Mapping potential foodsheds in Iowa:
A system optimization modeling approach

Abstract: Linear programming tools are used to gauge regional potential for local diversified agriculture required to meet the dietary needs of the population.

What was done and why?
The project investigators developed a linear programming optimization method to assess the regional potential for localized and diversified agricultural systems to meet the dietary requirements of local populations. While data from eight Midwestern states were used to fuel the model, the methods developed can be applied to most other regions of the country.

The project had three primary objectives:

1. Develop innovative protocols, metrics and optimization methods to analyze the foodshed localization potential of geographic areas in Iowa,
2. Apply the methods developed to define foodshed geographies for all cities and rural populations in Iowa, and
3. Present, communicate, and initiate peer review and discussion of results with the intention of prompting follow-up economic and environmental studies in Iowa.

What did we learn?

• Targeted MyPyramid recommendations can be met within an average distance (weighted by population) of 13.6 miles throughout the study region.
• Fifty-six percent of the population could be supplied in less than a five-mile production range.
• The Chicago area, which represents the largest concentration of consumers in the study area, could become self-sustaining within a 76-mile range.
• Minneapolis (37 miles), St. Louis (27 miles), Kansas City (24 miles), and Des Moines (10 miles) also could become self-sustaining within relatively small travel distances.
• The predominantly rural, wooded areas of northern Minnesota and Wisconsin require a relatively larger supply range relative to population.

These results do not account for seasonality, storage methods, or quality perceptions, which are beyond the scope of this study. Investigators believe that over time, a rise in transportation costs will drive investment toward more advanced food production and storage technologies to resolve these issues.