

Prebiotics -- the key to fewer food poisoning stomach upsets -- and healthy farm animals

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Natural sugars found in breast milk that are now included in prebiotic foods may help in the fight against Salmonella and other food poisoning bacteria, scientists heard today at the Society for General Microbiology's 162nd meeting being held this week at the Edinburgh International Conference Centre.

The sugars, or oligosaccharides, are called galacto-oligosaccharides and are already known to improve the health of breast-fed infants. They may also reduce the chances of Salmonella bacteria damaging the gut during a food poisoning episode, reducing the overall damage and severity of the infection.

“Salmonella Typhimurium is a disease-causing bacterium capable of infecting a wide range of animals including humans. It is responsible for outbreaks of serious illness every year,” says Laura Searle of the Department of Food and Environmental Safety at the Veterinary Laboratories Agency in Weybridge, Surrey, UK. “We are particularly concerned about it as we can trace people being infected through direct contact with animals or through the food chain.”

Symptoms of Salmonella food poisoning in people include diarrhoea, nausea, vomiting, stomach cramps, fever and headaches and in rare cases the disease can attack the whole system and can be fatal.

“Antibiotics are used to treat particularly severe Salmonella infections,” says Laura Searle. “But their effectiveness has been undermined by their

systematic use both as growth promoters in animals and as therapeutic agents, which has been implicated in widespread antibiotic resistance. In an attempt to overcome this problem the European Union banned the use of antibiotics as growth promoters in 2006, so now alternatives are urgently being investigated.”

One possibility is to use prebiotics made from natural complex sugars that are already known to improve gastrointestinal health. There have been many theories put forward about the way they actually work, including the suggestion that they may stimulate our natural gut bacteria to multiply, allowing them to fight off invading pathogens trying to colonise our guts.

The Veterinary Laboratories Agency has initiated a project to demonstrate the exact mechanism for the apparent success of a novel galacto-oligosaccharide mixture. Their studies have now shown that the specific galacto-oligosaccharide mixture protects animals from infection by reducing the invasion capabilities of Salmonella, and cutting the seriousness of the disease symptoms. After treatment with this mixture, fewer Salmonella bacteria were found in systemic and intestinal tissues.

“The next step will be to see if the novel galacto-oligosaccharide mixture can be used in farm livestock successfully, and whether it is still as effective when given before a Salmonella infection, protecting the animals in advance. We also need to see if it can protect against other pathogens,” says Laura Searle.

The novel galacto-oligosaccharide prebiotic mixture used in the tests is already available for people as a commercial preparation. It is claimed to aid healthy people who eat it as part of their daily diet, and also to help people suffering from irritable bowel disease, stomach upsets and diarrhoea.

The veterinary scientists hope that their tests will prove whether it is actually successful in farm animals, reducing gastrointestinal infections, improving animal health and cutting economic losses. The scientists need to now discover the exact mechanisms by which the sugars work.

Source: Society for General Microbiology

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