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Week of Sept. 16, 2006; Vol. 170, No. 12

Sea Turtles What Not To Eat

Janet Raloff

At dozens of beaches around the world, huge female sea turtles come back each year at about the same time. They slowly haul themselves out of the water near the places they themselves hatched, dig shallow holes in the sand, and lay clutches of eggs. The predictability of the turtles' return has made capture of the endangered reptiles and their eggs a reliable bonanza for poachers.



TURTLE DUMP. This beach site in the Bahia Magdalena region of Baja California in Mexico is known locally as a turtle graveyard. In fact, it's where locals deposit shells of any black sea turtles subspecies of green turtles they've eaten. People discard the shells to avoid being caught with evidence that they poached these endangered animals.

W. J. Nichols/Calif. Acad. of Sciences

Prized for their taste, putative therapeutic value, and cultural significance, the many species of sea turtles are heavily exploited for human consumption, especially in developing countries. Such consumption is high despite international laws that have been enacted to protect the animals. "Our guesstimates on how many turtles are eaten globally [each year] vary between 100,000 and 250,000," notes A. Alonso Aguirre, a wildlife epidemiologist at Columbia University and a member of the nonprofit Wildlife Trust. He adds that some 1 million people at least periodically ingest sea turtle meat, organs, blood, or eggs.

The harvesting of sea turtles continues despite scientific reports showing that populations of the marine species are plummeting.



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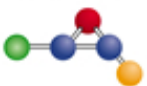
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To date, conservation-pegged attempts to halt sea turtle consumption have largely failed. Therefore, some scientists are now appealing to people's self-interests. A new report points out myriad dangers from bacteria and parasites to toxic pollutants that have been found in sea turtles' tissues. Such contaminants appear to explain illnesses that in recent years have been linked to sea turtle consumption.

Turtles get sick too

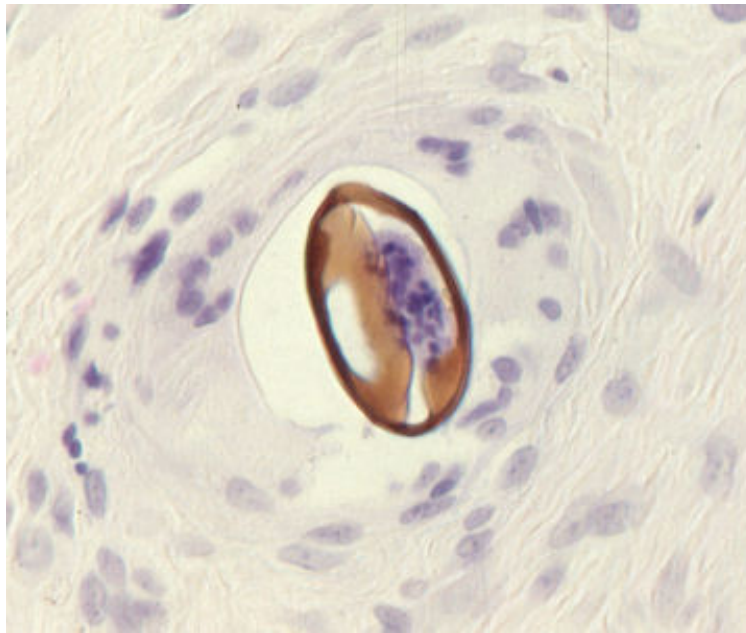
Many of the same germs that make people ill also harm wildlife. For instance, flocks of chickens and other bird species harbor and can spread flu viruses to people, including the dangerous one that recently emerged in Asia.

This ability to spread diseases to other species also applies to turtles, notes Aguirre. In the September *EcoHealth*, he and his colleagues review a host of infections that not only affect sea turtles, but also can pose threats to the people eating them.

Among the infectious agents:

- ***Salmonella*** bacteria, which are capable of causing headaches, nausea, vomiting, cramps, and diarrhea. At least one major outbreak of ***Salmonella chester*** sickened some 36 members of an aboriginal community in Australia's Northern Territory. A 1999 study found that more than 60 percent of surveyed victims said that they had eaten partially cooked, green sea turtle meat the day before they became ill. ***Salmonella*** bacteria were also found in 8 of 9 fecal samples that had been collected from some of these individuals.
- ***Mycobacteria***, including the species that causes tuberculosis in people and other animals. One unidentified species of these bacteria has been isolated from a loggerhead sea turtle that died after being stranded on an Italian beach. At least six sea turtle hatchlings captured around the northwestern Hawaiian Islands in the 1970s tested positive for tuberculosis. "Given these observations, the potential of acquiring a mycobacterial infection from a sea turtle by direct contact or consumption cannot be discounted," Aguirre's team says.
- ***Chlamydiaceae***, the same agents responsible for sexually transmitted chlamydia infections in people. When contracted through nonsexual contact, such as inhalation, the germs can cause pneumonialike diseases in mammals. Aguirre and other scientists have found antibodies to these germs in feces from sea turtles, indicating the animals' previous exposure to the bacteria. The likely source of the turtles' exposure is infected sea birds.
- ***Leptospires***, corkscrew-shaped bacteria. According to the Centers for Disease Control and Prevention, some people who become infected show no symptoms. Others develop high fever, severe headache, chills, muscle aches, and vomiting. Jaundice, red eyes, abdominal pain, diarrhea, and a rash may follow. Left untreated, leptospirosis can cause kidney damage, meningitis (inflammation of the membrane around the brain and spinal cord), liver failure, respiratory distress, or death. The new review notes that blood analyses and field observations indicate that sea turtles can serve as a reservoir for the germs responsible for these outcomes. Aguirre's own data from 2003 and 2004 showed that 80 percent of a sample of green sea turtles in Baja California exhibited "high antibody [concentrations] against 8 of 10 [types] of ***Leptospira interrogans***."
- **Parasites**, including ***Entamoeba invadens***, ***Cryptosporidium parvum***, and trematodes. Spirorchid trematodes, small flatworms, are a common parasite in sea turtles, especially those with disfiguring tumors known as fibropapillomas (see [Sea Sickness](#)). Although trematodes live mostly in heart tissue, their eggs move through the blood to the liver and have been found in the fibropapillomas. Recently, spirorchid trematodes have also shown up in human feces of Australian aboriginal children whose

culture values sea turtle meat.



WORMING IN. This is the egg of a spirorchid trematode, a little flatworm that settles into the hearts of hosts including sea turtles. The eggs, found in animals' feces, blood, and livers, can also infect people. To date, little is known about the effect of such infections on people.

Aguirre

Many people who have been stricken by a turtle-transmitted microbe may develop food poisoning but not realize the turtle connection. Sometimes, doctors or scientists reviewing cases of infection may suspect turtle meat but are unable to prove that it is the culprit because stool or blood samples from the sick person were not inspected and their microbes compared to those in local turtles. That was the case with Aguirre's mother, who 15 years ago developed gastrointestinal illness after eating sea turtle meat. "I think it was from *Salmonella*," he says, "but we weren't able to identify [the agent]."

Because babies and pregnant women are most likely to get sick from eating tainted turtle meat, many cultures try to limit consumption of turtle products which are often ceremonial foods served on sacred or festive days to adult men and women who aren't pregnant.

A June 2005 alert on *ProMED*, an online service to track emerging diseases, noted a 2001 poisoning outbreak in the Solomon Islands that reinforces the wisdom of such a policy, if sea turtle meat is to be eaten at all. In that incident, "6 people (all children between 3 months - 11 years old) out of the 28 [affected] people died within 5 days" after eating sea turtle meat. There was no doubt as to the source of the illnesses because people became sick 4 to 6 hours after eating meat from a sick turtle and no other protein. "Those who did not consume turtle meat did not experience the symptoms," the *ProMED* editors reported.

Poison reservoirs, not medicines

Aguirre's new report notes that because sea turtles can eat everything from mollusks to seaweed, sponges, and fish, they accumulate many of the pollutants present in their meals. These include potentially lethal toxins from harmful algal blooms generically known as red tides (see [Toxic Surfs](#)). In addition, turtle meat can carry dangerous doses of heavy metals, such as cadmium and mercury, and organochlorine pollutants, such as polychlorinated biphenyls (PCBs) and the pesticides chlordane, dieldrin, and DDT.



THE DOCTOR IS IN. Aguirre, a veterinarian by training, examines a green sea turtle (*Chelonia mydas*) on a beach in Hawaii. This animal, a juvenile male, exhibits signs of a fibropapilloma tumor, a disease that appears to render its victims especially vulnerable to trematode parasites.

T. Gellatt

Toxic breakdown products of DDT as high as 1,200 parts per billion (ppb) have been found in sea turtles in the Atlantic off the United States. Mediterranean sea turtles have been shown to have concentrations of those toxic chemicals exceeding 700 ppb. The World Health Organization and the European Union have set allowable concentrations of DDT and its breakdown products in food no higher than 50 ppb.

Ironically, Aguirre notes, sea turtle products have been prescribed over the centuries as curatives. He knows first hand. "My grandfather used to give us raw [sea turtle] blood with lime for asthma and respiratory problems," he says, adding that he would have to drink "half a glass" at a time despite its bad "metallic" flavor.

In many Latin American cultures, sea turtle eggs are considered an aphrodisiac. Not only are there no data to support such a claim, says Aguirre, but the eggs can have high concentrations of pollutants that might actually impair fertility.

One provocative turtle-conservation campaign launched in Mexico last year acknowledged the Viagrallike reputation of sea turtle eggs. Aguirre says it featured a Latin American model in a bikini saying that her boyfriend didn't need sea turtle eggs to make her happy.

That's one approach to getting attention. It's not, however, one that Aguirre and his colleagues favor. They're teaming up with two Mexican television stations to produce public service announcements focusing on health risks associated with turtle meat. In addition, Aguirre says, "we'll have training workshops for local [public health] agencies" and help them develop posters and brochures illustrating the types of parasites and other health concerns associated with eating sea turtles.

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A. Alonso Aguirre
Wildlife Trust
Columbia University
460 W. 34th Street, 17th Floor
New York, NY 10001

Brian Hutchinson
IUCN-Marine Turtle Specialist Group
State of the World's Sea Turtles Program
Web site: <http://www.seaturtlestatus.org/>

International Sea Turtle Specialist
U.S. Fish and Wildlife Service
University of West Georgia
Department of Biology
Carrollton, GA 30118-6300

Marine Turtle Newsletter

1 Southampton Place
Durham, NC 27705, USA
Web site: <http://www.seaturtle.org/mtn/>

Marine Turtles
Office of Protected Resources (F/PR)
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910
Web site: <http://www.nmfs.noaa.gov/pr/species/turtles/>

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2300 Southern Boulevard
New York, NY 10460
Web site: <http://www.wcs.org/>

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