

# Carbohydrate shows promise against food poisoning

By Steve Lundeberg  
Oregon State University

CORVALLIS – Chitosan, a natural carbohydrate derived from crustacean shells, is showing promise as a weapon against a bacterium that annually sickens more than a million people in the United States.

After salmonella poisoning, the second-most common bacterial foodborne illness in the U.S. is *Clostridium perfringens* food poisoning.

Present in soil, decaying vegetation and the intestinal tracts of vertebrates, *C. perfringens* typically infects humans when they eat meat that hasn't been thoroughly cooked or properly stored, allowing the bacteria to multiply.

Symptoms of *C. perfringens* food poisoning include abdominal pain, stomach cramps, diarrhea and nausea; patients often mistake it for a 24-hour flu.

"People aren't dying, but they're getting sick," said Oregon State University researcher Mahfuzur Sarker. "And many times people don't report it, so there are likely way more people

getting infected than we know about."

Sarker and OSU graduate student Maryam Alnoman were part of an international collaboration that studied the effect of chitosan on *C. perfringens*. Chitosan is a linear polysaccharide that results from treating the exoskeletons of shrimp and other crustaceans with an alkaline compound.

The tests involved both laboratory growth medium – bacteria in solution – and cooked, contaminated chicken meat left for several hours at 98.6 degrees Fahrenheit. The study looked at the full life cycle of the *C. perfringens* bacterium, which produces tough, metabolically dormant spores that are able to survive many food processing approaches.

Results were recently published in *Food Microbiology*.

The researchers found chitosan blocked *C. perfringens* growth in cooked chicken and also found chitosan inhibits:

- Spore germination and outgrowth;
- The spore core from releasing dipicolinic acid, which is associated with an early step of spore

germination;

• The growth of vegetative cells – cells that are actively growing as opposed to producing spores.

"In lab conditions, low concentrations of chitosan were effective," said Sarker, professor of microbiology in OSU's colleges of science and veterinary medicine. "In meat, the concentration needs to be higher because there are a lot of ingredients in the cooked meat that can inhibit the activity of the antimicrobial chemicals.

"But the larger dose of 3 milligrams per gram of food is still a good dose that can be used in making food products. This is the first time chitosan was shown to work consistently both in lab conditions and in chicken meat."

Sarker said the next steps are researching chitosan's effectiveness in other types of meat and meat products

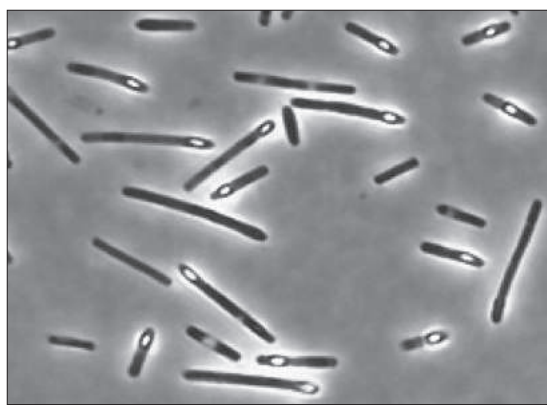


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*Clostridium perfringens* cells.

and optimizing the conditions for using it. It's possible, for example, that chitosan may work best when combined with other food preservative chemicals such as sorbate and benzoate.

"It could be a combination of multiple agents," he said. "There are options we can try."

The OSU researchers collaborated with scientists at Taibah University in Saudi Arabia and Kasetsart University in Thailand.

Oregon State's Agricultural Research Foundation supported the study. Funding also came from the U.S. Army Research Office.

# Legislature tackles health bills

By Kristena Hansen  
Associated Press

PORTLAND (AP) — Lawmakers in Salem have a packed schedule ahead from now through April 18, the deadline for all proposals to advance out of their initial policy committee. What that means is, save for some exceptions, the window for introducing new bills this year is pretty much closed and Senate and House committees that handle education, health care and other policy-related topics have scant time to advance any bills still awaiting their first vote.

The House Health Care Committee has roughly 50 bills up for vote on its meeting agendas next week, including House Bill 3391, sometimes called the Planned Parenthood bill that'd require Oregon health plans, with the exception of religious-based plans, to fully cover

See **HEALTH BILLS** on page 24

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