Avian Influenza Update and the North Carolina Response Plans

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INTRODUCTION

Avian influenza (AI) is a highly transmissible viral disease of birds. Disease produced by AI viruses may vary from asymptomatic, to respiratory disease and egg production drops, to severe systemic disease with up to 100% mortality. Waterfowl and shorebirds are usually asymptomatic carriers of the viurs; however some species can experience severe mortality with certain strains of the virus, such as Asian H5N1 virus. AI viruses that cause asymptomatic infections or low mortality in poultry are referred to as mildly or low pathogenic avian influenza (LPAI) viruses, while the more virulent viruses are referred to as highly pathogenic or HPAI viruses. The LPAI virus subtypes H5 and H7 are of concern because of their demonstrated ability to mutate or exchange genetic material and become a HPAI, thus they may have a negative impact on exports. Early control and elimination of any H5 or H7 viruses is essential, because when allowed to replicate in a large number of birds, the potential for genetic changes leading to HPAI dramatically increases. While LPAI are not considered to be zoonotic, worldwide there have been few reported cases of human infection with LPAI subtype H9 (3 cases). There is a greater concern of human infection with HPAI viruses, as described below.

CURRENT SITUATION

The outbreaks of highly pathogenic avian influenza (HPAI) Asian H5N1 between 2003 and 2006 have had considerable impact on international commerce of poultry and people's livelihoods. The virus has killed an unprecedented number of wild birds; infected over 240 people and most worrisome, has killed over 140 people. Asian H5N1 is truly a panzoonotic disease as it has spread worldwide and affects both animals and man. Never have so many countries and geographical areas been affected by one animal disease. In 2003-2004 about 10 countries in Asia were affected, by August 2006 fifty five countries in Asia, Europe, the Middle-East and Africa had reported this disease in wild or domestic birds.

POTENTIAL FOR SPREAD TO THE AMERICAS

Though poultry production and commerce have played the largest role in the spread of the disease, wild birds have also contributed to the introduction of the H5N1 virus to new geographic locations. While migration routes from Europe and Asia intersect with American flyways, historically not all of the avian influenzas from those countries have spread to the Americas. In fact of the 16 types of influenza hemagglutinin that occur in birds, 3 have never been reported in the Americas. Robert Webster, an expert on the evolution and spread of influenza viruses, suspects that H5N1 will not come into the Americas through Alaska or wild birds, but through smuggled birds.

WHY IS THE H5N1 VIRUS A PARTICULAR CONCERN?

The Asian H5N1 virus is of particular concern because it behaves differently from the other HPAI viruses we have studied; it has "broken the rules". While other HPAI viruses, once adapted to domestic poultry, have not killed wild birds, this virus may be endemic in wild waterfowl. In addition it continues to evolve rapidly, has increased thermal stability, has increased transmission from respiratory secretions, and has transmitted to felids and people. Mortality rates from people infected after direct contact with infected poultry or their manure has been about 60%. There has been at least one case of direct transmission from wild birds as well, at least one person in Azerbaijan who collected feathers from infected swans died. As this virus has "broken the rules" there is considerable concern that the virus could mutate or recombine with an existing human influenza and begin transmitting easily from person-to-person, leading to a new human pandemic. However the Asian H5N1 virus is not the only concern, another candidate for a human pandemic virus is the avian H9N2 virus which has been found co-circulating with "human" H3N2 virus in pigs in Southeastern China.

SURVEILLANCE

We do not have H5N1 avian influenza in the Americas, but surveillance has increased due to the concerns for spread to this country. Currently 95% of the commercial poultry flocks in the United States are tested prior to slaughter. In addition, wild birds are being tested by the US Fish and Wildlife Service, US Geologic Service and other partners. Samples are collected from live wild birds, hunter killed birds and birds that are found dead. Between April 1 and August 31, 2006 over 12,000 were tested in the US, with the bulk of the sampling occurring in Alaska. For more information: http://wildlifedisease.nbii.gov/ai/

PREPAREDNESS AND CONTROL

Avian influenza has the potential to result in significant economic losses for the poultry industry of NC. In an effort to limit the potentially devastating effects of avian influenza, the ***H5 and H7 Low Pathogenic Avian Influenza Response Plan for North Carolina*** (LPAI Response Plan) for the control and eradication of avian influenza was developed. That plan addressed all LPAI including those of the subtypes H5 and H7. Response to highly pathogenic avian influenza HPAI, when first diagnosed in NC, will be handled as a foreign animal disease. The specifics of that response will be addressed in this plan, the ***North Carolina Response and Containment Plan for Highly Pathogenic Avian Influenza*** (HPAI Response Plan).

The HPAI Response Plan was developed for commercial poultry; however the principles of the plan will also be applied to noncommercial poultry. The HPAI plan is an essential part of the NC Emergency Operations Plan. The essential components of the plan will be rewritten in an Incident Command Structure (ICS) and added as a Tab to the Foreign Animal Disease Operations Plan under Appendix 4 to Annex B of the NC Emergency Operations Plan. The HPAI Response Plan was developed by the NCDA&CS to help begin the dialogue, education, and training that may be needed for multi-agency input as a response to HPAI in NC. If that virus were to become easily transmissible to people, this multi-agency response would be especially important.

The HPAI Response Plan was developed by a working group consisting of representatives from the poultry industry, the NC Department of Agriculture and Consumer Services (NCDA&CS), and the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS). Other participants reviewed the plan and provided input, representing NCDA&CS, the NC Poultry Federation, NC State University and USDA-APHIS. Revision of both plans will be the responsibility of the NCDA&CS Poultry Disease Advisory Committee. The committee is appointed

by the Commissioner of Agriculture. Its members include representatives from all segments of the poultry industry, NCDA&CS, USDA-APHIS, and NC State University.

If HPAI is detected in wild birds in NC, surveillance will be increased; however the NC HPAI Response Plan will only go into affect if domestic poultry (either backyard or commercial) are infected with HPAI. The response involves:

- Rapid diagnosis and reporting
- Protection of personnel
- Swift imposition of effective quarantine
- Prevention of movement of known or suspect contaminated materials
- Stamping out of infected birds
- Increased surveillance

Control may include:

- Pre-emptive culling of epidemiologically link flocks
- Vaccination of extremely valuable genetic stock

For more information: http://www.offlu.net/