

Salt: The Dying Echoes of the Food Industry

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To the Editor: The article “Normal Range of Human Dietary Sodium Intake: A Perspective Based on 24-Hour Urinary Sodium Excretion Worldwide” by McCarron *et al.*¹ provides an opportunity to reflect on the major shift in an important public health debate. The issue is no longer whether reducing sodium (salt) intake is of public benefit; it is how best to reduce population salt intake to save the most lives. Therefore, why has the food and beverage industry mounted yet another campaign to try to resist beneficial changes, either directly or indirectly through their academic voices?^{2–4} Strategies to undermine public health intervention have included biasing research findings, co-opting policy makers and health professionals, lobbying politicians and public officials to oppose public regulation, and encouraging voters to oppose public health regulation.³ As early as 1982, the snack industry was systematically distracting attention from the salt–blood pressure issue by encouraging complacent scientists to divert

the focus of research elsewhere.⁵ Their intent was to delay public health measures. However, since then the weight of scientific evidence has accumulated beyond any reasonable doubt.^{6–8} This evidence now supports evidence-based policy changes worldwide.⁹ It is therefore a sad but familiar story when articles like those of McCarron and colleagues appear (and then reappear) in the scientific literature.¹ They reflect the huge amount of financial resources still committed to try and deny the harmful effects of salt. Witness the estimated €1 billion spent by the global food and beverage industry alliance to lobby against and sabotage the proposal for a traffic light food labelling system in Europe in 2010.^{2,3,10–13}

Let us now address the myths on which McCarron’s ill-founded arguments are based.

Myth 1: The current salt intake is a physiologically set normal range in adult humans.

During several million years of evolution, mankind has survived on very little salt in the diet (<0.25 g of salt per day). Even in modern times, this very low intake is still seen in the Yanomano and Xingu Indians living in the humid and hot environment of the Amazon jungle. They eat <1,200 mg of sodium (3 g of salt) per day, their blood pressure does not rise with age, and stroke events are rare.¹⁴ Meanwhile in industrialized populations, the high sodium intake, typically 3,600–4,800 mg of sodium (9–12 g of salt) per day, is a very recent phenomenon in evolutionary terms. In these groups, blood pressure rises steadily with age, followed by stroke and coronary heart disease.

Myth 2: The “normal” sodium intake is between 120 and 220 mmol (2,800–5,000 mg) (7.0–12.5 g of salt) per day.

The “normal” range of dietary sodium reported by McCarron *et al.*¹ is

only the “usual” range in industrialized, Westernized countries. It is not a physiological normal. The physiological level compatible with life is seen when access to dietary salt is limited, as in parts of the Amazon.¹⁴ Furthermore, this excessive sodium intake is not a matter of personal choice. Only 15% to 20% of sodium in our diets comes from that added to food by consumers.¹⁵

Myth 3: A reduction in sodium intake to <120 mmol (2,800 mg) per day activates the renin-angiotensin system.

There is no evidence for choosing 120 mmol per day as a cutoff point. When sodium intake is reduced, the activation of the renin-angiotensin system is a normal physiological response, similar to that which happens with diuretic treatment. Outcome trials have demonstrated clear benefits of diuretics on cardiovascular disease outcomes. Additionally, with a longer-term modest reduction in sodium intake, there is only a very small increase in plasma renin activity. A recent double-blind trial in 169 individuals with mildly raised blood pressure demonstrated that, when sodium intake was reduced from an average of 3,880 mg to 2,600 mg (from 9.7 to 6.5 g of salt) per day, which is very similar to the current public health recommendation in the United Kingdom, there was an increase in plasma renin activity from 0.35 to 0.55 ng of Ang I/ml/h in whites, and there was no significant change in plasma renin activity in blacks (from 0.1 to 0.1 ng of Ang I/ml/h) or Asians (from 0.12 to 0.20 ng of Ang I/ml/h), whereas a significant fall in blood pressure occurred in all ethnic groups.¹⁶

Myth 4: Sodium intakes of <120 mmol per day could be potentially harmful.

This claim is based on either flawed or unreliable evidence, as extensively argued in recent years. Indeed, McCarron and colleagues¹ quote 2 studies highly criticized in the world literature for their

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flawed assessments of exposure^{17–20} and the latest Institute of Medicine report, which is highly misleading in its conclusions based on questionable evidence in heart failure patients and has since been retracted from the medical literature.²¹ On the contrary, there is much evidence that a modest reduction in sodium intake has many beneficial effects on health and is one of the most cost-effective ways to reduce cardiovascular disease in the population.^{22–24}

Myth 5: Sodium intake in the United States has not changed during the past 50 years.

Clearly studies are needed to measure 24-hour urinary sodium and monitor the trend in a nationally representative sample of individuals. National Health and Nutrition Examination Survey (NHANES) data suggested an increase in sodium intake in the United States over the past 35 years. NHANES used 24-hour dietary recall that does not quantify the amount of discretionary sodium. Therefore the results indicate an increase in sodium intake from processed food. If 24-hour urinary sodium has not changed during the past 50 years, then there would have been a reduction in the amount of sodium discretionarily added to food by individuals.

Myth 6: Public policy cannot modify sodium intake.

The short-term experience in the United Kingdom (1.5 g salt per day population reduction achieved in 8 years) and longer-term experience in Finland and Japan (approximately 4 g salt per day population reduction achieved over 3 decades) clearly demonstrate that public health policy can lead to substantial reductions in population salt intake. This is paralleled by significant reductions in population blood pressure and in stroke rates, with ensuing cost savings.^{8,24} These salt reductions have very little to do with changing individual behaviour but mainly reflect a healthier environment: the reformulation of industrially produced and distributed food with lower sodium content. The vast majority of individuals in most developed countries have little choice over how much sodium they are eating because of the global distribution of processed food.^{2,25} Second, the health benefits of sodium reduction are greater if mandatory regulations for food reformulation are introduced.²³

Successful reformulation (voluntary and mandatory) has occurred in many places with no impact on sales, consumer choices, and eating habits. The experience from the United Kingdom and Finland clearly demonstrates that a gradual reduction in the amount of sodium added to food does not cause any technical problems. There is a large variation in the sodium content in the same branded food products. This evidence in itself indicates that a reduction in the amount of sodium added to food during manufacturing is entirely possible.

The majority of sodium is added to food before it is sold to make food more palatable, to increase the water content of meat products, and to increase thirst and sales of soft drinks, all generating profits for the food and drink industry. The current industry campaign is, therefore, not surprising because the world's 10 largest food and nonalcoholic beverage companies feed the populations of >200 countries worldwide (several hundred million people every day). This generated combined annual revenue of >\$422 billion in 2012.²⁵ This enormous commercial outreach further explains the levelling of population average sodium intakes within narrow ranges described by McCarron and colleagues.¹ It also highlights the huge potential for reducing such levels through widespread food reformulation.

The World Health Organization, the World Health Assembly, and many countries around the world have all independently appraised the scientific evidence of the health benefits and the cost-savings associated with the implementation of a population-wide moderate reduction in sodium intake and agreed upon global targets.²³ Reducing dietary sodium would save thousands of lives every year. Yet sadly, McCarron and colleagues still pursue the tactic of misinformation to promulgate confusion among consumers.

DISCLOSURE

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