Lupins – A New Super Food!

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What are Super Foods?
Why do we need Super Foods?

Evolution of obesity
Prevalence of heart disease and diabetes is increasing steadily

Source: OECD
Low dietary fibre
High Sugar
High fat
Excess energy consumption
Why Lupins?

- high protein (40%)
- high dietary fibre (30%)
- low fat (6%)
- Negligible starch (2%)
Lupin is not a new legume

Alkaloids removed by soaking & boiling in brine
20th Century Plant breeding

‘Sweet’ Lupin (alkaloids < 0.02%)
(wild, bitter lupins = 2 - 4% alkaloids)
Australian Food Standards Code A12 (FSANZ)
UK, European Union

In preparation
GRAS (United States)
KFDA approval (Korea)
Nutritional value
Australian Sweet Lupin
Narrow leafed lupin (NLL)
*L. angustifolius*

Seed Coat (hull) - 25%
- cellulose fibres (bran)

Kernel (cotyledons) - 75%
- Cell Wall Material - (30%)
  Pectin like Dietary Fibres

Inside Cells
- Protein bodies (40%)
- Fat bodies (7%)
- Oligosaccharides (6%)
- Puruvic acid (1%)
- H₂O (12%)
Comparative grain content of lupin
Soybean vs Lupin
Amino acid profile of lupin protein is similar to that of soybean

<table>
<thead>
<tr>
<th>Amino acids</th>
<th>Lupin flour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alanine</td>
<td>1.04</td>
</tr>
<tr>
<td>Arginine</td>
<td>3.59</td>
</tr>
<tr>
<td>Aspartic acid</td>
<td>2.99</td>
</tr>
<tr>
<td>Cysteine</td>
<td>0.42</td>
</tr>
<tr>
<td>Glutamic acid</td>
<td>6.63</td>
</tr>
<tr>
<td>Glycine</td>
<td>1.29</td>
</tr>
<tr>
<td>Histidine</td>
<td>0.79</td>
</tr>
<tr>
<td>Isoleucine</td>
<td>1.22</td>
</tr>
<tr>
<td>Leucine</td>
<td>2.12</td>
</tr>
<tr>
<td>Lysine</td>
<td>1.46</td>
</tr>
<tr>
<td>Methionine</td>
<td>0.20</td>
</tr>
<tr>
<td>Phenylalanine</td>
<td>1.18</td>
</tr>
<tr>
<td>Proline</td>
<td>1.26</td>
</tr>
<tr>
<td>Serine</td>
<td>1.59</td>
</tr>
<tr>
<td>Threonine</td>
<td>1.09</td>
</tr>
<tr>
<td>Tryptophan</td>
<td>0.31</td>
</tr>
<tr>
<td>Tyrosine</td>
<td>1.13</td>
</tr>
<tr>
<td>Valine</td>
<td>1.17</td>
</tr>
<tr>
<td>Cyst+Meth</td>
<td>0.62</td>
</tr>
<tr>
<td>Tyr+Phen</td>
<td>2.33</td>
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</tbody>
</table>
## Low fat content

<table>
<thead>
<tr>
<th></th>
<th>Lupin</th>
<th>Soybeans</th>
</tr>
</thead>
<tbody>
<tr>
<td>6%</td>
<td></td>
<td>20%</td>
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Vitamin E = 2.3-4.6 mg/kg of oil
## High Non Starch Polysaccharide/ fibre content

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<th>Soybeans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>30%</td>
<td>12%</td>
</tr>
</tbody>
</table>
# Low Anti-nutritional factors

<table>
<thead>
<tr>
<th></th>
<th>Lupin</th>
<th>Soybeans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trypsin inhibitor (mg/g)</td>
<td>0.14</td>
<td>17.9</td>
</tr>
<tr>
<td>Saponins (mg/kg)</td>
<td>573</td>
<td>19000</td>
</tr>
<tr>
<td>Phytates (%)</td>
<td>0.58</td>
<td>1.59</td>
</tr>
</tbody>
</table>
Lupin is an attractive GM alternative to Soybeans
Lupin Processing
Products of lupin processing

Whole grains

Dehulling

Hull

Kernels

Milling

Lupin flour

- Animal Feed
- Asian bean Sprouts
Lupin flour

Applications

Health benefits
Here at Bodhi's we guarantee that every Bodhi's loaf has the highest amount of all natural ingredients of any bread produced commercially and sold on the market today.
Health Practitioners - complete our quiz, receive an info pack!

Product Selections  Dietary Needs  Find a Retailer  News

Creating Nutritious & Innovative Bakery Products for your Lifestyle

Diet Choice Loaf (Made with Lupin)

Home - Product Selections - Healthy Living

Using research conducted by the University of Western Australia School of Medicine and Pharmacology, Lifestyle Bakery has created a loaf to...
Lupin made headlines in Australia

Lupin flour health benefits

✓ Keeping you feeling full longer (High Satiety value)
✓ Low GI
✓ Improving blood cholesterol
✓ Lowering blood pressure
✓ Pre-biotics for improve bowel health
✓ Very high source of fibre
Additional Benefits

Water Holding Capacity

✓ Increases yield
✓ Positive impact on Shelf life
Lupin based biscuits (20% lupin flour)

- 50% less sugar
- 5 times more fibre
- Double protein
- 1/3 less fat
Lupin crisp developed by Curtin Researchers (70% lupin flour)
Innovation Display – Curtin Open Day
Lupin Based Pasta

0% Lupin

10% Lupin

20% Lupin

30% Lupin

35% Lupin
Yellow Alkaline Noodle
Lupin flour is a natural colour improver
Possibilities are endless!
Novel weight loss product
Lupin flour

Fibre isolates

Fibre 77%
Protein 14%
Fat 4%

Protein isolates

Protein 91%
Fat 5%
Applications of Hull
High fibre Tiger loaf
Eat well and live healthy with VITAFIBER!!

**Main nutrients:** Fibre Insoluble 79grs. - fiber Soluble 4 Gr. - carbohydrate 17grs. - no cholesterol

Vitafiber is recommended for Control of obesity, as regulator of intestinal tránsstornos, daily supplement of fiber, metabolic disorders.

It is a highly concentrated product of dietary fiber.

*Dissolved in juice, milk or yoghurt is an ideal product for those who seek a source of concentrated fiber. You can add also to any food (biscuits, cakes, kuchen, breads and lunch) without altering its taste. Should consumise with much intake of fluid.*
Applications of Kernels
Lupin Tofu (Indonesia)
Lupin Tempeh
Lupin Sauces and Soups
Lupin Milk and yoghurt
Allergy

A small percentage of the population may have an allergic response to lupin protein.

People with peanut allergies may have similar reactions to lupin flour.
Coorow Seeds Operations

Cleaning and milling

Storage

Packing

Export
Acknowledgement

Dongeun ingredients
Ms. Barbara, Coorow Seeds
DAFWA
School of Public Health, Curtin University
To Learn More…..

Research Studies
• Hall et al. 2001 Assessing the nutritional benefits of Australian Sweet Lupin in human foods
• Spisas, S. 2008 Lupin Products –Concept and Reality
• Hodgson et al. 2010 Effects of increasing dietary protein and fibre intake with lupin on body weight and composition and blood lipids in overweight men and women.
• Lee et al. 2006 Lupin enriched bread increases satiety and reduces energy intake acutely
• Lee et al. 2009 Effects of lupin kernel flour –enriched bread on blood pressure: a controlled intervention study

Media releases
• Aug 8, 2007 –WA Centre’s lupin bread could aid diabesity fight
• Nov 15, 2006 –The bread which reduces energy intake and boosts satiety
• Sep 22, 2008 –Lupins deliver tasty and healthy benefits for the overweight
• Dec 2008 –Could lupins be the new global „super food“?
• July 2008 –Healthy junk food? –Curtin researcher is developing the humble lupin grain into a range of food products with all the attributes of junk food minus the health risks
• Jun 2010 –Tempe market a boost for WA lupin industry
Thank You!