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Effect of Feed Cost on the Economic Impact of PRRS

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Summary and Implications

Economic impacts based on PRRS associated losses as reported in a previous study were modeled with varying grain prices. Sensitivity tables show that as grain (feed) prices rise, the economic impact of disease events increases. As corn prices rise from $2.25/bu up to $5.00/bu, there is a $92.6 million increase in the cost of PRRS to US pork producers. Every $0.50/bu increase in corn price costs the pork industry $18.52 million in PRRS associated losses. In the PRRS-affected farm, for every $0.50/bu increase, the cost per litter increases $0.886, the cost per nursery pig increases $0.072/hd and the cost per finisher pig increases $0.405/hd. With corn at $2.50 to $5.00/bu the national impact is estimated at $594.19 to $686.77 million annually, or $5.94 to $6.87/hd marketed in the US. As feed prices rise, the value of improved health care also rises. As costs rise, it is imperative to continue efforts on disease control and prevention.

Introduction

Feed inputs traditionally represent 70% of the cost of raising pigs. Any activity that reduces the efficiency of feed conversion increases cost. Porcine Reproductive and Respiratory Syndrome (PRRS) virus is known to have an impact on pig growth, feed conversion and mortality as well as create reproductive losses in the sow herd. The year 2007 saw a great increase in the value of corn as well as resulted in much speculation on future prices. In light of energy demands and costs, it is foreseen that agricultural input costs will rise to a new level. Leading the increase in grain value is the increase in transportation costs and usage demands primarily spurred from biofuels production.

Materials and Methods

Previous Study

A previous study by the authors in 2005 first evaluated the impact of PRRS based on case studies and a Delphi survey. Production parameters for pigs affected by PRRS were compared to those not affected by PRRS. Costs of the disease were summarized for the breeding-farrowing phase, the nursery phase and finishing phase. Information collected by the USDA-National Animal Health Monitoring Systems 2000 study aided to apply the case study impacts and Delphi survey into national costs. The current study utilizes the case study losses to derive new impacts based on varying feed prices.

Feed Cost Sensitivity

In light of recent increases in grain prices, a sensitivity analysis was conducted to analyze the effect on feed price by phase. For an Iowa base, Omaha corn price was correlated with Illinois soybean meal (SBM) price to derive prices associated with selected cash corn. A simple regression for determining SBM price was determined to be: $SBM/ton = $121.11 + $31.13 * $corn/bu. Soybean meal price increases with corn price, as both offset the others supply and bid for limited acres.

Results and Discussion

Previous Study

Production efficiency impacts from the previous case study are summarized in Table 1. In the previous study, feed prices were based on corn at approximately $2.25/bu. The economic effect of PRRS in the breeding and farrowing phase was calculated to be $74.16 per litter on affected farms with $45.00 derived from a reduction in the number of pigs weaned per litter and $29.16 from reduced farrowing rate. In the nursery phase, the cost was estimated to be $6.01/hd with $3.58 due to increased mortality, $1.17 due to reduced feed conversion and $1.26 due to reduced average daily gain. In the finishing phase, the cost was estimated to be $7.67/hd with $3.23 due to increased mortality, $3.00 due to reduced feed conversion and $1.44 due to reduced average daily gain. At a national level, the impact was estimated at $560.32 million.

Effect of Feed Cost

The economic impact of PRRS for selected feed costs is summarized in Table 2. Under increasing grain prices, for every $0.50/bu increase in corn price, the cost of PRRS to the US pork industry increases by approximately $18.52 million per year. The sow herd impact is affected less by rising corn prices, as a higher portion of the production cost is fixed. The greater impact is in the nursery and finishing herds, where larger quantities of grain constitute production cost. In the PRRS-affected nursery, for every $0.50/bu increase, cost per pig marketed increases $0.072. In the affected finisher, costs rise $0.405 per head marketed. At the highest corn price utilized in the analysis ($5.00/bu), the cost of PRRS to US producers rises to $686.77 million. At $5.00/bu the impact per affected farm is $79.00 per litter in the farrowing phase, $6.41/hd marketed in the nursery and $9.91/hd marketed in the finisher. The aggregated national costs of PRRS under varying feed prices are summarized in Table 3.

Value of Health Care

Not only has the cost of feed increased due to an energy driven grain market, but it can be speculated that other farm input costs also rise. These costs include but are not limited to: transportation, labor, utilities, etc. As the cost of pork production rises, it is imperative to capitalize on all available efficiencies. As shown in Table 1, PRRS and other diseases cause substantial losses in production efficiencies. During times of increased input costs it is continually necessary to pursue best management practices and biosecurity to control and prevent disease. The value of veterinary services and improved health care measures rises. With the cost of PRRS between $7.91 ($2.50/bu corn) to $9.91 ($5.00/bu corn) per finishing pig marketed, efforts to control PRRS are worthwhile.

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Table 1. Summary of Pig Production Efficiency Impacts of PRRS – Case Study Farms

	Negative Group	Positive Group	Difference
Farrowing rate, %	79.36%	68.44%	-10.92
Pigs weaned/litter, #	9.13	7.63	-1.50
Litters/sow/yr, #	2.29	2.09	-.20
Nursery mortality, %	1.55	12.2	+10.65
Finishing mortality, %	3.64	9.69	+6.05

Table 2. Economic Impact of PRRS Outbreak for Selected Feed Cost.

Corn ($/bu):	**2.50**	**3.75**	**5.00**
SBM ($/ton):	**199**	**238**	**277**
Farrowing phase			
Reduced revenue per litter	$45.00	$45.00	$45.00
Reduced farrowing rate	29.57	31.73	34.00
Economic impact per litter	**$74.57**	**$76.73**	**$79.00**
Nursery phase			
Increased mortality	$3.58	$3.58	$3.58
Reduced feed efficiency	1.21	1.39	1.57
Reduced average daily gain	1.26	1.26	1.26
Economic impact per pig	**$6.05**	$6.23	**$6.41**
Grow-Finish phase			
Increased mortality	$3.23	$3.23	$3.23
Reduced feed efficiency	3.24	4.24	5.25
Reduced average daily gain	1.44	1.44	1.44
Economic impact per pig	**$7.91**	**$8.91**	**$9.91**

Table 3. Annual Cost of PRRS to the United States Swine Industry for Selected Feed Cost.

Corn ($/bu):	**2.50**	**3.75**	**5.00**
SBM ($/ton):	**199**	**238**	**277**
	(Million)		
Farrowing losses			
Reduced pigs weaned	$40.50	$40.50	$40.50
Reduced farrowing rate	$26.61	$28.56	$30.61
Nursery losses	$231.17	$238.05	$244.93
Finisher losses	$295.91	$333.32	$370.73
TOTAL	**$594.19**	**$640.43**	**$686.77**