

Agricultural Processing: Wages and Productivity

One of the traditional ways in which economists measure the productivity of an industry is to examine Gross State Product (GSP) per worker. Higher values of GSP to worker is said to be indicative of a more productive industry. Neoclassical economic theory also tells us that as labor productivity increases, or GSP to worker, wages should also increase. Hence, if food processing in Wisconsin is becoming more productive, we should see increasing in wages.

After adjusting for inflation and placing all values in 2010 prices we can see a general upward trend in productivity as measured by GSP per worker (Figure 1). In 1969 food processing output was \$65,240 per worker which compares variably to the national average at \$62,067 but is significantly below the Great Lakes regional average of \$74,524. In 2011, the most current year for which data are available, GSP per worker increased by 48.1 percent in Wisconsin to \$96,593. But for the states in the Great Lakes region food processing GSP per worker increased by 63.8 percent to \$122,047 and for the U.S. it increased by 97.6 percent to \$122,661.

While there is a noticeable jump in worker productivity from 2009 to 2010 the growth for Wisconsin has basically been stagnant from 1983 to 2008. This is in contrast to the Great Lakes regional which experienced growth from 1979 to 2002 after which there was a noticeable decline then recovery. Nationally, the food processing industry experiences strong growth in productivity from 1996 to 2000 followed by stagnation till the strong growth in 2009-2010.

While the up and down-ticks in worker productivity can be explained in part by swings in commodity prices, the overall trends are reflective of changing markets for processed foods and technological changes. As the tastes and preferences of consumers have shifted more toward prepared meals the demand for pro-

In a 2009 study of the Wisconsin agricultural economy Deller and Williams documented that the food processing industry generates about 252,000 jobs and \$15.5 billion in income. This represents just over seven percent of all employment and just less than seven percent of all income in Wisconsin. In addition, the economic activity associated with food processing generated just over \$1 billion in state and local government revenues. This series of factsheets is aimed at helping better understand the food processing industry in Wisconsin and identify policies that may enhance the competitiveness of the industry.

Agricultural process manufacturing, such as cheese making, vegetable canning and freezing and breweries as well as wineries, remains an important part of the Wisconsin economy. Equally important, the products that are associated with food processing, in particular cheese and beer, are an integral part of the Wisconsinites self-identity. Curly Lambeau, one of the founders of the Green Bay Packers, used funding from his employer, the Indian Packing Company, a meat canning processor, to fund the early operations of the team. The Milwaukee Brewers are named in recognition of the city and state's long tradition in making beer.

Figure 1: Food Processing Gross State Product per Job Trends (Adjusted for Inflation, in 2010\$)

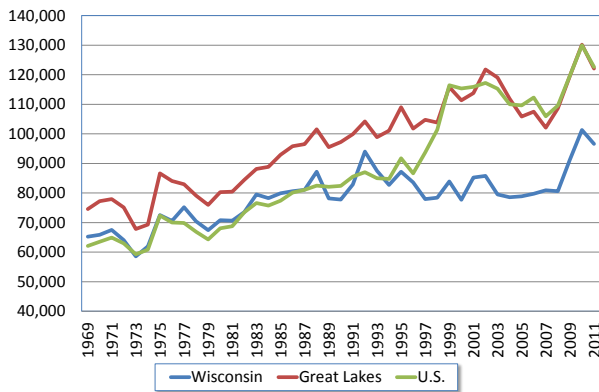


Figure 2: Food Processing Wages and Salary per Job Trends (Adjusted for Inflation, in 2010\$)

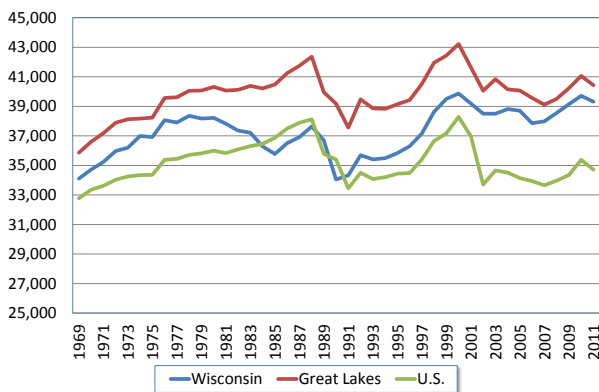
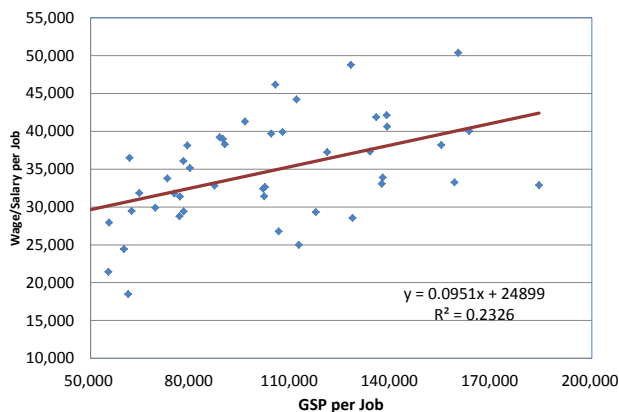


Figure 3: Food Processing Wage and GSP per Job



cessed foods and away from raw commodities has partially driven the growth in the industry. In addition, as in all manufacturing processes, the introduction of new technologies related to computerized mechanization has seen the growth in the demand for labor lag behind overall output. This has made the existing labor more productive.

But has this increase in labor productivity seen a corresponding increase in wages within the food processing industry? Again, adjusting for inflation and placing wages (and salaries) in 2010 prices or dollars, the typical worker in the food processing industry in Wisconsin earned \$34,103 in 1969 (Figure 2). This compares favorably to the U.S. average of \$32,780 but is below the Great Lakes average of \$35,868. While GSP per worker increased by 48.1 percent from 1969 to 2011, wages/salary per job increased by 15.3 percent to \$39,312. But when compared to wages/salary increases in the U.S. and the Great Lake States, Wisconsin performs well: for the Great Lakes the wage/salary per job increase by 12.7 percent to \$40,431 and for the U.S. the increase was only 5.9 percent to \$34,702.

If we construct a simple scatterplot of food processing wages/salaries per job and compare that to labor productivity measures by Gross State Product per job we do see that there is a positive relationship: higher productivity tends to be associated with higher wages. But the relationship is not as “strong” as one would expect. Specifically, labor productivity explains only 23.4 percent of the variation in wages. Given the slope of the simple scatterplot regression line, a 10 percent increase in labor productivity should see about a 5.7 percent increase in wages or salary. Thus, the modest growth in labor productivity in the Wisconsin food processing industry has restrained growth in wages.

References: Deller, Steven C. and Williams, David. 2009. “The Contribution of Agriculture to the Wisconsin Economy.” Department of Agricultural and Applied Economics Staff Paper No. 541. University of Wisconsin-Madison/Extension. (August). www.aae.wisc.edu/pubs/sps/pdf/