Farms for the Future

Kurtz Family Kurtland Farms Transformation Team Case Study









Kurtz Family Kurtland Farms

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Farm History and Executive Summary

Kurtland Farms, owned by Tim and Deborah Kurtz, is located in Berks County, directly bordering Chester County, which is one of the fastest growing counties in Pennsylvania. A third generation dairy farm, the family milked 125 cows in a tie-stall barn, three times a day, prior to the Transformation Team project. As Tim and Deborah considered a future in the dairy industry for themselves and their children, the farm's location presented unique urban sprawl pressures and a dwindling land base.

With the help of the state's dairy organizations, Tim began strategic planning and eventually, developed a farm business plan that considered expansion options. That plan included robotic milkers to improve cow comfort and business profitability, while also preserving the Kurtz family's quality of life. Tim's research led him to trade shows, workshops, conferences, phone calls and emails with experts in robotic technology.

Transformation Team professionals helped Tim focus on his robotic expansion plans, completing a critical feasibility study, pursuing funding grants through the Pennsylvania Infrastructure Investment Authority (PENNVEST) for manure storage and separation and navigating the maze of engineering and environmental permits required for a new animal agricultural construction project.

With the advice of the Transformation Team and his lender, Tim began leasing a satellite dairy in 2011. The satellite dairy allowed Tim to keep his replacement heifers, absorb additional costs and begin to delegate specific responsibilities to employees. Notably, after just three months of Tim's management, the satellite dairy cows' production increased 15 pounds per cow.

The project was not without many challenges and hurdles during the two year planning process. After four rounds of applications, the PENNVEST grant was finally approved in the spring of 2012. As detailed in the case study, the family had to find a new construction company, after the original company closed its doors; secure financing from a new financial institution; and work through additional expenses and delays caused by unexpected environmental permitting issues.

In September 2012, the Kurtz family finally broke ground on their 220 cow freestall barn, with a LELY A4 Astronaut robotic milking system. By the following March, the family moved cows into the new barn, bedded with separated manure solids, and by that Fall, hosted an Open House for the industry.

Today, the family is excited to welcome son Jared and his wife Marla into the business and a new generation of Kurtz dairymen, with the birth of their son.



Feasibility Plan

Situation Overview:

A. *Why did the farm need a feasibility study?* For our project, we needed to make projections with realistic numbers. This was tough with robotics because it was relatively new technology. We needed to be conservative to be safe, otherwise our lenders wouldn't have supported the project.

B. *Where did the farm turn for help in developing the plan?* Initially, we turned to our accountant, but our accountant didn't have access to the right tools. We needed better tools, which led us to Tim Beck, Penn State Cooperative Extension. With Tim's help, we were able to focus on feasibility. The document was constantly being updated, as we added new information and scenarios.

C. *What peripheral resource people did the team use to build the plan?* We met with loan officers to find out what they needed to see in the plan, and then went back to them with realistic numbers. In addition to Tim's expertise, we relied on our accountant, to a smaller degree, and our contractors, such as Fisher & Thompson, Red Barn Consulting and Whitehorse Construction once we needed to include project estimates and quotes.

Challenges and Opportunities:

D. *What challenges, if any, developed during the feasibility study process?* The grant application with PENNVEST was a challenge. We went through three sponsors, before it was accepted by the Berks County Conservation Office. Ultimately, we received a grant, instead of a loan, and it took us an extra year.

E. *How did the team overcome those challenges?* Communication was important and we needed multiple advisors. We had to stay on top of everything and keep pushing and following up. We had to include our nutrient management plan. The plan detailed exporting manure and communicating with other farmers. We also prepared a spreadsheet relative to labor, young stock and feed storage.



Feasibility Plan...continued

Actions:

F. What are the key components to the feasibility study?

- General farm information
- Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis
- Three year cash flow history and balance sheet
- Five year plan
- Annual and monthly cash flow projections
- Herd inventory plan
- Feed and rations analysis
- Human resource plan

G. *Approximately how much did the feasibility study cost?* There was no cost as it was a Penn State Extension service.

Results:

I. *How did the feasibility study help the farm move forward and make better decision?* It provided answers to the many questions that were critical in the decision making process within the business. The outside professional advice and services could better evaluate the plan and decide their specific roles on the team.

J. *Did the feasibility study reveal any surprising information about various scenarios?* The feasibility study clearly showed that in order to grow the business, expansion was needed. It also supported the satellite dairy expansion.

K. *What might you have done differently in regards to the feasibility study?* It basically did what it was designed to do at little or no cost. Very little would be done differently.

Business Plan

Situation Overview:

A. *Why did the farm need a business plan?* The business plan process started for the farm in 2007 after evaluating if there was a future in the dairy industry for our family during a Profit Team meeting. A Dairy Alliance Business Plan workshop led by Brad Hilty was the spring board for completing a business plan. This was necessary to address the question – Is there a future in the dairy industry for Kurtland Farms? Our first business plan was for three years that gave us a better long term picture of our business. The plan analyzed three options to consider for future growth and profitability.

A SWOT analysis, helped us evaluate some of the business dynamics. Results are listed below:

Strengths	Opportunities
Equity growth from farm income	Retail sales
Purchased feed + crop \$	Improved production
Supplies/cow	Increase sales of dairy cattle
EBIT/cow	Increase use of custom machine subcontracting
Operating expense ratio	
Debt service/cwt	
Replacements	Threats
	Environmental restrictions
Weaknesses	Urban sprawl
Production - 1000 lb. under	Loss of rented land
Lbs. milk shipped/worker	Loss of rBST milk marketability
Vet expense/cow	High labor costs
Repairs/cow	Fluctuating milk prices
Machine \$/cow	High interest rates

High traffic road/Difficulty moving equipment

As a family, we wanted to be on the same page. We wanted to grow, but we didn't know how growth would impact us. We picked three options which could potentially grow the business and provide a future for the next generation.

Business Plan Option A: 2007-2009

Cost of production

Objectives of the Plan: This option focused on herd health and facility improvements giving us plenty to work on from 2007 – 2009. Herd performance improved significantly. Higher milk production, better internal herd growth, and improved reproductive efficiency proved that we could make progress. The growth opportunity with this plan was to market an average of 85 pounds of milk per cow per day and market surplus dairy cattle.

Some management strategies adopted were:

- 3 x milking
- Sexed semen
- More aggressive use of reproductive hormones in a timed protocol
- Employee hiring, training and management protocols
- Written standard operating procedures
- Improve replacement housing (converted equipment barn into calf barn)
- Use of custom harvesting
- Increase no-till farming
- Convert to high corn silage ration with more double cropping

<u>Business Plan Option B</u>: This plan involved a cash flow and a feasibility study for a four robot milking parlor with a bedded pack barn. This was a very preliminary plan which only gave us an option of pursuing more in depth at a later date.

<u>Business Plan Option C</u>: This plan was to investigate the opportunities for other "side enterprises" to add value to the dairy. A retail business involving dairy, produce and or a garden center was considered but tabled. The feeling was that it would require an entirely different set of management skills which would compromise the dairy production enterprise.

Results of Business Plan A:

Despite the improvements that were made through 2009, we still were not labor efficient. Our cost of production was not viable, long term, and there was not a cushion in a bad year. There did not seem to be a future economic return. We were not competitive enough and the facilities weren't economically efficient, compromising animal health. Essentially, we were up against the ceiling. Our cull rate was still too high as cow comfort was inadequate in the tie stall facility. This meant we could not capture the premiums from marketing the higher value replacements as we needed them to keep the barn full.

With the current facilities, we felt our family's next generation could not continue to farm, even if they wanted to stay in the dairy business.

In August of 2009, we decided to look seriously at Option B. We decided to build at a different site on the farm which was more strategically located and in regards to manure storage and run-off.

B. *What resource people did the team use to re-build the plan?* Jeff Ainslie from Red Barn Consulting was instrumental in giving us insights into site/environmental hurdles we might encounter as well as grant opportunities. Dean Weidman was our go-to person for barn construction design and costs. We used Tim Beck, Penn State Cooperative Extension, for the business plan and feasibility study updates. In our estimation, Tim Beck's services were valued between \$15,000 and \$20,000. Across the dairy industry, extension personnel, such as Tim, are extremely helpful in providing valuable insights and assistance. Gary Heim, our attorney, played a major role in the real estate transaction to purchase the remainder of the farm from Tim's parents. He also played a key role in the mortgage process with Fulton Bank and our relationship manager, Lamar King.

- C. *Does the farm have a mission statement?* Yes. The values of the Kurtland Farm are the following:
 - Profit As in any business, profitability is the key. The dairy must generate an acceptable return for its owners to remain viable and competitive. Business profit needs to be a primary concern for each and every member of the Kurtland Farm team. A profitable business not only benefits the owners, but also the employees, agri-business, and the community in general.
 - People Our employees are our greatest asset. It's our goal to provide employees with a pleasant working environment and a compensation package that provides a standard of living that is comparable with other local businesses. We desire to be considerate of family, social, religious, and other off-farm interests. While operating in a team structure, we want everyone to be challenged so they can grow as individuals.
 - Leadership We will strive to be a leader in the local, state, and national dairy industry. Our definition of success is maintaining financial efficiency and production performance within the top 10% of the Northeast dairy industry. We will strive for a good business image and reputation by maintaining good relations with neighbors, providing our cattle with a clean, comfortable environment and keeping our dairy farm neat and attractive.
 - Having fun We feel that it is very important for the owners and staff to have fun doing what we do. The goal is to have every person involved on the dairy look forward to going to work. We will maintain a relaxed atmosphere and communication between everyone will be encouraged and enhanced. Undue stress will be avoided as much as possible.
 - Honor God Most important of all we want to honor our heavenly Father in what we think, say and do. This principle applies not only to our personal lives but to this business as well. Everything we have belongs to God, and we are his caretakers. It is our desire to follow biblical principles when dealing with our staff, our neighbors and our industry.

Challenges and Opportunities:

D. *What challenges, if any, developed during the business plan process?* The biggest challenge in developing the business plan was lack of voluntary milking systems (robotics) in Pennsylvania, and subsequently, lack of benchmark data to satisfy lenders. There also was a communication challenge, as we wanted information in a timely fashion.

E. *How did the team overcome those challenges*? The team left no stone unturned, in the quest to find relevant robotic milker data, attending conferences, calling manufacturers and meeting with farmers. Ultimately, the best sources of information were Tim Anderson, MN Community College, and Paul Berdell, an independent robotic start-up consultant. Contact information for both individuals is noted in this case study resource list.

Side note: It is advisable to continue researching a technology, until you find the right people. For me, attending the 2010 Precision Dairy Management and Robotic Milking Technology Conference in Toronto, Canada was very important to this project. I was the only U.S. dairy farmer at that global conference, with dealers and manufacturers. he financial data from other robotic dairies, supported our financial projections, and was helpful in convincing the bank that our plan was valid. The information I discovered significantly influenced the design of the barn and the comfort level with technologies.

The financial data from other robotic dairies supported our financial projections and was helpful in convincing the bank our plan was valid.

Actions:

- F. What are the key components to the final plan?
 - SWOT Analysis
 - 5-year Goals
 - Organization Chart
 - Budgets
 - Strategic Plan Tactics

G. *Approximately how much did the business plan cost?* The initial plan was done through a workshop, keeping the cost under \$500. The revised plan was free as we utilized the services of Penn State Cooperative Extension. As noted in Letter B, we estimate the market value was between \$15,000 and \$20,000.

- Estimates/Bids
- Historical Data Analysis
- Balance Sheet/Cash Flow
- DHIA Records
- Risk Management



H. *Approximately how long did it take to develop the plan?* The initial plan was done over a two month period. During this process, we experienced a paradigm shift – a business plan is never done. If you plan on staying in business, the business planning process never ends. The revised plan was done over a one year period.

Results:

I. What benefits, if any, has your farm dairy operation derived from engaging in a business planning process? The planning process allowed us to make objective decisions. Since the business is a sole proprietorship, we were fortunate because we could deal with questions or issues right away. The process also helped us recognize the business' strengths and weaknesses, rather than spin our wheels.

J. *How did the business planning process help the family make better decisions?* It provided the answers to the following questions:

- What are our long term goals and objectives?
- What are our values?
- Is this financially feasible?
- Do we have an adequate labor force to handle this expansion?
- Do we have enough land to provide feed and handle manure (Nutrient Management Plan)?
- Will this expansion be compatible with our community?

K. *How often will the farm update the business plan, in the future?* For our family, the business plan is never done. It's a continuous process, with new information constantly documented.

L. As a result of engaging in developing a business plan, what has your family learned that is unique to your dairy

operation? The SWOT analysis helped us realize we had challenges, including quality of life issues. Family is important, recreation is important, and for our family, the social center is not the farm. This process also revealed neighbor tensions.

M. Was there anything uncovered during the business planning process that helped family members to better understand other members of the family? Not initially, however, as time went on it helped to keep us all focused on why we were moving in this
10 direcKortz Family



Modernization and Technology

Situation Overview:

A. *Detail the farm's reasoning behind the decision to pursue a modernization plan.* At Kurtland Farm, we wanted to be a profitable, economically viable business for the long term. Quality of life is important to us, as is providing a business opportunity for the next generation. We also wanted to focus on our commitment to environmental stewardship and connecting with our consumers.

B. *List the key variables that impacted the decision to move ahead with the plan.* After completing the feasibility study, we had many answers to the questions that were critical in the decision making process within the business. The feasibility study clearly showed that in order to grow the business, expansion was needed. It also supported the satellite dairy expansion project.

- C. The farm was modernized in the following areas, during this project:
 - 208 cow free stall barn bedded with separated manure solids designed and built by Whitehorse Construction
 - 4- LELY A4 Astronaut robotic milking system
 - Mueller Refrigeration system
 - Sturdy Built gates and stalls
 - Keystone precast alley scraper gutters
 - Jamesway alley scrapers
 - Autovent ventilation
 - EYS screw press separator
 - Daritech manure compost drum
 - Manure lagoon with liner and cover
 - 40' x 80' manure solids storage building

Challenges and Opportunities:

D. What were the different options the Transformation Team considered as they worked together to pursue this plan? Please describe. Despite the improvements that were made through 2009, as detailed in the business plan chapter, we still were not labor efficient. Our cost of production was not viable, long term, and there was not a cushion in a bad year. There did not seem to be a future economic return. We were not competitive enough and the facilities weren't economically efficient and were compromising animal health. Essentially, we were up against the ceiling. Our cull rate was still too high as cow comfort was inadequate in the tie stall facility. This meant we could not capture the premiums from marketing the higher value replacements as we needed them to keep the barn full.

Modernization and Technology...continued

With the current facilities, we felt our family's next generation could not continue to farm, even if they wanted to stay in the dairy business.

In August of 2009, we decided to look seriously at Option B. A potential building site on the farm we purchased in 2000 was a factor too. It was time to make a decision.

E. *Did any barriers, or bottlenecks, occur during the project, and if yes, how did the team overcome those issues?* Funding sources and financing were our two biggest obstacles during the project. While we waited for financing and grants, we explored a satellite dairy concept and other growth opportunities. Ultimately, we leased that satellite farm and still milk cows there today, a year after our new dairy was completed.

We had financing discussions with multiple lenders, but everything was held up as we waited on grant approvals. There were also environmental issues regarding a storage tank. Our bank required an environmental survey, another major challenge for us. Our team wasn't involved with that challenge; we just got it done.

There were no major bottlenecks during actual construction, other than minor miscommunication over technical misunderstandings during the project. The three main setbacks were related to the manure/ environmental component of the project: 1) Sub-contractor misunderstanding bid specifications resulting in an additional \$15,000 we had to pay in addition to what was originally included in the bid. 2) An equipment down payment necessitated a bridge loan which we were not prepared for. 3) A rock removal contingency which was shifted to another project, costing us more than \$9,000.

Actions:

F. *How did the work done on a business plan or feasibility study impact the farm's final decisions?* For our family business, the planning process was probably "mission critical" to accomplishing the entire project. We wouldn't have a lender without the plans. It was extremely important to have realistic projections of what to expect with this new business model. When compared to our previous farm scenario, building a new barn with robotics showed significant opportunity, but not without significant risk.

G. How long did the project take, start to finish? The entire project, including planning, took us 3 ½ years.

- Planning, prints, estimates, contractor 2 ¹/₂ years
- Financing 2 months, once grants approved
- Breaking ground 2 months, after lender approved
- Pre-construction 4 months
- Construction 7 months

Modernization and Technology...continued

Results:

H. *How did the modernization and new technology change the business as it relates to profitability? Can the farm quantify labor savings, energy savings or environmental impact?* Now that we've been in the new facility almost a year, we are just beginning to see changes in profitability in the business. In the first year after expansion, it takes time to bring production levels up. We needed to work out technology bugs and labor efficiencies.

As of February 2014, we have our entire team trained how to efficiently run the operation.

I. *Did the modernization and new technology change management practices on the farm?* Yes. It changed many things for us. Our employees are doing more skilled labor, making better use of the computer. We have treatment protocols and systemized operations at all three milking facilities. Our new model is centralized management at all three facilities, incorporating what we learned at the other barns. If our cows are not adjusting and thus profitable in the robotic barn, we move them to one of the other two barns, providing us more flexibility.

J. *Have you learned anything that has influenced future decision making about technology or given you new enthusiasm for some aspect of modernization?* Our employees are not only competent, but with this new facility, they also enjoy what they do and are much more productive. Because of technology, employees found their niche. We are now large enough that our employees can specialize. We have weekly team and manager meetings.

Our future investments would be in additional robotics or other technology – software updates or new programs for production or milk quality control. It would be a system that could be easily incorporated into our robotic barn or perhaps at the other facilities.

We've also been excited about using separated manure solids as bedding. We've seen a decrease in foot problems, compared to our other barns with mattresses. Deep manure solids bedding is demonstrating major cow comfort benefits for us. The manure separator has paid for itself.

K. *Has the farm shared the new facilities or technology (milking facilities, manure management, etc.) with others in the community? If yes, what was the response from the community?* Yes. We've had an overwhelmingly positive response. We are constantly showing the new facility to our neighbors and hosting tours and guests.

I think we are an example of how the dairy industry can survive and thrive in our area. Guests also have been impressed by cow and facility cleanliness. Odor mitigation was important for us as we planned this expansion. We didn't want to have odor problems. We definitely do not, and we consider that a big accomplishment.

My son, Jared, and his wife see opportunity in the business for the future too, and are considering agritourism.

Site Survey

Situation Overview:

A. *How did the team analyze potential sites for construction?* For our team, the construction site was decided during previous business planning with our Center for Dairy Excellence Profit Team. There only was one obvious construction site on the farm for a new facility. The Transformation Team helped with engineering and design.

B. *What variables did the team consider as they reviewed sites?* The site needed to be in compliance with setbacks, easily accessible and adjacent to a large portion of cropland.

Challenges and Opportunities:

C. *During the site survey process, did the farm encounter any problems?* Yes. When land is developed, corner pins must be visible; it's not permitted to go off pin location. Pins were in the fields at Kurtland Farms, and buried over time. To find the pins, a backhoe was brought in to confirm there were no contradictions with the documents.

The township had several "Oh By The Way" policies that were unplanned for during the process including the request for \$96,000 in escrow for site inspections. Township engineers came out to the farm two to three times because the township wanted to make sure they actually saw the pins. For us, it was constant follow-up. Soil probes also were performed to determine soil and rock profiles in about 10 test pits.

We learned that these escrow accounts are becoming more popular, although we were surprised that our township was so high. Everything is becoming so regulated and townships are being cautious. If contractors exit the industry or experience business failure and dissolution, they will leave projects undone. The escrow accounts are protection for the municipality. We also had to prepare probes to determine soil and bank profiles.

We had to perform about 10 test pits for the manure lagoon. The bank also required an environmental survey to determine any environmental liabilities. We were required to remove an underground storage tank that was at least 55 years old. A certified environmental engineer was hired to remove and check for leakage. Some leakage had occurred so it required additional testing and monitoring.

D. *How long, from start to finish, was the site survey process?* The survey process was 6 to 8 months. The initial survey work was 6 months, but additional testing was required for manure storage.

E. *Approximately, how much did the site survey work cost?* \$8,000 - \$10,000 was the approximate cost for site engineering. PennDOT requested revisions to the driveway, costing an additional \$14,000.

A copy of the blueprint is included in the resource section of this case study.

Permitting and Regulatory

Situation Overview:

A. What was the process the farm went through to prepare for necessary permits? Since our project was considered land development, there were multiple meetings at the township and county level and PennDOT also became involved in the project. We were not a Concentrated Animal Operation (CAO) or Concentrated Animal Feeding Operation (CAFO), so we expected minimal environmental permitting impacts. When we began exploring this project in August of 2009, we budgeted \$25,000 - \$30,000 for permits. Actual permitting costs far exceeded our budget.

B. Please list the necessary permits needed for your modernization and technology project. Please also include the approval agency (DEP, County Conservation District, or Township), time to receive permit and cost of permits.

- Phase I Bunker silo
 - o Timing: May-August 2010
 - o Erosion and Sedimentation (E&S) Review-Berks County Conservation District =\$750.00
 - o Caernarvon Township Zoning Permit = \$70.00
 - o Total Cost, including engineering = \$2,245.00
- Phase II Dairy complex
 - o Timing: November 2010-September 2012
 - o Nutrient Management Plan (NMP), Erosion and Sedimentation (E&S), National Pollutant Discharge Elimination System (NPDES), Layout, Pit Probe testing
 - o Land Development Plan required
 - o Five months of township meetings
 - o Caernarvon Township Land Development Plan review and approval = \$6996.78
 - o Caernarvon Township Zoning Permit = \$170.00
 - o Total Costs = \$45,767.28 (permit related)
 - o Last permit issued 7/30/12
- Other
 - o Berks County Assessment Office: Clean and Green approval-No Fee
- Local municipality-Caernarvon township
 - o Land Development Plan
 - o Cost = \$10,294.28
 - o Municipal Improvement Agreement (MIA)
 - o \$96,780 bank letter of credit money never used, but had to be posted up front, for project to proceed

Permitting and Regulatory...continued

- PennDOT
 - o Driveway permit(s)
 - o Storm water concerns
 - o Cost = \$8,321.25
- Lender
 - o Required environmental survey
 - o Underground Storage Tank (UST) removal by licensed environmental company
 - o Cost = \$29,800.00
 - o Clean water act

Challenges and Opportunities:

C. *Which permit was the most challenging to secure?* The PennDOT driveway permits were the most challenging because they wanted us to change our driveway and in a way that would not allow us to access our new barn.

D. *How did you resolve those challenges?* For now, we continue to pay a six month \$20 extension request fee to PennDOT. They are not interested in talking or resolving the issue with us. Our Transformation Team hasn't previously encountered this issue, but agrees we are doing the right thing by filing the fee.

E. *What resources or resource people were used in addressing those challenges?* Jeff Ainslie, Red Barn Consulting.

Results:

F. *Was the local township supportive of the permitting process? Please explain.* As long as we followed all of the townships regulations and permitting steps, they were supportive. They didn't have anything against the dairy industry, but lots of hurdles before approval.

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Conservation and Environmental Stewardship

Situation Overview:

A. *How does this farm view their environmental responsibilities for both the farm and land? Please describe.* We view environmental responsibility as one of our most important values. We strive to not only comply with the regulations but to exceed the standards both in conservation practices and nutrient management. Our management decisions are strategic to the seasons and weather conditions in regard to soil and water conservation.

B. The following conservation and environmental best management practices (BMPs) have been incorporated into the farm plan the last 5 to 10 years:

- Crop residue management
- No-till planting
- Double and triple cropping
- Contour farming
- Contour strip cropping
- Filter strip
- Conservation buffers
- Crop rotations
- Cover crops
- Permanent vegetative cover
- Grassed waterways
- Diversions
- Pasture and hayland plantings
- Rotational grazing

- Stream bank protection
- Stream crossings
- Animal trails/Walkways
- Structure for water control
- Spring development
- Barnyard runoff controls/Heavy use area protection (i.e...Animal concentration areas)
- Water (manure) storages/Manure stacking
- Manure composter
- Milk house waste
- Roof runoff management
- Precision feeding/Feed management
- Integrated pest management

C. Does the farm have a Nutrient Management Plan (NMP) or Manure Management Plan? Yes. Did this project change the way the farm handles animal manure? Please describe. We were already in compliance with the standards.

D. Is manure applied in the winter months (generally December – February)? Is the manure applied in winter due to not enough storage or for other reasons such as timing, field conditions in spring, etc.? [if yes, for what particular reason(s):] Yes, primarily due to timing. We apply on alfalfa in December, after it is dormant.

E. *Does the farm have a conservation plan or an agricultural erosion and sedimentation control plan? If yes, what are the key components?* Yes. All best management practices are followed. Double cropping and no-till practices are the core of our plan. We keep as much of the land in vegetation as possible.

Conservation and Environmental Stewardship...continued

F. Was the farm a CAFO (Concentrated Animal Feeding Operation) or CAO (Concentrated Animal Operation) before the grant project? No. After? Yes. We were a CAO after the expansion.

G. Did a farm expansion require the development of an Odor Management Plan and any odor management Best Management Practices? How did you become aware of these requirements? Did you find enough experience private sector planners to assist? Although not required, odor control was a top priority. With the covered manure storage and low volume open storage, odor is not an issue on our farm.

H. If this project included new conservation or environmental changes, how did they impact farm profitability? Please describe.

- Manure storage and processing funded 95% by grants:
 - o Able to recycle manure with separator and compost drum which reduced bedding costs on entire operation by more than \$30,000/year
 - o Additional revenue from sale of surplus composted solids, estimated \$10,000/year
 - o Cover on manure storage reducing rainwater collection in manure resulting in reduced hauling costs, estimated \$5,000/year
 - o Additional maintenance and operation costs, estimated \$10,000/year
- High efficiency lighting
 - o \$5,000/year estimated savings
 - o Received \$10,000 rebate through electricity supplier
- Recycling of plate cooler water from milk cooling
 - o \$5,000/year estimated savings
- Robotic milking uses significantly less water per cow than a parlor
- I. Can the farm quantify the environmental impact of the project? Please describe.
 - Reduction of carbon footprint with lower fuel costs
 - Reduction of runoff due to improved storm water management
 - Over 1.5M cu. ft. methane gas flared annually
 - Virtually no manure spreading in winter

J. What is the most significant environmental/conservation improvement made on this operation within the last 5 years, and what improvement(s) did it result in?

- The new manure processing and storage system, as described above.
- No-tillage resulted in more timely planting and double cropping with lower fuel costs and minimized erosion.

Animal Care and Comfort

Situation Overview:

A. Can you determine if cow comfort or care was limiting the productivity or profitability of your dairy operation? Yes. If yes, please list animal factor(s) that needed to be improved.

- Ventilation
- Stall size and comfort
- Heat detection
- Sorting and handling-gating and headlocks
- Close-up housing
- Feed bunk limitations
- Water restrictions
- Floor surface too slick
- Overcrowding

B. *If you determined that cow comfort or care was a limiting factor, did you make structural and/or management changes to address the deficiencies? Please list structural and/or management changes.*

- 208 cow free stall barn bedded with separated manure solids
- 4- LELY A4 Astronaut robotic milking system
- Sturdy Built gates and stalls
- Keystone precast alley scraper gutters
- Jamesway alley scrapers
- Autovent ventilation
- Routine footbath

C. *What did you learn that would be of interest to the broader dairy community?* Our future investments would be in additional robotics or other technology – software updates or new programs for production or milk quality control. It would be a system that could be easily incorporated into our robotic barn or perhaps at the other facilities.

We've also been excited about using separated manure solids as bedding. We've seen a decrease in foot problems, compared to our other barns' with mattresses. Deep manure solid bedding is demonstrating major cow comfort benefits for us. The manure separator has been a good investment and will provide a quick payback.

D. What is your farm's approach to administration and documentation around the use of standard operating *procedures* (*SOPs*) *for animal care*? We have a SOP handbook for all procedures and policies. This is a tool that we use constantly, with continuous updates.

Animal Care and Comfort...continued

E. *Have you enrolled in a formal animal care program? If so, what have you learned that's been beneficial to your operation?* We have been Farmers Assuring Responsible Management (FARM) certified. This has been an eye opener for our business, especially with the difference in foot and leg scores between the new barn and the older barns. It's also raised our standards in the training of our employees.



Other Unique Project Components

Situation Overview:

- A. Please describe farm characteristics.
 - Number of cows before (130) and after project (425)
 - Number of acres before (300) and after project (350)
 - Total forage needs (in tons) increased forage needs by 2,000 tons
 - Storage structure facilities Two bunker silos with 4,500 ton forage capacity, three silos with 1,500 ton capacity, one silo with 8,000 bushel shelled corn capacity, and a pad for up to 1,000 ton bagged forages.
- B. Additional key factors to the Satellite Dairy project.
 - Adjoining dairy to our existing farm
 - Opportunity for additional cows and feed availability
 - Employee retention with expanded and improved operation
 - Allowed for more specialized employee responsibilities

We felt the location and size of an adjoining dairy would fit well with our operation so we entered a one year trial lease agreement with the owners. It helped to absorb some of the additional costs, allowed us to keep our replacements and integrate and streamline our labor forces. We immediately started milking three times/day at the dairy; within three months, production was up over 15 pounds per cow.

There were two key benefits from this step:

- It improved our balance sheet by allowing for additional cows without the major capital purchases of the land or facilities, thereby spreading our debt over more cows.
- It allowed us to capture synergies by utilizing the same employees and spreading management costs over both farms.

There were other significant savings due to size and scale of the combined operations. It was a successful venture, and we continue to milk at this satellite dairy today.

C. *How was the team instrumental in helping you think through available options? Please describe.* After discussing the opportunity this presented, the team strongly advised that it be pursued. Having a dairy business management specialist on the team was an enormous value as a cash flow plan was developed.

Other Unique Project Components...continued

D. Did any of these additional components result in added profitability or a change in management style? Please describe.

- There were first year startup costs and a learning curve like every new venture, but over time, the satellite dairy will be an asset to the entire business.
- Because the satellite dairy is located adjacent to the robotic dairy, there is future potential for expansion.
- A farm manager was assigned to the satellite dairy who worked for the previous owner.
- As a result, a management team was established which continues to function with the addition of the robotic barn.



Risk Management

Situation Overview:

A. The following traditional risk management tools applied to this farm before applying for this grant:

- Crop insurance field crops
- Livestock Gross Margin (LGM) for dairy
- Contract milk with a cooperative
- Contract feed with a mill

B. *What new risk management tools did the farm pursue during, and after, the project? Please describe.* We continued with the same risk management tools during and after our project, primarily LGM for dairy. There were no significant changes in our approach during the transformation project. More recently, we have enrolled in the Margin Protection Plan, with buy up coverage.

C. *Does the farm have a marketing plan? Please describe.* For our business, we strive to carry LGM on approximately 50% of our milk production, at a \$1 deductible, and the other remaining approximate 50% of our milk production on contract. We think it's important to have advisors that have good insight on how the markets are performing, and can make solid recommendations to us.

Actions:

D. What communication was necessary with the farm's ag lender and what were their requirements for additional ag protection through risk management to move the project forward? Please describe. We needed to increase our life insurance policy. We also had to update our fire and storm insurance policies. LGM is in our business plan, with our other risk management tools.

Results:

E. *Can the farm quantify the change in business profitability attributed to implementation of new risk management tools? Please describe.* It's difficult for us to quantify because we have been incorporating risk management tools in our business model before we started the construction project. I think these risk management tools help you sleep at night, in the event of any worst case scenarios. When you are highly leveraged, risk management goes hand-in-hand. It's an insurance policy, as I see it; it protects you if the market collapses.

Resources and Contact Information

Blueprints

CERTIFICATION OF OWNERSHIP AND ACKNOWLEDGEMENT	
COMMONWEALTH OF PENNSYLVANIA:	
COUNTY OF BERKS	
ON THIS THE DAY OF, 20, BEFORE ME,, THE UNDERSIGNED OFFICER PERSONALLY APPEARED	
WHO BEING DULY SWORN ACCORDING TO LAW, DEPOSES AND SAYS THAT HE/SHE IS THE OWNER OF THE PROPERTY SHOWN ON THIS PLAN, THAT THE SUBDIVISION AND/OR LAND DEVELOPMENT PLAN THEREOF WAS MADE AT HIS/HER/ITS DIRECTION, THAT	
HE/SHE ACKNOWLEDGES THE SAME TO BE HIS/HER/ITS ACT AND PLAN AND DESIRES THE SAME TO BE RECORDED AS SUCH ACCORDING TO LAW, AND THAT ALL STREETS SHOWN AND NOT HERETOFORE DEDICATED ARE HEREBY DEDICATED TO THE PUBLIC USE EXCEPTIONSE LABELED NOT ECRIPTICATION ON DAY AND	•
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20 OWNER	
CERTIFICATE OF ACCURACY	
HEREBY CERTIFY THAT THE PLAN SHOWN AND DESCRIBED HEREON, AS WELL AS ALL DRAWINGS BEARING MY SEAL, ARE TRUE AND CORRECT TO THE ACCURACY REQUIRED BY THE CAERNARVON TOWNSHIP SUBDIVISION AND LAND DEVELOPMENT ORDINANCE.	
WU WERE PREPARED BY ME OR UNDER MY DIRECTION AND FOR WHICH LACCEPT FULL RESPONSIBILITY.	
20ENGINEER	
STORMWATER MANAGEMENT AND DRAINAGE EASEMENT	
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AND EGRESS TO A PUBLIC RIGHT-OF-WAY.	
CERTIFICATION OF CONFORMANCE	
TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, JUDGEMENT, AND BELIEF, THIS PROJECT HAS BEEN INSTALLED PER THE ATTACHED DRAWINGS AND SPECIFICATIONS, DATE ON THE RECONATION DOWNED TO A DRAWING SPECIFICATIONS, DATE ON THE DECOMPTION DOWNED TO A DRAWING SPECIFICATIONS,	
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	PIPÉ AT
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	LOC - 57/F (PROPOSED)
	A" LEAK DETECTION PI
	BOTTOM OF BASIN
	PRINCIPAL SPILLWAY
	52-12' POLVETH. @1.9%
	(PROPOSED) 53'-12'POLYETH.@1.8%
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	E = 573.77"

Resources and Contact Information...continued



Resources and Contact Information...continued

Family Video:

Video production that aired on Berks Cable TV <u>http://www.bctv.org/special_reports/economy/economic-development-in-greater-reading/</u> <u>html_5919014a-66f3-53a1-b880-f087eafdf9cc.html</u>

Farm Facebook Page:

https://www.facebook.com/KurtlandFarm

Resources and Contact Information...continued

Articles:

Bloomberg Business Week

http://investing.businessweek.com/research/markets/news/article.asp?docKey=600-201312310649KRTRIB___BUSNEWS_61224_16828-1&page=2_

The Reading Eagle – feature story on Kurtz Family <u>http://berkscountry.readingeagle.com/barn-of-the-future-helps-save-chesapeake-bay/</u>

New York Times article on robotic milking, with quotes from Tim Kurtz <u>http://www.nytimes.com/2014/04/23/nyregion/with-farm-robotics-the-cows-decide-when-its-milking-time.html?r=1</u>

Contacts:

Please call the Center for Dairy Excellence to make contact with any of these individuals to learn more about their role in successfully completing this project.

Jeff Ainslie, Red Barn Consulting

Tim Beck, Penn State Cooperative Extension

Elizabeth Peifer, Dairy Industry Consultant, Transformation and Profit Team Facilitator

Paul Berdell, Robotic milking startup specialist, Robotic Milking Solutions

Tom Anderson, Robotic dairy business management, Riverland Community College

Dan McFarland, Penn State Extension

Lamar King, Fulton Bank

Gary Heim, Persun & Heim, P.C.

Glenn Horst, Whitehorse Construction

Amos Fisher, Fisher & Thompson

Tim Vossberg, AgPoint Construction



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