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## **'One Health' aims to integrate animal & human health issues**

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USDA's policy advisor for H1N1 pandemic issues, Doug O'Brien, told the "One Health Summit" in Washington, DC Nov. 17 that the key to the "One Health" approach is that it "recognizes the importance of controlling certain human diseases at their source that is sometimes in animals."

Other speakers at the summit held at the National Academy of Sciences noted that in today's interconnected world, microbes "move nearly at the speed of e-mail" and increasingly move between animals and humans. As reported by the One Health Commission formed last June, the result is more zoonotic diseases (diseases that animals pass to humans such as rabies), including diseases that move back and forth between humans and animals such as the H5N1 avian flu and today's H1N1 flu. The commission reports that such threats are increasing due to population pressures and climate change and that:

- "Approximately 75% of newly emerging human infectious diseases originate in animals."
- "Of the 1,461 diseases now recognized in humans, 60% are due to multi-host pathogens that affect multiple species."
- "Poor environmental health may affect human and animal health through contamination, pollution, and conditions conducive to the emergence and survival of new infectious agents."
- "Given the rise of antibiotic resistance, there is a need for a holistic approach and a better understanding of resistance related to the use of antibiotic drugs."
- "The spread of food-borne and water-borne diseases threaten human and animal health around the world."

Speakers including medical doctors, public health officials and veterinarians all agreed that what's needed is an interdisciplinary approach focused on globally coordinated monitoring of production agriculture, wildlife, and environmental conditions to identify potential problems in order to implement preventive action. The goal is to contain a problem at the animal or plant level before human populations are directly affected.

Rear Admiral Ali Khan, MD, MPH, Acting Director of the National Center for Zoonotic, Vector-Borne and Enteric Diseases at the federal Centers for Disease Control and



Rear Admiral Ali Khan at the One Health Summit. Photo: *Agri-Pulse*

Prevention (CDC), explained that the need for early intervention has become more urgent thanks to climate change pushing virulent diseases “much further north than ever before.” **He called for an international drive to remove “political barriers” and focus on “upstream prevention” in order to prevent “the next pandemic in humans.”**

Dr. Lonnie King, DVM, MS, MBA, Dean of the College of Veterinary Medicine at The Ohio State University, said that today’s “fabulous” \$3-trillion global food supply system unfortunately “also becomes a remarkable vehicle for infectious diseases.” Combine trade-borne disease with the largest population movements in history and huge immuno-compromised groups, he said, “and so

we wake up one morning with West Nile, with Monkeypox, and with SARS, in the United States, at one time, none of which had ever been in the Western Hemisphere before, all involved with wildlife interaction with people.” King said the obvious and urgent answer is “earlier detection, more rapid response, and better control systems” through the interdisciplinary One Health approach.

Three years after launching the One Health effort when he was President of the American Veterinary Medical Association, One Health Commission CEO Dr. Roger Mahr, DVM, told *Agri-Pulse* that **“Ensuring a safe food and water supply that is affordable, high-quality, and available is at the center of the One Health concept.”** He’s encouraged by the fact that the One Health Commission includes a full spectrum of human and animal health professionals from medical doctors, public health officials and microbiologists to veterinarians and the Association of Fish and Wildlife Agencies. He also points out that vets are a natural choice to lead the One Health effort since their training and practice have a uniquely multi-species, public-health and preventative focus.

Dr. Mahr notes that the prestigious Institute of Medicine, the health arm of the National Academy of Sciences, is writing a comprehensive report on the One Health approach. He looks forward to that report providing a scientific basis for policy initiatives affecting agriculture such as new livestock management regulations. Dr. Marguerite Pappaioanou, DVM, MPVM, Executive Director of the Association of American Veterinary Medical Colleges, says a scientific, multi-disciplinary One Health approach to issues such as whether to limit antibiotics use for livestock production would be much better than letting Congress step in with legislation.

### **Spinach – a One Health Commission case study**

- “An outbreak of E. coli O157:H7 was first noted on September 8, 2006 when CDC officials were alerted by epidemiologists in Wisconsin of a small cluster of E. coli O157:H7 infections of unknown source. . . CDC notified the U.S. Food and Drug Administration (FDA) about the Wisconsin and Oregon cases and the possible link with bagged fresh spinach.”

- “Quick sharing of information among the states led to warning the public not to eat fresh bagged spinach. Further investigation indicated that the outbreak was associated with bagged spinach produced under multiple labels in a single plant on a single day during a single shift.”
- “Potential environmental risk factors for E.coli O157:H7 contamination at or near the field included the presence of wild pigs, the proximity of irrigation wells used to grow produce for ready-to-eat packaging, and surface waterways exposed to feces from cattle and wildlife.”
- “The outbreak of E. coli O157 infections from the contaminated spinach illustrates how a large and widespread outbreak can occur, appearing first as small clusters, and then rapidly increasing if a popular commercial product is contaminated.”
- “As this and other outbreaks indicate, research needs to focus on tracing the specific pathways that connect fields of leafy green vegetables with potential animal reservoirs of E. coli and other microbes that cause food-borne human disease.”

At the summit, two slides from Dr. Lonnie King’s presentation summed up the problem and the solution this way:

**Need for Collaboration**  
Example – E. coli outbreak in spinach, 2006

- Viewed through *public health* lens: focus on morbidity, mortality, diagnosis, treatment
- Viewed through *animal health* lens: organism found in cattle and wild swine in spinach-producing region
- Viewed through *ecology/hydrology* lens: irrigation system strained due to weather anomalies

Investigation succeeded only when information was integrated.



For more information on the One Health Commission and other case studies, go to: <http://www.onehealthcommission.org/>. To read papers presented at the summit, go to: <http://www.onehealthcommission.org/summit-agenda.html>

For audio of the One Health Summit and photos, go to: <http://nationalacademies.org/newsroom/nalerts/20091117.html>

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