

Appendix: Data Sources

Dairy Farm Numbers, Size, and Location

USDA's National Agricultural Statistics Service (NASS) publishes annual data on the size structure of dairy farms in *Farms, Land in Farms, and Livestock Operations* (before 2004, in February issues of *Milk Production*). NASS reports the number of operations, cow inventory, and milk production, by herd size class. Six classes are identified for State-level data—1-29, 30-49, 50-99, 100-199, 200-499, and 500 or more milk cows, with the largest class replaced by classes of 500-999, 1,000-1,999, and 2,000 or more for the nationwide data. The data are based on surveys of all large producers and samples of smaller producers.

The annual survey data are supplemented with the 1992, 1997, and 2002 Censuses of Agriculture. Confidential individual census records are used to analyze changes in farm size among large dairy farms. Census records report farm location and milk cow inventories at the end of the year, allowing us to summarize changes in the size distribution of dairy farms between census years. With an ongoing expansion of large commercial dairies, the 2002 census end-of-year estimates of large dairies will exceed the 2002 estimates in *Farms, Land in Farms, and Livestock Operations*, which rely on beginning and midyear surveys.

Data for Cost Analyses

Cost analyses are based on data from the dairy version of the 2000 and 2005 Agricultural Resource Management Survey (ARMS), a complex annual survey applied to a stratified random sample of all U.S. farms. ARMS is USDA's primary source of information on the financial condition, production practices, resource use, and economic well-being of U.S. farms and farm households.

ARMS is a large multiphase and multiversion survey. The sample is screened for continued operation and commodity coverage in Phase I, conducted in the summer of the reference year. In the following fall, randomly selected Phase I farms are surveyed in Phase II concerning their crop production practices and chemical use at the field or production unit level. Phase III, initiated during the winter following the reference year, draws information on farm income and expenditures, farm financial transactions, and the farm operator household.

Several versions of the Phase III survey are distributed. A short "core" version is distributed and returned by mail, while other versions require personal interviews with trained enumerators. One enumerated version (version 1) covers farms of all types. This version is used for the wage analysis reported in table 6 because it elicits information on off-farm hours worked, off-farm earnings, age, and education for farm operators and spouses. Other enumerated versions include sections aimed at specific commodity enterprises, including dairy versions covering the years 2000 and 2005. The 2000 ARMS dairy version covered 22 States: AZ, CA, FL, GA, ID, IA, IL, IN, KY, MI, MN, MO, NM, NY, OH, PA, TN, TX, VT, VA,

WA, and WI. The 2005 version covered those States, plus ME and OR. The dairy versions elicit information on dairy enterprise production, inventories, expenses, assets, and technology use, as well as manure management and marketing practices. Further information on ARMS, including downloadable questionnaires, can be found at www.ers.usda.gov/Briefing/ARMS/.

Excess Nutrients and Manure Management Decisions

Data for the excess nutrient estimation were developed from ARMS, Phase III, version 1, which contains farm-level data on livestock inventories and crop acreage. The analysis focused on dairy farms in traditional production regions, where manure remains on the farm. Version 1, directed annually at all farms, covers several hundred dairy farms in each year, and a large sample could be obtained by drawing records for dairy farms in 11 States (IA, IL, IN, MI, MN, MO, NY, OH, PA, VT, and WI) from the 7 version 1 surveys carried out during 1996-2002. ARMS livestock inventory data were combined with external estimates of species-specific manure and nutrient production rates to generate estimates of manure-based N and P production on the farm. ARMS data on crop acreage were combined with external data on crop-specific nutrient uptakes to generate estimates of total nutrient uptake on the farm.

The data on manure management practices were drawn from the 2005 ARMS dairy version, which contained specific questions on those practices. The 2005 survey covered dairy farms in 24 States (listed above).