Project Title

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A strong and equitable local and regional food system is characterized by the accessibility, affordability, nutritional quality of its food, the equality of its distribution, and the infrastructure that supports that system. Accessibility is the combination of the presence of sufficient quantities of food and the ability to purchase or otherwise acquire that food. In addition, in order to be strong and equitable, a food system must provide food at affordable prices. A prevalence of healthy, high quality food means nothing if no one can afford it. The food available to consumers must also be of a sufficient nutritional quality to provide proper nourishment. A food system may provide adequate amounts of food of a sufficient quality and at affordable prices but have certain barriers such as large differences in income or a distribution of access entirely concentrated in an area prohibitively far from portions of the population, therefore the inequality of a food system must also be considered. Finally, the infrastructure that supports and facilitates the food system helps to reduce costs, allows for storage and processing services, and provides resilience to shocks. Each of these five characteristics is integral to describing the strength and equity of a food system.

We chose variables related to accessibility, affordability, nutritional quality, and equality. We believe that these categories encapsulate the strength of a food system well. They account for a wide range of factors and take into account multiple dimensions. The specific variables included in each of these subcategories are as follows. Accessibility: percent of population with low/no access to store, food banks per county, number of food deserts, retail food density index, and food insecurity rate; inequality: intercounty gini coefficient; affordability: median income, unemployment level, percent of people over 16 under poverty level; nutritional quality: fast food restaurants per 1000 people, convenience stores per 1000 people, full service grocery stores, specialized food stores per 1000 people, health factors z-score, health outcomes z-score; infrastructure: number of food hubs, farmers markets, number of public refrigerated warehouses, number of meatpacking plants, number of community supported agriculture businesses, percentage of farms selling direct and intermediated. Many of these variables are highly multicollinear. However, the use of principal components analysis negates these issues, weighting highly multicollinear variables as a single vector. The variables were transformed as z-scores prior to the principal components analysis and remain z-scores in the index.

Our visualization displays a colormap of the index values for each county in the lower forty-eight states (with orange being lower values and blue being higher values). Below this, we have mapped three regions of special interest: the Alabama Black Belt, the Mississippi Delta, and Central Appalachia. Finally, we display the ten highest and lowest ranked states (Washington D.C. excluded) along with the average index value of their counties.