

Implications for the Future of Hog and Milk Production

The experience of the hog and milk production sectors fits well into the conceptual structural change model presented by Reimund, Martin, and Moore (see fig. 2). Technological change has been dramatic in these industries, with capital-intensive technologies substituting for land and labor. These new technologies exhibit greater economies of size and have thus created opportunities for larger, more efficient production units. Production shifted regionally in both industries as hog production expanded in southern States while milk production extended West. The new, more efficient technologies adopted by producers in these areas allowed them to compete with traditional production areas, despite less locally available feed supplies. Growth and development continued in these industries as farm specialization and concentration of production intensified. Greater price and income risk is involved with large-scale, specialized livestock production. In response, expanded use of contracts for hog production transferred much of the risk to large corporate entities, such as feed companies or animal processors, who are much more able and willing to deal with added risk. Government price supports have reduced milk price variability and thus some of the price risk involved with milk production. However, milk price supports are set to be phased out under the new farm legislation (Young and Westcott). As market forces become more important for determining returns to milk production, the use of innovative production and marketing arrangements for managing risk is likely to increase.

The analysis presented in this report indicates that economic incentives, through lower production costs, exist in many areas for improving the efficiency of livestock operations. In both hog and milk production, the feed efficiency of operations is a primary cost determinant and is generally more important in nontraditional production areas where local feed supplies are more limited. Continued and sustained growth in many nontraditional areas is likely tied to further technological advancement that improves the efficiency of feed conversion. In contrast, feed efficiency is relatively less important in traditional production areas where more feed is grown. Future growth of hog and milk production in these areas is more likely to result from upgrading and replacing the existing capital stock to reflect modern industry standards.

While the economic incentives within agriculture will encourage continued structural change, forces outside of agriculture are likely to have an increasingly important role in determining the direction of this change. As the size and density of animal production grows, so do externalities such as the concern about how this growing concentration of animal waste affects the environment. Likewise, the absorption of farmland by urban areas and the expansion of suburbia creates conflict between the growing population and odor problems associated with concentrated animal production. These forces will likely alter the course of structural change by changing the economic incentives available to producers. For example, expansion may be limited in certain areas because of their proximity to environmentally sensitive areas or areas with a growing population. In these areas, cost-saving opportunities through expanded production may become fewer over time. Economic incentives could also be altered via regulations concerning size and location of the operation, animal density, and waste management and disposal. Permit costs and fines would have a direct impact on economic incentives for startup or expansion. Limitations imposed by regulations on the size and operation of livestock production units would also alter cost relationships among regions.

As an illustration, consider changes in the density of hogs and milk cows in counties of greatest structural change during the 1970's and 80's (fig. 23). The inventory of hogs and pigs per square mile is up nearly 300 percent in these counties, while density of the milk cow inventory is about 70 percent higher. At the same time, the human population density continues to grow in the counties of greatest change, up about 30 percent in hog counties and more than 60 percent in the dairy counties (fig. 24).

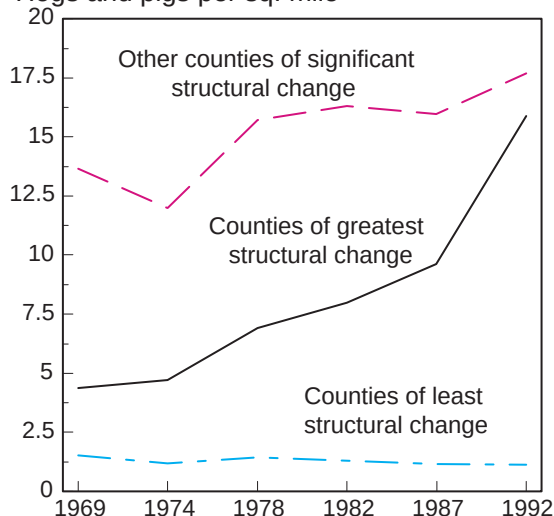
The analysis in this report does not suggest at what level animal production is too concentrated or when the interests of livestock producers and the human population conflict. However, trends during the 1970's and 1980's indicate that, in areas of greatest structural change, animal and human population densities are growing. If this trend continues, it is likely that the conflicting interests of livestock producers and the population will grow more severe. Structural change in hog and milk production will probably be influenced by technological developments in such

Figure 23

Animal density in each structural change area for hog and dairy operations, 1969-92

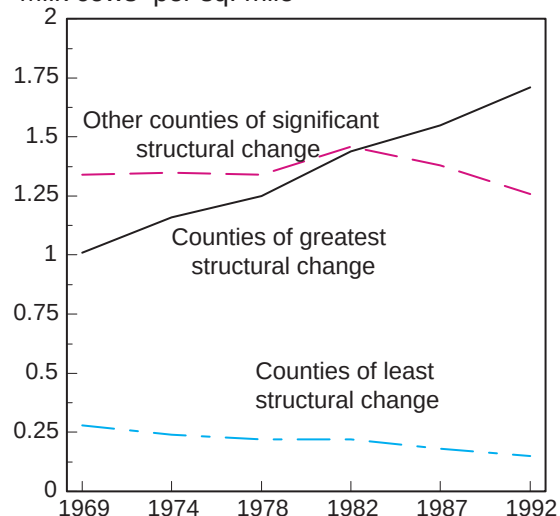
Density of the hog and pig inventory

Hogs and pigs per sq. mile



Density of the milk cow inventory

Milk cows per sq. mile



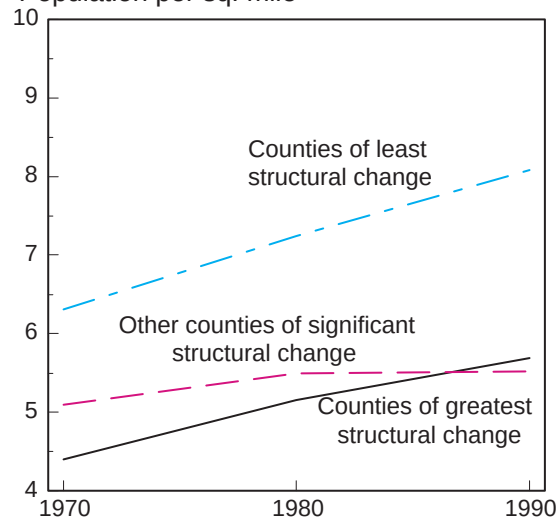
Source: Compiled by ERS using animal inventories from census of agriculture data and land area from census of population and housing data.

Figure 24

Human population density in each structural change area for hog and dairy operations, 1970-90

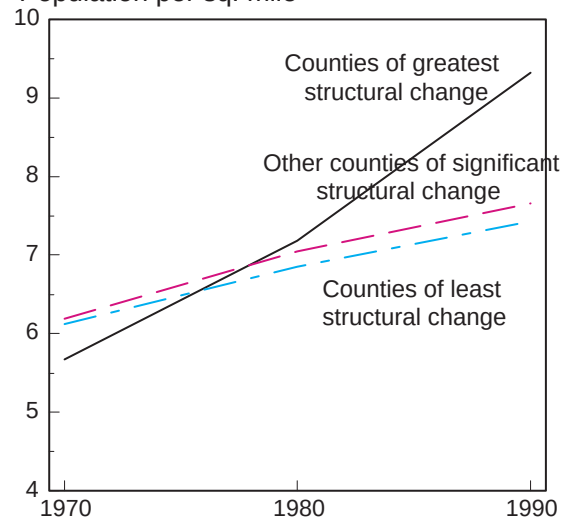
Density of population in hog areas

Population per sq. mile



Density of population in dairy areas

Population per sq. mile



Source: Compiled by ERS using census of population and housing data.

areas as livestock odor control and waste management. Also, it is possible that growing environmental and population concerns will alter economic incen-

tives such that production moves back into more traditional production areas or expands into new areas that are seeking opportunities for economic growth.