

### Author Profile



Dr Bruce Neal is Chair of the Australian Division of World Action of Salt and Health (AWASH), a Senior Director of the George Institute for International Health and Professor of Medicine at the University of Sydney. AWASH is a global group which aims to improve population health by gradually reducing salt intake. It encourages food companies to reduce the salt in their products and works with government to highlight the need for population salt reduction strategies. The Australian launch was in 2007, with a five year plan to reduce the salt intake of Australians to 6g/day and the salt content of processed foods by 25%.

## Dropping the salt in children's diets - a priority for Australia

The push for action to address salt in children's diets has received a major boost, with the results of the 2007 Australian National Children's Nutrition and Physical Activity Survey<sup>1</sup> (also called 'Kids Eat Kids Play') showing that boys and girls aged 2 to 16 years are eating more salt than recommended. Young children (both boys and girls) aged 2-3 years, had a mean daily intake of salt of 4.2g/day, far in excess of the recommended Adequate Intake (AI) of 0.5-1.0g and Upper Limit (UL) of 2.5g/day for this age group<sup>2</sup>. Those aged 4-8 years consumed 5.4g of salt/day, in excess of the AI of 0.75-1.5g and the UL of 3.5g. Boys in all age groups consumed more salt than girls. It found boys aged 14-16 years ate an average of more than 9 grams of salt daily, more than the 'recommended upper daily limit' of 6g for adults and the 'suggested adult dietary target' for the avoidance of chronic disease of just 4 grams (Table 1)<sup>2</sup>. Excess salt consumption on this scale is condemning the next generation to significant premature death and disability<sup>3</sup>.

## ***The adverse effects of salt***

The chief impact of excess salt consumption is on blood pressure and the risks of cardiovascular diseases – mostly heart attack, stroke, kidney disease and heart failure. High blood pressure is well established as a leading cause of disease in Australia<sup>4</sup> and cardiovascular conditions are the largest single cause of death<sup>5</sup>. There is also increasing evidence that salt contributes to a range of other serious diseases such as:-

- stomach cancer<sup>6</sup>
- osteoporosis<sup>7</sup>
- asthma<sup>7</sup>
- kidney stones<sup>7</sup>
- obesity<sup>7</sup>.

While many of these problems show themselves mostly in adults, it is clear that the scene is set in childhood<sup>8,1</sup>.

## ***Salt and children's blood pressure***

There is good evidence that excess salt can increase blood pressure from birth. While most babies are spared high levels of dietary salt until they are weaned, salt will eventually cause adverse effects on the blood pressure of most children.

***The idea that salt causes problems in only a minority of sensitive individuals is wrong<sup>9</sup>, as it is also wrong to think that salt affects only those eating very large quantities<sup>10</sup>.*** Recent research shows that while some people experience greater rises in blood pressure with salt than others, the great majority experience some rise<sup>11</sup>. Likewise, while large amounts of salt certainly cause large rises in blood pressure, smaller quantities also produce important adverse effects that will accumulate over years.

The harmful effects of salt on children's blood pressure, track through into adulthood<sup>12</sup> and salt appears to be one of the main reasons that blood pressure rises with age. In the few populations that eat consistently low salt diets from birth, blood pressure levels differ little between adolescents and older people<sup>13</sup>. By contrast, in Western societies like Australia, average systolic blood pressure amongst people in their sixties and seventies (140-150mmHg) is 25-50% greater than it was in their teens (100-110mmHg). This rise is almost certainly preventable and much could be averted by reducing salt intake. It is estimated that over 50 years an extra 5g of salt eaten each day will push up average blood pressure by 10-15mmHg, a rise that greatly increases the risks of stroke and heart attack, Australia's leading killers<sup>5</sup>.

### ***Salt and childhood obesity***

Recent research has shown a link between salt consumption and childhood obesity. The association between daily salt consumption and daily fluid intake in children is well established. The connection between salt intake and childhood obesity is thought to stem from the types of fluids consumed, particularly sugar sweetened soft drinks<sup>14</sup>. The number of sugar-sweetened soft drinks consumed is directly related to childhood obesity<sup>15</sup>. Trials show that restricting soft drink consumption reduces several key measures of overweight<sup>16,17</sup>.

In a recent UK study of 4-18 year olds, each additional gram of salt eaten daily resulted in 100mLs more fluid being consumed<sup>14</sup>. About one third of this additional fluid was sugar-sweetened soft drinks. It was calculated that decreasing daily salt consumption in children by 3g (about a third for teenage boys in Australia) would reduce energy consumption by 250kcal(1050kJ)/week.

One thousand kcal (4200kJ) extra a week is estimated to account for most of the excess weight gain in US children<sup>18</sup>. As such, salt reduction may have an important role to play in the battle against childhood obesity.

### ***The benefits of reducing children's salt consumption***

The good news is that, while excess dietary salt consumption is a cause of ill health in Australia, there is enormous potential to improve things. Reducing salt intake is achievable and even moderate reductions would reap significant gains<sup>19</sup>. The benefits would extend to children, with their blood pressure levels clearly reduced by moderate reductions in dietary salt consumption<sup>9</sup>, with long term health gains anticipated.

The benefits of salt reduction are both immediate and long term. Reducing population salt consumption will rapidly reduce blood pressure levels and lower the risk of heart attack and stroke in older individuals<sup>20</sup>. Sustaining the reduction will slow the rise of blood pressure with age and progressively shift population blood pressure levels downward. This is of primary relevance to children. Incremental health gains will accrue community-wide for decades after the initial intervention even if no additional reduction in salt intake is achieved. If the children of today keep their salt consumption down to recommended levels, they can reasonably expect risks of premature cardiovascular disease about half that of their parents.

### ***Where the salt's coming from and how to avoid it***

The majority of salt in the average Australian child's diet comes from processed and takeaway foods. Children's takeaway meals from the leading Australian fast food outlets may, for example, contain half to three quarters of the recommended

maximum daily intake in a single portion (Table 2). The same is true for the major Australian pizza outlets (Table 3). Processed foods eaten by children also contain levels of salt that are very high (Table 4). Careful selection of processed and prepared food products can make a lower salt diet possible. However, with high levels of salt in the majority of products, and many of those specifically advertised to children, the feasibility of keeping salt out of children's diets is fairly limited.

One encouraging aspect of the composition of processed foods is the huge range of salt levels present in the same type of product (Table 4). This means there is considerable scope for reducing the salt content of many food categories simply by lowering the salt levels in the products at the higher end of the range. This offers an early easy win for industry. Furthermore, repeated small reductions in salt content made as part of ongoing reformulation programs would likely go unnoticed by children and adults alike.

While waiting for industry to take the salt out of processed and prepared foods there are some immediate steps that can be taken to reduce children's salt consumption. These steps include:-

- Use as many fresh fruits and vegetables as possible when preparing meals
- Don't add salt when cooking or at the table
- Make take-a-ways and fast foods a special treat
- Watch out for snack foods - they are often very high in salt
- Check food labels – choose reduced and low salt food varieties. A sodium (“Na”) level of less than 120mg/100g is low in salt and above 500mg/100g is high
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- Include healthier options in lunch boxes, like boiled eggs, vegetable sticks and fruit
- Use lemon juice, vinegar, garlic and herbs to replace salt in cooking, and avoid stock cubes, soy sauce and pickles (or use reduced-salt varieties).

### ***How big are the potential health benefits***

A recent research project published in the Lancet medical journal showed that reductions in dietary salt consumption have greater potential to avert death and disability than stopping smoking<sup>3</sup>. There are several reasons for this, the primary one being that salt and blood pressure are health issues for almost everyone<sup>7</sup>. From childhood onwards, excess salt consumption steadily pushes up blood pressure in most of the population<sup>21</sup> because almost everyone eats more than the 1-2g/day required for good health<sup>7</sup>. Every millimeter of mercury our blood pressure rises from childhood onwards increases our risks of cardiovascular disease<sup>22</sup>. Tobacco on the other hand, while incredibly bad for those who use it, afflicts only smokers, which in the case of Australia, is now less than one fifth of the population.

### ***Summary***

It may seem surprising that salt, such a well established part of our diet, is such an important cause of disease. There is no doubt about the importance of salt to human ill health and in the broader historical context it is easily understandable. Humans have evolved for many hundreds of thousands of years and for the great majority of that time salt was hard to come by. Our bodies conserved salt and lived off just a couple of grams a day. With the discovery that salt could preserve food and the development of large scale salt production capabilities, our salt intakes shot up to between 5 and 10 times that we were used to. This happened

in just a few thousand years leaving the body little time to adapt. With the advent of refrigeration as an alternate widely accessible means of food preservation the requirement for salt consumption on the present scale has gone. While salt almost certainly saved lives when first used by humans to ensure a year-round supply of food, it now kills far more than it saves<sup>3</sup>. Australia urgently needs a national salt reduction program and an important focus of that program should be children. Few public health programs offer such a cost-effective option for disease prevention in Australia<sup>7</sup>.

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**Table 1: Adequate, maximum recommended and actual salt intakes for Australian boys (grams)**

| Age      | Adequate intake (g/day)* | Recommended upper daily limit (g/day)* | Actual intake (g/day)^ | Percentage of the upper daily limit |
|----------|--------------------------|--|------------------------|-------------------------------------|
| 1–3 yr   | 0.50 – 1.00              | 2.50                                   | 4.23                   | 169                                 |
| 4–8 yr   | 0.75 – 1.50              | 3.50                                   | 5.57                   | 159                                 |
| 9–13 yr  | 1.00 – 2.00              | 5.00                                   | 7.23                   | 145                                 |
| 14–16 yr | 1.15 – 2.30              | 5.75                                   | 9.18                   | 160                                 |

\* as defined by the National Health and Medical Research Council of Australia in 'Nutrient Reference Values for Australia and New Zealand Including Recommended Dietary Intakes, 2006'

^ from the 2007 Australian National Children's Nutrition and Physical Activity Survey

**Table 2: Salt content of children’s meals served by leading Australian burger, chicken and sandwich outlets (grams)**

| Outlet* | Meal portion size (g) | Meal salt content (g) | Percent of recommended upper limit for different age groups^ |         |          |
|---------|-----------------------|-----------------------|--|---------|----------|
|         |                       |                       | 4-8yrs   | 9-13yrs | 14-16yrs |
| 1       | 561                   | 3.03                  | 87   | 61      | 51       |
| 2       | 318                   | 3.42                  | 98   | 68      | 57       |
| 3       | 183                   | 2.44                  | 70   | 49      | 41       |
| 4       | 240                   | 2.63                  | 75   | 53      | 44       |
| 5       | 489                   | 2.92                  | 84   | 58      | 49       |
| 6       | 275                   | 3.17                  | 91   | 63      | 53       |
| Average | 344                   | 2.94                  | 84   | 59      | 49       |

\* data extracted from Websites of McDonald’s, Kentucky Fried Chicken, Subway, Oporto, Hungry Jack’s and Red Rooster.

^ defined by the National Health and Medical Research Council of Australia in ‘*Nutrient Reference Values for Australia and New Zealand Including Recommended Dietary Intakes, 2006*’ (4-8yrs = 3.50g salt/day, 9-13yrs = 5.00g salt/day, 14-16yrs = 5.75g salt/day)

**Table 3: Salt content of pizza slices served by leading Australian Pizza chains (grams)**

| Pizza*         | Slice size<br>(g) | Salt in<br>one slice<br>(g) | Percent of recommended upper limit provided<br>for different age groups^ |  |  |
|----------------|-------------------|-----------------------------|--|--|--|
|                |                   |                             | 4-8yrs<br>(assuming<br><u>two</u> slices)                                | 9-13yrs<br>(assuming<br><u>three</u> slices) | 14-16yrs<br>(assuming<br><u>four</u> slices) |
| 1              | 88                | 1.29                        | 74   | 78   | 88   |
| 2              | 94                | 1.225                       | 70   | 75   | 80   |
| 3              | 85                | 0.893                       | 52   | 54   | 60   |
| 4              | 83                | 1.025                       | 58   | 63   | 68   |
| 5              | 84                | 1.018                       | 58   | 60   | 68   |
| 6              | 76                | 0.74                        | 42   | 45   | 48   |
| <b>Average</b> | <b>85</b>         | <b>1.032</b>                | <b>58</b>  | <b>63</b>                                    | <b>68</b>                                    |

\* data extracted from websites of Dominoes and Pizza Hut.

^ defined by the National Health and Medical Research Council of Australia in 'Nutrient Reference Values for Australia and New Zealand Including Recommended Dietary Intakes, 2006' (4-8yrs = 3.50g salt/day, 9-13yrs = 5.00g salt/day, 14-16yrs = 5.75g salt/day)

**Table 4: Range of salt content in processed foods regularly eaten by Australian children<sup>^</sup>**

| Food category    | Number of products assessed in each food category | Highest and lowest sodium content (mg/100g)* |
|------------------|---|--|
| Breakfast cereal | 99  | 1-1063                                       |
| White bread      | 43  | 420-665                                      |
| Ham              | 42  | 427-1720                                     |
| Sausages         | 44  | 404-2157                                     |
| Beef burgers     | 6   | 572-740                                      |
| Processed cheese | 47  | 371-1857                                     |
| Barbecue sauce   | 8   | 550-2140                                     |
| Tomato sauce     | 17  | 355-1270                                     |

\* to calculate salt content in mg/100g multiply sodium value by 2.5

<sup>^</sup> AWASH Key Findings Document II - Salt levels in selected foods commonly eaten by children, October 2008 [www.awash.org.au](http://www.awash.org.au)