

Food cooking at an urban eatery
Image Gerard Prinsen



Research reveals the wider picture of food-borne disease

Rural slaughter slab
Image Gerard Prinsen



A rural butchery
Image Gerard Prinsen

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In sub-Saharan Africa, an estimated 100,000 people a year die from *Salmonella* infection alone

The ZELS project **Hazards Associated with Zoonotic enteric pathogens in Emerging Livestock meat pathways (HAZEL)**

worked in northern Tanzania, a hot-spot for food-borne diseases. Research by the team has helped to shed light on where non-typhoidal *Salmonella* bacteria may enter the meat supply chain – and, importantly, as well as where they may not. This is valuable information for informing public health interventions.

The Hazel field team collected hundreds of samples from cattle, goats, their meat, and the processing environment. The project’s laboratory team, working in a dedicated Zoonoses Laboratory, found non-typhoidal *Salmonella* in almost every sample type, albeit in low numbers. Findings were similar whether for meat from traditional small-scale slaughter slabs or from larger slaughterhouses.

Surprisingly, the bacteria were more common in environmental samples, for example those from butchers’ blocks and knives, than in samples from animal hides or meat – a finding which means slaughtered animals may not be the only source of the bacteria and that contamination persists in the environment. Improved hygiene in shops or kitchens may therefore be needed.

The research also included discussion with people dealing with food safety on a day-to-day basis, such as butchers and local meat inspectors. Working too with formal and informal meat

“Our discussions revealed an awareness of disease risk, and also an acknowledgement of the challenges of working in northern Tanzania. Often this means making the best of difficult conditions, including limited access to running water or electricity. Within these circumstances, all strive to strike a balance between food availability and food safety.”

Professor Ruth Zadoks – Principal Investigator

vendors, it was clear that many have adapted their food preparation methods in an effort to control remaining risks, including cooking meat thoroughly before it is served to customers.

However, sophisticated analysis of DNA sequence data showed that several *Salmonella* types found in the cattle and goat meat pathway were also found in people in the region. Eating habits reported by our interviewees, including the consumption of raw or rare meat, may contribute to the public health risk.

In short, the research showed that *Salmonella* is widely present in the meat supply system, but it is unlikely that meat is the main source of non-typhoidal *Salmonella* disease in people, despite very obvious challenges to implementing official food safety policy.

Rather, major reductions in the most common types of non-typhoidal *Salmonella* infections would require public health interventions beyond the meat processing and retail sectors. As the HAZEL team included policymakers from the Government of Tanzania, this finding can find its way directly to those who can act upon it.

Hazards Associated with Zoonotic enteric pathogens in Emerging Livestock meat pathways (HAZEL)

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