

MEMORANDUM OF AGREEMENT

This Agreement is hereby entered into this 29th day of September 2006 by the Virginia Polytechnic Institute and State University/Virginia Cooperative Extension an agency of the Commonwealth of Virginia, hereinafter referred to as the Vendor, and the Virginia Department of Agriculture & Consumer Services, an agency of the Commonwealth of Virginia, hereinafter referred to as the Agency.

WITNESSETH that the Vendor and the Agency, in consideration of the mutual covenants, promises, and agreements contained herein, agree as follows:

Subject: Proposal for demonstration and research project entitled: "Implementation Strategies for NAIS at Typical Livestock Markets"

1. Scope of Services:

Objective 1: Compare the efficacy and cost of various radio frequency identification device (RFID) technologies when applied in a commercial livestock market environment.

Objective 1 will focus on the comparison of the effectiveness of existing individual animal identification devices when operated in a typical livestock market. Cattle, both feeder cattle and culls cows (beef and dairy), as well as sheep will be the species of interest. Tag and reader technologies to be investigated are described in the project proposal. A minimum of ten (10) livestock markets operating in various geographical locations around Virginia will be cooperators for this study.

Cattle: Project personnel will cooperate with local and regional feeder calf marketing groups around the state. RFID tags will be distributed to producers for application on-farm. Virginia Cooperative Extension and Virginia Department of Agriculture and Consumer Services personnel will be integrally involved in the education of participating producers regarding proper tag placement and application (as described and recommended by manufacturer). Tag distribution will be managed centrally by the Project Data Coordinator. Tags will be applied prior to the delivery of cattle to the livestock market. Upon delivery of cattle to the livestock market, reader technologies listed in section V.B. will be used to record individual animal identification. Particular arrangement of reader devices within the market environment will be variable, and conform to the animal handling facilities and logistics of each individual market. Specific protocol applied to each market will be thoroughly described and noted. Each possible combination of tag/reader technology will be investigated at multiple markets. Specific data to be collected will be tag retention, read success (yes/no), read accuracy (ID number, multiple reads), and physical attributes associated with each technology (chute width, chute orientation, animal handling logistics, etc.).

During typical processing of these cattle through the livestock market, individual cattle descriptors will be recorded including weight, breed type, and USDA Feeder Cattle Grade along with farm of origin. Additionally, disposition/flight scores will be recorded for individual and groups of cattle during the tag reading process. Additional objective data to assess speed of movement through working facility containing reader technology will be collected by recording time required by an individual animal or group to move through the chute. It is estimated that 15,000 feeder cattle originating from over 500 premises will be targeted for this portion of the project. Preliminary work similar to protocol described here has been well received by producers and livestock markets.

In addition to feeder cattle, data will also be collected on cull cows. Tag distribution and allocation will follow same format as described for feeder cattle, as will data collected on various tag and reader technologies and their interactions. Both beef and dairy cows will be utilized.

Sheep: Similar protocol described for cattle will be applied to sheep. Lambs marketing through cooperative programs in conjunction with livestock markets will serve as the experimental unit. Appropriate technologies suitable for sheep as described in section V-B of the project proposal will be evaluated. Data collection protocol will be the same as described for cattle above. 800 sheep from more than 25 producers at three livestock markets will be utilized for this portion of the study.

Statistical analysis: Data will be analyzed using analysis of variance with tag type and reader type as the main effects. All interactions will be included in the model. The General Linear Models subroutine of SAS will be used to perform the statistical analysis. Statistical evaluation will focus on determining differences in performance between technologies, and explaining the nature of these potential differences. Effects of animal type and other variables will be assessed as to their impact on tag and reader performance. Economic variables will also be evaluated. Costs of each technology will be evaluated, and described statistically in terms of cost relative to technology performance (i.e. cost per successful record). Estimates of labor and time requirements will be derived from the objective data collected, and expressed for each technology evaluated.

Objective 2: Investigate the impact of collecting individual animal RFID data (compliant with NAIS) on animal handling facilities, animal handling logistics, and infrastructure in livestock markets.

Objective 2 of the project will focus on the impact of NAIS implementation on the physical, logistic, and infrastructure of typical livestock markets with specific focus on the adoption of electronic animal identification technology. As with Objective 1, both cattle and sheep species will be utilized. Specific technologies are listed in the project proposal.

Objective 2 will be carried out in conjunction with Objective 1. A minimum of ten cooperating livestock markets around the state will be utilized. These markets vary greatly in their facility design and cattle handling logistics during normal commerce. RFID technologies discussed in the project proposal for reading individual animal identification will be applied in these livestock markets. Manufacturer recommendations will be followed regarding technology set-up conforming to the physical facilities of each livestock market. Both portable and permanent facility adaptations will be evaluated. Specific evaluation will be made regarding technology set-up to conform to the wide variation in animal group size, as well as individual animal attributes (weight, linear size). Detailed data will be collected regarding physical adaptations made for successful implementation of individual animal identification reader technologies. Specific data will include design changes, physical measurements, and the costs associated with the materials and labor required. Of particular interest will be design specifics for panel reader technologies, including various chute widths, panel lengths, panel heights, and orientations and their interactions with different animal species and type (feeder cattle vs. cows).

Statistical analysis: Data will be summarized and statistically evaluated using analysis of variance with technology as the primary main effect. As appropriate, information collected for Objective 2 may be evaluated as to its impact regarding Objective 1.

2. Period of Performance

The period of performance for the project will be September 29, 2006 to September 28, 2007.

3. Compensation

The total amount of this project shall not exceed \$220,000.00, payable on a quarterly basis following submission of quarterly accomplishment reports, quarterly budget updates, and an invoice for expenses incurred during the previous quarter.

No payments will be made until the Agency has received satisfactory reports for the work accomplished and an invoice for expenses incurred according to the reporting scheduled outlined below.

4. Reporting Schedule

Quarterly accomplishment reports and budget summaries (tracking of actual versus budgeted expenditures) shall be completed by the Vendor and submitted to the State Veterinarian's Office, Division of Animal and Food Industry Services, Virginia Department of Agriculture and Consumer Services, PO Box 1163, Richmond, VA 23218, on the following dates:

1st Quarter Reports due:	Monday, January 15, 2007
2nd Quarter Reports due:	Monday, April 16, 2007
3rd Quarter Reports due:	Monday, July 16, 2007
4th Quarter Reports due:	Monday, October 15, 2007

Quarterly report formats are at the discretion of the Vendor, but must clearly, concisely and accurately relate project accomplishments and expenditures in a transparent fashion.

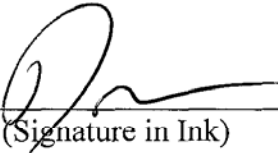
A final report summarizing project results and key findings shall be submitted by the Vendor to the State Veterinarian's Office by December 31, 2007.

6. Termination of Agreement

This agreement may be terminated by mutual agreement of both the Vendor and the Agency upon 60 days written notice.

IN WITNESS WHEREOF, the parties have caused this agreement to be duly executed intending to be bound thereby.

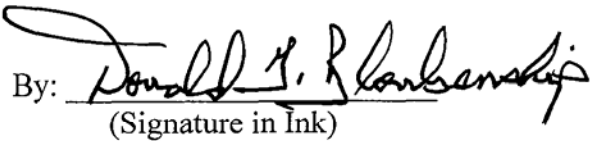
**For Virginia Cooperative
Extension – Sponsored
Programs for VPI & SU**

By: 
(Signature in Ink)

David W. Richardson, Director
Office of Sponsored Programs

11/9/06
(Date Signed)

**For Virginia Department of
Agriculture and Consumer
Services**

By: 
(Signature in Ink)

Donald G. Blankenship
Deputy Commissioner

11/9/06
(Date Signed)