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Cost of Organic Pork Production: A Seasonal Analysis and Needed Price Premium for Continuous Production

By

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Introduction

Niche markets of agricultural products are experiencing rapid growth. One such niche market is organic pork. Organic pork production is a relatively new and expanding segment of the pork industry. Similar to some other niche markets, it has also experienced rapid growth (Organic Trade Association).

It is well known that the cost of organic pork production is greater than for traditional pork production due to increased feed costs and decreased swine performance. The industry has dealt with this by paying premiums to induce producers to produce the organic product. However, it is not clear on what level or how the premiums should be paid to producers to provide an incentive to produce and market a steadier flow of product throughout the year. With premium structures currently used for organic pork production there are more hogs being produced using summer farrowing than with winter farrowing. This uneven pig flow causes instability of supply and creates product flow problems throughout the industry. This instability can lead to problems of slaughter capacity scheduling and/or utilization as the industry grows and matures. Also, at certain time periods the demand for fresh organic pork products may not be met. During other times, the availability of fresh organic pork may exceed demand. These issues create problems for a developing industry, which is attempting to establish and maintain a reliable consumer base.

The objective of this report is to evaluate alternative premium payments and structures for organic pork production. Structured properly, premiums provide adequate incentives for increased winter farrowing and a more even flow of fresh pork products available to consumers throughout the year. This report addresses the issue by examining the increase of costs involved in expanding a seasonal (summer only farrowing) organic pork

production system to continuous production of organic hogs. Previous studies by Becker et. al., Larson et. al. (1998), and Honeyman et. al., provides an initial analysis of a seasonal system. A seasonal and a continuous system of production are used to provide a basis to determine cost differences between the two types of production systems. It is also necessary to examine the production cost differences between the summer and winter periods of a continuous system to establish a basis for differences in premiums paid between winter and summer farrowed hogs within a continuous system. The final issue addressed is a comparison of premium payment alternatives.

This report first describes the flow of pigs through the two systems, the facilities, the breeding herd that is required for each system and how the two systems work. Pig marketing patterns and labor needs are provided for each system. This information along with the total cost break down is needed in order to provide an analysis of the premiums required to induce a more uniform level of organic pork production throughout the year, and the overall feasibility of the systems.

Production Flow

The seasonal system (summer farrowing only) is a system with four farrowings annually with three groups of 80 females. Two groups are gilts, and the third group is sows. Figure 1 demonstrates the movement of hogs within the seasonal system. The system is designed to farrow two groups of gilts, one farrowing in June and the second farrowing in July. Following weaning, fifty percent of the gilts are retained to establish a group of sows to be farrowed two more times the following year. These are farrowed in the April and the September/October time periods. These gilt groups are retained from the previous year's June and July farrowings. Finishing is in hoop buildings. The gilts from the previous June

and July farrowings are gestated and bred in the hoops after the other finishing hogs from that group are sold. Sows are gestated in 12 foot by 20 foot portable sheds. All sows are sold after the third litter. Farrowing occurs in individual sheds on hay acreage or on acreage with recently harvested small grains. Market hogs are sold at 250 pounds. The amount of time the pigs are on feed etc. is based on the ISU Life Cycle Swine Nutrition.

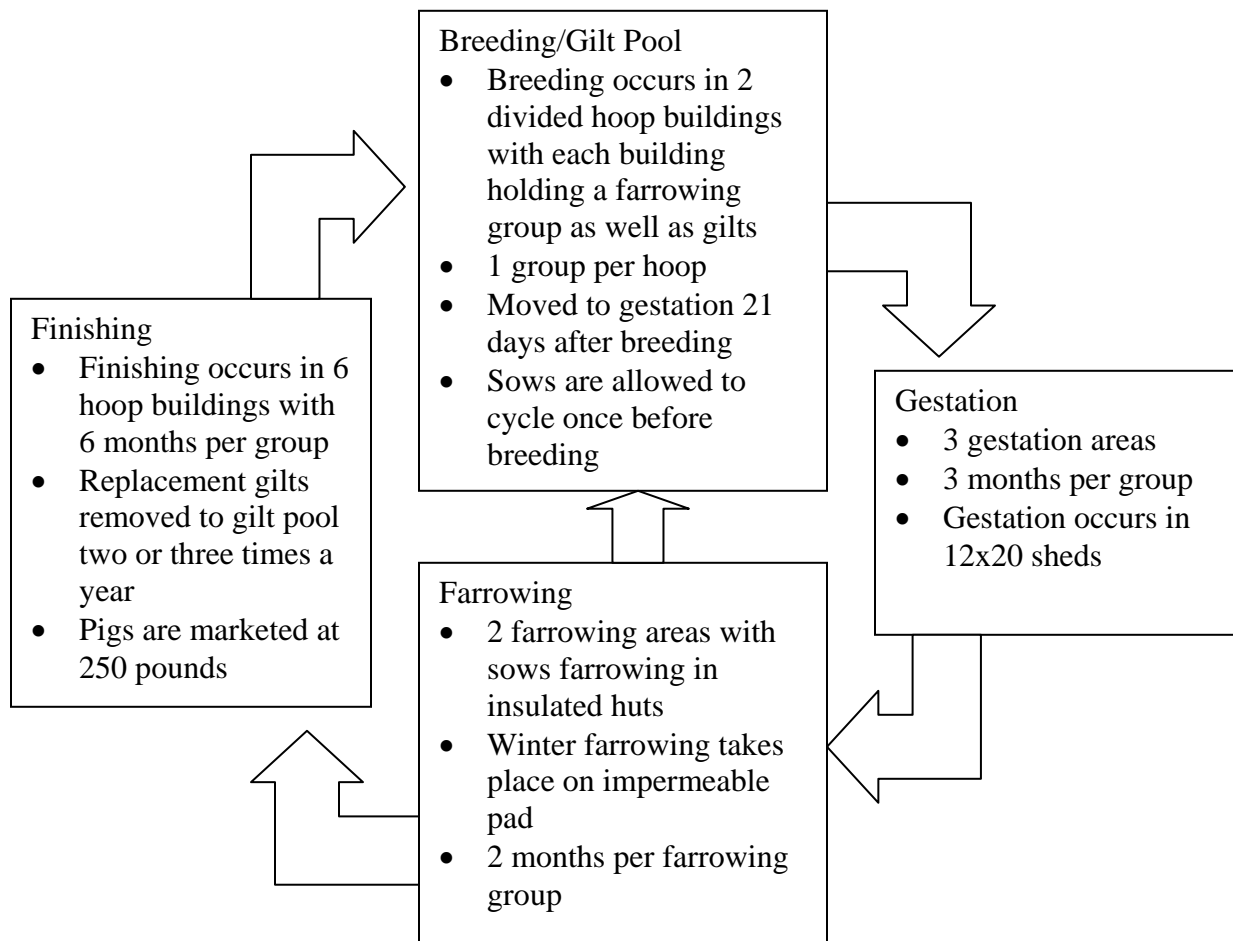
Figure 1. Pig Flow for Seasonal (Summer Farrow) Organic Pork Production System

Sow-Second Litter Farrow April Group 1	Gilts First-Litter Farrow June & July Groups 2 & 3	Sow-Third Litter Farrow Sept./Oct. Group 4
Breeding <ul style="list-style-type: none"> Breeding occurs Nov/Dec 80 2nd litter sows retained from farrow groups 2 & 3 from the previous year Breeding occurs in 12 x 20 portable sheds 	Breeding <ul style="list-style-type: none"> Breeding occurs in February Group 2 and March Group 3 2 groups of 80 gilts from offspring of prior year's farrow groups 2 & 3 Breeding occurs in the finishing facilities from the previous years group 2 & 3 	Breeding <ul style="list-style-type: none"> Breeding occurs in June 80 3rd litter sows from farrowing group 1 with some 1st liter gilts replacing non breeders Breeding occurs in the finishing facilities from farrowing groups 2 & 3
↓	↓	↓
Farrowing <ul style="list-style-type: none"> Farrowed late March/early April Farrowed in individual huts 	Farrowing <ul style="list-style-type: none"> Farrowed June & July Uses individual huts + group lactation ½ gilts sold ½ kept for next years farrow group 1 	Farrowing <ul style="list-style-type: none"> Farrowed late Sept./early Oct. All females sold after farrowing
↓	↓	↓
Finishing/Gestation <ul style="list-style-type: none"> Finishing occurs in 3 hoops which are also used for group 4 Gestation occurs first in the finishing area for groups 2 & 3 until Aug. when they are transferred to 12 x 20 sheds Sows bred for farrowing group 4 Pigs are marketed at 250 pounds 	Finishing/Gestation <ul style="list-style-type: none"> Finishing occurs in 6 hoop buildings which also serve as gestation area for the gilts before breeding Post farrow gestation occurs in 12x20 sheds 80 females retained for next years group 1 farrowing 80 females sold Pigs are marketed at 250 pounds 	Finishing <ul style="list-style-type: none"> Finishing occurs in 3 hoops which are also used for group 1 Sows remain in individual huts until they are dry and then sold Pigs are marketed at 250 pounds

The continuous system has six groups of 25-30 (average of 27) females farrowing twice per year. Farrowing occurs every month. Figure 2 demonstrates the pig flow of the

continuous system. This system creates a relatively even pig flow and distribution of labor needs since the sows are farrowed every month. During the winter months, farrowing occurs in individual insulated huts on an impermeable pad such as asphalt or concrete so that snow removal is made easier and mud problems are reduced. Finishing and breeding occurs in hoops. Gestation occurs in 12 foot by 20 foot portable sheds. Market hogs are sold at 250 pounds.

Figure 2. Pig Flow for Continuous Organic Pork Production System



Facility and Breeding Herd Investments

Facility and equipment investment information is provided in Table 1 for the seasonal production system and in Table 2 for the continuous production system. Investment is based on new facilities and equipment, etc. for both systems. The land charge is valued at \$150 an acre annually, which reflects the cash rent value of land. The amount of land reflects the number of acres devoted to the system minus the land that was double cropped either before or after early or late farrowing. Facilities are charged 9 percent interest on the average total investment. It should be noted that the facility investment level will be higher than that for the many current operators due to the use of new facility values. However, this will not create a difference in the relative comparison of the two systems as both systems are treated consistently or with new facilities. Additionally, valuing the two systems at new value provides a comparison of the full economic costs. Total facility and equipment investment for the seasonal system was \$273,150 (Table 1) compared to \$287,012 (Table 2) for the continuous production system. Annual investment cost for each system was \$48,622.32 and \$51,340.11, respectively.

Gilt prices are set at \$175 for both systems with boars priced at \$750. This amount covers opportunity cost of sales as well as costs for additional swine movement when the gilts are required to be separated for limit feeding. Breeding herd investment for the seasonal system is provided in Table 3 (\$39,894). Table 4 provides the breeding herd investment for the continuous systems (\$30,708). Both are reduced by the cull annual revenue to provide a net annual investment cost of \$19,680.95 and \$16,970.28, respectively. Annual costs were calculated by dividing the number of sows by the number of years in service then multiplying by the value of the sows. Numbers of cull animals were also determined by dividing by the

Table 1. Facility and equipment investment for seasonal organic pork production.

Production Phase	Number	Cost per Unit	Life Span	Total	Annual Cost
Gestation					
10x20 Sheds	8	\$1,000	7	\$8,000	\$1,142.86
Electric fencer	1	\$200	5	\$200	\$40.00
Battery	1	\$60	3	\$60	\$20.00
Electric Wire (roll)	3	\$50	5	\$150	\$30.00
Heavy Steel Posts	25	\$3	5	\$75	\$15.00
Small Steel Posts	100	\$2	3	\$150	\$50.00
Insulators (25)	4	\$12	3	\$48	\$16.00
Water Tank	6	\$250	5	\$1,500	\$300.00
Floats Connectors	3	\$20	5	\$60	\$12.00
Pipe (ft)	900	\$0.30	5	\$270	\$54.00
Self Feeders	8	\$600.00	10	\$4,800	\$480.00
Breeding/Gestation					
12x20 Sheds	5	\$1,000	7	\$5,000	\$714.29
Handling Facilities	1	\$2,500	7	\$2,500	\$357.14
Finishing					
40x60 Hoop	9	\$13,000	7	\$117,000	\$16,714.29
Scale	1	\$1,500	10	\$1,500	\$150.00
Handling facilities	1	\$1,500	7	\$1,500	\$214.29
Farrowing					
Individual Sheds	80	\$100	7	\$8,000	\$1,142.86
10x20 Sheds	8	\$1,000	7	\$8,000	\$1,142.86
Electric fencer	1	\$200	5	\$200	\$40.00
Heavy Steel posts	25	\$3	5	\$75	\$15.00
Battery	1	\$60	3	\$60	\$20.00
Steel Posts	50	\$3	5	\$150	\$30.00
Insulators (25)	6	\$12	3	\$72	\$24.00
Electric Wire	4	\$50	5	\$200	\$40.00
Water Tank	6	\$250	5	\$1,500	\$300.00
Floats Connectors	3	\$20	5	\$60	\$12.00
Pipe (ft)	900	\$0.30	5	\$270	\$54.00
Self Feeders	15	\$600.00	10	\$9,000	\$900.00
Misc.					
Tractor	1	\$65,000	10	\$65,000	\$6,500.00
Hydraulic Cart	1	\$5,000	10	\$5,000	\$500.00
Grinder Mixer	1	\$10,000	10	\$10,000	\$1,000.00
Bulk Bins	5	\$1,500	10	\$7,500	\$750.00
Land Acres	18	\$150	1	\$2,700	\$2,700.00
4 Wheeler	1	\$5,000	10	\$5,000	\$500.00
Manure Spreader	1	\$8,000	10	\$8,000	\$800.00
Total Investment				\$273,150	\$36,330.57
Interest	9%				\$12,291.75
Total Seasonal Interest and Investment					\$48,622.32

Table 2. Facility and equipment investment for continuous organic pork production.

Production Phase	Number	Cost per Unit	Life Span	Total	Annual Cost
Gestation					
10x20 Sheds	9	\$1,000	7	\$9,000	\$1,285.71
Electric fencer	1	\$200	5	\$200	\$40.00
Battery	1	\$60	3	\$60	\$20.00
Electric Wire (roll)	3	\$50	5	\$150	\$30.00
Heavy Steel Posts	25	\$3	5	\$75	\$15.00
Small Steel Posts	100	\$2	3	\$150	\$50.00
Insulators (25)	5	\$12	3	\$60	\$20.00
Water Tank	6	\$250	5	\$1,500	\$300.00
Floats Connectors	3	\$20	5	\$60	\$12.00
Pipe (ft)	900	\$0.30	5	\$270	\$54.00
Self Feeders	9	\$600.00	10	\$5,400	\$540.00
Breeding					
40x60 Hoop	2	\$13,000	7	\$26,000	\$3,714.29
12x20 Sheds	4	\$1,000	7	\$4,000	\$571.43
Handling facilities	1	\$2,500	7	\$2,500	\$357.14
Finishing					
40x60 Hoop	6	\$13,000	7	\$78,000	\$11,142.86
Scale	1	\$1,500	10	\$1,500	\$150.00
Handling facilities	1	\$1,500	7	\$1,500	\$214.29
Farrowing					
Insulated individual sheds	60	\$600	7	\$36,000	\$5,142.86
Electric fencer	1	\$200	5	\$200	\$40.00
Battery	1	\$60	3	\$60	\$20.00
Heavy Steel Posts	25	\$3	5	\$75	\$15.00
Steel Posts	50	\$3	5	\$150	\$30.00
Insulators (25)	6	\$12	3	\$72	\$24.00
Electric Wire	4	\$50	5	\$200	\$40.00
Water Tank	6	\$250	5	\$1,500	\$300.00
Floats Connectors	3	\$20	5	\$60	\$12.00
Pipe (ft)	900	\$0.30	5	\$270	\$54.00
Winter Pad (square feet)	5200	\$2.50	10	\$13,000	\$1,300.00
Self Feeders	3	\$600.00	10	\$1,800	\$180.00
Misc.					
Tractor	1	\$65,000	10	\$65,000	\$6,500.00
Hydraulic Cart	1	\$5,000	10	\$5,000	\$500.00
Grinder Mixer	1	\$10,000	10	\$10,000	\$1,000.00
Bulk Bins	5	\$1,500	10	\$7,500	\$750.00
Land Acres	18	\$150	1	\$2,700	\$2,700.00
ATV	1	\$5,000	10	\$5,000	\$500.00
Manure Spreader	1	\$8,000	10	\$8,000	\$800.00
Total Investment				\$287,012	\$38,424.57
Interest	9%				\$12,915.54
Total Seasonal Interest and Investment					\$51,340.11

number of years in service. A four percent death loss was calculated on all breeding animals. There was an allowance of ten extra gilts for the seasonal system and five extra gilts for the continuous system. The number of boars was determined by estimating the number needed to service the sows in the different time periods. While the seasonal system

Table 3. Seasonal Organic Pork Production System Breeding Herd Investment.

Item	Number	Value	Years in Service	Annual Costs
Sows	80	\$175	2	\$7,000.00
Boars	20	\$750	2	\$7,500.00
Gilts	90	\$175	1	\$15,750.00
Gilts	80	\$175	2	\$7,000.00
Sub total				\$37,250.00
Interest	9%			\$2,643.75
Total				\$39,894

Breeding Herd Cull Revenue

	Number	Weight	Revenue	Total Revenue
Sows	76.80	400	\$0.30	\$9,216.00
Boars	9.6	550	\$0.25	\$1,320.00
Gilts	86.40	320	\$0.35	\$9,676.80
Total				\$20,212.80

Breeding Herd Net \$19,680.95

Table 4. Continuous Organic Pork Production System Breeding Herd Investment.

Item	Number	Value	Years in Service	Annual Costs
Sows	162	\$175	1.5	\$18,900.00
Boars	12	\$750	2	\$4,500.00
Gilts	59	\$175	2	\$5,162.50
Sub total				\$28,562.50
Interest	9%			\$2,145.38
Total				\$30,708

Breeding Herd Cull Revenue

	Number	Weight	Revenue	Total Revenue
Sows	103.68	400	\$0.30	\$12,441.60
Boars	5.76	550	\$0.25	\$792.00
Gilts	4.80	300	\$0.35	\$504.00
Total				\$13,737.60

Breeding Herd Net \$16,970.28

has almost three times as many sows to be bred at one time they are not bred in as narrow of a window since there is adequate space to farrow over a full month. The seasonal system requires 20 boars to breed 80 sows over a one-month period. The continuous system uses twelve boars, which average breeding 27 sows in roughly one week. The continuous system requires fewer boars per litter, because there are more breeding periods and there are fewer sows to be bred per breeding period.

Market Hog Flow and Labor Distribution

A major problem with the seasonal production system is the uneven flow of market hogs. There is not a continuous flow of hogs to market to provide a uniform supply of fresh pork. Figure 3 provides information on the number of finishing hogs sold by month of the year for the seasonal and continuous systems. This clearly shows that for the seasonal system there is a shortage of organic pork production from May through August and a relatively large supply in January and December. The flow of pigs to market ranges from 420 in December and in January to no pigs in June and July. This underscores the problem with the seasonal system in providing processors as well as consumers a more uniform quantity of fresh pork products. The processor does not have a constant flow of slaughter hogs and thus there is not a consistent supply of fresh pork for consumers. The continuous system has a relatively constant pig flow, which would provide a more even flow of fresh pork. The flow of pigs ranges from 155 in June to 180 pigs per month in November through March.

Death loss and pigs per litter is provided in Table 5. As seen, the number of pigs per litter is lower for the winter farrowing than summer farrowing period. Mortality is also

greater for the winter farrowing time. The number of pigs finished per litter is .6 per pig less for the winter season than the summer season.

The distribution of labor needs is also an important consideration in the two systems. The seasonal production system uses ten hours of labor per litter on average per litter, whereas the continuous system uses 12 hours per litter during the summer and 14 hours per litter during the winter. However, the labor distribution is considerably different during the year because the bulk of the seasonal farrowing hours are spent during the summer. Continuous organic pork production can provide a more even distribution of labor needs. Although the labor required is greater for the continuous system, this could be an advantage if the producer's labor pool is currently underutilized. Additionally, the labor needs are more uniformly distributed throughout the year. Labor needs ranged from 5.1 to 12.7 hours per day in the seasonal system, whereas the continuous system has 10.5 hours per day during the summer and 12.2 during the winter (Figure 4). This provides the potential for added revenue for producers by more fully using their existing labor. It is important to use as much of the available labor as possible because it is not a storable resource. The seasonal system exhibits a more variable labor need. The seasonal system would be beneficial if it were possible to coordinate it with offsetting labor needs during the low labor need time period (November through February).

Table 5. Death loss and pigs per litter by organic production system.

Item	Seasonal	Continuous	Continuous Summer	Continuous Winter
Pigs per litter	8.61	8.46	8.61	8.32
Pre wean mortality	9.1%	9.9%	9.1%	10.7%
Pigs weaned per litter	7.83	7.63	7.83	7.43
Nursery mortality	7.41%	8.23%	7.41%	9.09%
Grower mortality	7.00%	8.00%	7.00%	9.07%
Finishing mortality	1.08%	1.09%	1.08%	1.10%
Pigs finished per litter	6.67	6.37	6.67	6.07

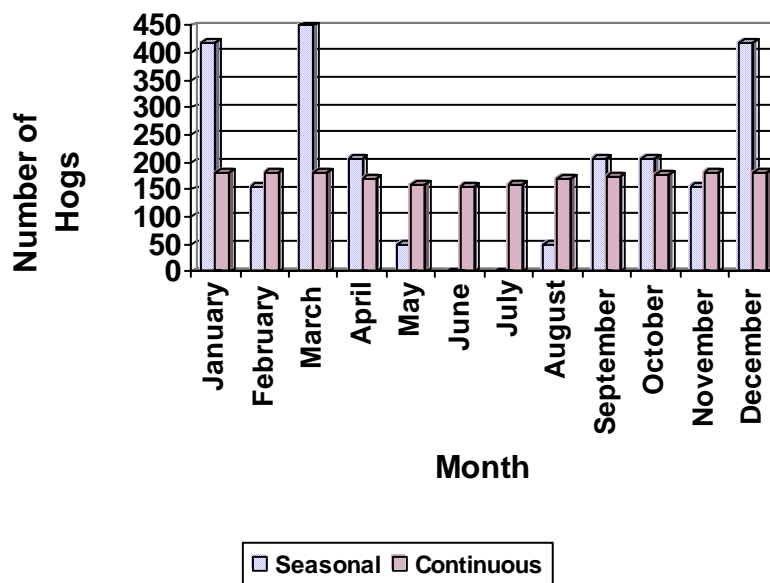


Figure 3. Number of Organic Hogs Sold by Month in Continuous System and Seasonal Summer Only Farrow Production System

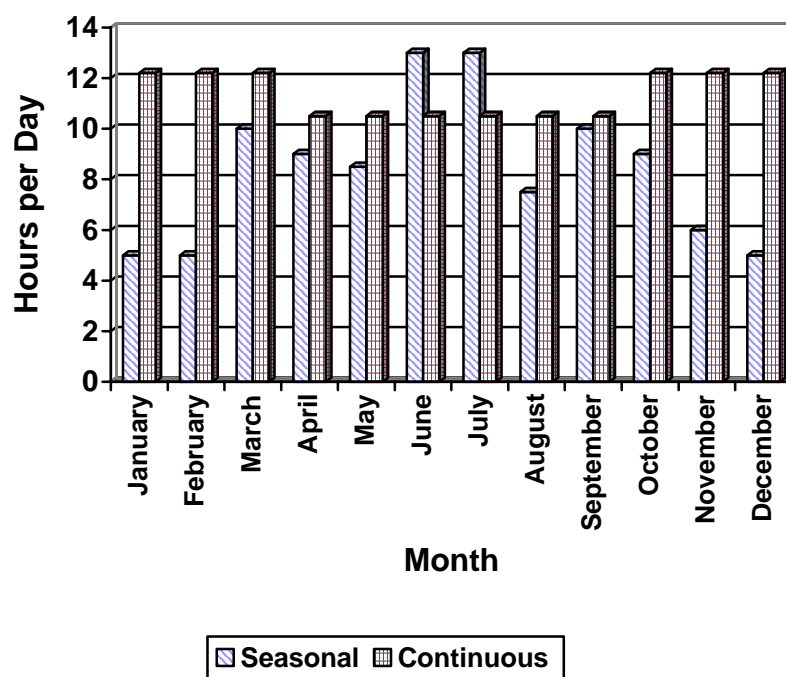


Figure 4. Labor Hours Per Day for Continuous Farrowing and Seasonal Summer Farrowing Organic Pork Production

Results and Discussion

Information provided in Table 6 summarizes organic pork production costs for the seasonal production system and the continuous production system. Costs from an organic budget previously prepared by Becker, Kliebenstein, and Honeyman were adjusted for additional costs for winter-farrowed organic hogs such as iron and a decrease in pigs farrowed and marketed. Ration costs per pound are as follows: 10.9 cents for the nursery phase, 9.3 cents for the grower phase, 8.0 cents for the finishing phase, 8.8 cents for the lactation phase, and 7.3 cents for the gestation phase. Winter feeding uses 10 percent more feed to produce a pound of gain. This result is what has been shown over time at the Iowa State University Rhodes Research/Demonstration Farm (Larson et. al. 2002). The overall feed efficiency used for the seasonal system is 3.89 lbs. of feed per pound of gain. It is 4.00 for the continuous system. Bedding use was taken, in part, from current research on hoop buildings at the Iowa State University Rhodes Research Farm with bedding costs added for farrowing and increased for winter farrowed groups. Annual repairs were set at 10 percent of the initial facility price. Record keeping was set at \$5,000/year for each system due to the requirements for maintaining records for organic audits as well as a mandatory 1 percent charge on sales revenue for hogs sold organically. Labor was placed at \$10.00/ hour and was set at 13 hours/litter for the continuous system (12 in the summer and 14 in the winter) and 10 hours/litter for the seasonal system. This difference is due to increased cleaning required for the floored insulated sheds, smaller batch sizes of feed prepared, increased snow removal, and additional winter farrowing care.

The cost of production per hundred pounds was \$63.88 for pigs from the continuous system compared with \$59.45 for the seasonal system, a difference of \$4.43 per hundred

pounds or \$11.08 per 250 pound market pig (Table 6).

It is also necessary to compare production costs between the winter and summer seasons for the continuous production system. Table 7 provides a comparison of production costs for the winter farrowed (October-March) and the summer farrowed pigs (May to September) within the continuous production system. The largest difference between systems is the labor costs with a \$5.07 per head difference. The facilities, which differ by an impermeable pad provided for winter farrowing is the second largest cost difference at \$4.87 per pig due largely to the fact that there is a 0.3 difference in pigs finished per litter. Winter farrowed pigs have also \$0.89 more in feed costs than the summer-farrowed pigs. This result

Table 6. Organic pork production costs for seasonal and continuous production.

Item	Continuous Farrowing		Seasonal (Summer Farrowing)		
	Total	Per Head	Total	Per Head	Difference
Variable Costs					
Feed	\$179,490	\$86.97	\$175,872	\$83.71	\$3.26
Health costs	\$1,032	\$0.50	\$735	\$0.35	\$0.15
Bedding	\$10,319	\$5.00	\$8,929	\$4.25	\$0.75
Repairs	\$3,842	\$1.86	\$3,633	\$1.73	\$0.13
Record keeping	\$5,000	\$2.42	\$5,000	\$2.38	\$0.04
Fuel/Utilities	\$4,128	\$2.00	\$3,152	\$1.50	\$0.50
Subtotal	\$203,812	\$98.75	\$197,322	\$93.92	\$4.84
Interest	\$10,191	\$4.94	\$9,866	\$4.70	\$0.24
Labor	\$42,120	\$20.41	\$31,500	\$14.99	\$5.42
Breeding herd	\$16,970	\$8.22	\$19,681	\$9.37	(1.14)
Trucking	\$5,160	\$2.50	\$5,253	\$2.50	\$0.00
Total variable	\$278,252	\$134.82	\$263,621	\$125.47	\$9.35
Fixed costs	\$51,340	\$24.88	\$48,622	\$23.14	\$1.73
Total	\$329,592	\$159.70	\$312,244	\$148.61	\$11.08
Total hogs sold	2,064		2,101		
Total weight sold	515,970		525,263		
Production cost/cwt		\$63.88		\$59.45	
Total production cost difference per hundred pounds			\$4.43		

may, at first, appear as low but the winter-farrowed pigs are in the grow-finish phase during the spring and summer months. The breakeven production costs per hundred pounds was \$66.92 for the winter-farrowed pigs compared with \$61.11 for the summer-farrowed pigs, a difference of \$5.81 per hundred pounds or \$14.51 per market pig.

Table 8 provides a summary of the production costs (breakeven prices) of the two systems as well as the breakeven values for the summer- and winter-farrowed pigs within the continuous production system. The lowest cost is with the seasonal system or summer only farrowing. The highest cost occurs for the winter-farrowed pigs.

Table 7. Organic pork production costs for continuous production winter vs. summer.

Item	Winter Farrowing		Summer Farrowing		
	Total	Per Head	Total	Per Head	Difference
Variable Costs					
Feed	\$85,977	\$87.43	\$93,513	\$86.54	\$0.89
Health costs	\$671	\$0.68	\$361	\$0.33	\$0.35
Bedding	\$5,418	\$5.51	\$4,902	\$4.54	\$0.97
Repairs	\$1,921	\$1.95	\$1,921	\$1.78	\$0.18
Record keeping	\$2,500	\$2.54	\$2,500	\$2.31	\$0.23
Fuel/Utilities	\$2,476	\$2.52	\$1,651	\$1.53	\$0.99
Subtotal	\$98,963	\$100.64	\$104,840	\$97.03	\$3.61
Interest	\$4,948	\$5.03	\$5,242	\$4.85	\$0.18
Labor	\$22,680	\$23.06	\$19,440	\$17.99	\$5.07
Breeding herd	\$8,485	\$8.63	\$8,485	\$7.85	\$0.78
Trucking	\$2,458	\$2.50	\$2,701	\$2.50	\$0.00
Total variable	\$137,535	\$139.86	\$140,718	\$130.23	\$9.64
Fixed costs	\$26,970	\$27.43	\$24,370	\$22.55	\$4.87
Total	\$164,505	\$167.29	\$165,088	\$152.78	\$14.51
Total hogs sold	983		1,081		
Total weight sold	245,835		270,135		
Production cost/cwt		\$66.92		\$61.11	
Total production cost difference per hundred pounds			\$5.81		

Organic pork production costs vary by season of the year, and by type of production system. Production cost, on average, for a continuous system is \$4.43 per hundred pounds over the seasonal or summer system. Production cost during the winter is \$7.47 per hundred pounds over the seasonal system. Given these differences in production, the premium structure established could encourage or discourage a more even supply of fresh organic pork

Table 8. Comparison organic pork production costs (\$) by system and season.

System or Season	Cost Per Pig	Cost Per cwt	Difference from Seasonal
Seasonal	\$148.61	\$59.45	
Continuous	\$159.70	\$63.88	\$4.43
Winter continuous	\$167.29	\$66.92	\$7.47
Summer continuous	\$152.78	\$61.11	\$1.66

throughout the year. The cost structure can provide insight into the necessary premium structure which would encourage production during the high-cost periods. There are several issues involved in determining how and when to pay premiums to organic swine producers.

These would include:

- Establishing a premium that would encourage producers to adapt to continuous organic pork production providing a more even supply of fresh organic pork products.
- Establishing a premium that would minimize the chances or opportunities for producers to abuse the system.
- Establishing a premium that adjusts or moves with changes in production costs.
- Establishing a premium system that provides benefits to the producers as well as the processor.

Summary and Conclusions

This study has shown that it costs more to produce organic pork with a continuous production system than with a seasonal system. Production costs are seasonal. Moreover,

they differ by production systems. To foster a uniform supply of fresh organic pork throughout the year, premiums received by producers need to reflect these production cost differences. If not, there will be a tendency to overproduce during the summer farrowing season and under produce during the winter farrowing season. The flow of pigs to market is much more even for the continuous system ranging from approximately 155 to 181 pigs per month, a difference of 14 percent. For the seasonal system, it ranges from 0 to 420 pigs per month, a much larger difference. For the seasonal system, there were 2 months where there were no hogs marketed; 2 other months produced approximately 50 pigs with the seasonal system. Forty percent of the fresh pork is available in 2 months (December and January) with the seasonal system. The continuous system provides a much more consistent supply of fresh pork throughout the year.

It is also shown that cost increases incurred by producers in moving from a seasonal (summer only) farrowing system to a continuous farrowing organic production system can be significant. While there is little doubt that incentives must be provided in order to encourage producers to shift to continuous production practices there is still some question as to how to properly allocate these premiums. These cost comparisons show that cash flow difficulties can be created if premiums do not reflect seasonal differences in production costs.

Moreover, if premiums do not reflect production cost differences they can encourage overproduction during one time period and underproduction during another. Premium systems that are designed according to season allow the premiums to change according to shifts in production costs and demand which would encourage producers to more clearly mirror the market conditions.

One of the key questions involved in the relevance of the production cost projections is the scale of production used. The production system that was developed in this study is larger than many of the organic operations which are currently in use. We would point out that information is provided as a per pig comparison. Thus, the values can be adjusted to fit alternative sizes of production systems. For example, the system could easily be reduced to half of the current size with very little added per pig cost by reducing the size of the groups of sows which are being farrowed by 50 percent in the continuous system and by reducing sow numbers in the seasonal system. These adjustments would not have a significant impact on the difference of costs if a smaller system was selected. The facilities are not capital intensive and there are not significant economies of size for building construction. Facility costs represent about 15-16 percent of production costs.

To effectively manage a stable flow of pigs, it would be best to provide premiums for an established number of pigs each month. Additionally, premiums should reflect seasonal production cost differences. If the premiums reflect differences in production costs, production costs for continuous organic production are \$4.43 per hundred pounds over seasonal organic production. It was \$59.45 for the seasonal system and \$63.88 for the continuous system. Summer continuous production is \$1.66 over seasonal production, whereas winter continuous production is \$7.47 over seasonal production. The continuous system had a production cost of \$61.11 for the summer farrowed pigs and \$66.92 for the winter farrowed pigs. Additionally, premiums which are an established percentage of cost of production, allow for automatic adjustments that follow the base cost of production. These premiums move in anticipation to changes in the base production cost. The base production cost changes with increases or decreases in input cost such as feed.

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