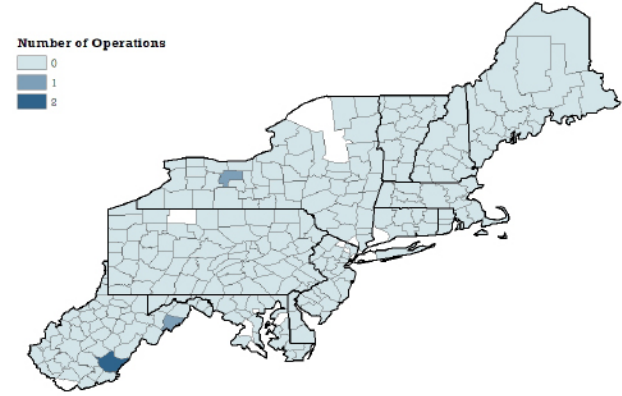


Northeast regional beef production:

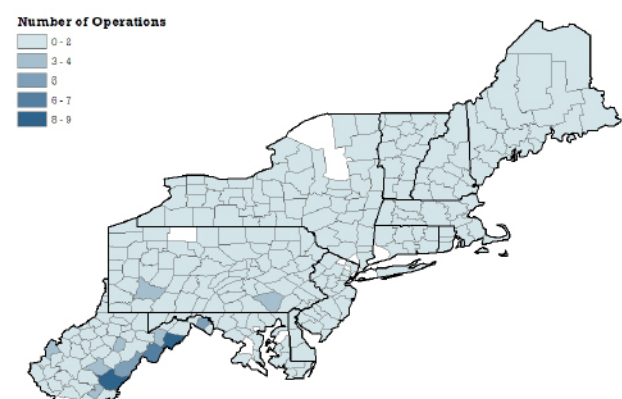
proximity to slaughter houses and seasonality as constraints to small operations

Density of beef operations by size

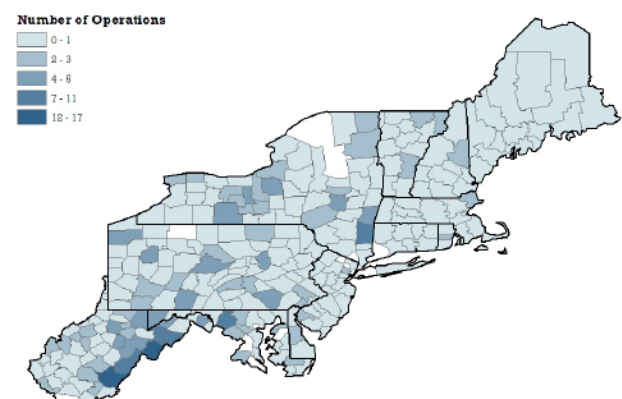
500+ head



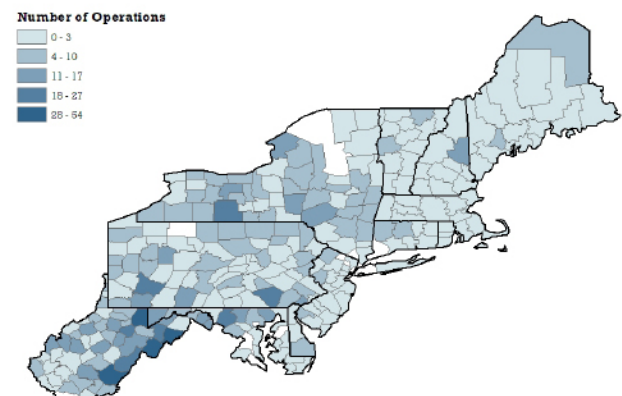
200-499 head



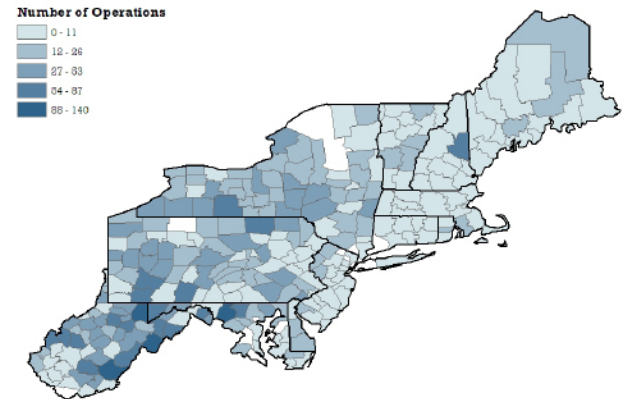
100-199 head



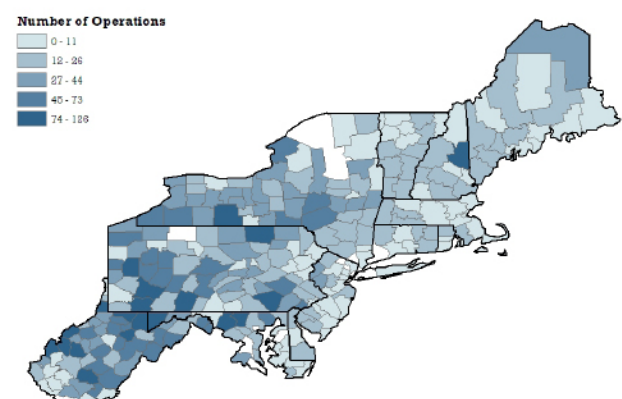
50-99 head



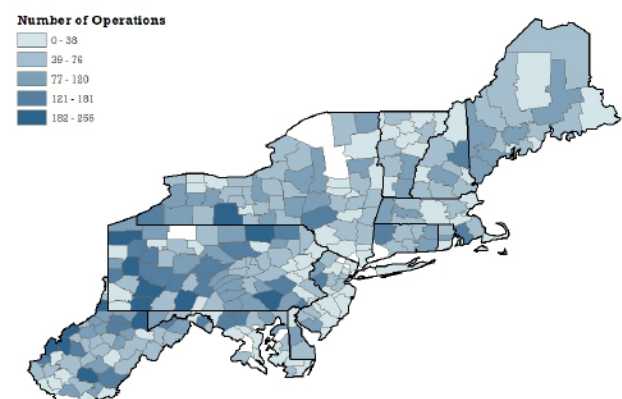
20-49 head



10-19 head



1-9 head



Source: USDA National Agriculture Statistics Service

Background

Demand for regional beef has increased across the United States, however supply chain constraints may be limiting this production in the Northeast (from West Virginia to Maine). According to a 2009 survey of southern New England livestock producers, access to slaughter houses is a barrier to expanding their production. In addition, there is a seasonal bottleneck at the slaughter houses that constrains access. (1)

An assessment of the proximity of beef producers to slaughter houses is needed to determine whether there are enough slaughter houses in the region or if more need to be built in the area. Combined with seasonal data, we can conclude when and where the regional beef supply chain is most vulnerable.

This poster seeks to inform research being done at the Tufts University Friedman School of Nutrition Science and Policy on beef supply chain food systems modeling.



Methods

The National Agricultural Statistics Service provides the number of beef operations in each county of the region from the 2007 USDA Agricultural Census. A series of maps shows the number of operations broken down into categories according to head of cattle.

These data were totaled and mapped to show the density of all beef operations in our region of interest. This map tells us that the southwest area of the Northeastern U.S. has more beef production than the area farther north.

The USDA's Food Safety and Inspection Service provides addresses of beef slaughter houses and processing facilities across the United States. By geocoding these locations we can see which areas might be limited by a lack of these businesses.

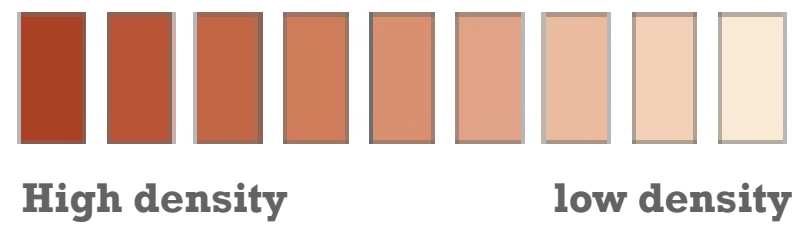
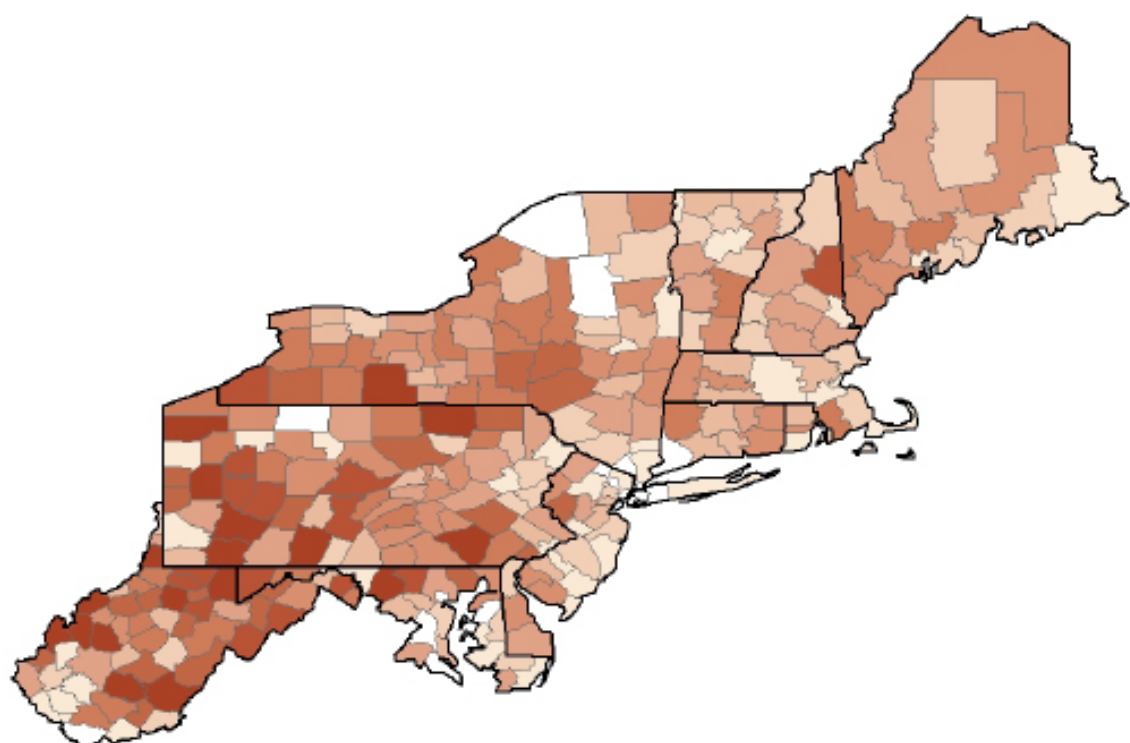
A fifty mile buffer is created around the slaughter houses in order to assess if most beef operations are within a reasonable Euclidean distance from this next step in the supply chain. We can see that almost all of the Northeast region is within 50 miles of a slaughter house.

The 2007 USDA Agricultural Census data is sorted to show the density of the smaller farms across the region. The counties with the highest density of the 0-9 head and 10-19 head range operations were selected to view which areas are vulnerable.

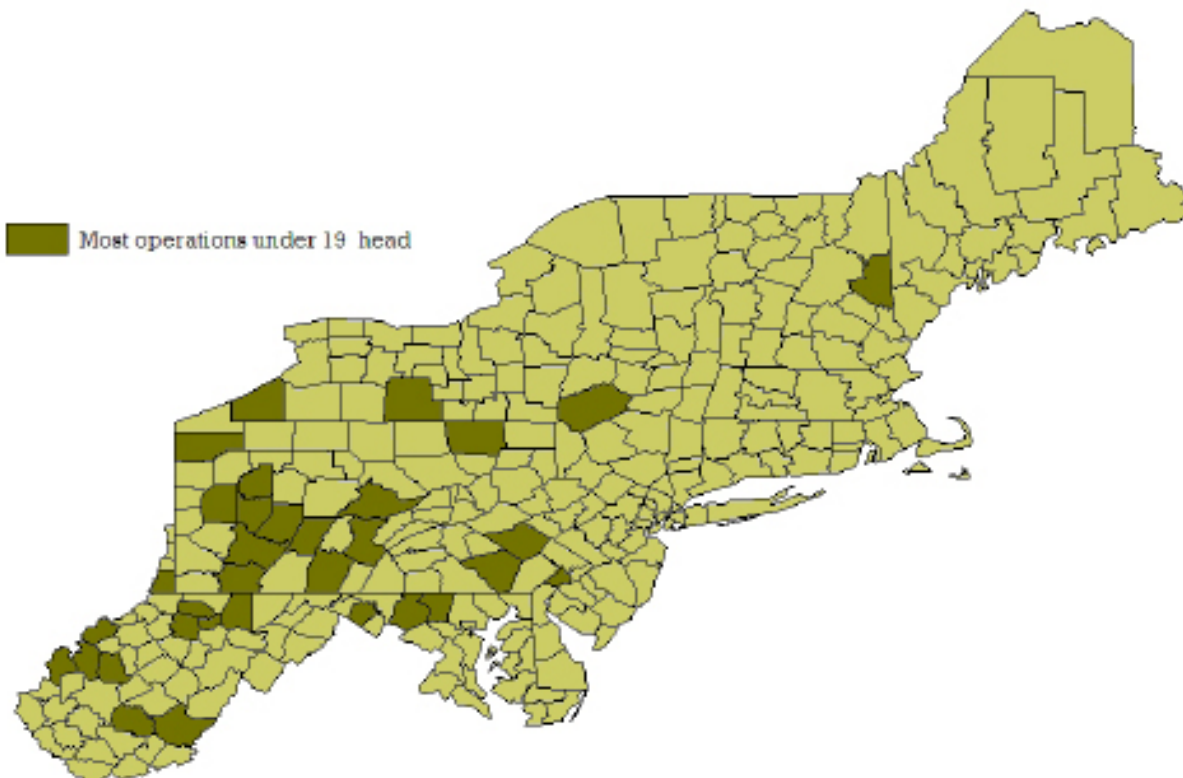
The counties with high density of small beef operations was overlaid with the geocoded slaughter houses to show which counties are most in need of a slaughter house from the perspective of the smaller beef operation.

The USDA provides data on the monthly head of cattle slaughtered in these states. This data was graphed to show when the counties shown in red are most vulnerable to a lack of access.

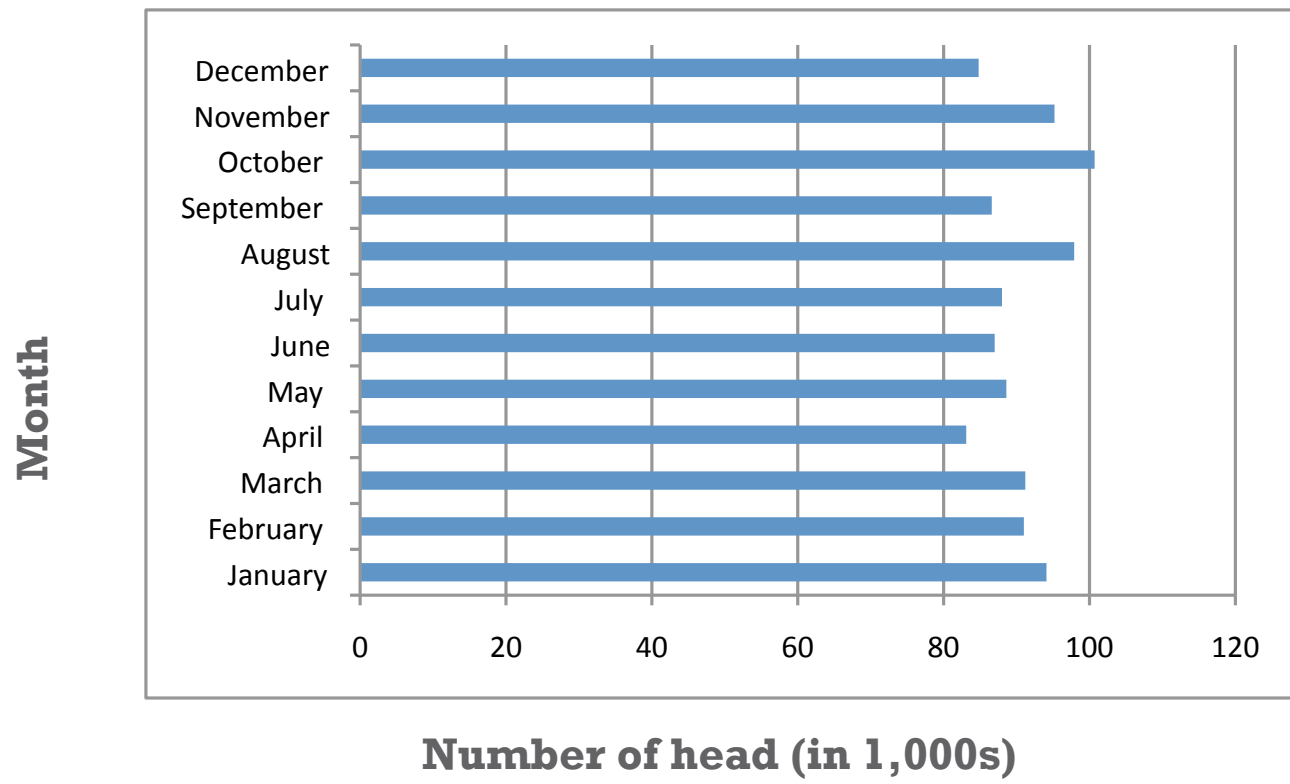
Density of beef operations



Density of small beef operations

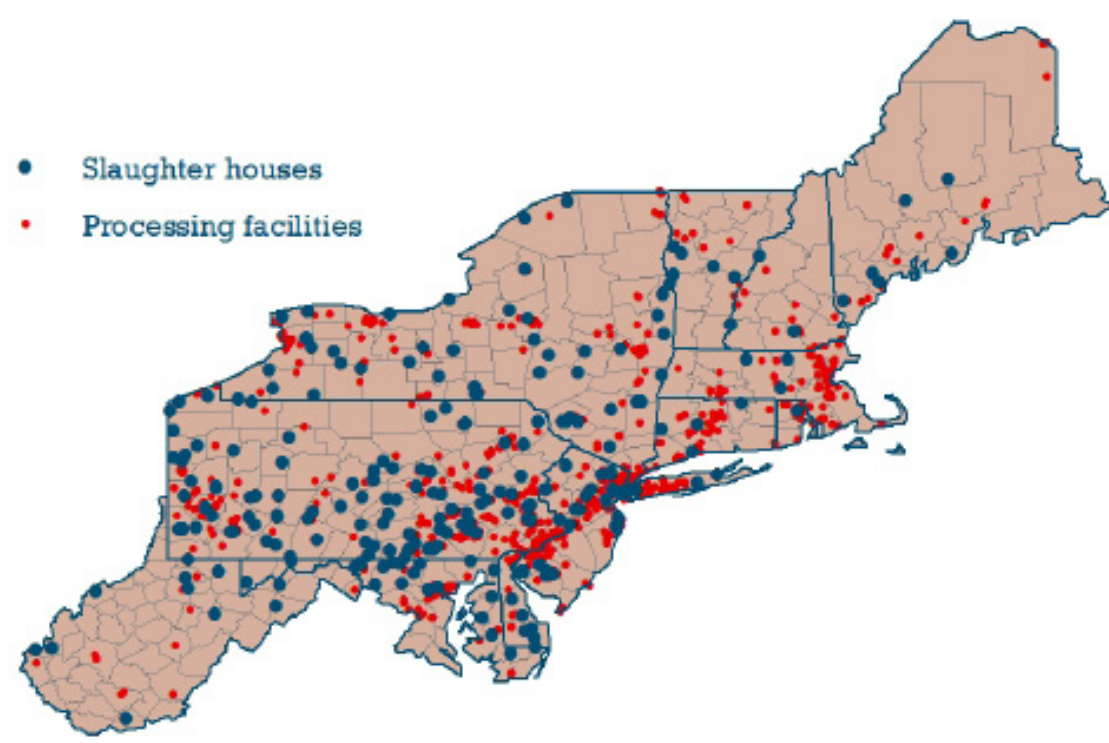


2012 monthly number of head slaughtered in region



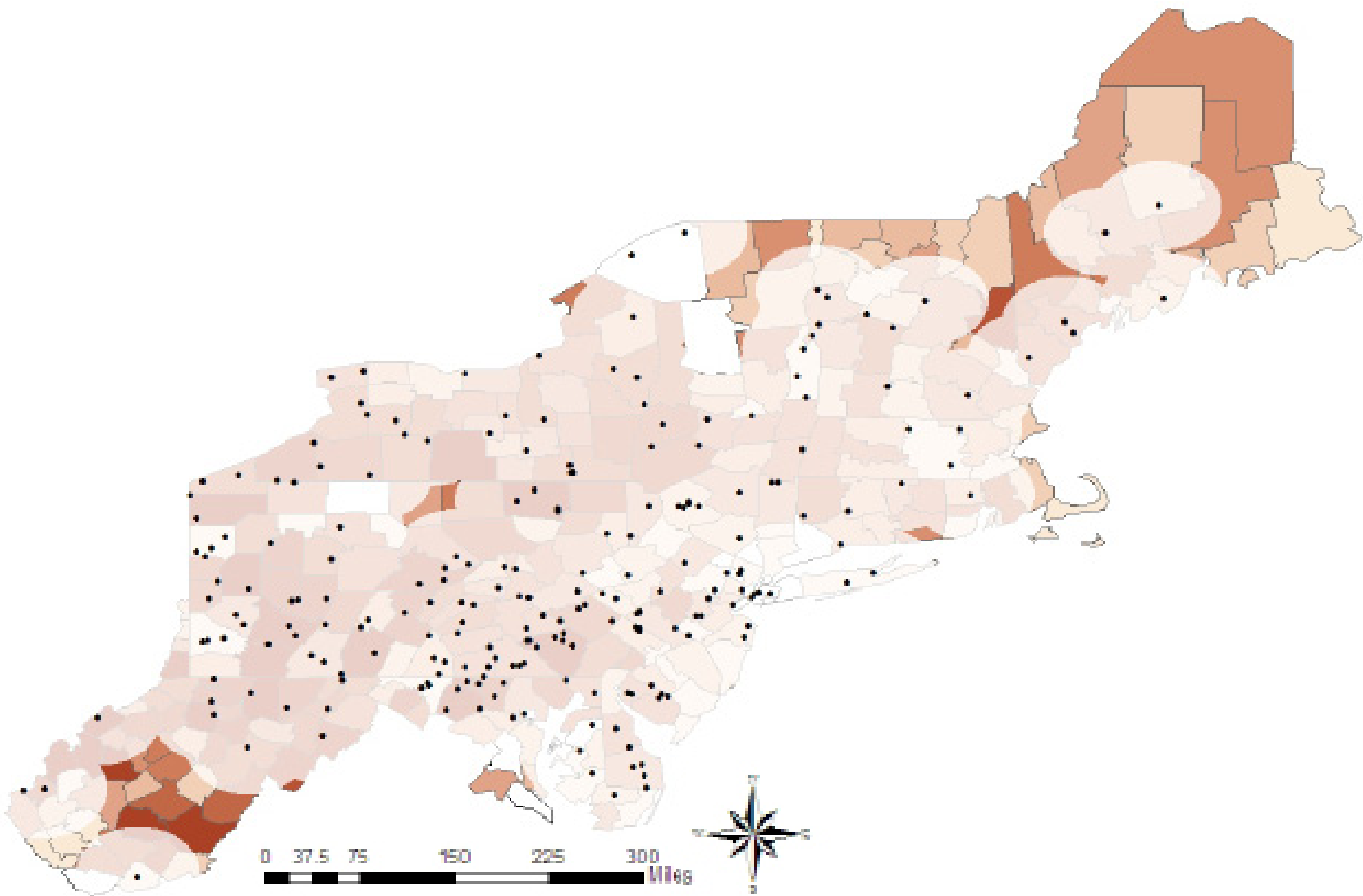
Source: USDA National Agriculture Statistics Service

Location of slaughter houses and processing facilities



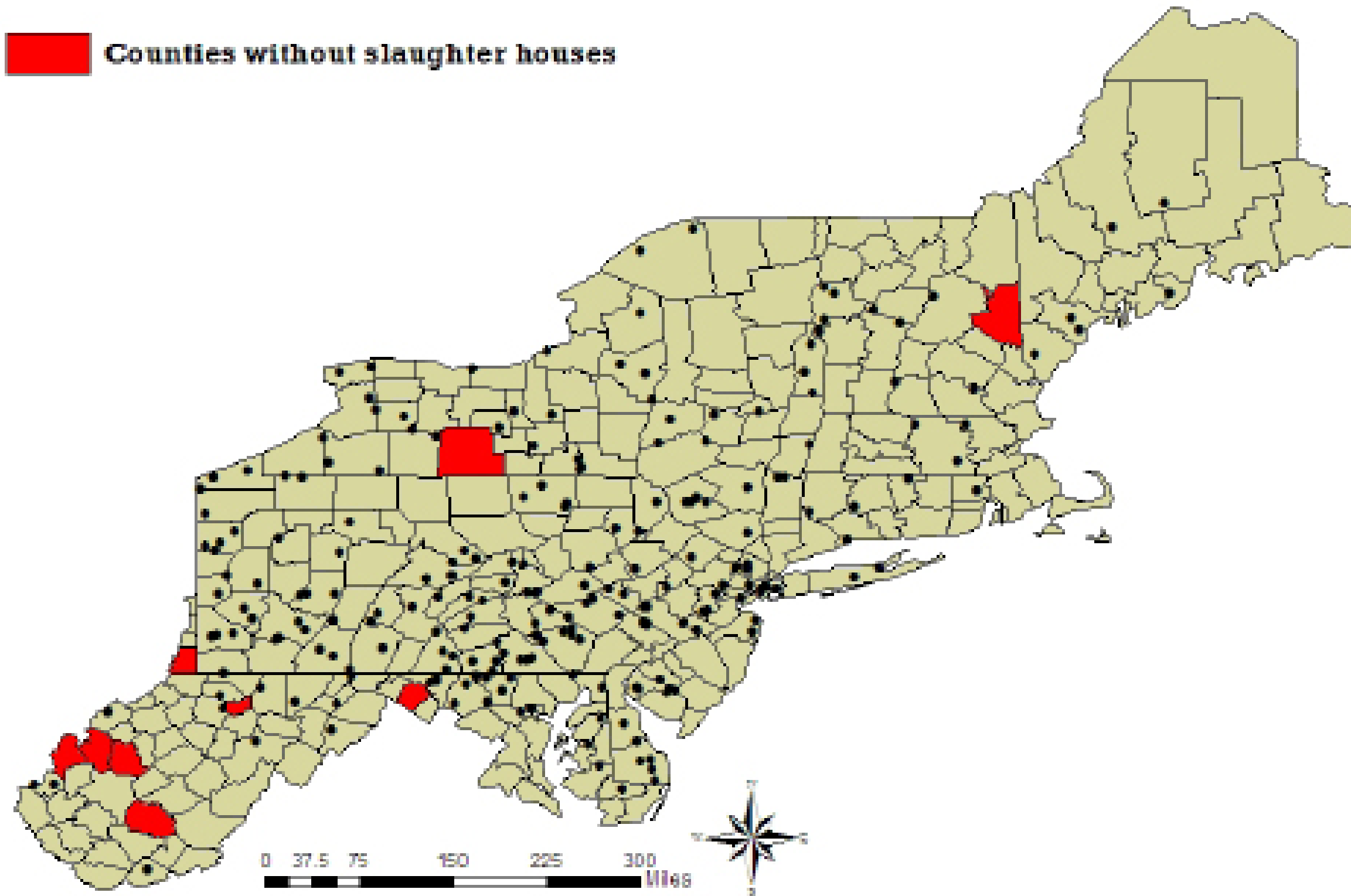
Source: USDA Food and Safety Inspection Service

Distance of slaughter houses to beef operations



Counties most vulnerable during the month of October

Counties without slaughter houses



Conclusions

Most of the Northeast is within 50 miles Euclidean distance of a livestock slaughter facility. However, we are mainly concerned about the smaller producers. Beef operations under 20 head lack the resources of larger farms. In addition, the diminishing returns per head of cattle make trips to the slaughter house more expensive for fewer head.

The Northeast is heavily populated so it is not surprising to see that most of the beef operations are smaller (see maps on left side). These are most dense in the southwest of the region. The data shows that October is the month with most slaughter house capacity.

This spatial analysis reveals the location of the farm operations that are most vulnerable to being constrained by slaughter house proximity during the bottlenecked month of October. These farms are in the counties: Carroll, WV; Marshall, WV; Berkeley, WV; Taylor, WV; Jackson, WV; Mason, WV; Roane, WV; Fayette, WV; Steuben, NY.

It is recommended to bring awareness to the extension agents in these counties so that they may work with these beef producers to best access the supply chain. Further research is needed to determine the extent to which this effects beef production in the Northeast region.

Cartographer: Wendy Mainardi
Coordinate System: GCS_WGS_1984
Sources: USDA FSIS, USDA NASS

1. Lewis, C. et al. "A Capacity of New England's large animal slaughter facilities as relative to meat production for the regional food system." July, 2011. Renewable Agriculture and Food Systems.

