daily training load
 - Competition schedule



Eating to train



Food is Fuel

Which of the following is the body's preferred source of energy during high intensity exercise?

- a. Protein
- b. Carbohydrate
- c. Fat
- d. Vitamins

- Primary fuel source for exercise performance and preferred fuel source for brain
- Body can only store limited amounts
 - Always needs to be 'topped up'
- Low body stores can result in fatigue, poor concentration and impaired performance

Food is Fuel



Nutritious carbohydrates
"CENTRE OF YOUR PLATE"
foods + healthy snacks



Less nutritious carbohydrates
In and around training/games

How much is enough?

< 1 hr moderate to high intensity exercise or exercise of low intensity	5-7 g/kg/day
1-3 hrs moderate to high intensity exercise	7-10 g/kg/day
> 4-5 hrs moderate to high intensity exercise	10-12+ g/kg/day

Daily intake of carbohydrate needs to reflect the demands of training

Importance of Protein

How much is enough?

Recreational	0.8 – 1.0 g/kg/day
Endurance	1.2 – 1.6 g/kg/day
Resistance	1.2 – 1.7 g/kg/day

- Important for healthy growth and development
- Needed to repair damaged muscle and enhance recovery
- Muscle growth
- Needs easily met through balanced diet



Sources of Protein

- Lean meat, chicken, fish
- Milk, cheese, yoghurt
- Lentils, legumes, nuts
- Wholegrain cereals



Go easy with fats and oils

- Not the body's preferred fuel source
- Can take the place of high quality carbohydrate and protein foods
- More difficult to control body fat levels when eating high fat diet
- Decrease speed, agility and endurance
- High fat diet can lead to long-term health problems
 - “Good” vs. “Bad” fat sources
 - Focus on monounsaturated fats and Omega-3 fatty acids



Fruit and vegetables

- Nutrient dense, low energy foods
- Provide a wide range of essential vitamins and minerals
- Targets...
 - Include vegetables at BOTH lunch and dinner
 - 2 - 3 pieces fresh fruit every day



Putting it all together...

Include carbohydrate as the base for main meals

Include a lean protein source at each main meal

Be smart with fats

Don't forget your veggies!



Assessing Nutrient Density

For each meal, ask yourself...

- How can I increase the *nutrient* density of this meal?
 - Is there a more *nutrient* dense (and less energy dense) snack?
- How can I reduce the *energy* density of this meal?

Consider...

1. Proportion of carbohydrates, compared to protein
2. Proportion of vegies on the plate/in the sandwich
3. Amount and type of fat
4. Amount of dietary fibre
5. Amount vitamins/minerals present (any vegies or fruit?)



Eating to compete



Game Day!

- Pre-competition meal (~2-3 hours prior)
 - Top up carbohydrate stores, prevents hunger and has psychological benefits
 - Experiment to find something enjoyable and familiar
 - If nauseous/nervous: liquid meal more than 2 hours before
- Tips:
 - High carbohydrate
 - Low in fat and fibre
 - Steady fluid intake



Pre-competition meal



During competition

- Type of foods/fluids needed/used will depend on the nature of the event
 - Triathlon vs. basketball game
 - Swimming carnival vs. marathon
- Maintain fuel and fluid levels
 - "Early and often"
 - Make use of formal and informal breaks in play



During competition

- Refuelling for 'tournament' play:
 - Types of food/fluid may differ depending on times between rounds

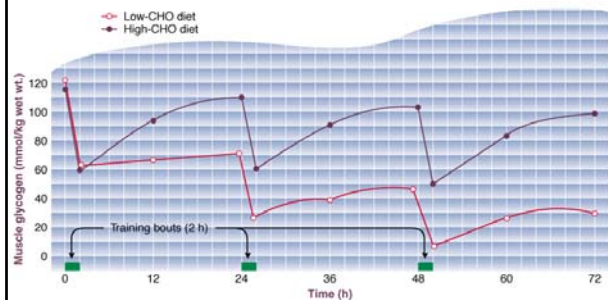
30 – 60 minutes: sports drinks, fruit, low fat flavoured milk, cereal bars

1 – 2 hours: Up&Go, low fat muesli bars, yoghurt, sandwiches (simple spreads)

More than 2 hours: pasta, noodle or rice based dishes (low fat sauces/ingredients), sandwiches (meat/cheese/salad fillings)



Importance of Refuelling



Why worry about recovery?

- Time of adaptation to become fitter, stronger and faster
- Complex processes, require nutrition strategies to optimise

Refuel = carbohydrate
Rehydrate = fluid
Repair = protein
Immune system = wide variety of foods

- Poor attention to nutrition recovery = compromise performance at next training session or game



Optimizing Recovery

- Important to recovery quickly after training/competition
 - Within 30-60 minutes after completion
 - Good source of carbohydrate meal/snack, and include some protein
- Be organised – plan ahead
 - Convenient and portable options
 - Don't rely on venue canteens



Eating for Recovery

Activity Sheet

- Using the table provided, think of two snack ideas that meet your carbohydrate and protein needs for recovery



Optimizing Recovery



Examples...

- Low fat flavoured milk or fruit smoothie
- Yoghurt/creamed rice + canned/fresh fruit
- Breakfast cereal and low fat milk
- Sandwich with cheese/ham + salad
- Baked beans on toast
- Crumpets/English muffins with peanut butter/nutella



Snack Comparison



2 200 kJ
7 g protein
33 g fat
50 g carbohydrate

=



2 200 kJ
25 g protein
5 g fat
95 g carbohydrate

Hydration



Hydration and Performance

- Dehydration leads to:
 - Increased body temperature
 - Elevated heart rate
 - Increase in perceived exertion
- Dehydration affects:
 - Performance – endurance and intensity
 - Coordination and skill
 - Concentration and decision making
- Negative effects when fluid deficits are as low as 2%

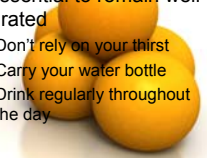


Q: When does hydration begin?

A: It never stops



- Chronic dehydration is common among athletes
- Signs of dehydration:
 - Dark coloured urine
 - Reduced urine volume
 - Dry skin
 - Headaches
 - Fatigue
- Replacing daily sweat losses with adequate fluid is essential to remain well hydrated
 - Don't rely on your thirst
 - Carry your water bottle
 - Drink regularly throughout the day



Monitor your status

Gatorade Your Gatorade Good Hydration Guide
AN EASY WAY OF FINDING OUT IF YOU ARE DEHYDRATED

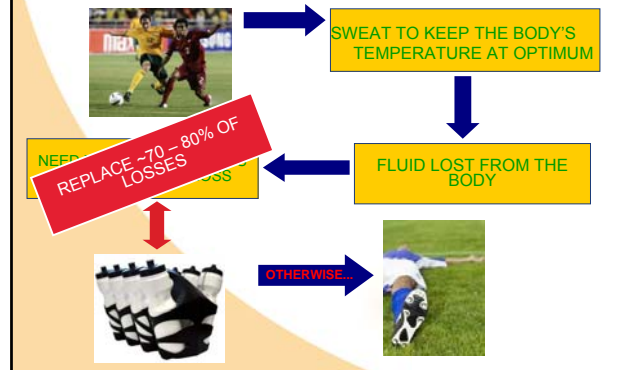


If your urine looks like this before exercise you are well hydrated. Follow your drinking plan during exercise.

If it's darker you need to drink more before starting exercise. Be sure to replace fluids adequately during your exercise session. Drink 150-200ml of fluids every 15 minutes.

When your urine looks like this before exercise you are severely dehydrated. See your coach right now!

Hydration and Performance



Monitor your status

- Check how much fluid you lose to improve your drinking practices

Sweat loss = change in body mass + fluid intake - urine losses

Pre training weight	75 kg
Post training weight	74 kg
Change in body mass	1 kg
+ Est. fluid intake	800 ml
- Urine loss	---
Total sweat loss	1.8 kg (~1.8 L)
% Change in body weight	3.0 %

Staying cool

Be organised to keep up fluid intake

Before	During	After
<ul style="list-style-type: none"> Drink adequate fluids ~2-4 hours before (with food) Keep 'sipping' until just before starting 	<ul style="list-style-type: none"> Drink small amounts at regular intervals <ul style="list-style-type: none"> During warm up Make use of formal and informal stoppages 	<ul style="list-style-type: none"> Aim to replace 150% of losses within 2-3 hours after finishing Try a variety of fluids to encourage intake

- Drinking during high intensity training sessions will help the body adapt for games

What should I be drinking?



Situations for Use

During and after easy training sessions, especially if they are less than 60 min

Best fluid to drink during the day



Situations for Use

During and after **hard or prolonged** workouts or games (60-90 min) and where fluid losses are likely to be high

Taste test

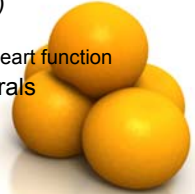


Which is which?

	A	B	C	D	E
Product	Gatorade + Gatorlyte	Electro-shotz	Powerade	Gatorade	Oral Rehydration Solution
Energy (kJ/serve)	630	13	798	630	57
Carbs (g/serve)	36	< 1	46	36	3.6
Sodium (mg/serve)	1052	215	167	282	1380
	600 ml + 1 sachet	250 ml + ½ tablet	600 ml	600 ml	200 ml + 1 sachet

Electrolytes

- Sweat contains more than just water...
 - Sodium (substantial amounts)
 - Maintain a normal fluid balance
 - Nerve and muscle function
 - Potassium (modest amounts)
 - Helps regulate water balance
 - Muscle contraction, including heart function
 - Small amounts of other minerals
- Composition is individual



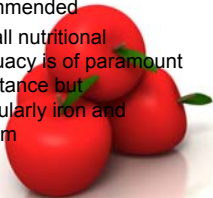
Kids, Food and Sport



Nutrient Requirements



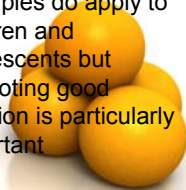
- Increased energy requirements for growth
- High carbohydrate, moderate protein & low fat eating plan recommended
- Overall nutritional adequacy is of paramount importance but particularly iron and calcium



Nutrient Requirements



- Increased fluid requirements also present
- Basic sports nutrition principles do apply to children and adolescents but promoting good nutrition is particularly important



Iron

- Plays a role in helping the body use energy
- Carries oxygen to cell around the body


Who's at risk of not having enough?

- Adolescent girls
- Vegetarians
- Low energy eaters
- High volumes of high-impact training

Requirements

- Children: 6-8 mg/d
- Adolescents: 10-13 mg/d (12+)





Iron

Have OJ or strawberries/citrus fruit with cereals




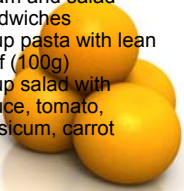

What if I don't like meat?

- Eggs
- Fortified products
- Legumes
- Nuts
- Wholegrain cereals

Remove sources of caffeine at meals to help absorption

The following foods provide ~13mg of iron:

- ½ cup of iron-fortified cereal
- 2 ham and salad sandwiches
- 1 cup pasta with lean beef (100g)
- 1 cup salad with lettuce, tomato, capsicum, carrot

Calcium



- Essential to build and maintain healthy bones
- Involved in muscle contraction

Who's at risk of not having enough?

- Adolescents
- Low energy eaters
- Non-dairy eaters

Requirements

- Children
 - Boys (4-15): 800-1200 mg/d
 - Girls (4-11): 800-900 mg/d
- Adolescents:
 - Males - 1000 mg/d
 - Females - 800-1000 mg/d

Calcium



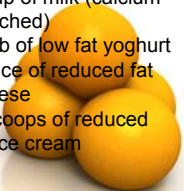
- 3 – 5 serves of dairy foods

Non-dairy sources:

- Fortified soy products
- Fish with bones
- Seeds, nuts, legumes



The following foods provide ~1000mg of calcium:

- 1 cup of milk (calcium enriched)
- 1 tub of low fat yoghurt
- 1 slice of reduced fat cheese
- 2 scoops of reduced fat ice cream

Fluid


- Children, like adults, underestimate their fluid needs during exercise
 - Thirst is not a good indicator of hydration status
- Sports drinks help to replace lost fluids better than water
 - May add extra, perhaps unnecessary, kilojoules


Fluid

Considerations:

- Amount of sweat loss
- Palatability of fluid
- Gastrointestinal comfort



- For children, water is suitable for all events
- Flavoured drinks may encourage children to drink more
 - Consider that this will add extra energy



Promoting Good Nutrition

- Good eating habits should be encouraged from an early age
 - Easily promoted by coaches through during- and post-competition eating
- During competition food and beverages should include fruit such as oranges or bananas and water for children
 - Older or more elite athletes may utilise sport specific foods and fluids




Kids, Food and Sport

Discussion

- Eating during tournaments/carnivals
 - What to pack
 - When to eat it



Example: School Swim Carnival

Time	Event	Advice
7:00 am	Breakfast	Cereal + low fat milk + slice of toast with jam
9:00 am	Warm up and race 50 m freestyle heats	Drink at least 1 cup of water in the half hour before race
10:00 am	Break	Fruche / banana + water or sports drink
11:00 am	Warm up and race 50 m backstroke	
11:30 am	Recovery, warm up and race 50 m freestyle final	Remember fluids – water or sports drink
12:00 pm	Lunch	Vegemite / ham sandwich + tinned fruit
1:30 pm	Warm up and race 100 m medley	Remember fluids – water or sports drink
3:00 pm	Break	Cereal bar + sports drink
4:00 pm	Warm up and race 4x50 m freestyle relay	Remember fluids between races.
4:30 pm	Recovery, warm up and race 4x50 m medley relay	Don't forget fluid replacement after racing. Sports drinks will help to replenish carbohydrate until you get home for dinner
6:00 pm	Dinner	Chilli chicken + rice

Summary

- Make the most of 'nutrient dense' foods at all meals and snacks
- Important to fuel body with carbohydrate-rich diet to meet demands of training and competition
 - Intake should reflect daily training demands
- Remain well hydrated
 - Develop your own personalised hydration plan
- Pre- and during-competition eating
 - Familiarity is the key
- Be organised
 - Plan ahead for training and game days
- Basic sports nutrition principles apply to young active people
 - Important to promote good nutrition from early age



For more information...

The screenshot shows the Australian Institute of Sport website with a navigation menu on the left and several content sections. The 'Factsheets' section is highlighted, and there are links to 'Sports Dietitians' and 'Competition and Training'. The website is titled 'AUSTRALIAN INSTITUTE OF SPORT' and includes a search bar and various links for users to explore more information.