Journal of Extension
www.joe.org

December 2009
Volume 47 Number 6
Article Number 6RIB5

Return to Current Issue

Promoting Alternative Enterprises: Assessing Farmers' Needs in Research, Education, and Extension

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Abstract: Small farms represent a significant proportion of the total U.S farms, and current trends in agriculture pose new challenges for their viability and survival. To meet such challenges, there is a need for introducing high-value non-traditional alternative enterprises. The study reported here explored goat, organic, and mushroom farming as potential alternative enterprises. Several focus group meetings were conducted in Tennessee and North Carolina to identify priority areas for future research, education, and outreach activities. The results from the study should contribute significantly to promoting and creating niche markets for proposed alternative enterprises among small farmers.

Introduction

Small farms represent a significant proportion of the total U.S farms but have been continuing to decline in the last few decades. According to the Census 2002, small farms (annual gross sale less than $250,000) represent about 93% of total U.S. farms. But about 71% of total U.S. farms have annual gross sale of less than $25,000. Despite these facts, small farms have been facing a number of problems over the years that continue to challenge their viability (National Commission on Small Farms, 1998; USDA/CSREES, 2002).

Nowadays, small-scale farmers struggle to keep up with economic and technological changes that have affected the U.S. agricultural industry within the last few decades. Small farms are facing uncertainty and additional risks in today's competitive world. It is necessary to acquire and use risk management tools and possess other marketing skills to survive in this competitive environment.

Small-scale farmers must be creative in order to compete with their large-farm counterparts. The small farms should seek innovative approaches to survive, such as more diversified enterprises and value-added activities as well as product and market development (Tubene & Hanson, 2002). The study reported here explored goat, organic, and mushroom farming as potential alternative enterprises for small farmers. Future research, education, and outreach activities are identified and prioritized to promote and create niche markets for proposed alternative enterprises among small and limited resource farmers.

Goat Industry

The demand for goat meat has continued to increase significantly over the last few decades. The U.S. has lower production levels than its consumption (Solaiman, 2005), indicating an opportunity for expansion of the goat meat industry. Goat production in the U.S. also has increased significantly over the years. In 1977, when USDA began keeping statistics on goat slaughtered at federally inspected plants, approximately 45,000 goats were slaughtered nationwide (NASS, 2004). By 1997, slaughter numbers had risen to nearly 394,297, about 776% increase over the 20-year period. In 2004 this number reached almost 650,000 heads of goats, with more than 45% increase during 1999-2004 (Solaiman, 2005). Data on other slaughter facilities such as state-inspected slaughter facilities and on-farm slaughter is not available, making it difficult to estimate the exact number of goat slaughtered in the U.S.

The demand for goat meat is not only ethnicity-based. Goat meat is also in demand as a gourmet item and a healthy food. The total fat (2.58g) and saturated fat (0.79g) in goat meat is much lower than in chicken (3.50g and 1.10g respectively) (Luginbuhl, 2000).

Despite an increase in domestic production, United States is a net importer of goat meat (FAS, 2004). In 2004, total import of goat meat was 9,551 metric tons valued at $28.05 million. However, it was only 3,630 metric tons valued at 7.85 million dollars in 1999. There was a 184% increase in total import of goat meat and 257% increase in total import value during 1999-2004 (Solaiman, 2005; FAS-USDA, 2004).

The goat industry has potential as an alternative enterprise for many small, part-time, and limited resource farmers. An increase in domestic production, import, and ethnic population indicates that prospects for the goat meat industry in the United States are promising.

Organic Farming

According to Global Survey on Organic Agriculture (Willer, 2008), the global market for organic products reached a value of 38.6 billion U.S. dollars in 2006, with the vast majority of products being consumed in North America and Europe. Using 1997 sales data and annual growth rates from the International Trade Center ITC (2002), projected market size in 2010 will be at least $46 billion in the European Union, $45 billion in the United States, and $11 billion in Japan. A survey in Europe, North America, and Japan indicated that 20 to 30% of consumers purchase organic foods regularly. Healthy annual growth rates of 15 to 30% are expected to continue in the coming years. It is suggested that the ever-growing demand for organic products offers attractive opportunities for producers including small farmers (Lohr, 1998).

By 2010, sales of organic foods are estimated to reach $23.8 billion or 3.5% of total retail food sales in the United States (NBJ, 2004). Fruits and vegetables are by far the largest portion of organic sales at 39% ($5.4 billion) of the total $13.8 billion sale (NBJ, 2006).

Fresh produce remains the top-selling organic category, followed by nondairy beverages, breads and grains, packaged foods (frozen and dried prepared foods, baby food, soups, and desserts), and dairy products (Dimitri & Greene, 2002). In order to meet growing consumer demand, production of organic products also increased significantly. According to USDA-ERS (2005), total certified organic farmland acreage in the U.S. increased about 152% from 1,776,073 acres in 2000 to 4,003,975 acres in 2005. During 2002- 2005, there was an increase of about 264% in pasture/rangeland acreage, 112% for livestock, 126% for total poultry, and 270% for broilers production during the same period under the certified organic production.

Small farmers who are struggling and declining in numbers can take advantage of this rapidly growing, high-value subsector of the food industry. Organic farming can be adopted as an alternative enterprise in order to increase farm profitability. Growing demand, high price premium, uniform standards, and increased production of organic food products indicate an opportunity as potential alternative enterprise for small and limited resources farmers.

Mushroom Production

The United States is the world's second largest mushroom producer (16%), following China, which accounts for 32% of total production. Mushroom is a leading U.S. specialty crop in terms of value of production. Mushroom is the fourth-leading vegetable commodity in terms of farm cash receipts—exceeded only by potatoes, tomatoes, and lettuce. U.S. mushroom consumption has been increasing over the past several decades. The per capita consumption of all mushroom totaled about 3.94 pounds in 2001, compared with about 0.69 pounds in 1965 (Lucier, Allshouse, & Lin, 2003).

Mushrooms are known to have nutritional qualities that are superior to those of many vegetables. Most of the specialty mushrooms are also reported to have medicinal properties. Shiitake, Maitake, and a few other mushrooms have been extensively studied and reported in Japan and many other countries in that region of the world (Chang & Miles, 2004). The current trends in mushroom production and consumption indicate opportunity as an alternative enterprise for small farmers.

Data and Methodology

The data for the study reported here was collected through face-to-face interviews of selected farmers during focus group meetings in Tennessee and North Carolina. The county Extension offices provided the locations and other assistance in organizing these meetings. The survey questionnaire was developed, including the information on proposed alternative enterprises (goat, mushroom, and organic). The respondents were asked about their interest in and needs (research, education, and outreach) required to adopt these enterprises. Questions regarding demographic characteristics, useful sources of information, and obstacles and barriers in adopting alternative enterprises were also included in the survey. A total of 65 completed surveys from both states were used for the analysis. The main purpose was to identify priority areas for future research, education, and outreach activities that would be more effective and efficient in promoting alternative enterprises among small-scale farmers.

Results and Discussion

Demographic Characteristics

The demographic characteristics of respondents in Tennessee and North Carolina are shown in Table 1. The results showed that a majority of respondents were above 50 years old (74.2%), African-American (67.8%), educated (44.3% with college degree), and working off-farm (57.4%). The farming experience varies significantly in Tennessee and North Carolina. The results showed 42.1% of farmers in Tennessee have farming experience of 30 years or more compared to 50% in North Carolina. About 90% of respondents have annual gross sales less than $100,000. A Majority of the farmers worked off-farm in both states and average household size was 3.04.

Table 1.
Demographic Characteristics of Respondents in Tennessee and North Carolina

	Tennessee	North Carolina	Total
Gender (%)			
Male	61.1	53.1	56.0
Female	38.9	46.9	44.0
Age (%)			
18-25 Years	0	2.6	1.7
26-35 Years	14.3	5.3	8.5
36-50 Years	9.5	18.4	15.3
51-65 Years	52.4	57.9	55.6
> 65 Years	23.8	15.8	18.6
Education (%)			
Less than high school	9.5	0	3.3
High School Diploma/GED	38.1	27.5	31.1
Some College	19.0	22.5	21.3
College Degree	33.3	50.0	44.3
Race (%)			
African-American	75.0	64.1	67.8
Asian/Pacific Island	5.0	0	1.7
Hispanic	0	2.6	1.7
White	20.0	28.2	25.4
Other	0	5.1	3.4
Gross Annual Sales (%)			
< $10,000	20.0	27.3	25.0
$10,000-$24,999	13.3	15.2	14.6
$25,000-$49,999	26.7	33.3	31.3
$50,000-$99,999	26.7	15.2	18.8
$100,000-$250,000	13.3	9.1	10.4
> $250,000	0	0	0
Experience (%)*			
1-5 years	15.8	17.6	17.0
6-10 years	0	11.8	7.5
	10.5	14.7	13.2

11-20 years	31.6	5.9	15.1
21-30 years	42.1	50.0	47.2
> 30 years			
Household size (No.)	2.67	3.19	3.04
Off-farm work (%)	60.0	55.9	57.4
*Significant at 90% confidence level using Chi-Square.			

Potential Alternative Enterprises

Respondents were asked their opinion in determining the potential of goat, organic, and mushroom farming as alternative enterprises. The majority of respondents believed that goat (81%), mushroom (88.3%) and organic farming (66.7%) have potential to grow as alternative enterprises on their farms. In addition, a significant number of producers do not have much information about these enterprises (Table 2).

The respondents were also asked if they are currently involved in producing these enterprises on their farms. The results showed that goat production is currently a common enterprise among the farmers (26.5%), followed by mushroom (13%) and organic farming (10.8%). The majority also showed interest in mushroom production (75.9%), followed by organic (56.8%) and goat production (23.5%). The respondents' opinion regarding the potential and their interest in proposed alternative enterprises are given in Table 2.

Table 2.
Farmers' Opinion Regarding the Potential of and Their Interest in Proposed Alternative Enterprises

	Goat	**Mushroom**	**Organic**
Potential	(%)	(%)	(%)
Have potential	81.0	88.3	66.7
Not good	4.8	1.7	8.3
Don't know	14.3	10.0	25.0
Interest			
Currently Producing	26.5	13.0	10.8
Interested	23.5	75.9	56.8
Unsure	26.5	5.6	21.6
Not interested	23.5	5.6	10.8

Assessing Research, Education, and Outreach Needs

Farmers were asked if they have sufficient information about proposed alternative enterprises. The majority (80.7%) indicated that they need more information in order to adopt these alternative enterprises. Only 8.8% farmers had sufficient information regarding goat, organic, and mushroom farming. The areas in which the respondents need more information were research (18.2%) and education/outreach (81.8%). The farmers also indicated their need areas in research (25%) and education/outreach (75%) in Tennessee compared to research (10%) and education/outreach (90%) in North Carolina. The assessment of farmers needs in different areas is shown in Table 3.

Table 3.
Assessing Farmers' Current level of Information and Needs about Proposed Alternative Enterprises

Current Level of Information	**Tennessee**	**North Carolina**	**Total**
Sufficient	11.8	7.5	8.8
Insufficient	11.8	10.0	10.5
Need more	76.5	82.5	80.7
Need Areas			
Research	25.0	10.0	18.2
Education/ Outreach	75.0	90.0	81.8

Research Needs

The respondents were asked to indicate the importance of various research activities that would enhance the adoption of alternative enterprises. The results showed that research activity to provide information on cost-benefit analysis was ranked first, followed by identifying niche markets and efficient production and management techniques. The first two choices of farmers in research activities were similar in both states. The farmers in Tennessee indicated their research need for risk management, which was ranked third. The mean comparison of responses using t-test in both states also found statistically significant differences in both states. The farmers in North Carolina gave more importance to research need areas such as cost-benefit analysis, efficient production and management techniques, nutritional value of the product/information, and value-added product development than farmers in Tennessee. The farmers' choices of various research activities with their ranks in Tennessee and North Carolina are shown in Table 4.

Table 4.
Importance of Research activities that will Enhance Adoption of Alternative Enterprises
(Where 1=Very important and 4=Not important)

	Tennessee		**North Carolina**		**Total**	
Research Needs	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**	**Mean**
Cost-benefit analysis*	1	1.26	1	1.08	1	1.14
Identify/create niche markets and market channels development	2	1.47	2	1.19	2	1.27
Risk management	2	1.47	7	1.52	6	1.50

Others	4	1.50	9	1.57	8	1.56
Market information system	5	1.56	5	1.36	5	1.43
Efficient production and management techniques*	6	1.60	3	1.24	3	1.35
Environmental impact	7	1.67	8	1.53	9	1.57
Animal health/integrated pest management	7	1.67	10	1.71	10	1.69
Nutritional value of the product-information*	9	1.71	4	1.27	4	1.40
Value-added product development**	10	1.88	6	1.38	7	1.54
Genetics/biotechnology	11	2.06	11	1.81	11	1.90

***Significant at 99% confidence level using t-test
**Significant at 95% confidence level using t-test
*Significant at 90% confidence level using t-test

Extension/Education/Outreach Needs

When farmers were asked in which areas they need more information in order to enhance adoption of alternative enterprises, a majority (77.3%) of the farmers (75% in Tennessee and 80% in North Carolina) indicated that they need more Extension/education/outreach information. The farmers were also asked to rank their various needs in order to promote alternative enterprises. The results showed that their first Extension/education/outreach need was "food safety practices," followed by developing marketing skills and on-farm demonstration. It is important to design and provide outreach programs in these areas that will enhance adoption of alternative enterprises. The other significant needs identified by farmers were "production/management skills" and "regulations and requirements" to promote goat, organic, and mushroom farming. The various Extension/outreach activities identified by farmers with ranks in Tennessee and North Carolina are shown in Table 5.

The farmers' Extension/education/outreach needs in Tennessee and North Carolina were ranked and compared. The results showed that rankings of outreach needs in both states were significantly different. In Tennessee, developing marketing skills was ranked first, followed by "food safety practices" and "innovative information sources," while information about certification process and requirements was ranked first in North Carolina.

The mean response on outreach needs of farmers in Tennessee and North Carolina was also compared using t-test, and statistically significant differences were found. The result showed that farmers in North Carolina placed much higher importance on receiving information about certification process and requirements and food safety practices compared to farmers in Tennessee. The farmers in North Carolina also indicated their need to provide efficient information delivery and dissemination and better-trained Extension agents. The results will help policy makers to design programs differently in each state to meet specific needs of their farmers.

Table 5.
Importance of Extension/Education/Outreach Needs

(Where 1=Very important and 4=Not important)

	Tennessee		North Carolina		Total	
Factors	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**	**Mean**
Marketing skills	1	1.38	3	1.27	2	1.31
Food safety practices*	2	1.40	2	1.17	1	1.25
Innovative information sources (such as Internet)	3	1.41	12	1.55	8	1.50
Risk management	4	1.42	16	1.59	11	1.53
On-farm demonstration	5	1.45	5	1.30	3	1.35
Production/management skills	6	1.47	6	1.32	4	1.37
Regulations and requirements	7	1.53	4	1.29	5	1.38
Record keeping and financial management	8	1.55	11	1.49	9	1.51
Value added products	9	1.58	14	1.56	12	1.57
Technology transfer	10	1.65	17	1.59	14	1.61
Business incubators	11	1.67	13	1.55	13	1.59
One-to-one assistance	12	1.75	8	1.38	7	1.50
Better outreach material	13	1.75	15	1.57	16	1.63
Certification process and requirements***	14	1.84	1	1.15	6	1.40
Efficient information delivery and dissemination**	15	1.87	7	1.35	10	1.52
Others	16	1.88	10	1.40	17	1.69
Better trained Extension agents***	17	2.06	9	1.39	15	1.63
Increased number of Extension agents	18	2.29	18	1.70	18	1.91

***Significant at 99% confidence level using t-test
**Significant at 95% confidence level using t-test
*Significant at 90% confidence level using t-test

Sources of Information

The information sources regarded as most useful will play critical role in promoting proposed alternative enterprises to the farming communities. It will be important to identify and disseminate information about alternative enterprises efficiently through the most trusted and used sources. For these reasons, farmers were asked to rank their major sources of information based on their usefulness. The results indicated that overall Internet was ranked first as a source of useful information, followed by county Extension office and their own research. The other farmers/neighbors and university/research stations were also preferred sources of information for the farmers.

It was found that Internet was ranked first as a useful source of information for farmers in Tennessee, followed by other farmers/neighbors and growers/marketing association. But farmers in North Carolina ranked their sources differently than those in Tennessee. In North Carolina, own research ranked first, followed by county Extension and university/research stations. The statistical comparison of mean of responses between two states also found that farmers in North Carolina put more importance on sources such as own research and private consultants. The mean response was found statistically significant using the t-test. The ranking of different sources of information in Tennessee and North Carolina are given in Table 6.

Table 6.
Major Sources of Information and their Usefulness
(Where 1=very useful and 4=not useful)

	Tennessee		**North Carolina**		**Total**	
Useful Source of information	**Rank**	**Mean**	**Rank**	**Mean**	**Rank**	**Mean**
Internet	1	1.27	4	1.50	1	1.41
Other farmers/neighbors	2	1.50	5	1.57	4	1.54
Growers/marketing Associations	3	1.56	7	1.61	6	1.59
County Extension office	4	1.65	2	1.39	2	1.48
University/research stations	5	1.75	3	1.46	5	1.57
Own research*	6	1.81	1	1.36	3	1.52
Friends/family	7	1.82	9	1.90	8	1.87
Magazines	8	1.88	8	1.74	7	1.80
Others	9	2.00	11	2.00	10	2.00
Scientific journals	10	2.07	10	1.96	10	2.00
Private consultants***	11	2.33	5	1.57	8	1.87

***Significant at 99% confidence level using t-test
**Significant at 95% confidence level using t-test
*Significant at 90% confidence level using t-test

Conclusions

Small farms are seeking high-value alternative enterprises to increase their income and sustainability. The goat meat, organic agriculture, and mushroom farming enterprises have potential for meeting the above criteria. Hence, small farmers can supplement their farm income by adopting these enterprises. The associated economic and environmental benefits of these enterprises are impressive.

In order to enhance adoption of alternative enterprises, there is a need for designing programs and activities based on priority areas identified from stakeholders inputs for future research, education, and outreach programs. The small farmers generally lack experience and appropriate technology for adopting new enterprises. Providing information on cost of production and overall farm income will be helpful because cost and income are usually the main considerations when adopting new enterprises. The higher cost of production and lack of enough information about markets affect decisions to adopt these enterprises.

Future research efforts should focus on cost-benefit analysis and identifying tools to manage risks associated with these enterprises. Extension and outreach programs should provide innovative information-delivery methods, including Internet and on-farm demonstration for small farmers. It was also concluded that designing and providing educational programs in developing marketing skills, food safety practices, regulations, and requirements would have a positive impact in promoting alternative enterprises.

Acknowledgements

Dr. Safdar Muhammad is currently on professional leave and working at United Arab Emirates University as Associate Professor and can be reached by email at <smuhammad@uaeu.ac.ae>. The project was supported by the National Research Initiative (NRI) of the USDA Cooperative State Research, Education and Extension Service, Grant number #. 2005-35618-15748. The authors would like to thank Extension staff in Tennessee and North Carolina for their assistance in organizing focus group meetings. The contribution provided by Dr. Fisseha Tegegne and Dr. Enefiok Ekanem, Tennessee State University was greatly appreciated by the authors.

References

Chang, S. T., & Miles, P. G. (2004). *Mushrooms: Cultivation, nutritional value, medicinal effect, and environmental impact*. 2nd edition, CRC Press, Washington, D.C.

Dimitri, C., & Greene, C. (2002). Recent growth patterns in the U.S. organic foods markets, *Agriculture Information Bulletin* No. 777, U.S. Department of Agriculture, Economic Research Service, September. Retrieved May 3, 2008 from: http://www.ers.usda.gov/publications/aib777/

International Trade Center UNCTAD/WTO (ITC). (2002). Organic agriculture worldwide 2002. statistics and future prospects. Chapter 6 - Market Situation.

Lohr, L. (1998). Implications of organic certification for market structure and trade. *American Journal of Agricultural Economics,* Vol. 80, No. 5, 1125-1129.

Lucier, G., Allshouse, J., & Lin, B. (2003). Factors affecting U.S. mushroom consumption. Outlook Report from Economic Research Service, USDA. VGS 295-01, March.

Luginbuhl, J. (2000). Meat goat production in North Carolina. College of Agriculture and Life Sciences, North Carolina State University.

National Business Journal (NBJ). (2006). The NBJ/SPINS Organic Foods Reports 2006, Penton Media, Inc.

National Business Journal (NBJ). (2004). The NBJ/SPINS Organic Foods Reports 2004, Penton Media, Inc.

Solaiman, S. (2005). *Assessment of the current meat goat industry in the United States*. George Washington Carver Agricultural Experiment Station, Tuskegee University, Alabama.

Tubene, S., & Hanson, J. (2002). The wholesale produce auction: an alternative marketing strategy for small farms. *American Journal of Alternative Agriculture*. Volume 17, Number 1.

Unites States Department of Agriculture, Economic Research Service. (2005). *Organic production*. Retrieved May 3, 2008 from: http://www.ers.usda.gov/Data/Organic/

Unites States Department of Agriculture, Foreign Agricultural Service. (2004). *Import and export data*. Retrieved May 3, 2008 from: http://www.fas.usda.gov

Unites States Department of Agriculture, CSREES. (2002). Abstracts of the Third National Small Farm Conference. Albuquerque, New Mexico, September 17-20.

United States Department of Agriculture. (2002). Census of Agriculture, National Agricultural Statistics Services (NASS).

Unites States Department of Agriculture. (1998). *A time to act*: *A report of the USDA National Commission on Small Farms*.

United States Department of Agriculture. (1997). Census of Agriculture, National Agricultural Statistics Services.

Willer, H. (2008). *The main results of the global survey on organic agriculture 2008*. Presentation at the BioFach Congress, Nuremberg, February 22, 2008.
