

A new pandemic could ride in on animals we eat, study warns

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Chris Balazs, farmer and CEO of Provenir (left), and RMIT's Professor Rajaraman Eri on an Australian farm with cattle. Credit: Ant Bragaglia, RMIT University

Researchers warn the animals we eat could be the gateway to a pandemic

in the form of antimicrobial resistance, unleashing a wave of deadly superbugs.

The World Health Organization estimates that drug-resistant diseases could cause up to 10 million deaths each year by 2050.

The researchers analyzed this [public health](#) and food security challenge in the food animal industry in Southeast Asia for the [*International Journal of Food Science and Technology*](#).

This challenge is relevant to Australia, which has strong political, economic and social ties with countries in the region. Australia marked 50 years of engagement with the Association of Southeast Asian Nations (ASEAN) at a special summit in Melbourne earlier this year.

Bioscientist Professor Rajaraman Eri and microbiologist Dr. Charmaine Lloyd from RMIT University in Australia and [public policy](#) expert Dr. Pushpanathan Sundram from Thailand co-wrote the journal article.

"There is a big pandemic waiting to happen in the form of [antimicrobial resistance](#)," said Eri, who is the Associate Dean of Biosciences and Food Technology at RMIT and also a veterinarian.

"We're going to face a situation in the world where will run out of antibiotics. That means we will not be able to treat infections."

Asia is a hotspot of antimicrobial resistance in animals, with Southeast Asia being an epicenter, the team says. There are more than 2.9 billion chickens, 258 million ducks, 7 million cattle, 15.4 million buffaloes, 77.5 million pigs, 13.7 million sheep and 30.6 million goats in the region, according to the Food and Agriculture Organization.

"Livestock farming, mainly for smallholders, provides employment and

side income, improves household dietary components and nutritional security, and provides food and economic well-being for their respective nations," said Sundram, who contributed to the research while he was at Chiang Mai University in Thailand.

The research paper highlights Southeast Asia's challenges associated with antimicrobial resistance and [residue](#) in animals, and points out the need to differentiate the two concepts.

Resistance occurs when microorganisms develop resistance to antimicrobial agents to which they are exposed.

"On the farm, the presence of antibiotics in food, soil, water run-off and animal waste can contribute to this resistance developing," said Lloyd, from RMIT's School of Science. "The overuse and misuse of antimicrobial drugs, especially for growth promotion in healthy animals, have resulted in the increased rate of resistance.

"Since resistant bacteria in animals may be transferred to humans through the [food chain](#) or by direct contact, this transmission pathway highlights the connection between human and [animal health](#), emphasizing the need to address antimicrobial resistance in food animals."

Food animals' residues are remnants of drugs, pesticides and other chemical substances that persist in animal tissues or products after administration or exposure to these substances.

"Veterinary drug residues commonly arise from overusing and improper use of antimicrobial agents, growth promoters and other veterinary drugs in animal husbandry practices," Eri said.

"Efforts in the region to regulate antimicrobial use are underway, but

there's growing concern over consuming products with antimicrobial residues, which can impact [human health](#) due to the presence of antibiotic-resistant microbiota and pathogens in hosts," Sundram said.

"In Australia, we have excellent policies to take care of antimicrobial resistance, specifically, the usage of antibiotics is well regulated," Eri said.

"But that's not the case at the global level. In many countries, anybody can buy antibiotics, whether it be for human or animal use."

The team has six recommendations for policymakers in ASEAN countries to address antimicrobial resistance and residue in food animals:

1. Recognize the difference between residue and resistance, to tackle the resistance challenges with the right interventions in Southeast Asia's food animals.
2. Collaborate regionally and develop tailored strategies to navigate disease outbreaks, environmental concerns, residue levels and antimicrobial resistance.
3. Implement country-specific awareness campaigns, robust surveillance of residues and resistance, appropriate regulations and responsible antimicrobial use, to reduce resistance risks.
4. Foster international cooperation and initiatives to address resistance comprehensively, ensuring a united front against both residue and resistance.
5. Strengthen public health systems and preparedness.
6. Promote innovation and research in alternative antimicrobial solutions, sustainable farming practices and advanced diagnostics, to stay ahead of evolving challenges.

More information: Addressing residue and resistance in food animals: a policy imperative in Southeast Asia. *International Journal of Food*

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