CARBOHYDRATES

TYPES OF CARBOHYDRATES

SIMPLE CARBOHYDRATES	COMPLEX CARBOHYDRATES
Sugar	Breads
Jam/ honey	Cereals
Syrups	Pasta/ noodles
Soft drinks/ cordials	Rice / other grains (quinoa, polenta etc)
Juice*	Potato/ sweet potato
Lollies/ chocolates	Lentils and legumes
Pastries / cakes	Rice cakes and crackers
Sports gels	Biscuits
Sports drinks	Fruit
Fruche*	Chips**
Flavoured yoghurts*	Fries**
Fruit smoothies*	Sweet biscuits**

Source: The Complete Guide to Food for Sports Perfomance. Dr L.Bourke and G.Cox, 2010.
* Nutrient dense simple carbohydrates – preferred over the other ones
** Low nutrient quality/ high fat or additives. Should be consumed minimally

GLUTEN VS GLUTEN FREE GRAINS

GLUTEN CONTAINING	GLUTEN FREE
Wheat	Rice
Rye	Quinoa
Barley	Corn
Oats*	Millet
Spelt	Amaranth
Most soy sauces*	Buckwheat
Couscous	Sorghum
Durum	Arrowroot
Udon	Potato starch/ flour
Beer*	Sago
Most processed foods*	Tapioca
Semolina	

Source: website www.coeliacsociety.com.au

CARBOHYDRATE REQUIREMENTS – DAY TO DAY

Situation		Carbohydrate targets per kg of the athletes body weight* (g/kgBW/day)
Daily needs for fuel and recovery*		(g)
Minimal	Light training program (low intensity or skilled based exercise)	3-5
Moderate	Moderate exercise program (i.e.~1h per day)	5-7
High	Endurance program (i.e.~1-3hrs per day of moderate to high intensity exercise)	6-10
Very high	Extreme exercise (i.e.~4-5hrs per day of moderate to high intensity exercise such as the Tour de France)	10-12
*Note that large athletes or athletes undertaking a weight loss program may be better suited to reduce their fuel intake to the needs of the previous category		

Source: The Complete Guide to Food for Sports Perfomance. Dr L.Burke and G.Cox, 2010.

CARBOHYDRATE REQUIREMENTS – EVENT SPECIFIC

Situation		Carbohydrate targets per kg of the athletes body weight* (g/kgBW/day)
Special situations requiring fuel		(g)
Maximal daily refuelling	Post event recovery or carbohydrate loading before an event	7-12 (for each 24h period)
Speedy refueling	Less than 8h recovery between two demanding workouts	1-1.2 (immediately after first session, and repeated hourly until next scheduled meal
Pre-event fuelling	Before an endurance event	1-4 (eaten 1-4hrs prior to event)
During exercise	Moderate intensity or intermittent exercise of >1h ultra-endurance event (Ironman, Tour de France etc)	30-60/hr (up to 90/hr)

Source: The Complete Guide to Food for Sports Perfomance. Dr L.Burke and G.Cox, 2010.

Carbohydrate Food	15 g / 1 serve
Breads and Cereals	
Wheat biscuit cereal (e.g. Weetbix)	22.5g / 2 biscuits
Flakes/ puffs cereal (e.g. corn flakes, rice bubbles, Special K, Sustain etc)	20g (1/2 cup)
Muesli/ oats	22.5g (1/4 cup)
Bread	30g (1 slice)
Bread rolls	30g (1/2 medium roll)
Pita bread	30g (1/2 pita)
Chappati	35g (1)
Crumpet	40g (~1 crumpet)
English Muffin	30g (1/2)
Bars, biscuits and cakes	
Muesli bar	1 bar
Rice cakes	3 thin ones
Dry biscuits (e.g. Saladas, Vitawheats)	2 large / 5 small
Plain sweet biscuits	2 biscuits
Cream filled/ chocolate biscuits	1 biscuit
Muffin	½ medium
Pancakes	1 medium
Scones	1 small
Iced fruit bun	1/4 commercial
Croissant	1/3 medium
Pasta. Rice, noodles	
Rice, cooked	1/3 cup
Pasta or noodles, cooked	½ cup
Canned spaghetti	½ cup
Creamed rice	½ cup
Fruit	
Fruit in natural juice	½ cup
Fresh fruit salad	¾ cup
Bananas	1 medium
Mangoes	½
Medium sized fruits (apples, pears, oranges etc)	1 medium
Grapes	2/3 cup
Berries	2 x 250g punnets

Fruit continued.	
Melon	2 cups diced
Sultanas	1.5 tbsp
Dried apricots	7 halves
Grapefruit	1 large
Vegetables and legumes * note that most vegetables have a low carbohydrate content	
Potatoes	1 medium
Sweet potato	¾ cup
Corn	1 medium cob
Baked beans	1 cup
Lentils, cooked and drained	1 cup
Soy beans, kidney beans, cooked and drained	2/3 cup
Dairy	
Milk	1 glass
Flavoured milk	150ml
Custard	1/3 cup
Yoghurt* varies either ½ cup up or down depending on sugar content in yoghurt	1 x 200g tub
Ice cream	½ cup
Sugars and confectionary	
Sugar	1 tbsp
Jam	1 tbsp
Syrups	¾ tbsp
Honey	¾ tbsp
Chocolate	25g
Filled chocolate bars (e.g Mars Bars)	1 x fun-sized bar
Jubes/ jelly lollies	25g
Drinks	
Fruit juice, natural	1 glass
Cordial	1 glass
Soft drink/ flavoured mineral water, full sugar	½ glass
Fruit smoothie	100ml
Sports foods	
Sports drink (e.g. Gatorade)	200ml
Sports gel (e.g. Endura gel)	½ gel

Adapted from The Complete Guide to Food for Sports Perfomance. Dr L.Burke, G.Cox, 2010.

PROTEIN

PROTEIN REQUIREMENTS- DAY TO DAY AND TRAINING SPECIFIC

Situation		Protein requirements per kg of the athletes body weight* (g/kgBW/day)
Daily needs		(g)
Australian RDI	Sedentary adult male Sedentary adult female	0.84g 0.75g
Suggested Target	Recreational level sports activity	~1g
Suggested Targets	Strength training athletes: - Maintenance phase - Muscle gain phase	 1.2g 1.6g
Suggested Targets	Endurance Training athletes - Moderate volume / intensity program - Prolonged strenuous training/ competition	 1.2g 1.7g
Suggested Targets	Team athletes - Moderate Training - Hard training/ match program	 1.2g 1.7g
Suggested Target	Adolescent and growing athletes	2.0g
Suggested Target	Female athletes	15% less than males
Australian RDI	Pregnant athletes	Extra 14g in the 2nd and 3rd trimester
Australian RDI	Breastfeeding athletes	Extra 20g per day
Special Situations		(g)
	After resistance training to promote maximal muscle gain	20g immediately after (this is over and above daily recommendations)
	Recovery after strenuous edurance or intermittent/ team training session	20g immediately after (this is over and above daily recommendations)

Source: Australian RDIs, NHMRC, Australian Government, 2006

Protein Food	Amount for 10g protein
Animal Sources	
Eggs	2 medium
Low fat milk	1 glass
Cheese, cheddar, reduced fat	2 slices (40g)
Cottage cheese	70g
Yoghurt	200g tub
Custard	250ml
Meats	35g lean
Chicken	35g lean
Fish	50g grilled
Tuna / salmon, tinned, drained	50g
Vegetable Sources	
Lentils/ legumes, cooked, drained	1 cup
Tofu	100g
Soy milk	1 glass
Nuts/ seeds	50g

Source: The protein composition data were estimated using FoodWorks Professiona Edition, Version 3.02, © 1998-2005 (Xyris Software, Brisbane Australia). Food composition data were com[plied from Nuttab 95, Ausfoods Australian AusNut and nutritional information from food manufacturers entered into the standardized Australian Institute of Sports Recipe database.

HIGH QUALITY PROTEIN	LOW QUALITY PROTEIN
Lean meat	Fatty meat / sausages / pies
Chicken breast	Chicken wings
5 star lean mince	Sausage mince (or anything lower than 4 star mince)
Fresh fish or tinned fish in springwater	Fish fingers / battered fish
Low fat dairy	Ice creams
Eggs	egg based desserts (custards)
Lean protein powders	Protein fortified breakfast cereals

IRON AND CALCIUM

IRON REQUIREMENTS

Population	Daily Iron needs (RDI)
	(mg)
Adolescent boys (growth)	11mg
Adolescent girls (pre-onset of periods)	8mg
Adolescent girls (growth and periods)	15mg
Adult males	8mg
Endurance training males – heavy training	8-17.5mg
Adult females (menstruating years)	18mg
Endurance training females – not menstruating	8-17mg
Endurance training females –menstruating	18-23mg
Adult females (post menstruating years)	8mg
Pregnant females	27mg

Source: NHMRC, Nutrient Reference Values for Australia and New Zealand, Australian Government, 2006

CALCIUM REQUIREMENTS

Population	Daily Calcium needs (RDI)
	(mg)
Young boys and girls	1000mg
Adolescent boys and girls (growth)	1300mg
Adult males	1000mg
Adult females (menstruating years)	1000mg
Adult females (post menstruating years)	1300mg
Pregnant females	1000mg
Breast-feeding females	1000mg

Source: NHMRC, Nutrient Reference Values for Australia and New Zealand, Australian Government, 2006

IRON CONTENT IN FOOD

Haeme-Iron foods		
Food	Serve	mg iron
Liver	100g cooked weight	9.3
Liver pate	40g (2 tbsp)	4.0
Lean steak	100g cooked weight	3.0
Chicken	100g cooked weight	1.1
Fish	100g cooked weight	0.3-1.9
Oysters	100g raw	3.9
Salmon	1 small tin	0.9
Non-haeme Iron foods		
Food	Serve	mg iron
Eggs	2 small	1.6
Fortified breakfast cereal	1 cup	5.00
Wholemeal bread	2 slices	1.4
Spinach cooked	1 cup	4.4
Lentils, canned and drained	1 cup	3.1
Kidney beans	1 cup	4.0
Textured vegetable protein	100g	10.4
Tofu	100g cooked	1.2
Almonds	50g	1.8

Source: The Iron composition data were estimated using FoodWorks Professiona Edition, Version 3.02, © 1998-2005 (Xyris Software, Brisbane Australia). Food composition data were com[plied from Nuttab 95, Ausfoods Australian AusNut and nutritional information from food manufacturers entered into the standardized Australian Institute of Sports Recipe database.

CALCIUM CONTENT IN FOOD

Food	Serve	mg calcium
Skim milk	1 glass	255
Low fat calcium enriched milk	1 glass	285
Soy milk	1 glass	27
Fortified soy milk	1 glass	230
Reduced fat cheese	1 slice	163
Cottage cheese	½ cup	94
Low fat fruit yoghurt	1 x 200g tub	358
Low fat ice cream	2 tbsp	30
Salmon	1 small tin	310
Sardines	100g	380
Oysters	100g	135
Almonds raw	50g	117
Tahini	1 tbsp	66
Spinach cooked	1 cup	90
Tofu cooked	100g	330

Source: The calcium composition data were estimated using FoodWorks Professiona Edition, Version 3.02, © 1998-2005 (Xyris Software, Brisbane Australia). Food composition data were com[plied from Nuttab 95, Ausfoods Australian AusNut and nutritional information from food manufacturers entered into the standardized Australian Institute of Sports Recipe database.

ESTIMATING YOUR REQUIREMENTS

ESTIMATING ENERGY REQUIREMENTS

TEE = BMR x AF

The Schofield Equation		
Age (yrs)	BMR (Males)	BMR (females)
0-3	(0.249 x W) – 0.127	(0.244 x W) – 0.130
3-10	(0.095 x W) +2.110	(0.085 x W) + 2.033
10-18	(0.074 x W) + 2.754	(0.056 x W) + 2.898
18-30	(0.063 x W) + 2.896	(0.062 x W) + 2.036
30-60	(0.048 x W) + 3.653	(0.034 x W) + 3.538
>60	(0.049 x W) + 2.459	(0.038 x W) + 2.755

BMR = Basal Metabolic Rate
W = wt in kg

Activity Factors

Resting (just breathing, nothing else)	1.1
Bed rest/ extremely sedentary	1.2
Light Activity	1.3
Moderate Activity	1.4-1.5
Heavy Activity	1.75

Source: Dietitians' Pocket Book, Curtin University of Technology, 2006