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Monitoring Farrowing Intentions from Quarterly Hogs and Pigs Reports

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Although there has been substantial consolidation in pork production, supply variability still affects prices. Farrowing intentions are a primary indicator of U.S. swine supplies. The U.S. Department of Agriculture’s National Agricultural Statistics Service (NASS) summarizes producers’ farrowing intentions and actual farrowings in Quarterly Hogs and Pigs reports.

When intentions or reported farrowings indicate large potential supplies, producers can adjust production levels, use the feeder pig market, or forward price to assure markets for their production. However, ways to monitor sow farrowing intentions and the accuracy of the reports have not been extensively studied. The purpose of this paper is to identify ways to gauge U.S. swine supplies using farrowing intentions. First, a discussion is presented on how to analyze a given quarterly report. Next, major trends in farrowing intentions are identified. Finally, the effects of imports and pig crops on supplies are discussed. If producers can improve their ability to assess the swine supply, they may be able to adjust farrowings and reduce business risk.

In the recently discontinued Monthly Hogs and Pigs reports, NASS gave breakdowns of monthly sow farrowings, pig crops, and sows bred. Because breeding is not always successful, monthly farrowings averaged 81 percent of the number of sows bred. Projected quarterly farrowings were obtainable by combining any reported monthly farrowings with those estimated from the number of sows bred. However, because of frequent revisions of monthly data once quarterly data was released, analysts criticized the monthly reports. The discontinuation of the monthly reports was accompanied by inquiries as to the reliability and accuracy of quarterly data.

Analyzing a Quarterly Report
NASS conducts a survey of producers early in the month that a quarterly report is to be released. Producers are asked for inventory levels as of the first of the month. They are also asked their farrowing levels for the previous quarter and farrowing intentions over the next two quarters. For example, the quarterly report released March 26, 2004 gave the second farrowing intentions of 2,852,000 head for the United States for the quarter March-May of 2004. The first intentions for the next quarter, June-August of 2004, were reported at a level of 2,851,000 head. These intentions can be compared to actual farrowing levels from the previous quarter or year to identify general trends in supply (Figure 1). Second intentions can be compared to first intentions to gauge any adjustments to price signals that occurred in recent months.

Actual farrowings during the December-February 2004 quarter of 2,814,000 head were above the first and second intentions for that quarter. Generally, pigs are slaughtered about 6 months or two quarters after being farrowed. Thus, more hogs will be marketed in the June-August 2004 quarter than had earlier been anticipated. The second intentions for the March-May 2004 quarter were higher than the first intentions for that quarter. Therefore, producers may have become more optimistic about profit prospects and chosen to expand. The first intentions for the June-August 2004 quarter can be compared to the previous quarter or to the same quarter a year earlier. The level of intentions says producers are keeping supply stable relative to the previous quarter, but still not to levels seen a year earlier. Potential market effects of intentions levels are routinely analyzed whenever quarterly reports are released in Livestock, Dairy, and Poultry Outlook.

Figure 1. Recent Actual and Intended Sow Farrowings.

Data from USDA-NASS
The gestation period for sows is about 4 months, meaning that any sows to farrow in the current quarter would already need to be bred. Producers will have decided a farrowings level by the time they report the second intentions for a quarter. To some extent, sampling error instead of adjusted production would be the likely cause of any deviations from second intentions and actual farrowings. A full year is necessary between the time a sow is bred and any offspring are slaughtered. Thus, producers would be looking for price signals from the most deferred and thinly traded futures contract months. Should supply contraction be warranted, hogs kept for breeding and sow slaughter can be monitored to quantify any reduction in herd size.

Reliability of Intentions

Runkle (1991) found that the intentions for the current quarter are unbiased, meaning that producers are as likely to overstate as to understate farrowings. Unbiased intentions are good from a producer standpoint, because it means the intentions can be used with confidence when making supply-related decisions. Runkle also found that the second intentions were biased, as producers tend to decrease farrowing levels when their intentions were above the average intentions of the sample and increase farrowing levels when their intentions were below the average.

Looking at a sample of farrowings from 1996 through 2003 shows that the intended and actual farrowings are positively correlated. Furthermore, the second intentions and actual farrowings are more strongly correlated than are the first intentions and actual farrowings. The strongest correlation, however, is actually between the first and second intentions. This observation is consistent with Runkle’s finding that the second intentions explain part of the variability of first intentions.

Farrowing intentions can be assessed using a calibration diagram where actual farrowings are plotted against the sets of intentions (Figure 2). The closer intentions are to actual farrowings, the closer the observations are to the diagonal line in the chart. When actual farrowings are above (below) intentions, observations will lie above (below) the diagonal. Each first intention observation has a second intention observation at the same horizontal position. The farrowing observations from the December-February 2004 quarter are found just above the horizontal line labeled “2,800”. Locate the intentions level on the horizontal axis (1st at 2,766,000 head and 2nd at 2,806,000 head) and the actual farrowings on the vertical axis at 2,814,000 head. The intentions changed in the expected direction and were above the diagonal. The most recent intentions are shown on the diagonal line at about 2,850,000 head.

Not surprisingly, the second intentions usually lie closer to the diagonal line than first intentions, i.e., second intentions are better forecasts of actual farrowings. Observations are equally likely to be above or below the diagonal and by a similar amount. The observations in the upper right-hand corner show the situation in 1998 when actual farrowings were high and above intentions. Thus, the calibration diagram is useful for assessing the level and any changes in actual farrowings relative to intended farrowings.

Additional Factors

Pig crop variability is an additional factor that influences U.S. swine supplies. Both farrowing levels (number of litters) and farrowing performance (pigs per litter) determine pig crops. Analysts can use pig crops in a “pipeline approach” to estimate supplies. Pig crops would need to be supplemented with any feeder pigs imported from Canada.

Finally, the relationship between prices and farrowing intentions needs to be further explored. Differences between actual farrowings and second intentions would likely correspond to changes in feeder pig prices and futures prices two quarters ahead. Adjustments between first and second intentions would correspond to changes in futures prices three quarters ahead. Surprising levels for first intentions would correspond to futures prices four quarters ahead. If futures a year out respond to first intentions, there would be enough time for producers to respond by adjusting farrowings.

References