

Salt Raises Chimps' Blood Pressure

Four thousand five hundred years ago, the Yellow Emperor of China noted in the *Nei Ching*, an ancient book of medicine, that "if too much salt is used for food, the pulse hardens." That hardened pulse signals high blood pressure.

Researchers today still debate how large a role—if any—salt plays in the epidemic of high blood pressure in Western societies. Some rank salt intake high among determinants of hypertension, while others maintain that factors such as smoking and the stresses of modern society have much greater significance.

Now, research by an international team of investigators goes far in teasing out salt's role from the morass of factors contributing to hypertension. By studying the effects of salt in chimpanzees, the team shows that dietary salt alone can significantly raise the animals' blood pressure.

"The real importance of this experiment in this species, which is closest to humans, is in relation to the basic principles for diet for infants, children, and young adults," says lead investigator Derek Denton of the Howard Florey Institute of Experimental Physiology and Medicine at the University of Melbourne in Australia. "It probably is a good idea to reduce the sodium intake and increase the potassium to make our diet closer to that we evolved with."

Epidemiological evidence to support Denton's advice has existed for years. Preliterate peoples such as the Kalahari Bushmen live on largely vegetarian diets, consuming about half a gram of salt per day compared to the 10 grams a day of the average person in the United States. And the Bushmen's diet is high in potassium. Unlike people in developed countries, Bushmen see no increase in hypertension with age, and the disease itself is virtually unknown.

When the Bushmen move into cities and begin eating a more Western diet, however, their rates of hypertension rise. But such observations fail to prove that salt causes hypertension. As well as changing their diets, urbanized Bushmen may start smoking, drinking alcohol, and eating more fat. Changes in social dynamics may cause stress, which can increase blood pressure.

"It is very difficult in human epidemiological studies to get clear relations between salt and high blood pressure," says Denton. But the chimpanzee study "was a one-variable experiment."

Denton's team studied an established colony of 26 chimpanzees in Gabon, as they report in the October *NATURE MEDICINE*. The researchers separated the ani-

mals into two groups of 13, giving them identical diets of fruits and vegetables. The researchers supplemented the animals' diets with a liquid infant formula that provided calcium—previous studies have indicated that low calcium may lead to hypertension—and, for one group, an amount of sodium that increased over 22 weeks to 15 grams per day.

The researchers measured the animals' blood pressure in millimeters of mercury (mmHg) as a ratio of systolic pressure (when the heart pumps blood) over diastolic pressure (when the heart rests between beats). Normal adult human blood pressure is around 120/80. After 20 months on the high-salt diet, blood pressure in seven chimps rose by an average of 33 mmHg systolic and 10 mmHg diastolic. Three chimps showed no increase, while three others failed to

drink all of their sodium-laced formula. The control group experienced no rise in blood pressure. Moreover, 6 months after the researchers weaned the animals off sodium, their blood pressures returned to normal.

Alan R. Dyer of Northwestern University Medical School in Chicago, who wrote a commentary in the same issue, told *SCIENCE NEWS* that "the paper is quite convincing about the effect sodium can have in an animal model that is close to man." He notes that "most of the animals can be described as salt-sensitive."

Denton agrees that the data indicate salt sensitivity in most of his animals, but he observes that some develop no problems with the added salt. He suggests that genetic testing may one day identify which humans are susceptible, but until then he advises everyone to lower their salt intake. —L. Seachrist

OTA dies, but its analyses will live on

The Librarian of Congress got \$350 million and all I got was this lousy T-shirt.

That mordant slogan, worn by many long-time staffers last week, characterized their reaction to the closing of the congressional Office of Technology Assessment Sept. 30. With the end of the federal fiscal year, all but 17 of OTA's employees lost their jobs. And those 17, who are archiving the agency's files, inventorying furniture, closing out contracts, and emptying computer files, will themselves be out of a job come Jan. 31.

Over OTA's 23-year history, staff analysts have issued some 750 reports in response to requests from congressional committees. These ran the gamut from investigations into unconventional cancer therapies, the reliability of polygraph tests, and telecommunications opportunities for American Indians, to ways of reducing urban ozone, designing less-polluting products, and simulating combat. All of the analyses focused on issues with a considerable scientific or technical component. Moreover, they often laid the groundwork for legislation.

But last December, Senate Republicans backed a congressional reform plan drafted by Pete Domenici (R-N.M.) and Connie Mack (R-Fla.) that included a recommendation to abolish OTA. This year, Republican leaders in the House and Senate convened hearings on the matter. And though few criticized OTA's work, several invited witnesses argued that the office's investigatory activities duplicated those of other agencies—such as the Congressional Research Service (CRS)—



Since August, a strangled eagle parody (left) of OTA's logo (right) has emerged on T-shirts—even on the cover of OTA's farewell party program.

or was simply a luxury in this era of extremely tight budgets.

Abolishing OTA promises no great savings, however. Its \$23 million annual budget equals just half a percent of the cost of weapons not requested by the Department of Defense but nonetheless added to DOD's fiscal 1996 appropriation by the House National Security Committee.

Indeed, OTA's size made it especially vulnerable, says Rep. Amo Houghton (R-N.Y.), who was slated to become chairman of the agency's bipartisan board this coming year. "You don't cut the big bully down to size because he's too big to handle. But the little guy, who may even be the next genius, you can pummel the dickens out of him. And that's what happened to OTA," he says.

Roger Herdman, the agency's last director, points to OTA's low visibility as an additional factor. Unlike the CRS, which will look up information for any member of Congress, OTA worked only for committees. As a result, Herdman says, most of the large group of incoming