

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Global Food Security and Hunger - Animals and Animal Products

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	15%	15%	15%	15%
302	Nutrient Utilization in Animals	15%	15%	15%	15%
303	Genetic Improvement of Animals	10%	10%	10%	10%
305	Animal Physiological Processes	10%	10%	10%	10%
307	Animal Management Systems	20%	20%	20%	20%
308	Improved Animal Products (Before Harvest)	10%	10%	10%	10%
311	Animal Diseases	15%	15%	15%	15%
315	Animal Welfare/Well-Being and Protection	5%	5%	5%	5%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	28.8	4.0	33.2	4.0
Actual	24.6	26.0	26.0	3.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
758955	254842	531110	745035
1862 Matching	1890 Matching	1862 Matching	1890 Matching
860944	334638	1790377	665210
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2111534	0	6525792	166295

V(D). Planned Program (Activity)

1. Brief description of the Activity

Conduct research experiments, conduct workshops, meetings, trainings, develop publications, curriculum, resources, provide consultation, leadership, facilitation, partner with industry, and conduct needs assessment and impact.

2. Brief description of the target audience

The target audience includes animal owners, youth, Extension educators, allied industry personnel, consumers, policy makers, and academic colleagues.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	85000	150000	30000	7000
Actual	63977	101141	29954	9274

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 2

Patents listed

- Using routine blood chemistry results to estimate plasma amino acids during an acute or chronic transmissible disease episode
- Mixture of non-starch polysaccharidases increases the metabolizable energy content of co-products fed to livestock and poultry.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	5	10	
Actual	79	11	90

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational meetings, workshops, conferences, training sessions, and field days

Year	Target	Actual
2010	600	518

Output #2

Output Measure

- Number of fact sheets, publications, newsletters, and other print resources

Year	Target	Actual
2010	750	423

Output #3

Output Measure

- Number of web sites, applications, modules

Year	Target	Actual
2010	40	63

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percent increase in beef cattle marketed through value-added programs
2	Number of additional beef producers trained and certified for quality assurance/best management practices
3	Percent of participating farms reducing phosphorus over previous year in dairy animal waste
4	Number of dairy herds improving milk quality by culturing quarter milk samples and implementing mastitis control procedures.
5	Number of swine producers receiving continuing education credit for waste management permit requirements
6	Number of youth adopting best practices related to animal agriculture through youth animal projects and events
7	Percent increase in sheep population in Southwest Virginia as a result of favorable lamb marketing arrangements
8	Number of program participants acquiring knowledge on best management practices related to equine.
9	Percent increase in freshwater shrimp production by Virginia farmers utilizing best management practices
10	Percent increase in sales of pond raised fish due to adoption of best management practices.
11	Increased fish production via recirculating aquaculture system (RAS) and pond production techniques through innovative research and dissemination and application of results through VCE programming to producers.
12	Number of individuals who gain knowledge to improve small ruminant production.
13	Effect of Management Practices on Alpaca Fiber Production
14	Aquaculture Pond Management Education

Outcome #1

1. Outcome Measures

Percent increase in beef cattle marketed through value-added programs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Adding value to Virginia's beef cattle operations is critical to sustainability of Virginia agriculture and rural communities. Adopting improved health, management, and marketing practices for Virginia feeder cattle adds value to the Commonwealth's second largest agricultural commodity.

What has been done

Extension Specialists partnered with the Virginia Cattlemen's Association to develop and administer this program which encourages the use of scientifically-based cattle health and management procedures for feeder cattle. The VQA program is a cooperative effort among VCE, the Virginia Cattlemen's Association, VDACS, VMRCVM, and producer organizations. Producers that manage their cattle in this manner are eligible to market their calves through the VQA certified feeder cattle program.

Results

In 2010, a total of 10,887 calves were marketed through the VQA program. Producers received a premium of \$46 per calf resulting in \$508,432 of additional income realized by Virginia beef producers. Since 1997, producers have marketed over 110,000 head of feeder cattle resulting in \$3.7 million in value-added income.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
308	Improved Animal Products (Before Harvest)
311	Animal Diseases

Outcome #2

1. Outcome Measures

Number of additional beef producers trained and certified for quality assurance/best management practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	125	75

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

U.S. consumers are very concerned about the safety and wholesomeness of the food they eat. If beef is to be safe so as to be competitive with other food choices producers must make choices at the farm level based on scientific knowledge and a commitment to produce a quality product.

What has been done

The Virginia Beef Quality Assurance Program educates and certifies beef producers in best management practices that improve the safety and quality of beef. \$16,800 was secured to carry out the training efforts from the Virginia Beef Industry Council. Agents throughout Virginia have conducted training and demonstrations and have invited producers to make a commitment to conducting their operations in such a manner that quality beef is produced.

Results

The total number of certified producers in Virginia stands at over 4000 which makes Virginia one of the national leaders in BQA activities. During 2010 there were 625 producers either certified or re-certified. These producers came from 50 counties and two surrounding states. We estimate that the certified producers represent over half of the cattle produced in Virginia. Added value of cattle produced on BQA certified farms is estimated to be \$1.5 to \$2.0 million annually.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
307	Animal Management Systems

308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection

Outcome #3

1. Outcome Measures

Percent of participating farms reducing phosphorus over previous year in dairy animal waste

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Water quality is a significant issue in the Mid-Atlantic especially in the Chesapeake Bay drainage area. Phosphorus is a nutrient of concern by federal and state agencies. Reduction of phosphorus excretion results in less potential for pollution due to water runoff from fields.

What has been done

The Phosphorus Feeding Incentive Program is a collaborative program between Virginia Cooperative Extension, Virginia Tech Department of Dairy Science, and the Virginia Department of Conservation and Recreation. The program utilizes research-based dietary management of dairy cattle and an incentive program to reduce phosphorus feeding on dairy farms, thereby decreasing phosphorus run-off and potential pollution

Results

In 2008-2010, the program had 160 enrolled herds, representing 24,522 dairy cows or 25% of Virginia dairy cows. There was a measured reduction in the amount of phosphorus fed and thus excreted of 2.65 pounds per cow per year or 32.6 total tons of phosphorus. In addition, \$158,975 has been approved for incentive payments to Virginia dairy farms and free feed testing has contributed thousands of dollars in support of better feeding management to reduce environmental pollution potential from dairy farms.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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302	Nutrient Utilization in Animals
305	Animal Physiological Processes
307	Animal Management Systems

Outcome #4

1. Outcome Measures

Number of dairy herds improving milk quality by culturing quarter milk samples and implementing mastitis control procedures.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	20	145

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Producing high quality milk with low bacterial numbers, results in increased farm profitability, increased shelf life and improved food safety. The average herd in Virginia can earn an additional \$8,400 per year by producing milk of highest quality. However, milk quality bonuses are often missed due to the complexity and difficulty in achieving the cut-offs required for the premium payments. A new premium/penalty system was due to be initiated as of January 2010. This program involved the preliminary incubation (PI) count, one that many producers did not previously focus on, as it was not part of the payment scheme. This new premium program resulted in a surge of producers needing help troubleshooting problems related to high PI counts.

What has been done

A team of Extension and industry representatives formed with the mission to work together to troubleshoot VA farms with high PI counts and work until these farms were in a state where premiums were achieved. Specifically, our team worked closely with seven dairy producers in 2010. In each situation, it was a team effort to troubleshoot the problem, determine the cause, and recommend change and conduct follow-ups.

Results

Working intensively with these seven producers, we were able to improve milk quality counts on all farms. Evidence of impact was highly apparent in one particular situation. The PI count on this farm was consistently running 100,000-300,000 cells/ml. Premiums are awarded for counts less than 40,000 cells/ml (\$0.10-0.30/100 lbs of milk) and penalties are assessed when counts

are above 100,000 cells/ml (\$1.00/100 lbs of milk). The start date for the penalties was April 2010 and this farm contacted us in December of 2009. Over the course of the next 4 months, our team of experts worked to troubleshoot the problem. Initial issues we found included an improperly functioning washing machine used to wash towels prior to milking, not enough soap dispensed into the washing machine and not enough hot water from the hot water heater. Our laboratory cultured the towels and found an overabundance of *Pseudomonas* spp., which was also the main bacterial contributor to the high PI count. We thought the contaminated towels must have been contributing to the high PI count and therefore, the washing machine was replaced and the hot water heater was repaired. Following these changes, the PI count dropped and remained steady at 30,000 cfu/ml. Although this was a considerable improvement, we continued to work to further lower the count below the goal of 10,000 cfu/ml. After many hours spent examining equipment function, milking procedures and wash procedures, we noticed that the gaskets were being removed from the milk weigh jars during cleaning and not replaced. This allowed the dirty wash water to run into the weigh jars and thus into the bulk tank. All of the gaskets were immediately replaced, farm personnel were informed this was not necessary to properly clean the equipment and within one month this farm was receiving their premium check (averages \$8,640/month). This farm is just one example of how we, as a team, have made a significant impact to improve the milk quality on Virginia dairy farms.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
305	Animal Physiological Processes
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases

Outcome #5

1. Outcome Measures

Number of swine producers receiving continuing education credit for waste management permit requirements

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	25	136

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

State regulations dictate that all swine producers maintaining a no-discharge permit are required to receive periodic continuing education in manure management and environmental protection. Additionally producers who raise or sell market hogs to packers with process verified systems must be trained as certified Pork Quality Assured Plus (PQA-Plus) producers. Those hauling pigs to market must be Transport Quality Assurance certified. The Extension Swine Specialist collaborates with the Virginia Department of Conservation and Recreation (DCR) and with swine production integrators in developing and delivering these continuing education and certification programs.

What has been done

Educational seminars were developed and delivered at multiple locations throughout the state including one 6-hour seminar for manure management training, two PQA-Plus producer certification seminars, two TQA producer certification seminars and three PQA-Plus advisor training sessions.

Results

Thirty seven producers received continuing education credits in manure management and environmental protection. A direct impact of the continuing education program has been the ability of producers holding waste management permits to maintain those permits and operate their farms in an environmentally sound manner. An additional 77 producers were certified in PQA-Plus and 22 producers in TQA via training sessions. These certification programs allow maintenance of market access and assure customers of safe wholesome pork produced under appropriate animal welfare conditions. In addition nine Extension Agents, one swine researcher, one veterinarian and one packing company representative were trained and certified as PQA-Plus advisors.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals

Outcome #6

1. Outcome Measures

Number of youth adopting best practices related to animal agriculture through youth animal projects and events

2. Associated Institution Types

- 1862 Extension
- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	27000	30706

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Livestock projects (beef, sheep, swine, dairy, equine, and poultry) and educational events provide a vehicle for educating youth about the importance of animal agriculture to society and are instrumental in developing life skills in youth. Participation in youth livestock projects serve as a foundation for stimulating career choices in agriculture, and provide a vehicle for the dissemination of knowledge to the public.

What has been done

Training of youth occurs locally by Extension agents, volunteer 4-H leaders, and agriculture educators. State contests are coordinated by campus-based Extension specialist faculty with assistance from Extension agents, volunteers, and agriculture educators. Comprehensive competition is held at the state level for youth age 9-19. In these events, youth are asked to evaluate animal quality, identify items, rank groups of items, perform calculations, and justify their decisions to others.

Results

Youth participation in animal projects and embryology totaled 30,706 in 2010. An additional 2,980 youth participated in state-level livestock and equine contests. The ability to observe and evaluate, ability to make decisions, and communication skills were enhanced by the students' participation in these events. State 4H Horse Judging Team finished first at regional and national contests, as well as first place team at Arabian Nationals and 2nd and 3rd at Quarter Horse Congress. The state 4H Skillathon team finished second at the national contest. Youth livestock members showed and sold over 3000 project animals at the various show and sale events held throughout the state and received sales proceeds in excess of \$2.3 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
305	Animal Physiological Processes
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases
315	Animal Welfare/Well-Being and Protection

Outcome #7

1. Outcome Measures

Percent increase in sheep population in Southwest Virginia as a result of favorable lamb marketing arrangements

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Declining burley tobacco production has resulted in economic losses to local communities in Southwest Virginia. With a prime climate, suitable topography, and an abundance of forage the region is well suited for livestock production systems as an alternative to tobacco.

What has been done

Research and Extension efforts at the Southwest Agricultural Research and Extension Center demonstrated the profitability and utility of hair sheep in low-input, easy-care production systems. Results of this research have been disseminated throughout the region through field days, publications, and demonstrations and applied by local producers and producer marketing groups.

Results

Sheep numbers in Virginia increased a modest 1% in 2010 according to USDA after a 15% increase in 2009. With the renewed interest in sheep, Virginia Cooperative Extension assisted local sheep producers with production and marketing endeavors. Direct sales to a local grocery chain resulted in \$250,000 in sales which was down compared to 2009 as a result of very strong commercial live lamb prices. Extension worked with local producers to facilitate a 10% increase in price paid for direct-marketed lambs to the local grocery chain. This will result in an additional \$15.00 per head premium and bring prices comparable to local and regional livestock markets.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
307	Animal Management Systems

308 Improved Animal Products (Before Harvest)

Outcome #8

1. Outcome Measures

Number of program participants acquiring knowledge on best management practices related to equine.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500	600

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The 2006 Virginia Equine Survey reported a 26% increase in the number of horses and a 41% increase in the number of horse operations since 2001 (NASS Virginia Equine Survey Report, 2008). Many horse owners, whether new or experienced, are attempting to maintain their horses on their own property to try and decrease expenses and allow them more opportunity to enjoy time with their horses. Unfortunately, they often lack the necessary horse or pasture management experience to select appropriate feeds and health care products for their animals or to maximize forage production while minimizing the environmental impact of having horses on their small farm. Relative to pastures in particular, this leads to over-grazed pastures lacking sufficient forages resulting increased purchase of hay, grain, and feed supplements, as well as erosion problems. Also, the number of complaints of potential pollution from horse operations rose from 19% to 23% of all founded complaints lodged in 2009 (Ag Stewardship Annual Report, 2010). Educating horse owners on best management practices for equine health and pasture care should allow them to implement said practices and help increase pasture health, decrease expenses associated with hay and feed purchases, and decrease the potential for pollution from horse operations.

What has been done

Four one-day programs and six separate presentations were delivered at various Virginia Cooperative Extension and horse industry events. Additionally, over a dozen on-site visits were conducted to discuss specific problems and issues of concern to farm owners. Presentations and discussions covered such topics as choosing hay alternatives in an economically challenged time; the economics of the hay industry for horse owners; evaluating hay and the hay market; equine forage issues and considerations for hay producers; general pasture management; large animal mortality composting, and health and feeding strategies for horses. Hands-on participation

including identification of various species of fresh forage and hay; evaluation of quality based on visual inspection; taking forage samples and reading forage analysis results; comparison of visual inspection to actual hay test results; compost pile evaluation; and evaluation of horse health through body condition score, body weight estimation, and growth measurements.

Results

Approximately 600 Virginians attended the various programs and presentations. In one program in particular, 41 of 67 participants responded to an after-program survey. One of the more highly valued topics included the impact of composting on pasture nutrition, where over 50% of participants strongly agreed that they had a better understanding of the potential value of composting, and the remaining participants agreed with the statement. Over 68% learned some or a lot about the topics presented and 100% found the program to be highly valuable. One participant responded, "Great speakers; they made things easy to understand."

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #9

1. Outcome Measures

Percent increase in freshwater shrimp production by Virginia farmers utilizing best management practices

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

A sustainable alternative agriculture enterprise is needed to stimulate rural economic conditions in Southside Virginia.

What has been done

Site checks were conducted for new producers. Contingency plans were developed and followed due to the destruction of regional shrimp nursery. Eight regional workshops and two field days were held to promote best management practices for shrimp farming. Assistance was provided during the labor intensive juvenile stocking period. Value-added alternatives to day-of-harvest

sales were explored. Low-density pond production demonstration was conducted at Virginia State University's Randolph Farm. Media promoted shrimp farming. Extension support provided to two shrimp grant proposals. Furthermore, baseline value-added post-harvest processing techniques were developed and evaluated with a processor in Hampton, Virginia. This is a critical component to large-scale expansion of Virginia's shrimp industry, allowing for proper freezing of an otherwise perishable and seasonal product.

Results

Freshwater shrimp pond production continues to expand and has been shown to be a viable alternative agriculture operation stimulating rural economies throughout the Commonwealth. Target production for 2010 was: 700,000 juveniles stocked; >25,000 lbs produced; value = \$200,000. Actual results for 2010 were 500,000 juveniles produced and distributed primarily in the tobacco growing counties of Southside VA; 22,000 lbs harvested; approximately 50% sold at an average price of \$9.00/lb for a total value of \$99,000; remainder frozen and processed before IQF and future sale during months until next harvest. Growth is expected next year as operations expand and new producers start pond construction. Two grant proposals were funded. Furthermore, post-harvest value-added freezing trials were conducted with excellent results. Ongoing product quality sensory and food safety analyses are being conducted over time to verify shelf-life.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases

Outcome #10

1. Outcome Measures

Percent increase in sales of pond raised fish due to adoption of best management practices.

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Adopting best management practices (BMP) for fish production will increase production level, protect aquatic environments and reduce losses due to poor water quality and diseases. Fish farmers and the Virginia AquaFarmers Network (VAN) are in need of adopting BMPs. VAN wants BMPs as part of their overall production strategy to make their organization successful.

What has been done

A list of preliminary BMPs for catfish production was given to VAN for their review and possible acceptance. Seven workshops were given that covered BMPs in pond production, transportation and processing of fish (Catfish). These workshops also covered feed management, water quality and fish health. Technical Assistance was provided for live fish transport for sales.

Results

VAN and other fish farmers have developed new markets for processed and live fish sales, especially for stocking pond and lakes with many in urban fishery zones. Live fish represented around 50% of sales for catfish farmers. Farmers have increase stocking by more than 30% to meet previous year demand. Three workshops are planned for 2011 to increase farmer's awareness of BMPs especially water quality, for fish farming. By adopting best management practices (BMP), fish production. Fish farmers and the Virginia AquaFarmers Network (VAN) are in need of adopting BMPs. VAN wants BMPs as part of their overall production strategy to make their organization successful.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)

Outcome #11

1. Outcome Measures

Increased fish production via recirculating aquaculture system (RAS) and pond production techniques through innovative research and dissemination and application of results through VCE programming to producers.

2. Associated Institution Types

- 1862 Extension
- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
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2010

5

5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many farm pond owners are searching for alternative uses for their farm ponds. Many would like to raise fish for fun and profit. However, these ponds are not suitable for open pond culture of fish without expensive renovation.

What has been done

Three workshops were conducted that showed alternate production methods for farm ponds. Two workshops were conducted showing owners of farm ponds how to construct cages for these ponds. Handouts were developed and distributed on cage culture for farm ponds that was distributed as part of Aquaculture Field Day program at Virginia State University. Improved fish population management was promoted at regional workshops. Workshops also exposed participants to the basics of recirculating aquaculture production systems (RAS), including benefits as well as issues and opportunities. Furthermore, significant efforts into development of live markets in Washington DC have been done, and are ongoing to expand available markets while concurrently developing value-added niche markets in the live fish sector. Furthermore, a demonstration/validation was conducted for a private entrepreneur at the VT-VSAREC. This demonstration collected all inputs and performance curves for intensive hybrid striped bass production in RAS. Also, ongoing research and support has increased the sale of live spot to the baitfish markets for an Eastern shore producer. In addition, preliminary research on the production of Atlantic Spadefish was conducted at the VT-VSAREC.

Results

Five new producers adopted cage production for their farm. One farmer is selling trout to a local farmers market as both a frozen and smoked added value product. Twenty-five site visits in conjunction with ANR Educators were conducted to evaluate ponds for alternative aquaculture production methods. A workshop on recirculating systems is planned for 2011. A research proposal is being designed for using tanks production using pond water for 2011. Further, a new large-scale 100,000 pound per year expansion facility for the production of hybrid striped bass in under construction in Mathews Virginia. This facility is a scale-up for the R&D trial at the VSAREC, and is a proportional scale-up to what will be a 500,000 pound per year facility by 2015. Further, spot sales increased to \$85,000 in 2010 from an Eastern Shore Producer. Furthermore, live cobia are now being test-marketed in Washington DC, from a producer in S.W. Virginia. Also, resulting from the preliminary work conducted on spadefish, successful funding from Sea Grant was achieved to further research closed life-cycle and nutrition research towards enhanced spadefish production. 3 producers are interested in this species both for foodfish and ornamental markets, and the Virginia Marine Resources Commission is interested from the potential perspective of future stock enhancement opportunities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
311	Animal Diseases

Outcome #12

1. Outcome Measures

Number of individuals who gain knowledge to improve small ruminant production.

2. Associated Institution Types

- 1890 Extension
- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	533

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Small ruminants (sheep and goats) are a relevant component of rural economies in Virginia, with over 5,000 farms (>10%) having small ruminants as a part of their livestock enterprise.

What has been done

Many small ruminant farmers have livestock enterprises as a secondary income, or are new to the business. Therefore, there is a strong need for fundamental education which provides basic skills related to animal management, marketing, and business principles.

Results

In 2010, Virginia Cooperative Extension reached over 500 small ruminant producers through various educational workshops, field days, and activities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases

Outcome #13

1. Outcome Measures

Effect of Management Practices on Alpaca Fiber Production

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Alpacas make the greatest contribution to camelid fiber production, providing approximately 90 percent of the world production. Raw alpaca fleeces range in price from \$30 to \$50/lb, depending on fiber quality and coloration. As domestic and world demand for alpaca fiber exceeds supply, the expansion of the alpaca fiber industry has potential as a high-value, alternative crop for specialty and niche markets in a non-traditional production system. Parasites are a major concern for alpaca breeders, and little is still known about the effectiveness and dosage of anthelmintics (anti-parasite drugs).

What has been done

A project is underway at Virginia State University to document deworming practices on Virginia alpaca farms and determine evidence of anti-parasite drug resistance in these herds. Twenty-five breeders were identified and agreed to participate in the survey and on-farm sampling. Fecal samples were collected from a minimum of eight and maximum of 30 alpacas on each farm to conduct a fecal egg count reduction test to determine the presence of dewormer resistance. During the first season, the survey was completed on 13 farms. Twelve additional surveys are scheduled for the upcoming parasite season, and data will be analyzed as surveys are completed following the second year collections.

Results

Data collected to date indicate that alpacas limited to on-demand anti-parasite drug treatment had the same fiber yield and quality compared to alpacas receiving standard frequent deworming that are industry practice. There were no differences in the internal parasite load between the two groups or clinical signs of parasitism. This suggests that an alpaca fiber herd can be managed with an on-demand protocol which limits the number of dewormings, and will help to decelerate

the development of resistance of gastrointestinal nematodes to pharmacological dewormers. Information from this project has been communicated to alpaca producers through an alpaca field day and a workshop on parasite management has been conducted.

4. Associated Knowledge Areas

KA Code	Knowledge Area
305	Animal Physiological Processes
307	Animal Management Systems
311	Animal Diseases

Outcome #14

1. Outcome Measures

Aquaculture Pond Management Education

2. Associated Institution Types

- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Aquaculture is an expanding sector in Virginia agriculture with an increased demand for locally produced products. Aqua-farmer organizations, pond owners and VCE personnel seek best pond management techniques to increase the value of their aquatic resources.

What has been done

Multiple approaches were used to meet the demand. A three day summer hands-on aquaculture education program was conducted at Virginia State University's pond complex. Regional management workshops were conducted. Demonstrations were held at farmer facilities in conjunction with farm labor. Literature was developed and distributed.

Results

Adoption of pond best management practices has led to improved water quality, feed conversions, and successful harvests. Extension labor, although still participating, has been replaced by farm employees. These farmers are the base on which the private sector pond

aquaculture industry will build.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Populations changes (immigration, new cultural groupings, etc.)
- null

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Time series (multiple points before and after program)
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}