

# POWERING ACTIVE ADULTS

**INFORMATION AND RECIPES  
TO POUR MORE INTO YOUR  
PERFORMANCE**



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Sport and exercise performance is influenced by a number of factors including natural talent, the right training, recovery and a quality diet. A healthy, balanced diet is not just for elite athletes. Active people of all ages and levels of skill can benefit from eating well.

Eating a variety of nutrient-rich foods such as fruits, vegetables, wholegrain breads, cereals, rice and pasta, dairy (such as milk, cheese and yoghurt) and lean meat, fish, poultry, eggs, nuts and legumes (e.g. beans and lentils) will provide the nutrients you need to stay healthy and active. The right nutrition and hydration can also maximise energy levels during exercise, enhance adaptation from training and help your body to recover effectively between sessions.

The type, timing and amount of food and drinks you eat can all play a role in your exercise or sport performance. For example, milk is shaping up as the ultimate post-exercise recovery drink. There is growing evidence that drinking milk after exercise is the best way to rehydrate and can also help repair and rebuild muscles.<sup>1</sup>

At Dairy Australia we are passionate about sport and exercise and we love good food! We want to help athletes and active people to achieve their goals. With the help of Sports Dietitians Australia we have developed this booklet that combines practical advice with nutritious and tasty recipes for the active person. Whether you are looking for meals and snacks to fuel your body for competition, or tips on gaining muscle, this booklet provides something for you.

**Note:** Throughout this booklet reduced fat dairy options were included in recipe analysis where nutrition information is provided. Both regular and reduced fat milk, cheese and yoghurt are considered healthy dairy options for healthy individuals and can be used in all recipes.



1 Roy, BD (2008) Int Sports Nutr. 5: 15-20.

# ENERGY FOR SPORT AND EXERCISE



Just like a car needs fuel to drive, your body needs energy to function and exercise. We get energy from food in the form of kilojoules (or calories). The amount of energy (or number of kilojoules) you need depends on a variety of factors such as your age, gender, whether you are trying to gain or lose weight and your exercise intensity and duration. In general, for people who exercise or train very frequently, or when training sessions are long and intense, energy requirements will be high. For people who train infrequently, or where training sessions are short or easy, energy needs will be less. The three main nutrients from food that supply the body with energy are carbohydrate, fat and protein. These are known as macronutrients.

## Carbohydrate

Carbohydrate is the body's preferred energy source for exercise and should form the base of an athlete's diet. When we eat carbohydrates, they are broken down into glucose and are stored in the muscles and liver as glycogen (energy reserves). During exercise, your muscles use the stored glycogen as the main energy source. Muscle can usually store enough glycogen for about 60 to 90 minutes of high-intensity exercise, provided you regularly eat a healthy, balanced diet that meets your daily energy needs. If you have not eaten enough carbohydrate, fatigue sets in and can affect performance. Nutrient-rich carbohydrate foods include cereals, breads, pasta, rice, fruits, starchy vegetables (e.g. potatoes and sweet potatoes) and legumes. Milk and yoghurt are also nutritious sources of carbohydrate in the form of the natural milk sugar, lactose. Foods high in refined sugar, such as lollies, soft drink, honey and jam, also contain carbohydrate. These foods can be a useful additional source of carbohydrate for athletes with very high energy requirements and can play a role in topping up carbohydrate stores during long events. However, these foods have very few other nutrients and should not be a major part of the diet.

## Protein

Proteins are made up of chains of smaller chemicals called amino acids which are the building blocks of our muscles. The key role of protein for active people is to help repair and rebuild muscle after exercise. Protein can also be used during exercise as an energy source when carbohydrate reserves are very low. While protein is important for active people, you don't need a lot. Those who need larger amounts of protein include young athletes who are still growing and have a high training load, and athletes training for endurance sports or strength-based sports. The protein needs of most active people can be met by a well-balanced diet.

High-quality protein can be found in lean meat, fish, poultry, eggs and dairy foods such as milk, cheese and yoghurt.<sup>1</sup> 'High-quality' means the protein in these foods contains all of the essential amino acids our bodies need. Most plant sources of protein such as legumes, cereals, nuts and seeds are considered incomplete proteins because they lack one or more of the essential amino acids.

## Fat

Fat provides the main fuel source for long-duration, low to moderate-intensity exercise such as marathons. Even during high-intensity exercise, where carbohydrate is the main fuel source, fat is needed to help access the stored carbohydrate (glycogen).

A healthy diet includes moderate amounts of fats from nutrient-rich foods such as nuts, seeds, fish, dairy foods, lean meat and avocados. Biscuits, pastries, chips and deep-fried foods are high in fat but low in other nutrients and should be limited. It is generally not advised to eat foods high in fat immediately before or during intense exercise as fat is slow to digest and can remain in the stomach for a long time.

<sup>1</sup> Young VR and Borgonha A. (2000) Journal of Nutrition. 130:1841S–1849S

A swimmer wearing a blue swim cap and black goggles is captured in a dynamic underwater shot. The swimmer is in a streamlined position, moving through clear blue water. Bubbles and light reflections are visible around the swimmer's head and arms, creating a sense of motion and depth. The background shows the surface of the water and some blurred lights, suggesting an indoor pool setting.

### **MAKE A MEAL OF IT**

Now that you know where your 'fuel' should come from, you might be wondering how to put this into practice. Easy! We have developed a range of everyday meals and snacks that include nutritious carbohydrates, high-quality protein and plenty of vitamins and minerals to help support your active lifestyle.



## BIRCHER MUESLI PANCAKES

**Serves** 4 (Makes 16)

**Preparation time** 25 minutes  
(+ overnight chilling)

**Cooking time** 15 minutes

### Ingredients

1¾ cups rolled oats  
1 cup milk  
1 cup vanilla yoghurt  
2 tablespoons honey  
4 apples, peeled, cored and quartered  
2 tablespoons honey, extra  
1 tablespoon water  
½ teaspoon cinnamon  
finely grated rind of ½ lemon  
½ cup plain flour  
1½ teaspoons baking powder  
2 eggs, lightly beaten  
¼ cup dairy spread, melted  
olive oil spray  
1 cup vanilla yoghurt, extra, to serve

1. Combine the oats, milk, yoghurt and honey in a large bowl. Cover and chill overnight.
2. Place apples, extra honey, water, cinnamon and lemon in a microwave safe bowl. Cover and microwave on high for 2 minutes or until apple is tender.
3. Sift flour and baking powder into oat mixture. Combine eggs and melted dairy spread and stir into batter until smooth.
4. Spray a non-stick frypan with oil and heat over medium-high heat. Pour ¼ cup of batter into the pan and cook until bubbles form on the top, turn and cook the other side. Remove and cover to keep warm while cooking remaining batter.
5. To serve, arrange pancakes into stacks, pile apple on top and dollop with extra yoghurt.

### Notes

Leftover pancakes can be individually wrapped and frozen for up to 1 month. Defrost and warm in the microwave as required. The honeyed apples can also be frozen in an airtight container for up to 3 months.



## QUINOA, CHICKEN AND FETA SALAD

**Serves** 4

**Preparation time** 25 minutes

**Cooking time** 30 minutes

### Ingredients

2 tablespoons chopped flat-leaf parsley

2 tablespoons chopped mint

1/3 cup lemon juice

1 tablespoon olive oil

freshly ground black pepper, to taste

500g skinless chicken tenderloins or thigh fillets

200g quinoa, rinsed, drained

olive oil spray

1 bunch broccolini or asparagus, cut into 4cm lengths

250g feta, crumbled

4 spring onions, thinly sliced

50g baby rocket leaves

1 pomegranate, seeds removed

1. Whisk together parsley, mint, lemon juice and oil; season to taste. Pour half of the dressing over the chicken and allow to marinate while cooking quinoa. Reserve remaining dressing for salad.
2. Boil quinoa for 10-12 minutes, or until just tender but still firm to the bite. Drain and transfer to a large bowl. Set aside to cool.
3. Spray chicken and broccolini or asparagus lightly with oil, BBQ or char-grill over high heat until cooked through and tender. Rest for 5 minutes and slice.
4. Add the sliced chicken, broccolini or asparagus, feta, spring onions, rocket and pomegranate seeds to the quinoa and drizzle with reserved dressing. Toss to combine and arrange in a serving platter.

### Notes

If preparing this salad ahead of time for a work lunch, omit the rocket and refrigerate, then only toss through at the last minute, to prevent it from wilting.



## MIDDLE EASTERN LAMB BURGERS

**Serves** 4

**Preparation time** 30 minutes

**Cooking time** 40 minutes

### Ingredients

olive oil spray

180g haloumi cheese, sliced

4 wholegrain or sourdough rolls, toasted

1 small Continental cucumber, sliced

2 cups baby cos lettuce leaves, to serve

### Tomato Yoghurt Sauce

1/3 cup tomato relish or chutney

1 teaspoon harissa paste or 1/8 teaspoon cayenne pepper

200g natural yoghurt

### Lamb Burgers

500g lean lamb mince

1 medium onion, grated or finely chopped

1 cup grated pumpkin

1/2 cup dried wholegrain breadcrumbs

freshly ground black pepper, to taste

1 tablespoon chopped flat-leaf parsley

1 teaspoon ground cumin

1 teaspoon ground coriander

1 teaspoon paprika

1. Mix together relish, harissa and yoghurt in a small bowl. Set aside.
2. Combine all the burger ingredients in a large bowl until well combined. Form the mixture into 4 burgers.
3. Heat a non-stick frypan over medium heat and cook the burgers for 4-5 minutes each side until browned. Transfer to a baking paper lined oven tray and bake at 180°C for 25-30 minutes or until cooked through.
4. Wipe out the frypan with absorbent paper and heat over medium heat. Pan-fry haloumi for 1-2 minutes on each side or until golden brown. Serve the Lamb Burgers on toasted rolls with haloumi, Tomato Yoghurt Sauce, lettuce and cucumber.

### Notes

Burger patties and yoghurt sauce can be made the day before and kept covered in the fridge.

To reduce the saltiness of haloumi, soak in a little milk for about 10-15 minutes before patting dry and cooking.





## LEMON YOGHURT POTS WITH MINTED STRAWBERRIES

**Serves** 4

**Preparation time** 15 minutes

### Ingredients

250g block cream cheese

2 tablespoons caster sugar

finely grated rind and juice of 1 lemon

2 cups vanilla yoghurt

250g punnet strawberries, hulled and sliced

1 tablespoon torn mint leaves

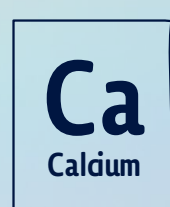
8 (100g) sponge finger biscuits

1. Beat cream cheese, sugar, lemon rind and juice with an electric mixer until smooth. Add yoghurt and beat on the lowest setting until smooth. Spoon mixture into 4 serving glasses.
2. Combine strawberries and mint leaves and divide between each of the glasses. Serve with biscuits.

### Note

Make a layered trifle by placing chopped biscuits on the base topped with lemon yoghurt and repeat layers again.

If making in advance, make the pots until the end of Step 1 and refrigerate for up to 2 days. Top with strawberries just before serving.



# IMPORTANT VITAMINS AND MINERALS

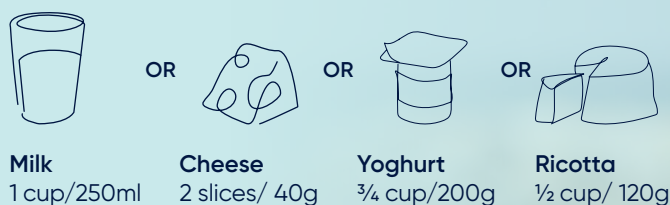
Vitamins and minerals are known as micronutrients because we need them in smaller amounts compared to fat, protein and carbohydrate (macronutrients). Minerals that we receive from food include calcium, zinc, iron, potassium, sodium and iodine. The vitamins we receive from food include vitamins A, C, D, E and K, as well as the B-complex vitamins.

Vitamins and minerals are vital to make the body function properly and are essential for good health and performance. While vitamins and minerals don't provide energy, they do play key roles in how our bodies use the energy from our food. Eating a wide variety of foods from the five food groups, such as fruits, vegetables, wholegrain breads, cereals, rice and pasta, dairy and lean meat, fish, poultry, eggs, nuts and legumes will help ensure you meet the recommended daily intake of vitamins and minerals. Eating these foods every day will also provide other important nutrients such as fibre and anti-oxidants.

## Minimum recommended number of serves from the dairy food group

	Age (years)	No. of serves per day
Men	13–18	3½
	19–70	2½
	70+	3½
Women	13–18	3½
	19–70	2½
	70+	4
	Pregnant or breastfeeding (19–50)	2½

## One serve of dairy is equivalent to



Adapted from: 2013 Australian Dietary Guidelines. The dairy food group includes milk, cheese, yoghurt and/or alternatives (1 cup [250 ml] soy beverage or beverages made from rice or other cereals which contain at least 100mg calcium per 100ml).

## Important micronutrients for active people

### Iron

Iron transports oxygen to all parts of the body, including muscles, and helps release energy from cells. If iron levels are low, you can feel tired and low in energy.

Iron deficiency is a common problem for many athletes, particularly among women, vegetarians and adolescents. High-intensity training stimulates an increase in red blood cell production, increasing the need for iron. Iron can also be lost through damage to red blood cells in the feet due to running on hard surfaces with poor quality shoes, through blood loss from injury and through sweat.

It is important to regularly eat iron-rich foods such as lean meat, poultry and fish. Vegetarians need to eat legumes, green leafy vegetables and ironfortified cereals to obtain adequate iron intake. These foods should be combined with vitamin C-rich foods to help increase iron absorption.

### Calcium

Adequate calcium intake along with vitamin D and weight-bearing exercise is necessary to develop and maintain strong bones that are resistant to fracture and osteoporosis in later life. Whilst most athletes will have above-average bone mass, some female athletes are at high risk of developing osteoporosis prematurely. Absence of menstruation, known as amenorrhea, can occur when women undertake intense exercise and do not take in enough energy to maintain a normal menstrual cycle. This means the body produces less oestrogen, which stops bones from reaching peak mass and strength.

As well as containing a package of other important nutrients, dairy foods are a good source of calcium. Having the recommended number of serves from the dairy food group can help meet your calcium requirements.





Keep your energy levels up with these iron-rich tasty triangles.

## MEXICAN FILO TRIANGLES

**Serves** 4

**Preparation time** 20 minutes

**Cooking time** 30 minutes

### Ingredients

olive oil spray

1 small onion, chopped

250g lean beef mince

1 small carrot, grated

1 tomato, chopped

125g can red kidney beans, drained

1 tbsp salt reduced taco seasoning

½ cup mild tomato salsa

12 sheets filo pastry

½ cup natural yoghurt

1 cup grated cheddar or mozzarella cheese

1. Spray a non-stick saucepan with oil, add onion and cook over medium-high heat until soft. Add the beef and brown, stirring for 5 minutes. Add carrot, tomato, beans, taco seasoning and salsa. Simmer for 5 minutes or until sauce thickens. Cool slightly.
2. Place 1 filo sheet on a clean bench, lightly brush with yoghurt. Top with another sheet and brush with yoghurt. Repeat to form 3 layers. Cut into thirds lengthways to form 3 long strips. Repeat with remaining pastry and yoghurt, keeping pastry covered with a damp tea towel to prevent it from drying out.
3. Spoon ¼ cup of mince mixture into the corner of one of the pastry strips. Sprinkle with cheese. Fold pastry corner over the filling to form a triangle. Continue to fold triangle over itself until end of the strip. Repeat with remaining pastry and mince.
4. Place triangles on a baking lined oven tray and bake at 200°C for 15–20 minutes or until pastry is golden and crisp. Serve warm or cool.

### Notes

Make a double batch and freeze uncooked triangles for up to a month in an airtight container, thaw before baking.



## CREAMY CHICKEN LAKSA

**Serves** 4

**Preparation time** 10 minutes

**Cooking time** 10 minutes

### Ingredients

1/3 cup laksa paste

2 x 375ml cans evaporated milk

300g skinless chicken breast fillets, cut into small cubes

1 cup trimmed and chopped green beans

125g baby corn spears, sliced lengthways

1/2 cup chopped red capsicum

350g hokkein noodles

3/4 cup bean sprouts

2 spring onions, sliced

2 tablespoons freshly picked mint leaves

2 tablespoons freshly picked coriander leaves

lime wedges, to serve

1. Heat a non-stick saucepan over medium-high heat. Add laksa paste and cook, stirring, for 2-3 minutes or until fragrant. Add evaporated milk and bring to the boil.
2. Add chicken, beans and corn, reduce heat and simmer for 3 minutes. Add capsicum and noodles and simmer for a further 3-5 minutes or until chicken is cooked through.
3. Ladle into serving bowls and top with remaining ingredients to garnish. Serve immediately.

### Notes

Evaporated milk is a great high calcium substitute for coconut milk and cream in curry dishes.

# FUELLING THE BODY FOR SPORT AND EXERCISE



Eating a meal or snack before sport or exercise provides fuel for your muscles and brain to help you perform your best.

Eating a meal or snack before exercise will replenish your fuel stores (muscle glycogen) so you can workout harder and longer. Ideally a meal should be consumed three to four hours before exercise or a light snack one to two hours before exercise. This will give your body time to digest and absorb the food so that the fuel becomes available to your working muscles during the workout.

The pre-exercise meal or snack should provide carbohydrate, which is the key fuel source for muscles during exercise. Starting a workout with low carbohydrate stores can lead to early fatigue and a reduced ability to train hard.

The amount of carbohydrate should be specific to your level of activity and overall energy needs. If you are training less than three times per week with rest days in between, restoring glycogen levels will be easier to achieve. However, if you are training every day for more than 60 minutes, or doing more than one workout a day, focusing on topping up glycogen levels with carbohydrate should be a priority before each exercise session.

Foods eaten before exercise should be low in fat and moderate in fibre to make digestion easier and reduce the risk of stomach discomfort. Fluid is also an important component of pre-exercise nutrition to ensure maximum hydration.

The recipes in this section are high in carbohydrate to help you fuel your body for sport or exercise. Depending on when the sport or competition is taking place, your preexercise meal might be breakfast, lunch or dinner – so we've included options for any time.

## Pre-workout meal ideas (3–4 hours)

Fruit toast with ricotta and banana  
Baked potato with corn and cheese  
Baked beans on toast  
Breakfast cereal with milk  
Sandwich with meat and salad filling  
Fruit salad or berries with yoghurt  
Pasta or rice with a reduced fat sauce  
Pita bread wrap with tuna and salad

## Pre-workout snack ideas (1–2 hours)

Fresh fruit e.g. banana  
Canned fruit  
Tub of yoghurt  
Cereal/muesli bar  
Flavoured milk  
Fruit bun or fruit scone

## WHAT IF I HAVE NO APPETITE?

For some people, nerves or excitement before a sporting event leaves them with little or no appetite. Liquid meals such as reduced fat milkshakes, fruit smoothies or flavoured milk products are easily digested and are not too bulky, making them a great pre-event energy snack when appetite is poor.

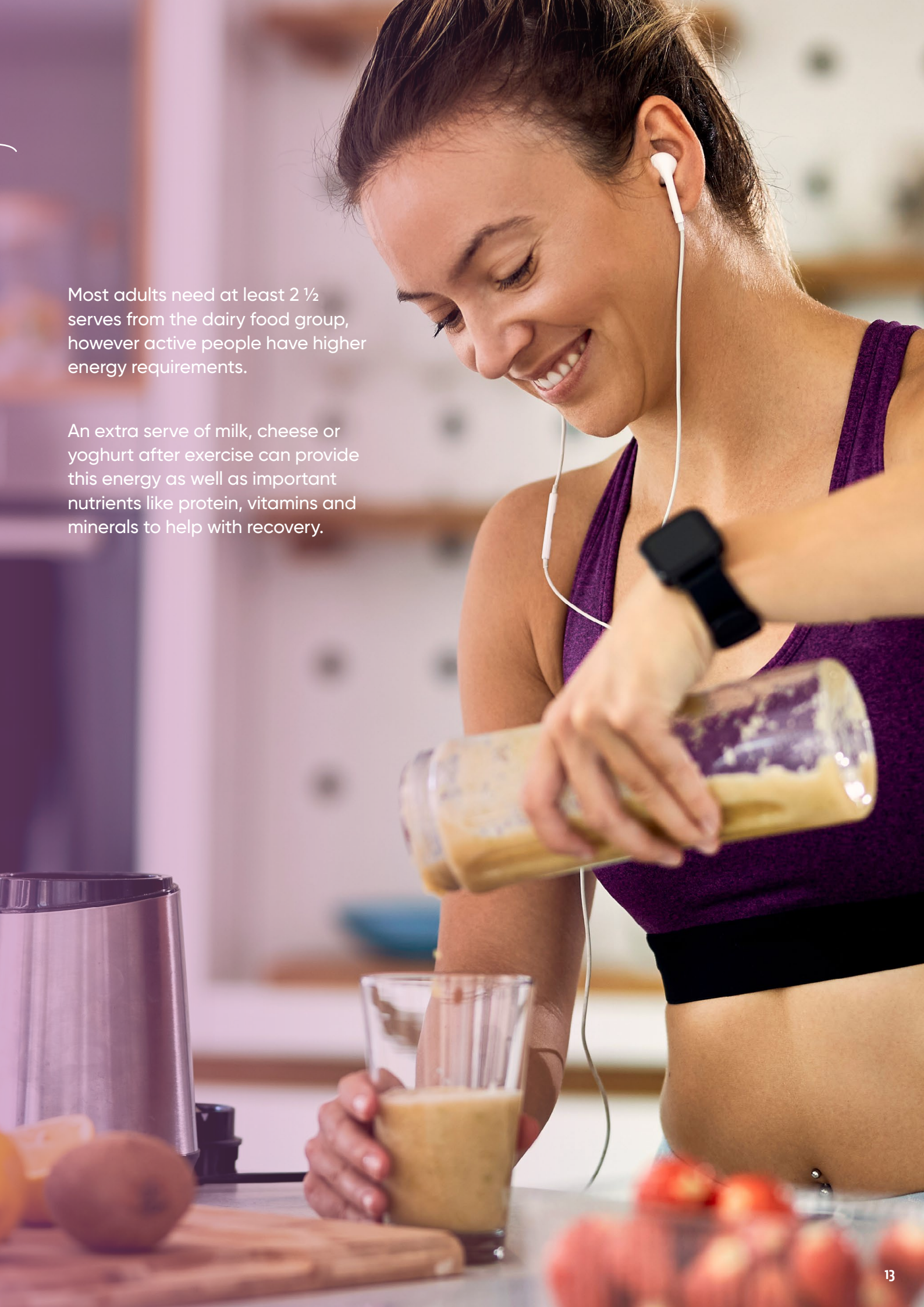
## WHAT IF I'M TRYING TO LOSE WEIGHT?

It's important to match carbohydrate intake to training load. On a heavy training day, include plenty of carbohydrate-rich snacks or increase the carbohydrate portion of meals. On rest days or lower intensity training days, reduce carbohydrate snacks or portion sizes.

If your goal is weight loss, you can still aim to refuel glycogen stores before your next session. It's important that the post-workout meal is considered as part of your overall energy budget. Plan to have one of your main meals or snacks straight after your workout.

Most adults need at least 2 ½ serves from the dairy food group, however active people have higher energy requirements.

An extra serve of milk, cheese or yoghurt after exercise can provide this energy as well as important nutrients like protein, vitamins and minerals to help with recovery.





## CHICKEN AND MUSHROOM RISOTTO WITH WALNUTS

**Serves** 4

**Preparation time** 20 minutes

**Cooking time** 45 minutes

### Ingredients

olive oil spray

500g skinless chicken breast fillet

1 leek, thinly sliced

2 cloves garlic, crushed

200g button mushrooms, thinly sliced

2 cups arborio rice

1.25 L salt reduced chicken stock

1.25 L milk

¼ cup finely grated parmesan cheese

⅓ cup chopped flat-leaf parsley

2 tablespoons chopped toasted walnuts

parsley and freshly ground black pepper, for serving

1. Spray a large heavy-based saucepan with oil and heat over medium-high heat. Cook chicken for 3-5 minutes on each side or until browned and just cooked through. Rest chicken in a warm place for 10 minutes before slicing.
2. Re-spray saucepan with oil and cook leek and garlic for 2-3 minutes, until softened. Add mushrooms and cook stirring for 2-3 minutes until tender. Add rice and cook, stirring for 1 minute until well coated.
3. Add stock and milk to pan. Cover and bring to boil. Reduce heat to low and simmer, covered for 25 minutes or until rice is almost tender. Remove lid and simmer for a further 10 minutes.
4. Stir in chicken, parmesan, parsley and half the walnuts. Serve risotto sprinkled with remaining walnuts, parsley and a sprinkling of pepper.

### Notes

Replace button mushrooms with Swiss brown or portobello mushrooms for a fuller flavoured risotto.

Use leftover risotto to make risotto 'patties' – take heaped dessertspoonfuls of risotto and flatten into pattie shapes. Dust with breadcrumbs, spray with oil and brown in a frypan.





## ROASTED PUMPKIN AND BASIL ORECCHIETTE

**Serves** 4

**Preparation time** 20 minutes

**Cooking time** 25 minutes

### Ingredients

250g peeled pumpkin, cut into 2cm cubes

1 red onion, coarsely diced

olive oil spray

375 ml can evaporated milk

2 cloves garlic, crushed

1½ cups fresh basil leaves, chopped

400g dried orecchiette pasta, cooked, drained and kept warm


½ cup finely grated parmesan cheese

2 tablespoons toasted pine nuts

2 tablespoons finely grated parmesan cheese, extra, for serving

fresh basil leaves and freshly ground black pepper, for serving

1. Place pumpkin and onion on a baking paper lined oven tray and spray with oil. Bake at 220°C for 15-20 minutes until tender and golden.
2. Combine milk and garlic in a large saucepan and bring to the boil. Add basil, reduce heat and simmer for 1-2 minutes. Stir in pasta and vegetables, parmesan, pine nuts and gently toss to coat.
3. Spoon into serving dishes and served topped with remaining pine nuts, extra cheese and basil leaves and pepper.



Match your sandwiches with a glass of milk to boost your pre-workout fluid and carbohydrate.

## THAI-STYLE TUNA WRAPS

**Serves** 4

**Preparation time** 10 minutes

### Ingredients

- 1 small carrot, grated
- 2 spring onions, sliced
- 2 tablespoons roughly chopped coriander
- 1 Lebanese cucumber, chopped
- 185g can tuna in spring water, drained and flaked
- 1 cup grated cheddar cheese
- 2 tablespoons Thai-style salad dressing
- 4 tortilla or lunch wrap breads

1. Combine all ingredients except wraps in a small bowl.
2. Spoon topping onto wraps and fold up to enclose.

### Notes

Refrigerate filling in a container for up to two days and assemble wraps just before serving.

### Simple Sandwiches

Sandwiches are a great snack to pop in a cooler bag and take with you to your game. Here are a few simple ideas for light sandwich fillings to give you the energy boost you need:

- ✓ Cream cheese and sliced strawberries
- ✓ Cucumber and cream cheese
- ✓ Ricotta and raspberry jam
- ✓ Raisin bread with ricotta and banana
- ✓ Cheese and Vegemite
- ✓ Tzatziki dip and ham
- ✓ Grated cheese mixed with tuna, corn and mayonnaise



## TURKEY AND BEETROOT RICOTTA SANDWICH

**Serves** 4

**Preparation time** 10 minutes

### Ingredients

225g can sliced beetroot, drained

1 cup firm ricotta cheese

2 tablespoons chopped chives

8 slices white bread

200g shaved roasted turkey breast

50g mixed lettuce leaves

1 Lebanese cucumber, sliced

1. Blend or process beetroot, ricotta and chives until smooth.
2. Spread beetroot ricotta mix over bread and sandwich with turkey, mixed lettuce and cucumber.

### Note

Beetroot ricotta spread can be refrigerated for up to 2 days.

# RECOVERY NUTRITION

You now know the importance of eating before exercise, but did you know that what you eat after sport or training can be just as important? The foods and drinks you eat after exercise can affect how quickly your body recovers and how well you perform at your next game or training session.

## THE THREE KEY PRINCIPLES OF RECOVERY NUTRITION ARE TO:

1

**Refuel** the muscle and liver glycogen (carbohydrate) stores

2

**Rehydrate** by replacing the fluid and electrolytes lost in sweat

3

**Repair** muscle tissue and promote muscle adaptation

## Refuel

After moderate and high intensity exercise your muscle glycogen (carbohydrate stores) will be depleted. If these glycogen stores are not replaced, your performance during your next training session or competition could be compromised. The amount of carbohydrate you require will depend on the fuel cost of the workout you completed and the timing of your next session. On average, 1-1.2 grams of carbohydrate per kilogram of body weight is required for adequate refueling. This equates to 50-100 grams of carbohydrate depending on the weight of the individual. If an intense workout is planned in the next 24 hours, consuming carbohydrate within the first hour of finishing your exercise session is recommended to maximise glycogen stores before your next event.

If your goal is weight loss, you can still aim to refuel glycogen stores before your next session; however it is important that the post-exercise meal is considered as part of your overall energy (kilojoule or calorie) budget. You may wish to plan for one of your main meals or snacks to be consumed straight after your workout.

This meal should provide a nutritious carbohydrate source along with other nutrients such as protein, vitamins and minerals.

## Rehydrate

After a workout, replacing fluid and electrolytes are important for optimal recovery. You continue to lose fluid and electrolytes through sweat and urine even after finishing your session, so aim to replace losses by 150%. In practice, this means if you are a kilogram lighter after your workout, you need to drink 1.5 litres over the next two to six hours (one kilogram weight loss equals a litre fluid deficit).

If sweat rates are high, include a source of electrolytes to help the body rehydrate more effectively. Milk, sports drinks and soup are examples of foods providing electrolytes to help with rehydration. Remember these also provide additional energy (kilojoules) and should be considered in your total energy budget.

## Repair

High-intensity or resistance training sessions result in the breakdown of muscle tissue. Consuming protein after a workout provides your body with the amino acids needed to repair muscles and promote the development of new muscle tissue. Although protein requirements vary between individuals, consuming 20-25 grams of protein soon after finishing exercise can help maximise the muscle rebuilding and repair process.<sup>1</sup> Eating foods high in protein after this period will still promote the muscle rebuilding and repair process, though the rate at which it occurs is less.

1 Phillips SM et al. (2009) Journal of the American College of Nutrition. 28(4):343-54.

The table below provides a list of snacks that provide 50 grams of carbohydrate and also provide a protein source to help you refuel and repair.

**Nutritious carbohydrate and protein recovery meals or snacks**

1 bread roll with cheese or meat filling and a large banana

300g fruit salad with 200g flavoured yoghurt

300g creamed rice

250-300ml milkshake or fruit smoothie

600ml reduced fat flavoured milk

1 large bowl (2 cups) breakfast cereal with milk

2 small cereal bars and 200g flavoured yoghurt

220g baked beans on 2 slices of toast

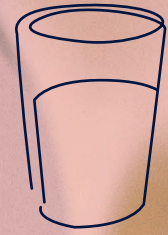
Cheese toastie or grilled cheese on two slices of toast and a piece of fruit

2 crumpets with thickly spread peanut butter and a 250ml glass of milk

300g (large) baked potato with cottage cheese filling and a 250ml glass of milk



# MILK: NATURE'S RECOVERY DRINK



One drink can help rehydrate, refuel, repair – and it is probably already in your fridge! A growing body of scientific research has identified milk as an effective exercise recovery drink, prompting athletes and sports nutrition experts to take notice.

Milk naturally provides both fluid and electrolytes to assist with rehydration. The electrolyte concentration of milk is similar to conventional sports drinks and fluid retention is aided by other nutrients found naturally in milk.

Flavoured milk also provides useful amounts of carbohydrate to refuel muscle glycogen stores. In fact, research has shown that people who drink milk or flavoured milk immediately after training are able to exercise longer in their next session than those who drink sports drinks or plain water.<sup>1,2</sup>

Milk and other dairy foods also contain a unique combination of high-quality proteins (whey and casein), which play an important role in muscle growth and repair.

## DAIRY FOODS PROVIDING APPROXIMATELY 10 GRAMS OF PROTEIN

	Serve size
Milk	300ml
Flavoured milk	300ml
Evaporated milk	125ml
Flavoured yoghurt	250g
Ricotta cheese	100g
Cheddar cheese	40g
Vanilla custard	250ml



1 R Karp et al. (2006) International Journal of Sport Nutrition and Exercise Metabolism. 16:78-91.  
2 Thomas K, Morris P, Stevenson E. (2009) Applied Physiology, Nutrition and Metabolism. 34:78-82.



## CRUNCHY BANANA YOGHURT MUFFINS

**Serves** 12

**Preparation time** 20 minutes

**Cooking time** 30 minutes

### Ingredients

½ cup rolled oats  
2 teaspoons cinnamon  
¼ cup almond meal  
2 tablespoons sunflower seeds  
2 tablespoons brown sugar  
1 tablespoon dairy spread  
1¾ cups self-raising flour  
2 teaspoons cinnamon, extra  
½ cup caster sugar  
2 medium bananas, mashed  
2 eggs  
1 cup vanilla yoghurt  
½ cup peanut butter  
140g tub apple puree

1. Combine oats, cinnamon, almond meal, sunflower seeds, brown sugar and dairy spread in a small bowl to make the topping. Set aside.
2. Sift flour and extra cinnamon into a large bowl, stir in sugar.
3. Place bananas, eggs, yoghurt, peanut butter and apple into a jug. Whisk with a fork to combine. Gently fold into flour mixture until just combined. Spoon into 12 x ⅓-cup capacity muffin pans lined with paper cases.
4. Evenly divide topping over the muffins. Bake at 180°C for 25 to 30 minutes. Stand for 5 minutes before turning onto a wire rack to cool.

### Note

Muffins are best served warm.



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## CREAMY MUSHROOM SOUP WITH FETA

**Serves** 4

**Preparation time** 15 minutes

**Cooking time** 25 minutes

### Ingredients

2 tablespoons olive oil

2 onions, thinly sliced

500g mixed mushrooms (e.g. Swiss brown, cup or field), thinly sliced

1 medium potato, peeled and chopped

2 ½ cups salt reduced vegetable or chicken stock

375ml can evaporated milk

freshly ground black pepper

100g feta

fresh thyme leaves (optional)

4 cheese topped rolls, for serving

1. Heat oil in a large saucepan over medium heat, add onion and cook, stirring for 5 to 7 minutes or until softened. Add mushrooms and cook, stirring, for a further 5 to 7 minutes or until softened.
2. Add potato, stock and evaporated milk. Bring to the boil then reduce heat, cover and simmer for 10 minutes or until potatoes are soft and liquid has reduced slightly. Blend soup in batches, until smooth.
3. Gently warm soup over medium heat and season with pepper. Ladle into bowls or a thermos and serve topped with feta and thyme leaves. Serve with cheese rolls.

### Note

This soup is ideal for keeping in a thermos to enjoy after sport or activity.





## LEBANESE LAMB PIZZA

**Serves** 4

**Preparation time** 20 minutes

**Cooking time** 25 minutes

### Ingredients

1 red onion, finely chopped  
 2 teaspoons ground cumin  
 2 teaspoons ground coriander  
 500g lean lamb mince  
 2 tablespoons currants  
 freshly ground black pepper, to taste  
 1 cup natural yoghurt  
 ⅓ cup sour cream  
 2 tablespoons finely chopped mint  
 juice of ½ lemon  
 450g Turkish bread  
 160g grated mozzarella cheese  
 35g baby spinach leaves  
 1 Lebanese cucumber, thinly sliced  
 mint leaves, extra, to serve  
 2 tablespoons toasted pine nuts

1. Lightly spray a non-stick frypan with oil and heat over medium-high heat. Add onion and cook for 5 minutes or until softened, stir in spices and cook for a further minute. Add mince, and cook, stirring for 5 minutes until browned and moisture has evaporated. Stir in currants and season to taste.
2. Combine the yoghurt, sour cream, mint and lemon juice. Spread half the mixture evenly over the base of the whole Turkish bread. Top evenly with mince mixture and cheese. Bake at 200°C for 13-15 minutes or until cheese is golden brown.
3. Combine spinach leaves, cucumber and mint. Arrange over cooked pizza, drizzle with remaining mint yoghurt and sprinkle with nuts.

### Note

Lamb mixture and mint yoghurt can be made a day ahead and refrigerated until required.

# GOOD HYDRATION



Good hydration is an important priority for athletes and active people. During exercise your body produces sweat to help cool it down. Training for long intervals or in hot conditions can lead to large amounts of fluid loss through sweat, which can result in dehydration and poor performance.

## The hydration zone

When it comes to hydrating for sport and exercise, the goal is to avoid gaining weight (a sign that you've consumed too much fluid) and avoid losing more than two per cent of your pre-exercise body weight (which is the level of fluid loss beyond which performance is affected). This is the 'hydration zone', in which individuals perform at their best and avoid the adverse health effects of dehydration or over-hydration.

The way to stay in the hydration zone is to consume fluids at a rate that keeps pace with your sweat rate. Fluid needs vary based on factors such as body size, exercise intensity and competition conditions. This means everyone will have their own unique sweat rate, so it is best that you calculate your individual sweat rates for the various conditions in which you train or compete.

## What is the best drink during sport?

Water is cheap and effective for hydration during low-intensity or short-duration workouts. For longer, more intense workouts, combining water with a food source containing carbohydrates and electrolytes can be an effective hydration and fuelling strategy. A sports drink can also be used for longer sessions and where sweat losses are high (e.g. when training in hot or humid conditions), especially when taking food may not be a practical option.

Sports drinks provide carbohydrate to top-up fuel levels during exercise and electrolytes such as sodium and potassium, which help your body retain more fluid and replace the electrolytes lost in sweat.

After exercise, milk or flavoured milk can help you rehydrate and also meet other recovery goals such as muscle repair and refuelling.

## KNOW YOUR SWEAT RATE

You can estimate your fluid requirements by weighing yourself before and after training. Each kilogram (kg) of weight lost is equivalent to approximately one litre (L) of fluid.

1. Weigh yourself before training (Initial Weight).
2. Weigh yourself after training (Final Weight).
3. Subtract Final Weight from Initial Weight.
4. The difference plus the volume of fluid consumed during training gives you your sweat rate for that period of time.
5. Divide this by the total time spent training, in hours (hr), to determine hourly sweat rate.
6. Aim to match fluid intake to sweat rate.

Sweat Rate (L/hr) =  
(Initial Weight (kg) – Final Weight (kg))  
+ Fluid (L) ÷ Time (hrs)

## Example Calculation

Weight before workout: 70kg

Weight after workout: 69kg

Fluid consumed: 1.5L

Training duration: 3hr

Fluid loss =

Weight before (70kg) – Weight after (69kg) = 1kg

Sweat loss =

Fluid lost (1L) + Fluid consumed (1.5L) = 2.5L

Sweat rate =

2.5L ÷ 3hr = 0.83L/hr

Drink 830 ml per hour of exercise

(approximately 200 ml every 15 minutes)

Urine colour and quantity is another simple indication of hydration status. A large amount of light coloured urine probably means you are hydrated; dark coloured, concentrated urine probably means you are dehydrated.





## MOCHA FRAPPE

**Serves** 2

**Preparation time** 5 minutes

### Ingredients

2 cups milk

2 scoops (130g) vanilla ice cream

100ml (approx. 1/3 cup) espresso coffee

2 scoops (60g) chocolate protein powder

1 cup ice cubes

1. Blend all ingredients until smooth, pour into chilled glasses and serve immediately.

### Note

Substitute the vanilla ice cream for vanilla yoghurt, if desired.

## BREAKFAST SMOOTHIE

**Serves** 2

**Preparation time** 5 minutes

### Ingredients

1 cup natural yoghurt  
1 cup milk  
2 bananas  
2 teaspoons honey  
½ cup ice cubes  
1 tablespoon rolled oats  
1 passionfruit, halved, pulp removed, to garnish

1. Blend all ingredients except passionfruit until smooth, pour into chilled glasses and serve topped with passionfruit.

### Note

For a berry twist, add ½ cup frozen raspberries to the blender.

## APPLE, GINGER AND MINT LASSI

**Serves** 2

**Preparation time** 5 minutes

### Ingredients

3 green apples  
2cm piece fresh ginger (10g), grated  
2 tablespoons loosely packed mint leaves  
400g natural yoghurt  
2 teaspoons caster sugar  
½ cup ice cubes

1. Push apples through juice extractor into a jug. Blend with remaining ingredients until smooth. Pour into serving glasses and serve immediately.

### Note

If you don't have a juicer, try substituting apples for 350ml of cloudy apple juice.

## STRAWBERRY BASIL PROTEIN RECOVERY SMOOTHIE

**Makes** 2

**Preparation time** 5 minutes

### Ingredients

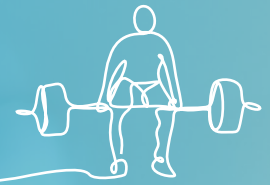
250g punnet strawberries, hulled  
2 cups milk  
1 cup strawberry yoghurt  
15 basil leaves  
½ cup ice cubes  
2 scoops (60g) vanilla protein powder

1. Blend all ingredients until smooth, pour into chilled glasses and serve immediately.

### Note

If protein powder is unavailable substitute with skim milk powder.

# HOW TO GROW MUSCLE MASS



Increasing muscle mass and strength is a common goal for people wanting to get the most out of their sport; not to mention looking and feeling fit off the field as well! When it comes to growing muscle mass, what you eat is just as important as the training you do.

## Increase energy intake

To grow muscle mass you need to support regular strength training sessions (e.g. lifting weights) with a higher-energy diet. This calls for a general increase in foods containing carbohydrate, high quality protein and fat in the right proportions.

Carbohydrates are important to fuel the muscles to train hard. This will stimulate muscles to grow. A carbohydrate-rich meal or snack prior to resistance training has been shown to increase the effectiveness of the workout<sup>1</sup> so you can lift heavier weights and perform more repetitions.

Suitable pre-workout snacks include:

- ✓ Fresh fruit
- ✓ Canned fruit
- ✓ Tub of yoghurt
- ✓ Cereal/muesli bar
- ✓ Flavoured milk
- ✓ Fruit bun or fruit scone

## Well-timed Protein

Many people wanting to grow muscle mass believe they need to eat large amounts of protein. But most Australians easily consume the protein they need, and consuming more won't result in more muscle mass. Rather than just trying to eat more, the focus should be on protein timing. Most people get enough protein in their evening meal, so make sure your breakfast and lunch also contain protein to help achieve a more balanced intake.

Eating protein after a workout provides the amino acids needed to repair muscle fibres and to promote the development of new muscle tissue. Although protein requirements vary between individuals, consuming 20–25 grams of protein within 30 minutes of finishing training can help maximise the muscle rebuilding and repair process.<sup>2</sup>

## Quality protein

When it comes to building new muscle tissue you need a high-quality protein source that contains all the essential amino acids. Protein from animal sources, such as milk, cheese, yoghurt, eggs, meat, poultry or fish is high quality,<sup>3</sup> because it contains all nine of the essential amino acids.

One amino acid, leucine, plays a key role in turning on the muscle-building machinery after exercise. Whey protein from dairy products<sup>4</sup> such as milk, cheese and yoghurt is rich in leucine.

1 Watson P et al. (2008) *European Journal of Applied Physiology*. 104 (4); 633–42.

2 Phillips SM, et al. (2009) *J Amer Coll Nutr* 28 (4); 343–354

3 Young VR and Borgonha A. (2000) *Journal of Nutrition*. 130:1841S–1849S.

4 Layman DK. (2003) *Journal of Nutrition*. 133: 261–267S.

A person wearing a blue tank top is lifting a blue dumbbell. The background is blurred, showing a gym setting.

**Snacks providing 10 grams of high-quality protein  
(combine to reach 20–25g target soon after exercise)**

2 small eggs

30g (1.5 slices) cheese

70g cottage cheese

1 cup (250ml) reduced fat milk

35g lean beef, lamb or pork (cooked weight)

40g lean chicken (cooked weight)

50g grilled fish

50g canned tuna or salmon

200g yoghurt

150g light fromage frais

250ml vanilla custard

**SET REALISTIC GOALS**

It is important to set realistic individual goals, as everyone has different genetic potential to develop muscle mass. It is often difficult to build muscle during the competition season, because the demands of training and games leave little time for the required resistance training and rest needed to grow muscles. The off-season or pre-season is therefore the best time to focus on building muscle.



Serve these post-workout rewards with a glass of milk or yoghurt for an extra protein boost.

## RICOTTA AND CHERRY PROTEIN BALLS

**Serves** 10 (Makes 50 balls)

**Preparation time** 20 minutes

### Ingredients

¼ cup oatbran

⅔ cup hazelnut meal

250g wedge reduced fat, firm ricotta cheese

2 tablespoons honey

¼ cup chopped dried cherries or cranberries

¼ cup chopped dried pears

¼ cup skim milk powder

1 teaspoon cinnamon (optional)

⅓ cup chia seeds (we used a combination of black and white)

1. Mix oatbran, hazelnut meal, ricotta, honey, dried fruit, skim milk powder and cinnamon in a large bowl until well combined.
2. Using clean hands, roll heaped teaspoonfuls of ricotta mixture into balls and coat in the chia seeds.

### Note

Balls will keep refrigerated for up to 3 days.

For easy coating, put chia seeds in a resealable container, add balls, seal and shake until coated.





## CHOCOLATE PEANUT AND RASPBERRY PROTEIN SLICE

**Serves** 8 (Makes 16 bars)

**Preparation time** 20 minutes

**Cooking time** 20–25 minutes

### Ingredients

½ cup rolled oats

¼ cup cocoa powder

60g chocolate or vanilla protein powder

⅓ cup firmly packed brown sugar

¼ cup peanut butter

2 eggs

120g apple puree

½ cup milk

150g wedge firm ricotta cheese, crumbled

¼ cup dry roasted peanuts

½ cup frozen raspberries

1. Blend oats in a food processor until the consistency of flour, tip into a bowl and sift in cocoa then stir in protein powder and sugar.
2. Whisk peanut butter, eggs, apple sauce and milk together until combined and then gently stir into dry ingredients. Spread mixture into a baking paper lined 17x26cm slice tin.
3. Crumble ricotta over the slice mixture and sprinkle with nuts and raspberries, pressing in slightly. Bake at 180°C for 20–25 minutes or until only just cooked through. Cool in tin for 5 minutes before lifting onto a wire rack to cool completely.
4. Cut into 16 bars and refrigerate until required.



# MANAGING BODY WEIGHT

For some athletes, storing excess body fat can slow them down and reduce performance. If you are trying to lose a few kilograms, it is important to work with your coach and an Accredited Sports Dietitian to identify a weight and body fat level that corresponds with good health and performance.

The aim is to lose fat but keep your lean body mass (muscle) the same. To do this you need to change your energy balance so that daily energy expenditure (from exercise) exceeds your daily energy intake (from food). Remember that losing body fat is a long-term goal. The best approach is to set yourself a realistic goal of losing about 0.5 kilograms per week. This can be achieved by a small reduction in energy intake (kilojoules or calories) each day.

## DAIRY FOODS CAN HELP ACCELERATE WEIGHT LOSS

Unfortunately, when many people embark on a weight-loss program they incorrectly reduce or eliminate dairy foods from their diet in the mistaken belief that dairy foods are fattening. But research is showing that the opposite is true! Including dairy foods such as milk, cheese and yoghurt in a weight-loss diet can actually help accelerate fat loss.<sup>1</sup>

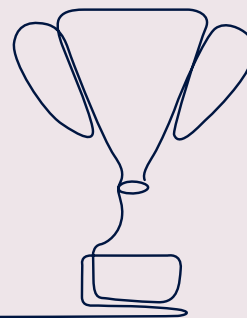
A number of studies have looked at the effect of dairy consumption on weight, body fat mass, waist circumference and lean muscle mass in adults. The pooled results suggest the consumption of three to four serves of dairy foods as part of a kilojoule-restricted diet can lead to greater weight and fat loss compared to a standard kilojoule-restricted diet. The increased dairy diets also led to a greater loss of fat from around the stomach.<sup>1</sup>

Another benefit of including dairy foods in your weight-loss diet is that they can help you maintain or gain lean muscle mass. Preserving or gaining muscle is very important for maintaining metabolic rate and preventing weight regain, which can be a major problem for people wanting to lose weight.

## Tips for reducing body fat levels:

1. Don't eliminate carbohydrates: Carbohydrates are the base of a healthy diet and are needed in order to keep up with the musclefuelling demands of exercise and sport. Remember to match your carbohydrate intake to your training load (see p. 15).
2. Pack some protein: As you lose weight, you lose body fat and some lean muscle as well. Foods containing protein such as dairy (milk, cheese, yoghurt), meat (lean cuts), fish and eggs can help reduce the loss of muscle and can help you feel more satisfied when reducing kilojoules. Including a source of protein at each meal will help you spread your protein intake evenly throughout the day.
3. Moderate fat: Fat contains more kilojoules per gram than protein or carbohydrate. Limiting your intake of junk foods with hidden fat and kilojoules such as takeaway, fried foods, biscuits, chips and chocolate will help to reduce your overall kilojoule intake. Also choose lean cuts of meats and poultry.
4. Fill up – not out: Bulk up your meals with plenty of vegetables or salad. Vegetables are very low in kilojoules and high in fibre, which will help you feel fuller for longer.
5. Don't drink kilojoules: Juice, soft drink and energy drinks are high in kilojoules and offer little or no nutrition. Choose drinks such as water and milk.
6. Use sports drinks wisely: Sports drinks play an important role in rehydration; however, they are also high in kilojoules. Limit sports drinks to long-duration and high-intensity training sessions only.
7. Avoid or limit alcohol: Alcohol is high in energy and drinking too much may lead to excess energy being stored as fat.
8. At least 3 serves of dairy: Including adequate amounts of dairy foods such as milk, cheese and yoghurt in a weight-loss diet can actually help accelerate fat loss and protect lean muscle.<sup>1</sup>

# NUTRITION FOR TRAVELLING ATHLETES



Travel is common for people competing in events such as triathlons or swimming, or for athletes competing at a state level in their sport. Some athletes find it difficult to meet their nutritional goals while travelling, which might impact performance. The following tips will help you achieve your nutrition goals, wherever you go.

## Know your nutrition goals

The main nutrition goals when travelling are to:

- maintain energy levels
- maintain your body composition and strength
- avoid dehydration.

## Be prepared

When travelling you can't always rely on venues to provide the nutrition you need.

Depending on the destination you may want to pack:

- favourite foods which are unlikely to be available at the destination
- snacks to supplement limited catering
- special sports foods or supplements, which are a regular part of your nutritional regime.

## Eat and drink well in transit

Air travel increases fluid losses from the skin and lungs, so it is important to drink plenty of fluids such as water, sports drink or flavoured milk, depending on your energy requirements.

Remember to:

- pack your own drink bottle
- aim for 300ml fluid per hour
- don't be afraid to ask for extra water
- avoid alcohol.

The meals offered on a flight may not be appropriate for athletes. You may want to take a supply of suitable snack foods to supplement the meals provided. Good snack choices include cereal or muesli bars, sports bars, milk-based drinks or supplements, fruit or nut mixes.

Athletes with reduced energy needs may not need all the meals and snacks provided during flights. Drinking fluids and chewing sugar-free gum can decrease the temptation to snack excessively during flights. Some airlines offer low fat or kilojoule-reduced menu options, but these usually need to be pre-booked before you fly.

Long hours of travel can upset your digestive system. To minimise constipation, drink plenty of fluids and eat fibre-rich foods such as fresh fruit, wholemeal bread, breakfast cereals and vegetables.

## Make good meal choices

When it comes to meals, it is important to stick to your nutrition goals. If you are travelling with a team there will often be catering, which has been approved by a team dietitian or coach, however you still need to think about what you put on your plate.

## Buffet or dining hall

- Include carbohydrate and protein at all meals and avoid high-fat foods and dressings.
- Remember it is not your last meal! You don't need to include every item from the buffet.
- Don't concern yourself with what other athletes are eating. Their nutritional needs may vary from your own. Stick to what is right for you.
- Remove yourself from the food environment once you have finished your meal. Don't leave yourself exposed to 'boredom eating'.



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