

Original Article

Dietary sodium reduction in New Zealand: influence of the *Tick* label

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Background and Objectives: The *Tick* programme of the National Heart Foundation (NHF) is the longest standing voluntary front of pack signpost nutrition logo in New Zealand. It provides a platform for collaboration with the food industry to encourage development of healthier products. This study evaluated the impact of the *Tick* programme on sodium in processed food. **Methods and Study Design:** Fifty-two *Tick* programme products from food categories known to contribute substantially to sodium intake were identified. Sales volumes (kg) from January 2011 to December 2013 were multiplied by changes in sodium content over that time, producing an estimate of programme impact. Five semi-structured interviews with industry representatives were conducted, to look at other influences for sodium reduction, and themes identified through methods of thematic analysis. **Results:** Over the period, the *Tick* programme influenced food companies to remove approximately 16 tonnes of salt through the reformulation and formulation of 52 *Tick*-approved breakfast cereals, edible oil spreads, cooking sauces and processed poultry products. Other factors influencing sodium reduction reported by company representatives included increased consumer and industry interest in healthier product nutrition profiles and other sodium reduction programmes targeting reformulation/formulation. **Conclusions:** The *Tick* remains a credible and well-recognized brand and may provide a competitive edge for participating food manufacturers in the current market. The *Tick* programme is effective in influencing industry to reduce sodium in processed foods in New Zealand. The combined impact of the *Tick* and other NHF programmes has the potential to reduce population sodium intake and improve health outcomes.

Key Words: food industry, New Zealand, sodium dietary, food labelling, cardiovascular disease

INTRODUCTION

The World Health Organization (WHO) has identified population sodium reduction as a key target for the prevention of non-communicable diseases, and recommends adult sodium intakes should be less than 2000 mg per day.¹ Despite this, most countries (including New Zealand) have a population sodium intake that substantially exceeds recommended levels.^{2,3} Therefore, WHO has set a global target of a 30% reduction in population sodium intake by 2025.⁴

In a Western-style diet, approximately 75% of sodium intake is derived from that inherent in processed foods with only about 10-12% added in the home during cooking or at the table and around 10-12% naturally occurring in foods.⁵ The National Heart Foundation of New Zealand (NHF), a non-profit and non-government organization, introduced the *Tick* programme in 1991, and it is longest standing voluntary front of pack (FOP) signpost nutrition logo in New Zealand.⁶ The *Tick* label helps consumers identify foods with nutrient profiles that are more consistent with a 'heart healthy' diet. Importantly, the *Tick* programme also aims to engage manufacturers to reformulate or formulate products in line with category-specific criteria designed to produce healthier products. Products that meet these criteria are eligible for license

with the *Tick* programme, and an endorsement logo is displayed on the product packaging. The *Tick* programme's license fees contribute solely towards development and maintenance of the programme, which includes activities such as random testing, nutrition research and creating educational resources for the *Tick*. Random testing of *Tick* products is conducted regularly at independent laboratories to ensure continued compliance with the *Tick* nutrition criteria.⁷

A previous study evaluated the impact of the NHF *Tick* programme sodium reduction in the New Zealand food supply, and found that 33 tonnes of salt was removed from products over a 12 month period between July 1998 and June 1999.⁸ At this time the *Tick* was the only being undertaken. Since then the NHF has engaged in other salt reduction initiatives: Project Target 450 which aims to reduce sodium in bread,⁹ and HeartSAFE, an industry led

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sodium reduction programme targeting ten high sodium food categories.¹⁰ This study aims to explore the extent to which the *Tick* programme currently contributes to sodium reduction in processed foods in New Zealand in the context of a wider range of sodium reduction initiatives, both nationally and internationally.

METHODS

Four out of 62 *Tick* food categories with specific nutrition criteria were selected for inclusion in this study. These were chosen because they were *Tick* products most likely to contribute substantially to sodium intake in New Zealand based on findings from the 2009 New Zealand Total Diet Study.¹¹ Although bread was identified as the greatest contributor of dietary sodium intake in New Zealand, this category was excluded from the analysis as it was the focus of a stand-alone sodium reduction programme: Project Target 450.⁹ The four product categories included in this analysis were: breakfast cereals (20 products), edible oil spreads such as margarine (7 products), cooking sauces (14 products) and processed poultry (11 products).

Products within each category were divided into two groups: reformulated (pre-existing products reformulated to contain less sodium) and formulated products (new products formulated with the intention of meeting the *Tick* nutrition criteria). Only active *Tick* products carrying the logo and that had been reformulated or formulated to contain less sodium between 1st January 2011 and 31st December 2013 were included in this study.

Quantitative analyses

All 13 companies with products included in these categories were contacted and asked to provide information regarding: product reformulation or formulation status upon entering the *Tick* programme, the year and month the product entered the New Zealand market, the sodium concentration prior to reformulation as well as product sales volume data between 1st January 2011 and 31st December 2013. If the company declined to provide sales volume data (n=8), this information was purchased from A.C. Nielsen New Zealand, a leading global market research information and measurement company.

The most recent sodium content of each product was obtained from the NHF database. This information was derived from nutrition analysis provided by the companies and verified by independent laboratories approved by the NHF. For formulated products, or if the company declined to provide product sodium content prior to reformulation, we compared current sodium content with the

mean sodium content of other non-*Tick* products within the food category. The mean sodium concentrations were estimated through surveys conducted at five large chain supermarkets in Auckland, New Zealand's largest city, representing all three main supermarket brands in New Zealand in March 2014. Mean sodium levels for cooking sauces were calculated using the 2003 NHF cooking sauces market research data.

We then estimated the amount of sodium removed from the New Zealand food supply due to compliance with *Tick* criteria over the study period. For reformulated products, the amount of sodium removed was estimated by multiplying the sodium difference before and after reformulation by the volume of product sold within the study period. For formulated products, the amount of sodium removed from the food supply was estimated by multiplying the sodium difference between the formulated product and the average category sodium content by the volume of product sold. Sodium was then converted into salt using the conversion factor of 1 g sodium (Na) = 2.5 g salt (NaCl).

Semi-structured interviews

All thirteen companies with products in the selected categories were invited via email and telephone to participate in a 30-minute interview. Five companies (including seven representatives) participated in the interviews. The company representatives interviewed were: marketing managers (n=2), brand managers (n=2), nutritionists (n=2) and a regulatory manager. One interview was conducted face-to-face and four were conducted via telephone.

A schedule (Table 1) was used to guide the interview. The interview explored the reasons for using the *Tick* logo, whether other factors may be influencing companies to reduce sodium in their products, and the company's experience of using the *Tick* programme. The interviews were conducted between March and June 2014, and were audiotaped and transcribed by the same researcher. Two researchers reviewed the interview transcripts, and identified themes using thematic analysis as described by Braun and Clarke, where 'thematic analysis involves searching across a data set identifying, analysing and reporting repeated patterns of meaning'.¹² Key themes were identified for each of the interview headings.

Ethical approval for the study was obtained from the University of Otago Human Ethics Committee (Ref D14/087), and all participants provided written and informed consent.

Table 1. Semi-structured interview questions: overview

Key questions
<ul style="list-style-type: none"> • What is your role in this company? • Is your company New Zealand or internationally owned and operated? • What factors influenced your company's decision to reformulate/formulate your food products to reduce sodium? • What other <i>internal</i> factors (such as policies or specific sodium targets) influenced your company's decision to reformulate/formulate these food products? • Are there any individuals in your organisation that encourage healthier food production? • What other <i>external</i> influences played a role in your company's decision to reformulate or formulate your products? • What does working with the <i>Tick</i> Programme mean for your company? • What do you think are some of the strengths and limitations of the <i>Tick</i> Programme? • How does the <i>Tick</i> Programme endorsement influence your sales and how do customers respond to products with the <i>Tick</i>?

RESULTS

Five out of 13 companies completed and returned the questionnaire for 20 out of 52 products. The supermarket sales volume data of the remaining 32 products were purchased from A.C. Nielsen New Zealand. Out of 52 products, 19 were formulated and were reformulated products. All cooking sauces were reformulated, while all processed poultry were newly formulated products.

Table 2 shows the changes in sodium due to product reformulation and formulation in breakfast cereals, edible spreads, processed poultry and cooking sauces. Between January 2011 and December 2013, approximately 16 tonnes of salt was removed from 52 Tick products to meet the Tick sodium criteria. Reformulation of 19 products removed ~10 tonnes, which is approximately double the amount of salt removed from 33 formulated products (~6 tonnes).

A mean sodium reduction of 46%, ranging from 35%–59% was achieved across the four food categories. Breakfast cereals achieved the highest average sodium reduction in both formulated (53%, 125 mg/100 g) and reformulated products (59%, 68 mg/100 g). However, there was high variability in sodium reduction within this category ranging from 9% to 98%. Percentage sodium reduction exceeded 80% for six out of 20 breakfast cereals. Although cooking sauces had the lowest average sodium reduction of 35%, they had the highest sales volume overall and were also the largest contributor to total salt removed from all categories.

Interviews with key stakeholders

Four key themes emerged from the five food company interviews as factors influencing sodium reduction.

Improving product nutrition profile and consumer health

All company representatives reported the product nutrition profile and its impact on consumer health as a key influence on product development to reduce sodium. This drive to improve product nutrition profile was greater for larger companies which were leading brands in a range of different food categories, including more commonly con-

sumed 'everyday' food categories. *'The company is a leading company in NZ...with a significant number of products on the shelf. So we do have a part we can definitely play in terms of consumer health, and we should be playing it.'* – R2

Internal sodium reduction policies

Representatives from two large multinational companies stated their company set internal nutrition standards, often in consultation with external guidelines from organisations such as the NHF. Company representatives reported that some targets for improving consumer health were present regardless of the Tick programme endorsement.

"Sodium is part of a broader initiative to look at the nutrition of our products...we have a brief put together, within that brief there are nutrient criteria that are set...the sodium targets will be based on what the criteria are internally as well as meeting the external criteria of sodium, so those that would be set by the NHF or government" – R5

Representatives identified the influence of nutritionists and dietitians working within their companies.

"Essentially my role [Nutritionist] in the business is to say nutrition is important in our company... we need to know what we should be doing and why, and so things like looking strategically at what we need to do when we can see a consumer trend or genuine health trends. Assessing whether it's an issue for us and how we would manage it." – R2

External drivers of sodium reduction

Three companies stated their participation in other NHF sodium reduction programmes further influenced reformulation/formulation of lower sodium products for the Tick programme.

"I was involved in the salt reduction in breads project (Project Target 450), working with the NHF...doing it as a category I think is quite good too, instead of individually. Let's look at it at an industry perspective and work together, with organizations like the NHF" – R4

Three companies cited the work of AWASH (the Australian division of World Action on Salt and Health),¹³ as

Table 2. Changes in sodium content in breakfast cereals, edible spreads, processed poultry and cooking sauces due to product formulation and reformulation between January 2011 and December 2013

	Average sodium of comparable products (mg/100g)	Average sodium on formulation (mg/100g)	Average sodium difference (mg/100g)	Average sodium difference (%)	Total volume of product sold (kg)	Total sodium excluded from food (kg)	Total salt excluded from food (kg)
Effect of formulation (new products)							
Breakfast cereals (n=18)	260	135	125	53	1,116,057	1,622	4,055
Edible spreads (n=4)	468	262	206	44	139,703	229	572
Processed poultry (n=11)	615	385	231	38	197,056	461	1,153
Subtotal new products					1,452,816	2,312	5,780
Effect of reformulation of existing products							
Breakfast cereals (n=2)	115	46	68	59	81,935	61	152
Cooking sauces (n=14)	482	315	168	35	1,396,875	2,746	6,866
Edible spreads (n=3 [†])	640	320	320	50	386,233.5	1,236	3,090
Subtotal existing products					1,865,043.5	4,043	10,108
Overall total					3,317,860	6,355	15,888

[†]Three products with the same formulation sold under different Stock Keeping Units (SKU) due to differing product size.

well as the Australian Food and Health Dialogue,¹⁴ as key influencers, mainly for their profile in the media: “[they] do have some impact on what we might do”- R5

Credibility of the *Tick* logo

All representatives identified the *Tick* programme as a credible programme and well recognised and trusted logo. “When we are trying to make health claims...we found that with the *Tick*...it adds something of credibility...certainly for us, its an external object of credibility”- R4. Although the logo holds credibility among consumers, company representatives reported feeling there may be a lack of consumer understanding regarding the process required for a product to carry the *Tick* on its packaging.

The potential usefulness of the *Tick* as a marketing tool depended on the degree to which competitor products already had the *Tick* within the category. This potential marketing effect was greatest in food categories with high consumer demand for healthier products and a low number of competitor products already with the *Tick*. Many products carry the *Tick* logo in more ‘everyday’ product categories such as breakfast cereals and edible spreads. The marketing effect of the *Tick* within these categories was reported as being negligible, and the *Tick* was used predominately to compete against similar products already with the *Tick*. “...we are in a competitive market against other brands from Australia and such some of those products and brands have the *Tick*, and so we need to match to compete with them”- R1.

One representative also identified that there was high consumer expectation for new products entering these categories to carry the *Tick* logo. “It’s just one of those things you have to have because the nature of our product. People want to see it and it’s a matter of keeping the consumers happy” - R1.

DISCUSSION

The *Tick* programme continues to be an effective programme contributing to sodium reduction in processed foods in New Zealand. Between January 2011 and December 2013, approximately 16 tonnes of salt was removed from 52 *Tick* products via product reformulation and formulation. Company representatives perceived the *Tick* as a credible programme, which was trusted by consumers. However, motivation for seeking the *Tick* endorsement varied between food categories. Some products used the *Tick* logo to give a competitive edge, while others used the *Tick* logo to match up against products in *Tick*-dominated categories such as breakfast cereals and edible oil spreads.

In contrast to the previous evaluation conducted in 1999,⁸ company representatives reported a wide range of factors that influenced their company’s decision to reduce sodium in their products. In New Zealand, the *Tick* programme is only part of the NHF’s range of programmes targeting sodium reduction, which have included Project Target 450⁹ and HeartSAFE, an industry led sodium reduction programme targeting ten high sodium food categories.¹⁰ A few companies also reported that they had internal policies on sodium reduction and aimed to improve the health of consumers. These internal policies were influenced by international company policies, as

well as dietitians and nutritionists employed within their company. The existence of international sodium reduction initiatives and programmes such as AWASH¹³ and the Australian Food and Health Dialogue¹⁴ were also cited as important influences. All of this indicates a much more complex landscape than in 1999 when the *Tick* programme was cited as the main driver of sodium reduction in New Zealand, and companies reported reductions in sodium would not have been made if they were not seeking *Tick* approval.⁸

The wider range of influences and programmes for sodium reduction, as well as methodological differences are likely to account for the lower amount of sodium reduction found in this study compared to the previous study in 1999. Sixteen products (31% of total products included) in the current study had sales volume data of <9 months, which would have contributed to a lower estimated salt reduction. The total volume of product sold in the previous study was approximately triple the volume of product sold in our current study. However, our study demonstrated a higher average percentage sodium reduction in reformulated (50%) and newly formulated (44%) edible oil spreads compared to the previous study (reformulated, 11%; newly formulated, 30%). A large contributor to total sales volume in the previous study was bread, which was not included in our study.

Our study results showed more than twice as many new products were developed to meet the *Tick* criteria compared to reformulated products (33 out of 52). This was similar to findings in a similar study evaluating the Choices ® logo in the Netherlands.¹⁵ In product reformulation, companies risk altering the product taste consumers are accustomed to, which may negatively impact sales.^{16,17} There are also unavoidable costs associated with reformulation such as production trials and packaging changes.¹⁸ Increasingly, newly formulated products entering the New Zealand market already qualify for the *Tick* as the product nutrition profile is considered throughout the development process. This is an emerging trend particularly in food categories such as breakfast cereals, where current consumer expectations of healthier products are high.¹⁹

The growth of NHF’s *Tick* programme has been substantial in the last 15 years. The programme has expanded from 390 *Tick* products in 1999 to 1020 *Tick* products in 2014 with nutrient criteria specific to 62 different product categories. The programme continues to respond to changing food environments with recent addition of a ‘Two *Ticks*’ endorsement used to help consumers identify core foods for a healthy diet.²⁰ In March 2015, the NHF announced the re-introduction of sugar into the *Tick* nutrition criteria in response to mounting concern in academic and public circles about the role of excessive sugar intake and health.²¹

The NHF *Tick* programme remains credible and recognisable among consumers and food producers. In a survey in 2013, 87% of shoppers were aware of and had bought products with the *Tick*, and 78% of shoppers reported that they would buy a *Tick* product over a similar non-*Tick* product if they were the same price.¹⁹ As a signpost label it provides an overall endorsement of the product’s nutritional value, rather than information about individual nu-

trients. Other front of pack label formats currently in use internationally (such as the 'traffic light' or 'recommended daily intake' label) contain nutrient specific information, and require a higher degree of consumer interpretation and cognitive processing.²² Food Standards Australia and New Zealand (FSANZ) has recently endorsed the use of a new voluntary front-of pack label in both countries that encompasses a Health Star rating system which gives a product a rating of between 0 and 5 stars based on nutrient assessment criteria, accompanied by a 'recommended daily intake' label.²³ The *Tick* will continue to be used alongside the health star label as an indication of the Heart Foundation's assessment of nutritional quality.

Strengths and limitations

A strength of this study was our access to the NHF database and resources including a complete list of *Tick* foods in each category, access to laboratory verified nutritional information, and facilitated access to company representatives. Sales volume data for 62% of products included in this study were purchased from A.C. Nielsen New Zealand, which were monthly barcode-monitored sales from major supermarkets, generally considered to be an accurate representation of purchasing. There were some limitations. The average non-*Tick* sodium reference data was an estimate as only products on display at time of visit to five supermarkets in central Auckland was used to construct the reference data. Sodium content of all cooking sauces prior product reformulation was unable to be sourced via the manufacturer, therefore was sourced alternatively from the 2003 NHF cooking sauces market research. This may have overestimated salt reduction in the cooking sauces category as gradual sodium reduction could have occurred since 2003. Interviews were limited to only five companies with eight companies not available or declining to participate.

Conclusions

The NHF *Tick* programme continues to be an effective programme influencing food manufacturers to reduce sodium in existing and newly formulated processed foods in New Zealand. Our results indicate there are now multiple programmes in New Zealand targeting product reformulation/formulation, which contributes to the overall sodium reduction in processed foods. The *Tick* programme, accompanied by other NHF initiatives and internal company policies are driving sodium reduction. However, population sodium intake in New Zealand is still substantially above recommended levels and more action is required to achieve the WHO target of a 30% reduction in population sodium intake by 2025.

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