

Wholegrains and coronary heart disease – FSANZ consideration of a commissioned review

Review Title:

Relationship between wholegrain intake and risk of coronary heart disease

Reviewer:

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The definition of wholegrain in the Australian New Zealand food regulations is “*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 ration of those fractions occurring in the whole cereal, and includes wholemeal*”.

The starting point for the review was the 2003 draft Canadian report entitled ‘Short Literature Review for Fruits, Vegetables and Grain Products that Contain Fibre, Particularly Soluble Fibre, and Coronary Heart Disease’ examining the relationship between dietary fibre and risk of coronary heart disease. This included grains and grain products, fruits and vegetables. The overall conclusion was: “*Diets low in saturated fat and cholesterol and rich in high-fibre, intact foods, such as whole grains, fresh fruits and vegetables, may reduce the risk of heart disease, a disease associated with many factors.*”

With respect to the subject of wholegrain, the Health Canada review included studies of wholegrains and brans, including oat bran, and excluded secondary prevention studies or studies which should have been confounded by other dietary differences, such as fat intake. With respect to experimental studies, reductions in total cholesterol and LDL-cholesterol were the biomarkers considered and studies of oat bran gave favourable results. A number of these studies used wheat bran as the control arm to keep total fibre intake constant between the groups. When reviewing cohort studies, three out of four studies using the definition of wholegrain as a food containing greater than 25% of wholegrain in the product found a protective effect with higher consumption.

2.1 Evidence published since the Canadian review

A range of intake descriptors were used among the six new cohort studies that examined coronary heart disease rather than all cardiovascular disease or stroke. Of the six, two studies measured fibre - cereal fibre in one and total fibre in the other – and so did not assess wholegrain intake. In another two studies, only part of the possible wholegrain intake was assessed: one measured only wholegrain breakfast cereal while the other included dark bread as well as wholegrain breakfast cereal. The remaining two studies calculated wholegrain intake by including partially wholegrain foods on a proportional basis. Among the last four, a range of important confounders were adjusted for, but aspects of diet (e.g. saturated fat intake), and sometimes elevated blood pressure were not included. Therefore, although four studies found a beneficial effect on coronary heart disease, it is unclear whether many of them measured wholegrain intake sufficiently well to be sure that the results were due to wholegrain intake. Only in the Norwegian study did the highest intake group consume more than three serves per day.

There have been five new intervention studies examining effects of wholegrains on plasma lipids: one study compared rye bread to wheat bread, one study compared oats to wheat

cereals, one study compared oats to corn cereal, one study compared barley to wheat and brown rice and the fifth study compared barley enriched with B-glucan to a glucose substitute. Of the first three studies, rye bread and oats reduced total and/or LDL-cholesterol levels compared to the wheat or corn controls. Wheat bread had no effect on total and/or LDL-cholesterol levels and the wheat cereals increased them non-significantly. Only one of the barley studies found an effect on cholesterol levels after barley consumption.

2.2 Relevance to Australia and New Zealand

The evidence for wheat alone conferring a protective effect against coronary heart disease is inconclusive. It is clear that wheat consumption does not reduce total or LDL-cholesterol. Wheat is the primary cereal consumed in Australia and so any potential health claim about wholegrains would appear predominantly on wheat-based products. There is also mismatch between the types of foods examined in a number of the studies and the predominant wholegrain consumed in Australia.

FSANZ also notes that the evidence cited in the Australian Dietary Guidelines for Adults (NHMRC, 2003) for the recommendation of ‘eat plenty of cereals ... preferably wholegrains’ references studies examining cancer, diverticular disease, diabetes and weight control with a specific reference to oats and psyllium and cholesterol lowering, and dietary fibre and constipation. Given that the current review examined a specific type of both the dietary components and the diseases mentioned in the guideline, it would not necessarily have expected to find a convincing relationship and so the conclusion is not necessarily at odds with the more general guideline.

2.3 Conclusion

FSANZ considers that the relationship between a higher intake of wholegrains and a reduction in coronary heart disease is not convincing and therefore a health claim has not been substantiated.

- The focus of the requested review was on wholegrains and bran, not on fibre.
- The definition of wholegrain in available studies was inconsistent and often vague.
- Some of the available studies measured intake of fibre rather than wholegrain and so may have included intake from other non-wholegrain sources. As intake of wholegrains is often very low in many studies it was unclear whether the results could be attributed to intake of wholegrains as such.
- There was inadequate control for confounding by a range of other lifestyle factors. The evidence supports a general trend for a relationship between coronary heart disease and a ‘healthy’ diet rather than a relationship specific to wholegrain intake.
- Results from the subset of studies on oats and barley, which are high in soluble fibre, could not be generalised to wheat, which is low in soluble fibre and the primary type of wholegrain that would be eaten in Australia and New Zealand. It is clear that the non-soluble fibre found in wheat does not lower cholesterol levels.
- Therefore there was an insufficient number and range of study types to form an adequate evidence base to examine the possible relationship between wholegrain, as consumed in Australia and New Zealand, and coronary heart disease.

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