



GIWA
Grain Industry Association
of Western Australia



Australian Sweet Lupin: The Next Superfood?

NUTRITIONAL INFORMATION & RECIPES



*This project was supported through funding from the
Australian Government's Package Assisting Small Exporters.*

Australian Sweet Lupin: The Next Superfood?

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Western Australia is the world's largest producer and exporter of Australian Sweet Lupin and Australian Albus Lupin, producing over 700,000 tonnes annually in 2016, worth over AUD\$200 million. Due to its unique nutritional value and health benefits, lupin is attracting increasing attention as a potential new "superfood" for human consumption, which can help address heart disease, diabetes and obesity. Western Australia also grows and exports for human consumption smaller quantities of other pulses such as chickpea, red lentil, field pea and faba bean.

A number of peak industry bodies, researchers, commercial plant breeders, seed distributors, pulse exporters, food ingredient exporters and nutritional consultants service the Australian Lupin Industry – their contact details are listed in the Resource Appendix to this recipe book.

In 2016, the Australian federal Department of Agriculture and Water Resources, through the Package Assisting Small Exporters (PASE) Program, contracted the Grain Industry Association of Western Australia (GIWA) to assist small exporters of Australian lupin in developing a pre-competitive market entry strategy into Middle Eastern countries based on the human nutritional qualities of Australian

sweet lupin. This Recipe book is one of the pre-competitive promotional resources resulting from this "GIWA PASE Lupin As Food to the Middle East Project".

The Grain Industry Association of Western Australia (GIWA) gratefully acknowledges the following organisations and individuals for their assistance in this project:

- Growers and Small Exporters of Australian Sweet Lupin
- Australian Department of Agriculture and Water Resources
- Package Assisting Small Exporters (PASE) Program
- Department of Agriculture and Food Western Australia
- Department of State Development Western Australia (Trade Office Dubai)
- Pulse Australia
- Grains & Legumes Nutrition Council
- Australian Export Grain Innovation Centre
- Chemcentre
- Curtin University
- University of Western Australia
- The University of New South Wales
- Dr Shyamala Vishnumohan, Project Coordinator



Australian Government
Department of Agriculture
and Water Resources



Grains &
Legumes
Nutrition
Council

Cultivating Good Health



Australian Export Grains Innovation Centre

Love Lupins

Lupins are the world's richest natural source of combined plant protein and fibre

Australian Sweet Lupins (ASL) are capturing the attention of the food industry, health and culinary professionals and consumers from around the world due to its exceptional nutritional value and versatility.

40% protein | 34% fibre | negligible starch | low GI | gluten free
Non GMO | sustainably produced



"I grew up in an Indian household where no meal was complete without a steaming hot bowl of dhal! I am not short of pulses, but I admit it – I am now officially obsessed with Australian Sweet Lupins"

***Pictured: Dr Shyamala Vishnumohan
Qualified Nutritionist and Australian Food
Revolution Ambassador, a campaign lead
by Jamie Oliver***

Lupin is an ancient food

Lupin is an ancient legume consumed throughout the Mediterranean region and Andean mountains for thousands of years. However, the ancient cultivar (*Lupinus albus*) contains bitter alkaloids which must be removed by soaking in brine followed by boiling. They are usually consumed cold as a delicious whole bean snack, forming an important part of the Mediterranean diet. They are known to contribute to the fertility of soil.

What are Australian Sweet Lupins?

The Australian Sweet Lupin is iconic to Western Australia where the vast majority of lupins are now produced and the Mediterranean style climate is absolutely perfect to cultivate this nutrient rich crop. In fact, Western Australia is responsible for 85% of the world's lupin crop.

Over the last 60 years lupin has been subjected to plant breeding in Australia resulting in a cultivar (*Lupinus angustifolius*) which has negligible amounts of bitter alkaloids. This sweeter neutral tasting bean no longer needs soaking in brine or cooking and can now be eaten uncooked.

Sweet lupin is highly versatile and is currently available as splits, grits, flakes and flour (kernel flour and wholemeal).

Australian Sweet Lupin nutrition and health benefits

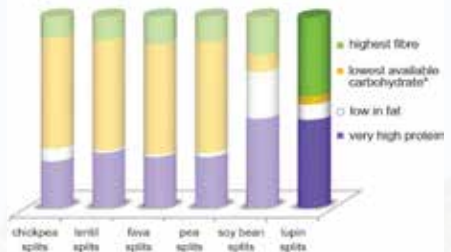
- Lupin kernels are impressively high in protein (40%). That's **twice the amount of protein in chickpeas**, four times the amount of protein in whole grain wheat.
- They are loaded with fibre (34%). That's nearly **twice the amount of fibre in chickpeas**. The dietary fibre acts like both soluble fibre (oat fibre) and insoluble fibre (wheat bran).
- Lupins have the **lowest glycaemic index** of any commonly consumed grain. Low GI foods slow down the absorption of sugars into the bloodstream, helping balance the blood glucose level for people struggling with type 2 diabetes.
- Lupins have **three times more iron than kale**.
- Lupins act as a **prebiotic**, promoting the growth of good bacteria and assisting with gut health.
- Lupins in the diet **can benefit people with hypertension**. Lupins are a rich source of arginine, an amino acid that is thought to improve blood vessel performance.
- Lupins promote satiety (**keeping you full longer**).
- Naturally **gluten free**, lupins are suitable for people with gluten intolerance and Coeliac disease.
- Lupins contain **negligible amounts of phytoestrogens**, avoiding potential problems from hormone- like components abundant in soy products.
- Australian Sweet Lupins are **low in alkaloids and anti-nutritional factors**.
- Lupins are **not genetically modified**.

Please see appendix for a list of studies on Australian Sweet Lupin.

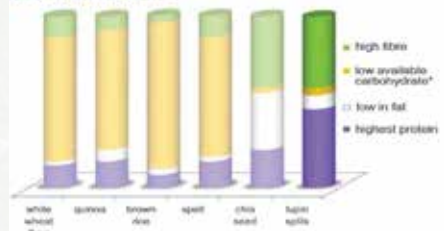
How does Sweet Lupin compare nutritionally to other ancient grains, cereals and legumes?

NUTRITION PROFILES

Lupins compared to other Legumes



Lupins compared to other Cereals & Ancient Grains



Source: Kouris Blazos & Belski APJCN 2016

Sustainability

They are eco-friendly with a low carbon foot-print. They play an important role in the ecological balance of agriculture by fixing nitrogen to soils, creating a better environment for growth.

Allergy

Lupin, like other protein containing foods (eg. peanuts, soy, dairy, shellfish, eggs) may trigger an allergic reaction in a small % of the population (Less than 1%) and need to be protected. People with allergies, especially to peanuts and legumes, should avoid lupin.

Lupins Love Your *Whole* Body

Brain

- Magnesium for an active brain

Teeth

- Magnesium for strong teeth

Heart

- Soluble fibre to reduce cholesterol
- Arginine to help lower blood pressure

Immunity

- Zinc for immunity

Weight

- Low GI and high protein for weight loss
- Appetite control to stay a healthy weight

Gut Health

- Prebiotic fibres for good gut health

Diabetes Control

- Low GI to help maintain healthy blood glucose levels

Energy

- Iron to fight fatigue
- Soluble fibre to even out energy spikes and dips

Muscles

- Three times the protein of quinoa for muscle strength

Bones

- Magnesium for strong bones



Grains & Legumes[™]
Nutrition Council

Cook Lupins

DELICIOUSLY NUTRITIOUS RECIPES USING
AUSTRALIAN SWEET LUPINS

Please note:

The nutritional information supplied on our recipes is based on theoretical data and cooked weight and calculated using NUTTAB from Food Science Australia New Zealand (FSANZ). Nutrient values may vary from those published and are based on the lower number of servings.

Lupin hummus

Three Ways



Makes 10 serves

Lupin hummus:

100 g lupin grits
5 g bicarb soda
200 ml ice cold water
4 garlic cloves chopped
5 g lemon salt
25 ml lemon juice
100 g tahini
Pinch of salt
5 ml Olive Oil



Method

Soak lupin grits in hot water for 20 minutes and drain. Cook the grits for 15 minutes in water with bicarb soda until soft. Drain and rinse with cold water. Blitz lupin with 200 ml of ice cold water, lemon juice, garlic and lemon salt to a smooth and creamy paste in a food processor. Add tahini and mix into the paste.

To serve

Drizzle olive oil just before serving.
Serve with warm fresh flatbread.

Lupin hummus with beetroot:

60 g lupin hummus
4 walnuts chopped
100 g beetroot (1/2 beetroot pickled) finely chopped
30 g slices of fresh beetroot, cut into fine shapes and deep fried
2 g of green chilli

Mix all the ingredients into the Lupin hummus and serve with bread sticks.



Lupin hummus with avocado and pistachio:

60 g of basic Lupin hummus
20 g pistachio nuts blanched and finely chopped
150 g of an Avocado (half medium size)

Mix the pistachio nuts into the Lupin hummus and mash the Avocado in the above mixture.



Nutrition per serving Lupin Hummus

Calories	Fat	Saturates	Protein	carbs	sugar	salt
110	7.4 g	1 g	6.2 g	1 g	0.4 g	341 mg

Lupin and cottage cheese with baby aubergine & yoghurt sumac dressing



Makes 2 serves

Baked baby aubergines

2 baby eggplants
15 ml orange juice
15 ml lemon juice
15 ml honey
1 tablespoon olive oil
Salt and pepper

Lupin salad with cheese

40 g cottage cheese
40 g lupin splits
30 g tomatoes
30 g Lebanese cucumber
30 g diced green, red and yellow peppers (each)
10 g spring onions, cut into thin rounds
50 g fresh mint, finely chopped
5 g black sesame seeds
15 ml extra virgin olive oil

Yoghurt sumac dressing

60 ml fresh leban (buttermilk/yoghurt)
3 g sumac
1/2 garlic clove, finely chopped



Method

Cut the baby aubergines in half lengthwise and make deep diagonal criss-cross cuts, taking care not to pierce the skin.

Mix remaining ingredients mentioned with baby aubergines well for marinade. Brush over the aubergines and bake them for about 20 mins at 160 C. Take the aubergines out and leave to cool.

Scoop the eggplant from shell to mix with cottage cheese, other vegetables, black sesame seeds and olive oil.

Soak lupin splits in hot water for 20 mins and drain. Cook the splits for 20 minutes in water. Leave aside for cooling. Mix with prepared eggplant salad.

Combine all the ingredients for the dressing.

To serve

Place aubergines cups in a bowl or a platter

Fill the lupin and cottage cheese salad, sprinkle with dressing and garnish with mint

Nutrition per serving

Calories	Fat	Saturates	Protein	carbs	sugar	salt
305	17.1 g	2.7 g	16 g	16.4 g	14.8 g	1 g



Orange lupin vegetables with chargrilled squid in mint yoghurt

Makes 4 serves

Orange lupin

200 g lupin grits
50 g orange segments
200 ml orange juice
5g cinnamon
10g cumin
50 ml honey
60 ml olive oil
Salt and pepper

Vegetables

100 g peppers, cut into small pieces
10 g mint leaves, finely chopped
60 g Kalamata olives cut into small pieces
60 g tomatoes, diced small
40 g spring onion, cut into very thin slices

Squid

120 g fresh squid, cut into rings
20 g dill chopped
40 ml lemon juice
5g paprika
40 ml olive oil
Salt and pepper

Mint yoghurt

300 ml buttermilk/yoghurt
80 g cucumber peeled, seeded and finely chopped
20 g fresh mint, finely chopped
2 garlic cloves, finely chopped
Fresh mint leaves to garnish
Salt and pepper



Method

Soak lupin grits in hot water for 20 min and drain. Cook the lupin grits using orange juice for 15 min.

Lupin should absorb all the liquid while cooking, if necessary sprinkle some water. After the lupin grits has finished cooking, carefully mix honey, cinnamon, cumin and olive oil before seasoning.

Allow the lupin to cool and then mix it with the vegetables and orange segments.

Season squid with salt, pepper, paprika, lemon juice and olive oil and char-grill the squid.

Cut the char-grilled squid into strips and place them on prepared salad.

Sprinkle dill on top.

Mix all the ingredients for mint yoghurt and season to taste.

To serve:

Place the orange flavoured lupin into individual bowls

Arrange the char-grilled squid on top

Garnish with chopped mint and serve mint yoghurt separately



Nutrition per serving

Calories	Fat	Saturates	Protein	carbs	sugar	salt
501	29 g	4.5 g	25.8 g	25.2 g	21.8 g	321 mg



Lupin and lentil with pineapple tabbouleh and pomegranate

Makes 4 serves

Lupin tabbouleh

50 g lentils
50 g lupin splits
1 tablespoon caraway seeds
50 g roasted cashew nuts
150 g Italian parsley very finely chopped
100 g tomatoes diced
80 g shallots, diced small
40 g fresh mint, finely chopped
80 g pomegranate
120 ml lemon juice
75 ml olive oil
200 g fresh pineapple diced
5g sweet paprika
Salt

Garnish:

Pineapple leaves
20 g pomegranate seeds

Method

Soak lupin splits in hot water for 20 minutes and drain. Cook the lupin in hot water for 20 minutes.

Roast caraway seeds and sprinkle on top of the salad.

Cook lentil same as lupins.

Soak the roasted cashew nuts in 20 minutes.

Mix all the ingredients lupin, lentil, nuts and diced pineapple.

Season well with lemon juice, olive oil and salt.

Garnish with pomegranate and pineapple leaves.

Nutrition per serving

Calories	Fat	Saturates	Protein	carbs	sugar	salt
389	25 g	4 g	14 g	18.5 g	11.5 g	70 mg

Mhajeb stuffed Algerian pastry with lupin

Makes 4 serves

Lupin pastry

125 g lupin flour
65 g plain flour
50 ml water
Salt

Courgette filling

300 g zucchini, cut into small pieces
1 garlic clove, peeled and crushed
2 roma tomato, diced without seed and pulp
1 red chilli chopped
1 tablespoon dried mint
1 onion diced
Salt and pepper
Olive oil

Chicken liver filling

200 g chicken liver
20 g cocoa butter powder
1 garlic cloves, peeled and crushed
 $\frac{1}{2}$ tsp. peppercorn, coarsely ground
 $\frac{1}{2}$ onion, finely chopped
1 tablespoon pomegranate
1 tablespoon lemon juice
5 g fresh coriander chopped
Salt

Salad

30 g rocket salad
30 g zaatar or watercress
4-5 cherry tomato, halved
Salt and pepper



Method

Combine the pastry ingredients to make smooth, soft pastry dough (like pizza dough)
Allow the dough to rest for half an hour
Divide into equal portions to desired size

For courgette filling

Heat oil, add garlic, onion and sauté well and add paprika and red chilli

Add zucchini, again sauté well and add salt, pepper and dry mint

Finally add diced tomato and stir it well

Keep aside for cooling

For chicken liver filling

Mix chicken liver with cocoa butter powder and fry them quickly in a very hot pan

Add onion, garlic and coarse pepper for about 5 mins

Add lemon juice, pomegranate syrup

Add finely chopped coriander and salt

Keep aside for cooling

Salad

Mix all the ingredients well

Sprinkle extra virgin olive oil

To make Mhajeb

Roll the portioned dough into very thin rectangles.

Place the stuffing of your choice over half of the rectangle, then fold over the other half and press it down firmly along the edges.

Fry both sides of each pastry in oil until golden brown before cutting it diagonally into four triangular pieces

Nutrition per serving (Lupin pastry with Chicken liver filling)

Calories	Fat	Saturates	Protein	carbs	sugar	salt
258	6.9 g	2.2 g	24.2 g	18.6 g	4.7 g	1.4 g





Lupin falafel balls

150 g lupin grits
25 g plain flour
50 g fresh coriander chopped
50 g spring onions (greens only)
50 g Italian parsley
1 tbsp cumin powder
Salt
½ tbsp. baking powder
Oil for deep frying

Method

Soak lupin grits in hot water for 20 min.

Drain the soaked lupin and rinse in a running cold water.

Mix all the ingredients lupin, coriander, spring onions and parsley in a blender and make into smooth paste.

Season with cumin and salt.

Stir the baking powder in the above mix.

Heat the oil to 180 C.

Roll the falafel mix into small balls about 30-40 gms.

Flatten slightly and deep fry them in hot oil.

Temperature of the oil should be adjusted according to the size of the falafel balls.

Nutrition per serving

Calories	Fat	Saturates	Protein	carbs	sugar	salt
263	13.4 g	1.3 g	18.2 g	9.8 g	2.4 g	251 mg

Tart of lupin with crusted salmon on cumin potato puree

Makes 4

Tart

200 g of puff pastry for tarts

Fill the below stuffing onto the tarts

120 g lupin grits

20 ml olive oil

20 g onion diced small

30 g tomatoes chopped

20 g spring onion chopped

½ tablespoon cumin

1 garlic cloves, peeled and chopped

5 g peel of marinated lemon, finely chopped

5 ml lemon juice

Salt and pepper

Marinade for salmon

600 g fresh salmon fillets (skin on)

20 g lupin flakes

½ tablespoon Moroccan spices

½ tablespoon cumin

Olive oil

Lemon juice

Salt and pepper

Kachumber salad

100 g red onion thinly sliced

50 g Lebanese cucumber

50 g roma tomato

5 g finely chopped mint

5 g finely chopped coriander

Salt

Lemon juice

1 tablespoon sumac



Cumin potato puree

1 large potato cut in dice
½ tablespoon cumin, whole
Olive oil
Lemon juice
Salt and pepper
Chopped parsley

Garnish

1 tablespoon roasted cumin seeds
20 g kunafa crumbs
4 sprigs coriander leaves
Lupin splits
Lemon zest julienne

Method

Allow the lupin splits to soak in hot water for 20 minutes, drain and sauté with the onions in olive oil.

Fill the pan with enough water to cover the lupin and onions.

Add the tomatoes and spring onions, and then season with cumin, marinated lemon, garlic, salt and pepper.

Simmer until the the splits are cooked through and the water has boiled away leaving a porridge like mixture.

Use a blender to puree this mixture finely and then add lemon juice, salt and pepper to taste. To make the texture even more smooth and creamy, a little more olive oil may be added.

Roll out the puff pastry until thin, prick with a fork, cut into small lozenges (broad strips) brush with butter and then bake until golden brown and allow to cool.

Pipe out or spread lupin stuffing onto tarts.

Salmon

Marinate salmon with lemon juice, olive oil, salt and pepper.

Mix all dry ingredients and coat the marinated salmon.

Pan fry or oven roast in hot pan each side for 30 seconds or oven roast in 200 degree oven for 3 minutes. Salmon should be nice and pink in the middle.

Nutrition per serving

Calories	Fat	Saturates	Protein	carbs
688	36.7 g	6.6 g	57.2 g	25.3 g



Cumin potato puree

Boil the potatoes and allow it to cool.

Peel the potatoes, cut into small cubes.

Heat olive oil, crackle cumin seeds.

Add diced potatoes, sauté well.

Add lemon juice, salt and pepper.

Puree this mix well and mix with chopped parsley.

Kachumber salad

Mix red onion slices, cucumber and tomato julienne.

Season with lemon juice, salt and sumac

To serve

Spread the pureed lupin splits on the lozenges pastry and then place the grilled/pan fried salmon thinly sliced and sprinkle lemon peels on top.

Place the kachumber and cumin potato pure next to the pastry of lupin split mix.

Garnish cumin potato puree with cumin and coriander leaves before sprinkling with sumac.

Sprinkle little extra virgin olive oil over the salmon and sprinkle with kunafa crumbs.



Middle Eastern tapas

A. Chicken kibble

200 g lupin splits soaked and cooked for 20 minutes (Make sure you only add double the quantity of water).

100 g chicken breast sliced

2 tablespoon cumin

Salt and white pepper

Pinch of black pepper, coarsely ground

Shawarma filling

200 g Chicken breast with skin on

30 g garlic paste

10 g chilli powder

1 g cardamom powder

20 ml lemon juice

Salt

Chilli garlic dip

6 garlic cloves

10 g chilli paste

100 g olive oil

20 g lemon juice

Salt

Method

To make the chicken kibble pastry, pass through lupin splits and chicken together in a mincer twice using the fine settings.

Add cumin and season well.

Grill chicken breast and slice it thinly.

Roll the kibble pastry into small balls; make an indent in each using your index finger dipped in a little oil.

Fill thin slices of chicken and then close again.

Deep fry at 180 c.

For dip

Simply puree all of the ingredients in a blender and season to taste.



B. Money bag

Sambuisk pastry

400 g flour: 200 g lupin flour (Kernel flour/
wholemeal) + 200 g plain wheat
150 ml water
60 ml clarified butter
10 gm sugar
Salt

Filling

40 g eggplant
40 g tomatoes
20 g red and green pepper
10 g shallots
2 cloves garlic
20 ml olive oil
Salt and pepper

Salad

60 g Julienne of red, green and yellow peppers
40 g julienne of black olives and tomatoes
1 tablespoon Chilli vinegar

Method

To make filling, fry the small diced vegetables in olive oil until they are al-dante and then season.

Mix all the ingredients of sambusik pastry with flour to make a smooth pastry and allow it to rest for 30 mins.

Roll out the sambusik pastry and cut out circles.

Place filling in the centre of each, left up edges of the pastry circles and form each into a shape of little sack and fry it at 180 c.

Julienne salad

Pour some vinaigrette dressing over strips of vegetables and olives and season with salt if necessary

To serve

Serve these appetizers on an oval plate.

Place the chicken kibble on a garlic chilli dip and arrange green lettuce leaves around it

Finally place sambusik sacks on the julienne salad.

All recipes from

Chef GoGo

(Mr Govindha Rajalu Govardhan)



- Graduated from Institute of Hotel Management in Catering Technology & Applied Nutrition
- Executive Chef at various locations of Sheraton group of Hotels in India, Singapore and Japan
- Executive Chef - Orchid Group of Hotels & Grand Chancellor Hotels
- Sports Catering events - catered for the 1998 World swimming champions sponsored by Barilla pasta (12 international teams)
- Worked with the Australian Cricket team along with dietitian to look after the needs and requirements of the players
- Catering for international cricket teams from various countries
- Simultaneously operated Gogo's group



WA Signature Dish – Dorper Lamb in Lupin and Za’atar Crust with Sweet Potato and Lupin Salad with Moroccan Flavours (Gluten free)

Lamb ingredients:

8 x 2 ribs; French trimmed Dorper Lamb
Cutlets
150g lupin flake
30g rice flour
15g Ras el Hanout
500ml Fini Olive Oil
1 grilled lemon
10g sugar
2 eggs
50g za’atar

Salad ingredients:

1 large sweet potato, peeled
8 golden beetroot pieces
2 medium beetroot pieces
Garlic oil – fresh garlic
in extra virgin olive oil
80g fresh goats cheese
1 bunch flat leaf parsley
1 Pemberton Finger Lime
100g macadamia nuts
60ml Chardonnay vinegar
15g cumin seeds
1 cinnamon quill (broken up)
Pink River Salt

Method:

Preheat oven to 180 degrees celsius.

Peel and cut beetroot into cubes, toss with garlic oil and season with salt. Trim and peel golden beetroots and toss with garlic oil and season with salt. Peel and cut sweet potato into one centimetre cubes, toss with garlic oil, season. Place beetroot and sweet potato onto a roasting tray, roast until cooked but crisp.

Place all the beetroot trimmings on a tray with garlic oil and season, roast in the oven until soft, then blend to make a fine puree, finish with a touch of vinegar.

Cut lamb racks into 8 x 2 ribs. Lightly coat in rice flour. dip into egg wash (beaten eggs). Coat in lupin crumb.

Heat pan, add oil and check temperature before placing cutlets into pan. Cook until golden and turn over. Cook for another two minutes. Remove from pan, place on a tray and finish cooking in hot oven (4-5 minutes).

Remove cutlets from oven and place on absorbent paper, then rest in a warm place (uncovered).

Sprinkle two half lemons with sugar and grill in pan.



Pictured: Rhiannon Birch with WA Signature Dish Lamb and Lupins

Toast lupin flake in the oven then mix with salt, cumin and cinnamon powder, then blend or mortar.

Roughly crush macadamia nuts and add to roast beetroot.

Remove sweet potato and beetroot from the oven when cooked.

Add the beetroot, sweet potato, nuts, parsley and crumbled goats cheese together. Season with lupin salt.

To serve:

Place a circular ring on the plate, spoon in the beetroot and the sweet potato mix, press down then remove the ring and sprinkle with lupin salt and picked parsley and finger lime, drizzle with vinegar and extra virgin olive oil (50\50).

Place lamb alongside sweet potato and lupin salad, serve with grilled lemon.

Smear a little beetroot puree.

Accompany with the lupin and cumin salt.

Australian Sweet Lupin suppliers from Western Australia

COMPANY	PRODUCTS	CONTACT DETAILS
Coorow Seeds	Lupenta splits, Lupenta grits, Lupenta flour (Kernel), Lupenta bran	http://www.coorowseeds.com.au/ admin@coorowseeds.com.au M: +61 427 521 033 P: +61 8 99521088
Golden West Foods	Whole lupin seeds, lupin splits, whole meal lupin flour, kernel Lupin flour, Lupin bran Season sauce - in a variety of flavours, including oyster, fish and teriyaki Cake and cookie mixes, pastas and wraps	www.goldenwestfoods.com robert@goldenwestfoods.com M: +61 428 939 165 P: +61 8 99291074
Irwin Valley Lupin Foods	Lupin flour	www.irwinvalley.com.au rocoffey@irwinvalley.com.au M: +61 417 926 263
The Lupin Co	Lupin flakes	http://www.thelupinco.com.au/ David@thelupinco.com.au M: +61 427 427 226 P: +61 8 62631140
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Health Studies and Reviews

HEALTH INDICATOR	LUPIN CONSTITUENT	EVIDENCE	REFERENCE
Satiety; controlling appetite	whole kernel	Dietary intervention study	Lee, YP et al (2006) Lupin-enriched bread increases satiety and reduces energy intake acutely. <i>Am J Clin Nutr</i> .2006; 84: 975-980
	kernel fibre	Dietary intervention study	Archer, BJ et al. (2004) Effect of fat replacement by inulin or lupin-kernel fibre on sausage patty acceptability, post-meal perceptions of satiety and food intake in men. <i>British Journal Nutrition</i> 91: 591-599.
Reduced blood glucose and insulin response	whole kernel	Dietary intervention study	Dove, ER et al. (2011) Lupin and soya reduce glycaemia acutely in type 2 diabetes. <i>Br J Nutr</i> . 2011 Oct;106(7):1045-51.
	whole kernel	Dietary intervention study	Belski, R et al. (2010) Effects of lupin-enriched foods on body composition and cardiovascular disease risk factors: a 12-month randomized controlled weight loss trial. <i>Int J Obes</i> . 35:810-819
	kernel fibre	Dietary intervention study	Johnson, SK et al.(2003) Sensory acceptability of white bread with added Australian sweet lupin (<i>Lupinus angustifolius</i>) kernel fibre and its glycaemic and insulinaemic responses when eaten as a breakfast. <i>J. Science Food Agr</i> . 83:1366–1372
	whole kernel	Dietary intervention study	Hall, R. S., et al. (2005) Australian sweet lupin flour addition reduced the glycaemic index of a white bread breakfast without affecting palatability in healthy human volunteers. <i>Asia Pacific J. Clinical Nutrition</i> 14: 91-97
	g-conglutin	Rat feeding study	Magni, C et al. (2004). Conglutin , a lupin seed protein, binds insulin in vitro and reduces plasma glucose levels of hyperglycemic rats. <i>J. Nutr. Biochem</i> . 15:646.
	g-conglutin	Rat feeding study	Terruzzi, I (2001) Insulin-mimetic action of Conglutin , a lupin protein, in mouse myoblast. <i>Nutr Metab Cardio-vasc Dis</i> . 21:197-205
Hypotensive activity	lupin protein	Rat feeding study	Pilvi TK, et al (2006) Lupin protein attenuates the development of hypertension and normalises the vascular function of NaCl-loaded Goto-Kakizaki rats. <i>J Physiol Pharmacol</i> . 57(2):167-76.
	whole kernel	Dietary intervention study	Lee YP.(2009) Effects of lupin kernel flour-enriched bread on blood pressure: a controlled intervention study. <i>Am J Clin Nutr</i> . 89: 766
	whole kernel	Dietary intervention study	Belski, R et al. (2010) Effects of lupin-enriched foods on body composition and cardiovascular disease risk factors: a 12-month randomized controlled weight loss trial. <i>Int J Obes</i> . 35:810-819
Bowel health (reduced transit time, lower colon pH, prebiotic)	kernel fibre	Dietary intervention study	Fechner A, et al (2013) Effects of legume kernel fibres and citrus fibre putative risk factors for colorectal cancer: randomized, double-blind, crossover human intervention trial. <i>Nutr J</i> . 12:101
	kernel fibre	Dietary intervention study	Johnson SK, Chua V, Hall RS, Baxter AL. (2006) Lupin kernel fibre foods improve bowel function and beneficially modify some putative faecal risk factors for colon cancer in men. <i>British Journal of Nutrition</i> 95(2): 372-8.
	kernel fibre	Dietary intervention study	Smith, SC et al (2006) Lupin kernel fiber consumption modifies fecal microbiota in healthy men as determined by rRNA gene fluorescent in situ hybridization. <i>Eur J Nutr</i> . 2006 Sep; 45 (6):335-41
	lupin -oligosaccharides	Rat feeding study	Juskiewicz J, et al (2006) Influence of pea and lupin oligosaccharides on caecal short chain fatty acids production and nitrogen excretion patterns in rats. <i>Pol. J. Food Nutr. Sci</i> . 15/56 :77–82
	whole lupin meal	Rat feeding study	Champ M, et al (1991) Volatile Fatty Acid production from lupin meal in the caecum of the rat: the role of cell wall polysaccharides and α-galactosides. <i>Animal Feed Science and Technology</i> 32, 3177-183
Hypocholesterolemic activity	lupin protein	Dietary intervention study	Bähr et al.(2013) Lupin protein positively affects plasma LDL cholesterol and LDL:HDL cholesterol ratio in hypercholesterolemic adults after four weeks of supplementation: a randomized, controlled crossover study. <i>Nutrition Journal</i> 2013, 12:107
	lupin protein	Dietary intervention study	Bahr M, et al. (2015) Consuming a mixed diet enriched with lupin protein beneficially affects plasma lipids in hypercholesterolemic subjects: A randomized controlled trial. <i>Clinical Nutrition</i> 34: 7–14
	lupin protein	Dietary intervention study	Weisse K, et al. (2010) Lupin protein compared to casein lowers the LDL cholesterol:HDL cholesterol-ratio of hypercholesterolemic adults. <i>European Journal of Nutrition</i> 49: 65–71
	kernel fibre	Dietary intervention study	Hall, R. S., et al.. (2005) Lupin kernel fibre-enriched foods beneficially modify serum lipids in men. <i>European Journal of Clinical Nutrition</i> 59: 325-33.
	lupin protein	Dietary intervention study	Nowicka G, et al. (2006) Lupin proteins in the treatment of hypercholesterolemia. <i>Atherosclerosis Supplements</i> 7: 477-477
	lupin protein	Rat feeding study	Spielmann et al., (2007) Dietary protein lowers triglyceride concentrations in liver and plasma in rats by reducing hepatic gene expression of sterol regulatory element-binding protein-1c. <i>Ann. Nutr.Metab</i> .51:387-392
	lupin protein	Rat feeding study	Marchesi, M et al. (2008) Hypolipidemic and anti-atherosclerotic effects of lupin proteins in a rabbit model. <i>Brit J Nutr</i> . 100(4):707-10

Reviews:

Arnoldi, A et al (2015) The health benefits of sweet lupin seed flours and isolated proteins. *J Functional Foods*. 18: 550-63

Kouris-Blazos, A (2016) Health benefits of legumes and pulses with a focus on Australian sweet lupins. *Asia Pac J Clin Nutr*. 2016;25(1):1-17.



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