

Researchers map out Asian poultry intensification in cross-country project



As South Asia finds more mouths to feed, it is predicted the poultry industry will grow between two and eight times, writes ZAHRAH IMTIAZ. This could also mean that issues of food safety and quality are going to be of even greater concern in future.

In January, UK Research and Innovation, a government agency that directs funding for research into global challenges, set out to do something about these concerns by funding an interdisciplinary research program to study poultry production and distribution networks in Bangladesh, India, Sri Lanka and Vietnam.

Starting this year, researchers at the One Health Poultry Hubs in these countries will set out to understand how and why intensification of poultry production can increase the risk of infectious diseases, including those that affect humans. It also aims to identify high-risk behavior, processes and environments while also testing and evaluating novel interventions for disease control.

The one-hub initiative

The One Health Poultry Hub is led by London's Royal Veterinary College, and includes partners in Asia, Australia, Europe and elsewhere in Britain.

The college's hub director Professor Fiona Tomley, speaking to *Asian Poultry Magazine*, explained that from both a microbiological and a food-safety perspective, the countries involved are ideal study sites because they encompass many different modes, ▷



Prof Fiona Tomley

forms and densities of poultry production.

"All the study countries are undergoing rapid growth in their chicken and egg industries and collectively, we want to understand how transmission of microbes occurs through different kinds of production systems, and how best to minimize the risk of food contamination, antimicrobial resistance and emergence of new disease epidemics," she said.

International researchers will work in each country in partnership with local experts to analyze methods of production, quantify microbe levels along production networks, and assess the likelihood of disease transmission to humans.

Multi-disciplinary approach

The research teams include anthropologists and social scientists who will work alongside biologists, veterinarians and clinicians to understand the driving factors and influences that affect the behavior of people working along the entire food chain, from producers to abattoir workers and retailers.

"We propose taking samples from [live and dead] chickens, [as well as] from people who work with the chickens, and from the environments linked to production," Prof Tomley said. These could be from chicken houses, egg-crates, transport vehicles, live-bird markets and retail outlets.

"Samples will be analyzed through microbial techniques and in-depth genetic sequencing to examine what happens to particular bacteria and viruses as they are transmitted through production chains."

The research will address one of the biggest issues the poultry industry faces by investigating the potential link between poultry intensification and antimicrobial resistance. According to Prof Tomley, there is a lack of detailed research into whether the use of antibiotics can be linked directly to the increased resistance in microbes that infect humans.

Because the hub applies the same study methods at each Asian site, the data they collect will be used to examine the risks in each country. The robust comparative data, when it is collated, will be used to develop mathematical models that can pin down situations where risk of disease

is the highest. The hub also hopes to provide evidence that could change the way people work.

To achieve their goals, teams will work with industry stakeholders and advisers in each country. It is expected that the research will contribute to the development of new recommendations and possibly new policies to improve food safety, as well as animal health and public health in the countries.

"We can hopefully support sustainable intensification without putting additional risk to animals and humans," said Prof Tomley.

Sri Lankan case study



Dr Ruwani Kalupahana

In Sri Lanka the hub will be partnering with University of Peradeniya's Department of Animal Production and Health and the country's Veterinary Research

Institute. The hub's national coordinator, Ruwani Kalupahana, said its work aims to establish, "specific causal connections between socio-economics, human behaviors, pathogen evolution and disease transmission."

It would also help researchers "identify the gaps in Sri Lanka's poultry and egg industry to uplift products to international quality standards," Dr Kalupahana told *Asian Poultry Magazine*.

In Sri Lanka, where chicken consumption has doubled to 10kg per person over the last 10 years, 95% of the poultry market is either frozen or chilled. It is expected local per capita consumption may double in the next decade.

Dilan Satharasinghe, of Peradeniya University's faculty of veterinary medicine and animal science, said a lack of space in Sri Lanka presented an acute challenge that would lead to intensification of farming.

Though Sri Lanka is an outlier in the region in terms of being the only country to have avoided avian Influenza, Dr Satharasinghe believes that there are still gaps in the control of other poultry diseases.

"Biosecurity in many farms is still



Dr Dilan Satharasinghe

lax. We frequently have outbreaks, such as Newcastle disease," he said.

The researchers also aim to show farmers how they can improve biosecurity in their farms, especially in rural communities.

"Many major producers are expanding production as they expect 4-5% growth in the economy. There are many myths and misconceptions among the people which affect consumption, especially in rural areas," said Dr Satharasinghe.

Studies in Bangladesh

Prof Md Ahasanul Hoque, of Chittagong Veterinary and Animal Sciences University's faculty of veterinary medicine, is national



Prof Md. Ahasanul Hoque

coordinator for the One Health Poultry Hub in Bangladesh.

Speaking to *Asian Poultry Magazine*, he said his team's focus will be on investigating avian influenza in the country and studying food-borne pathogens and their genetic potential.

"At the start of the program we will meet with stakeholders, farmers, companies and policymakers so they can be informed about the program's aims and objectives," he said.

Combining scientific and sociological research will be important to them as many zoonotic diseases spread due to lack of awareness of proper hygiene and biosecurity.

"Some farms do not have boundaries and antiseptic outlets. The mindset has to be changed first. So our anthropological study within the scope of the program will be crucial," said Prof Hoque.

Farmer groups in India

India has one of the biggest poultry industries in the world, concentrated mostly in the south.

Prof Raman Muthusamy, of the Tamil Nadu Center for Veterinary and Animal Sciences in India's poultry hub of Namakkal, is national coordinator of the Indian hub. To reach the farmers, he has proposed the formation of "farmers' clubs" in each poultry region, beginning in Namakkal.

"During the project period we cannot go to every area to create awareness, so it would be like a self-help group. A representative from each club would be the point of contact for us when we want to implement projects in their area. They will give us feedback on local problems and how they practice



Prof Raman Muthusamy

farming," he explained.

The overall plan

In the first year, British teams will travel to Asia to map the different production and distribution networks of poultry at the various hubs there. Once these are identified, more detailed studies will be undertaken in the second year that look into what happens within the supply chains.

"We plan to start with what people are purchasing and consuming, and work backwards to track the product sources. This is a good way to map networks because it is relatively unbiased," said Prof Tomley.

"However, to ensure that all types of production are covered we will also do some mapping where we start with specific types of farms or producers and work forward through the network to get to the point of consumption." In both cases, biological sampling and socioeconomic analyses will accompany the detailed mapping.

"It is easy to think we know

what is going on, and what high risk is and what is not. We say dirty environments cause the contamination of carcasses, but rarely have direct or precise evidence," said Prof Tomley.

Researchers have not been able to quantify the number and diversity of pathogens in chicken tissues, faeces or contaminated environments along the food chain, or across different types of production, she said.

"We have a good idea of how bacteria and viruses may spread by considering levels of hygiene and biosecurity, and by examining reports of disease outbreaks and levels of food poisoning. But detailed evidence is often lacking."

Most importantly, any future changes in the way that poultry production systems are managed or regulated to reduce risk must not stifle innovation in the industry, nor impact on the ability of farmers and workers to earn a living, Prof Tomley added. **Ap**

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