V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Global Food Security and Hunger - Animal and Animal Products

☑ Reporting on this Program

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	10%	10%	10%	10%
315	Animal Welfare/Well-Being and Protection	10%	10%	10%	10%
	Total	100%	100%	100%	100%

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	26.9	1.8	28.8	4.0
Actual Paid Professional	25.6	3.5	29.2	0.0
Actual Volunteer	822.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
34665	207518	531918	781313
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
752050	302851	1196190	801635
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
2231970	0	5872968	13956

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.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	58933	89821	25961	4670

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

Patent Applications Submitted

Year: 2012

Actual: 1

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	15	81	96

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

Year	Actual
2012	1082

Output #2

Output Measure

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

Year	Actual
2012	706

Output #3

Output Measure

- Number of animal and animal products web sites, applications, and modules

Year	Actual
2012	184

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	Number of dairy herds improving milk quality by culturing quarter milk samples and implementing mastitis control procedures.
4	Number of swine producers receiving continuing education credit for best management practices
5	Number of youth adopting best practices related to animal agriculture through youth animal projects and events
6	Number of program participants acquiring knowledge on best management practices related to equine.
7	Percent increase in freshwater shrimp production by Virginia farmers utilizing best management practices
8	Percent increase in sales of pond raised fish due to adoption of best management practices.
9	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.
10	Number of individuals who gain knowledge to improve small ruminant production.
11	Number of commercial poultry growers adopting biosecurity practices to lower the risk of disease transmission
12	Acclerated lambing of hair sheep
13	Survey of management and deworming practices on mid-Atlantic alpaca farms

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	Actual
2012	8

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 implement 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 handle their cattle in this manner are eligible to market their calves through the VQA certified feeder cattle program.

Results
In 2012, a total 9,380 calves were marketed through the VQA program. Producers received a premium of $74 per calf resulting in $694,120 of additional income for Virginia beef producers. Since 1997, producers have marketed over 127,000 head of feeder cattle resulting in $4.9 million in value-added income.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
- 1890 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	780

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
US consumers are very concerned about the saety 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 780 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

307	Animal Management Systems
308	Improved Animal Products (Before Harvest)

Outcome #3

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	Actual
2012	47

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Clinical mastitis in dairy cows is often treated with an intramammary antibiotic preparation. However, some types of mastitis do not respond well to antibiotic therapy and for other types of mastitis, antibiotic therapy is not recommended. Therefore, many producers will send milk samples to a local laboratory for culture prior to treatment initiation. However, results are typically not received for 2-3 days, at which point the producer will have already initiated treatment. In response, researched have examined the use of on-farm culture systems whereby dairy producers can collect milk samples, culture the samples on-site and treat the cow 24 hours later according to these results (culture-based). The research suggests no ill-effects to the cow when treatment initiation starts 24 hours after the onset of clinical signs and the use of antibiotics can be cut in half. However, dairy producers must receive training before implementing such a program on-farm and no formal training had been previously available in VA.

What has been done

In response to this need, I developed a two-day workshop whereby dairy producers would aseptically collect milk samples from clinical mastitis samples on their farm. These samples were frozen until the time of the workshop but under normal circumstances they would be cultured immediately. On the first day of this workshop, the producers learned about the culture system, the medias involved, the importance of culture, how to culture and then streaked out their own milk samples onto plates provided. These plates were then incubated overnight as they would on-farm. The following day (day two of the workshop), the producers met and we discussed and interpreted the results and then also discussed potential treatment options, based on recommendations from Dr. John Currin from the veterinary school.

Results

This workshop was held twice in 2012, reaching a total of 11 producers. The evaluations from the workshops suggested the workshops should be held again, all 11 said they would recommend it to their peers and all 11 said they gained significant knowledge regarding milk culturing. After a follow-up 3 months later, 10 of the 11 had implemented this on-farm. One producer volunteered that they had cut their antibiotic use in half, also saving 50% of treatment costs by implementing this program. They estimated this savings to be over $2000 annually.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

Number of swine producers receiving continuing education credit for best management practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	186

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Pork 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 and producer-transporters must be Transport Quality Assurance (TQA) certified. The Extension Swine faculty lead programs to allow producers to be trained and certified directly, and train-the-trainer programs to expand delivery of the programs. In addition the need for technical and educational niche market and small farm pork production is growing.

What has been done
Educational seminars were developed and delivered at multiple locations throughout the state to provide certification programs for PQA-Plus and TQA certification and individual sessions were held for new trainer certification. In addition to the traditional commercial pork production conference, a special conference directed at niche market pork producers was developed and delivered.

Results
Twenty nine producers received certification or recertification in PQA-Plus and TQA training; and a new PQA-Plus trainer was certified to deliver certification training in a commercial pork production company. In addition to the annual pork production conference that reached 121 persons addressing critical issues related to swine health, bio-security and environmental protection, a special pork conference was held that reached 35 new clientele. These producers learned new information that will support production of safe, wholesome pork products for non-traditional market channels.

4. Associated Knowledge Areas

KA Code	Knowledge Area
302	Nutrient Utilization in Animals

Outcome #5

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	Actual
2012	32134

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 serves as a foundation for stimulating career choices in agriculture, and provides 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 competitions are 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 and to demonstrate their handling skills with their livestock projects. In 2012, the first stockmen?s camp was held. Seventy youth and adults participated. A high percentage of attendees strongly agreed that their knowledge of the livestock industry, as measured by several different factors by a post-attendance survey, was improved by attending the camp.

Results
Youth participation in animal projects and embryology totaled 27,855 in 2012. 4,279 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. The State 4H Horse Judging Team finished in the top five teams at all contests. They were second at Arabian Nationals (with high individual) and second at Eastern Nationals. The state 4H Skillathon team won the national contest at the NAILE. The state 4-H Livestock Judging team finished eighth at the national contest and the 2011 team represented the United

States at the Royal Highland Show in Scotland and placed 2nd in Beef and 3rd in Sheep. Youth livestock members showed and sold over 3880 project animals at the various show and sale events held throughout the state and received sales proceeds in excess of $1.7 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases

Outcome #6

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	Actual
2012	1000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Virginia?s horse industry has an estimated $1.2 billion impact on the state?s economy, and horses are the 8th largest agricultural commodity in the Commonwealth. Also, Virginia horse owners spend $926 million annually and support over 16,000 full-time jobs in the areas of racing, showing, recreation, breeding and other industry activities.

What has been done
Across the state, over a dozen one-day programs and separate presentations addressing topics of pasture management were delivered at various Virginia Cooperative Extension, Agricultural Research and Extension Center, and horse industry events. Additionally, on-site visits were conducted to discuss specific problems and issues of concern to farm owners. Speakers from academic institutions, veterinary practice, and horse industry professionals covered such topics

as hay and forages, large animal mortality composting, health, nutrition and economics.

Results
Over 1000 Virginia youth and adults attended the various programs and presentations. In several cases, extension agents later conducted on-site farm visits with participants who took a more active interest in adopting best management practices at their operation. Finally, over 100 first responders, veterinarians, and horse owners were educated on emergency preparedness and disaster planning.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #7

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	Actual
2012	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
Best management guidelines were distributed to interested farmers. Site checks were conducted for new producers. Assistance was provided to freshwater shrimp nurseries in Virginia. Four regional workshops, educational displays including the Virginia State Fair and two field days were held to promote best management practices for shrimp farming. Assistance was provided during the labor intensive juvenile stocking period. Shrimp farm tours were conducted, Best Aquaculture Practices Education was provided to members of the Virginia AquaFarmers Network. Value-added alternatives to day-of-harvest sales were explored. Enhanced fertilization pond

production demonstration was conducted at Virginia State University's Randolph Farm. Media promoted shrimp farming. Extension continued to provide support to two shrimp grant proposals. Furthermore, baseline value-added post-harvest processing techniques were developed and evaluated with a processor in Hampton, Virginia. Web based marketing of frozen shrimp has been initiated.

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 2012 was: 500,000 juveniles stocked; >20,000 lbs produced; value = $200,000. Actual results for 2012 were 450,000 juveniles produced at two nurseries and distributed (value $45,000) primarily to growers in the tobacco growing counties of Southside VA; 12,500 lbs harvested; approximately 70% sold at an average price of $10.00/lb for a total value of $93,750; remainder frozen and processed before IQF and future sale during months until next harvest. Gross revenue from sales of frozen shrimp is estimated at $37,500. Expansion may be impacted by economic conditions. Some growth is expected next year as operations expand and new producers start pond construction. New market promotions were conducted with shrimp boils and wine/shrimp festivals.

4. Associated Knowledge Areas

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

Outcome #8

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	20

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. BMPs are being developed to avoid adulterated products with antibiotic and pesticide residues. HACCP training by VAN is critical to achieve a safe consumer product. Virginia AquaFarmers Network (VAN) wants BMPs and HACCP as part of their overall production strategy to make their organization successful.

What has been done
A list of preliminary BMPs for Cage production was given to VAN for their review and possible acceptance. Two workshops and a two-day Aquaculture Forum: Growing Fish in Cages were given in 2012 that covered BMPs for cage production and handling post harvest product. Three workshops that showed pond owner?s how to improved water quality were conducted at the County Level. These workshops also covered feed management, water quality and fish health. Technical Assistance was provided to develop HACCP plans for processing fish and to test fish for presents of anitbiotics.

Results
VAN and other fish farmers have taken HACCP training. VAN is now selling in Farmers Markets (Charlottesville and Williamsburg). This has resulted in a 25% increase in Catfish sales as well as trout and freshwater prawns. As the result of the Aquaculture Forum, 20% of the attendees plan to adopt cage aquaculture. Two workshops are planned for 2013 to increase farmer's awareness of BMPs especially water quality and food safety. Using antibiotic free fish will be useful marketing tool to increase sales in markets (Charlottesville and Williamsburg) that are concerned with adulterated products. This should increase sales by another 5% - 10%. VAN wants BMPs as part of their overall production strategy to make their organization successful. Farmers have increased stocking by more than 20% to meet previous year demand. Twenty percent of pond owners attending pond workshops would take actions to improve water quality for fish population.

4. Associated Knowledge Areas

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

Outcome #9

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	Actual
2012	167

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Aquaculture is, and has been the fastest growing sector of agriculture in the US for the past decade. Aquaculture has the potential to reduce our current 10 billion dollar national seafood trade deficit, enhance domestic seafood quality and safety, and can do so concurrently with revitalizing America?s rural agriculture sectors and coastal fishing communities.

What has been done
In Virginia, Extension faculty from VT and VSU have worked cooperatively to expand Virginia?s aquaculture production sector. This has been accomplished through numerous technical, marketing, value-added, Good Aquaculture Practice and subject-specific extension workshops, as well as field and technical onsite support at the producer level and faculty participation in producer grant submissions. Furthermore, industry requested research towards enhanced freshwater and marine shrimp and catfish production, identifying emerging marine species such as Cobia, Pompano, and Black Sea Bass, along with nutritional, biological and environmental optimization requirements, and production system optimization was conducted by VSU and VT Extension faculty and research facilities.

Results
In 2011, Virginia's finfish and crustacean production sectors increased by over $300,000. These increases included expanded pond and RAS production of marine and freshwater shrimp, marine finfish such as Spot, Black Sea Bass, Cobia, Pompano and Flounder, and freshwater finfish including Hybrid Striped Bass and Tilapia. These expansion efforts continued into 2012, with major emphasis upon serving new aquaculture producer start-ups. Production numbers for 2012 are expected to add another $200,000 on top of the $300,000 from 2011, for a 2-year increase of over $500,000 dollars in new revenues to producers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
311	Animal Diseases

Outcome #10

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	Actual
2012	800

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 2012, Virginia Cooperative Extension reached over 800 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 #11

1. Outcome Measures

Number of commercial poultry growers adopting biosecurity practices to lower the risk of disease transmission

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	800

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In Virginia, poultry and egg production contributed approximately $1 billion to the economy in 2011, accounting for approximately 34% of all farm commodities. With the continuing threat of disease outbreak in the poultry industry, including widely recognized and publicized Avian Influenza (AI), the importance of biosecurity measures to prevent and limit disease spread are critical.

What has been done
A Biosecurity Audit Program was developed and is reviewed quarterly by the Virginia Poultry Disease Task Force with representatives from academia, industry, and regulatory agencies. As part of this program, commercial poultry producers in Virginia participate in biannual audits of their biosecurity practices. The external Biosecurity Audit team assesses all segments of live production for the commercial broiler, turkey, and egg producers in Virginia to identify biosecurity risks and opportunities for improvements in the control of disease outbreak or spread.

Results
In 2012, seven biosecurity audits were conducted of commercial poultry producers in Virginia. Middle management communicated that as a result of audit reports provided to each company, other company personnel and growers were educated on the identified biosecurity risks, corrective measures were taken by company personnel and growers, and awareness of biosecurity practices was increased. Audits performed this year also provided evidence that additional biosecurity practices and guidelines have been implemented in individual companies in response to suggestions and educational material provided. Since the audits were initiated, the average audit scores (percentage of maximum score achieved) of those companies participating every year have improved from 85% in 2004 to 97% in 2012.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

Outcome #12

1. Outcome Measures

Acclerated lambing of hair sheep

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There has been a dramatic increase in the nontraditional lamb market, which now represents 48% of the 2.5 million lambs slaughtered annually. Hair sheep are well-suited to supply the ethnic, specialty, and niche markets for lamb now becoming more dominant. While the number of sheep declined by 0.5 million over the past 5 years, the number of farms increased by app. 10,000 during this period. This shift towards more small scale and low-input operations favors easy-care characteristics found in hair sheep. Seasonal breeding of sheep in temperate environments limits production. Increasing the frequency of lambing and shifting towards year-round production, utilizes facilities and labor more effectively, and takes advantage of favorable markets, which in turn will make lamb production more efficient and cost effective.

What has been done

Flocks of the Katahdin, Barbados Blackbelly and St. Croix hair sheep were established on Virginia State University?s Randolph Farm to evaluate the comparative performance of the breeds in forage-based production systems. The sheep were mated in 8-months intervals, rather than annually to evaluate their suitability for accelerated mating system in a mid-Atlantic environment. Ewes were exposed to rams of like breed in single-sire mating groups in November, July and March. Mating periods were selected to avoid breeding ewes during periods of deep seasonal anestrus (April through June). Ewes lambed unassisted on pasture, and lambs were weaned at 2 months of age. Data were collected over two production cycles (4 years).

Results

Pregnancy and lambing rates were higher for all breeds following November mating (>90%) during the peak of seasonal breeding, but also exceeded 80% in the other two mating periods (July and March). Pre-natal losses were limited (0-2%) except in Katahdin in the first July mating period (12%). The accelerated mating system produced an annual lamb crop of 2.36-2.77 lambs/ewe lambing depended on breed, with a production efficiency of 62-63% (weight of litter weaned as percentage ewe body weight). This represents an increase of 28-38% in annual lamb crop, and 20-22% increase in production efficiency compared to a once annual November mating. Production efficiency also increased from 43.1 to 47.0% from the first to the second two year cycle, suggesting no negative long-term effects of accelerated mating on ewe productivity. Data suggest that hair sheep are well-suited for accelerated mating under mid-Atlantic conditions, and can form the basis for a system of year-round production of lamb. The results indicate that selected hair sheep breed can be managed in an accelerated mating system that uses facilities and resources more efficiently, enhances production, and allows for year-round production of lamb to supply lucrative seasonal markets.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals

Outcome #13

1. Outcome Measures

Survey of management and deworming practices on mid-Atlantic alpaca farms

2. Associated Institution Types

- 1890 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The alpaca industry in the U.S. has exponentially grown, and Virginia currently has about 500 breeders with 7500 registered alpacas. However, there is limited research-based information on appropriate management practices applicable to the environmental conditions of the mid-Atlantic region. Gastrointestinal parasites are a major concern for small ruminant producers in this region,

and anthelmintic resistance is widespread on sheep and goat farms in Virginia and Southeastern United States. Information is needed on current deworming practices and the incidence of anthelmintic resistance on alpaca farms to help device appropriate management practices for alpaca breeders.

What has been done

On-farm surveying/testing was conducted to document management and deworming practices on Virginia alpaca farms, and determine evidence of anthelmintic resistance in the herds. Twenty-four on-farm surveys were completed in late spring and summer of 2010 and 2011. The survey identified herd demographics, general herd health management, and current deworming practices. Fecal samples were collected from a minimum of 8 and maximum of 39 alpacas on each farm. Farm visits were timed with scheduled deworming on each farm and fecal egg count reduction tests were conducted when 8 or more alpacas on a farm had strongylid eggs counts exceeding 10 eggs/g to determine the presence of dewormer resistance in strongylid parasites.

Results

Fifty-eight percent of breeders considered parasitism of moderate concern (14/24), while 5/24 considered it a severe problem, 2/24 thought is was of low importance and 3/24 were not sure about the impact. Breeders judged the impact of parasitism on their own farm as follows: less severe 29% (7/24), the same 50% (12/24), or more severe 21% (5/24); while judging their own knowledge in this area as: very good 25% (6/24), adequate 67% (16/24), or rudimentary 8% (2/24). All farms had done some form of fecal testing before. Seventy-five percent of farm of farms routinely dewormed their herd, while 25% used on-demand worming. Most dewormers had been in use since inception of the operation, and the routine deworming interval ranged from 4 to 6 weeks. Dewormer schedules were described as pre-set on 25% (6/24) and as needed on another 25% (6/24) farms, while 50% (12/24) used a combination of both. Fecal egg counts (6/17), visual assessment of animals (1/17) and a combination of the two (10/17 were used to determine as-needed use. Fecal egg count reduction tests were conducted at 16 locations that satisfied minimum sampling requirements. In all cases reduction of initial egg counts were less than 90%, and indicated widespread resistance in strongylid parasites to a number of anthelmintics, especially marcocyclic lactones, in mid-Atlantic alpaca herds. Together with indications of alpacas dying from haemonchosus, there is a need to re-evaluate deworming practices for alpacas.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases

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.)
- Other (land values near urban areas)

Brief Explanation

Specific external factors have impacted the state defined outcomes, in particular those related to the livestock sector. A combination of high input costs and other economic factors have resulted in a decrease in cattle numbers similar to other regions of the country. Outcomes measures based on quantification statistics are impacted by number of cattle and number of producers raising cattle accordingly.
Additionally, increased focus on issues surrounding the environment and regulartory items with the Chesapeake Bay Watershed have shifted local programming in some instances away from outcomes measured in Animal/Animal Products to those more appropriately measured in Ag Sytems and/or Climate Change/Natural Resources.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}