Australia’s biosecurity procedures and preparedness

There is sometimes concern expressed in Australia and other countries that we do not specifically test imported food for the presence of antimicrobial resistant (AMR) bacteria. How significant is this threat and how do the biosecurity measures taken by Australia address these?

Australia operates a biosecurity regimen that is risk and science-based. Australia is one of only a few countries that has a legislated and clearly articulated Appropriate Level of Protection (ALOP) achieved through managing the risk posed by imported goods to an acceptable level. These actions include prudent sourcing, certification and testing of food products to manage the biosecurity and food safety risk.

The challenge with imported food is determining if there is a demonstrable risk. We know that AMR is a global problem, one that is estimated to threaten 10 million lives a year and a cumulative US$100 trillion of economic output by 2050 due to drug-resistant infections. What we don’t know is the relative contributions of factors such as inappropriate dispensing of antibiotics to the human population, resistant infections acquired through travel or hospital stays, use of antibiotics in agriculture, environmental exposure through contaminated water and soils, and consumption or preparation of foods carrying AMR bacteria.

For foods to pose an AMR risk multiple factors are likely to be in play including:

- The food animals or plants are treated with or exposed to an antibiotic,
- The antibiotic is of significance to human health,
- Bacteria in or on the food animal or plant need to have resistance to that antibiotic,
- The bacteria need to survive the various stages of food processing to the extent that they are able to transmit their resistance capability to bacteria in a human host,
- The bacterium must be able to cause disease in humans, or transfer its resistance to bacteria that can cause disease in humans, and
- The disease requires treatment with antimicrobials for which the bacterium is resistant, leading to treatment failure.

In practice these criteria are rarely always met and so the contribution of food, whether imported or of domestic origin, to human AMR is not yet quantifiable and could be quite minor.

Antibiotics are used to treat and prevent disease in livestock because it is generally recognised that sick animals pose a food safety risk to humans and that livestock should be afforded good health on ethical and animal welfare grounds. Access to antibiotics for veterinary therapeutic use in Australia is controlled.

In Australia and many other countries, most food is produced without the use of antibiotics, there is some minor use in horticulture and use in livestock agriculture is largely confined to intensive rearing systems. While some livestock are provided with antimicrobials for growth promotion purposes, generally these are antimicrobials that do not impact on human health but in some countries this is not always the case. In Australia antibiotics available for growth promotion are regulated through the registration process.

Probably the most effective measure to prevent transmission of AMR through food is good food hygiene. Any good food processing and preparation process should work to reduce the number of bacteria carried forward at each step and ideally be completed with a kill step of cooking the food to remove any residual bacterial contamination. In human medicine, infection prevention and control (IPC) is an essential element contributing to any AMR strategy. Likewise, breaking the chain of transmission through good agricultural practices and good food hygiene is equally important in the food production system. If bacteria in the gut, or on the hide, of an animal can be prevented from spilling onto the meat then the risk of AMR transmission is effectively minimised. Likewise, preventing transfer of bacteria on ready-to-eat horticultural products reduces the risk of AMR transmission. Good food hygiene not only prevents exposure to AMR carrying bacteria, it also prevents food poisoning and the demand for antimicrobials.

In 2009, Australian farms produced 93% of the total volume of food consumed in Australia. Over the past 20 years there has been a steady increase in the value of food imports averaging 4.8 per cent.
per year. Australia’s food imports are generally processed, high-value products. We live in a connected world and foods from around the world are readily available in Australia. Steps are taken at airports to prevent travellers bringing in foods that pose biosecurity (and food safety) risks, but nothing can be done to address the possibly greater risk posed by the travellers themselves who may be carrying AMR bacteria from environmental exposure, contaminated food, infection or medical treatment as part of their travel.

Australia’s biosecurity measures work to support our food safety objectives. We source from countries of compatible disease status and apply risk management measures (such as treatments and testing) to address potential risks. All imported food must meet biosecurity requirements before being allowed into the country and is subject to risk-based inspection at the border. To manage other biosecurity risks Australia does not import livestock and this has the side benefit of not introducing resistant bacteria through live animals into our national herd. Furthermore, chicken and pig meat imported into the country are either cooked, or further processed upon arrival, and fresh beef can only come from a few select countries.

As previously mentioned, Australia does not currently conduct AMR tests on foods at the border, just as domestic foods are not routinely tested for AMR. To conduct testing at the border in the absence of a demonstrable scientific risk and without similar testing of domestic foods would be inconsistent with our international obligations and place Australia in a vulnerable position with trading partners. Likewise, Australia would question or challenge any country that commenced testing our exported foods for AMR in the absence of a demonstrable scientific risk and an official control program.

We do not know how much of the AMR observed globally and within Australia can be attributed to food. This is acknowledged in Australia’s AMR strategy, which has identified a comprehensive literature review as a key first step. The likelihood is that food’s contribution is small, but it needs to be identified and possibly quantified so that measures can be devised to manage any unacceptable risk. The existing guidance provided by Codex Alimentarius is valuable and is currently being reviewed.

Global interest in the increasing threat of AMR has been conveyed by consumers to the food production and retail industry with a rising number of food outlets introducing antibiotic requirements on animals sourced by their suppliers. Australia is well placed to respond to this new demand given our strong controls over critical antibiotics, our largely extensive livestock agricultural production system, and our nimble and responsive industry and government assurance systems.

As AMR is an emerging threat we do not yet have all the answers, nor all the tools. It is thought that food may contribute relatively little to this threat, but our prudent national strategy recognises the gap in our knowledge and seeks to fill this through a comprehensive literature review. Meanwhile, Australia’s biosecurity system will continue to manage the risk, appropriately informed by research and experience with this rapidly developing global issue.

References

Biography
Mark Schipp was appointed Australian Chief Veterinary Officer in 2011. In 2012 he was elected to the OIE Council and in 2015 was elected Vice President of the OIE General Assembly. He is chair of Wildlife Health Australia management committee and chair of Animal Health Committee. Together with the Chief Medical Officer, Dr Schipp chairs the Australian Strategic and Technical Advisory Group on Antimicrobial Resistance. Previously Dr Schipp has held positions responsible for animal derived food product inspection, market access and export certification. Dr Schipp served two terms overseas as Agriculture Counsellor in Seoul, South Korea and in Beijing, China. Mark is a biology and veterinary graduate of Murdoch University. After graduation he worked with the Western Australian Department of Agriculture.
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