

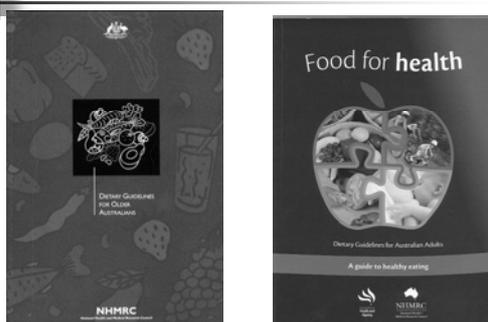
Grains, Grain-based foods and Legumes – Staples in the Diet

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1. What are the recommended intakes of grain-based foods?
2. What nutrients do they provide?
3. What are the health benefits?

Australian Dietary Guidelines



Dietary Guidelines for Australian Adults 2003

- **1. Enjoy a wide variety of nutritious foods**
 - eat plenty of **vegetables** and fruits
 - eat plenty of **cereals (including breads, rice, pasta and noodles), preferably wholegrain**
 - include lean meat, fish, poultry and alternatives such as eggs, nuts, **legumes**
 - include reduced fat dairy foods and alternatives *and*
 - drink plenty of water

Eat plenty of cereals (including breads, rice, pasta and noodles) preferably wholegrain

| FOODS SHOWN ON THE GUIDE | EXAMPLES OF FOODS OR TYPES OF FOOD WHICH CAN BE USED AS SUBSTITUTES |
|--|---|
|  Breads (sliced and unsliced) | All types of bread including white, wholemeal, wholegrain, rye. |
|  Pita bread Lavash bread | All breads from European, Asian, Middle Eastern and other cultures. |
|  Wheat flake breakfast cereal | All wholegrain ready-to-eat breakfast cereals. |
|  Breakfast cereal flakes | Ready-to-eat cereals made from a variety of grains. |
|  Oats | Minimally processed cereals, wholegrain. |
|  Rice | All types of rice and other whole grains. |
|  Spaghetti or noodles | All pasta and noodles made from a variety of grains. |

Eat plenty of vegetables, legumes and fruits

| FOODS SHOWN ON THE GUIDE | EXAMPLES OF FOODS OR TYPES OF FOOD WHICH CAN BE USED AS SUBSTITUTES |
|---|---|
|  SPINACH | Dark green leafy and cruciferous vegetables including: cabbage, Chinese cabbage, cauliflower, brussels sprouts, endives, green lettuce, silverbeet. |
|  BOK CHOY | |
|  BROCCOLI | Orange vegetables including: pumpkin, sweet potato (orange variety). |
|  CARROT | |
|  POTATO | Sweet potato, taro, yam. |
|  TOMATO | The range of available vegetables, including: alfalfa sprouts, asparagus, beans, beetroot, capsicum, celery, cucumber, eggplant, leek, lettuce, marrow, mushroom, onion, parsnip, radish, shallot, swede, turnip, zucchini. |
|  CAPSICUM | |
|  CORN | |
|  PEAS | |
|  CHICK PEA | All legumes, including: kidney beans, black-eyed beans, blue pea, borlotti bean, broad bean, cannellini bean, haricot bean, Lima bean, mung bean, pinto bean, split pea. |
|  SOY BEAN | |
|  LENTILS | |

Note: All varieties of vegetables and legumes are included: fresh, frozen, canned and dried.

Include lean meat, fish, poultry and/or alternatives

How much from the *Meat, poultry, fish, eggs, nuts, legumes* group is needed every day?

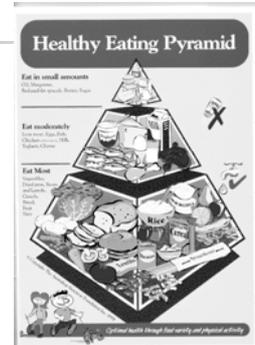
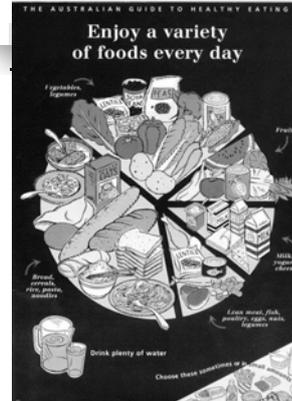
The range for people 4 years old and over is between 1/2 and 2 sample serves per day from this group. Use the information on pages 19, 20 and 21 to work out how many sample serves you need.

What is a sample serve?

A SAMPLE SERVE OF MEAT, FISH, POULTRY, EGGS, NUTS, LEGUMES IS:

- 65-100 G COOKED MEAT, CHICKEN, EG 1/2 CUP LEAN MINCE, 2 SMALL CHOPS OR 2 SLICES ROAST MEAT
- 1/2 CUP COOKED (DRIED) BEANS, LENTILS, CHICK PEAS, SPLIT PEAS, OR CANNED BEANS
- 80-120 G COOKED FISH FILLET
- 2 SMALL EGGS
- 1/3 CUP PEANUTS OR ALMONDS
- 1/4 CUP SUNFLOWER SEEDS OR SESAME SEEDS.

Australian Guide to Healthy Eating



AGHE recommended daily serves – A (more cereal); B (more meat)

| | Men A | Men B | Women A | Women B |
|---------------------|-------|-------|---------|---------|
| Breads and cereals | 6-12 | 5-7 | 4-9 | 4-9 |
| Vegetables | 5 | 6-8 | 5 | 4-7 |
| Fruit | 2 | 3-4 | 2 | 2-3 |
| Dairy | 2 | 2-4 | 2 | 2-3 |
| Meat & alternatives | 1 | 1.5-2 | 1 | 1-1.5 |
| Extra foods | 0-3 | 0-3 | 0-2.5 | 0-2.5 |

BREAD, CEREALS, RICE, PASTA, NOODLES



Foods in this group come from grains like wheat, oats, rice, rye, barley, millet and corn. The grains can be eaten whole, ground into flour to make a variety of cereal foods like bread, pasta and noodles, or made into ready-to-eat breakfast cereals.

The nutrients provided by the foods in this group include carbohydrates, protein, fibre and a wide range of vitamins and minerals including folate, thiamin, riboflavin, niacin and iron. Wholemeal or wholegrain varieties provide more fibre, vitamins and minerals. Some foods in this group may have fibre, vitamins and minerals added during processing.

How much from the *Bread, cereals, rice, pasta, noodles* group is needed every day?

The range for people four years old and over is between 3 and 12 sample serves each day. Use the information on pages 19, 20 and 21 to work out how many sample serves you need.

What is a sample serve?

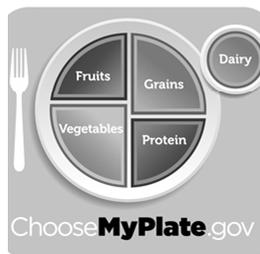
A SAMPLE SERVE OF BREAD, CEREAL, RICE, PASTA, NOODLES IS:

- 2 SLICES OF BREAD
- 1 MEDIUM BREAD ROLL
- 1 CUP COOKED RICE, PASTA, NOODLES
- 1 CUP PORRIDGE, 1 1/2 CUP BREAKFAST CEREAL FLAKES OR 1/2 CUP MUESLI.

2010 US Dietary Guidelines

For a 2400Cal diet:

- 8 oz cereal/day (half of serves as wholegrain)
- 2 cups legumes per week



Dietary guidelines in Asia and the Middle East

| Country or region | Grain related guidelines |
|-------------------|--|
| Japan | Eat grains at every meal to maintain sufficient intake of energy from carbohydrate |
| China | Eat a variety of foods with grains as the staple food Eat milk and legumes and their products every day |
| Malaysia | Eat more rice and other cereal products, legumes, fruit and vegetables |
| Thailand | Eat adequate amounts of rice or alternative carbohydrate sources Eat fish, lean meats, eggs, legumes and pulses regularly |
| Singapore | Increase intake of fruit, vegetables and whole grain cereal products |
| Korea | Eat a variety of grains, vegetables, fruit, fish meat and dairy products |
| India | Highly refined and polished cereals should be avoided in preference to under-milled cereals |
| Arab Middle East | Derive the major portion of energy from carbohydrate in cereal grains, vegetables and fruits |

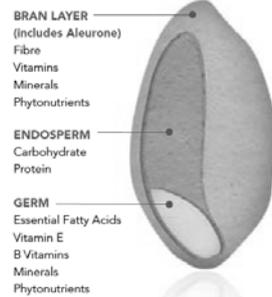
Wholegrain content of foods

Go Grain and ILSI
Australian target for
wholegrain intake:
48g per day

| Food | Serve size | Wholegrain content |
|-----------------------------|--------------|--------------------|
| Wholemeal bread | 2 slices | 30-40g |
| Wholegrain breakfast cereal | 30-45g | 15-30g |
| Natural muesli | ½ cup | 30-40g |
| Porridge | 1/3 cup raw | 30g |
| Wholegrain pasta | 1 cup cooked | 55-65g |
| Rice cakes | 4 thin | 20g |
| Popcorn (plain) | 20g | 15g |
| Muesli bar | 1 bar | 10-15g |

The nutrients in cereal grains

Figure 1: Cross Section of a Grain



BRAN LAYER
(Includes Aleurone)
Fibre
Vitamins
Minerals
Phytonutrients

ENDOSPERM
Carbohydrate
Protein

GERM
Essential Fatty Acids
Vitamin E
B Vitamins
Minerals
Phytonutrients

Legumes and nutrition

- Good sources of
 - B-vitamins
 - Iron
 - Zinc
 - Calcium
 - Magnesium
 - Omega-3 fats
 - Phytonutrients (isoflavones, lignans)
- Economical sources of good quality protein
- Mostly low in fat and cholesterol



Percentage of mean adult nutrient intake provided by cereal foods (1995 NNS) excluding cakes, biscuits and other cereal-based items

| Nutrient | Males 19+y | Females 19+y |
|---------------|------------|--------------|
| Energy | 20.0 | 20.8 |
| Carbohydrate | 33.2 | 33.1 |
| Protein | 15.8 | 16.7 |
| Dietary Fibre | 34.9 | 33.6 |
| Thiamin | 41.3 | 40.5 |
| Iron | 30.1 | 29.3 |
| Magnesium | 24.3 | 24.8 |
| Fat | 6.2 | 6.7 |

Legume intake in Australia (1995 NNS)

| | |
|--|------|
| Percentage of adults consuming | 6.9% |
| Mean daily intake | 9.8g |
| Percentage of dietary fibre from legumes | 2.0% |
| Percentage of folate from legumes | 1.3% |

Wholegrain phyto-nutrients

| Nutrients | Benefits |
|---|----------------------------|
| Vitamin E, Selenium | Antioxidants |
| Polyphenols and phenolics (eg ferulic acid) | Antioxidants |
| β-glucans and phytosterols | Cholesterol-lowering |
| Sphingolipids | Tumour control |
| Phytate | Lowering glycemic response |
| Pentosans | Promote bowel regularity |

Total antioxidant content of rolled oats and popcorn > broccoli or green tea

Grains and Legumes: Health Benefits



Key Findings: Wholegrain foods can 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 disease
 - US health claims for oats, barley and psyllium for cholesterol lowering
 - type 2 diabetes
 - certain cancers

** US serve sizes, (eg. one serve is equivalent to one slice of bread)*
 - 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 drugs
 - Wholegrain foods may help to lower blood pressure.
- * US serve sizes, (eg. one serve is equivalent to one slice of bread)*

Key Findings: Wholegrain foods can reduce risk of obesity

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



Grains and cancer: meta-analyses

- Meta-analysis of soy intake and breast cancer (Trock et al *J Nat. Canc. Inst* 2006;98:459-471)
 - 14% reduction in risk with high soy intake
- Wholegrain and colorectal cancer (Haas et al *Int. J. Food. Sc. Nutr* 2009;60:1-13)
 - 6% reduction in risk with high wholegrain intake
- World Cancer Research Fund (2010)
 - Now concludes there is convincing evidence that dietary fibre reduces the risk of colorectal cancer

Key Findings: Legumes can 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
 - US health claim for soy protein and cardiovascular disease
 - diabetes
 - obesity
 - improve gut health
- Consuming legumes four or more times a week (compared with less than once a week)
 - 22% lower risk of coronary heart disease
 - 11% lower risk of cardiovascular disease

Costs savings

- Potential cost savings with 3 serves of wholegrains each day
- 20% reduction in cancer, cardiovascular diseases and type 2 diabetes in Australia could save over:
\$1.2 billion dollars annually.

Grains and Legumes Health Report

- Available at: <http://www.gograins.com.au>

