

Case Study: 150 Pair Cow-Calf Indoor Facility

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Case History: 150 Pair Cow-Calf Indoor Facility

Located in Western Illinois, this facility was built in November 2016. It is 100 feet wide x 252 feet long, including a working area. The total investment was \$450,000 or \$3,000 per pair. There are three pens with 50 cows per pen. Two 150 head groups are calved each year.

In developing this case history, the 11 following areas were evaluated to determine if they add to or detract from profitability and a 12th factor was added which is additional property tax and vaccine cost.

1. Potentially Longer Cow Life

This producer did not feel there was a measurable addition to cow life. As a slight disadvantage, the cows get less exercise but over the life of the cow it probably helps more than hurts.

2. Feed and Pasture Cost Savings

In relation to feed costs, the indoor facility helps with cost savings. The ration is wheat bales, mineral and alfalfa. The cost per head per day is outlined below.

- Wheat \$.57 per head per day
- Mineral \$.15 per head per day
- Alfalfa \$.12 per head per day

Total is \$.84 per head per day. This compares to custom pasture cost previously of \$1.60 per head per day plus other feed at a comparable cost.

Comparing to a \$1.20 per head per day cost as estimated by Iowa State University, this is a total savings of \$131 per head over conventional costs.

The wheat bales include baling, wrapping, and grinding cost. Soybeans are then planted in the wheat stubble after the wheat bales are made. Approximately 120 acres of wheat are used. The wheat is baled just as the heads begin to show.

3. Calf Weaning Weight Improvement

This is not calculated by this producer as of yet.

4. Additional Manure Value

This producer is able to spread manure 80 acres at an estimated value of \$40 per acre or \$21 per cow.

5. Improvement in Conception Rates

This producer has always had good conception rates so no change.

6. Estrous Synchronization & Timed AI Advantage

This is a large factor for the producer as they raise embryos from the herd. They have a 50% stick rate and then use bulls for cleanup. The bull bred cows lose 1 $\frac{3}{4}$ cycles or 36.75 days of growth. At 1.1 pounds per day they are losing 40.3 pounds and at \$1.80 per pound totals \$73 per head.

In addition, the embryo calves are sold for \$1,750 per head at weaning. Estimated value per pair is \$100, which is very conservative.

7. Labor Savings or Additional Cost

It is estimated that there is a 15% increase in labor requirements which cost approximately \$21 per head based on a total labor cost per pair of \$140. (ISU data)

8. Capitalizing on Higher Seasonal Prices by Shifting Calving Season

This is definitely an advantage as there are two groups of cows calving each year. The fall calves are in the barn 4 months and the winter calves are in the barn 7 to 8 months and spend the rest of the time in open lots. This allows the producer to have cattle to sell at the peak seasonal price which is 6% higher than the low seasonal price.

9. Decreased Calf Mortality Rate

Live calves at 45 days old increased from 92- 93% to 97 %. With calf value at \$949 this amounts to \$42.69 added value.

10. Need for less Clean Up Bulls

One clean up bull is used per 50 cow pen, or 6 bulls for 300 cows which is half the bulls needed compared to conventional systems.

11. Increased Cow Salvage Value

An estimated 100 pounds per cow on salvage value is used as cows gain better in confinement as opposed to outside lots.

12. Property Tax and Vaccine Cost

\$5,000 cost was used for property tax and \$10 additional vet med cost due to more exposure to bacteria during late season calving.

Return on Investment

Using the attached Profitability Worksheet, the increased value per pair is \$406

\$406

\$3,000 investment per pair =14% (based solely on impact to operation by facility)

Credits and Disclaimer

This document was developed under contract to Summit Livestock Facilities, Remington, IN, by Moe Russell, Co-Founder of Russell Consulting Group, Panora, IA. **March 2018.**

Case Study: 300 Pair Cow-Calf Indoor Facility

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Case History: 300 Pair Cow-Calf Indoor Facility

Located in Southeast Nebraska, this facility was completed in 2014. It is 100 feet wide x 360 feet long, including a working area. The total investment was \$3,000 per pair. There are four pens with 72 cows per pen, 36 at each side bunk during calving which totals 288 cows.

In developing this case history, the 11 following areas were evaluated to determine if they add to or detract from profitability and a 12th factor was added which is additional property tax and vaccine cost.

1. Potentially Longer Cow Life

This producer has cows that are 17 to 18 years old which is very rare, but he estimates about two years additional life of the cows due to the facility. He indicated genetics play a big part in a cow's life. The cows are not in the building year-round. The cows are on grass several months and plans are to add sudex as a forage supplement.

2. Feed and Pasture Cost Savings

For four months there is a cost savings from feeding on grass and less in the building. We estimated a 20% cost savings. Grass rent is very expensive in this particular area, ranging from \$375 to \$450 per pair for 5 months. The cost of ownership would be higher for a producer who rented.

3. Calf Weaning Weight Improvement

This is a big advantage ranging from 35 to 50 Pounds per calf.

4. Additional Manure Value

The manure was tested and valued at \$28 per ton and estimated at two tons per pair.

5. Improvement in Conception Rates

This producer really likes the building for AI as it is easier to handle the cows for breeding. Conception rate is 75 to 80% the first time and 92% after the second time.

6. Estrous Synchronization & Timed AI Advantage

Synchronization is not used. The heifers usually calf at about nineteen months old.

7. Labor Savings or Additional Cost

It is estimated that there is a 25% decrease in labor costs versus grass as the cows are much easier to manage in an indoor facility.

8. Capitalizing on Higher Seasonal Prices by Shifting Calving Season

Definitely an advantage for this producer, calving starts in mid-January and cattle reach market weights at 14 to 15 months of age and go to market at the end of March which seasonally is one of the highest months.

9. Decreased Calf Mortality Rate

Producer reports 30% less mortality, due to early detection of sick calves inside the facility.

10. Need for less Clean Up Bulls

Due to high success of AI, there is less need for clean-up bulls because 93% born live.

11. Increased Cow Salvage Value

An estimated 200 pounds per cow on salvage value is used as culls gain better in the building versus being outside.

12. Property Tax and Vaccine Cost

\$5,000 cost was used for property tax and \$10 additional vet med cost due to if calving runs into May more vaccine is needed due to “barnyard bacteria” in the building.

Return on Investment

Using the attached Profitability Worksheet, the increased value per pair is \$475.

\$475

\$3,000 investment per pair =16% (based solely on impact to operation by facility)

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Case Study: 500 Head Deep Pit Facility

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Case History: 500 Head Deep Pit Facility

Located in Central Iowa, this facility helps contribute profits to a grain and cattle farm.

Description of Operation Before the Facility

This producer has a lot of experience with hog buildings, having built five over the years and subsequently sold them and retained manure rights.

Having milked 120 head of cows for 24 years this producer had a lot of experience with cattle. The free stall cow barn was converted to a deep bedded cattle feeding barn.

The current operation consists of 180 head in an outside lot, 180 head in a deep bedded barn and 495 head in a deep pit Summit facility. The deep pit barn has rubber on the slats which works very well. This producer has placed cattle in the facility at 550 pounds and fed to 1,580 pounds with no feet problems. The facility was built to expand the cattle operation and not do it in outside lots where mud is a problem.

Financial Performance Benchmark Before the Facility

This producer keeps excellent rate of gain records on each pen of cattle. The rate of gain in the outside lots is around 2.9 pounds per day and ranges from 3.3 to 3.4 in the deep pit facility. It is hard to care for the cattle in the outside lot, with mud and weather issues. This is a problem during much of the year as is the case with many Midwestern feedlots. It is estimated feed consumption is similar between outside and deep pit facilities so feed efficiency could be 16% greater. Actual data is not available. There is no bedding cost in the deep pit which is an additional savings.

Producer Concerns or Goals

Below is a list of goals that the producer set for his cattle operation.

- 1.) Get the cattle out of the mud and in better conditions to improve animal comfort
- 2.) Improve feed efficiency
- 3.) Capture more of the nutrients from feedlot manure
- 4.) Provide opportunities for the future generation

Changes in Management in Transitioning to the New Building

There were no changes in management, however prior to building the facility the owner had years of experience feeding and caring for cattle.

Post Construction Financial Performance

Consequently, plans were developed to build a 500-head deep pit facility. Completed in 2014, the building is 64 feet wide and 270 feet long. It includes three pens each 48 x 72 and for 165 head that equates to 21 square feet per head. The facility also includes a working area and loadout. Bunks are also located on both sides of the pens.

Financial performance has been very good. Rate of gain has ranged between 3.3 to 3.4 pounds of gain per day, or 16% improvement versus an outside lot. That equates to an \$82 per head savings in feed cost. Actual feed efficiency data was not provided but it estimated to be 16% greater versus open lots.

The value of the manure is very significant. A manure test revealed the nutrient value to be 50-37-35-6 in NPK and Sulfur. At current fertilizer rates and 3,400 gallons per acre this equals \$158 manure value prior to application costs. Manure is hauled by the owner. About 80 pounds of ammonia is applied, pre-plant for corn production.

At 6 ¼ gallons of manure per head per day this equals \$106 per head manure value. Assuming application costs equal 25% of the manure value, this equals \$80 per head value. Estimated value of manure from open lots is \$30 per head.

3400 galloons = \$158 1 gallon = \$.0464705 if 6.25 gal/hd/day then 6.25 x 365 = 2281.25 gal/space/year. 2281.25 x .0465705 = \$106.07.

Extra gain value	\$82/head
<u>Manure value net</u>	<u>\$80/head</u>
Total	\$162/head

\$162

\$1,350 per head cost = 12% Return on Investment

Overall Advantages

- Animal comfort
- Feed efficiency
- Good ROI
- Diversification

Concerns or Surprises

- Death loss is about 1% more than outside or bedded lots.
 - The reason is in outside lots if the cattle do not come to the bunk you see them immediately; inside they are difficult to notice. Since feed efficiency data was not available, but estimated at 16% greater, this more than offsets death loss.

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Case Study: 960 Head Deep Bedded Facility

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Case History: 960 Head Deep Bedded Facility

Located in Southwest Iowa, this facility helps contribute profits to a grain and cattle farm.

Description of Operation before the Building

Prior to building the facility, this was a 1,000 head open feedlot sloping towards the south.

The producer was concerned about the feedlot not meeting DNR (Department of Natural Resources) guidelines for containment of water and waste run-off from the feedlot. Although the feedlot had not had any violations or warnings from the DNR, the producer wanted to be proactive in keeping their excellent reputation with the DNR.

Consequently in 2010, he and his family began researching alternative cattle feeding programs. It was at this time they began researching Summit Livestock Facilities.

Financial Performance Benchmark before the Building

The producer keeps excellent records on each of the cattle pens. The feed efficiency in the outside lots averaged between 7.5 and 8.0 pounds of feed per pound of gain on a dry matter basis. He also noted that mud was a problem during much of the year, as is the case with many Midwestern feedlots.

Producer Concerns or Goals

Below is a list of goals that the producer set for his cattle operation.

- 1.) Get the cattle out of the mud and in better conditions to improve animal comfort
- 2.) Improve feed efficiency
- 3.) Capture more of the nutrients from feedlot manure
- 4.) Provide opportunities for the future generation

Changes in Management in Transitioning to the New Facility

For this producer, there were no changes in management after the building compared to open lots. However, prior to building the facility the owner owned part of the cattle in the feedlot.

Since building the facility, 100% of the cattle are custom fed. This is much easier to manage and greatly reduces the financial risk.

Post Construction Financial Performance

After much research was done about Summit Livestock Facilities, in 2010 plans were developed to build a 960 head deep bedded mono-slope facility. The building is 96 feet wide and 584 feet long. It includes four pens with a working facility and loadout area. Feed bunks are also located on both sides of the pens.

Corn stalks are used for bedding and it takes roughly 1,200 large bales per year. The stalks are ground down and blown in the middle of each pen. The pens are scraped when needed by removing the manure next to the bunks. The middle pack has never been removed.

At that time, the building cost \$1,200,000 and was completed in 2011. An unanticipated cost was \$60,000 of earth work that had to be moved due to site location. There have been no repairs or maintenance on the building.

The outside lots are still occasionally used for excess cattle that the facility cannot accommodate. The producer also has a waiting list for owners who want to put cattle in the building.

Financial performance has been remarkable. Feed efficiency has ranged between 5.7 to 5.8 pounds of feed per pound of gain on a dry matter basis, or 26% improvement versus an outside lot.

The difference in yardage break down between the outside lot and the facility is \$53,300 per year. The manure value is estimated at \$65,000 based on nutrient value or \$67 per head. The producer also estimated that a 25% cost of the manure value for baling the stalks and hauling the manure.

There is some value to the outside manure, however hauling dirt back in off sets much of that.

Extra yardage	\$55,300
Manure value net	<u>\$48,750</u>
Total	101,050

\$101,050

\$1,200,000 = 8.4% Return on Investment

Based on if one owned all the cattle, the 26% improvement in feed efficiency would amount to \$74,380 reduced feed costs.

Reduced feed costs	\$74,380
Manure value	<u>\$48,750</u>
Total	<u>\$123,130</u>

$\$1,200,000 = 12.3\% \text{ ROI}$

Overall Advantages

- Animal comfort
- Feed efficiency
- Good ROI
- Diversification
- Multiple Uses
 - If the next generation does not feed cattle the building could be used for hay, grain, or machinery storage.

Concerns or Surprises

- Cost and maintenance of rolling stock was higher than expected compared to outside lots mostly due to making and handling of bedding.

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