

## Conclusions

U.S. milk production is rapidly shifting to much larger dairy enterprises. The shift occurred first in Western dairy regions, and milk production has increased in Western States as more capacity has been added in large-scale farms. However, similar changes are occurring in more traditional dairy States, which are rapidly adding large operations and losing smaller ones.

Large dairy farms have substantial cost advantages over smaller farms, derived from the ability to take advantage of economies of scale. On average, farms with at least 1,000 cows realize costs, per hundredweight of milk produced, that are 15 percent lower than farms in the next largest size class (500–999 head) and 35 percent lower than farms with 100–199 head. Other evidence suggests that costs may continue to decline as herds increase to and above 3,000 head.

Smaller farms tend to get higher prices for their milk than larger farms. But cost differences tend to overwhelm this advantage: larger farms, especially those with more than 1,000 cows, are realizing economic profits while most smaller farms are realizing negative net returns. In turn, differences in returns are driving investment decisions that are shifting production to larger farms.

Still, some small farms realize economic profits—in that the value of their production exceeds their total costs, including operating costs, capital recovery costs, and the opportunity costs of the operators' time. Others, although not returning enough to encourage reinvestment, earn enough to remain in business.

The continued shift of production to larger operations will likely reduce industrywide costs, leading to lower dairy prices for consumers even as it forces more small operations out. But the shift also creates increased environmental risks associated with the concentration of manure-based nitrogen and phosphorus. Federal and State regulators have been applying rules to govern the storage, application, and disposal of nutrients. Some large specialized dairies already remove most or all of their manure to other sites, at modest costs; moreover, large dairies have begun to invest in technologies that allow for lower cost transport of manure-based nutrients. At present, the costs of manure treatment and transport are not large enough to offset the considerable production cost advantage held by large dairies. Given this, production should continue to shift to large dairy farms.