Wholegrain Foods and Legumes in Health and Nutrition:
A Review

Go Grains Health & Nutrition Ltd

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Introducing Go Grains Health & Nutrition

- **Australia’s leading independent voice in grains and legumes in health and nutrition**

- Knowledge centre – specialised resources
  - translate nutrition science into key messages for influencers
    - health care professionals
    - Government
    - Regulators
    - food industry

- Key contributors
  - Members of the grains and legumes value chain

Go Grains is Australia’s leading independent voice for grain foods and legumes in health and nutrition.
Objective of the Review

• Go Grains commissioned a review of the science in wholegrain foods and legumes in the diet in 2010

• Examined the extensive body of literature exploring evidence for the role of grain-based foods and legumes in the diet

• “The Grains & Legumes Health Report – A Review of the Science”\(^1\), co-authored by Assoc. Prof Peter Williams from the University of Wollongong and Go Grains

• Includes results from 2009 Go Grains Consumption Survey

• Report is available at [www.gograins.com.au](http://www.gograins.com.au)
Wholegrain Foods and Legumes in Health and Nutrition: A Review

• Grains and Wholegrain Foods
• Legumes
• Consumption
• Health Care Savings
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• Legumes

• Consumption

• Disease Status and Health Care Savings

• Key Messages
Background Information: Grains

- **Grains** (cereals), are the edible seeds of plants belonging to the cereal grass family
- **Wheat, rice, oats**, rye, barley, corn, triticale, sorghum and millet
- Grains are a staple food around the world
- Cereal grains are high in carbohydrates, low in fat, good sources of protein and provide varying amounts of fibre, vitamins and minerals
- NNS 95’ – breads and cereal based foods were key contributors in the diet
  - Primary source - fibre, thiamin, magnesium and iron
  - Secondary source - folate, niacin, zinc and protein
Background Information: Wholegrains

- Grains need to be processed to make them suitable to eat

- Milling helps release valuable nutrients concentrated within the outer layers of the grain

- Wholegrain Definition (FSC) “the intact grain or the dehulled, ground, milled, cracked or flaked grain where the constituents – endosperm, germ and bran – are present in such proportions that represent the typical ratio of those fractions occurring in the whole cereal, and includes wholemeal²

- Wholegrains contain many functional components that work both alone and in synergy to promote health and offer significant protection against
Key Findings:
Wholegrain foods reduce disease risk

- Eating 2-3# serves of wholegrain foods a day is associated with a reduced risk of developing chronic disease by 20% - 30%
  - cardiovascular disease³,
  - type 2 diabetes⁴
  - certain cancers⁵

- Eating 2-4# serves of wholegrain foods a day can reduce the risk of heart disease by as much as 40% - equal to the effect of statin drugs⁶,⁷.

- Wholegrain foods can help to lower blood pressure.⁸

- A diet high in wholegrains is associated with
  - a lower body mass index (BMI,)
  - waist circumference,
  - reduce weight gain and assist in weight loss as part of a kilojoule controlled diet.

*US serve sizes, (eg. one serve is equivalent to one slice of bread)*
Key Findings: Wholegrain foods reduce disease risk

- Wholegrain foods can reduce the progression from impaired glucose tolerance to type 2 diabetes by up to 58%.10

- Wholegrain foods are associated with lower cancer risk
  - The evidence suggests wholegrain and fibre rich cereal foods may protect against colorectal cancers, gastric cancers and possibly also breast, endometrial and prostate cancers.11-14, 15

- Emerging science about the benefits of wholegrain consumption for prevention of periodontal disease,16 and asthma17,

- Suggestive evidence for improvements in mood and cognitive function.18-20
Dietary Recommendations: Grain-based foods

• Australian Dietary Guidelines / Australian Guide to Healthy Eating recommend **four serves of grain based foods each day, ‘preferably wholegrain’**¹⁵

• What is a serve of grain-based food?
  - 2 slices of bread
  - ½ cup muesli
  - 1 cup cooked rice, noodles, pasta
  - 1 cup of porridge
  - 1 cup of breakfast cereal or 2 wheat flake biscuits

• In 2008, Go Grains in collaboration with the International Life Sciences Institute (ILSI) established an achievable, evidence-based Daily Target Intake (DTI) for wholegrains of 48g a day²²,²³

• The 48g DTI can be found on the labels of many breads, breakfast cereals, rice, crispbreads and snacks
Wholegrain Content of Wholegrain Foods

- No Australian definition for ‘wholegrain food’
- Wholegrain content varies across food categories, brands and recipe formulation
- Commonly available foods containing wholegrains (approx amounts):

<table>
<thead>
<tr>
<th>Food</th>
<th>Serve Size</th>
<th>Wholegrains (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wholemeal bread</td>
<td>2 slices</td>
<td>30-40</td>
</tr>
<tr>
<td>Multi-grain bread</td>
<td>2 slices</td>
<td>5-30</td>
</tr>
<tr>
<td>Wheat-flake breakfast biscuits</td>
<td>2 biscuits</td>
<td>30</td>
</tr>
<tr>
<td>Wholegrain breakfast cereal</td>
<td>30-45g serve</td>
<td>15-30</td>
</tr>
<tr>
<td>Porridge</td>
<td>1/3 cup raw rolled oats</td>
<td>30</td>
</tr>
<tr>
<td>Brown rice</td>
<td>1 cup cooked</td>
<td>65</td>
</tr>
<tr>
<td>Wholegrain pasta</td>
<td>1 cup cooked</td>
<td>55-65</td>
</tr>
<tr>
<td>Wholegrain crispbreads</td>
<td>2-4 slices</td>
<td>20-35</td>
</tr>
<tr>
<td>Popcorn (plain)</td>
<td>20g</td>
<td>15</td>
</tr>
<tr>
<td>Muesli bar</td>
<td>1 bar</td>
<td>10-15</td>
</tr>
</tbody>
</table>

48g Daily Intake Wholegrains - at least 2 serves /day
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Legumes

- Also known as pulses, include all forms of beans and peas

- Butter beans, haricot (navy beans), cannellini beans, red kidney beans, adzuki beans, black eyed-peas, soybeans, mung beans, lentils, split peas, peanuts and chickpeas.

- Provide a range of essential nutrients including protein, low glycaemic carbohydrates, dietary fibre, vitamins, minerals and phytochemicals.
Key Findings: Legumes reduce disease risk

- Low intake of legumes in most populations
- Lower number of scientific studies conducted, evidence is weaker than for wholegrain foods
- Epidemiological studies consistently show that eating legumes can help reduce the risk of
  - cardiovascular disease
  - diabetes
  - obesity
  - improve gut health\(^24\)

Consuming legumes four or more times a week (compared with less than
- 22% lower risk of coronary heart disease\(^25\)
- 11% lower risk of cardiovascular disease\(^25\)
Key Findings: Legumes reduce disease risk

- 20g increase in legumes per day was associated with a 7-8% lower risk of death in older people in a 7 year study of five cohorts in Japan, Sweden, Greece and Australia.\(^{26}\)

- The World Cancer Research Fund and the American Institute for Cancer Research recommend people “eat relatively unprocessed cereals (grains) and/or pulses (legumes) with every meal”\(^{27}\)

- Go Grains involved in further research with Uni SA, Uni of Manitoba, Simplot, Heinz, Sanitarium, SA Govt, Pulse Australia and GRDC
  - cardio-metabolic risk factors and cognition
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Key Findings:
Australians don’t eat enough grain-based foods

Go Grains Consumption Study 2009
- n=1718, nationally representative sample, aged 5-80yrs
- 2 day food diary (self reported), followed by an online survey
- Collected data for 63 foods

Results: Grain-based Foods
- Australians on average consumed 5 serves of grain-based foods per day
- 25% made up of non-core grain-based foods or extra foods such as cakes, biscuits, pastries, hamburgers, hot dogs, pies, sausage rolls and other takeaway foods
- Adjusted average serves per day 4.08
  - minimum number of serves recommended by Australian Dietary Guidelines
    - Females – 3.28* serves per day
    - Kids 5 – 14 yrs – 3.14* serves per day
    - Rural communities - 3.77* serves per day
Key Findings:
Low consumption of wholegrain foods & legumes

Results: Wholegrain Foods
• Australians on average consumed 1.43 serves of wholegrains foods each day
• Rural communities consumed 1.29 serves of wholegrain foods each day

Results: Legumes
• consumed by only 23% of all Australians
• Baked beans were the main contributor to legume intake, particularly in rural communities

Go Grains Consumption Study 2011
• Extended focus on rural communities
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Key Findings:
Significant health care savings with just three serves of wholegrain foods a day

<table>
<thead>
<tr>
<th>Disease Group</th>
<th>2001 Annual Healthcare Expenditure ($million)</th>
<th>Percent Related to Diet</th>
<th>20% Annual Saving ($million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancers</td>
<td>2,918</td>
<td>40% (prostate, colorectal, breast only)</td>
<td>233.3</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>5,479</td>
<td>40% (CHD, stroke)</td>
<td>438.3</td>
</tr>
<tr>
<td>Diabetes</td>
<td>812</td>
<td>84% (type 2)</td>
<td>136.4</td>
</tr>
<tr>
<td>Endocrine, nutritional, metabolic</td>
<td>1,587</td>
<td>45% (obesity)</td>
<td>142.8</td>
</tr>
<tr>
<td><strong>Total in 2001</strong></td>
<td><strong>10,796</strong></td>
<td></td>
<td><strong>950.8</strong></td>
</tr>
</tbody>
</table>

Based on a conservative 20% reduction in the incidence of each of these major diseases, health expenditure cost savings >$1.2 billion annually.
The Challenge: Increasing Consumption

Barriers to wholegrain food and legume consumption

• Traditional and cultural preferences for refined grain foods

• Limited availability of wholegrain foods and legumes in supermarkets and foodservice settings

• Unfamiliarity with preparation and cooking techniques

• Confusion in product labeling

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www.gograins.com.au
The Challenge: Increasing Consumption

Solutions:

- Consistent wholegrain and legume messaging to influencers and consumers
  - On pack
  - Education
    - Dietitian Information and Workshops
    - Go 4 Grains Kids Design Challenge
  - Go Grains brochures (www.gograins.com.au)
  - Recipes
Key Messages

• Grains, particularly wholegrains and legumes can reduce the risk of chronic diseases, by at least 20%

• Australian population is under-consuming grain-based foods, particularly wholegrains and legumes

• Go Grains plays a role in increasing consumption
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Thank You

Further Information

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References:

References: