

Is sunny-side-up a salmonellosis haven?

Anyone who has taken home economics knows that damaged goods are suspect, that a cracked shell means potential food poisoning from the *Salmonella* bacteria commonly found in chickens. But consumers assume that using inspected eggs will help protect against the gastrointestinal distress of salmonellosis. Now a new report lays another worry on the public — by scratching from the menu sunny-side-up eggs and those juicy over-easies, even if the egg's shell was intact. Also out are the tremulous three-minute egg, the delicate Caesar salad dressing and the raw-egg-in-beer of lumbermen and boxers. Scientists from the Centers for Disease Control (CDC) in Atlanta said last week that they have found *S. enteritidis* inside uncracked, cleaned and inspected grade A eggs, and that thorough cooking may be necessary to eliminate risk of food poisoning in affected areas of the United States. Adequate cooking means boiling for seven minutes, poaching for five minutes or frying on each side for three minutes, say the scientists.

Alerted by a six-fold increase in reported *S. enteritidis* infections in the northeastern United States from 1976 to 1986, CDC scientists began looking for sources of infection. From January 1985 to May 1987, say the scientists, there were 65 foodborne outbreaks caused by a specific strain of *S. enteritidis* involving 2,119 cases and 11 deaths. In the April 8 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, the researchers report that grade A eggs or egg-containing products caused 77 percent of the 35 outbreaks for which a specific food source could be identified. The new study is the first to suggest that *S. enteritidis* may be passed from a hen's ovaries to her egg during the egg's development, rather than later transfer through cracks, say the authors. This transovarian explanation is "a very exciting hypothesis," says CDC's Robert V. Tauxe, adding that eventually chickens may have to be screened for the culprit bacterium and removed from egg production. He said in an interview that this strain of *S. enteritidis* may be more invasive than others and better able to enter the ovaries, or it may work its way through the egg's shell.

Tight buildings, more airborne disease

Residents of new buildings with modern, energy-saving heating and air conditioning systems get respiratory infections significantly more often than residents of older buildings, reports a team of doctors. In a four-year study of army trainees at four different training camps, the researchers found an incidence of respiratory diseases 45 percent greater among trainees housed in modern barracks than among those housed in barracks built in the 1940s and 1950s. They attribute the differences to modern heating and cooling systems, which recirculate about 95 percent of the air in the buildings to save energy. The older, less-energy-efficient buildings reused only 50 to 60 percent of the air in the building and mixed in outdoor air for the remainder.

While the researchers found increased risk of infection in new buildings, they say there are still too many unstudied factors to decide why this is so. The study, reported in the April 8 issue of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, is the first long-term study of building-associated respiratory disease to be made with such a large, uniform group: The trainees were randomly assigned to barracks, were immunized at the same time, and were outdoors and indoors in the same weather for identical time periods.

The authors note that respiratory infections in the United States account for 75 million doctor visits and \$15 billion in direct medical costs each year. During flu epidemics, indoor airborne infections may account for thousands of deaths and billions of dollars in social and health costs, they add.

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Methane, methane, where from art thou?

Concerned with rising global temperatures and the threat of a substantial "greenhouse" effect in the near future, scientists have watched carefully during the last decade as the atmospheric levels of methane grew each year by 1.5 percent. Because it efficiently traps energy from the earth, methane is an important player in the greenhouse scenario. But scientists are having trouble determining how much the different sources of methane contribute, which is the first step in understanding why this molecule, the chief component of natural gas, is accumulating in the atmosphere. Now, researchers from the Institute of Nuclear Science in Lower Hutt, New Zealand, report that they have cracked part of the methane source problem. About one-third of the methane in the atmosphere comes from so-called fossil sources, they announce in the April 7 NATURE.

Scientists believe that almost all methane comes from two types of biological sources: organisms that were alive a long time ago, and those alive today or recently dead. Fossil methane, formed millions of years ago from decaying plants and animals, is found in pockets of porous rock deep within the earth. When brought to the surface, most fossil methane is burned as a fuel and never enters the atmosphere. However, some escapes into the air during mining operations and natural-gas production. Sources of modern methane are wetlands, burning vegetation and the bowels of ruminants.

In the 1950s, researchers measured methane (CH₄) for the ratio of two isotopes of carbon: C-12 and the radioactive form, C-14. Fossil methane contains little C-14 because this isotope decays away in thousands of years. The 1950s analysis showed that 10 to 15 percent of the methane in the atmosphere then came from fossil sources. However, above-ground tests of nuclear weapons in the late 1950s littered the atmosphere with extra C-14, and scientists have only now been able to resume these types of analysis in conjunction with studies of C-13.

The New Zealand analysis is by no means a final solution to the problem. Indeed, other atmospheric chemists currently working on similar budgets for the sources of methane are coming up with preliminary figures in the realm of 15 percent to 20 percent for the fossil contribution. According to Ralph Cicerone of the National Center for Atmospheric Research in Boulder, Colo., the New Zealand work "is not perfect, but it's a real step forward." The percentage of fossil methane in the atmosphere has grown, he says, because of increased mining operations and use of natural gas.

Nailing down an ancient eruption

Atlantis' slide into the sea may have been a myth, but archaeologists long have suspected that the fable sprang from an ancient volcanic eruption on the Aegean island of Thera. One of the strongest in recorded history, this blast blew away most of the island, leaving only a crescent of the volcano's rim standing above the ocean. The eruption heralded a new phase in the bronze-age civilization of the Aegean, and archaeologists have traditionally dated the blast between 1550 BC and 1500 BC. But scientists using a 7,000-year-old sequence of tree rings are confirming evidence that suggests a date of 1628 to 1626 BC.

Researchers from Queen's University in Belfast, Ireland, report in the March 24 NATURE that oaks living in the bogs of Ireland set down narrow growth rings for the decade following 1628 BC. They reason that the Thera eruption created a global-cooling cloud of volcanic dust that affected tree growth.

This date supports previous work on a tree ring sequence from bristlecone pines in California, which indicated the same date. Dendrochronologists construct tree ring histories by using many trees whose lifespans overlap. Last year, Danish geologists dated the blast to 1645 BC ±20 years by looking for signs of the volcanic dust in the Greenland ice sheet.

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