



Projected Economic Impacts of a Exotic Newcastle Disease (END) Outbreak in Tennessee

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If END were to occur in Tennessee, the effects on the poultry industry, including the caged-bird industry and poultry hobbyists, could be devastating. The value of industry output would decline due to birds that had to be destroyed. Industry output value would also be lost due to a poor market for animals not destroyed. Additional costs would be incurred for animals quarantined and destroyed. Quarantine cost estimates are around \$3.23 per bird. An estimated \$160 to 315million loss to Tennessee's economy could occur if END were discovered in the state. In addition, an estimated 10, 000 jobs could be lost.

Background

- Exotic Newcastle Disease (END) is a fatal viral disease that is highly contagious and affects all species of birds. It is one of the most infectious diseases of poultry in the world.
- The bird's respiratory, nervous, and digestive systems are affected primarily. However the birds may have partial to complete drop in egg production, thin-shelled eggs, and swelling of tissue around the eyes and neck. Some birds may die suddenly without showing any clinical signs.
- The disease spreads through direct contact between healthy birds and the bodily discharges of infected birds. The disease spreads the most rapid among birds kept in confinement.
- To eradicate END from commercial poultry all infected flocks must be destroyed followed by imposing strict quarantine measures and verifying controls with in-depth surveillance programs.
- A major outbreak occurred in 1971 among commercial poultry flocks in southern California that threatened not only the California poultry industry but also the entire U.S. poultry and egg supply.
- Of the 1,341 infected flocks identified in the 1971 outbreak, almost 12 million birds were destroyed. Taxpayers' costs for eradication efforts was \$56 million (\$228 million in 2002 dollars) and caused disruption of operations of poultry producers, and increased prices of poultry and poultry products to consumers.
- Recently, there have been outbreaks in California, Arizona, New Mexico, Texas, and Nevada. The quarantine period in California is currently approaching 11 months while the quarantine period in Texas lasted approximately 4-months.

Measuring the Economic Impacts

- The economic effects of a potential END outbreak under 4- and 12-month scenarios are explored.

The **TN-AIM** IMPLAN based model describes the transfer of money between industries and institutions and contains both market-based and non-market financial flows, such as inter-institutional transfers. When total sales of a particular industry sector are expected to change, three types of impacts economy wide are measured: Direct, Indirect and Induced effects.

- **Direct effects**-the immediate effects associated with the change in the final demand for a particular industry.
- **Indirect effects**-secondary effects or production changes in backward-linked industries caused when inputs needs change due to the impact of directly affected industry.
- **Induced effects**-response by all local industries caused by increased expenditures of new household income and inter-institutional transfers generated from the direct and indirect effects of the change in final demand for a specific industry.
- **Total effects=direct + indirect + induced**

- Using TN-AIM (an IMPLAN based input-output model for the Tennessee economy), industry output of the sector for poultry production is decreased by \$141.0 million in the 12-month scenario and \$47.0 million in the 4-month scenario.
- Based on information from the California experience, the number of animals disposed of is multiplied by \$3.23 to arrive at a total cost of quarantine. These costs are then allocated across the relevant sectors. Quarantine costs are those of maintaining quarantine checkpoints, including labor and disinfectant. The Commodity Credit Corporation has funds (\$10 million) to compensate for certain costs associated with the quarantine.¹ These are accounted for in the analysis.

Results

With a 4-month outbreak, the projected direct impacts are estimated at \$48.8 million in losses to industry output and over 4,500 jobs lost. When the direct effects are combined with effects from decreased purchases from supplying industries and service providers and effects from fewer expenditures with income losses, the total economic losses are estimated at \$158.9 million in industry output and 6,024 jobs. As can be seen, these effects multiply with a lengthier outbreak. Under a 12-month outbreak, the direct losses expand to \$139.7 million in industry output and 8,067 jobs, while the total economic losses expand to \$314.9 million in industry output and 10,662 jobs.

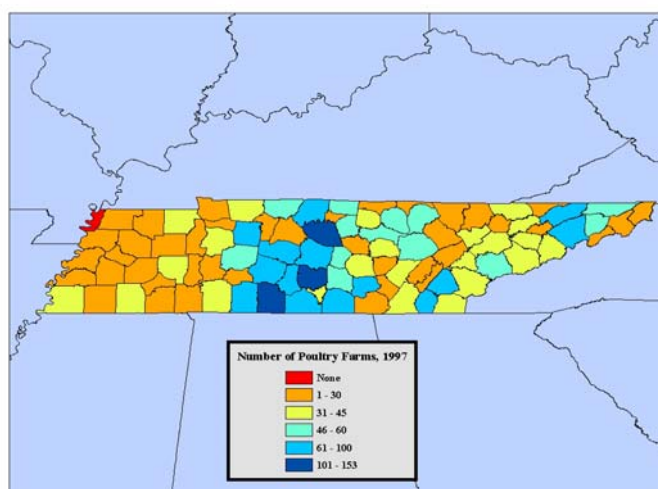
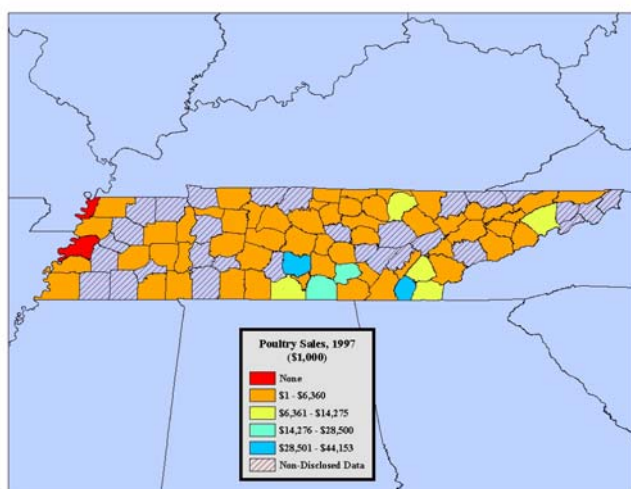
Projected Statewide Economic Impacts of END Outbreaks of Varying Severity.

Outbreak	Total Industry Output		Employment	
	Direct Effects	Total Effects	Direct Effects	Total Effects
4-Month	\$-48.8 million	\$-158.9 million	-4,567	-6,024
12-Month	\$-139.7 million	\$-314.9 million	-8,067	-10,662

These impacts assume the state and local governments will offset producers' expenses (\$183 million will be transferred from taxpayers to producers) for disposal and cleanup beyond USDA compensation.

Areas of Impact

As shown in the maps below, poultry production exists throughout Tennessee. However, Middle Tennessee and upper East Tennessee are production centers.² The impacts of END on the poultry sector would likely be greatest in Middle Tennessee.



¹ The USDA has the authority to pay up to 100% of the expenses of the purchase, destruction, and disposition of animals and materials required to be destroyed.

² For example, if the following Middle Tennessee counties were impacted – Bedford, Coffee, Franklin, Grundy, Lincoln, Marion, and Moore – this would represent about 52.4% of the state's poultry flock.