An Economic Development Plan for Lancaster County Agriculture

Lancaster County Agriculture Council
Lancaster, PA

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An Economic Development Plan for Lancaster County Agriculture

In 2011, agriculture leaders in Lancaster County created the Lancaster County Agriculture Council as a way to move the important work of the Blue Ribbon Commission on Agriculture, the Agriculture Committee of the Lancaster Chamber, the Center of Excellence in Production Agriculture, the Lancaster County Conservation District, the Lancaster County Cooperative Extension Service, and other groups to a new level with a shared vision and a strategic point of view that speaks to the need for the industry locally to be competitive in the global marketplace.

To advance this idea, the Council was formed as a collaborative organization to work with agriculture partners in the County to…

- Serve as focal point for Lancaster County agriculture;
- Serve as a leading industry advocate and voice for Lancaster County agriculture;
- Identify critical and significant agricultural issues and opportunities for the agriculture industry to focus on;
- Advocate for agriculture in matters involving legislation and/or regulation;
- Initiate communication, understanding, and appreciation among and between various Lancaster County agriculture segments for the benefit of Lancaster County agriculture as a whole;
- Maintain direct involvement in broader Lancaster County planning issues, including farm preservation and economic development plans;
- Provide facilitation and support to address emerging challenges and opportunities in environmental and renewable energy arenas;
- Prioritize, strategize and advocate for education and communication about Lancaster County's farming practices and substantial economic value of the agriculture industry to the non-agriculture public and broader Lancaster County business community;
- Identify activities and collaborate with other organizations to organize activities that enhance and foster the future of agriculture in Lancaster County (such as the Ag Summit);
- Identify issues and suggest solutions around workforce development in the agriculture and food industry to the Workforce Investment Board and the agriculture education system in Lancaster County; and
- Collaborate with the Lancaster Chamber for planning and execution of other agriculture-related programming.

Within six months, the Council adopted the mission of "strategically cultivate, coordinate, and celebrate Lancaster County agriculture and its global impact" and began to focus on a role of providing leadership within the agriculture and food cluster to keep the industry growing and competitive in the global economy. It has

developed annual strategic plans along with action steps under the strategic objectives of "Coordinate/Collaborate, Educate, Advocate, and Innovate".

At the Agriculture Summit in November 2013, the Council rolled out a series of research projects designed to provide benchmark data that would help planners have a sense of where the industry begins with regard to the metrics related to growth in output, employment, productivity, and other measures.

- One project concentrated on the shear size and scope of the industry in the region and in comparison with our competition around the country.
- The second project attempted to understand and quantify the supply and distribution (exports) chains of the layers of sub-industries that make up the cluster as a whole.
- Finally, the third project looked at the value of the intangible elements of agriculture…its positive effects on water quality, its connection to tourism, its role in the local food system, and its general contribution to the quality of life in the area.

While this initiative began with the Summit, it required an ongoing effort over the next two years to gather the data, interpret the information, and publish the results in time for the next Agriculture Summit on November 10, 2015. We engaged several research entities with the support of a $28,000 grant from the PA Department of Agriculture. We formed several Steering Committees to work on the interpretation of the data.

Eventually, we presented the results at several points in 2014 and 2015 in an attempt to inform the 2015 Summit which occurred during the first Lancaster County Agriculture Week.

Through the research, the Council sought to answer four action-oriented questions…

- How could we shorten and localize the existing regional supply chains and, in the process, increase productivity of the agriculture entities that are the end users?
- How could we increase exports out of the County and, in the process, increase overall output of the agriculture sector?
- How can production agriculture engage other parts of the agriculture and food cluster to further enhance supply and distribution chains?
- How can the agriculture and food cluster in Lancaster County and adjacent areas in Pennsylvania engage the same clusters in the Shenandoah Valley and the Eastern Shore with the goal of adding additional advantages of scale?

All of this activity would lead toward the development of this Agriculture Economic Development Plan, which will be presented during Ag Week in October 2016. The Plan is…

- Forward looking with a 10-year planning horizon;
- Benchmarks key indicators of economic performance;
- Develops a vision of what can be accomplished;
- Engages the agriculture and food industry in identifying threat and opportunities as well as the priority of action steps to move the needle on measures of economic performance.

Results of the Research

Size and Scope of the Industry

Normally, when we think of the agriculture and food industry, we think of production agriculture. However, production agriculture is part of a supply and distribution chain that extends to food processing, food distribution, and consumer consumption of food. In Pennsylvania, the PA Department of Agriculture also includes the forestry and wood products industry as well as service industries such as horse racing, landscaping, and veterinary services with its areas of oversight.

Additionally, we determined anecdotally that Lancaster County and the related agriculture businesses that call it home are not only the infrastructure for the County but also for a geographical region that extends to the Shenandoah Valley and the Eastern Shore but also to New York and New Jersey. People come to Lancaster County to buy everything from feed to seeds to farm equipment to forage and young stock.

Our supply and distribution network studies get to the issue from the standpoint of the size of the industry in the County but more work is needed on determining the reach of Lancaster County businesses in the supply chains of other, more regional producers. See our Summary of the Survey of the Supply and Distribution Chain of Dairy Producers, June 2015, in Appendix B and our Summary of the Survey of Poultry (Broiler) Producers, September 2016, in Appendix C.

Lancaster Leads the Way

In the production of agriculture products alone, Lancaster County is a powerhouse…

- Total market value of products sold was $1.47 billion in 2012 with 18% in crop sales and 82% in livestock sales;
- Lancaster County ranks 1st in the US in layers and 2nd in pullets as well as 3rd in corn for silage and 4th in poultry and eggs (out of 3,079 counties in the US)
- Within PA, Lancaster County leads the Commonwealth in many agriculture categories including…

    - Grains
    - Vegetables

- Milk from cows
- Poultry and eggs
- Hogs and pigs
- Sheep and goats
- Corn for grain and silage

Lancaster County also leads the Commonwealth in two important parts of the agriculture distribution chain…

- Food processing which includes industries which process and package eggs, milk, iced tea, ice cream, hot dogs, cookies and crackers, candy, and many food products employs over 5,000 workers, which is more than 2 times more concentrated than the national average.
- Forest and wood products with a high concentration of cabinetmakers employs more than 7,800 workers, which is nearly 3 times the national average.

Contributor to the Regional Economy

As an industry cluster, the agriculture and food industry is a major contributor to the regional economy…

- 23,841 jobs which is 8% of the total workforce in the County;
- Earnings of $1,088,057,016 or 8% of all earning;
- Sales of $6,699,582,779 or 16% of all sales in the region;
- High productivity

However, if we also look at the multiplier effect, which includes the effect of the supply and distribution chain on these measures, the result is even more significant…

- 36,399 jobs which is 12% of the total workforce in the County (compared to 6.75% for PA);
- Earnings of $1,609,137,974 or 12% of all earning;
- Sales of $8,824,105,093 or 21% of all sales in the region (compared to 8.42% for PA).

Additional Metrics

Our work with partners such as Lancaster Farmland Trust, the Lancaster County Conservation District, and the Lancaster County Agriculture Preserve Board along with the research from Earth Economics reminds us of other metrics by which we can measure the indirect value of the agriculture and food system…

- % of acres where no-till is the primary crop practice
- % of streams with riparian buffers

- Amount of farmland preserved
- Ecosystem service values by land cover class (see Beyond Food: The Environmental Benefits of Agriculture in Lancaster County, PA by Earth Economics, March 2015, in Appendix D and a Local Analysis in Appendix E)
- Net present value of natural capital (Earth Economics study)

Another item for further development in the near future is an annual scorecard of agriculture economic development metrics. Appendix A is reserved for that document.

Innovation in the Industry

As we begin thinking about the future of the agriculture and food industry in Lancaster County, we need to keep in mind the innovation that is happening in the industry…

- Technology and, more specifically, automation has had a significant impact. In packaging, machines now wrap candy faster than the eye can see. Robotic forklifts move product off the production line and into warehouses. The dairy industry has experimented with automated milkers while our neighbors in Adams County are working with prototypes of robots that can pick fruit and prune fruit trees.
- We see farmers being very creative in their efforts to be good environmental stewards as they explore no-till techniques and the use of cover crops. Manure management has shown farmers to be experts not only in crop management but also in the biotechnology and engineering needed to make digesters work.
- Urban farmers are experimenting with increasing the intensity of production on small plots of land, with rehabilitating brownfields, and developing new food hubs, and distribution networks.
- Vegetable growers and others are extending the growing season with hoop tunnels and the creative use of plastic.
- Designers of agricultural equipment have loaded today's machinery with technology that allows the satellite to drive (GPS), statistics to be collected, and precision agriculture techniques to be applied.
- Changes in consumer attitudes, preferences, and buying behaviors have revolutionized the way that we do business in the agriculture and food system. Niche markets in poultry keep the egg case full of a variety of products that consumers demand. Food cooperatives and roadside markets are growing as are the wholesale auctions that support them. We are engaged in a conversation about food safety that extends from the field to the supermarket.

In the midst of these changes, we find ourselves asking questions about how the agriculture and food infrastructure must change from the press of regulatory

functions to our need for more workers with a high levels of skills, particularly in science, technology, engineering, and math (STEM).

Involving Stakeholders

At the Summit in 2015, the Council presented the results along with an overview of agriculture innovation to a broad stakeholder group and asked them through a series of structured sessions to answer four questions…

- From where you sit in the agriculture and food industry, what are the challenges that will threaten the growth of the industry in the next ten years?
- In the face of these challenges, where do you see opportunities for Lancaster County agriculture to grow and thrive?
- Prioritize these threats and opportunities.
- Of the top five opportunities that have been identified, what actions could be taken to help the Ag Council and its partners move toward the goals?

In priority order, the ***regulatory environment***, in general, was the most mentioned challenge. Related comments focused on local permits, the enforcement of environmental regulations, and an interest in being proactive with regard to air and water quality. Participants expressed ***frustration with the way that consumers feel*** about the agriculture and food industry with opinion based on ideology instead of scientific fact.

There was considerable concern about the need for ***sustaining the workforce*** that will be needed to continue the industry in the future. Aging owner population, the capital challenge to succession planning, needed skill development, and access to an adequate workforce were among the topics mentioned. Finally, ***maintaining the current infrastructure*** was another concern with specific issues related to sustaining small farming operations, the nature of the supply and distribution chains, and the capacity of the transportation system being specific issues.

Opportunities reflected the positive side of some of the challenges mentioned above. Items related to ***building diversity of markets, expanding the supply and distribution chains, developing alternative revenue sources (tourism, composting, energy) for farming operations*** were items that were highly ranked by participants. Commenters believed in the ***application of new technology*** (drones, precision agriculture, new equipment capabilities, data collection) with more opportunities for education for practitioners of all ages. Better nutrient management and increased efficiency will be the result of the better application of technology.

Finally, those participating believed in ***initiating a proactive and constructive dialogue on environmental issues with all levels of government***. Respondents

called for ***better collaboration and a more aggressive telling of the story of agriculture*** in Lancaster County.

Carrying the Plan Forward with Action

In response to the question of what can the Lancaster County Agriculture Council accomplish alone and with its community partners in addressing the following issues over the next ten years, the stakeholders present suggested the following strategic goals and action plans in this priority order.

Under each strategic statement, the Ag Council has added examples of action plans that have been, are being, or could be pursued.

- Change the tone of the regulatory environment (local, state, federal) and continue a proactive and constructive dialogue and plan of action on environmental issues with all levels of government in partnership with the Lancaster County Conservation District, the County of Lancaster, and local municipalities.

    - Proactively complete more management plans for individual farms by funding more staff or recruiting volunteers;
    - Support an initiative to count all best management practices (BMPs) for use toward EPA metrics; and
    - Follow-up Penn State survey with farm visits where necessary.

- Respond to the drumbeat of negative opinion of the industry based on ideology (animal welfare, GMO, food labeling) with a more positive telling of the story of agriculture in Lancaster County.

    - Take advantage of every opportunity to talk about Lancaster County agriculture with a trained cadre of spokespeople trained in media relations;
    - Continue offering family-friendly events and support such activities as they occur in other venues
        - Family Farm Days
        - Ag Night at the Barnstormers
        - Cherry Crest Adventure Farm
        - Turkey Hill Experience
        - Hands-On House;
    - Sponsor positive media products such as “So Much to Celebrate” video;
    - Where appropriate, develop position statements on agriculture topics for release to the media. Anticipate hot topics and have talking points available.

- Develop ways to address the workforce manpower and skill shortage (succession, new workers, immigrants, more skill development options).

    - Support the agriculture education and FFA programs in the County to keep the pipeline of agriculture workers full and relevant;
    - Where needed, expand the agriculture education system to include other entities (community colleges, career and technology centers);
    - Work with the PA Departments of Agriculture and Education to develop innovative programming for agriculture education
        - Apprenticeships
        - Micro-credentials
        - Skill training beyond high school;
    - Actively promote agriculture and food careers throughout the entire education system, including new careers to meet emerging needs (such as Agriculture Technician).

- Support the transfer of technology at all levels of the agriculture education system and into practice as an adult.

    - Encourage research-based demonstrations of new technology among local agriculture practitioners;
    - Encourage the incorporation of new technology into all facets of formal and continuing education
        - Precision farming
        - No-till
        - Season extension methods
        - Hydroponics, aquaponics, and aeroponics

- Expand market opportunities for large and small producers and companies (international and domestic imports, new connections to the food system, new product opportunities, new businesses).

    - Specifically, work on developing new markets for milk by developing local processing capability;
    - Expand the connection between local growers of produce and new avenues for food distribution;
    - Encourage diversification of products where opportunities exist;
    - Constantly look for opportunities to bring new companies into the area to expand the range and depth of processing and distribution activities.

- Assure that the infrastructure that supports the agriculture and food industry in Lancaster County remains strong (fill gaps in the supply and distribution chains).

- Regularly study the supply and distribution chains in the area to identify gaps that exist;
- Encourage the use of contract operators, providing ways for them to break into the business and connect with those needing their services;
- Support and recognize those entities that are a part of the agriculture infrastructure in partnership with the Lancaster Chamber;
- Support and collaborate with the Lancaster Farmland Trust and the Lancaster County Agriculture Preservation Board in continuing to grow farmland preservation.

It is the intention of the Council to review each strategic objective and the corresponding action steps annually to update them as needed and to develop a more specific listing of priorities each year.

Measuring our Results

As a way of monitoring the progress toward our goals, we have identified the following high-level metrics on which we would expect to see growth on an annual basis.

- Total market value of agricultural products
- Total number of jobs in agriculture and food processing
- Total sales in agriculture and food processing
- Total value-added contribution to the Lancaster County economy
- Market ranking by animal and crop categories
- % of acres where no-till is the primary crop practice
- % of streams with riparian buffers
- Amount of farmland preserved
- Ecosystem service values by land cover class (Earth Economics study)
- Net present value of natural capital (Earth Economics study)

References

Schwartz, A, and Kocian, M., 2014. Beyond Food: The Environmental Benefits of Agriculture in Lancaster County, PA. Earth Economic, Tacoma, WA.

Appendix A

Statistical Summary of Agriculture Economic Development Indicators

Statistical Summary

Lancaster County Agriculture Council
October 2016

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    - Vegetables
    - Milk from cows
    - Poultry and eggs
    - Hogs and pigs
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Appendix B

Summary of the Survey of the Supply and Distribution Chain of Dairy Producers in Lancaster County, PA

Lancaster County Agriculture Council
Lancaster, PA

Summary of the Survey of the Supply and Distribution Chain of Dairy Producers in Lancaster County, PA

As part of a process designed to better understand the supply and distribution chain of the various segments of the agriculture industry in Lancaster County, the Lancaster County Agriculture Council undertook a survey of dairy producers in late summer of 2014 in partnership with the Center for Dairy Excellence, the Dairy Herd Improvement Association, Cooperative Extension, and other members of the Council. The Council designed the survey to solicit qualitative information to complement what can be found in the US Department of Agriculture Census of Agriculture and other data in input and output from the US Department of Commerce Bureau of the Census.

This report will become a part of a series of similar reports on the poultry, swine, vegetable, and horticulture industries in Lancaster County. The Council plans to use the data to create an Agriculture Economic Development Plan that will guide its priorities for the next 5-10 years.

Census of Agriculture

According to the 2012 US Census of Agriculture, the value of milk from cows produced in Lancaster County was $425,171,000…

- Milk is roughly 28.8% of all farm product ($1,474,954) in Lancaster County
- Lancaster County ranks 1st in PA and 8th in the US in milk production
- Lancaster County alone produces 21.6% of all PA production ($1,966,892,000)
- There are 1,776 farms involved in dairy farming in the County compared to 7,048 dairy farms in PA
- The 1,776 dairy farms in Lancaster County are 31.4% of all farms in Lancaster County (5,657)

Input-Output

An analysis of the supply and distribution channels of a key industry leads directly to the ripple effect that an industry can have in a local economy. Dairy farmers buy a wide assortment of good and services. They then turn to a distribution network, which often follows demand and price.

A key part of the analysis for the sake of economic development revolves around Thewhere goods and services are purchased and where product is sold. Keeping supply and distribution channels closer to the regional economy where the product

is produced allow that economy to reap more of the benefits of the multiplier effect and allow the producer to lower their costs related to supply and distribution.

This study used the input-output data from the US Department of Commerce as mined and modeled by Economic Modeling Specialists International based in Moscow, ID. We used information for the NAICS code 112000 for Animal Production as a general profile for input-output for all farmers realizing that dairy farmers are a subset of this group and acknowledging that there may be some differences between dairy farmers and other farmers.

Even with these caveats, we found patterns that we believe are confirmed by the primary research that occurred with the survey of the dairy industry that we report below…

- Feed is one of the primary inputs in animal agriculture valued at nearly $108.5 million with crop production adding another $40.9 million. Most feed (61.6%) is produced locally but 78.6% of forage comes from outside of the region
- Energy costs add roughly $48.4 million in costs ($24.7 million for petroleum products, $5.2 million for coal-related products, $1.7 million for gas, $1.5 million for electricity, and others) with most provided by entities outside the region
- Trade agents ($10.1 million) and wholesalers ($3.1 million) help bring product to market
- Transportation categories especially trucking and rail account for $22.4 million + in expenses with roughly 25-33% provided within the region
- Farm machinery, custom operators, veterinary services, construction and real estate, and warehousing are categories in the top 25 of expenditures and with more than 33% or more purchased in the region while drugs, medical supplies, pesticide, and soybean processing are also in the top 25 but have less than 10% purchased in the region.

Survey of the Dairy Industry in Lancaster County

Following some of this secondary data, the Lancaster County Agriculture Council developed a survey using Survey Monkey that could be done online or in hard copy. We relied on e-mail contacts from a number of sources but we also mailed surveys in hard copy to members of the Dairy Herd Improvement Association in Lancaster County.

In the end, we received 288 surveys, which reflect roughly 16% of the dairy farms in Lancaster County. More than ½ were paper and pencil surveys reflecting the large number of Plain Sect dairy farmers in the sample.

The Questions

We asked survey participants these questions…

- How big is your herd size (Q1)?
- From where do you purchase the following items (Q2)?
    - Young stock
    - Feed
    - Seed
    - Fertilizer
    - Veterinary services
    - Genetics
    - Labor
    - Custom operators
    - Operational consultants
    - Trucking/transportation
    - Energy
    - Equipment
    - Financial services
    - Legal services
    - Insurance services
    - Environmental consultation
    - Other
- Are there any gaps in the suppliers in the area where you would suggest there should be an effort to recruit additional resources (Q3)?
- Where do you sell your fluid milk (Q4)?
- Is there anything else that you can tell us about where you buy products or sell fluid milk?

The Responses

- Among the 288 respondents, herd size ranged as follows…
    - 49 or under: 109 (38%)
    - 50-99: 149 (52%)
    - 100-199: 18 (6%)
    - 200-499: 9 (3%)
    - Over 500: 3 (1%)
- From where do you purchase the following items (Q2)?
    - Most respondents raise their own young stock
    - Feed, seed, equipment, energy, financial services, and insurance services have 5-8 companies that do a significant share of the business followed by dozens of entities that serve far fewer respondents
    - Vendors for fertilizer, veterinary services, genetics, and environmental consultants tend to cluster around 6-10 major companies in each category

    - Not too many respondents hire labor from off the farm
    - The lists of custom operators, operational consultants, and trucking/transportation providers are long and mostly individual providers
- Are there any gaps in the suppliers in the area where you would suggest there should be an effort to recruit additional resources (Q3)?
    - Wide agreement on nothing else needed
    - Amazing infrastructure
    - More independent dairies
- Where do you sell your fluid milk (Q4)?
    - Leading buyers include Land O'Lakes (61), Dairy Farmers of America (41), Maryland and Virginia Milk Producers (38), Lanco Pennland/Hagerstown (31), Mt. Joy Farmers Co-op (28), Clover Farms/Reading (14), Cloverland Green Springs Dairy/Baltimore (13), East Smithfield Farm (8), Oregon Dairy (8), and Organic Valley Wisconsin (7)
    - A variety of one or two farms selling to miscellaneous, mostly local processors
- Is there anything else that you can tell us about where you buy products or sell fluid milk?
    - Several mention the growing interest among consumers in organic and raw milk
    - "With all the interest the local public has about drinking and eating local food, why can't we have a processing plant for dairy products here instead of sending our milk to Reading and New Jersey. It would save on transportation and create jobs for the local economy."
    - "Milk haulers…do not have mercy on us…they charge too much."
    - "Tell them to keep the milk as wholesome as possible instead of selling it like water."
    - "Many feed by-products like peanut hulls for bedding come from North Carolina, molasses from Baltimore, wet brewers grain from Virginia and so on."

Debriefing the Survey

In November 2014, the Agriculture Council gathered together a group of subject matter experts from government, education, and the dairy industry to look over the results and comment on the findings. The initial group included John Frey, Director, PA Center for Dairy Excellence, PA Department of Agriculture; Leon Ressler, District Director, Cooperative Extension, Chester, Lancaster, and Lebanon Counties; Luke Brubaker, Brubaker Farms; Andy Bollinger, Meadow Spring Farm; and Tim Forry, Oregon Dairy.

Jere High, Manager, Dairy Herd Improvement Association, contributed his comments at a meeting in early January. Ron Ohrel, Director of Community Outreach, Mid-Atlantic Dairy Association added additional observations in February.

As our commenters looked over the Survey, we asked them to consider whether the Survey seemed to reflect the buying and selling patterns of the dairy industry as they know it. We also asked them to consider the geographical distribution of those who responded to the Survey (and whether it is skewed because of our reliance on the DHIA mailing list). The consensus was that, on its face, it is representative of the industry.

Commenters suggested that…

- There needs to be some additional work done on the role of forage in the system. Is it adequately accounted for in our numbers?
- There is a great deal of fluid milk that is going out of the County for processing.
- Some additional research on the location of local dairies would be helpful.
- On the lists of vendors that are very long and individualized (custom operators, operational consultants, and trucking/transportation providers), most of these areas involve using personal relationships to accomplish tasks.
- Is there more room for dairy processing and manufacturing in the County? We would benefit from additional innovative dairy outlets.
- The Lancaster brand is important for further development.
- There has been a huge uptick in raw milk permits in the five years, although this market still represents less than 1% of the total Lancaster milk supply.
- Many of the commenters to the Survey spoke to the role that the Lancaster County infrastructure plays in other areas. Perhaps, we should ask the top companies to profile the amount of business that they do out of the County.

Recommendations

In response to the Survey, the following recommendations are put forward to the Lancaster County Agriculture Council for further action…

- Engage local economic development officials in dialogue about developing more local resources for the processing of milk;
    - Explore the demand, uses, and supply of raw milk products;
    - Access the supply of milk that is or could be available for other processed milk products;
    - Support economic development entities in the development of local companies producing processed milk products and the recruitment of companies based outside of the area.

- Reach out to companies in the agriculture infrastructure that provide technical and business services to further understand their business needs as they reach out to the industry beyond Lancaster County.
- Appoint an exploratory task force to analyze and evaluate the value and potential opportunity for new innovation in dairy processing or manufacturing.
- Support some additional development work on the role of forage in the local dairy supply chain (how much is produced, how much is imported, what is its value, how is that measured and accounted for)

Appendix C

Summary of the Survey of the Supply and Distribution Chain of Poultry (Broiler) Producers in Lancaster County, PA

Lancaster County Agriculture Council
Lancaster, PA

Summary of the Survey of the Supply and Distribution Chain of Poultry Producers in Lancaster County, PA

As part of a process designed to better understand the supply and distribution chain of the various segments of the agriculture industry in Lancaster County, the Lancaster County Agriculture Council undertook a survey of poultry producers in late summer of 2014 in partnership with Wenger Feeds and other members of the Council. The Council designed the survey to solicit qualitative information to complement what can be found in the US Department of Agriculture Census of Agriculture and other data in input and output from the US Department of Commerce Bureau of the Census.

This report will become a part of a series of similar reports on the poultry, swine, vegetable, and horticulture industries in Lancaster County that the Council plans to do in the coming years. The Council plans to use the data to inform its Agriculture Economic Development Plan that will guide its priorities for the next 5-10 years.

A Vertically-Integrated Industry

Hen and egg production were common on most farms at the turn of the century and production was primarily for home use. Before the 1950s, most farms raised chickens, but meat was a byproduct of the egg enterprise. Since that time, the industry has moved almost completely from a home industry to one dominated by contract production.

Vertical integration through production and marketing contracts has become the dominant model for livestock production in the US. Growers raise animals owned by integrators. Farm contracts contain detailed conditions for growers, who are paid based on how efficiently they use feed, provided to the integrator, to raise the animals. The contract dictates how to construct the facilities; how to feed, house, and medicate the animals; and how to handle manure and dispose of carcasses.

In the poultry industry, chicks are hatched at company-owned hatcheries, vaccinated against poultry diseases, and delivered to the grower's farm, where they are housed in large, specialized structures called growout houses. The company also provides feed as needed. When the birds reach market age and weight in six to seven weeks, the farmer is paid on the basis of weight gained by the flock, which is seen as a measurement of the farmer's skill and good management.

The National Chicken Council (2015) counts the benefits of the contract system to growers and the public as…

- Less man hours to produce more chickens, due to improved technology and larger flock sizes;
- A reduction in the amount of feed required to produce a pound of broiler meat, due to continual discoveries in genetics and nutrition;
- A reduced growing period to produce a market broiler chicken, meaning reduce space, labor, equipment, and a much smaller environmental impact;
- Better health programs for the welfare of birds; and
- Being able to go to the market at any time of the year and buy a tender, flavorful chick product at a price that is very kind to your budget.

Not everyone sees contracting as positive. Harris (referenced in Perry et al., 1999, 110-113) suggests that contracting reduces entrepreneurial capacity by removing opportunities for human capital development on the part of grower. Kolmer et al. (1963) worry about the possibilities for exploitation of growers in the presence of unequal bargaining power.

Census of Agriculture

According to the 2012 US Census of Agriculture, the value of poultry and eggs produced in Lancaster County was $469,021,000…

- Poultry and eggs is roughly 31.8% of all farm products ($1,474,954,000) in Lancaster County.
- Lancaster County ranks 1st in PA and 4th in the US in poultry and eggs and, more specifically, 1st in PA and 1st in the US for layers; 1st in PA and 2nd in the US for pullets; and 1st in PA and 32nd in the US for broiler production.
- Lancaster County alone produces 34.4% of all PA poultry production ($1,966,892,000).
- More than 53,586,600 broilers were sold in 2012.
- There are 1,577 farms involved in poultry farming in the County compared to 7,102 poultry farms in PA (22% in Lancaster County).
- The 1,577 poultry farms in Lancaster County are 27.8% of all farms in Lancaster County (5,657).

Input-Output

An analysis of the supply and distribution channels of a key industry leads directly to the ripple effect that an industry can have in a local economy. Poultry farmers buy a wide assortment of good and services. They then turn to a distribution network, which often follows demand and price.

A key part of the analysis for the sake of economic development revolves around where goods and services are purchased and where product is sold. Keeping supply and distribution channels closer to the regional economy where the product is

produced allow that economy to reap more of the benefits of the multiplier effect and allow the producer to lower their costs related to supply and distribution.

This study used the input-output data from the US Department of Commerce as mined and modeled by Economic Modeling Specialists International based in Moscow, ID. We used information for the NAICS code 112000 for Animal Production as a general profile for input-output for all farmers realizing that poultry farmers are a subset of this group and acknowledging that there may be some differences between poultry farmers and other farmers.

Even with these caveats, we found patterns that we believe are confirmed by the primary research that occurred with the survey of the poultry industry that we report below…

- Feed is one of the primary inputs in animal agriculture valued at nearly $108.5 million with crop production adding another $40.9 million. Most feed (61.6%) is produced locally but 78.6% of forage comes from outside of the region.
- Energy costs add roughly $48.4 million in costs ($24.7 million for petroleum products, $5.2 million for coal-related products, $1.7 million for gas, $1.5 million for electricity, and others) with most provided by entities outside the region.
- Trade agents ($10.1 million) and wholesalers ($3.1 million) help bring product to market.
- Transportation categories especially trucking and rail account for $22.4 million + in expenses with roughly 25-33% provided within the region.
- Farm machinery, custom operators, veterinary services, construction and real estate, and warehousing are categories in the top 25 of expenditures and with more than 33% or more purchased in the region while drugs, medical supplies, pesticide, and soybean processing are also in the top 25 but have less than 10% purchased in the region.

Survey of the Poultry Industry in Lancaster County

Following some of this secondary data, the Lancaster County Agriculture Council developed a survey using Survey Monkey that could be done online or in hard copy. We relied on e-mail contacts provided to us by Wenger Feeds, one of the largest providers of feed in the region. This automatically invalidated our numbers around feed but the designers of the survey accepted the constraints for the sake of getting the survey into the hands of producers who would complete it. We also decided to survey only broiler producers since that segment of the business involves a higher quantity of producers.

In the end, we received 32 surveys, which reflect roughly 2% of the poultry farms in Lancaster County.

The Questions

We asked survey participants these questions…

- How many birds (broilers only) are on your farm at any one time during the years (Q1)?
- How many flock turns do you have per year (Q2)?
- In which of these segments of the industry are you involved (Q3)?
    - Pullets
    - Conventional meat birds
    - Organic
    - Antibiotic-free
    - Cage-free
    - Free range
- Do you contract (Q4)?
- If so, with which company (Q5)?
- If not, to whom do you sell (your distribution contacts)(Q6)?
- From where do you purchase the following items (Q7)?
    - Young stock
    - Feed
    - Veterinary services
    - Contract Labor
    - Operational consultants
    - Seed
    - Fertilizer
    - Custom operators
    - Trucking/transportation
    - Energy (electric)
    - Energy (propane)
    - Construction/Renovations
    - Equipment
    - Financial services
    - Legal services
    - Insurance services
    - Environmental consultation
    - Other
- Are there any gaps in the suppliers in the area where you would suggest there should be an effort to recruit additional resources (Q8)?
- Is there anything else that you can tell us about where you buy supplies and/or services and/or sell your product?

The Responses

- How many birds (broilers only) are on your farm at any one time during the years (Q1)?
    - Under 25,000 (3%)
    - 25,001-100,000 (75%)
    - 100,001-250,000 (22%)
    - 250,001-500,000 (0%)
    - More than 500,000 (0%)
- How many flock turns do you have per year (Q2)?
    - Under 2 (3%)
    - 2-5 (31%)
    - More than 5 (66%)
- In which of these segments of the industry are you involved (Q3)? (total will be more than 100%)
    - Pullets (3%)
    - Conventional meat birds (67%)
    - Organic (30%)
    - Antibiotic-free (10%)
    - Cage-free (10%)
    - Free range 3%)
- Do you contract (Q4)?
    - Yes (100%)
    - No (0%)
- If so, with which company (Q5)?
    - Tyson (55%)
    - Coleman (23%)
    - Perdue
    - Farmer Pride
    - Risser
    - Bell & Evans
    - Heritage
    - Sullivan
- If not, to whom do you sell (your distribution contacts)(Q6)?
- From where do you purchase the following items (Q7)?
    - This is a highly-integrated industry which is evident in the fact that producers depend on their integrator as the source for many products and services. In our list, producers rely on integrators for young stock, veterinary services, labor, operational consultants, and trucking.
    - Poultry producers are very conscious of their energy (electric and propone) costs and, clearly, as seen by the length of the list, shop around for the best deal.
    - There appear to be a relatively few construction companies that do work for this industry.

    - Seed, fertilizer, equipment, financial services, legal services, insurance services, and environmental consulting have 2-3 companies that do a significant share of the business followed by other entities that serve far fewer respondents and have a local flavor.
    - Vendors for custom operators and environmental consultants tend to cluster around 6-10 major companies in each category
    - Respondents did not have much to say about their labor situation.
    - The lists of custom operators and insurance service providers are long and mostly individual providers.
- Are there any gaps in the suppliers in the area where you would suggest there should be an effort to recruit additional resources (Q8)?
    - Educational seminars (animal health, feed ingredients, equipment trends, grower networking)
- Is there anything else that you can tell us about where you buy supplies and/or services and/or sell your product?
    - "Equipment suppliers are influenced by the poultry companies. They should listen to the people who pay the bill."
    - Farmers Pride/Bell & Evans can answer most of this for you. As a contract grower, I cannot answer these questions for you."
    - "We need a local buyer for soybeans. Presently they most all have to be delivered to the shore."

Findings

In looking at the survey and a recent qualitative doctoral dissertation that was done using broiler producers in the area a subjects, the following findings are noted…

- A contractual relationship with a major integrator is the major way that broiler (and layer) production is done in Lancaster County. Perdue, Tyson, and Bell & Evans are the major players in the poultry meat market.
- In response to consumer demand, there is a significant increase in the interest in organic chicken, which is causing a reshuffling of the importance of the players, as Bell & Evans significantly grows its producer network with a value-added product.
- Producers like the contract relationship because the integrator tends to deliver a turnkey operation, negotiates many of the inputs as well handling the connection to markets, and offers a product that is very stable in its financial rewards from month to month. Financial stability is important to producers who have financed building construction to expand.
- Downsides for producers are contract restrictions on what companies can be used as vendors and what the requirements are for certain parts of the process (buildings, for example).

- Outside of the contracts, producers tend to rely on proven providers where certain technical expertise (construction, environmental concerns, legal services) is required.
- For other goods and services (insurance, banking, seeds, fertilizer), farmers tend to do business with people that they know in their local areas

Recommendations

A Work Group of the Lancaster County Agriculture Council will be meeting in Fall 2016 to discuss additional findings and make recommendations for the Lancaster County Agriculture Economic Development Plan.

Appendix D

Beyond Food:
The Environmental Benefits of Agriculture in Lancaster County, PA

Appendix E

Beyond Food:
The Environmental Benefits of Agriculture in Lancaster County, PA

A Further Analysis of the Report

Beyond Food: The Environmental Benefits of Agriculture in Lancaster County, PA

A Further Analysis of the Report

Early in 2014, the Lancaster County Agriculture Council contracted with Earth Economics, a non-profit based in Tacoma, WA, to conduct an ecosystem service valuation of Lancaster County as a part of a larger research project that attempts to capture the value of the agriculture sector in the region. The study looked at the value of 21 ecosystem services that include food, water supply, recreation and tourism, air quality, climate stability, pollination, soil formation, waste treatment, and water regulation among others.

In its Executive Summary, "this study estimates that Lancaster County's natural capital provides an estimated $676 million in economic benefits on an annual basis. Of 21 economically valuable ecosystem services present in the County, 13 were valued across 7 Lancaster County land cover types.

If the natural capital that generates this annual benefit stream were regarded as a short-lived economic asset, Lancaster County's natural capital asset value would be roughly $17.5 billion (4% discount rate over 100 years).

In truth, open space, pastures, forests, fertile soils, wetlands and aquifers are not short-lived and do not depreciate or fall apart like bridges, cars, and power plants. Because natural capital assets are renewable, self-sustaining, and long-lived, there is good reason not to discount the value of future ecosystem services like water and food provisioning or flood protection. Recognizing the long lifespan of natural assets and using a zero discount rate over a 100- year period (this counts no value after 100-years), Lancaster County's natural capital asset value would be as high as $114 billion. This figure still omits many valuable natural asset benefits.

Agricultural lands make up over 65% Lancaster County's ecosystem and form a key part of the region's economic foundation. In addition to a robust agricultural sector that provides the livelihoods for much of Lancaster County's population, agricultural lands generate key ecosystem services. When viewed in fiscal terms, cultivated, pasture, and associated agricultural lands were estimated to provide a stream of $483 million in annual ecosystem service benefits."[1]

Further, the Report speaks to the value of preserved agricultural land providing as little as $33 million and as much as $231 million of the total value of benefits enumerated above.

[1]Schwartz, A, and Kocian, M., 2014. Beyond Food: The Environmental Benefits of Agriculture in Lancaster County, PA. Earth Economic, Tacoma, WA.

A Task Group of the Lancaster County Agriculture Council[2] met in August 2014 to evaluate the Earth Economics report and to think through its implications for the work of the Council as it moves toward a valuation of the agriculture economy, in general, and, just as importantly, recommendations for the agriculture economic development plan that the Council is planning going forward.

As the Task Group reviewed the report, it raised some definitional questions related to the categories of Land Use Land Cover that were used in Lancaster County. In particular, the Shrub/Scrub and Urban Green Space categories seem low. It also suggested asking the contractor for some additional information about how Lancaster County compares to other areas in which the contractor has or does work. The Group was also interested in further study, which could apply this same methodology, to the situation historically so that one could answer the question of what the County has lost in the value of agriculture land as well as forest and wetlands over time.

It was agreed that the Executive Summary of this Report should be shared broadly with township, County, and economic development officials. It was noted that this would be a part of the 2015 Agriculture Summit but that some of this detail could be shared before the Summit if opportunities arise.

Discussion

In the course of discussion, these issues surfaced…

- In the future, land in agriculture will need to be more productive. Scale will increase. Higher density farming will impact all producers, large and small. USDA predicts the need to growth output by 70% in the near future. The question is how to increase production responsibly?
- Preservation of farmland will be one part of the solution to increasing production. Without farms and farmers, it is difficult to think of sustaining, let alone growing agriculture. Preserving the economic viability of the farm as well as preserving the land itself will be an important consideration.
- With animal agriculture dominating Lancaster County agriculture, an increase in scale will mean much more attention needs to be paid to nutrient management, particularly manure and waste management. There are already great examples of best practices but they will also need to come to scale.
- Water quality will continue to be a major issue for environmental sustainability in general but also because of the needs to preserve the viability of the Chesapeake Bay watershed. Once again, best management

[2]Task group consisted of Dean Severson, Lancaster County Planning Commission; Lamont Garber, Stroud Water Research Center; Steve Hershey, dairy farmer; Scott Miller, PA Dutch Convention and Visitors Bureau, and Kevin Rohrer, farmer.

practices are already in place but they need to be expanded to brought to a higher level of scale as quickly as possible. We also need to encourage our friends in more urban areas to do their part with better storm and wastewater management.

- It is clear that the public wants to be more involved in the food system and has some specific ideas about what it can do to address water and other environmental concerns, ranging from urban farming to agriculture preservation and sourcing more of its food needs locally. There is an opportunity to use these positive motives to get the general public more involved in a variety of efforts.
- Ag-related tourism is an outgrowth of a vibrant agriculture sector. The curiosity and interest of the public in food may become a draw for people in a way that can grow the market for locally-grown food and food-related attractions.

<u>Recommendations</u>

With these points of discussion in mind, the Task Group makes the following recommendations to the Agriculture Council for inclusion in the Lancaster County Plan for Economic Development in Agriculture…

- Task a wide variety of partners with coming together to search for ways to increase agricultural output and productivity as well as to increase market diversity and imports out of the County.
- In collaboration with local and County government, reinforce the value of land use goals and urban growth boundaries to a variety of audiences.
- Continue to support the agriculture preservation efforts in the County.
- Bring best practices in nutrient management forward and seek ways to support their replication throughout the area.
- In collaboration with the Lancaster County Conservation District and its network of community organizations, increase efforts to stabilize and upgrade existing natural areas so that their value to the ecosystem increases.
- Lift up and promote specific agriculture-related practices (no-till, precision feeding) that can have an impact on water quality issues.
- Continue to support events (Family Farm Days) that encourage the public to be more knowledgeable about the food system.
- Look for community-based partners that could increase the involvement of the public in food and environmentally-related activities.
- Increase the dialogue with the hospitality industry about the needs of agriculture-related tourism.