

EAT MORE SPUDS FOR A HEALTHY GUT!

Busting the myths on the nutritional benefits of potatoes.

by Paulette Baumgartl



A bowl of roast potatoes, a cooling potato salad, or smooth mash are all favourites of the Australian table. Yet, many dated misconceptions continue to linger about potatoes and their health benefits.

Far from being a mere comforting and economic staple, potatoes pack a nutritional punch and are a healthy carbohydrate choice.

The Hort Innovation project (PU190002), *Educating health professionals about Australian potatoes*, set out to bust some of the myths about potatoes.

Instead, the aim was to deliver evidence-based nutritional information about Australian potato products to dietitians, nutritionists, naturopaths, GPs, students of health-related disciplines, as well as other health professionals such as personal trainers and health coaches.

Although primarily targeted to these groups, potato growers and the broader potato industry can also access all the data, resources, and information via the project's online platform (<https://www.powerpackedpotato.com.au>) for their own business development.

HIGH IN FIBRE, LOW IN CARBS

To provide clear and evidence-backed information, an essential part of the project was to generate new, current data. The project team carried out nutrient testing (July to September 2020) with analysis performed by *AgriFood Technology* on six varieties of potato (Crème Royale, Royal Blue, Sebago, Desiree, Cremoso, Dutch Cream) sourced from growing regions in South Australia, Western Australia, Tasmania, and Queensland. Potatoes were steamed before testing. Samples tested while hot for all nutrients, except resistant starch (RS). To test for RS the potatoes were steamed as usual, then chilled at 4°C for 2 hours and tested cold.

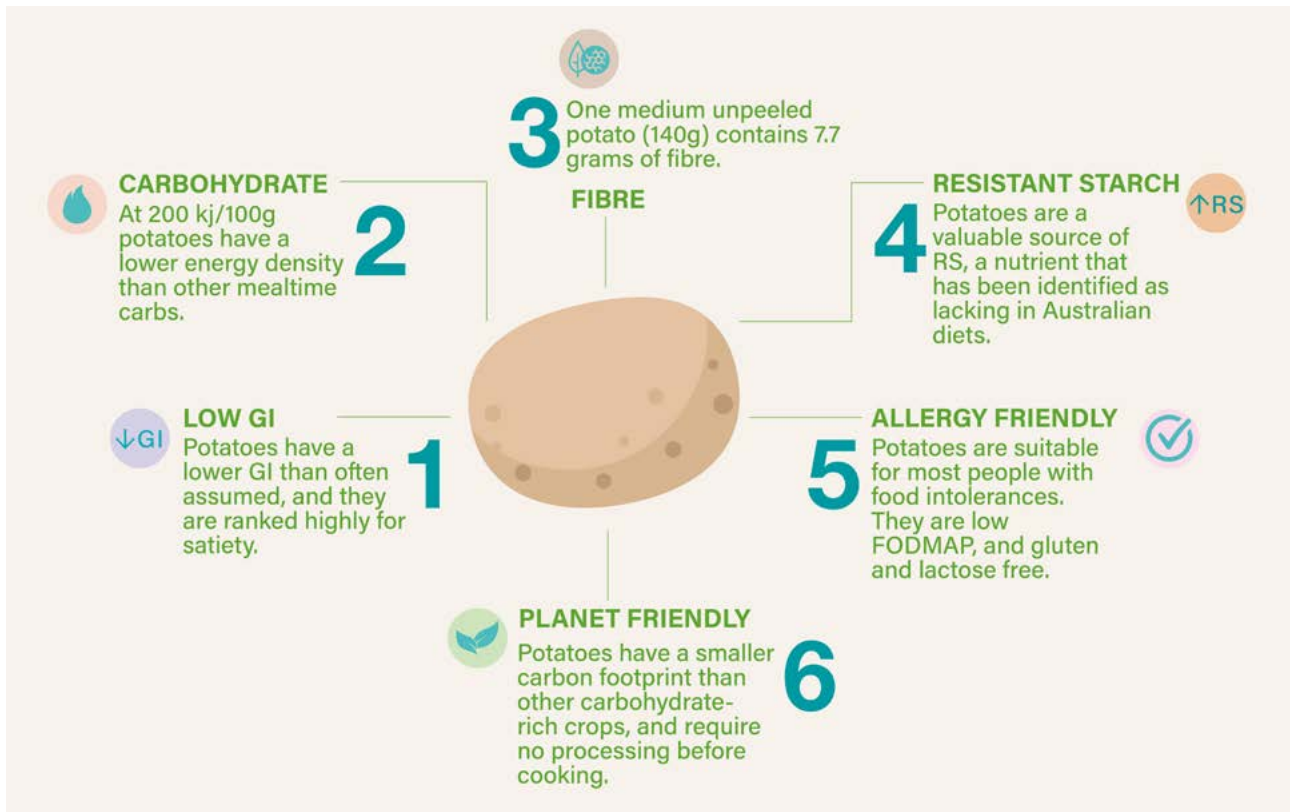
Potatoes are a greatly misunderstood vegetable. They are often dismissed as 'too fattening' by career dieters and banned from the *five a day* list because they are considered a starch.

KEY POINTS

- This project generated new data on the nutritional values of potatoes and forms the basis for evidence-based education for health, nutrition, and sports professionals
- Potatoes are much higher in fibre than previously believed, especially resistant starch
- When cooked and then cooled, resistance starch increases and GI decreases
- Potatoes are the main intake of resistance starch in Australian diets
- The full suite of resources generated from this project is available online

However, the new nutritional values obtained demonstrate that their nutrient profile is a lot more favourable than broadly perceived. Two particularly notable outcomes were **energy density** and **fibre content**.

Potatoes have a much lower energy density (or KJ value) and are much higher in dietary fibre than assumed. Critically, the fibre in potatoes is



high in resistant starch, which in turn lowers the glycaemic index of potatoes. Win, win and win!

Fibre

As most Australians currently fall short of the recommended daily intake, understanding sources of dietary fibre is all-important.

Currently, dietary fibre values for potatoes are sourced from the Australian Food and Composition Database (AFCD). Examination reveals some incongruities with the AFCD data, and no comparative data for resistant starch in cooked and cooled potatoes. Information from this project therefore provides a valuable contribution to understanding the nutritional qualities of potatoes.

Compared to AFCD data, results for this project showed higher values of dietary fibre, as shown in Table 1.

These new insights into the value of potatoes will support health professionals in recommending the inclusion of potatoes into diets.

Resistant starch and pre-biotics

Resistant starch has been identified as lacking in Australian diets. Resistant starch is considered a pre-biotic fibre because it cannot be broken down by usual digestive processes in the small intestine. It reaches the large intestine intact, where it is fermented by gut bacteria. It is excellent for gut health, providing the gut with lots of useful microbiota. There are many health benefits of prebiotics including:

- reduces prevalence and duration of infection and antibiotic-associated diarrhoea
- reduces inflammation and symptoms associated with inflammatory bowel disease
- helps protect against colon cancer
- enhances bioavailability and uptake of minerals, including calcium, magnesium and possibly iron
- lowers risk factors for cardiovascular disease, and

- promotes satiety and weight loss

Currently potatoes, followed by bananas, are Australian's primary source of resistant starch. We need to eat more potatoes!

MYTH NO. 1 - POTATOES ARE BAD FOR BLOOD SUGAR

The glycaemic index (GI) is a ranking from 0 to 100 based on how quickly the carbohydrates in food are broken down into glucose. It is based on how much different foods raise blood sugar after they are eaten.

The lower the GI, the more slowly the energy contained in that food is released. This helps manage diabetes, as well as keeping us energised and feeling fuller for longer. Not the dreaded peaks and troughs of sugary foods!

Most people know that whole grain foods have a lower GI than their processed counterparts (that is, they are broken down more slowly). However few would realise that

| FIBRE | Serving size: 1 medium potato, unpeeled (140g) | | | | | |
|-------------------|--|----------------------------|---------------------------|----------------------------|----------------------------|---------------------------|
| | AFCD data | | | Project data | | |
| | Average quantity per serve | % daily intake per serving | Average quantity per 100g | Average quantity per serve | % daily intake per serving | Average quantity per 100g |
| Total | 2.7g | 9g | 2g | 7.7g | 26% | 5.5g |
| Soluble | | | | 2.6g | | 1.9g |
| Insoluble | | | | 5.1g | | 3.6g |
| Resistance starch | | | | 2.2 | | 1.6g |

Table 1. Dietary fibre data from this project and AFCD data

potatoes are a low carbohydrate food, lower even than brown rice (Figure 1), and when prepared properly, can be a low GI food.

However, calculating GI in any food is harder than it seems. This is particularly true for potatoes, which have widely variable GIs, more so than any other food. Potatoes are often represented as high GI; however, it isn't that simple. The GI of potatoes is influenced by many factors. Variety, storage, age, and preparation can all affect the GI of potatoes.

While there is no clear pattern between the GI of potatoes cooked using different methods, cooling cooked potatoes for at least two hours increases the level of resistance starch (RS), which is associated with lower GI. Some studies have reported that GI after cooling is 28% lower, and if eaten with vinegar (hello European potato salad), GI is 31-43% lower than that of freshly boiled potatoes.

MYTH NO. 2 - POTATOES ARE FATTENING BECAUSE THEY ARE HIGH IN CARBOHYDRATES

Despite many associating weight loss with no carb/low carb food, healthy carbohydrates are essential to a balanced diet. Potatoes are often sacrificed at the altar of rapid weight loss, or unfairly plonked into the 'sometime food' basket.

This is where the project team busted

myth number 2. Potatoes contain less carbohydrate and have a lower energy density than other mealtime carbohydrates such as pasta and rice. Because of their high water content, potatoes are far and away not a high carb food.

This is great news for calorie counters who can literally have their (oven baked) potato cake and eat it too!

MYTH NO. 3 - POTATOES ARE BAD FOR THE ENVIRONMENT

Potatoes are not just good for us, they are also good for the planet. Potatoes are the world's fourth largest food crop and with a smaller carbon footprint than most other staples. Potato crops are less resource intensive than

other carbohydrate-rich crops and require no processing before cooking. Furthermore, as potatoes are grown in from Atherton in the north to Tasmania in the south, all fresh potatoes available for purchase are grown in Australia, meaning that their carbon miles are also low.

Australians typically eat fewer potatoes per person per year than culturally and economically similar countries. Promoting the nutrition and environmental merits of this not-so-humble vegetable could shift consumption upwards.

Good for the industry.

Good for our health.

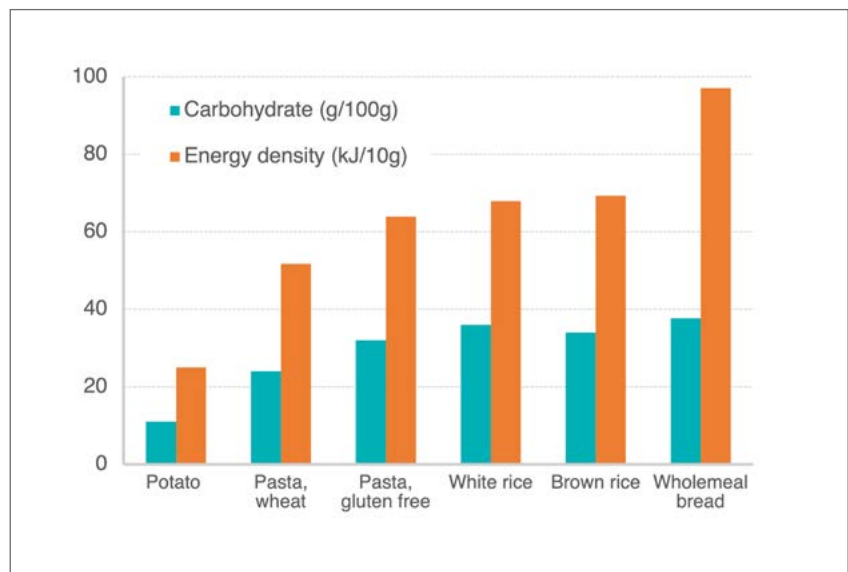


Figure 1. Energy density and carbohydrate content of common mealtime carbohydrates.

POTATOES POWER PERFORMANCE

Every athlete knows that carbohydrates are essential fuel for top performance as well as post workout recovery. Potatoes provide the carbohydrates, potassium, and energy that strength and endurance athletes need to perform at their best.

At the recent World Potato Congress in Ireland, Dr Katherine Beals gave an inspirational talk into the benefits of potatoes for exercise. Dr Beals is an Associate Professor in Nutrition at the University of Utah, as well as holding a PhD in exercise science, so she has professional expertise on both topics.

Dr Beals gave several examples of studies where potatoes have been compared against artificial sports supplements as fuel for athletes.

In one trial, twelve cyclists were given either water, PowerBar Gels, or potato puree during a two-hour ride followed by a 10-mile time trial. Both the potato and the gels significantly improved their time trial performance compared to water alone, there being no difference in results between the two supplements¹.

The researchers concluded that *“potato ingestion during prolonged cycling is as effective as carbohydrate gels to support exercise performance in trained athletes”*

In another experiment², 16 recreational cyclists were given either potatoes or sports supplements after 90 minutes of cycling. The researchers measured levels of glycogen (glucose used for energy) in their muscles during a four-hour recovery period. The cyclists then completed a 20km time trial. Once again, potatoes were just as good as the sports supplements in helping muscle recovery as well as supporting time trial performance.

Other new research asked young men to do leg presses and knee extensions until they could do no more³. Potato protein and milk protein were identical in helping muscle recovery but, of course, potato provides a plant-based, environmentally friendly option.

According to Dr Beals, potatoes are simply the best fuel for exercise. Not only do they contain the carbohydrates needed for energy, but an average potato contains 3g of complete protein. This has high biological value, supporting muscle synthesis and tissue repair.

Many will be also surprised to learn that potatoes contain more potassium than a banana (approx. 620mg vs 450mg).

Potassium is essential for correct muscle function, and must be replaced after sweating.

Perhaps that is why pro-rider Toms Skuijns, champion of Latvia and member of the Trek Segafredo cycling team, is an official potato ambassador of the World Potato Congress. Toms is a true believer in the power of potatoes; check out his YouTube video on the Potato Man of the Peleton (www.youtube.com/watch?v=NSbg_HzdhiY) and website (<https://www.tomsskuijns.com/potato>) for favourite potato recipes and tips, as well as his pride in being able to promote potatoes.

So clearly there is nothing humble about potatoes. Next time you're out exercising, don't reach for that sugary sports drink, choose a potato.

Ed. – I have tried this myself; on a recent bike ride, I pulled a couple of baked potatoes out of my jersey pocket while my buddies sucked on their gels. Sure, they looked at me strangely, but I found it a lot more satisfying than the sticky, sugary substances they were forcing down...



Toms Skuijns, the potato ambassador

1 Salvador AF et al. 2019. Potato ingestion is as effective as carbohydrate gels to support prolonged cycling performance. *J. Appl. Physiol.* 1:1651-1659.

2 Flynn S et al. 2020. Males and females exhibit similar muscle glycogen recovery with varied recovery food sources. *Eur. J. Appl. Physiol.* 120:1131-1142.

3 Pinckaers PJM et al. 2022. Potato protein ingestion increases muscle protein synthesis rates at rest and during recovery from exercise in humans. *Med Sci Sports Exerc.* 54:1572-1581.

Research undertaken as part of this project was detailed and extensive. Full reports are available via the Hort Innovation website and at <https://www.powerpackedpotato.com.au>.

Article based on: *Final Report: Educating health professionals about Australian potatoes - Project leader: Rachel Bowman; Delivery partner: Seedbed Media; Potato Nutrition: An evidence-based Approach, Compiled by Dr Jane Watson.*