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Impact of the UK voluntary sodium reduction targets on the sodium content of processed foods from 2006 to 2011: Analysis of household consumer panel data ☆

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ABSTRACT

Objective. In 2006 the UK Food Standards Agency (FSA) introduced voluntary sodium reduction targets for more than 80 categories of processed food. Our aim was to determine the impact of these targets on the sodium content of processed foods in the UK between 2006 and 2011.

Method. Household consumer panel data (n > 18,000 households) were used to calculate crude and sales-weighted mean sodium content for 47,337 products in 2006 and 49,714 products in 2011. Two sample t-tests were used to compare means. A secondary analysis was undertaken to explore reformulation efforts and included only products available for sale in both 2006 and 2011.

Results. Between 2006 and 2011 there was an overall mean reduction in crude sodium content of UK foods of −26 mg/100 g ($p \leq 0.001$), equivalent to a 7% fall (356 mg/100 g to 330 mg/100 g). The corresponding sales-weighted reduction was −21 mg/100 g (−6%). For products available for sale in both years the corresponding reduction was −23 mg/100 g ($p < 0.001$) or −7%.

Conclusion. The UK FSA voluntary targets delivered a moderate reduction in the mean sodium content of UK processed foods between 2006 and 2011. Whilst encouraging, regular monitoring and review of the UK sodium reduction strategy will be essential to ensure continued progress.

Introduction

There is strong evidence of a link between high salt or sodium consumption, high blood pressure, and risk of cardiovascular disease (CVD) (He and MacGregor, 2009; World Health Organization, 2006). In 2002 the World Health Organization recommended that populations reduce their salt intake to ≤5 g (2000 mg sodium) per day (World Health Organization, 2007). In 2003 the United Kingdom (UK) Government's Scientific Advisory Committee on Nutrition recommended that the UK set a target to reduce the average salt intake of adults to 6 g (2400 mg sodium) per day by 2010, with lower targets for children (Scientific Advisory Committee on Nutrition, 2003). At the time average dietary salt intake in the British population was 9.5 g (3800 mg sodium) (Scientific Advisory Committee on Nutrition, 2003). Moreover, 22% of men and 13% of woman aged 19 to 64 years had high blood pressure (Swan, 2004).

A three-pronged dietary salt reduction programme with high level Government support was thus developed to achieve step-wise reductions in population dietary sodium intake: (1): setting voluntary sodium targets for food categories and working with the food industry to reduce sodium levels in processed foods; (2) improving and encouraging the use of nutrition labels; and (3) undertaking consumer awareness campaigns and raising awareness of dietary salt/sodium as a health issue (Medical Research Council Human Nutrition Research, 2003; Sadler et al., 2012).

Following stakeholder consultation, the UK Food Standards Agency (FSA) published the first set of sodium reduction targets for the food industry in 2006 (Medical Research Council Human Nutrition Research, 2003). The targets covered 85 food groups, were intended to be met by 2010, and were revised in 2009 based on evidence of progress in some food categories (Food Standards Agency, 2010b). The revised lower targets were intended to be met by the end of 2012. Prior to the

Abbreviations: FSA, Food Standards Agency; NIP, Nutrition Information Panel.

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release of the first set of targets in 2006, three trade associations (breakfast cereals, soups and sauces, and bread) came together in cross-sectorial groups committing to 10% reductions in their products year-on-year for three years. Similar groups were later set up for meat products; biscuits, chocolate, cake and confectionary; and snacks, nuts and crisps (Food Standards Agency, 2009).

Until 2010, the UK FSA collected annual information from food manufacturers regarding progress towards the targets (the Salt Commitments Table (Food Standards Agency, 2010a)). From 2012 progress has been reported by companies as part of the Public Health Responsibility Deal (new targets were also set in 2012 as part of this programme) (Jebb, 2012). In 2011 achievements across seven food categories were formally published and (as reported by industry) ranged from −13% for crisps to −49% for branded breakfast cereals (Wyness et al., 2012). However, there has been no published independent comprehensive evaluation of the extent to which the FSA targets have impacted on sodium available and purchased across the entire processed food supply, or the extent of food reformulation.

Methods

Data source

Analyses were undertaken using 12-months of continuous household consumer panel data collected by the UK Kantar Worldpanel in 2006 (n = 18,099 households) and 2011 (n = 22,562 households). The UK Kantar Worldpanel comprises a nationally representative sample of household members who scan and record all food and drink purchases brought into their homes. Quality control procedures are used to ensure correct panel data capture, panel continuity, and barcode matching and to monitor extreme purchasing (Ni Mhurchu et al., 2011). Foods consumed outside the home are not collected by the entire panel and are thus excluded from this analysis.

Since 2006 Kantar has also collected nutrient data from the Nutrition Information Panels (NIPs) of food packages in the UK. Nutrient data are collected annually by fieldworkers for ~100,000 UK food and drink products; new products are included when purchased 20 or more times by panel members over a 12-week period. For products not displaying a NIP on the package, nutrient data are derived from category averages or national food composition tables (Food Standards Agency, 2002). Nutrient data are linked with sales data to provide nutritional information on household shopping baskets of panel members.

Identification of foods contributing sodium to the UK diet

Foods selected for inclusion in these analyses were chosen based on their known contribution to sodium in the UK diet (Anderson et al., 2010; Food Standards Agency, 2010b; Ni Mhurchu et al., 2011; Webster et al., 2010).

Data management

Only food and beverage products with actual sodium values presented on the NIP of food packages were included in this analysis. Products were manually categorised into 14 food groups and further sub-divided into 56 smaller food categories (Table 2 and supplementary information). Herbs, spices and table salt were excluded because such products are unlikely to be reformulated. To enable comparison with previous analyses of the sodium content of UK processed foods in 2008/09, food groups and categories were based on a previously developed pragmatic classification system (Ni Mhurchu et al., 2011). However, many of these food groups were not directly comparable with those used by the UK FSA for salt reduction targets. Information by which to make sales weighted-estimates of mean sodium content was available for each product in the form of total (1) pounds (£) purchased; (2) number of packets sold; and (3) kg sold.

Statistics

Statistical Analysis Software (SAS Version 9.3) and Microsoft Excel (2010) pivot tables and formulae were used for statistical analyses. The primary outcome was the difference in crude (un-weighted) sodium content of foods from 2006 to 2011. Sales-weighted means were calculated by multiplying the sodium content for each product by its sales weight, summing the products for all constituent foods overall and within food groups/categories, and dividing them through by the sum of the weights for the constituent food groups/categories. The primary method of weighting was by pounds (£). Additional sales-weighted estimates were made based upon the number of packets and kg sold. It was not possible to calculate the variance (SE) around mean differences in crude or sales-weighted sodium contents because different products were available for sale each year.

Secondary analyses were undertaken to examine changes in sodium levels amongst matched products available for sale in both 2006 and 2011 (n = 16,858), and (unmatched) products for sale in either 2006 or 2011 (n = 56,032). Estimates of variance (SE) were calculated for matched analyses. The percentage of products meeting sodium reduction targets was also calculated.

Independent two-sample t-tests investigated overall mean differences in crude sodium content. A paired sample t-test investigated overall mean difference in sodium content of matched products available for sale in both years. All tests of significance were two-sided with a level of significance of 0.05 (5%). No allowances were made for multiplicity, although the potential for chance findings due to the large number of t-tests was considered in interpreting the findings.

Results

Table 1 provides demographic data for the UK Kantar Worldpanel member households in 2006 (n = 18,099) and 2011 (n = 22,562). The panel sample is weighted to reflect the demographic structure of Great Britain. The majority of households (~65%) comprised one or two members spending £2601 and £3116 per year on food in 2006 and 2011, respectively. Households were distributed across the UK, with the greatest proportion from London (~20%).

Fig. 1 illustrates the food products, food groups, and food categories included in the analysis and the structure for presentation of results. Sales volumes and actual, recorded sodium data were available for 47,337 products in 2006 and 49,714 products in 2011 (40% and 42% of the data set, respectively); 16,858 products were sold in both 2006 and 2011. The food groups with the highest crude mean sodium content were similar in 2006 and 2011 (Table 2). These were: processed meat (845 and 849 mg/100 g, respectively), and sauces and spreads (823 and 716 mg/100 g, respectively). Within these food groups, the categories with the highest crude mean sodium contents were: bacon (1063

Table 1
Demographics of the UK Kantar Worldpanel household members in 2006 and 2011.

	2006	2011
Number of households[a]	18,099	22,562
Annual household spend on food	£2601	£3116
Household size[b]		
Single person	30%	32%
Two people	35%	33%
Three people	16%	16%
Four or more people	19%	19%
Household region		
London	20%	19%
Midlands	16%	15%
North East	5%	5%
Yorkshire	10%	10%
Lancashire	12%	12%
South	10%	10%
Scotland	10%	10%
Anglia	7%	8%
Wales & East	8%	8%
South West	3%	3%
Social class[c]		
A & B (upper middle and middle)	20%	21%
C1 (lower middle)	28%	28%
C2 (skilled working)	19%	19%
D (working)	16%	15%
E (lowest level)	17%	16%

[a] Households providing sales data continuously for each year.
[b] Weighted to reflect demographic structure of Great Britain.
[c] A & B are the highest social classes in the United Kingdom.