ACCESS ECONOMICS Pty Limited

May 2007

Costs of fortifying bread and bread products with iodine

Report by Access Economics Pty Limited for

Food Standards Australia New Zealand

TABLE OF CONTENTS

LIST OF TABLES

EXECUTIVE SUMMARY — SUMMARY OF COSTS

	Net present value over 15 years	Upfront cost	Ongoing (per annum)
Australia			
Salt industry	A$3.8 million	A$161,000	A$314,000
Bakers	A$7.3 million	A$6,950,000	A$30,000
Government	A$1.6 million	A$31,000	A$137,000
Total(a)	**A$13 million**	**A$7.1 million**	**A$482,000**
New Zealand			
Salt industry	NZ$525,000	NZ$303,000	NZ$20,000
Bakers	NZ$1.8 million	NZ$1.5 million	NZ$30,000
Government	NZ$1 million	NZ$8,000	NZ$89,000
Total(a)	**NZ$3.4 million**	**NZ$1.8 million**	**NZ$138,000**

(a) Totals may not sum due to rounding

1. BACKGROUND

In 2006, Food Standards Australia New Zealand (FSANZ) commissioned Access Economics to undertake a cost benefit analysis of fortifying the food supply with iodine. The initial proposal was to require mandatory fortification of salt used in processed cereal based foods (principally, bread, biscuits and breakfast cereals) with iodine. The proposal had two components:

- mandatory addition of iodised salt, in place of non-iodised salt, in processed cereal based foods[1] at 30mg iodine per kg salt; and
- reduction in the voluntary iodine fortification of discretionary (retail) salt to 20mg iodine per kg salt.

In response to industry and community comment, the original proposal has now been modified to require fortification of bread (alone).

- The revised salt iodisation level would be in the range: 35-55 mg of iodine per kg of salt (used in bread making).
- "The voluntary permission for iodine in iodised salt and reduced salt will be retained, but will be adjusted from the current range of 25-65 mg per kg to 35-55 mg per kg, to be consistent with the mandatory requirement. Currently salt manufacturers iodise at approx 45 mg per kg and so in effect they will not be required to adjust their current iodisation practice." (pers. comm., FSANZ, 8 March 2007).

FSANZ commissioned Access Economics in March 2007 to update the original costs to reflect the modifications to its initial proposal.

In accordance with the scope for the project set by FSANZ, the costs of mandatory fortification quantified here are:

- the costs to government of administering and enforcing mandatory fortification; and
- the costs to the salt and bread manufacturing industry of fortification.

Previous reports also provided estimates of the costs of monitoring the health (including iodine sufficiency) of the population, and outlined in brief the other costs of fortification including potential restriction of consumer choice, potential adverse health effects from excess iodine intake (likely to be rare). Consistent with the purview of FSANZ, policy alternatives or complements to fortification (for example, public health advice for pregnant women on the need to supplement their iodine intake) are not in scope here.

[1] Processed cereal based foods include bread and bread products (English muffins, buns, bread rolls, fruit breads, pizza bases, crumbed products and stuffings), biscuits (sweet & savoury) and breakfast cereals (pers. comm., FSANZ, 6 June 2006).

2. METHOD

This report provides an update on previous work and uses the same methodology as that used for the original work. In light of this and the need to maintain comparisons with the benefits, the base year for analysis is 2005.

The initial cost benefit analysis compared the benefits of avoiding cognitive harm caused by iodine deficiency, with the costs associated with mandatory fortification. This report revises the costs of the previous work based on the new modified proposal. The original estimates of benefit have not been revisited.

The 'in principle' costs of iodine fortification are outlined in Table 2.1. As noted earlier, the costs to industry, and the costs to government of administering and enforcing mandatory fortification are estimated here. Only the extra or additional costs that can be attributed to the FSANZ proposal are incorporated in the cost estimates. The costs are calculated on the basis that iodine fortification continues for 15 years.

TABLE 2.1 IN PRINCIPLE COSTS OF IODINE FORTIFICATION

Type of cost	Data source	Included in this analysis
Restriction of consumer choice		✗
Cost to government of administering and enforcing regulation	governments	✓
Cost to industry of complying with regulation	Industry and research	✓
Potential adverse health effects from excess iodine intake		✗
Cost of monitoring nutrient intake and urinary iodine concentration		✗
Complementary policies required alongside fortification but outside the purview of FSANZ		✗

2.1 COST TO INDUSTRY

2.1.1 COST CENTRES

Access Economics sought data from industry on the following cost centres: labelling and packaging, capital equipment, iodine, iodine-premix, analytical/compliance testing, administration, and transport and storage. Companies indicated that the costs of administration were negligible.

2.1.2 BUSINESS COST CALCULATOR

The Business Cost Calculator (BCC) (see the Office of Best Practice Regulation website) provides a structured means of categorising the costs of government initiatives to business. The cost items identified in the BCC and how they relate to this analysis are summarised in Table 2.2.

TABLE 2.2: TREATMENT OF BUSINESS COST CALCULATOR COST ITEMS IN THIS ANALYSIS

BCC cost item	Description	Treatment here
Notification	Requirement to notify an authority that an event has happened	na
Education of staff	Raising awareness amongst staff	✓ The vast majority of bakeries are small and covered by the costs of govts initiatives to raise industry awareness (included here). Govts indicated that they may seek contributions to costs from industry and were asked to incorporate these costs in the overall costs to govt. Thus, these costs are not separately itemised for firms.
Permission	Applying for/maintaining registration via permits or licences	na
Purchase costs	Materials and equipment	✓ Companies provided estimates of costs of additional machinery and equipment needed, including installation and maintenance costs. Additional labour hours to run additional machinery costs included here. Cost estimates for additional iodine also included in analysis.
Record keeping	Filing and maintaining statutory documents (eg. permits and workplace accident records)	✓ No need for statutory documents/permits. Companies advised administration costs minimal ("just need to buy iodised salt"). Costs assumed to be zero here.
Enforcement	Cooperating with government inspections	✓ Firms provided estimates of their additional expenditure on food content/analytical tests. State/Territory govts advised no additional inspections so zero marginal cost to firms. Govts purchase bread samples for audit/analytical testing so no cost to firms.
Publication/ documentation	Labelling and signage	✓ Labelling costs for both salt industry and bakeries are estimated based on company estimates.
Procedural	Eg. fire safety drills or equipment inspections	na
Other		✓ Also included: Additional transport and storage for the salt industry Costs of writing off old labels for bakeries Trade related costs (zero as no bread exported).

2.1.3 DATA COLLECTION FOR THIS ANALYSIS

Salt industry

Access Economics approached salt suppliers directly for assistance in updating their original estimates in accordance with the new modified proposal. The companies approached were Olsson's Pacific Salt, and Cheetham Salt (encompassing Western Salt Refinery and Dominion Salt in New Zealand).

Bread and ingredients manufacturers

The two largest conglomerates (George Weston Foods and Goodman Fielder) were approached for assistance in revising their original cost estimates for iodine fortification. The estimates for bakers here are therefore based on:

- cost estimates for the new (narrower) iodine fortification proposal provided by the two major plant bakeries;
- the cost estimates originally provided by bakers to Access Economics for the old FSANZ iodine fortification proposal (bread, biscuits and breakfast cereals); and
- data and cost estimates provided by bakers and ingredients makers for calculating the costs of fortifying bread at the bakery with folic acid.

Breadcrumbs

No data were able to be collected from manufacturers of products using breadcrumbs as either a coating (eg. Crumbed fish) or as content (eg. Sausages).

2.2 DISCOUNT RATE

Choosing an appropriate discount rate for present valuations is a subject of some debate, and can vary depending on which future income or cost stream is being considered. There is a substantial body of literature, which often provides conflicting advice, on the appropriate mechanism by which costs should be discounted over time, properly taking into account risks, inflation, positive time preference and expected productivity gains.

The absolute minimum option that one can adopt in discounting future income and costs is to set future values in current day dollar terms on the basis of a risk free assessment about the future (that is, assume the future flows are similar to the certain flows attaching to a long term Government bond). We have settled upon the following as the preferred approach for Australia.

- **Positive time preference**: The long term nominal bond rate of 5.8% pa from recent history is used as the parameter for this aspect of the discount rate. If there were no positive time preference, people would be indifferent between having something now or a long way off in the future, so this applies to all flows of goods and services.
- **Inflation:** The Reserve Bank has a clear mandate to pursue a monetary policy that delivers 2 to 3% inflation over the course of the economic cycle. This is a realistic longer run goal and we therefore endorse the assumption of 2.5% pa for this variable. It is important to allow for inflation in order to derive a real (rather than nominal) rate.
- **Productivity growth**: The Australian Government's Intergenerational report assumed productivity growth of 1.7% in the decade to 2010 and 1.75% thereafter. We suggest

1.75% for the purposes of calculating the value of earnings over an individual's life time with a life expectancy of 70 years or so.

The discount rate applied to estimates of the **costs** acknowledges that productivity growth is incorporated in the cost estimates, so the discount rate used is: 5.8 – 2.5 = **3.3%.**

In selecting discount rates for New Zealand, we have settled upon the following as the preferred approach.

- **Positive time preference**: The long term nominal bond rate of 6.0% pa (from recent history in trading of NZ Government 10 year bonds) is used as the parameter for this aspect of the discount rate.
- **Inflation:** The Reserve Bank of New Zealand has an agreement with the New Zealand government to pursue monetary policy that delivers 1% to 3% inflation on average over the medium term. Over the past few years inflation has consistently remained in the top half of this band, and is expected to remain above 2.5% until 2008 (New Zealand Treasury) and so we use an assumption of 2.2% pa for this variable.
- **Productivity growth**: The New Zealand Treasury expects labour productivity growth of around 2% per annum in the year to March 2007, before returning to its long-term trend of around 1.5% per annum (New Zealand Treasury, 2005). For New Zealand based disease costing, this estimate of 1.5% will be used.

Similarly, the discount rate applied to estimates of **costs** acknowledges that productivity growth is incorporated in the cost estimates, so the discount rate used is: 6.0 - 2.2 = **3.8%**.

3. COSTS TO SALT MANUFACTURERS

The major suppliers of salt to the bread manufacturing industry in Australia and New Zealand are:

- Cheetham Salt Ltd (which has plants in various parts of Australia, notably SA and Queensland, and which includes Western Salt Refinery in WA and also Dominion Salt in New Zealand). In Australia, Cheetham supplies between 70-90% of the bread industry with salt. It supplies 100% of the New Zealand market.
- Olsson's Pacific salt (Australia only).

Salt manufacturers indicated that they will not incur costs as a result of the change to the regulated requirement for iodine content of table salt given that the average content requirement has not changed.

Machinery and equipment

In some cases, plant upgrades would be required to install a dry mixing system to enable increased production of iodised salt. In addition, where salt products are certified as an organic allowed input, firms need to ensure that there is no cross contamination, so a separate processing area would be required. The total cost of the machinery and equipment as well as installation costs have been included in the estimates. In Australia, around A$143,000 of additional machinery and equipment would be required (including installation costs). In New Zealand, two plants would be affected and around NZ$300,000 worth of machinery would be required.

Associated (additional) maintenance costs for the extra machinery have been included in the projections of annual ongoing costs (around A$5000 per annum and NZ$2,000 per annum).

Industry advised that the same amount of additional machinery would be required whether the fortification vehicle was restricted to bread alone or whether it included biscuits and breakfast cereals.

Labelling

Some salt manufacturers indicated that changes to labelling would be necessary of a type to ensure that iodised and non-iodised salt are not confused. The costs incurred would be around $1,000 per plate. One suggested the costs would be $1.00 per tonne of salt, however, this was inconsistent with the majority of responses and was altered to reflect the $1,000 per plate estimate.

One manufacturer advised that the additional costs of changing labels would be minimal, as fortified salt was already provided to bread manufacturers.

In Australia, upfront costs associated with changing labels would amount to around A$18,000, with no further costs modelled after the first year. Upfront labelling costs in New Zealand would be around NZ$3,000.

Industry advised that the labelling costs would remain the same whether the fortification vehicle was restricted to bread alone or whether it included biscuits and breakfast cereals.

Iodine

Manufacturers indicated that an iodine compound would be added in a premix of fine salt. Costs were calculated on the basis of adding an average 45mg iodine per kilo salt (which equates to around 77mg/kg potassium iodate). Manufacturers noted the importance of establishing a 'working range' for concentration of iodine to compensate for normal process variation. Most indicated they would use potassium iodate which costs A$30-40 per kg in Australia and NZ$55-65 in New Zealand.

In principle, the cost benefit analysis should be based on estimates for the costs of *additional* iodine (i.e. iodine purchased specifically as a result of the fortification requirement — over and above that already purchased). However, the current quantities of iodised salt already used in bread manufacturing are not known. Only one salt company was able to provide an estimate of the proportion of salt supplied to bread manufacturers that is already fortified. The rest of the estimates provided are based on the total costs of iodine added to salt for bread manufacturers. Thus, the additional costs for iodine are likely to be **overestimated**, but the extent of overestimation is not known.

The approximations of the cost of iodine required in Australia used for the modelling here are A$48,000 per year (around 10% of total ongoing costs per year), and in New Zealand are NZ$9,000 per year (around 35% of total ongoing costs per year).

Analytical testing

Analytical or compliance testing refers to the need to analyse the content of salt to determine whether the concentration of iodine complies with the proposed regulation. The total costs of analytical testing depend on the quality assurance approach adopted by each company.

Responses on approaches to analytical testing differed, with the amount of salt tested ranging between 6% and 20%. In Australia, estimates of test costs also differed depending on whether tests were carried out in-house, or externally at a laboratory.

Based on company estimates of test costs and the proportion of salt tested, the cost of analytical testing in Australia is around $14,000 per year, and in New Zealand, is around NZ$4,000.

Other costs

- Additional **ware-housing** costs would be incurred to separately store multipurpose non-iodised salt with sector specific iodised salt, at around A$14,000 per annum in Australia and NZ$2,000 per annum in New Zealand.
- A salt manufacturer in Australia indicated that one of its plants is not structured to manufacture iodised salt. It would therefore incur additional inter-state **transport** costs (as an alternative to building a new plant). These transport costs are substantial, at A$230,000 per year, and comprising 78% of annual ongoing outlays associated with fortification.

Transition time

Salt manufacturers in Australia and New Zealand advised that a transition period of **12 months** would be required to ameliorate the costs of stock in trade, to avoid additional labelling costs, and to allow preparation of plant and installation of machinery.

Technological issues

- Iodine will not disperse evenly in salts with large crystals or granules the way it does in finer salt. One salt manufacturer advised that a few food manufacturing companies use larger granules, although this is diminishing as larger granules require extended dough kneading times. Most companies are moving to use of smaller salt granules. Given the scope for this project, Access Economics was not able to pursue the significance of this potential problem for those using large granule salt in food manufacture although it would appear that the costs of changing recipes or processes is unlikely to be material.
- FSANZ has responded to salt manufacturers concerns about the importance of establishing a 'working range' to compensate for normal process variation in the concentration of iodine.

Summary of costs of fortification to salt manufacturers

The cost estimates are summarised in the table below (Table 3.1). The net present value figure (NPV costs) is based on implementation of the policy over 15 years — although only 4 years are shown in the table below.

- In Australia, the net present value over 15 years of the costs to the salt industry of fortifying salt with iodine for bread manufacturing would be approximately A$3.8 million.
- In New Zealand, the net present value over 15 years of the costs to the salt industry of fortifying salt with iodine for bread manufacturing would be approximately NZ$525,000.

Given that costs for salt manufacturers were based on a census of firms supplying bakers with salt, no sensitivity testing has been undertaken on these costs estimates.

TABLE 3.1: FORTIFICATION OF SALT WITH IODINE FOR BREAD MANUFACTURING — COSTS TO SALT INDUSTRY

Year		0	1	2	3	4
AUSTRALIA						
machines		$143,000				
labelling		$18,050				
total upfront		$161,050				
maintenance			$5,000	$5,000	$5,000	$5,000
iodine			$47,736	$47,736	$47,736	$47,736
analytical testing			$14,333	$14,333	$14,333	$14,333
transport			$233,333	$233,333	$233,333	$233,333
storage			$13,867	$13,867	$13,867	$13,867
Total ongoing			$314,269	$314,269	$314,269	$314,269
Discount rate	3.30%					
Discount index		100.00%	96.81%	93.71%	90.72%	87.82%
Discounted costs		$161,050	$304,230	$294,511	$285,103	$275,995
NPV costs	$3,832,647					

Year		0	1	2	3	4
NEW ZEALAND						
machines		$300,000				
labelling		$3,000				
Total upfront		$303,000				
maintenance			$2,000	$2,000	$2,000	$2,000
process labour			$3,016	$3,016	$3,016	$3,016
iodine			$8,726	$8,726	$8,726	$8,726
analytical testing			$4,000	$4,000	$4,000	$4,000
storage			$1,933	$1,933	$1,933	$1,933
Total ongoing			$19,675	$19,675	$19,675	$19,675
Discount rate	3.80%					
Discount index		100.00%	96.34%	92.81%	89.41%	86.14%
Discounted costs		$303,000	$18,955	$18,261	$17,593	$16,949
NPV costs	$524,850					

Comparison with previous estimates

The estimated costs to salt manufacturers associated with the original FSANZ proposal to require mandatory fortification of bread, biscuits and breakfast cereals with iodine are in Table 3.2. As expected, most of the ongoing annual costs in the updated analysis are around one third lower than the original cost estimates (reflecting that **for salt manufacturers, bread comprises two thirds of salt production for the bread and cereal processing industry**). However, there are some exceptions, and these are outlined in the "refinements to the updated analysis" column in Table 3.2. This column explains refinements made to the new updated analysis based on further discussions with two salt industry representatives from two different companies.

TABLE 3.2: COMPARISON WITH ORIGINAL ESTIMATES OF COSTS TO SALT INDUSTRY

	Fortification of bread, biscuits and breakfast cereals (original proposal)	Refinements to the updated analysis
Australia	Upfront costs A$160,000 Total ongoing costs A$490,000 per year. NPV over 15 years A$5.9 million.	Two different estimates of labelling costs for the same company were brought into line. Iodine costs for one company were overestimated in the original analysis and have been adjusted here.
New Zealand	Upfront costs NZ$303,000 Total ongoing costs NZ$18,170 per year. NPV over 15 years NZ$508,000.	The original costs did not include storage. Storage costs were added to the estimates here. The original costs did not include a 10% overage for iodine — adjusted here.

4. COSTS TO BAKERS AND INGREDIENTS MAKERS

4.1 BREAD MAKING INDUSTRY

Wholesale and plant bakeries produce bread for wholesale distribution and exporting, and account for the majority of bread production. Plant bakeries in Australia and New Zealand include:

- Goodman Fielder (whose brands in Australia include Helga's, Molenberg, Buttercup and Wonderwhite and whose brands in New Zealand include Quality Bakers, Ernest Adams, Molenberg and Vogel's [under licence]); and
- George Weston Foods (whose brands include Tip Top, Golden, Noble Rise, Top Taste and Burgen).

Traditional hot bread shops, supermarket in-store bakeries and franchise outlets have on-site manufacturing and retailing. In Australia, Coles and Woolworths dominate the supermarket in-store bakeries and Bakers Delight, Banjos (in Tasmania) and Brumby's dominate the franchise bakeries. Bakers Delight and Brumbys are also represented in New Zealand.

Ingredients makers — companies producing bread improvers or premix mainly for supermarket bakeries, franchises or hot bread shops — may also be affected by the proposal. Goodman Fielder and George Weston foods manufacture ingredients as do a number of other suppliers in Australia and New Zealand (such as Allied Mills).

Bakers also supply breadcrumbs to companies producing coated products (eg. crumbed fish) and food using breadcrumbs as an ingredient (eg. sausages).

4.2 NUMBER OF FIRMS AND SHARE OF PRODUCTION

In Australia in 2000-01, there were around 7,000 establishments involved in baking bread and bread products (BRI 2003). It is not clear how many ingredients makers there are. In New Zealand, based on estimates by baking industry representatives approached for previous work by Access Economics on fortification of bread with folic acid:

- there are around 8 major bakeries (including sites owned by George Weston, Goodman Fielder, and others) (pers. comm., New Zealand Association of Bakers, August 2006); and
- around 2000 to 3000 small bakeries (pers. comm., Baking Industry Association New Zealand, 14 August 2006).

The plant, franchise and supermarket bakeries produce the majority of bread in both Australia and New Zealand (over 90%). Table 4.1 shows the proportion of bread produced by each sector of the baking industry in Australia in 2000-01 based on the BRI (2003). According to the New Zealand Association of Bakers, the proportions are relatively similar in New Zealand (pers. comm., New Zealand Association of Bakers, August 2006) and for the purposes of the analysis here are assumed to be same in both countries.

TABLE 4.1 BAKERY INDUSTRY, AUSTRALIA, 2000-01

	Proportion of bread production by volume	Number of establishments
Wholesale bakeries	na	211
Plant bakery	61%	52
Franchise bakery	14%	886
Retail bakery	5%	4,681
Supermarket bakery	20%	1,163
Total bakeries	100%	6,993

Source: BRI 2003, tables 2.3 and 2.4.

4.3 VOLUME OF BREAD PRODUCED

In order to calculate the total costs of the FSANZ proposal nationwide (in Australia and in New Zealand) it is necessary in some instances below to use a unit cost per kilo of bread and then multiply this by the total volume of bread produced. The aim of this section is to estimate total bread production.

Unfortunately, little information is available on the production of bread and bread making flour. A literature review and advice from the BRI suggests that no robust estimates of bread production are available for Australia or New Zealand. It is also necessary to calculate only the additional costs of the FSANZ proposal. In Tasmania, some bread is already fortified with iodine and therefore, the total costs of the FSANZ proposal should not include the costs of fortifying bread that already includes iodine. Around 80% of bread in Tasmania is fortified[2]. The Tasmanian population represents around 2.4% of the Australian population[3]. Assuming this is a good proxy for the amount of bread produced for the Tasmanian market, then Australian bread production needs to be factored down by 0.8x2.4% (1.9%).

4.3.1 TOTAL BREAD PRODUCED IN AUSTRALIA

There are three sources of estimates of total bread production in Australia:

- According to the BRI (2003:12), in 2000, the volume of bread produced in Australia was approximately 777 kilo-tonnes (equivalent to 777,000 tonnes). However, the BRI subsequently advised that this estimate represents a lower bound (pers. comm. via email, BRI, 17 August 2006). Factored down by 1.9% for bread already fortified in Tasmania, this leads to an estimate of **762,000 tonnes of bread**. Assuming a loaf of bread weighs around 0.7kg, this corresponds with around **1.1 billion loaves** (or around one loaf per week per Australian).
- It is also possible to estimate bread production based on the amount of bread making flour produced, combined with estimates of the amount of flour used in each type of bread — white, wholemeal, and other — and the proportion of each type produced (see Table 4.2). The BRI advised Access Economics that the volume of flour used in Australian bread making in 2005 was 956,000 tonnes (based on data from the Flour

[2] Seal J, Johnson E, Doyle Z, Shaw K, 2003, Tasmania: doing its wee bit for iodine nutrition, MJA; 179 (8): 451-452

[3] Population for the December quarter, 2005, from ABS Ausstats, cat. no. 3101.0, http://144.53.252.30/ausstats/abs@.nsf/0e5fa1cc95cd093c4a2568110007852b/6949409dc8b8fb92ca256bc60001b3d1!OpenDocument

Millers Council) (pers, comm. via email, BRI, 17 August 2006). This suggests that around 1,690,000 tonnes of bread were produced in Australia in 2005 (Table 4.2). Factored down by 1.9%, this leads to an estimate of **1,658,000 tonnes of bread**. Assuming a loaf of bread weighs around 0.7kg, this corresponds with around **1.3 billion loaves** (or around 1.2 loaves per week per Australian).

- Two major plant bakeries provided data on their bread production for this report. If these companies account for around 60% of the total bread volume produced, around 900,000 tonnes of bread is produced each year. Factored down by 1.9%, this leads to an estimate of **883,000 tonnes of bread**. Assuming a loaf of bread weighs around 0.7kg, this corresponds with around **2.4 billion loaves** (or around 2.3 loaves per week per Australian).

These three estimates are used below to derive the costs of revising labelling to firms producing unpackaged bread or ingredients (bread improvers and the like).

4.3.2 NEW ZEALAND

Information for New Zealand is less robust than that for Australia as there are no systemic national data on production of bread making flour. In part this reflects that NZ flour millers do not separate bread making flour from other types of flour. The amount of bread making flour produced in 2004-05 was previously estimated by Access Economics based on feedback from New Zealand flour mills at 150,000 tonnes[4]. This is equivalent to 266,000 tonnes of bread (Table 4.2). Assuming a loaf of bread weighs around 0.7kg, this corresponds with around 380 million loaves.

TABLE 4.2 BREAD PRODUCTION BASED ON FLOUR PRODUCED, 2005

	Type of bread			
	White	Wholemeal	Other	Total
Bread type as a proportion of total bread sales	60%	15%	25%	100%
Amount (on average) of flour used to produce bread of each type	60%	55%	50%	
Australia				
Tonnes bread produced from 956,000 tonnes of flour	956,000	260,727	478,000	1,694,727
New Zealand				
Tonnes bread produced from 150,000 tonnes of flour	150,000	40,909	75,000	265,909

Source: Distribution of bread types by sales for 2001 from BRI (2003:12). Averages for proportion flour in bread from pers. comm., New Zealand Association of Bakers, August 2006, Bakers Delight (Australia) 15 August 2006, and recipes from New Zealand ingredients manufacturer, August 2006.

[4] According to the New Zealand Flour Millers Association (NZFMA), around 270,000 tonnes of flour was produced for all purposes in 2004-05. NZFMA estimates of the amount of flour used in bread were in the range 150,000 to 220,000 tonnes. Drawing on similar proportions in the New Zealand market compared with the Australian market, between 45 per cent to 51 per cent of flour is used in bread. Using these proportions suggests the lowest NZFMA estimate of 150,000 tonnes is the most reliable.

4.4 THE COSTS

Access Economics sought data from industry on the following cost centres: labelling and packaging, capital equipment, iodine, premix, analytical/compliance testing, administration, and transport and storage.

4.4.1 FORTIFIED SALT

Iodised salt would cost cereal processing firms around 10% more than non-iodised salt. The increase in the price of salt reflects the additional costs of fortification to the salt industry. Salt industry costs are already incorporated in the modelling here (see Section 3). Adding the additional costs of iodised salt to the costs of bakers would double count economy wide costs, so the higher price of iodised salt is simply noted here.

4.4.2 REVISING PACKAGING AND LABELLING (BREAD AND INGREDIENTS)

Pre-packaged bread

If mandatory fortification were introduced, bakers producing **pre-packaged** bread, would incur upfront costs associated with adjustment of label templates to ensure compliance with labelling standards. The redesign is likely to be relatively minor, involving inclusion of iodised salt in the ingredients list. FSANZ advised that foods containing iodised salt need to reflect this on the ingredients list only — not on the nutritional panel (FSANZ email, 16 April 2007). That said, the costs depend on the colours and plates involved for each stock keeping unit (SKU). Estimates provided to Access Economics of the costs of label redesign were in the range:

- for retail products in Australia — A$550, A$1000 and A$2000 per SKU;
- for retail products in New Zealand — NZ$500 per SKU; and

As noted in the previous reports on folic acid and iodine fortification, these retail label cost estimates are consistent with cost estimates for label changes in KPMG 2000 (cited in NZIER 2005). Two large plant bakeries producing pre-packaged bread provided revised estimates of labelling costs for this report.

Australia:

- For Australia, one bakery (company 1) estimated the cost of revising labels would be around A$1,050,000 (including a labour component). The company advised that this did not include the cost of revising labels for its ingredients businesses (making premixes or improvers) (email 20 April 2007).
- The other (company 2) estimated the cost of revising packaging on bread would be around A$260,000. While the company noted that this does not include the cost of revising ingredients labels (premixes etc), it stated, "*labelling costs would be minimal as products are used in in-store bakeries, where labels are generally printed at the point of sale*" (email, 19 April 2007).

It is difficult to reconcile these estimates without further information. While company 1 produces more bread than company 2, its implied unit labelling revision costs (labelling revision cost divided by bread production) are more than 3 times the other firm. This may reflect differences between the two companies in the mix of products and the required packaging. The impact of using the two different unit costs on the total estimates is reflected in Table 4.3 (write-off costs are discussed further below). For the purposes of modelling,

packaging revision costs are the sum of the estimates from the two plant bakeries (A$1.3 million).

TABLE 4.3 LARGE PLANT BAKERIES — CHANGE IN ESTIMATES USING ALTERNATIVE UNIT COSTS

Large Plant bakeries	Total sum of estimates as provided	Total estimated using unit costs from company X	Total estimated using unit costs from company Y
Label revision	$1.31 million	$580,000	$2 million
Label write off cost	$5.05 million	$2.3 million	$7.5 million

It should be remembered that these estimates are not exact. In economic terms, the differences in label revision costs are not material for the project overall, but the differences in packaging write-off costs are material and will be further examined in sensitivity analysis. **However, it should be kept in mind that the packaging revision costs are material for the individual companies concerned. Introducing both fortification proposals at the same time (folic acid and iodine) will mean that the companies do not unnecessarily incur these packaging revision costs twice.**

New Zealand:

- In New Zealand, company 2 indicated the costs of changing label plates would be NZ$120,000.
- The other company did not provide an updated estimate for New Zealand, so its estimate for the cost of revising labels for folic acid fortification at the bakery is used — NZ$272,000.

The total cost of revising labelling/packaging to the plant bakeries in New Zealand is therefore around A$392,000.

Unpackaged bread

In-store supermarket bakeries, franchise bakeries, and individual bakers would incur some labelling costs, but to a lesser extent than manufacturers of pre-packaged products. According to the labelling standards, food sold **unpackaged**, or made on the premises from which it is sold, or packed in the presence of the purchaser, does not require a label. Enterprises producing unpackaged products generally provide information about ingredients via information manuals available for public perusal, label stickers, or cardboard inserts listing ingredients. **For the purposes of this analysis, it has been assumed that the upfront costs of adjusting labelling for unpackaged bread are the same for fortifying bread with iodine as for fortifying bread with folic acid.**

- Two franchise bakeries indicated the once-off costs of updating manuals and labels would be A$10,000 to A$15,000 each.
- A franchise bakery in New Zealand indicated once-off costs of updating manuals of NZ$2,000.

Bread ingredients (premix, improvers etc)

Companies producing bread improvers or premix for supermarket bakeries, franchises or individual retail shops may also need to change their labels, but at a lower unit cost as the labels are less complex than for the retail market (pers. comm. NZ bakery ingredients company, 15 August 2006). One ingredients maker in New Zealand indicated that labelling costs for his business (including changes to recipes and ingredients lists on websites) would amount to approximately NZ$24,000 (ballpark). This source was not able to estimate the associated amount of bread, however. Without further surveying of the companies concerned, the estimates for revising labelling for bread ingredients (for companies other than the large plant bakers) are uncertain. A number of assumptions have been made to estimate the costs to ingredients makers of revising labels (see next).

Total costs of revising packaging and labelling for bread

For the purposes of modelling, to determine overall total costs, the proportions of bread produced by each type of bakery (Table 4.1) have been used. The calculation of the costs of revising labels is summarised in Table 4.4, based on the following:

- the cost estimates from the two plant bakers which contributed data to this analysis constitute the costs of revising packaging for packaged bread, and the costs of half of the ingredients market (noting one company's statement that the costs of revising labelling of ingredients would be minimal — see above);
- the costs of revising manuals and labels of the franchise bakers represent the unit costs to those producing unpackaged bread.
- The unit costs to ingredients makers of revising labels are the same as those of in-store supermarket bakeries, franchise bakeries, and individual bakers; and
- Premixes are used for 40% of the bread market (**uncertain**).

Estimates of the total costs of revising packaging and labelling of bread and bread premixes are shown in Table 4.4.

TABLE 4.4 CALCULATION OF COSTS OF REVISING PACKAGING AND LABELLING

	Bread production by volume	$ per kilo bread	Australia (based on three different estimates of bread production)	New Zealand
Plant bakers (including half the ingredients market)	60%	na	A$1.31 million	NZ$392,000
franchise supermarket, individual retail	40%	$0.0024 per kg bread (assume same for Aus/NZ)	These three estimates based on the three estimates of total bread production in Australia (see Section 4.3.1) A$731,748 (762 m kg bread) A$847,584 (883 m kg bread) A$1,591,574 (1,658 m kg bread)	NZ$255,360
Ingredients (the half not covered by plant bakeries) **(uncertain)**	40% x 0.5	$0.0024 per kilo bread (assume same for Aus/NZ)	These three estimates based on the three estimates of total bread production in Australia (see Section 4.3.1) A$365,874 (762 m kg bread) A$423,792 (883 m kg bread) A$795,787 (1,658 m kg bread)	NZ$127,680
Total costs of revising labels			**A$2,407,622 A$2,581,376 A$3,697,361**	**NZ$775,040**

4.4.2.1 PACKAGING AND LABELLING ON PRODUCTS USING BREADCRUMBS

Breadcrumbs are used as a food coating, for example, crumbed fish fillets, and a food ingredient, for example, in sausages. Labelling standards require that the compound ingredients[5] of a compound (such as breadcrumbs) be declared if the amount of the compound ingredient in the final food is 5 per cent or more by weight. Further, salt may be considered to be performing a 'technological function' (clause 6, standard 1.2.4) in which case there may be labelling implications (pers. comm., email, FSANZ, 2 June 2006).

- A proportion of breadcrumbs are purpose-baked to give specific crumbing characteristics. In this case, it would be possible to use non-iodised salt if preferred by customers without incurring labelling costs.
- Other breadcrumbs are produced using unsold bread from retail bread production, in which iodine would unavoidably be present. In this case, customers using the product as an ingredient in a packaged food product may incur labelling costs if breadcrumbs represent 5% or more of the final product, or if the clause relating to technological function is relevant.

One large plant bakery stated that the majority of crumb produced uses excess bread from retail bread production (pers. comm. email, 17 April 2007). Other evidence, collected by FSANZ, suggests that the proportion of crumbs that are purpose baked varies across enterprises and that in some cases, considerable amounts are purpose made (pers. comm.

[5] Compound ingredient means an ingredient of a food which is itself made from two or more ingredients.

email, FSANZ, 17 April 2007). There is no definitive data showing the proportion of crumbs derived from purpose baked bread.

This rests on the assumption that iodine is a stable material, and drying of bread in the process of manufacturing breadcrumbs will not affect iodine content.

Corporations in the food industry that use breadcrumbs were not contacted for this report, and bakers were not able to estimate the expected value of the potential costs. **There is therefore substantial uncertainty about the potential costs of revising packaging and labels for products including breadcrumbs. If packaging and labelling need revising, there is also the potential cost of writing-off old packaging.**

4.4.2.2 WRITING-OFF OLD STOCKS OF PACKAGING AND LABELLING

A transition time is necessary so firms can pre-order new labels, allow for them to be printed and delivered, rearrange label storage, and then actually changeover labels.

A transition period may also moderate the problem of disposing of unused pre-printed labels, allowing old stock to be reduced. However, it is unclear how much difference a transition period would make to the costs of label write offs.

- Labels must match product content (pers. comm. FSANZ 16 April 2007), so companies cannot run-down old label stocks by using them on newly fortified bread.
- The NZIER suggested that for a given product, in order to gain economies of scale in purchase, manufacturers may purchase labels for up to two years in advance, but usually for shorter periods (NZIER 2005). However, the large plant bakeries have hundreds of different product lines. The duration for running down label stocks differs for each line and so label stocks will not all run out on the same day.

Companies providing data for the report on the proposal to require fortification of bread with iodine provided the following estimates of the value of labels written-off:

- One company (company A) indicated A$1.05 million[6] and NZ$360,000 in pre-printed bread labels would need to be written-off in Australia and New Zealand respectively. These estimates do not include the ingredients segment of the business, but the same proviso applies as above ie. the company advised that, "*labelling costs would be minimal as products are used in in-store bakeries, where labels are generally printed at the point of sale*" (email, 19 April 2007). The company advised that the costs apply no matter what the transition period. This is because fortification would be implemented on the same date at all of its bakeries. This represents the most reliable transition approach and would capture efficiencies in auditing.
- Another plant bakery in Australia (company B) indicated that iodine fortification implies a packaging write off of A$4 million no matter what the transition period. This company advised that this estimate did not include the costs of disposing of old labels for bread premixes etc (email 20 April 2007).

It is difficult to reconcile these estimates without further information. While company B produces more bread than company A, its implied unit label write-off costs (write-off cost divided by bread production) are more than 3 times the other firm. This may reflect differences

[6] The company advised that this is based on previous experience, and equates to an average write-off of around 2.5 weeks worth of packaging stock per SKU.

between the two companies in the mix of and number of products, the required packaging, and also the approach to packaging administration (ie. Storage and handling, printing etc). **The impact of the different unit costs to the total packaging write-off are reflected in** Table 4.3 **(above). The upper and lower estimates for packaging/labelling write-offs are used as upper and lower bounds for sensitivity analysis.**

- Other (smaller) wholesale bakeries indicated that they would be able to use up their stocks of pre-printed labels in three months and so would not need to write off label stocks if the transition period is 12 months.
- Enterprises producing unpackaged bread (such as franchises, supermarket in-store bakeries and small individual bakers) would most likely be able to use up their stocks of information cards and labels in a transition period of 12 months and would not need to write off label stocks.
- One company noted the need to dispose of pre-printed packaging is not consistent with government policies aimed at reducing waste, for example, the National Packaging Covenant.

Assuming a 12 month transition period, and based on estimates from the two large plant bakeries, the value of labels written-off for the base case is between A$2.3 and A$7.5 million in Australia and NZ$720,000 in New Zealand as a best approximation (2XNZ$360,000). This estimate does not include packaging write offs associated with firms using breadcrumbs.

If iodine and folic acid are introduced at different times, the costs of writing off old packaging and labelling would approximately double (depending on whether folic acid is introduced into bread or flour). The savings from simultaneous implementation of these two proposal are estimated in the conclusion (section 6).

4.4.2.3 ANALYTICAL TESTING

Analytical testing was defined earlier (Section 3). The charges for testing the folic acid content of bread are higher than for testing iodine content: folic acid content tests are A$200 per test, whereas a laboratory certified by the National Association of Testing Authorities indicated that the charge for testing the iodine content of bread (excluding GST) is A$77.75[7].

FSANZ advised that the point of compliance is the salt manufacturer (pers. comm., email, 16 April 2007). Around half of the cereal processing firms that contributed data to the original calculations of the costs of fortifying bread, biscuits and breakfast cereals with iodine indicated that they would not undertake analytical testing. Others stated they would rely on salt suppliers' guarantee that iodine concentration complied with the proposed fortification regulation. Two large plant bakers indicated that they would undertake auditing and provided cost estimates for this report.

- One firm indicated that audits of salt suppliers would be undertaken via spot checks annually on a range of breads and on the salt supply. This would cost around A$5,000 per annum and probably around the same in New Zealand.

[7] Agriquality in Australia stated that the charge for testing the iodine content of bread (excluding GST) is A$77.75 (pers. Comm., Agriquality customer help, 26 March 2007)

- Another firm indicated that a mandatory requirement to fortify bread with iodine would result in analytical testing costs of A$25,000 per year, covering testing of salt and testing the end product.

In summary, since the point of compliance is the salt manufacturer, only the larger plant bakers are likely to undertake auditing at a cost of around A$30,000 per year in Australia and a similar amount in New Zealand.

4.4.2.4 TRADE-RELATED COSTS

Less than one per cent of Australian bread turnover was exported in 2001-02 (BRI 2003). Companies responding to this analysis indicated that that exports include frozen bread, spice mixes, premixes and breadcrumbs. Trade related costs will be incurred **if**:

- countries with a high iodine diet such as Japan proscribe imports of food fortified with iodine. It is not clear how export markets for these products would be affected; **and**
- products that are exported to countries that proscribe imports of fortified food are not purpose-processed for export (ie. processed separately and therefore easily able to continue using non-iodised salt). Some exports are currently customised for the export market (purpose-processed) but without surveying the companies themselves, there are no data publicly available on what proportion.

In the event that a company must separately produce unfortified products for export, trade related costs could include:

- the upfront costs of isolating products exported to countries that proscribe fortified imports (or losing this business altogether); revising labelling of other exported products (eg. where “iodised salt” needs to be included on labels that are in other languages and so are not included in the general costs of revising labels (ie. products destined for the Australian or New Zealand markets).
- Ongoing costs of additional transport and warehousing costs (including pallets) for separately produced products for export and labour costs associated with switching between fortified and non-fortified products (depending on whether purpose-processes were implemented or not).

Without surveying the companies themselves, it is not possible to estimate the magnitude of potential costs if export destinations proscribe fortified imports. For the purposes of modelling, in the base case, trade related costs are set at zero. Without knowing the probability, zero costs is a possibility given that costs will not be incurred unless export destinations proscribe imports of fortified products.

4.4.2.5 OTHER COSTS

- **Public liability insurance premiums paid by industry:** It has been assumed that these will remain unchanged as a result of fortification because the health risk-benefit assessment commissioned by FSANZ concluded that there is no risk to health. In the event that health risks were identified, insurance premiums could rise.
- **Potential loss of sales:** For the folic acid fortification analysis, one large plant bakery represented in both Australia and New Zealand suggested that it would lose around 1% of sales as a result of folic acid fortification (costing A$2,960,000 and $NZ537,200 respectively). While this represents a loss to this company, consumers who switch away

from bread will increase consumption of a substitute product, which does not represent a loss to the economy as a whole.

4.4.2.6 THE IMPACT ON THE PRICE OF BREAD

Bread markets are highly competitive. It is likely that over time bread prices would rise slightly — some bakers contributing to this study indicated price rises of up to two per cent. A change in the price of bread as a consequence of fortification could impact on the benefits associated with fortification by changing bread consumption patterns. However, demand for bread is relatively inelastic and the price change is likely to be small, so the change in consumption of bread (if any) would probably be small.

4.4.2.7 SUMMARY OF COSTS TO BAKERS

The individual itemised costs to bakers in this updated analysis are not comparable with the estimates in the original iodine fortification report. The updated estimates are calculated on the basis of tonnes of bread produced rather than salt used in bread.

Nevertheless, it is worth noting that **the costs to bakers of the modified (narrower) proposal to fortify bread only are substantially less than for the original (broader) proposal to fortify biscuits and breakfast cereals as well. This is because the in the base case in the current analysis trade related costs are zero**. The trade related costs associated with biscuits and breakfast cereals were estimated at A$2.3 million in ongoing outlays per year in Australia and more than NZ$280,000 in ongoing outlays per year in New Zealand. These trade related costs comprised 85% of all ongoing costs to cereal processing firms per year associated with iodine fortification of the broader original proposal.

TABLE 4.5 SUMMARY OF COSTS OF FORTIFICATION TO BAKERS OF IODINE FORTIFICATION (2005)

Type of cost	Australia	New Zealand
Upfront (once off) cost of revising packaging and labels — bread and ingredients	These three estimates are based on the three estimates of total bread production in Australia (see Section 4.3.1, and Table 4.4) $2,407,622 $2,581,376 $3,697,361	NZ$775,040
Upfront (once off) cost of revising labels — Breadcrumbs	Uncertain	Uncertain
Upfront (once off) costs of writing-off old packaging stock — bread and ingredients (assuming a 12 month transition period)	(see Table 4.3 and section 4.4.2.2) Between A$2.3 million and A$7.5 million	NZ$720,000
Upfront (once off) costs of writing off old packaging stocks — Breadcrumbs	Uncertain	Uncertain
Ongoing analytical testing costs (per annum)	A$30,000	NZ$30,000
Upfront and ongoing trade related costs	Base case zero	Base case zero

(a) Using a purchasing power parity conversion rate from the OECD 2006 of 1.068 ($NZ/$A)

4.4.3 SENSITIVITY TESTING OF COSTS FOR BAKERS

Sensitivity analysis has been conducted using the @RISK 4.5 for Excel program. Sensitivity testing has been undertaken because of the uncertainty in the estimates relating to:

- the costs of revising pre-packaged labelling; and
- the costs for writing off old packaging.

Importantly, there is also uncertainty about:

- the costs for breadcrumb manufacturers; and
- trade related costs.

However, sensitivity analysis is only useful if ball park estimates are available and can be combined with some knowledge about the probabilities for the parameters used to create the estimates.

- For **trade related costs**, we know that a lower bound of zero is a reasonable assumption. Costs only arise if destination countries for Australian or New Zealand exports proscribe imports of food fortified with iodine and the exported products are not easily able to be purpose-produced (see above). Further, we know that less than one per cent of Australian bread turnover was exported in 2001-02 (BRI 2003).
- No quantitative information was available concerning the costs for breadcrumb manufacturers. There are no publicly available data and no quantitative estimates were available for this report — two companies provided qualitative information only. Despite the fact that no quantitative estimates are available, this parameter should not be ignored.

Table 4.6 summarises the basis for the sensitivity testing undertaken.

TABLE 4.6 SUMMARY OF PARAMETER VALUES AND DISTRIBUTIONS FOR SENSITIVITY TESTING

	Australia	New Zealand
Revision of packaging/labelling	Normal distribution. Mean of $2,900,000. Distribution truncated based on different estimates of bread production (min $2,407,622, max $3,697,361) (See Section 4.3.1, and Table 4.4)	No sensitivity
Packaging write-off	Normal distribution. Mean of $4,050,000. Distribution truncated based on different estimates of unit costs of packaging write-off from two different plant bakeries (min $2,300,000, max $7,500,000). (See Table 4.3 and section 4.4.2.2)	No sensitivity
Breadcrumbs	No quantitative estimates available for this report	No quantitative estimates available for this report
Trade related	Lower bound zero. No quantitative estimates of upper bound available for this report, but costs only arise if destination countries for Australian or New Zealand exports proscribe imports of food fortified with iodine and the exported products are	Lower bound zero. No quantitative estimates of upper bound available for this report but costs only arise if destination countries for Australian or New Zealand exports proscribe

	not easily able to be purpose-produced (see above). Further, we know that less than one per cent of Australian bread turnover was exported in 2001-02 (BRI 2003).	imports of food fortified with iodine and the exported products are not easily able to be purpose-produced (see above)

Applying these assumptions about the distributions for these variables, the likely range for the costs to bakers of iodine fortification over 15 years are in Table 4.7. A reasonable estimate of the net present value of costs over 15 years to Australian bakers (noting that the costs to companies using breadcrumbs are not included) is A$7.3 million. The net present value of costs to **New Zealand** bakers over 15 years (noting that the costs to companies using breadcrumbs are not included) is around NZ$1.8 million.

TABLE 4.7 RANGE OF NPV OF COSTS TO BAKERS OF IODINE FORTIFICATION OF BREAD OVER 15 YEARS, AUSTRALIA

	Australia (A$)
Minimum	7,237,497
5th percentile	7,277,137
Mean	7,300,489
95th percentile	7,323,513
Maximum	7,354,267

5. COSTS TO GOVERNMENT

The costs to society of regulation include the costs of resources used in monitoring and administering the regulations by governments. These costs are estimated in this section. There are three elements of the costs to government:

- The costs of administering and enforcing the regulations for the bakery industry
- The costs of awareness raising amongst GPs
- The costs of monitoring the effectiveness of the regulation.

Only the first element — the costs of administering he enforcing the regulations for the bakery industry — are incorporated in the analysis here. Monitoring costs were included in the original report (along with the analysis of benefits of the fortification proposal).

FSANZ advised that the point of compliance with the new proposal is the salt manufacturer (as bakers only need to replace unfortified with fortified salt) — the implication being that governments need only sample salt rather than bread[8]. However, when advised of the FSANZ proposal previously, cost estimates from governments generally included collecting bread from a sample of bakeries in their jurisdiction for content testing. Whether or not this is necessary is up to the relevant jurisdiction. As indicated by their estimates, different governments will adopt different approaches to administer and enforce the proposal. They may audit a sample of bakeries to check whether they are using iodised salt without testing the content of the bread, or they may also test the content of the bread. **Nevertheless, the laboratory costs of testing bread content have been removed from the Australian estimates here (this was not possible for New Zealand). The costs of visiting bakeries to check whether iodised salt is being used remain included. Notably, one jurisdiction indicated that savings in laboratory testing costs may be off-set by visiting a larger number of bakeries to determine compliance.**

Access Economics contacted one Australian State Government and the New Zealand Food Safety Authority. These entities advised that the costs of administering and enforcing the modified FSANZ proposal to fortify bread with iodine would be very similar to the costs associated with the proposal to require bakers to fortify bread with folic acid, after adjusting for the difference in charges for laboratory tests. For this report, the costs based on the analysis for folic acid (adjusted for the difference in charges for laboratory tests) are used as an **upper bound**.

5.1.1 COSTS OF ADMINISTERING AND ENFORCING REGULATION

The cost estimates in this section reflect only the value of resources allocated to activities that would not otherwise be undertaken if mandatory fortification was not introduced, ignoring costs already sunk in developing the proposal thus far. Cost centres for governments include awareness raising and training, auditing (surveillance), administration and enforcement.

[8] There are few salt manufacturers. However, the bakery industry is made up of a large number of firms, many of which are small businesses. In 2000-01 there were around 7,000 bakers Australia wide (BRI 2003) (Table 4.1). Of these, around 4,700 were small retail bakeries with less than 20 employees (Table 4.1). Industry estimates for New Zealand suggest there are around 2000 to 3000 small bakeries. There is a higher rate of instability amongst small businesses PC (2000), so monitoring compliance of small businesses over time is relatively difficult.

5.1.1.1 AUSTRALIA

Administration and enforcement of mandatory fortification would be undertaken by the relevant section of the health or human services department in each State and Territory, often in concert with local government. For example, in Victoria there is a legal requirement for local councils to test a certain number of food samples per population each year (pers. comm., Victorian Health Department, 14 August 2006 — see detail below under the heading 'auditing'). In NSW, local councils currently check retail food premises while the NSW State Government checks high risk premises (for example, oysters and meats like salami) (pers. comm., NSW Health Department, 14 August 2006).

FSANZ would be involved in preparation of manuals but indicated that these costs (in the case of folic acid) would be negligible.

For the folic acid fortification analysis, Access Economics obtained full cost estimates from three jurisdictions (two small and one large), and part cost estimates from one jurisdiction (large).

Method

The costs to government of administering the proposal to require bakers to fortify bread with folic acid were used as the basis for the analysis. Adjustments were made to the Australian data to remove the cost of laboratory testing of bread. The total costs of administration and enforcement by all State and Territory governments Australia-wide were then estimated by calculating the jurisdictional cost per head for those jurisdictions that provided cost estimates to Access Economics, and then applying these per capita costs to the entire Australian population (around 20.5 million people in 2005).

Upfront set up costs

These costs include setting up systems for administering the regulation (files, manuals etc), along with training government staff (for example via workshop) and some collaboration with other jurisdictions. Estimates differed across jurisdictions — with some at $0.0003 per head ($6,000 Australia-wide) and others at $0.03 per head ($570,000 Australia-wide).

Training industry and raising awareness

Salt manufacturers need to be notified of the requirement to provide bakers with iodised salt. Bakers also need to be notified that they need to use fortified salt.

Proposed approaches to raising awareness amongst industry participants and providing training differed across jurisdictional governments. Costs are also likely to differ across jurisdictions because of differences in distances and population dispersion.

- One state indicated that it would distribute a letter to firms affected by fortification. In addition, during general survey and monitoring work, discussions would be held with enterprise owners, but this does not constitute an additional cost attributable to iodine, so has not been included in the costs of fortification.
- One state suggested that this would be a significant ongoing cost because of bakery business turnover. Costs were based on face-to-face contact with bakers and so incorporated travel. At around 9 cents per head, this estimate amounts to $1.9 million Australia-wide.

- Another jurisdiction foreshadowed a range of awareness-raising activities including information provision on its website, in media releases, on baking industry websites and in trade magazines, in concert with distribution of fact sheets (including in foreign languages). At $0.002, this would cost $40,000 Australia-wide.

Auditing

Auditing includes testing food content for risk to health and checking compliance with compositional requirements (including appraising food content against statements on food labels). Estimates of auditing costs depend on the approach adopted (for example, sample structure and size). Costs are also likely to differ across jurisdictions because of differences in distances and population dispersion.

One State Government advised that given the modified FSANZ proposal does not stipulate a level of iodine in bread, from an enforcement perspective there is little merit in the analytical testing of bread. The addition of iodised salt could be confirmed during audit/inspection. However, 'savings' in analytical testing may be off-set with an increase in the number of businesses visited to verify the use of iodised salt.

Cost estimates differ according the auditing model that would be implemented. The original folic acid cost estimates for this component were able to be revised for two states — one large and one small. Further revisions were undertaken to remove the costs of laboratory analysis on FSANZ advice that this would not be necessary.

- One jurisdiction indicated that its usual approach is to undertake surveys at irregular intervals to test foods from a sample of businesses. Around 3 samples might be purchased from each of around 100 businesses, and analysed for content. Removing the cost of laboratory testing and the cost of purchasing the samples, but retaining the labour costs of visiting businesses (assuming that checks are still undertaken to see if bakeries are using fortified salt, without actually checking the content of bread) and the approach was repeated every 5 years, the cost per year would be 0.2 cents per head. Australia-wide, this amounts to $38,000 per year.
- The other state government foreshadowed that — every three years — it would take samples from 15% of outlets, including four bread categories (white, wholemeal, grain and other), 5 batches, 5 samples per batch and 4 bakery categories (plant, supermarket, franchise and local retail). It would also check labels. Assuming that there is no testing of bread content, but that businesses are visited and labels checked, the cost would be around 0.6 cents per head or $125,000 Australia-wide.

Administration

Administration costs for governments include the costs of briefing Ministers and the Executive, filing and answering questions.

- One jurisdiction estimated the costs of administration would account for around 10% of a Professional Officer's salary per year, or close to 2 cents per capita. Australia-wide this is around $360,000.
- Other estimates of administration costs were substantially lower ($500 per year in one state).

Enforcement

Enforcement costs include the costs of 'encouraging' compliance and the costs of responding to complaints. The costs of prosecutions have not been included in the analysis. FSANZ

advised that prosecutions are rarely mounted on food standards compliance issues (pers. comm., FSANZ, 4 May 2006), with 'encouragement' being the preferred approach.

- One jurisdiction estimated that the costs of writing to and negotiating with firms to encourage compliance would be equivalent to around 10% of a Professional Officer's annual salary, and likewise, the costs of dealing with complaints would cost around 10% of a Professional Officer's salary. This amounts to around 3.5 cents per head, which Australia-wide is $722,000.
- Another jurisdiction indicated that it might need to follow up 20% of bakeries at a cost of $0.002 per head, or around $40,000 Australia-wide.
- Another suggested there might be around 30 complaints to respond to, and also estimated that enforcement costs might be based on an assumption of a 25% failure rate of the premises surveyed, with a warning letter sent out, followed for some by a penalty infringement notice. The cost of this would be around $0.003 per head, or Australia-wide, $65,400.

Summary of costs to State and Territory governments, Australia

Overall, for the two states whose data were able to be revised (and removing the costs of laboratory testing of bread), the cost estimates are outlined in Table 5.1. For the purposes of calculating the total costs of the FSANZ proposal, the @RISK program was used based on the following assumptions about the cost to government:

- Upfront government costs were distributed uniformly (minimum A$9,788 and maximum A$52,506).
- Ongoing yearly government costs were distributed uniformly (minimum A$84,650 and maximum A$190,153).

TABLE 5.1: REVISED COST TO GOVERNMENT, FORTIFICATION OF BREAD WITH IODINE, AUSTRALIA (A$)

	Lower	Higher
Upfront	9,788	52,506
Ongoing per year	84,650	190,153

Comparisons with previous estimates

The estimates of the costs to Australian governments for the original iodine fortification proposal are in Table 5.2 and the proposal to require bakers to fortify bread with folic acid are in Table 5.3. Remember that the estimates in this report were based on those for fortification of bread by bakeries with folic acid, adjusted down by removing the costs of laboratory testing.

TABLE 5.2 ESTIMATES OF THE COSTS OF GOVERNMENT ADMINISTRATION OF REGULATION, ORIGINAL IODINE PROPOSAL (BREAD BISCUITS AND BREAKFAST CEREALS), AUSTRALIA (A$)

	Lower estimate	Upper estimate
Upfront	1,835	138,182
Ongoing per year	96,490	215,600

Source: based on estimates from two Australian state governments.

TABLE 5.3 ESTIMATES OF THE COSTS OF GOVERNMENT ADMINISTRATION OF REGULATION, FOLIC ACID FORTIFICATION BY BAKERIES, AUSTRALIA (A$)

	Lower estimate	Middle estimate	Upper estimate
Upfront	9,788	52,506	209,896
Ongoing per year	245,750	270,320	4,533,761

Source: based on estimates from a sample of three Australian state governments — one large and two small.

5.1.2 NEW ZEALAND

Administration and enforcement of mandatory fortification in New Zealand would be undertaken by the New Zealand Food Safety Authority (NZFSA). The NZFSA estimates of the costs associated with the proposal to require bakers to fortify bread with folic acid are outlined in Table 5.4.

The NZFSA advised that auditing costs associated with the narrower iodine proposal would likely fall. However, there was no itemised break down of the auditing cost estimate provided by NZFSA, so it is not possible to adjust for the lower charge for testing iodine (compared with folic acid) or indeed, accurately adjust the estimate for no laboratory testing of bread. The NZFSA auditing costs for folic acid and for the original iodine proposal were exactly the same — see Table 5.5. $80,000 is used for analysis here, acknowledging that it is likely to overestimate the true cost.

The enforcement costs include the cost of time taken to write to and negotiate with firms that don't have correct labels or correct concentration of folic acid in bread and the cost of dealing with complaints.

TABLE 5.4: COSTS OF GOVERNMENT ADMINISTRATION OF REGULATION, FOLIC ACID FORTIFICATION BY BAKERIES, NEW ZEALAND (NZ$)

	Upfront	Ongoing cost per year
Set up costs	$2,520	
Training and Awareness raising (industry)	$4,800	$2,400
Administration		$1,320
Auditing	$600	$80,000
Enforcement		$4,780
Total	**$7,920**	**$88,500**

Source: NZFSA

TABLE 5.5: ESTIMATES OF THE COSTS OF GOVERNMENT ADMINISTRATION OF REGULATION, ORIGINAL IODINE PROPOSAL (BREAD BISCUITS AND BREAKFAST CEREALS), NEW ZEALAND (NZ$)

	Upfront	Ongoing
Training and Awareness raising	4,800	1,200
Auditing	600	80,000
Administration	2,400	1,320
Complaints		2,280
Cost of one prosecution (not likely so excluded)		80,000
Total	**7,800**	**84,800**

Source: NZFSA

6. CONCLUSION

Remember that:

- the estimates are based on a lower bound for trade related costs for bakers of zero. No quantitative estimates of a possible upper bound for these costs was available for this report. However, costs only arise if destination countries for Australian or New Zealand bread, breadcrumb or bread ingredient-type exports proscribe imports of food fortified with iodine and the exported products are not easily able to be purpose-produced (see earlier discussion). Further, we know that less than one per cent of Australian bread turnover was exported in 2001-02 (BRI 2003).
- no quantitative estimates of the costs to breadcrumb manufacturers were available for this report

Comparisons of costs with the original iodine fortification proposal are discussed throughout the text above. However, the costs of the modified proposal are substantially lower than those for the original iodine fortification proposal because trade related costs were set at the lower bound (zero) — in part reflecting evidence outlined in previous reports that exports of bread are less than those of biscuits and breakfast cereals. Comparisons with the estimates of net present values of costs with those of the original proposal should also take into account that the original estimates include health monitoring costs which are not incorporated here.

The net present value of the total costs for Australia of the FSANZ iodine fortification proposal over a 15 year period are between A$12.2 million and A$13.3 million (Table 6.1). For New Zealand, the costs are around NZ$3.4 million. These represent underestimates of the total because the potential costs to companies using breadcrumbs are not included (see above).

TABLE 6.1 NET PRESENT VALUE OF COSTS OVER 15 YEARS, IODINE FORTIFICATION OF BREAD AUSTRALIA

	Australia (A$)
Minimum	12,119,410
5th percentile	12,215,890
Mean	12,769,540
95th percentile	13,322,840
Maximum	13,430,550

Further detail on the costs are in Table 6.2 and Table 6.3 below. The net present value of the costs has been calculated on the basis of the policy being implemented over a 15 year period — although only four years are shown in these tables.

6.1 REDUCTION IN THE COST OF THE FORTIFICATION PROPOSALS IF IODINE AND FOLIC ACID FORTIFICATION ARE INTRODUCED SIMULTANEOUSLY

The upfront costs associated with changing packaging and labelling and writing-off old packaging will be lower if folic acid and iodine are introduced simultaneously. For bakers, depending on whether the fortification proposals use bread or (in the case of folic acid) flour, if iodine and folic acid fortification proposals are implemented in unison, the costs to bakers will be between A$4.5 million and A$6.5 million lower in Australia (based on the package write-off and revision costs for folic acid) and close to NZ$1 million lower in New Zealand.

Breadcrumbs: The costs to manufacturers who use breadcrumbs will also be lower. These cost reductions are not able to be quantified.

Table 6.2: Summary of costs of fortification of bread with iodine, Australia

Year			**0**	**1**	**2**	**3**	**4**
Discount rate	3.30%						
Discount index			100.00%	96.81%	93.71%	90.72%	87.82%
Govt	A$'000		31				
Industry (salt)	A$'000		161				
Industry (bakers)	A$'000		6,950				
Total upfront	A$'000		7,142				
Government	A$'000			137	137	137	137
Industry (salt)	A$'000			314	314	314	314
Industry (bakers)	A$'000			30	30	30	30
Total ongoing	A$'000			482	482	482	482
Discounted costs	A$'000		7,142	466	451	437	423
NPV costs	A$'000	**12,770**					

Table 6.3: Summary of costs of fortification of bread with iodine, New Zealand

Year			**0**	**1**	**2**	**3**	**4**
Discount rate	3.80%						
Discount index			100.00%	96.34%	92.81%	89.41%	86.14%
Govt	($'000)		8				
Industry (salt)	($'000)		303				
Industry (bakers)	($'000)		1,495				
Total upfront	($'000)		1,806				
Government	($'000)			89	89	89	89
Industry (salt)	($'000)			20	20	20	20
Industry (bakers)	($'000)			30	30	30	30
Total ongoing	($'000)			138	138	138	138
Discounted costs	($'000)		1,806	133	128	124	119
NPV costs	($'000)	**3,364**					

Access Economics
27 March 2007