

Public health issues on zoonoses in wildlife and farmed game

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‘One medicine’ or ‘One health’ is a concept aiming at protecting public, animal and ecosystem health by through the integration and collaboration of human medicine, veterinary medicine and environmental science. The veterinarians in wildlife and farmed game, work in one frontiers of one health. The importance of this work is highlighted by the fact that around 70% of the new infectious diseases during the last 60 years has emerged from wildlife. Environmental problems may initially show their impact in wildlife animals health – an old example from Sweden is the case of mercury poisoning of birds more than 70 years ago. Problems in environmental health can indicate issues in public health for which the outbreak of West Nile Virus in the USA first appeared as increased mortality of crows.

Moreover, when animals are domesticated from wildlife to farmed game and to domestic animals then previously low virulent pathogens might become virulent and zoonotic. The wildlife veterinarian is at frontier of when pathogens become virulent for animals and man. One example from birds is presence of low virulent avian flu virus that might become highly virulent for domestic birds and with zoonotic potential. Another example is when aquaculture developed then for example infectious salmon anemia (ISA) virus which appears to be present in the wild salmon population, but in farmed Atlantic salmon the virus appears to become virulent and is today a serious disease problem. What is it that triggers the increase in virulence when wild animal species become farmed and domesticated?

The veterinary work wild and farmed game could be thought of as having 3 aims beyond helping game keeper and farmers with their wild and farmed game animals – the monitoring and surveillance of:

- Public health which includes
 - Food safety as farmed and wild game is a major source of high quality protein with a low carbon footprint
 - Detection of emerging infectious diseases and zoonoses (this is both for animal and public health)
 - Non food borne zoonoses (e.g., tularaemia, hantaviruses)
- Animal health
 - Diseases in wildlife both infectious and due to poisoning
 - Epizootic diseases (classical swine fever in wild boars)
- Environmental health
 - Sentinels for pollution (e.g., birds of prey)
 - Sentinels for changes in the environment – climatic change
 - New species entering the country or region

In this presentation food safety being one public health issue of wild and farmed game will be the major focus using the revision of meat inspection procedures as an example. Meat

inspection aims at protecting public health, detecting animal health and welfare problems, and to monitor the environment. To protect public health the meat inspection has to be risk based and the question then becomes which risks are present in farmed game animals. The assessment of which risks are important is difficult and resource intensive and the lack of hard data on consumer risk is therefore a problem if wishing to a quantitative risk assessment. One practical 2nd best solution chosen in the European Food Safety Authority (EFSA) is to rank the hazards (food borne zoonoses) into high or low risk based on the answers to 4 questions:

1. Is the hazard meatborne at the time of slaughter? (this will exclude listeriosis and *staphylococcus aureus*)
2. Is the hazard causing a serious human health problem? Refined into following sub-questions
 - a. Is it a frequent food borne disease in the EU
 - b. Is the disease burden (DALY, hospitalisation rates) high?
 - c. Does the disease cause high mortality?
3. Does the game meat in question represent a source of the disease?
 - a. Is the source attribution high?
 - b. Is it inked in epidemiological studies or outbreak investigations?
 - c. Is it linked by genetic fingerprinting?
 - d. Is it a high prevalence found on carcasses at slaughter?
 - e. Are there comparative considerations that make it likely that the game meat is a source?
 - f. Are there expert opinions that clearly support the game meat and pathogen combination in questions as a source of disease?
4. Are the pathogen already controlled successfully (e.g *trichinella* in wild boar and bears) by meat inspection?

By addressing these questions one is able to identify which game meat pathogen combinations that represent a high risk for the consumer. The next question is then how meat inspection might contribute to the control of the hazard. If the meat inspection is not resulting in an acceptable protection, the next question is whether there are alternative control options or combinations thereof that can do.