Special Report: A pinch of doubt over salt

By Kate Kelland, Health and Science Correspondent
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(Reuters) - In Britain it started with Sid, the "giant slug with a message", who slicked his way onto television screens back in 2004 as part of a government health campaign to warn people about the dangers of consuming too much salt. "Stay away from fast cars, loose women and SALT!" he screamed.

Sid's message -- that liberal sprinklings of sodium, the main component of salt, don't only kill slugs but humans too -- has now become conventional wisdom worldwide. High salt intake is linked to high blood pressure, or hypertension, a key risk factor for strokes, heart attacks and other cardiovascular diseases. Together those rank as the world's number one killers. The World Health Organization (WHO) puts cutting salt intake alongside quitting smoking as one of the top 10 "best buys" in public health.

"Blood pressure is the biggest cause of death in the world ... and salt is the most important thing that puts it up," says Graham MacGregor, a professor of cardiovascular medicine at the London-based Wolfson Institute of Preventive Medicine and chairman of the influential World Action on Salt and Health lobby group (WASH). "Cutting back on salt gives a direct beneficial effect on the biggest cause of death in the world. That's why it's so important."

Or is it? Recent scientific papers suggest the basis for a global crackdown on salt is not what you'd call rock solid. Two 2011 studies indicate that the evidence is inconclusive, or that reducing salt may even be harmful.

"There's a view that salt is the root cause of all high blood pressure worldwide and some people religiously hold on to that belief," said Tony Heagerty, head of the cardiovascular research group at Britain's Manchester University and a former president of the International Society of Hypertension. "But the evidence for that is actually pretty flimsy."

It's a debate that has flared over the past few months, with each side harnessing a legion of experts in hypertension, heart disease, nutrition and scientific analysis. The salt industry has, naturally, jumped on studies that question the conventional wisdom, and at least one food manufacturer has started to add salt back to some of its processed foods. At times the row has become personal. Trapped in the middle are consumers, who may worry they have become unsuspecting guinea pigs in a grand global experiment.

"The two sides are totally polarized and there's no agreement or consensus on what the answer is," says Peter Sherratt of the UK Salt Association. Any new scientific paper which supports the anti-salt position is lauded as

proof salt consumption is dangerous, but any piece of evidence or science showing salt is beneficial, or reducing it dangerous, is criticized as unrepresentative, he said.

The debate has big implications for business. Salt for food use accounts for only a fraction of the 250 million tonnes of annual global production. Looking at the United States alone, 1.5 million tonnes of so-called human nutrition salt was sold in 2009 with a value of more than $321 million.

But the U.S. snack foods industry -- a key consumer of salt which includes major companies like Pepsico's Frito-Lay and Kraft's Nabisco -- has a combined annual revenue of $27 billion, according to analysis by company profile builder Hoover's. Then there's the business of selling drugs to treat high blood pressure. Worldwide sales of anti-hypertensives were around $35 billion in 2009, according to research by Deutsche Bank.

Heagarty disclosed that 15 years ago, his department accepted 2,000 pounds ($3,200 at today's rates) from the U.S.- based industry lobby, the Salt Institute, but said he has no current financial conflict of interest.

WORTH THE SALT?

Salt has been taxed, monopolized, treasured and fought over for thousands of years. Today's scientists are waging a modern-day salt war.

In the 1970s, American researchers experimenting on rats found very high doses of salt raised blood pressure. Some of the most-cited evidence on salt and health came in a 1988 international study called InterSalt, which surveyed more than 10,000 men and women in scores of populations across the world. The study included four remote tribes in Brazil, Kenya and New Guinea whose people had the lowest salt intake and were also found to have the lowest blood pressure and very few, if any, cases of hypertension. Although these findings were disputed by parties including the Salt Institute, it wasn't long before a scientific consensus emerged that too much salt is bad for you.

A 2005 study in the PubMed journal found almost 1 billion people around the world have high blood pressure, which makes the heart work too hard, hardens the walls of the arteries and can cause other problems such as heart failure, kidney disease, and blindness. Cardiovascular diseases are the leading cause of death globally, claiming 17.1 million lives a year. A substantial number of these deaths are put down to smoking, which raises the risk of hypertension, strokes and heart attacks.

In the past few years, governments have begun to act. Under its health-promoting mayor Michael Bloomberg, New York City pledged in 2010 to coordinate a U.S.-wide effort to cut salt in restaurant and packaged foods by 25 percent. National sodium reduction strategies have been adopted across Europe and in Australia, China and India.

Scores of health authorities around the world advise that we should aim to reduce our salt intake from the roughly 9 to 12 grams a day we eat now down to around 6 grams - about a teaspoonful a day. Since around 75 percent of all the salt we consume comes from packaged and processed food, rather than from what we sprinkle on top of it, food manufacturers have been in the firing line.

Under pressure from health authorities and the WHO, the food industry -- which stands accused of using salt to boost the flavor, shelf-life and profit of what would otherwise be bland ingredients -- has taken action. Big brands like Heinz, Kellogg's, Nestle, Pepsico, General Mills and others have been steadily reducing sodium levels in their foods.

According to Susan Jebb, a nutrition adviser to the UK government, Britain is leading the way, forcing foodmakers to make some "impressive" reductions including a 30 percent reduction in salt in bread, about a 50 percent cut in branded breakfast cereals and around 25 percent in pasta sauces.

Among the health-conscious at least, a salt-shaker on the dining table is becoming almost as frowned on as an ashtray.

NOT CRYSTAL CLEAR

But the findings that policy-makers have accepted as settled are not as clear-cut among scientists. A study in July by the much-respected Cochrane Library, which conducts meta-analyses of scientific data by grouping together the best studies on a subject and pooling the results, found no evidence that reducing salt intake cuts the risk of developing heart disease or dying before your time.

In that study Rod Taylor, a professor of health services research at Exeter University, analyzed seven randomized controlled trials covering more than 6,500 people and found that although cutting down did appear to lead to slight reductions in blood pressure, this did not translate into lower risk of heart disease or premature death.

In one group of people -- those with pre-existing heart conditions -- reducing salt was actually associated with an increase in the likelihood of premature death.

Taylor said he did not receive payment from, or have links to, the salt industry. His study was funded by a grant from the UK government's National Institute for Health Research.

Taylor's study came hot on the heels of another, by Belgian scientists, which was published in the Journal of the American Medical Association (JAMA). That found people who ate lots of salt were no more likely to get high blood pressure, and were statistically less likely to die of heart disease, than those with low salt intake.

The researchers used data from two different studies, involving a total of around 3,700 Europeans whose salt consumption was measured through urine samples. The scientists divided the participants into three groups with low, medium and high intake: those with the lowest salt intake had the highest rate of death from heart disease - at 4 percent. People who ate the most salt had the lowest death rate from heart disease, at less than 1 percent.

"One should be very careful in advocating generalized reduction in sodium intake in the population at large. There might be some benefits, but there might also be some adverse effects," says Jan Staessen, head of hypertension studies at the University of Leuven and the lead investigator on the Belgian study. "You have to ask, should public health policies be based on something which is still being debated? I don't think so."

Staessen told Reuters he had no financial conflicts of interest. His work was funded largely by grants from the European Union and European national governments.

WHO SAYS A TEASPOONFUL WILL DO?

Such studies are re-drawing the battle lines around salt. Foodmakers are starting to fight back against the low-salters. Campbell's is now putting more salt back into all 31 of its Select Harvest soups after consumers voted with their taste buds and stopped buying the reduced-salt version.

"One size doesn't fit all," says Juli Mandel Sloves, Campbell's senior manager for nutrition and wellness communications. "And what this research debate shows is exactly that. You can't make a recommendation based on the needs of only one part of the population. It's really important that we offer a variety of choices."

Other major food industry groups and manufacturers approached by Reuters, including Kellogg's and Pepsico, as well as the U.S. Grocery Manufacturers' Association, either declined to be interviewed or sent statements reiterating their commitment to reducing sodium levels in their foods, in line with government dietary recommendations.

But the powerful U.S. National Restaurant Association is questioning the accepted wisdom. "The science is very clear in showing that reducing sodium reduces blood pressure. There's no question about that. The controversy is around reducing cardiovascular disease and ... basically the risk of death. That's where the evidence is completely weak," says Joy Dubost, the NRA's Director of Nutrition and Healthy Living. In other words, cutting back on salt does reduce blood pressure, but it may not reduce the risk of dying early.

Michael Alderman, a blood pressure expert at Albert Einstein College of Medicine in the United States and editor of the American Journal of Hypertension, believes there's a sense that some scientists -- and most policymakers -- may have moved too early to target salt as the cause of the problem. "If we're doing something so dramatic to the diets of whole populations, there should be no argument. The evidence should be overwhelming, but it's not overwhelming at all," he said.

Of around a dozen scientists interviewed by Reuters for this story, about half shared this point of view; but since they included salt-reduction campaigners and salt industry representatives, that is not necessarily an indicator of the balance of opinions across the scientific community.

Alderman argues that in addition to changing blood pressure, cutting sodium can cause other physiological changes such as increased resistance to insulin -- which can set the stage for diabetes and increase the risk of death from heart disease. Too little sodium can also increase sympathetic nerve activity which raises the risk of heart attacks, and boost the secretion of aldosterone, a hormone produced by the adrenal gland that is bad for the cardiovascular system.

"What we have -- like almost all interventions in health and medicine -- is something that produces a multitude of different effects," said Alderman, who disclosed having taken one $750 payment more than a decade ago

from the Salt Institute, but who said he has since had no financial help from the industry. Besides Alderman and Heagerty, none of the other academic scientists interviewed for this article have disclosed financial interests.

In a letter to the British government seen by Reuters, the UK's Salt Association -- which along with the Salt Institute has a vested interest in defending the salt industry -- cites the Cochrane and JAMA papers and demands an urgent review of the salt reduction strategy. It goes as far as to say: "People may actually be dying as a result of poorly founded advice."

IS SALT THE NEW TOBACCO?

That kind of talk exasperates the Wolfson Institute's MacGregor, one of the most vocal advocates of salt reduction anywhere. Along with Franco Cappuccio, head of the WHO's collaborating center for nutrition at Warwick University and Simon Capewell, a professor of clinical epidemiology at Liverpool University, McGregor argues that salt -- most of it hidden in processed and packaged foods -- is a huge problem.

It's perhaps an indication of his conviction that MacGregor equates the argument about salt to past rows over tobacco, even though unlike tobacco, salt is a fundamental nutritional requirement for humans to survive.

"We're in exactly the same position as we were with tobacco 20 or 30 years ago when people were still arguing about whether tobacco caused lung cancer or heart disease," MacGregor says. "It obviously did, there was no doubt about it -- and the only people arguing were people who had commercial interest."

WASH and its UK counterpart CASH (Consensus Action on Salt and Health), which is also chaired by MacGregor, are funded by donations from individuals and charities.

Cappuccio and Capewell point to scores of scientific analyses to make their point. A 2007 study predicted that reducing salt intake around the world by 15 percent could prevent almost 9 million deaths by 2015. Another study published in March 2010 found that cutting salt intake by 10 percent in the United States could prevent hundreds of thousands of heart attacks and strokes over decades and save the government $32 billion in healthcare costs.

In a recent British Medical Journal commentary, Capewell and Cappuccio cautioned: "Denial and procrastination will be costly in terms of both avoidable illness and expenses."

When confronted with the two most recent scientific studies suggesting the contrary, MacGregor dismissed them as flawed or paradoxical. "There is absolutely no evidence of any harm from reducing salt intake. Absolutely none," he said.

In the case of the Cochrane review, MacGregor set about re-crunching the numbers and swiftly published a fresh analysis of the data in a rival medical journal, The Lancet, which drew the opposite conclusion.

Taylor responded by saying MacGregor had taken two of the sets of data in the study -- one from people with normal blood pressure and one from people with hypertension - and grouped them together. This, he said, is like comparing apples and oranges, and breaks a central tenet of statistical analysis.

Manchester University's Tony Heagerty has a wry observation of this to-and-fro: "If you torture data long enough it will give you the answer you want."

ONE BIG EXPERIMENT

Much of the argument barely touches on the data -- descending instead into personal attacks and accusations of conflicts of interest. Scientists on both sides talk of being taunted by their rivals. Both Cappuccio, who advocates less salt, and Staessen, the hypertension expert who has found risks in salt reduction, say they have been victimized or intimidated after publishing papers in scientific journals.

Salt-reduction advocate MacGregor points at one of his main opponents across the Atlantic, Morton Satin, director of science and research at the U.S.-based Salt Institute, who says reducing salt across whole populations may do more harm than good. "Imagine he's wrong," MacGregor said. "That would mean he's responsible for millions of strokes worldwide. When he goes to sleep tonight, he might like to think about that."

Satin hits back that the whole situation has left science behind. "Passions overtake an objective view of science... and we can have an entire society being led to believe something that doesn't stack up."

There is one thing the two sides appear to agree on: the matter could be settled by a large-scale -- 20,000 to 30,000 people -- randomized clinical trial with half allocated to a high and half to a low salt diet. To be done properly, the main protagonists agree, such a trial would need to run for several years. The huge numbers are needed so that all other possible factors -- weight, age, fitness, quality of diet, and medical conditions -- are roughly equal in both groups.

But salt-reduction advocates MacGregor and Cappuccio say such a trial would be prohibitively expensive, unnecessary, and may even be unethical. Again they draw comparisons with smoking. Since, in their view, the harms of salt are indisputable, asking people to be kept on a high salt diet for the purposes of a medical experiment would be equivalent to forcing people to smoke.

Alderman is enraged by such suggestions. "Any medical ethicist would say that before you impose changes you have to make sure they are safe and beneficial. If the science is uncertain, then how can it be unethical to do the right studies to answer the scientific questions? If you're asking 300 million Americans and I don't know how many millions of other people around the world to change their diet so dramatically, you ought to have overwhelming evidence that it's a good idea and it's safe."

Until the row is settled, people's salt intake will probably be guided by personal taste.

(Edited by Simon Robinson, Michael Williams and Sara Ledwith)