



Agriculture Security

Risks, Mitigations and Response



The potential for terrorist attacks against agricultural targets is recognized increasingly as a national security threat with the objective of causing economic damage, social unrest, and loss of confidence in government. Our model allows for the determination of quantitative differences that drive the basic biology of disease.

Cows and crowding—potential targets for agroterrorism

Background

Agriculture is uniquely vulnerable—farms are geographically disbursed in unsecured environments; livestock or poultry are concentrated in confined locations and transported or commingled with other herds; and diseases can be obtained, handled, and distributed easily. International trade in food products is often tied to a disease-free status which could be jeopardized by an attack. While response capabilities are being upgraded to address agroterrorism, now is the critical time in the planning process to investigate the dynamics and consequences of a biological attack.

Capabilities

We will conduct comparative analyses of top foreign animal diseases introduced by a bio-terrorist attack and compare different surveillance and response capabilities and strategies. The methodology consists of calculating risk—the convolution of threat, vulnerability, and consequence components. Our model predicts the transmission and progression of highly pathogenic avian influenza and other infectious diseases such as Newcastle disease virus upon poultry, cattle, or swine populations within a single county.

Future Applications

For avian influenza or other diseases, the most important control measures may be rapid culling of all infected or exposed birds, proper disposal of carcasses, the quarantining and rigorous disinfection of farms, and the implementation of strict sanitary or “biosecurity” measures. Restrictions on the movement of live poultry, both within and between countries, are another important control measure. Preparedness for agricultural security requires plans that have been tested in theory prior to implementation, due to the large consequences.

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Work performed in collaboration with LANL Decision Applications (D) and Theoretical (T) divisions

- Counties with:
- Susceptible poultry
 - ≥10 infected asymptomatic birds
 - ≥1 symptomatic infected birds
 - + No susceptible poultry (or depopulated)

Right: Disease progression maps show how quickly avian influenza could spread through poultry.

