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Less salt in bread: a cost-effective way to reduce New Zealand population blood pressure levels

Dietary sodium is an important modifiable determinant of blood pressure,[1] and recent estimates suggest almost two thirds of the burden of stroke and half that of ischaemic heart disease are associated with non-optimal blood pressure levels.[2] Since blood pressure is so strongly related to cardiovascular disease (CVD), reductions of only a few mmHg could avert many deaths, if such reductions were population wide. Reducing dietary sodium intakes has particular relevance to New Zealand as surveys suggest that daily sodium intakes in this country are approximately 150 mmol (9 g salt)/day[3] – considerably higher than the current recommended daily intake of less than 80 mmol (5g salt).[4]

About 75% of our sodium intake is non-discretionary, coming from salt added to food during manufacturing and processing,[5] and bread is the leading source of sodium in the New Zealand diet (26% of all dietary sodium).[3] The usual sodium content of white sliced bread is approximately 666 mg/100 g,[6] which is considerably higher than the National Heart Foundation 'Pick the Tick' target of 450 mg/100 g. One deterrent to meeting this target is concern that reductions in salt content may compromise the taste of bread and lead to reductions in sales. In order to determine if small reductions are detectable by the average consumer we carried out a study to examine taste discrimination between breads with standard and reduced salt content.

Three formulations of white sliced bread were produced. One contained the standard salt content (~550 mg), one had the salt content reduced by 5% (~530 mg), and the other had the salt content reduced by 10% (~490 mg). On arrival at the study site (Massey University Sensory Laboratory), the identification on each loaf was replaced by a three-digit code. The study population was a consumer panel made up of 60 volunteers (31 males, 28 females, 1 unknown) aged between 20 and 60 years who normally consumed white bread. This sample size gave 82% power to detect a significant difference between samples.[7]

Triangle taste tests were carried out in which the volunteer was provided with two identical samples and one different sample and asked to identify the odd sample. Half of the volunteers completed the test tasting the 5% reduced salt sample first and the 10% reduced salt sample second, while half tasted the 10% reduced salt sample first and the 5% reduced salt sample second. The samples within the test were presented in one of six random orders of presentation.

Seventeen of the 60 volunteers (28%) correctly identified the 5% reduced salt sample while 22 (37%) correctly identified the 10% reduced salt sample. Comparison to table values of the minimum number of agreeing judgements necessary to establish significance indicated that these proportions were not large enough to conclude that there was a significant difference between products ($p > 0.05$).[7]

In conclusion, reductions of up to 10% in the salt content of white bread are feasible without a detectable change in taste. This is in keeping with other studies in New

Zealand[8] and Australia.[9] With the widespread support of the food industry successive small reductions could be performed annually, leading to a significant reduction in population salt intake without any noticeable effect on taste. This could be one of the most cost-effective ways to reduce CVD.[10]

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