Salt -the Greatest Myth in the History of Modern Medicine

Salt and Health

"The great enemy of truth is very often not the lie – deliberate, contrived and dishonest – but the myth – persistent, persuasive, and unrealistic."
John F. Kennedy Yale Commencement Address,1962.

Abstract

In June 2016, the highest public health authority in the US, the Food and Drug Administration (FDA) issued voluntary standards for the reduction of salt in a large range of common processed foods. It is understood that what is called a "voluntary reduction" is a rather misanthropic bureaucratic tool to achieve a "mandatory reduction." Few companies have the courage of being "named and shamed" for not volunteering to follow a government public health recommendation, even if it is acknowledged to be incorrect. This dramatic FDA move took place after more than a century of debate over the role of salt in human health, and at a time when the overwhelming medical evidence made it clear that salt reduction in the US diet is not only unnecessary but could pose a greater risk to many consumers.

The voluntary reductions recommended by FDA were based upon the erroneous assumption that; 1) Americans ate more salt than ever before in recorded history; 2) the levels of salt consumption led to hypertension; 3) Americans could massively reduce their salt consumptions, without any dietetic turmoil or negative health consequences; 4) the methodology employed to demonstrate the role of salt in the etiology of hypertension was proper and precise, and; 5) the US population would gain significant health benefits from major population-wide salt reduction.

Not long after it was issued, several scientists, who traditionally came down on opposite sides of the salt/hypertension debate, joined together and agreed the balance of evidence was against population-wide salt reduction, and thus, the voluntary standards were misdirected.

The paper will show what the latest evidence on methodology reveals; what the generally-recognized safe range of salt intake is; the inadvisability and negative impacts of population-wide salt reduction and; how the highly political nature of the global salt-reduction campaign, including every public health institution from WHO to national, state and local public health departments, makes it the greatest myth in the history of modern public health.

Introduction

Salt, the world's most basic food ingredient, is indispensable to life. All living creatures, having evolved from the primordial saline sea are dependent upon this mineral for survival. Because it is the essence of life, salt has played an incredible role in the development and survival of human society from the dawn of time. With the exception of water, no other item in our diet comes close to its significance - to all the human cultures on our planet, where it finds near identical prominence and function.

Look at some examples. Because of its high, consistent value, salt was used as a form of currency and the word, 'salary' has its origin in the Latin root 'Sal,' because salt was distributed as wages to Roman soldiers. The natural preservative and medical properties of salt bestowed upon it a universal sense of reverence and credited it with the properties of immortality. So important was salt to the ancient Hebrews, that holy and sacred obligations were considered to be "salt covenants," a reference symbolizing the covenant between God and Israel. An array of rituals, many followed by several other religions included the salting of bread, the use of salt in temple sacrifices, the casting of salt to purify and sanctify places, and its dramatic reference in the Bible's Book of Genesis recounting of the story of Sodom and Gomorrah.

In the New Testament, Jesus considered his followers "the salt of the earth." The spilt salt on Leonardo da Vinci's Last Supper table foreshadowed bad luck and we still observe this response to anxiety when we throw a pinch of salt over our shoulders to ward off evil or to give us good luck. Just as the Latin term 'Sal' was the basis of the word salary, in the Catholic Church, it serves as the root of the word 'Salvation.'

And similar example of salt's significance can be found in all other cultures and religions. Salt has been inextricably bound up in all our lives.

Yet, in the course of the last 40 years, this relationship has become somewhat obscured and strained. Media commentators, public health officials and consumer advocates are telling consumers that salt is harmful and advise us to reduce, and in some cases, totally eliminate the consumption of salt from our diet. The most sensational of these exclaim that salt is toxic.[1]

For a limited percentage of individuals in our population that have uncontrolled hypertension and salt sensitivity, there is no doubt that a reduction in salt consumption is warranted. However, these individuals comprise a limited proportion of the population - about 15%. All others who do not have hypertension or those whose hypertension is well controlled through medication, experience very little or no benefit from salt reduction. That notwithstanding, the consumption of salt has been so maligned that it can be legitimately characterized as an abuse of consumer trust.

Despite these dire warnings, salt consumption has remained stable for the last 50 years. Given their own choice, driven by their physiological needs, consumers have not cut back on their intake and our overall health outcomes and health adjusted life expectancy continue to improve. This does not infer that our current level of salt consumption is responsible for this health improvement, but it clearly infers that these levels are fully compatible with our gains in health and longevity.

During the last 10 years, the majority of peer-reviewed medical evidence concluded that there may be increased risks to health if we reduce our current levels of salt intake. Shamefully, the efforts that certain quarters of the public health establishment made to conceal or discredit this evidence is truly extraordinary. And, unfortunately, these efforts may end up having grave consequences for consumers.

In June 2016, the highest public health authority in the US, the Food and Drug Administration (FDA) issued voluntary standards for the reduction of salt in a large range of common processed foods. It is understood that what is called a "voluntary" reduction is a rather misanthropic bureaucratic tool to achieve a "mandatory" reduction. Few companies have the courage of being "named and shamed" for not volunteering to follow a government public health recommendation, even if it is acknowledged to be incorrect. This dramatic FDA move took place after more than a century of debate over the role of salt in human health, and at a time when the overwhelming medical evidence makes it clear that salt reduction in the US diet is not only unnecessary but could pose an increased health risk to most consumers.

The voluntary reductions recommended by FDA were based upon the erroneous assumptions that: 1) Americans eat more salt now than ever before in recorded history; 2) current levels of salt consumption lead to hypertension; 3) Americans could massively reduce their salt consumption, without any dietetic turmoil or negative health consequences; 4) the methodology employed to demonstrate the role of salt in the etiology of hypertension is sound and precise, and; 5) the US population would gain significant health benefits from major population-wide salt reduction.

The paper will show what the latest evidence on salt reveals; what the generally-recognized safe range of salt intake is; the inadvisability and negative impacts of population-wide salt reduction and; how the highly political nature of the global salt-reduction campaign, including every public health institution from WHO to national, state and local public health departments, making the call for population-wide salt reduction, the greatest myth in the history of modern public health.

The method I have chosen to address this matter is to examine the various myths that, as John Kennedy once put it, are "…persistent, persuasive, and unrealistic," and for consumers constitute the "…great enemy of the truth."

The Major Myths

Americans Eat More Salt than Ever

The current level of salt consumption in the US is about 8.5g or 1 ½ teaspoons per day. That's the equivalent of 3,400 mg of sodium (Na) per day. When compared to the rest of the world's salt consumption, is just a shade under the statistical global average. In fact, 90% of the countries in the world consume salt in the narrow range of 1-2 teaspoons per day. There are a very few outlier countries that consume a bit less than 1 teaspoon per day, because the cost of salt is a sizable portion of their disposable income, and a very few that eat more than 2 teaspoons per day because of their persistent tradition of eating salt-preserved meats, fish or vegetables as major components of their diets.

In fact, the traditional role of salt as a food preservative provides the clue to debunking the myth that we now eat more salt that ever. If we are to address this question with any integrity, we

must refer to genuine evidence. Although there is a lot of speculation about Paleolithic diets, there is no proof of how much salt we consumed in the distant past, and almost no documented physical evidence of historical salt consumption, going back more than 200 years. However, the military have a habit of keeping very good records, and from those it appears that we may currently be consuming a far lower level of salt than ever before in recent recorded history.

The United States declared war on England on June 18, 1812 to protest the undue control of the British government over the lives of Americans. During the War of 1812, the daily salt ration for the Continental army was 18g of salt/day.[2] American forces that were captured were first shipped up to Canada and thence crammed aboard ships for the long, cold voyage to the prison camps in England. There, each man was given a daily ration of a 1½ pounds of coarse bread (containing 8-10g salt), some boney beef and 9g of table salt. They were also given one or two turnips a week. American prisoners of war described their treatment by the British as "ungenerous, inhuman and unmerited oppression." The 1.5 teaspoons of salt per day they received was part of a, "...scanty and meager diet for men brought up in the land of liberty, and ever used to feast on the luscious fruits of plenty..."[3]

The rations allotted to American troops in the Mexican War was established in 1838 and also contained 18g of salt per day. The Civil War rations enacted by Congress in 1860 and 1861, increased the variety of foods in the ration, but maintained the level of 18g salt per day.

During the Spanish American War, very few changes were made to army rations except for a slight increase in potatoes and a decrease in wheat flour and beans. Again, the salt ration was kept at 18g/day. Toward the end, a portion of the salt was replaced with salted corned beef in cans.

During World War I - the daily army reserve ration included a one-pound can of corned beef (containing 10g salt), two 8-ounce tins of hard bread (4g salt), and 4½ g of table salt, for a combined total of 18 ½ g salt.[4]

During World War II, the salt ration for American prisoners of war in Germany was 20g of salt per day and a similar amount was allotted to the Italian prisoners of war interred in South Africa.[5]

The main reason that salt consumption was maintained at that level for centuries was because salt was the most widely used and effective food preservative. Most traditional foods we eat such as cheeses, corned beef, salt pork, ham and bacon, salted fish and vegetables were preserved in dry salt or with salt brine. The use of salt for food preservation is as old as civilization itself, because an advanced stage of social development and organization could only be attained once our food supply was stabilized.

This situation changed dramatically with the commercial introduction of refrigeration during the 1930s. The most significant decrease in salt consumption occurred immediately after World War II, when home refrigeration became popular in the United States and replaced salt as the primary means of food preservation. Instead of salt fish and pickled green tomatoes, consumers naturally gravitated towards a fresher food supply. Salt consumption almost

dropped in half in the decade following the end of WWII. This took place naturally, without any government pressure or advocacy efforts to reduce salt consumption. Yet, after that initial steep drop, salt consumption levelled off in the late 1950s and has remained there ever since.[6]

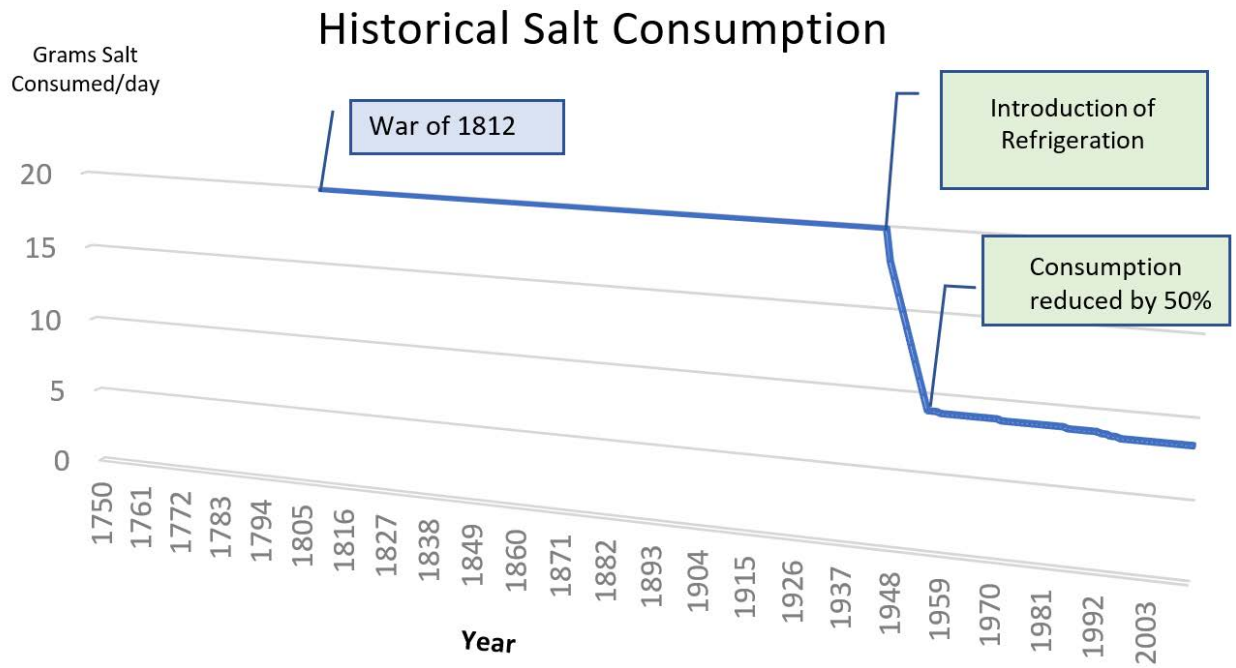


Figure 1 Historical Salt Consumption

This same pattern was repeated soon afterwards in most other Western countries as they developed economically. Understandably, those countries that clung most closely to their traditional diet were the slowest to achieve this reduction. This is not surprising considering that virtually all of our “gourmet” foods such as caviar, cheese, prosciutto, choucroute, etc., are salt-preserved.

It is difficult to say exactly why salt consumption did not continue to decline more than it did. One can speculate that the developing economy was better served with a growing number of convenience foods, or perhaps our natural metabolic feed-back mechanism, or "Wisdom of the Body"[7] was signaling us that we should not go below a particular level of salt consumption. No one is quite certain; however, it is remarkable that our consumption of salt has remained stable for over 50 years. Of course, we have now come to realize that for most people, at salt consumption levels below 1 teaspoon per day, the renin-angiotensin-aldosterone system is stimulated and acts to conserve sodium by signaling the kidney to prevent its elimination. That, along with our several other innate, biological salt-conservation mechanisms, may well drive our desire to consume salt at the levels we do.

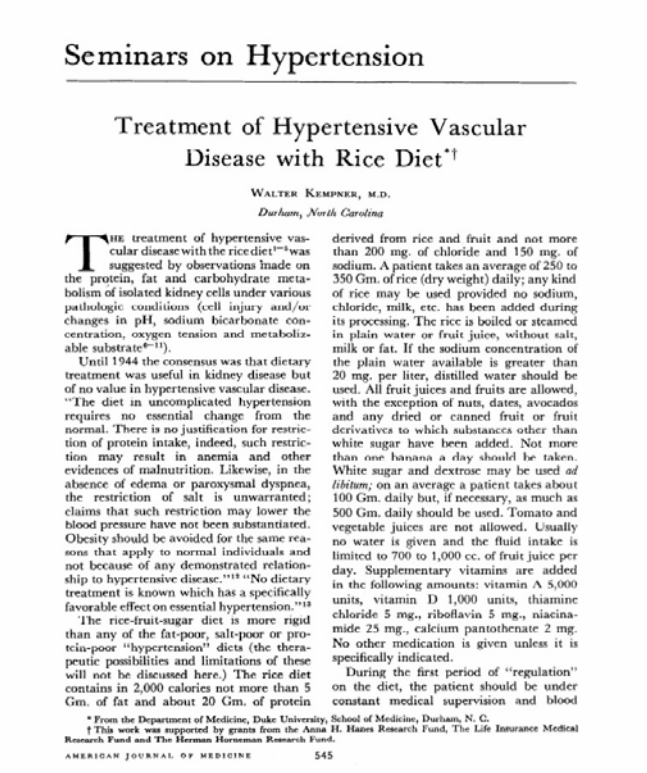
Nevertheless, our current levels of salt consumption are about ½ of what the available evidence tells us we ate for more than the two previous centuries, putting an end to the myth that we currently eat more salt than ever.

Current Levels of Salt Consumption Lead to Hypertension

The relationship between salt and blood pressure has been speculated upon for millennia. The most famous treatise in ancient Chinese medicine, "The Yellow Emperor's Classic of Internal Medicine," written by Huang Ti Nei Ching Su Wein more than 2000 years ago, makes reference to the impact of salt consumption on the pulse. More recently, researchers going back to 1850 claimed that depriving hypertensive individuals of salt would reduce the blood pressure.[8 9] Initially, it was thought that the chloride portion of salt (sodium chloride) was the responsible pressor agent for this phenomenon, but later research shifted this relationship to sodium.[10] Even at that time, however, there was some opposition to this idea.[11] What is clear is that the entire controversy hinged on a mere handful of patient case studies. Furthermore, because one physician's work was seldom reproduced by another, the salt/hypertension hypotheses quickly became the subject of considerable debate, frequently characterized by an advocacy- rather than an evidence-driven approach. One of the earliest proponents for salt reduction was Allen,[12] who eventually avowed that if anyone with hypertension was not found experimentally to have elevated chloride levels, then they were incorrectly analyzed. In 1922, together with another physician named Sherril, Allan placed patients with essential hypertension on low salt diets. Essential hypertension is the most common form of hypertension characterized by persistent high blood pressure for which no specific cause can be determined. It tends to be familial, so it is likely to be the consequences of genetics. Their results were subsequently verified by some physicians, and refuted by other, and the practice was eventually abandoned, but not without Allen unequivocally and aggressively declaring himself to be correct.[13] There is little doubt that passion and perhaps even obsession rather than reproducible evidence drove their testimony.

Very little else was done in this area until Dr. Walter Kempner, was brought in 1934 as a refugee from Nazi Germany, to join the faculty of Duke University's Department of Medicine. and became world-renowned for his investigations the effect of diet on various diseases. In 1940, he began treating patients with advanced kidney disease and severe hypertension, a rare condition known as malignant hypertension, with a diet comprised only of white rice, fruit, fruit juice and sugar. Malignant hypertension is extremely high blood pressure that develops suddenly and rapidly and is often associated with kidney disease. Average blood pressure is around 120/80 mm Hg, however an individual with malignant hypertension is typically above 180/120 mm Hg. This is considered a hypertensive crisis and is often treated as a medical emergency. The austere rice diet advocated by Kempner for treating malignant hypertension severely curtailed salt intake and the very high consumption of fruit and fruit juices resulted in a reversal of the customary sodium/potassium ratio, providing almost 20 times as much potassium as sodium. Unfortunately, Kempner did not take the sodium/potassium ratio reversal into account nor the impact of the weight loss his patients experienced and claimed that salt reduction was solely responsible for the observed drop in blood pressure. His celebrity, along

with the fame of his diet, led to a major shift in support towards the sodium/hypertension hypothesis.



Seminars on Hypertension

Treatment of Hypertensive Vascular Disease with Rice Diet*†

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THE treatment of hypertensive vascular disease with the rice diet[1–3] was suggested by observations made on the protein, fat and carbohydrate metabolism of isolated kidney cells under various pathologic conditions (cell injury and/or changes in pH, sodium bicarbonate concentration, oxygen tension and metabolizable substrate[4–11]).

Until 1944 the consensus was that dietary treatment was useful in kidney disease but of no value in hypertensive vascular disease. "The diet in uncomplicated hypertension requires no essential change from the normal. There is no justification for restriction of protein intake, indeed, such restriction may result in anemia and other evidences of malnutrition. Likewise, in the absence of edema or paroxysmal dyspnea, the restriction of salt is unwarranted; claims that such restriction may lower the blood pressure have not been substantiated. Obesity should be avoided for the same reasons that apply to normal individuals and not because of any demonstrated relationship to hypertensive disease."[12] "No dietary treatment is known which has a specifically favorable effect on essential hypertension."[13]

The rice-fruit-sugar diet is more rigid than any of the fat-poor, salt-poor or protein-poor "hypertension" diets (the therapeutic possibilities and limitations of these will not be discussed here.) The rice diet contains in 2,000 calories not more than 5 Gm. of fat and about 20 Gm. of protein derived from rice and fruit and not more than 200 mg. of chloride and 150 mg. of sodium. A patient takes an average of 250 to 350 Gm. of rice (dry weight) daily; any kind of rice may be used provided no sodium, chloride, milk, etc. has been added during its processing. The rice is boiled or steamed in plain water or fruit juice, without salt, milk or fat. If the sodium concentration of the plain water available is greater than 20 mg. per liter, distilled water should be used. All fruit juices and fruits are allowed, with the exception of nuts, dates, avocados and any dried or canned fruit or fruit derivatives to which substances other than white sugar have been added. Not more than one banana a day should be taken. White sugar and dextrose may be used *ad libitum;* on an average a patient takes about 100 Gm. daily but, if necessary, as much as 500 Gm. daily should be used. Tomato and vegetable juices are not allowed. Usually no water is given and the fluid intake is limited to 700 to 1,000 cc. of fruit juice per day. Supplementary vitamins are added in the following amounts: vitamin A 5,000 units, vitamin D 1,000 units, thiamine chloride 5 mg., riboflavin 5 mg., niacinamide 25 mg., calcium pantothenate 2 mg. No other medication is given unless it is specifically indicated.

During the first period of "regulation" on the diet, the patient should be under constant medical supervision and blood

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Figure 2 Kempner's Rice Diet

Brookhaven National Laboratory physician Lewis Dahl began studying the Kempner diet in 1950[14] and by 1962 became the principal advocate of salt reduction in the United States. Dahl held a number of opinions on salt that were never well-supported by evidence. As an example, the introduction to his paper, "Possible role of salt intake in the development of essential hypertension,"[15] he stated that the widespread use of salt as a condiment to food was uncommon until modern times. However, salt had functioned both as a preservative and a condiment (by itself and in sauces) for more than two millennia in Europe and Asia.
Dahl's principal research was carried out on rats, under experimental conditions that could only be qualified as extreme. He continually fed his rats levels of salt bordering on the lethal dose (LD_{50}) for sodium chloride - the human equivalent of 1¼ lbs. of salt per day! Under these conditions, some of the rats did eventually develop increased blood pressure and Dahl maintained this was evidence of the relationship of salt to hypertension. There are still many physicians who do not grasp the absurdity of using this type of stress-inducing physiological experimentation, and then extrapolating it to realistic human circumstances. They continue to believe that he convincingly substantiated the salt/hypertension hypothesis.

Nonetheless, the renewed interest in linking sodium consumption to hypertension prompted the famous Intersalt Study[16] – an observational study based on a sample of more than 10,000 men and women between the ages of 20-59, from 52 population centers in 38 countries spread across the world. The purpose of Intersalt was to investigate in a systematic and standardized manner, the relationship between electrolyte excretion and blood pressure based, on samples

from many countries. The report analyzed sodium excretion, potassium excretion, and the sodium/potassium ratio from 24-hour urine samples in relation to blood pressure, among over 10,000 men and women aged 20-59, taking body mass index and alcohol intake into consideration as confounding variables.

Although most populations around the world had sodium consumption levels in a narrow region from 100 – 200 mmol (2,300-4,600 mg Na/day), there was an outlier group that consumed 50 mmol or less per day. A critical conclusion of the study was that those Intersalt populations with very low-sodium intakes appear to have had low median blood pressures, a low prevalence of hypertension and no increase in blood pressure with age, leading to the conclusion that the low levels of hypertension among these groups was the exclusive result of low-salt consumption. When the four low sodium outlier populations were included in the analysis a direct relationship between sodium intake and blood pressure was established (Figure 1).

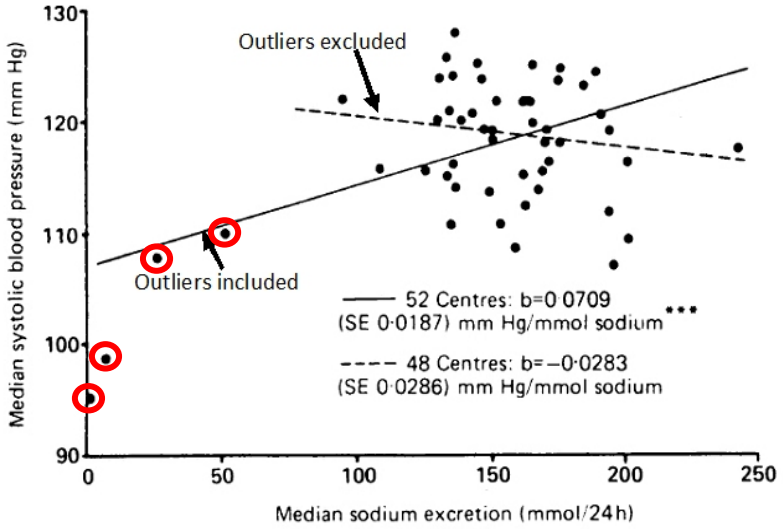

Figure 3 The Intersalt Study

However, when this same outlier group was not included, there was an inverse relationship noted between sodium and blood pressure for all other populations.

Intersalt was touted to be an inclusive global study of the world's inhabitants and cultures. As highlighted above, it had several unique populations that were socially remote from most country populations. Primitive Yanomamo and Xingu Indians of Brazil, rural Papua New Guineans, secluded Kenyans and isolated Newfoundlanders were mixed in with major urban centers around the world. They purported to cover all the different population bases, but did they? No, not quite.

There was not a single Arab country included in the Intersalt Study!

Not one of the six Arab countries in Africa were selected; not a single Arab country in the Middle East was chosen; neither was one of the eight Arab Gulf states included and neither was Turkey or the Indian Ocean Comoros. If a study was claimed to include the all world's residents and

cultures, surely Arabs ought to have been included - not only because of cultural diversity, but for another rather special reason.

An extremely important trait of population characteristics related to hypertension was totally disregarded by Intersalt - genetics.

The angiotensin-converting enzyme, or ACE, is a central part renin-angiotensin aldosterone system (RAAS), which controls blood pressure by regulating the volume of fluids in the body. It converts the hormone angiotensin I into the vasoconstrictor angiotensin II. So, ACE indirectly increases blood pressure by causing blood vessels to constrict. Studies have shown that different genetic forms of ACE can influence one's health and performance. ACE I/D polymorphism (genetic variation) consists either an Insertion (I) or absence (D for deletion) of a 287 base-pair gene sequence. People carrying this I-sequence usually produce lower ACE levels and have lower levels of cardiovascular disease and blood pressure, while people carrying the D-sequence have higher ACE levels and higher levels of CVD and hypertension. This is significant because the near absence of the D-sequence results in very low blood pressures and an elevated level of D-sequence can cause very high levels of blood pressures. One would have thought that the Intersalt study would have been very interested and sensitive to this phenomenon, much of which was known at the time. But was it?

As it happens two out of the four low-sodium populations in the Intersalt study, the Yanomamo and Xingu Indians are Amerindian rainforest dwellers that have a near absence of the D/D genotype, and therefore, almost no hypertension. These individuals present a low risk for developing cardiovascular disease, despite data that show serum triglyceride concentrations to be slightly higher in this population than in Caucasians at any age.[17 18] Another one of the outlier groups from Papua New Guinea is also from a region where a very low incidence of D/D genotype is prevalent.[19 20] The genotype of the fourth outlier (from Kenya) has not been published.

As previously mentioned, Arab countries, which all have relatively high frequencies of the D/D genotype and high levels of hypertension,[19] were never included in the Intersalt study, not one. For a massive study that had the, "…. explicit aim of providing reliable data about sodium excretion and blood pressure between and within cultures...,"[21] it is curious that no Arab country was included. The fact that Intersalt included three populations (Yanomamo, Xingu, and Papua New Guinean) known to have the lowest frequency of the D/D genotype and lowest hypertensions in the entire world, but excluded all Arab populations, known to have the highest frequency of the D/D genotype and highest hypertension in the world is curious, if not suspect. Surely, this incongruity must have come up during the planning of Intersalt, yet no indications of any such discussions exist anywhere in the available literature.

Thus, not only was Intersalt's key methodology for determining sodium consumption (the 24-hour Urinary sodium analysis) suspect, but the particular selection of populations appears to have been highly partial. For what was touted to be the largest and most definitive international study to positively link salt consumption to hypertension, Intersalt ended up being a genuine disappointment. Researchers who were committed to the salt hypertension link were left with an accumulation of data that did no such thing, unless massaged and manipulated to the point of absurdity. No matter how hard they tried, all the king's horses and all the king's men couldn't

put Intersalt together in any credible way. Yet, many still consider that the Intersalt study is convincing proof of the relationship between salt and hypertension, despite of the fact that, were the study to come under any serious scientific scrutiny, it would be cast out as a stage-managed sham.

Nevertheless, the Yanomamo Indians were held up as an example of the benefits that would accrue to us if we substantially reduced our salt intake. While there is no doubt that their environment has epi-genetically driven them to be incredible salt conservers, this is accomplished at sky-high levels of renin-angiotensin-aldosterone activity, which results in a high cost to overall health and life expectancy.

In fact, if we compare the available data on blood pressure using the WHO Global Health Observatory[22] against the most recent data on global salt consumption,[23] it is perfectly apparent, from both males and females, that very low (<2,500 mg Na/day) and very high sodium consumption (>5,500 mg Na/day) both lead to the highest systolic pressures, however, the broad range of consumption in-between, where most countries reside, have the lowest blood pressures, putting an end to the myth that current levels of salt consumption lead to hypertension.

We Can Massively Reduce Salt Consumption without Any Negative Dietetic or Health Consequences

This myth is particularly menacing because it has lulled consumers into thinking that salt reduction is benign, and it has motivated the international food industry to abandon the evidence from health science and pursue the development of sodium-reduction science designed to deceive our innate sensory mechanisms into believing that we are consuming more salt than we actually are. Using our current food supply, it is questionable whether a diet that meets the reduced sodium requirements of the Dietary Guidelines is practically achievable.[24]

More importantly, the available evidence shows that significantly reducing our current levels of salt consumption may lead to insulin resistance,[25] increases in mortality from Type 1[26] and Type 2[27] diabetes, increased risk of cardiovascular events,[28] [29] [30] negative impacts on blood pressure and hypertension,[31] increased levels of renin, aldosterone, catecholamines, cholesterol and triglycerides,[32] hyponatremia[33] and increased mortality.[34]

This evidence promptly and convincingly puts an end to the myth that we can massively reduce salt consumption without any negative dietetic or health consequences and begs the question as to why the largest and most influential food companies in the world are aggressively pursuing the means of reducing salt in the diet.

The Methodology Employed to Demonstrate the Role of Salt in The Etiology of Hypertension is Sound and Precise

The myth has long been perpetuated that the 24-hour urinary (HrUr) collection was a “Gold Standard” for the measurement of sodium in the diet. However, evidence from radiolabeled

sodium studies carried out in the 1950s, show that ingested sodium is exchangeable between plasma, bone and skin tissue.[35 36 37 38 39 40 41 42 43] More recently, it has been confirmed that salt intake and urinary sodium excretion are not directly related on a daily basis, due to an inherent circaseptan rhythm in excretion.[44 45 46] Thus, all data using a single 24 HrUr Na analysis are unreliable, as well as data supported by urinary markers such as para-amino-benzoic acid (PABA), which does not follow the same consumption/excretion pattern as sodium does. Sodium analysis is further complicated by an artifact resulting from the consumption of sodium levels below 200 mmols/day. Alderman et al., demonstrated that stimulation of the renin-angiotensin-aldosterone system causes the reabsorption of sodium, which, consequently reduces the sodium recovered in the 24 HrUr collection.[47]

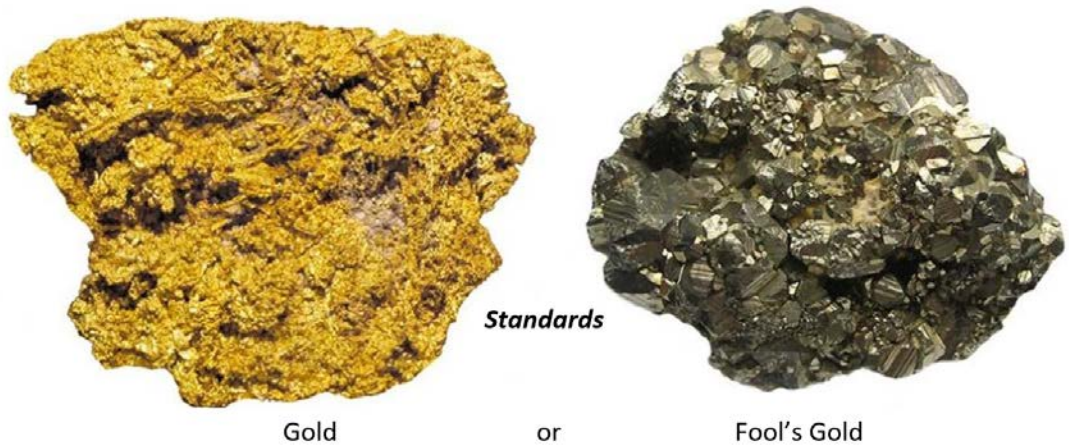

Figure 4 A Gold Standard?

These are critical considerations and put an end to the myth that the methodology employed to demonstrate the role of salt in the etiology of hypertension is sound and precise, yet they have never been accounted for in the literature and many continue to rely on this data in their advancement of a policy of population-wide sodium reduction.

The US Population Would Gain Significant Health Benefits from Major Population-Wide Salt Reduction

With the exception of the small minority of individuals who have untreated or uncontrolled hypertension, the research shows that there is no relationship between sodium or salt consumption and blood pressure.[48 49 50 51 52 53 54] It is generally agreed that salt intake has a very weak or non-existent relationship with hypertension for most individuals,[55] and a very limited benefit of a 1-5 mmHg reduction in systolic BP and 1-2 mmHg diastolic BP, for the small minority that is sensitive. That reduction in BP is minimal and only for a minority of the population. Yet, we have seen from the above-cited literature, the staggering array of negative side effects that can arise from population-wide sodium reduction – a consideration that is almost never taken into account by the salt-reduction advocates. Given the indiscriminating adoption of population-wide sodium reduction as a high-profile public health policy by most countries, it is no surprise that this situation is referred to as "The Sodium Phantom?"[56]

Figure 5 Medical Myths Can Cause Harm

Why is Salt the Greatest Myth in the History of Modern Medicine?

At a time when it is clear that a policy of population-wide salt reduction has to be reviewed with great precaution, the FDA has introduced measures for the reduction of salt in processed foods. Of course, the term "voluntary" is the bureaucratic euphemism for "obligatory," since no food processing company would ever chance being the odd man out, when all others are reducing salt. Furthermore, the methods employed to reduce salt will not simply depend upon its removal. The salt in processed foods will be replaced or enhanced by other ingredients or technologies. In some cases, these techniques are highly complex in nature and their long-term impact on the health of consumers may not be known for decades to come. They are designed to deceive our senses into thinking we are consuming higher levels of salt. While our taste-buds may be deceived, our basic physiology is not, and the consumption of sodium below current levels may lead to increased illness and mortality according to the latest evidence. While the food may appear to taste similar to traditional foods made with normal levels of salt, consumers may not be getting an amount of salt sufficient to maintain optimal health. But, they will not know it and worse, they may not be safeguarded by natural feed-back mechanisms to correct for it.

As we have never experienced this dramatic a change to diets previously, it effectively means that 330 million Americans will be subject to the largest clinical trial in history, without their knowledge or their permission, much in the same way as lab rats would be. If the science published during the last decade is valid, it means we will all be exposed to a higher risk of negative health consequences.

The goal of this paper is not to convince people to eat more salt. It is to present the story of the massive salt fallacy, the myth which has resulted in the latest government action and the refusal of the food industry to question it. Without doubt, when harm to consumers from dietary salt

reduction occurs, the food industry will be blamed, and it will in turn blame the government, who will then plead that their recommendations were only "voluntary." The sort of bureaucratic regulatory two-step that always leaves consumers out of the equation. Quickly and quietly fading from the scene will be the international cabal of strategically-placed salt-reduction fanatics who, driven by an inflated sense of power and self-importance, mis-characterized the available evidence in order to create the greatest myth in modern medicine.

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