

# CAFFEINE *some real information*

By Greg Cox, Sports Dietitian

Caffeine use by athletes has recently hit the headlines. Everyone has had a chance to comment on the issue with much of the information published being hearsay, speculation and anecdotal. So what's the real story behind caffeine and exercise performance, and how does this relate to everyday athletes?

**C**affeine is a social drug that occurs naturally in the leaves, nuts and seeds of a number of plants. It enjoys social acceptance and widespread use throughout Australian homes, cafés, restaurants and take-away stores. Dietary sources of caffeine, such as tea, coffee, chocolate and cola drinks, typically provide 30–200 mg of caffeine per serve – although you can never be sure how much caffeine you are getting in some products. Research has found that an espresso may contain anywhere between 25–214mg of caffeine per serve, with 26% of espresso's containing more than 120mg of caffeine. To put that into perspective, a No-Doz tablet contains 100mg of caffeine. Caffeine is also found in numerous sports products, energy drinks and various confectionary items. This has increased the opportunities for athletes to consume caffeine in a convenient form before or during exercise.

Despite conflicting media reports over the past few months, caffeine consumption is legal in sport. On January 1, 2004, caffeine was removed from the World Anti-Doping Agency Prohibited List, allowing athletes to consume caffeine, within their usual diets or for the specific purposes of performance enhancement, without fear of sanctions.

## **What are the effects of caffeine on sports performance?**

Caffeine has numerous actions on different body tissues. The actions vary between individuals and can be both positive and negative.

Effects include:

- Mobilisation of fats from adipose tissue and muscle cells.
- Changes to muscle contractility.
- Increases in gut motility.
- Alterations to the central nervous system to change perceptions of effort or fatigue.
- Stimulation of the release and activity of adrenaline.
- Direct effects on cardiac muscle.

There is sound evidence that caffeine supplementation improves endurance and provides a small but worthwhile enhancement of exercise performance over a range of different settings. One consistent finding across many studies is that caffeine reduces the ratings of perceived effort compared with placebo conditions. Recent research also found that for endurance athletes, caffeine supplementation resulted in an increase of ~3% in endurance power with a smaller benefit seen for non-athletes compared with well-trained or elite athletes. Also, for greatest effect it's best to

withdraw from caffeine for at least 2 days prior to the testing session and definitely use caffeine, not coffee. Other interesting findings include performance benefits seen at doses as low as 3 mg of caffeine per kg body weight and that more than this isn't necessarily better, also the benefits of caffeine ingestion appear to last for hours.

## **Is all caffeine the same?**

It's important to distinguish between the performance effects of coffee and that of pure caffeine. Terry Graham, a world expert on caffeine and sports performance, conducted a study in 1998 that examined the impact of ingesting the same amount of caffeine in a coffee beverage compared with pure caffeine and water. The results showed that despite similar levels of caffeine in the blood following the different caffeine trials, performance was only enhanced when caffeine was consumed independent to coffee. The researches concluded that other compounds in coffee interfere with the normal ergogenic response to caffeine.

## **Does caffeine dehydrate you?**

Some athletes avoid using caffeine before or during exercise as it causes dehydration – or does it? In a recent study researchers investigated the effects of consuming caffeine over the course of the day. The

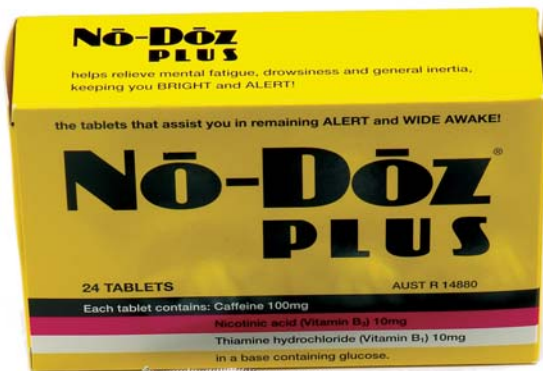


# CAFFEINE CONTENT OF COMMON FOODS, DRINKS AND SPORTS SPECIFIC PRODUCTS



80mg of pure caffeine.

Food or drink	Serve	Caffeine content (mg)
Instant coffee	250ml cup	12-169*
Brewed coffee	250ml cup	40-110*
Espresso Coffee	1 Espresso	25-214*
Tea	250ml cup	9-51*
Hot Chocolate	250ml cup	5-10
Viking chocolate bar	60g	58
Coca Cola	375ml can	49
Pepsi Cola	375ml can	40
Musashi E shot Cola	300ml	95
Jolt Soft drink	375ml can	75
Red Bull energy drink	250ml can	80
V energy drink	250ml can	50
PB Sports Nutrition Sports Gel (Espresso)	35g Sachet	40
High5 Energy Gel Plus	38g Sachet	35
Gu caffeinated sports gel	32g sachet	20
Carboshotz (all flavours)	50g sachet	2.5
PowerBar Performance bar with ActiCaf (Raspberry + Cream)	65g bar	50



One No-Doz tablet contains 100mg of pure caffeine.



50mg of pure caffeine.



\* The caffeine content of tea and coffee varies depending on the brand, type of coffee, the way the beverage is made and the size of the cup.

results questioned the widely accepted notion that caffeine acts chronically as a diuretic.

For many people caffeine-containing drinks such as tea, coffee and cola provide a significant source of fluid in their everyday diet. It's likely they would drink less fluid if they were to exclude all caffeine containing beverages, so any increases in urine loss associated with caffeine is likely to be overshadowed by a decrease in total fluid intake for habitual caffeine drinkers.

#### What are the side-effects?

Now it's not all blue skies when looking at caffeine use. It's worth considering the likely side-effects of caffeine before using or suggesting it.

Side-effects include:

-The potential to cause increases in heart rate, impairments or alterations of fine motor control and technique, and over-arousal which is likely to interfere with concentration during exercise, and recovery and sleep patterns following the exercise.

-Caffeine is a gastric irritant, which for some athletes will cause gastrointestinal upset if used close to or during exercise. Athletes that get pre-race toilet jitters, are best to avoid trialing or using caffeine before or during exercise as this is likely to compound the problem.

-Although evidence of specific health problems is equivocal, long-term intakes of large amounts of caffeine (>500 mg per day) are generally discouraged by health authorities.

#### Other considerations

Caffeine is unlikely to be beneficial for younger athletes as performance benefits will be washed out by

the general development of the athlete. Given there is so much room for improvement in their general conditioning and fitness, along with their experience of racing, it would be wrong for them to attribute any increase in performance to caffeine use.

Athletes that get revved up or nervous before an event may find taking caffeine an hour before exercise detracts from their ability to mentally focus. Endurance athletes in this situation may find benefit in taking caffeine closer to the event to avoid being over stimulated at the start of the race. Also, It certainly needs to be trialed by individual athletes as research has clearly shown response varies greatly.

#### Suggested strategies for caffeine use

Given there are numerous strategies you can employ in using caffeine, the following table simply provides an example of use for various running events.

Runners already using caffeine or those interested in using caffeine to enhance their sports performance should trial caffeine following advice from a qualified Sports Dietitian or Exercise Physiologist.

Event	Timing	Strategy
10,000m or less	60min before racing.	3mg of pure caffeine per kg of body weight
Half Marathon Marathon	15-60min before racing. Closer for those that get over stimulated.	As above
Ultra-endurance race (eg 100km)	During the final third of the race.	Replace sports drink with flattened cola.



## Eggplant Moussaka

1 medium eggplant, sliced  
5 medium potatoes, sliced and par cooked (preferably steamed)  
olive or canola oil spray  
1 medium onion, diced  
1 teaspoon crushed garlic  
1/2 red capsicum, diced  
2 medium zucchini, diced  
6 mushrooms, diced  
440g tin diced tomato  
150 g tomato paste  
1 tablespoon MAGGI soy sauce  
1/2 teaspoon oregano  
1/2 teaspoon basil  
salt and pepper to taste  
375g low-fat ricotta cheese  
150 ml CARNATION Light and Creamy evaporated skim milk  
1/4 cup low fat grated cheese  
1/4 cup diced sundried tomatoes (no oil variety)  
4 large or 6 small bread rolls

Serves 4-6

Preheat oven to 180°C. Spray eggplant lightly with olive oil and grill or barbeque until cooked. Spray a frypan with cooking spray and add onion, garlic and capsicum. Cook until soft. Add zucchini, mushrooms, tinned tomatoes, tomato paste, soy sauce and herbs and simmer for 15 mins. In a separate bowl, mix low-fat ricotta

cheese with evaporated skim milk. In a medium sized lasagne dish place a layer of potato slices, followed by a layer of eggplant and a layer of vegetable mix. Repeat this step and then top with ricotta cheese mix. Sprinkle with grated cheese and then place sundried tomatoes evenly on top. Bake 30-40 minutes or until golden brown.

Serve with bread and salad.

Optional – To make this a complete vegetarian meal – add 1/2 cup of textured vegetable protein (TVP) to the sauce. You will need to add 1/4 cup of water to allow for the TVP to rehydrate.



*Recipe taken from 'Survival Around The World' cookbook.*

## Restaurant Review



### The Vegie Bar

380 Brunswick Street

Fitzroy, Victoria.

Ph: 03-9417 6935

Website: [www.vegiebar.com.au](http://www.vegiebar.com.au)

For the ultimate vegetarian experience visit the Vegie Bar!

This funky café/restaurant situated centrally along bustling Brunswick St has a very warm, earthy feel and due to its popularity it is often busting at the seams. It has large group tables as well as private alcoves, with an open kitchen for all to see. You may find yourself sharing a table with strangers but that's part of the experience. The service is slick, yet casual, and the staff friendly and eager to help out.

#### What's on offer

It's a full vegetarian experience, also

catering for vegans. The starters are extensive and range from spring rolls and siamese samosas, to nachos, dips and bread. All ingredients are fresh and serves are generous. Entrees and mains include soups, burgers, woodfired oven pizzas, noodles, pasta, and curries – the only downside to the Vegie Bar is there's so much delicious food to choose from! For dessert they have a range of baked delicacies that rotate daily, including crumbles, slices, cakes and pudding. Also, The Vegie Bar is fully licensed and caters for gluten free.

#### Prices

The price list is fantastic, most mains are around \$10. For entrées, mains, dessert and drinks, a couple won't spend more than \$30-40.



Thanks to R4YL and The Vegie Bar if you take this coupon you'll receive a free juice with any main meal purchased!