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SOME RAW-MEAT SAMPLES CONTAIN ANTIBIOTIC-RESISTANT BUG: STUDY

Think twice before ordering that steak tartare

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SINGAPORE – The next time you prepare raw meat for a meal, consider this: It may harbour antibiotic-resistant bacteria that could potentially cause difficult-to-treat infections.

In a study published in the journal Annals by the Academy of Medicine, Singapore, last December, 15 out of 19 (almost 80 per cent) raw chilled and frozen samples of chicken meat obtained from various retail stores here tested positive for a type of bacteria known as extended-spectrum beta-lactamase-producing Enterobacteriaceae, or ESBL-E. They are known to be resistant to strong antibiotics, and infection rates among humans have risen globally.

While the findings do not mean that the chicken products are unsafe for consumption — none of the seven cooked samples obtained from fast-food restaurants and hawker centres tested positive for ESBL-E in the study —they raise fresh concerns on whether the use of antibiotics in farming is doing more harm than good.

Bacteria that has become resistant to antibiotics is a growing health concern worldwide, and the food supply chain is one part of the multi-faceted problem.

Singapore is developing a national action plan to tackle the problem of resistant bacteria. The Ministry of Health recently told The Straits Times it is working with the Agri-Food & Veterinary Authority (AVA), the National Environment Agency and the National University of Singapore (NUS) to develop a nationwide strategy that could include educating the public on which illnesses should or should not be treated with antibiotics, and stepping up the monitoring of their use.

REAL BUT MINUTE RISKS

About 90 per cent of the food available in Singapore is imported, and chicken is brought in from countries such as Malaysia, Brazil, France and the United States.

In livestock farming, antibiotics are routinely used to treat infections and limit the impact of bacterial outbreaks. Small amounts of antibiotics are also used in animal feed to help animals grow more quickly and put on more weight.

These practices are "not without accompanying minute but real risks", said Associate Professor Hsu Li Yang, one of the study authors and programme leader of the Antimicrobial Resistance Programme at the Saw Swee Hock School of Public Health.

Following the study on retail chicken meat, the researchers found a similar problem in pork and beef here, albeit to a lesser degree.

Six of 30 meat samples obtained in a follow-up study were found to harbour antibiotic-resistant bacteria. Methicillin-resistant Staphylococcus aureus (MRSA) — a superbug once found mainly in hospital settings — was found in a pork sample.

Resistant bacteria rarely cause infections in humans but may transfer their resistant genes to human bacteria that then have the potential to cause human diseases, said Assoc Prof Hsu, who estimated that the antibiotic-resistant bacteria causes around 7,000 to 8,000 infections a year in Singapore.

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> **Associate Professor Hsu Li Yang**
> ONE OF THE STUDY AUTHORS AND PROGRAMME LEADER OF THE ANTIMICROBIAL RESISTANCE PROGRAMME AT THE SAW SWEE HOCK SCHOOL OF PUBLIC HEALTH

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In the US, about one in five resistant infections are caused by germs from food and animals, according to the Centers for Disease Control and Prevention.

ESBL-E is considered a "serious threat" there, causing around 140,000 infections and 1,700 deaths per year.

"On a population level, we understand that such transfers do happen. In the long-run, as such bacteria become more ubiquitous, the risk of subsequent infections will naturally increase," he said.

Scientific data has indicated that antibiotic use in agriculture contributes to the emergence of resistant bacteria, said Dr Natasha Bagdasarian, consultant at the Division of Infectious Diseases at National University Hospital.

Multidrug-resistant organisms, which can cause infections ranging from urinary tract infections to the more serious bloodstream infections and sepsis, were once found mainly in hospital settings.

Most of the infected patients had typically spent a lot of time in hospitals and had received multiple courses of antibiotics, said Dr Bagdasarian.

"However, we now see patients without these risk factors coming into the hospital with these infections. This means that these infections are now being acquired in the community, and antibiotics used in agriculture may be an important driving force for these community-acquired multidrug-resistant infections," she said.

The experts stress that the risk of acquiring infections from meat with resistant bacteria is small. "There is a greater risk from crossing the road, for example.

"As seen from our small study and other studies, it is difficult to culture out the bacteria if the meat is cooked properly," said Assoc Prof Hsu.

Singapore also has strict food safety measures in place. The AVA regularly monitors and tests food products for the presence of drug residues such as antibiotics and hormones, chemical contaminants and microbial contaminants such as E Coli, Salmonella and campylobacter. Food products that do not adhere to the country's stringent food safety requirements will not be allowed for sale.

In addition, the AVA regulates the use of veterinary drugs in local farms.

Only approved antibiotics are to be used to treat disease and prevent infections in animals, but not for growth promotion in food-producing animals, a spokesperson said.

If antibiotics are used to treat animals, farmers are required to observe a certain time period (known as withdrawal period) before the animals or animal products can be slaughtered or sold.

This will ensure that the antibiotics are passed out of the animals' systems, and any residual antibiotics are trace levels below the maximum allowed residue levels.

AVA also works with local farmers on good animal husbandry practices.

'ANTIBIOTIC-FREE' MEAT?

Concerned consumers may consider purchasing meat produced without antibiotic growth-promoters, said Dr Bagdasarian.

However, livestock raised using antibiotic-free methods may still receive antibiotics as part of treatment for diseases, said Assoc Prof Hsu.

In the Singapore study, ESBL-E was found in more than half of the raw chicken meat samples (four out of seven) labelled "antibiotic-free" on its packaging. In conventionally raised chicken, the figure was over 90 per cent.

"As such bacteria are increasingly ubiquitous in the environment, it is possible for some animals to acquire them without ever receiving antibiotics, much like how some patients who have not received antibiotics can still come down with infections caused by drug-resistant bacteria," said Assoc Prof Hsu.

Another possible reason is that contamination might have occurred at some point between farm and retail outlets, where the meat samples were obtained for the study, he added.

7,000

TO 8,000 INFECTIONS A YEAR IN SINGAPORE ARE CAUSED BY ANTIBIOTIC-RESISTANT BACTERIA