

Milk may help bacteria survive against low levels of antibiotics

September 8 2008

Milk may help prevent potentially dangerous bacteria like *Staphylococcus* from being killed by antibiotics used to treat animals, scientists heard today at the Society for General Microbiology's Autumn meeting being held this week at Trinity College, Dublin.

Bacteria sometimes form structures called biofilms that protect them against antibiotics and the body's natural defences. Now scientists have discovered that one of the most important micro-organisms that causes mastitis in cows and sheep, called *Staphylococcus*, can evade the animal's defences and veterinary medicines by forming these protective biofilms. Mastitis is an infection of the udder in cattle and sheep. It is often a painful condition for the cows and can even cause death.

"Mastitis is a difficult disease to control. It causes risks for public health if people drink infected milk and is expensive for farmers as it usually causes severe milk production losses, increased treatment costs and means the animals may have to be culled," said Dr Manuela Oliveira from the Faculty of Veterinary Medicine at the Technical University of Lisbon, Portugal. "When the staphylococci produce a biofilm, the structure protects them against host defences and antibiotic treatment, allowing the bacteria to persist in the udder."

In the past, scientists studying mastitis have conducted most of their experiments under laboratory conditions rather than mimicking the conditions found in living animals. This may mean that they have missed important contributory factors. However, Dr Oliveira and her colleagues

have used realistic conditions to overcome this problem.

"We have discovered that milk may also protect bacteria against low concentrations of antibiotics – in the presence of milk, three of the five antibiotics tested, penicillin, gentamicin and sulphamethoxazole combined with trimethoprim, were less effective against *Staphylococcus* when compared with the same experiment performed in the absence of milk," said Dr Oliveira.

The Lisbon team is currently trying to identify the correct antibiotic concentrations needed to stop biofilms forming in the first place and also the concentrations needed to destroy a biofilm that has already formed. The scientists are also looking at the influence of the forces acting inside an udder during milking to see whether these help or hinder the bacteria in producing biofilms.

"This will allow for a better control of staphylococcal mastitis, cut disease costs and give an important improvement in the protection of consumers' health," said Dr Manuela Oliveira. "If we can get the doses right, and the animals are cured quicker, we will have less antibiotic residue in the environment and the risk of bacteria such as *Staphylococcus aureus* developing and spreading antibiotic resistance is lower."

Source: Society for General Microbiology

Citation: Milk may help bacteria survive against low levels of antibiotics (2008, September 8) retrieved 23 April 2024 from <https://phys.org/news/2008-09-bacteria-survive-antibiotics.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is

provided for information purposes only.