



# Presence of gluten in foods labelled “gluten-free”

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# Executive Summary

The NSW Food Authority purchased 211 “gluten-free” labelled products and analysed them for the presence of gluten. Products included sauces, flours, breads, chips, confectionary, beverages, cakes, infant foods, meat products, soups and spreads. Of foods tested 95.3% contained no detectable levels of gluten. Samples where gluten was detected included:

- 2 samples each of pancake mix, biscuit mix and flour; and
- 1 sample each of infant food, meat product, breadcrumbs and prawn crackers

For those products where gluten was detected, regulatory action was taken commensurate to the risk presented by the amount of gluten present. The results from this survey are similar to those from other surveys conducted in Australia, although the products where gluten was detected differed for each survey.

# Introduction

Wheat flour and gluten is commonly used in foodstuffs to improve product texture, moisture retention and flavour. They can be found in a variety of products including pasta, meat products, sauces, bread, chips and others.

A proportion of the population is intolerant to gluten resulting in a condition known as coeliac disease. Coeliac disease is an immune reaction which causes inflammation and damage to the lining of the small intestine (Swain, Soutter and Loblay, 2005). This in turn affects the ability of the small intestine to absorb nutrients. Symptoms of coeliac disease include fatigue, bloating, cramps, diarrhoea and mouth ulcers.

Coeliac disease is also known to affect the growth rate of children and in some situations can be associated with other autoimmune conditions such as diabetes (Mann and Truswell, 2007). It has been suggested that coeliac disease affects 1% of the population in USA (Mann and Truswell) and in Australia different studies quote between 1 in 250 and 1 in 100 (Coeliac Society of Australia, 2008). The treatment for people with coeliac disease is lifelong avoidance of gluten-containing foods.

To ensure people with coeliac disease can buy food with confidence, the Australian New Zealand Food Standards Code (Food Standards Code) has requirements in respect to both ingredient listing and products claiming to be gluten-free. Standard 1.2.3 - Mandatory Warning and Advisory Statements and Declaration of the Food Standards Code requires a declaration of the presence of cereals containing gluten and their products in foods (Food Standards Australia New Zealand, 2008a).

Standard 1.2.8 – Nutrition Information Requirements of the Food Standards Code requires food that claims to be free from gluten to have no detectable gluten present and foods that claim to have a low gluten content to have less than 20 mg of gluten per 100 g of food (200 ppm) (Food Standards Australia New Zealand, 2008b).

Previous surveys of gluten in foods have been conducted by the Western Australian and South Australian authorities. In the most recent survey conducted by the Western Australian Department of Health, 70 “gluten-free” products were tested, with gluten detected in five samples (Government of Western Australia Department of Health, 2003). Products where gluten was detected included cake, pasta, condensed soup and processed meat.

The snapshot survey conducted by the South Australian Department of Health tested 53 “gluten-free” foods and found a low level of gluten in a “gluten-free” flour (Government of South Australia, Department of Health, 2005).

In recent years there has been an increase in the range of “gluten-free” products available for people with coeliac disease. Products include biscuits, breakfast cereal, meat products such as hamburger patties and sausages, pasta, flour and baby foods to name a few. The aim of this survey was to determine the gluten status of products claiming to be gluten-free available for sale in NSW.

# Materials and methods

During 2007, a total of 211 “gluten-free” labelled foods were purchased from retail outlets such as supermarkets and health food stores. The categories of food sampled are shown in Table 1.

Table 1: “Gluten-free” labelled food categories

<b>Food category</b>
Beverages
Biscuits
Bread and bread products
Cakes
Chips (e.g. corn, vegetable, prawn)
Confectionery
Dairy
Flour and premixes
Infant foods
Meat products
Pasta
Rice/Corn cakes
Snack bars
Sauces and gravy
Soups
Spreads

Samples were analysed by the Division of Analytical Laboratories (DAL) using the Biokits Gluten Assay Kit catalogue No.: 802002Y manufactured by Tepnel BioSystems. This kit, which measures gluten both qualitatively and quantitatively, is an accredited AOAC Official Method 991.19 (Gliadin as a measure of gluten in foods). The limit of reporting for this kit is 3 ppm. The tests were conducted as per the manufacturer’s instructions.

# Results and discussion

Results of all tests are present in Appendix 1. Of the 211 “gluten-free” products analysed, 95.3% contained no detectable gluten. The 10 samples that contained detectable gluten are outlined in Table 2.

Table 2: Samples containing detectable gluten.

<b>Product</b>	<b>Gluten level (ppm)</b>
Prawn crackers	160
Self-raising flour	45
Self-raising flour	30
Biscuit mix	27
Bread crumbs	26
Biscuit mix	24
Infant food	12
Pancake mix	11
Pancake mix	6
Sausage	4

The products presented in Table 2 do not meet the requirements of the Food Standards Code and as such regulatory action, commensurate with the risk to human health for the individual food product, was taken. However, international standards permit gluten free claims for products containing less than 20 ppm of gluten.

Thresholds for gluten have been based on reported gastrointestinal effects related to coeliac disease. A threshold for coeliac sensitivity has been reported in the range 20 - 100 ppm gluten (US Food and Drug Administration, 2006). This range has been used in the determination of action levels for labelling.

Based on the above, where detected levels were less than 20 ppm, manufacturers and/or the appropriate State/Territory food regulatory jurisdiction were informed of the results. Levels of less than 20 ppm of gluten may be attributed to cross contact of gluten with gluten free ingredients during manufacture and as such while the ingredients used by the manufacturer may contain no gluten, the final manufactured product may contain occasional traces of gluten. There has been considerable discussion internationally concerning “gluten free” claims and the presence of low levels of gluten. At a recent meeting of Codex Committee on Nutrition and Foods for Special Dietary Uses it was suggested that the term “gluten free” could be made where gluten levels were less than 20ppm (Codex Alimentarius Commission,

2007). If this proposed standard was applied to the foods included in this survey, 97.2% of samples would comply.

Levels of gluten between 20 and 100 ppm are likely to affect some of those with coeliac disease. As such, manufacturers and/or the appropriate State/Territory jurisdiction were informed of the results. Product withdrawal was requested along with a review of procedures and/or labelling. Further investigation of the origins of the gluten in these products is required although it could be expected that the presence of gluten was due to either unintentional contamination during manufacture or was present in the raw materials, probably at low levels.

Where gluten was detected at levels greater than 100 ppm, a voluntary food recall was initiated by the manufacturer. This occurred in one sample due to the detection of elevated levels in prawn crackers (see Table 2) (Food Standards Australia New Zealand, 2007).

The survey found gluten in a small but significant proportion of "gluten-free" foods. This is comparable to results from surveys conducted in Australia. However, the range of positive products varied from state to state.

## Conclusion

This survey illustrates that the majority of foods labelled “gluten-free” do not contain gluten. Only 4.7% of samples contained gluten, and only 2.8% exceeded internationally recognised levels for gluten free, of which one food (0.5%) exceeding 100ppm. Where gluten was detected, follow-up activities by regulatory agencies occurred.

While only a small number of samples were positive for gluten, testing of “gluten-free” labelled product continues in the interest of consumer safety.



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# Appendix 1

Listed below are the results of product tested between April 2007 and October 2007.  
Detectable levels are in bold.

Sample	Gluten level (ppm)
Arrowroot	<3
Baking powder	<3
Beef burger	<3
Beef burger	<3
Beer	<3
Beer	<3
<b>Biscuit mix</b>	<b>24</b>
<b>Biscuit mix</b>	<b>27</b>
Bread	<3
Bread	<3
Bread	<3
Bread	<3
Bread	<3
Bread	<3
Bread	<3
Bread	<3
Bread	<3
Bread	<3
<b>Bread crumbs</b>	<b>26</b>
Bread mix	<3
Breakfast cereal	<3
Breakfast cereal	<3
Breakfast cereal	<3
Breakfast cereal	<3
Breakfast cereal	<3
Breakfast cereal	<3
Brownies	<3
Cake mix	<3
Canned meal	<3
Canned meal	<3
Canned spaghetti	<3
Chicken burger	<3
Chicken soup	<3
Chips	<3
Chips	<3
Choc chip cookies	<3
Choc chip cookies	<3
Chocolate biscuit	<3
Chocolate biscuit	<3
Chocolate biscuit	<3
Chocolate cake	<3
Chocolate cake	<3
Chocolate pudding	<3
Chocolate spread	<3

Sample	Gluten level (ppm)
Corn cakes	<3
Corn cakes	<3
Corn cakes	<3
Corn chips	<3
Corn chips	<3
Corn flakes	<3
Cornflour	<3
Crackers	<3
Curry powder	<3
Curry powder	<3
Custard	<3
Custard powder	<3
Donuts	<3
Drinking chocolate	<3
Fettuccine	<3
Fettuccine	<3
Flavoured milk mix	<3
Flavoured milk mix	<3
Flour	<3
Flour	<3
Flour	<3
Flour	<3
Fruit bar	<3
Fruit bar	<3
Fruit bar	<3
Fruit bar	<3
Fruit bar	<3
Fruit bar	<3
Fruit bread	<3
Gravy	<3
Gravy	<3
Infant cereal	<3
Infant cereal	<3
Infant cereal	<3
Infant cereal	<3
Infant cereal	<3
Infant cereal	<3
Infant dessert	<3
Infant dessert	<3
Infant dessert	<3
Infant dessert	<3
Infant dessert	<3



<b>Sample</b>	<b>Gluten level (ppm)</b>
Sausages	<3
Sausages	<3
Sausages	<3
Sausages	<3
Sausages	<3
Savoury biscuits	<3
Savoury biscuits	<3
<b>Self raising flour</b>	<b>30</b>
<b>Self raising flour</b>	<b>45</b>
Snack bars	<3
Snack bars	<3
Soft drink	<3
Soup	<3
Soy flakes	<3
Soy milk	<3
Spaghetti	<3
Spaghetti	<3
Spaghetti	<3
Spread	<3
Stir fry sauce	<3
Stir fry sauce	<3
Stock powder	<3
Sweet biscuits	<3
Sweet biscuits	<3
Sweet biscuits	<3
Soup	<3
White chocolate	<3
Yoghurt	<3

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