Item No. 1 of 1

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ASSESSING PRODUCTION SYSTEMS, ECONOMICS, MARKETING, PRODUCER AND PROCESSOR PERCEPTIONS AND CHARACTERISTICS OF MEAT FROM FORAGE-BASED SYSTEMS

NARRATIVE: Small to medium sized family farms are at a disadvantage compared with large commercial farming entities if production efficiency is the measurement criterion. Yet, economic prosperity of these small farms is important, as they are critical to rural economies and total food production in the United States. Grass-based finishing systems are uniquely well suited to small and medium sized beef and sheep producers. While few data are available quantifying input costs, an opportunity may exist to reduce production costs for smaller producers by utilizing grass-based production systems. Due to an increasing consumer demand, the value of differentiated grass finished products is greater than that of commodity products. As a result, sustainability of farm profitability is not solely dependent on volume of sales and economies of scale, but is increasingly dependent on producing a high-demand product. Direct marketing options are excellent and smaller producers tend to be situated closer to more densely populated regions of the United States. Research discoveries and producer education developed from this project will increase small to medium sized livestock farm economic prosperity, through the improved production of forage-fed beef and lamb, and by identifying processing and marketing opportunities for locally raised differentiated meat products. Gaps exist in our knowledge of how forage-based livestock production systems affect the palatability factors for meat products including flavor, color, chemical composition and texture. If these are impacted negatively, the perception and expectation of consumers relative to their eating experience will be hindered. A thorough economic assessment of diverse grass-based meat production systems has not been conducted. Profitability will rely on the creation of high-value, consumer products versus the mere economic efficiency of production and returns for commodity products. The research focus of this proposal is to evaluate novel forage-based finishing systems for beef cattle and lambs and to compare these to a standard feedlot grain-based production system. The increasing popularity of the locally-grown foods movement necessitates gathering information related to the production efficiency and meat products that can be produced using a variety of forage-based programs. Additionally, understanding how food animal producers (primarily beef, sheep, and dairy grazers producing grass-based beef) use information to make decisions to transition their operations to a primarily forage-based finishing system is a prerequisite to developing effective Extension and outreach programs. These programs can then be aimed at aligning producers with smaller scale meat processors who are transitioning their operations toward meeting the high-value demand for locally-grown, and often novel meat products. The end result could be the building of a holistic system (one that encompasses the producers, processors, and marketers) which would allow for more interaction among creative, progressive, and engaged partners.

OBJECTIVES: Goals and Objectives: 1. Determine the current producer a) knowledge of the sustainable farming practice of grazing; b) levels of participation in soil and water conservation programs; c) factors that are driving change, e.g. cost of feed and fuel; and d) understanding of direct- and niche-marketing, e.g., organic, forage-based, local or natural meat product. 2. Determine effects of novel forage-based beef and lamb finishing systems on: animal, land, and economic inputs required; measures of animal production; measures of carcass quality and composition; and measures of production efficiency. 3. Determine the effects of various forage-based management and nutrition options on the value, consumer desirability, and human nutritional characteristics of the final beef and lamb meat products; these products will be compared with those produced by confinement grain feeding. 4. Determine the effect of forage-based systems on farm profitability through comparative financial analyses of revenue, input costs (fixed and variable) and total returns. Data collection will establish foundation for development of financial analytical tools and enterprise budget templates. 5. Determine the willingness of local, small-scale, State and Federally -inspected, meat processors to work with niche or specialty meat producers. 6. Based on results from the above goals, develop appropriate extension publications and curriculum for use by county educators and other non-profits who work closely with forage-based small to medium sized farms. Expected Outcomes: Primary outcome from this project will be the discovery and transfer of knowledge through research and education. Significant publications will result in the scientific and popular press. A significant number of producers will be engage by communications, workshops, and on-farm events. Small to medium sized producers will adopt forage based production systems for finishing beef and lamb. These producers will become more aware of direct marketing opportunities for livestock products, will have increased networking with meat processors, and will have increased understanding of their economies of production and the quality characteristics of the meat they produce. Extension and university personnel will have increased knowledge of producer barriers to adoption, increased knowledge of barriers to processor participation, and increased knowledge of production systems and meat quality characteristics. This will be accomplished by current and future data sharing among collaborating scientists and outreach specialists as outlined. Outputs will be sustained after the end of the project through Beef and Sheep Team newsletters, and national extension and animal science meetings. NCCC beef and sheep regional research committee meetings will provide a venue for continued discussion and expanded collaborations throughout the U. S. The information generated from this project will have significant impact on production, food quality, and economic prosperity of small to medium sized livestock producers.

APPROACH: A series of three animal experiments will be conducted. The first experiment will investigate three novel beef production systems to determine effects of grass finishing system on animal, land, and economic inputs required, measures of animal production, and carcass characteristics. Experiment 2 will be conducted to determine the effects of 3 perennial forage finishing systems versus a limit-fed corn-based finishing system on lamb growth and meat characteristics. Experiment 3 will be conducted to evaluate the incorporation of novel forages, chicory and sorghum sudangrass, as an option for finishing ruminants in late summer and fall. A grass finished product line will be established as part of the commercial sale program of the OSU Meat Laboratory. In addition Dee-Jay's Custom Butchering, Fredericktown, OH and Tucker Packing, Orrville, OH will investigate local market opportunities in their region for grass finished product lines. The effect of forage-based finishing systems on farm profitability will be determined through comparative financial analyses of revenue, input costs (fixed and variable) and total returns. Data collection will establish foundation for development of financial analytical tools and enterprise budget templates. These assessments will begin in Year 1 and continue for the duration of the project by quantification of all fixed and variable costs for the three grass-based beef production systems plus the grain-based finishing system outline in Experiment 1 above. Total enterprise budgets will be developed. Total returns will be assessed and compared across production system. Similar assessments will be conducted for lamb experiments 2 and 3, and for collaborating producers. This project proposes to conduct a pre and post assessment of producers and a survey of meat processors. In year one, the pre-assessment will provide a baseline regarding producer beliefs, attitudes, knowledge and practices that relate to forage-based management and the marketability of grass-fed animals. The second survey, a post-assessment will measure changes in knowledge, perceptions, and actions towards implementing forage-based management in the final year of this project Ohio State Extension educator Jeff McCutcheon and Small Farm Institute Director Leah Miller will be doing outreach for producers and stakeholders. In year 2, a mail survey of the full universe of Ohio meat processors (227) will be conducted. Statistical analysis will be performed on all research components. Economic analysis will be performed on budget and production data collected at all locations. Impact and

outcomes associated with the education objectives will be assessed by pre and post assessment surveys and interviews.

PROGRESS: 2011/01 TO 2011/12
OUTPUTS: Small to medium sized family farms are at a disadvantage compared with large commercial farming entities if production efficiency is the measurement criterion. Yet, economic prosperity of these small farms is important, as they are critical to rural economies and total food production in the United States. Grass-based finishing systems are uniquely well suited to small and medium sized beef and sheep producers. While few data are available quantifying input costs, an opportunity may exist to reduce production costs for smaller producers by utilizing grass-based production systems. Due to an increasing consumer demand, the value of differentiated grass finished products is greater than that of commodity products. As a result, sustainability of farm profitability is not solely dependent on volume of sales and economies of scale, but is increasingly dependent on producing a high-demand product. Direct marketing options are excellent and smaller producers tend to be situated closer to more densely populated regions of the United States. Gaps exist in our knowledge of how beef and lamb producers transition to new management systems as consumer desires change, and how forage-based production systems affect economic sustainability, and the palatability attributes of meat products. Research goals are to determine effects of novel forage-based beef and lamb finishing systems on: enterprise economics, animal production, carcass quality and composition, and production efficiency. In 2010, as part of the AFRI grant, a survey identifying the extent of grass-based beef and lamb production was sent to over 600 producers listed as active in county Extension databases in Ohio. Survey responses were received from 246 beef producers and 110 lamb producers. Dr. Lois Morton, Director of the Leuopold Center for Sustainable Agriculture at Iowa State University, is in the process of analyzing the data, and two technical bulletins, one for sheep and one for beef, will be produced in 2012. PARTICIPANTS: Francis Fluharty, Henry Zerby, Paul Kuber, and Steve Loerch are faculty members in the Department of Animal Sciences at the Ohio State University. Jeff McCutcheon is the Morrow County Extension Educator in Ohio. Leah Miller is the Director of the Small Farm Institute in Fresno, Ohio. Lois Morton is a a Professor of Sociology in the College of Agriculture at Iowa State University. TARGET AUDIENCES: The target audience for this project includes beef, sheep, and dairy grazing producers who wish to develop value-added, grass-based production and marketing options from their farming operations, and small to medium sized meat processors who process the animals into food products. PROJECT MODIFICATIONS: Not relevant to this project.

IMPACT: 2011/01 TO 2011/12
This project is conducting a pre and post assessment of producers and a survey of meat processors. In year one, the pre-assessment was used to provide a baseline regarding producer beliefs, attitudes, knowledge and practices that relate to forage-based management and the marketability of grass-fed animals. The second survey, a post-assessment will measure changes in knowledge, perceptions, and actions towards implementing forage-based management in the final year of this project Ohio State Extension educator Jeff McCutcheon and Small Farm Institute Director Leah Miller will be doing outreach for producers and stakeholders. In 2012, a mail survey of the full universe of Ohio meat processors (227) will be conducted. Statistical analysis will be performed on all research components. Impact and outcomes associated with the education objectives will be assessed by pre and post assessment surveys and interviews. Three hundred and forty-four (344) producers sent their valid responses to the pre assessment survey. Median age of Ohio residents is 37.9. The livestock producers in general are older people. The mean age of all producer respondents is 54, with the median age being 56. Thirty percent (30.5%) of survey respondents are aged 50 or young (16.8% are aged between 40 to 49, and 13.7% younger than 40). Two larger age groups are those aged 50 to 59 (28.8%), and 60 to 69 (25.9%). About one fifth (14.8%) of the respondents are aged 70 and above. In total there are 246 beef producers and 110 lamb producers. The 110 lamb producers averagely have 30 years of experience raising sheep (median being 30, too). They also reported an average of 17 years' beef raising experience (median being 7.5). For the 110 lamb producers, about 12.7% of them did not own any land on their own. Half of them owned 80 acres and less, and only ten percent owned 300 acres and more. Average acreage owned is 195.6 with median acreage owned being 82.5. Over half of the 110 lamb producers (53.6%) did not rent any land, and about 20% rented 80 acres or more. Average total land rented is 112.37 acres. The 246 beef producers had an average of 33 years of beef raising experience (median 35). They averagely had about eight years of experience raising sheep (median being 0). For the beef producers, about 7.3% of them did not own any land at all. Compared with lamb producers, beef

producers generally owned more acreage. Half of them owned 150 acres or less, and ten percent of them owned more than 500 acres. Average acreage owned is 219.67 with median acreage being 151. This research will fill in gaps that exist in our knowledge of how forage-based livestock production systems affect the operations of small to medium sized livestock farms, and meat processors, in Ohio, as well as the palatability of meat products from various production systems. This program should result in the discovery of novel grass-based production systems that enhance revenues through improved meat quality and palatability (leading to greater consumer demand and a higher value), and will be assessed by both processors and direct markets.

PUBLICATIONS (not previously reported): 2011/01 TO 2011/12

1. Radunz, A. E., F. L. Fluharty, I. Susin, T. L. Felix, H. N. Zerby, and S. C. Loerch. 2011. Winter-feeding systems for gestating sheep II. Effects on feedlot performance, glucose tolerance, and carcass composition of lamb progeny. J. Anim. Sci. 89:478-488.
2. Zerby, H. N., Bard, J. L., S. C. Loerch, P. S. Kuber, A. E. Radunz, and F. L. Fluharty. 2011. Effects of diet and Aspergillus oryzae extract or Saccharomyces cervisiae on growth and carcass characteristics of lambs and steers fed to meet requirements of natural markets. J. Anim. Sci. 89:2257-2264.
3. Radunz, A. E., F. L. Fluharty, H. N. Zerby, and S. C. Loerch. 2011. Winter-feeding systems for gestating sheep I. Effects on pre- and postpartum ewe performance and lamb progeny preweaning performance. J. Anim. Sci. 89:467-477.