Friday, January 9

AM

9:00 **Virginia Sheep Producers Association Board Meeting (Open to the public)**

11:00 **Virginia Sheep Industry Board Meeting (Open to the public)**

PM

1:00 **"Internal Parasites: New and Revisited Strategies"**
Dr. Anne Zajac, DVM, VA-MD Regional College of Veterinary Medicine

1:45 **"The National Animal ID Program: Implications for the Sheep Industry"**
Dr. Neil Hammerschmidt, USDA/ APHIS/VS
Mr. David Greene, ASI Region II Representative, White Hall, MD

2:45 **Break**

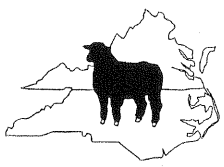
3:00 **"Ewe Obstetrics & Newborn Lamb Management"**
Dr. Kevin Pelzer, DVM, VA-MD Regional College of Veterinary Medicine

3:45 **"Genetic Lessons from the United Kingdom"**
Dr. Ron Lewis, Dept of Animal & Poultry Sciences, Virginia Tech

4:30 **"Overview of the National Wool Program"**
Mr. Robert Padula, Wool Quality Consultant, American Wool Council

6:00 **Social Hour and Commercial Exhibits**
Tropical Court Area

7:00 **Lamb Banquet and Entertainment**
Ballroom



Saturday, January 10

AM

7:30 **Virginia Sheep Producers Association Annual Meeting (Breakfast)**

"National Programs and Their Impact on Virginia Producers"
Mr. David Greene, ASI Region II Representative, White Hall, MD

CONCURRENT SESSIONS

9:30 **"Virginia Tech Research Update: Evaluation of Hair Sheep in Easy-Care Lamb Production Systems – Para site Resistance, Growth, Carcass, and Palatability"**
Dr. Scott Greiner, Dept of Animal & Poultry Sciences, Virginia Tech
Dr. Dave Notter, Dept of Animal & Poultry Sciences, Virginia Tech

9:30 **"Opportunities for Value-Added Wool Products"**
Mr. Robert Padula, Wool Quality Consultant, American Wool Council

10:30 **"Keys to a Successful Sheep Enterprise" – Producer Panel**
Moderator: Ms. Susan Schoenian, Maryland Cooperative Extension Sheep & Goat Area Agent

10:30 **"Capitalizing on Virginia's Wool Clip" – Panel and Open Discussion**
Moderator: Ms. Robin Freeman, VSPA President

12:00 **Lunch on Your Own**

PM

1:00 **ROCKINGHAM COUNTY FAIRGROUNDS**

"Lamb Grading and Evaluation Workshop"
Mr. Mike Carpenter, Virginia Department of Agriculture and Consumer Services

2:00 **4th ANNUAL VIRGINIA BRED COMMERCIAL EWE LAMB SALE**
Rockingham County Fairgrounds

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2004 VA-NC Shepherds' Symposium
Presented By
Virginia Sheep Producers Association

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MANAGING THE WORMS IN YOUR SHEEP
(OR—IS THERE LIFE AFTER DRUGS?)

Anne Zajac, DVM, PhD
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THE BIGGEST HEALTH PROBLEM FACED BY SMALL RUMINANT PRODUCERS IN THE MIDATLANTIC AND SOUTHEAST U.S. IS WORMS.

We have all become accustomed to having several highly effective drugs to select from for the treatment of worms, but as the level of parasite drug resistance increases, these drugs are not the easy solution they once were. Drug resistant worms are spreading and drug companies are not developing new products. Control programs based on drug treatment alone are not the answer.

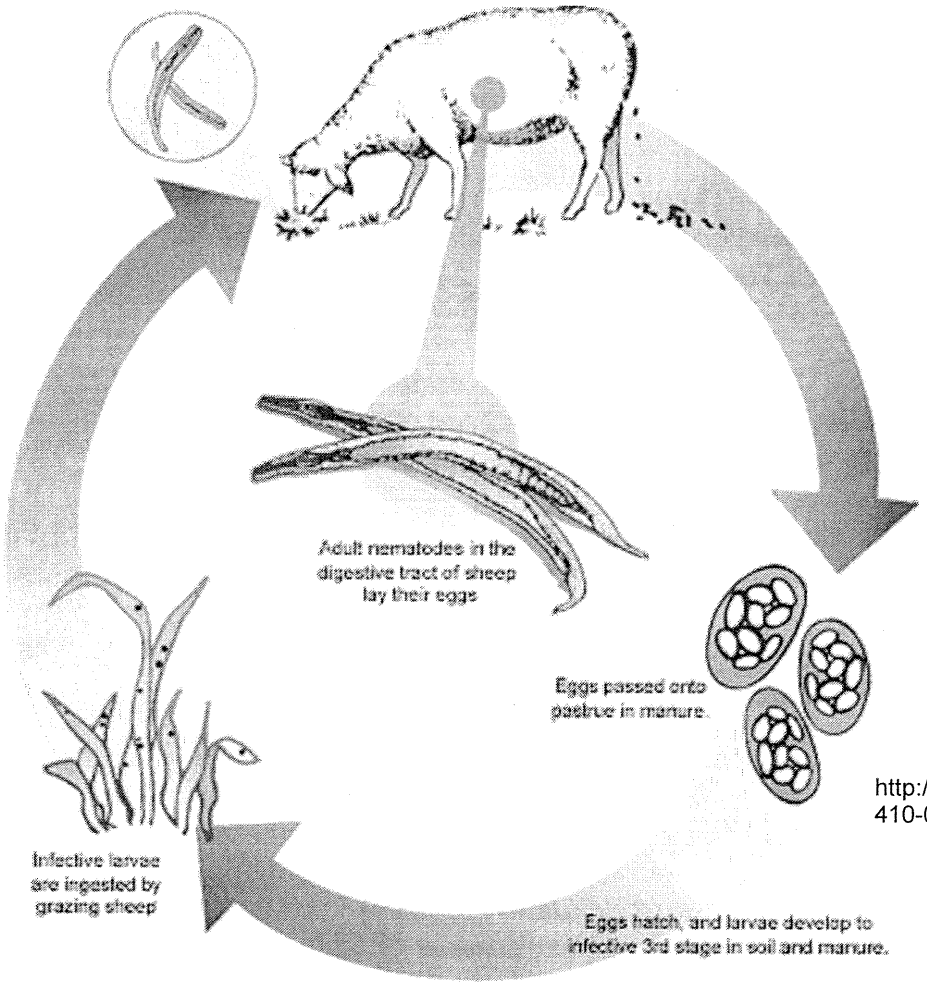
What are the most important worms?
The most important worm parasites live in the stomach and intestine. They are nematodes and belong to a family called trichostrongyles. Throughout the U.S., but especially for us in the mid Atlantic and southern states, the really important member of this family is the barber pole worm (*Haemonchus contortus* -- it causes many deaths every year. This is a bloodsucking parasite that causes anemia and bottle jaw but usually not scouring.

Some near relatives of the barber pole worm can cause scouring in large numbers and contribute to the general debilitation caused by barber pole worm disease, but in this region they usually do not cause severe production losses or death by themselves. Examples of some of these worms that you will see on dewormer labels are *Trichostrongylus, Ostertagia, Cooperia*

In order to control parasites most effectively there are some facts about the life cycle hat are important to understand.

1. Adult female worms produce eggs that are passed in manure. Larvae hatch out and go through several stages of development in the environment before they can infect the next host.

2. During the warm months of the year enormous numbers of larvae can build up on your pasture.



http://www.ext.vt.edu/pubs/sheep/410-027/410-027.html

3. Virtually all these worms need pasture for successful development; they do not do well on dirt lots or in the barn. The success of larvae outside the host depends on the climate. Moisture and warmth are necessary for development and survival. Barber pole worm does not survive cold winters well, but in eastern Virginia with its mild winters larvae will probably survive better over the winter. Dry weather is very hard on these larvae once they are out on the grass.

4. *Haemonchus* (and its relations) larvae can also undergo a process called ARRESTED DEVELOPMENT where they sit quietly in the stomach following infection and don't become adults until several months later. This is an important adaptation for keeping the worm around through cold winters when eggs and larvae don't survive well on pasture. The worms that became arrested in the fall resume development in the spring and reproduce.

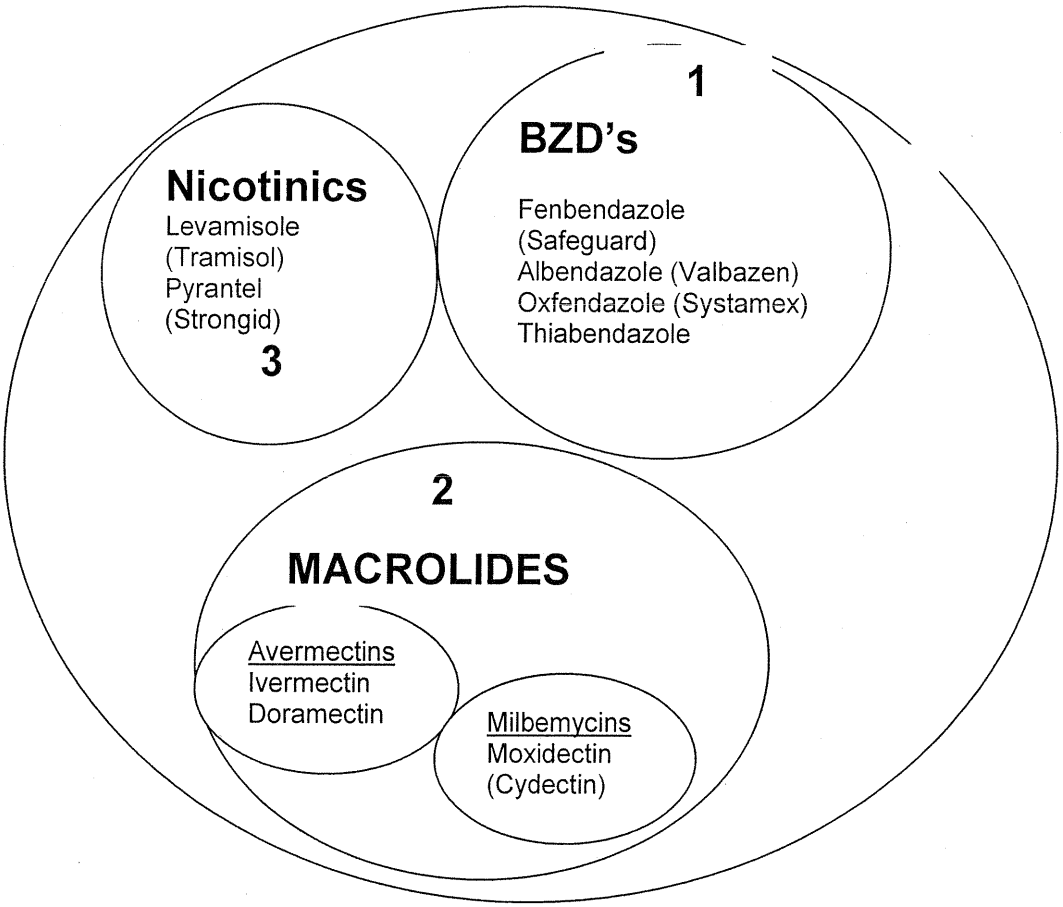
This information can be used in several ways to target parasite control for times of the year when it will have the greatest impact.

CONTROLLING BARBER POLE WORM AND ITS RELATIONS

Worm parasites are a part of the natural sheep world. We can't eradicate them as long as sheep are on pasture. The goal is to maintain the parasites at a level that will not produce any illness or economic loss.

What is the Current Status of Drug Resistance?

Drug resistant *Haemonchus* is widespread throughout the world in sheep and goats and the problem is increasing in the U.S. There are 3 basic categories of dewormers now is use: Benzimidazoles, Macrolides (also called macrocyclic lactones) and a third group we'll call nicotinic agents that includes levamisole and pyrantel.



What Is Drug Resistance?

Inherited ability of worms to resist the action of a drug—passed from generation to generation. The more a population of worms sees a drug, the faster resistance will develop.

What Does Drug Resistance Look Like?

As the proportion of resistant worms increases generation after generation, a drug will become less and less effective. However, you may not see any obvious effect on your sheep until a drug is hardly working at all and significant losses in production or even deaths occur.

Drug Failure May Not Be Drug Resistance!

Other factors may cause a drug to be ineffective that are NOT related to resistance in the parasites.

1. Not giving enough (inaccurate estimation of weight, always dose for the heaviest animal in an age or sex group, not the average

2. Out of date or inadequately stored drug.

3. Inappropriate administration (example, not mixing the Safeguard well)

4. Too many worms! Sheep are treated but immediately pick up the same number of parasites again when they return to pasture.

How Do You Know If You Have Resistant Worms?

A Fecal Egg Count Reduction Test can be performed. Fecal samples are collected from about 10 sheep, they are dewormed and then a second set of fecal samples is collected from the same sheep 7 to 10 days later. Some untreated sheep should also be sampled at the same times. The number of parasite eggs is counted in each set of samples and the percentage reduction after treatment is determined. This test has to be done by a laboratory that counts eggs. The state labs currently do not count eggs. We can perform the tests in the parasitology lab at the veterinary school. If you are interested do this procedure, contact me for additional information.

How Can You Slow Down The Development Of Resistance?

1. **Reduce the number of treatments you give (see below).**

2. Use the correct dose (no underdosing!). Divide sheep into age or weight categories, dose for the heaviest animal in each category.

All of the available "modern" dewormers fall into 3 major groups of drugs. You need to recognize which ones are in each group because once worms become resistant to one member of the group, they will be resistant to the other members of the group

Some of the drugs listed here are not FDA approved for use in sheep and, as such, can only be used following consultation with your veterinarian with appropriate consideration of withdrawal times.

Chemical Name and Family		Approved for Sheep	Trade Name (example)	Dose **(mg/kg)**
Fenbendazole	BZD	No	Safeguard	5
Albendazole	BZD	**Yes**	Valbazen	7.5 not for first 30 days of pregnancy
Levamisole	Nicotinic	**Yes**	Tramisol	8
Pyrantel	Nicotinic	**No**	Strongid T	25
Ivermectin	Macrolide	**Yes**	Ivomec	0.2
Doramectin	Macrolide	**No**	Dectomax	0.2
Moxidectin	Macrolide	**No**	Cydectin	0.2

3. Use product that is fully effective (not expired, etc.)

4. When giving a product orally, make sure you put it in the back of the mouth. If you deposit it in the front of the mouth it is more likely to stimulate the closure of the esophageal groove. This groove is important in lambs because it allows the milk to go directly from the esophagus to the stomach and bypass the rumen, but with dewormers it is much better if they go into the rumen because they will be more slowly absorbed and stay in the body longer

5. When giving a benzimidazole or ivermectin orally it is better to hold the sheep off feed for 12 to 24 hours before treatment (don't remove water, just food). The drugs will not pass so quickly through the GI tract and active levels will be maintained in the body longer.

6. Rotate Dewormers

To reduce the selection for resistance it is best not to use any single drug group for too long. For small ruminants the general recommendation is to change your dewormer groups annually.

7. Don't Bring Resistance To Your Farm

If you get new sheep, don't let them bring in worms with drug resistance. Always quarantine new animals and immediately deworm them with at least 2 drug classes.

Keep them separated, preferably away from any pasture, for a week until no further eggs would be passed in the manure from imported drug resistant parasites.

What Can You Do If You Have Resistant Parasites

1. **Reduce the number of treatments that you give (see below)**

2. Change the drug group you are using

3. Dose twice

For BZD resistant worms give 2 doses of the drug separated by 12 hours. This protocol will be especially important at the point where you start noticing that the drug isn't working so well. It will only be a temporary fix since the population of worms will become increasingly resistant.

With ivermectin, give 2 doses 18 hours apart. Just increasing the amount of drug in a single treatment will not work as well as the separated doses.

4. Drug Combinations

If you find that you do have worms resistant to more than one drug group, you can maintain the activity of the drugs for a while by giving them in combination. This is another temporary fix.

5. Use the recommendations above for minimizing development of resistance.

HOW CAN YOU REDUCE THE NUMBER OF DEWORMING TREATMENTS?

The goal here is to reduce the number of worms that are exposed to the drug and reduce the selection for resistance.

1. Monitor eye color

With some parasites, like coccidia, signs of scouring will alert you to a problem. With barber pole worm there is no scouring but there is anemia with pale mucous membranes. You can check the color of the membranes around the eye—this is the easiest place to see changes.

A South African researcher has produced an eye color chart, called the FAMACHA system, in which sheep are checked on a regular basis and the color of the mucous membranes is checked against a chart that then directs which sheep should be treated. This system is beginning to be used in the U.S. Producers who wish to use this chart must be trained in the system. We are planning to offer some training sessions here in Virginia. However, you can begin monitoring your animals without the chart. Develop an idea of what normal is and you will be able to appreciate the sheep that are very anemic because of a heavy load of barber pole worm.

2. Reduce Your Stocking Density

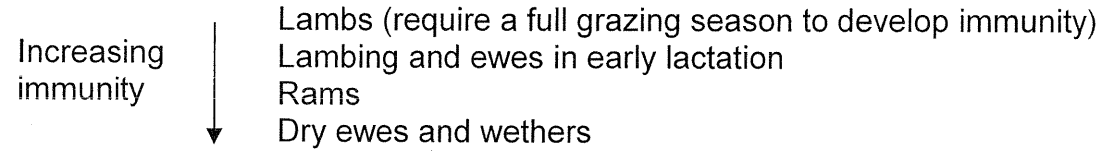
Sheep and their parasites have evolved over a long period of time and under more primitive conditions the level of parasitism in animals would probably be limited by their tendency to roam over greater areas. Now, we often collect up the animals and restrict them to small pastures where the numbers of parasite larvae can build up to dramatic numbers leading to frequent drug treatments. The intensive deworming programs used for parasite control rapidly lead to drug resistance.

3. Don't Pinch Pennies On Diet

Many experiments over the years have shown that animals on a high nutritional plane are more resistant to the adverse effects of parasites than those on marginal diets. Protein and minerals, as well as energy, are important in resisting the effects of barber pole worm because new red blood cells must be generated to replace those lost to the parasites. Nutrients are also needed to develop an immune response to the parasites.

4. Use the Sheep's Normal Immune Responses To Parasites

Sheep develop some immunity against worm parasites levels of resistance vary with age and reproductive condition.



Concentrate your worm control efforts on the sheep that need it the most. The pasture with the lowest number of parasite larvae should be used for ewes and lambs, not for rams or dry ewes. Remember that immunity will be overcome if sheep are exposed to high numbers of worm larvae.

5. Consider Resistance To Parasites In Your Selection Program.

There is definitely a genetic component in resistance to parasites that is most likely related to the immune response. In any breed there will be some highly resistant sheep and some very susceptible sheep. You should eliminate the highly susceptible ones from your flock. In other words, the sheep that always develops bottle jaw before the others should be culled. Similarly, keep the ones that never seem to get anemic. There are other ways to select for resistance based on fecal egg counts, but they work best with large flocks.

Some sheep breeds, especially the West Indian hair sheep breeds, appear to have a high level of resistance to gastrointestinal nematodes.

6. Maximize Pasture Use To Reduce Parasite Numbers.
Some ways to reduce parasite numbers on your pasture to safe levels include:

a. Let pasture sit ungrazed for long enough for most parasite larvae to die. The length of time required will vary with the time of year and conditions, but will be at least several months.

b. Take a cutting of hay from the pasture—this dries out lots of worms and by the time the pasture is regrown there will be very few larvae left.

c. Have an early lambing season so that kids are weaned and sold before pasture larvae levels become really high

d. When you have safe pasture, always put the most vulnerable animals on it first—in most cases that would be the lambs

e. Graze the pasture with a different animal (horses or cattle, not goats or young calves, because they also get barber pole worm) or use mixed grazing. Most of the worms in the stomach and intestines are pretty specific to their hosts and won't infect other animal species. The exception is a stomach parasite that infects ruminants and horses, but usually does not cause any problems.

7. Restrict Access to Pasture
This is obviously a more radical solution, but worms will not be a problem if sheep aren't grazing.

WHAT ABOUT ORGANIC DEWORMERS?

There are some "natural" products sold as alternatives to standard commercial dewormers. This category includes herbal dewormers and diatomaceous earth. There are no studies that I know of that suggest that these products have any substantial effect on barber pole worm or other internal parasites. In the case of diatomaceous earth there have been several studies done by parasitologists in different parts of the country that have found no beneficial effect to feeding it or offering it as mineral.

Specific brands of herbal dewormers have not been rigorously tested so it is difficult to make recommendations about them. There are certainly a number of plants that contain compounds that can be shown to have anthelmintic activity but how that translates into efficacy of these products isn't clear. There is also not much information about their safety. These products do not go through the same rigorous testing for safety that drugs do and just because they are plant derived does not mean that they can't be harmful. Herbal dewormers and diatomaceous earth may have a place in parasite control but until there are some controlled tests to support them, it is not possible to recommend their use.

The U.S. Animal Identification Plan (USAIP)

- The USAIP was developed by the National Animal Identification Development Team (NIDT). Established by USDA, APHIS, VS at the request of the United States Animal Health Association, the team is composed of approximately 100 animal and livestock industry professionals representing over 70 associations, organizations, and government agencies.
- The USAIP defines the standards and framework for implementing and maintaining a national animal identification system for the United States, and includes a standardized premises numbering system, and a standardized electronic individual animal identification system.
- The USAIP is needed to help protect American animal agriculture. This national plan will enhance disease preparedness by rapidly identifying animals exposed to disease permitting rapid detection, containment, and elimination of disease threats. This is essential to preserving the domestic and international marketability of our nation's animals and animal products.
- The purpose is to provide the United States with a system capable of tracing an animal back to the herd that is the most logical source of a disease of concern, and any contact that animal has had with other herds within 48 hours of detection. Thus, the purpose and intent is for animal disease control, not quality assurance, added value, food safety, or country of origin verification.
- The program will provide benefits to industry in terms of increased efficiencies in marketing animals, protection of the national supply of animals and animal products, and consumer confidence in a continued abundant supply of affordable meat. The USAIP will uphold the country's international reputation as a premier source of animals and animal products.
- It is important to also consider the benefits the system will provide. Based on pilot projects using automated data collection and reporting systems such as is proposed in the USAIP, we anticipate that much, if not most of the cost will be offset by benefits associated with data accuracy, data collection efficiencies, labor reduction (public and private), employee safety, speed of tracking animals, and improved animal welfare due to decreased handling time. In addition, establishing an infrastructure of automated data collection and reporting provides tool that private industry can use for other purposes in order to improve production and marketability.
- All livestock, such as beef, dairy, swine, sheep, goats, cervids, equine, aquaculture, poultry, llamas, and bison will ultimately be included in the USAIP. Some features of the plan are common to all species, while others are species specific. Species working groups are now being established to further define their needs and develop transition and implementation plans to include in the USAIP.
- As the plan is being developed at this time, there are no mandatory requirements in place. Eventually, as the system is developed, tested, and the details worked out, all livestock and food animals will be able to be tracked through the system. Not all animals, however, will need to be individually identified if they are raised, fed, and slaughtered as a group. In that case, they would be identified with a Group/Lot identification number. This process will likely vary between species.
- The department is working on options to provide confidentiality for data collected under this system
- Animals entering the United States from other countries will be subject to the same identification procedures as animals already in the country. The identification devices that are on animals entering the United States would remain on the animals as official devices and not be removed.
- The primary source of up-to-the-minute information is located at www.usaip.info. This is an interactive website that provides details on the development of the plan as well as specific information directed at the segments of the livestock industry involved in the identification effort.
- The draft USAIP was presented at the United States Animal Health Association (USAHA) meeting in October 2003. A resolution at USAHA accepted the plan as a work in progress and encouraged its further refinement and implementation. Species specific groups are being formed to determine the final design and implementation process for their specific groups.
- At this time, the NIDT steering committee is receiving comments through January 31, 2004, and will revise the plan if needed.

Frequently Asked Questions on the U.S. Animal Identification Plan

December 9, 2003

1. What is the U. S. Animal Identification Plan?

The U.S. Animal Identification Plan (USAIP) defines the standards and framework for implementing and maintaining a phased-in national animal identification system for the United States.

2. Why is this program needed?

A national animal identification system is needed to help protect American animal agriculture. This national plan, which identifies all food animals and livestock, will enhance disease preparedness by allowing the U.S. to identify any animals exposed to disease and will facilitate stopping the spread of that disease. In addition, it will provide benefits to industry in terms of market access and consumer demand. The USAIP will uphold the U.S.'s reputation for having a safe food supply and will promote continued confidence in agricultural or livestock products. Having a working system that allows for tracebacks to all premises that had direct contact with an animal with a foreign animal disease within 48 hours of discovery will reduce the financial and social impacts of such a disease.

3. Is this plan part of Country of Origin Labeling (COOL)?

No, the USAIP is not intended to be a part of Country of Origin Labeling. The plan's sole intent is to create the ability to track animal disease to its source within a 48-hour period.

4. Why 48-hour traceback capability?

To protect the health of the U.S. herd, sound scientific principles indicate that being able to track and contain a disease event within 48 hours is essential. For the industry to maintain consumer confidence and protect its economic viability, the industry will need to demonstrate its ability to meet this standard

5. What are the benefits for producers in adopting the U.S. Animal Identification Plan?

The adoption of a national identification system will help secure the health of the national herd. The program will provide producers and animal health officials with the infrastructure to improve efforts in current disease eradication and control, protect against foreign animal disease outbreaks and provide infrastructure to address threats from deliberate introduction of disease.

The industry may integrate the standards and technologies defined in the USAIP with their management systems and performance recording programs. The utilization of the same ID technologies for both regulatory and industry programs allows for the development of a more cost effective and user-friendly system for the producer. Producers can also benefit from additional animal identification information obtained to improve production efficiencies and add value to their products. However, the information systems are completely separate; production data will not be transmitted to nor maintained in the national identification databases.

6. How much will the program cost?

The plan for the program is currently being developed. Initial start-up costs will be different than the costs of a fully operational system in all 50 states.

7. Who will pay for the plan?

It is anticipated that the federal government and all industry stakeholders will share in the costs of an identification system.

8. Where do I get a premises ID number?

The administration and maintenance of premises ID lies with each state's department of Agriculture. State departments will use a national mechanism to obtain a unique national premises ID, and will record additional information such as type of premises, contact name, address, and phone number to contact the person in charge of a premises. Key pieces of information will be sent to the national premises database that can be used in the case of a disease trace-back.

9. What forms of identification will be used?

The form of animal identification used is intended to optimize accuracy, promote efficient information transfer, and be practical and effective in its application for individual species and/or industries. Species groups will have the choice of designing a system that may or may not use accompanying visible ID. For example, the cattle industry plans to use radio frequency identification (RFID) technology using an eartag attachment.. Other species are exploring methods suitable for their industries, although effective official identification methods as described in the 9 CFR will be maintained for certain species. Electronic identification may be necessary for efficient and accurate data collection and animal tracking in some species or in particular animal movement scenarios. Official identification tags will not replace management ear tags unless the species groups establish those options. Ultimately it is anticipated that technological advances will allow for one tag or ID device that performs multiple functions. Implants (i.e., microchips) may be permitted for certain species in which no other form of ID is suitable and assuming that the implant site has been approved by the FDA and FSIS relative to ease of discovery at slaughter when appropriate.

10. Where do I get an official ID tag or device?

Currently the distribution mechanism for ID devices is being discussed. It has not been decided where and how a producer can obtain official ID devices at this time. Different species will have different requirements in regards to the type of device that can be used, however standards in regards to RFID technology and code structure, and retention will ensure that various ID devices can be read with RFID readers that meet the same RFID technology standards.

11. Will producers need to have a radio frequency identification (RFID) reader?

Radio frequency (RF) technology is the form of electronic identification that is currently being considered. Producer's that have livestock that utilize RFID for official identification will not necessarily need to have a RFID reader. For example, the producer will be able to record the RFID code of the electronic device before it is applied to an animal and cross-reference the code with a visual-tag number. This will allow them to maintain a record of the RFID code without having the read (scan) the transponder. For cattle, the plan calls for the utilization of a RFID eartag attachment on which the RFID code is to be printed for visual readability. While reading and recording the RFID code manually is not ideal, it can be achieved.

An array of readers will be available on the market; ones that merely read and display the RFID code to ones that are attached to an advanced handheld computer. Palm type devices encased together with a built in reader are becoming quite popular.

12. Who will pay for RFID readers and their installation in markets and slaughter plants? Who will pay for the electronic identification devices?

The plan is being developed as an industry-government partnership, so it is expected that industry and the government will share the cost of the necessary elements. Exactly how those costs will be shared is currently under discussion within the various Species Working Groups.

13. If I am currently using an ID program through a private service or marketing alliance, will my ID be usable in the USAIP?

Yes, assuming the program you are using will be compliant with the official USAIP standards.

14. Should I, or my State Cattle Association, consider options for aligning ourselves with a database management provider so I can be sure I comply with the USAIP?

The Steering Committee would characterize such action as premature. There is definitely no urgency as no immediate implementation requirements have been established. The Steering Committee, and in the future, the USAIP Oversight Board, will clearly communicate dates that will call for action or producer-participation. The program will be phased in over time, and an adequate transition period will be established for producers to work into the system.

The USDA is taking necessary steps to have the standards established as official; the U.S. Animal Identification Number is an example. The standards established in the USAIP are to be recognized as official so industry initiatives that are developing programs containing an ID component may start to incorporate them if they so desire. Additionally, this will allow the standards to be used in various pilot projects that are being formulated. Also, please note that the timetables outlined in the USAIP are target dates, which will be updated through consensus of the Species Working Groups.

15. Who will be responsible for ID application in livestock?

During the phase in period, animals will need to be identified as they leave whatever premises they are on regardless of where they were born. After the first few years of the program, identifying animals will be the responsibility of the "premises of birth" producers. For producers who lack equipment for individual identification, tagging stations will be available.

16. What is a tagging station and where will such stations be located?

A tagging station is an entity operating from a fixed location that has been officially approved by USDA/APHIS to apply ID devices to animals that are being moved into commerce. The USAIP work plan recognizes that not all producers will have facilities to individually tag animals before they leave the farm. Therefore, producers who are required to individually tag animals that leave the farm can elect to truck animals to an approved tagging station and pay the operator of the tagging station a fee to apply individual animal ID devices and report the ID information to the central database. Such tagging stations may include, but not be limited to an existing livestock marketing facility, a veterinary clinic, a fairgrounds or a facility specifically dedicated to performing tagging services.

17. What data will be required to be kept, by whom and in what form?

This part of the plan is under development. It is anticipated that the final plan will be user-friendly such that it will be easy for all stakeholders to implement and make part of their daily practice. Ideally animal movements will be electronically tracked and sent from the stakeholders to the central database. For the plan to be successful, this key part, i.e. data entry, will need to be easy to follow, thus achievable in real-time such that data entry becomes a routine management practice.

Only essential information will be reported to the central database. In the case of individual animals, this is: 1) an US AIN (US Animal Identification Number), 2) the premises ID that the US AIN was seen at or allocated to, and 3) the date it was seen or allocated. Additional information that can be important in a disease trace-back such as species, breed, sex, age or date of birth can also be reported if available. In the case of group or lot movements, the key data are the groups' Lot ID number, the premises ID the Lot ID number was seen at, and the date it was seen. If species is available, this can also be provided to the central database.

The goal of the work plan is to work with existing information systems so additional recording of information by producers and auction markets is minimized.

18. Who will have access to information in the National Animal ID Databases?

Only state and federal health officials will have access to the premises and animal ID information when performing their duties to maintain the health of the national herd. Proper safeguards are being researched and will be put in place to ensure that the data is protected from public disclosure.

19. What species are included in the program?

Currently, the species include beef, dairy, swine, and sheep. It is anticipated that equine, aquaculture, poultry, goats, camelids, cervids and any other species deemed necessary to protect animal agriculture will be included in the future.

20. Will this be a mandatory program?

Efforts are geared toward developing a national animal identification program that will provide for the ability to rapidly track animals exposed to a disease concern, and will meet the needs of producers, animal industries, domestic and international markets and consumers. The plan still needs to be completed and the system needs to be tested to be sure it is effective and workable. Incremental implementation of the plan as development continues will allow for potential problems within the system to be identified and the plan modified to address those problems. Ultimately there needs to be full compliance for the system to work as effectively as it should. Once the USAIP has been finalized, considered workable and accepted by industry, it is likely that industry and market forces will drive the process towards full compliance. At that time, USDA will work with industry and state partners to achieve full participation with the USAIP.

21. Will I be able to sell my livestock if they are not officially identified?

Yes, as the plan will begin as a voluntary program. Over time some markets may require animals to be identified that are not identified now. Species where ID is currently required will continue to have to be identified prior to entering commerce, i.e. sheep and goats under the national Scrapie eradication program.

As the program is phased in, all animals of covered species will be encouraged to have premises identification, and eventually individual identification, prior to sale. For producers who lack facilities to apply identification devices at the premises of birth, there will be provisions for initiating the process at the point of sale.

22. Can animals be identified as a group?

Yes an animal production system can use Group/Lot identification if the producer is able to demonstrate to the satisfaction of state animal health officials that, through group identification and production records, traceback to all premises with direct contacts of a suspect animal can occur in 48 hours. Each group will be identified with a unique and standardized number. Verifiable records will be required to further document premises ID and dates of movement.

23. What are the penalties for not using the program?

At this point, the USAIP is not fully developed and producers are not yet required to comply with any rules. When the plan is finished, the market forces may drive the process towards compliance.

24. What are the liability issues of this program for producers?

Producers are, and have always been responsible for the livestock they produce. If practices are employed that would endanger consumers at any level the producer responsible for creating that threat could have increased liability. Merely having the animals Identified through the USAIP will neither increase nor decrease that liability.

Effective traceability can help protect producers who apply best management practices. The system can help limit liability and narrow the scope of eradication efforts in the case of a disease emergency by being able to document that appropriate and responsible measures were followed.

25. What is the timeline for implementing this program?

Several steps need to be completed before the USAIP could be fully implemented, however the USAIP recommends that:

- All states have a premises identification system initiated by July, 2004;
- Unique, individual or group/lot numbers be available for issuance by the middle of 2004;
- All cattle, swine, and small ruminants possess individual or group/lot identification for interstate movement by July 2005;
- All animals of the remaining species/industries identified above be in similar compliance by July 2006.

These standards will apply to all animals **in commerce** within the represented industries regardless of their intended use as seedstock, commercial, pets or other personal uses.

26. Who has developed this plan?

The National Animal Identification Development Team has developed the USAIP. It is a group of approximately 100 animal and livestock industry professionals representing over 70 associations, organizations, and government agencies. Development has been a voluntary effort by all participants working collaboratively to establish an effective national animal identification plan.

27. Who is on the Team?

Individuals on the team include producers, animal and livestock association and organizational representatives, and State and Federal governmental animal production and health professionals. Represented industries include beef, dairy, swine, sheep, goats, and cervids. Other species groups are welcome and encouraged to participate.

28. What government entities will have oversight of this plan?

In keeping with the aim of the program to safeguard the health of the U.S livestock population through disease surveillance and monitoring, that includes trace back to individual animals within 48 hours, it is envisioned that USDA-APHIS will administer the program. Further, the plan calls for governance as a joint federal-state responsibility with industry input. To ensure uniformity of operations across the U.S., APHIS and individual state animal health entities will develop and administer key regulatory elements of the plan.

29. What will be the ID requirements for animals entering the United States from other countries?

Animals entering the country will be subject to the same identification requirements as animals in the U.S. that move interstate and/or through commerce. Currently, various species working groups are defining species-specific identification requirements.

30. With the phase-out of existing official animal identification devices by July 2005, what will happen with Brucellosis vaccination tags? Will they still be used?

The USAIP does not yet specify how it will affect the animal identification protocols currently associated with the Brucellosis eradication program. It is likely that Brucellosis vaccination tags will be phased out gradually as individual vaccination records are included in the database linked to each USAIN.

31. What will happen with the national Scrapie eradication program's ID system?

With uniformity and consistency being key objectives of the USAIP, the U.S. Animal Identification Number (USAIN) will become the official number for use in the Scrapie eradication program. It is likely that animals currently Identified through other official plans/programs will be "grandfathered" into the program, meaning producers will phase in the USAIN on animals Identified for the first time after a mutually acceptable date.

32. Where can interested stakeholders go to obtain more information about this plan?

The primary source of up-to-the-minute information is www.usaip.info - an interactive, user-friendly website that provides details on the development of the plan as well as specific information directed at the segments of the livestock industry involved in the identification effort. Also, fact sheets, brochures, and other forms of media will be developed to target those needing information on the USAIP.

33. Is there still time to have input into the plan?

The U.S. Animal Identification Development Team is seeking comments from all interested individuals. The comment period runs until January 31, 2004. You can send comments

- from the USAIP web site --- www.usaip.info ,
- by faxing (719) 538-8847 or
- by mailing to USAIP Comments, 660 Southpointe Court, Suite 314, Colorado Springs, CO 80906.

Species-specific working groups are being formed to provide input to the USAIP. Final reports are to be submitted to the National Animal Identification Development Team Steering Committee by April 1, 2004. To find out who represents your species on a species-specific working group, contact Neil Hammerschmidt at Neil.E.Hammerschmidt@aphis.usda.gov or look on the www.usaip.info website.

1 ## USAIP-Sheep Industry Issues

David L. Greene
Region II Representative
ASI Executive Board

2 ## Current ASI Policy

- "ASI endorses the concept and development of voluntary individual, permanent animal identification with consideration of international standards and based on practically and feasibility"

3 ## ASI Policy Review

- A review of this policy will occur at the ASI Annual Meeting and Convention in Sacramento, CA January 22-24, 2004

4 ## Sheep Industry Issues

- The cost of identification supplies and devices will impose a tremendous financial burden on the U.S. sheep industry

5 ## Sheep Industry Issues

- We already have a national identification program for sheep--National Scrapie Eradication Program (NSEP). Any other national ID program should not be duplicative but should be planned so that a seamless transition can occur between the two

6 ## Sheep Industry Issues

- A National ID System should accommodate **all** the various production systems in the U.S.

7 ## Sheep Industry Issues

- A National ID System should accomplish the goals of the public sector as well as be consistent with and contribute to marketing and business needs of the U.S. sheep industry

8 ## USAIP Sheep Working Group

A group formed by the industry

9 ## USAIP Sheep Working Group--Role

- A Sheep Working Group has been formed to advance the USAIP through the development of more precise transition, implementation and continuity of plans consistent with the established standards and goals of the USAIP

10 ## USAIP Sheep Working Group--Actions

- Premise Identification
- Identification Devices
- Event Protocols
- Implementation Time Table
- Financial Support
- Definitions

11 Premise Identification

- "--establish more details for how a premise is to be defined given different management scenarios within the species."

12 Identification Devices

- "List official identification devices that can be used effectively and affordably--"
- "Provide recommendations for the preferred identification device distribution system"

13 Event Protocols

- "Establish procedures that can be used by the producer and others in the industry to facilitate the recording and/or reporting of data for the primary events, such as-
- Interstate movement
- Intrastate movement
- Movement to/from exhibition
- Movement between premises with retained ownership, etc

14 Implementation Time Table

- "Review and finalize a phase-in plan to achieve 48-hour trace-back capability"

15 Financial Support

- "Develop a budget proposal solution: i.e., industry and government cost share ratio"

16 Definitions

- "Add the definitions of any terms that need to be included in the USAIP"

17 Sheep Working Group Members

- Bill Brennan--processor
- John Cargile--livestock marketing
- Dr. Cleon Kimberling--academia
- Dr. Charles Palmer--state animal health
- Dr. Stan Poe--purebred/show
- Stan Potratz--animal identification
- Dr. Bill Seals--purebred/show

18 Sheep Working Group Members- continued

- Sandy Snider--lamb cooperative/range
- Bill Salina--lamb feeders
- Dr. Lyndon Irwin--academia/farm flock
- Neil Hammerschmidt--USAD-APHIS
- David Greene--farm flock
- Paul Rodgers--ASI (Asst Dir Policy)
- Judy Malone--ASI (communications)

19 ▣ **Sheep Working Group Members--continued**

z Dr. Cindy Wolf, Chair/ USAIP Steering Committee

20 ▣ **Sheep Working Group Communication to Industry**

z Communication to the industry will be through the monthly Sheep Industry News, news releases to sheep industry publications and other national livestock publications

21 ▣ **Addendum-Goat Industry**

z On this particular issue, ASI is not representing the interests of the U.S. Goat Industry. They have requested to respond through their existing organizations

Ewe Obstetrics and Newborn Lamb Management

Kevin D. Pelzer DVM, MPVM
Virginia-Maryland Regional College of Veterinary Medicine
Blacksburg, VA 24061

It really doesn't matter what you do, ewes will decide for themselves when they want to lamb. You can, however, be prepared for lambing and the potential problems that can occur. The most common physical sign of impending lambing or parturition in the ewe is the udder begins to fill or bag up. If ewes have a short fleece, one may also observe a softening of the tissues around the dock. The vulva enlarges and a colorless mucous discharge, the cervical mucus plug, may be observed. Even observing these signs in ewes only gives one an approximate time of lambing as these observations may be present a week before lambing.

Parturition occurs in three stages. The first stage of parturition lasts from 2 to 12 hours, the time during which the cervix dilates. During this stage, ewes will try to isolate themselves. In a crowded barn, this may be in a corner or up against a wall. The ewe acts uncomfortable, getting up and down, lifting her lip, pawing the ground, and frequently urinating. Ewes do not "push" at this stage but the uterus is contracting causing dilation of the cervix. Some ewes seem to stare off into space and then go back to chewing their cud or eating.

The second stage of parturition is expulsion of the lamb. This stage is fairly quick, only lasting 1 to 2 hours. The water bag may be observed followed by the feet and the head. There should be steady progress once the water bag is observed or appearance of the feet. If the ewe strains longer than 45 minutes without producing a lamb, she should be checked for problems. Ewes may rest between delivering twins, but twins should be delivered within 45 minutes of the first delivery.

Cleanliness is important when examining a ewe for problems. Contamination of the uterus can lead to serious infection that will negatively impact the health of not only the ewe but also the newborn. Likewise, it protects the shepherd as well. The ewe's vulva should be cleaned with a mild soap and water solution. The shepherd should use an obstetrical sleeve and apply generous amounts of lubrication on the sleeve before entering the vagina.

The most common problem observed in ewes with dystocia, difficult birth, is fetal postural abnormalities. Normally, the lamb is born with the front legs extended followed by the head. The head should be 2 to 4 inches from the tip of the toes. If the head is right on top of the toes, the lamb may be "stuck" because the elbows are caught. Pulling on one leg at a time and fully extending the limb usually resolves this problem. If difficulty occurs in trying to manipulate the fetus, raising the hind quarters of the ewe sometimes allows the uterus to fall forward and reduces the ewe straining allowing for easier repositioning.

A common problem occurs when twins are trying to come out at the same time with each having a leg in the birth canal. One should follow each leg back to the chest to ensure that the legs presented are of the same lamb. If the head and 2 different legs are presented, it is best to gently push the head back in and then replace the leg and retrieve the other matching leg. Be sure to guard the feet as they are sharp and can tear the uterus. In any ewe dystocia, always keep in mind that you may have more than one lamb coming out at the same time.

Sometimes the legs appear but the head seems to be missing. Again check to be sure the legs belong to the same lamb. The head may be turned back or down between the legs. In any case, by gently pushing back on the lamb's brisket, one will usually have enough room to manipulate the head into the proper position.

Sometimes a ewe may not strain but the membranes are present or the tail is present but no legs. When you examine the ewe, the lamb's butt is pushed up against the pelvis and the legs are extended forward. This is referred to as a true breech. Gently push the butt forward and reach under to grab one of the legs. Place a finger around the hock and gently retract, then reach forward and grab the foot. With the hand around the foot, guarding the toe from penetrating the uterine wall, bring the toe to the middle and push the hock to the side while lifting the toe into the vagina. Repeat with the other leg. Place the tail between the legs, this reduces the chances of tearing the uterus and remove the lamb.

The third stage of parturition is expulsion of the placenta. The placenta should pass within 8 hours of lambing. If the placenta retains, the ewe's appetite should be monitored as well as her temperature for a fever (>103.3). If the ewe goes off feed or develops a fever, she should be given penicillin. Mild traction can be applied to the placenta but it should not be torn. If the ewe remains bright, alert, and eating, nothing needs to be done and eventually the placenta will fall out.

Lambs should be born in a dry draft free environment to reduce the risk of hypothermia. Lambs attempt to stand and nurse within 30 minutes of birth. The ewe should have been crutched and clipped around the flank so the lambs have easy access to the teats. If lambs are being crushed, shearing may reduce this problem as ewes can't feel the lambs when overly fleeced. Lambs should nurse within the first 2 hours of birth. Lambs should receive 50ml of colostrum per kg of body weight (3/4 oz/lb) during the first 2 hours and a total of 200 – 250 ml/kg (3.5 oz/lb) during the first 24 hours of life. For example, an 8 lb lamb should receive 6oz in the first 2 hours and 28 oz over the first 24 hours of life.

If a ewe does not have adequate amounts of colostrum, colostrum from another ewe may be used. If ewe colostrum is not available, goat or cow colostrum can be used. There is a chance for disease transmission to occur using goat or cow colostrum, eg. Johnes Disease, so investigation into the health status of the herd is important. Likewise, in rare cases some lambs fed cow colostrum may develop a

hemolytic anemia. Commercial colostrum substitutes are available but their efficacy is not known.

Lambs should be placed in a claiming pen or lambing jug. This allows for proper bonding to occur as well as gives the shepherd an opportunity to observe the ewe and lambs for problems. Lambs should remain there a minimum of one day plus a day for every lamb. Ewes may ignore weak lambs or lambs born subsequent to the first of a litter, so even though the lambs are with the ewe, one must observe ewe lamb interactions.

The lamb's navel/umbilical cord should be dipped in a disinfectant. A 2% iodine, betadine, solution can be used as well as chlorohexidine. Chlorohexidine has been shown to provide some residual bacterial inhibition. Although tincture of iodine is commonly used, it may be too strong as it can cause burning of the tissues.

Lambs may need selenium supplementation if ewes are not properly supplemented. Feeding a quality trace mineral salt with the highest allowable selenium should provide the ewe and her lambs adequate selenium. If supplementation is given, lambs should receive 1/3 ml of BoSe.

Heat lamps may provide lambs needed warmth if the lambs are wet or sick. Lamps should be no closer than 4 feet from the ground. Positioning of the lamp is important as a misplaced lamp may set the barn on fire.

Fostering of lambs may be necessary in the case of triplets or inadequate milk production. Match lambs for size, color, and age. The closer to birth fostering occurs, the better the results. Placing fetal fluids on the adopted lamb may help the fostering process.

Colostrum should be hand fed before fostering to insure adequate passive transfer of immunoglobulins. When selecting the lamb to foster, pick the strongest of the lambs. Remove the ewe's lambs and return them after she accepts the new lamb. Do not separate the ewe from her lambs any longer then 2 –3 hours.

Bottle feeding may be necessary if fostering is not an option. Provide the lamb colostrum during the first 24 hours of life. A lamb milk replacer should be used. Lambs should be fed 4 times a day. The lamb should receive a total of 20% of its body weight a day. For example, a 10 lb lamb would receive 2 lbs of milk (2 pints) a day, 8 oz per feeding. The milk should be fed warm in order to avoid chilling of the lamb during the first week of life. If bloating is a problem, either try feeding cold milk replacer or feed smaller quantities at a time more frequently. The second week of life, lambs can be fed 3 times a day rather than 4. Lambs should be offered creep feed within a week of life and can be weaned when they weigh 20 lbs. More information is available at http://www.sheepandgoat.com/articles/artificialfeeding.html.

Lambing Equipment Box
Bucket
Mild soap, Ivory
Towels
Obstetrical lubrication, KY Jelly, J-Lube
Obstetrical sleeves
Clean baling twine
Antiseptic to dip navels
Hair clips to use on umbilicus in case of hemorrhage.
Bottle nipples
Feeding tube
60 cc syringe to fit feeding tube

Genetic Lessons from the United Kingdom

Dr. Ron Lewis
Department of Animal & Poultry Sciences
Virginia Tech

Introduction

Sheep farming in the United Kingdom (UK) is characterized by its enormous diversity. Major differences in climate and topography dictate different systems of sheep production, with specific breed types used in the different environments. However, these systems of production are integrated through a stratified structure unique to the UK. Hardy hill breeds are farmed in the harsh hill and mountain environments, where they are maintained as pure breeding flocks. After three to four lamb crops, hill ewes are drafted onto better upland pastures where they are crossed with rams from the 'Longwool' (primarily Leicester) breeds. Ewe replacements are then chosen from the resulting crossbred lambs, shifted to lowland areas and mated to terminal sire (meat) breeds of rams to produce prime lamb. This stratified system focuses on the production of lamb meat, as milk and wool are currently minor contributors to economic returns to UK sheep farmers.

In recent years there has been a major shift in emphasis away from quantity towards quality within the meat sector, which has encouraged sheep producers to seek to improve carcass quality through use of genetic improvement. In this paper I will overview the breeding strategies in place in the UK aimed to improve lamb meat quality. I will describe the national on-farm recording system, *Sheepbreeder*, the measures recorded in that system, and the way these measures are combined to aid sheep farmers in their selection decisions. Even with the large size of the national flock, approximately 36 million sheep, the average size of many purebred flocks in the UK is small (40 to 50 breeding ewes). With relatively few lambs for breeders to select among within individual flocks, this constraint of small flock size slows genetic progress. As a means to overcome this constraint, a form of co-operative breeding program known as sire referencing has become the mainstay breeding tool in the UK. I will briefly describe the main characteristics of sire referencing schemes in the paper. When evaluating the efficacy of breeding programs, it is important to check that they are actually achieving their desired aims. Thus, as the last section of the paper, I will overview results of a testing program underway assessing whether selection to increase lean growth rate on-farm is indeed improving carcass quality.

The sheep examples I will draw upon will primarily be taken from the terminal sire breeds, since genetic improvement schemes were first initiated in these breeds in the UK. However, very similar strategies are now in place in the Hill and Longwool breeds, allowing pure and commercial breeders throughout the stratified sheep industry to reap the benefits of genetic improvement.

Dynamics of sheep farming in the United Kingdom

Rationale of the stratified structure

The stratified structure of sheep farming developed as a direct consequence of government policy and subsidy payments, and was designed to maximise meat production from the lowland sector at a time when the UK was only around 50% self-sufficient in lamb meat production. By concentrating the breeding of replacement females higher up within the stratified structure, it allowed lowland producers the opportunity to supply a greater proportion of their lambs directly into the carcass sector. At the same time, it provided a real purpose to sheep production in the hill and upland areas.

Development of national improvement schemes

The development of national schemes to increase carcass quality was initially targeted at the terminal sire breeds because (i) the cost-benefit ratio of the research to develop such schemes was likely to be greatest because these breeds make the greatest genetic contribution to the slaughter generation, and (ii) the selection objectives were easiest to define for this particular sector. For the terminal sire breeds, their primary role is to sire the slaughter generation out of crossbred ewes. Characteristics such as mothering ability and reproductive rate have less relevance to this role, with the consequence that the selection objectives can be limited to improving growth rate and carcass characteristics. National schemes to improve carcass quality through selection for lean growth rate in terminal sire breeds have been in place for over a decade, and will be discussed latterly.

With improvement schemes well established in the terminal sire sector of the UK sheep industry, the attention has turned to the genetic improvement of carcass quality in hill and Longwool breeds. These breeds also make a substantial contribution to the slaughter generation since they are the parental breeds of the crossbred ewe that dominates lowland sheep flocks (Figure 1). However, given their different place in the stratified sheep production system, maternal and longevity traits are also relevant to hill and Longwool breeds. Defining appropriate selection objectives for hill and Longwool breeds is therefore more complicated than for terminal sire breeds. In the quest to improve carcass quality of these breeds, it is essential that any selection pressure applied for carcass traits does not compromise hardiness, longevity, prolificacy or mothering ability, which would be detrimental to overall economic performance of hill and crossbred ewe flocks. Because of these considerations, maternal and fitness traits are being intimately incorporated into selection programmes in such breeds.

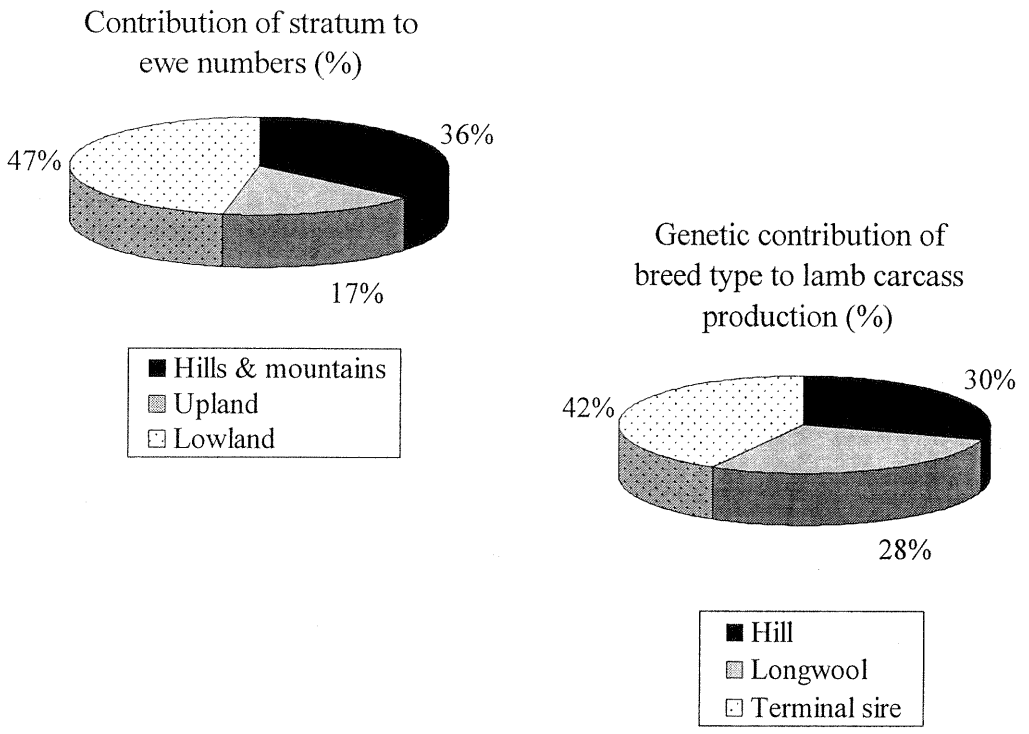


Figure 1 *The proportional contribution of different stratum of the UK sheep industry to ewe numbers, and the proportional genetic contribution of the different breed types to lamb carcass meat production (data courtesy of the Meat and Livestock Commission, Milton Keynes, England)*

On-farm recording and genetic evaluation (*Sheepbreeder*)

Signet on-farm recording

The national livestock recording scheme in the UK is undertaken by Signet Farm Business Consultancy, a subsidiary of the Meat and Livestock Commission (MLC). The Commission is the Levy Board for the sheep, beef and pig industries supporting marketing and R&D. Signet provides a bureau service, which relies on on-farm performance recording by individual breeders. The performance records collected by Signet include litter size at birth and weaning, live weights at a range of ages from weaning to breeding - these are used as measures of both the lamb's own merit for growth and its dam's milking and mothering ability – and ultrasonic measurements of fat and muscle depths in the loin region. A Signet technician visits individual farms to weigh and collect the ultrasound measurements on lambs when they are 20 to 21weeks of age. All other records are sent to Signet Headquarters (in Milton Keynes, England), either as paper records or in an electronic format.

Ultrasound scanning

Since the focus of genetic improvement in the UK is to improve carcass merit, primarily defined as carcass lean content, ultrasound measurements are used widely as *in vivo* predictors of carcass composition. In Figure 2, ultrasound scans for a comparatively lean and fat lamb are shown. There scans were taken at the 3rd lumbar vertebrae. Note that the outside (or horizontal) border of the muscle - the *m. longissimus lumborum* - and its overlying subcutaneous fat is difficult to discern. This is a major reason why depths rather than areas were chosen as the standard for ultrasonic measurements in the UK. Even when collecting depth measures, the level of precision achieved with ultrasound measurements in sheep is moderate. However, when combined with live weight, such measures are effective live indicators of lean and fat composition of the carcass.

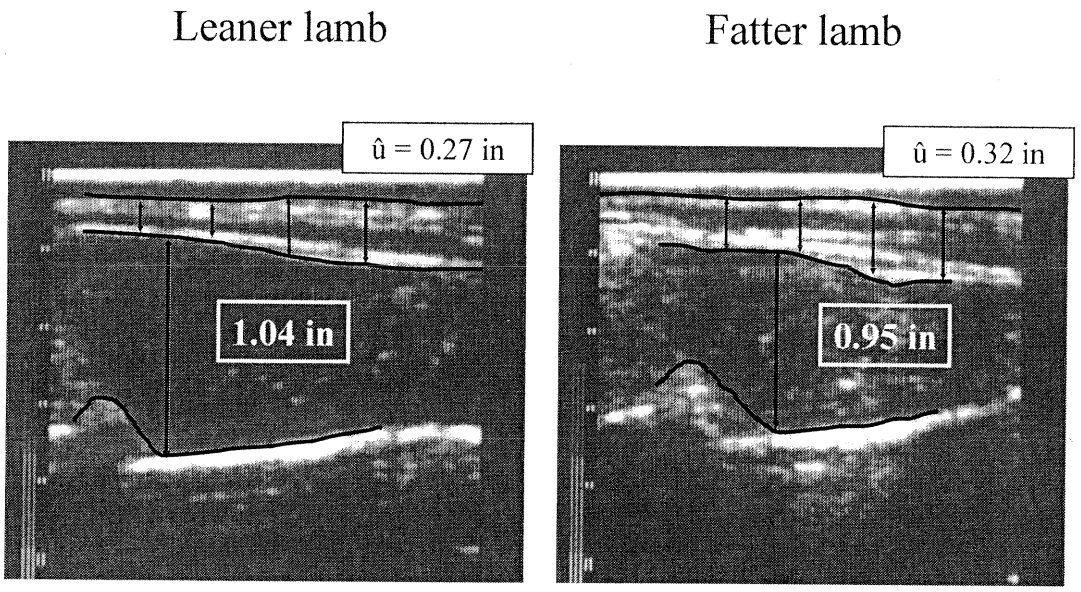


Figure 2 *Ultrasound scan of two lambs, one that is leaner (muscle depth of 1.04 inch and average fat depth of 0.27 inch) and the other fatter (muscle depth of 0.95 inch and average fat depth of 0.32 inch. The images shown were collected with a real-time 'B' mode (Vetscan) ultrasound scanner.*

X-ray Computed Tomography

Over the past few years, there has been considerable interest in the application of more advanced imaging techniques, developed primarily for use in human medicine, in livestock breeding programs to allow more accurate *in vivo* measure of carcass composition. One of these techniques, X-ray Computed Tomography (CT), has recently been introduced to sheep breeding in the UK. In Figure 3, a CT image taken at the 2nd lumbar vertebra of a lamb is shown. Note that the lamb is lying on its back in the scanning cradle. As compared to ultrasound, lean, fat and bone can be more clearly delineating with CT. In addition CT allows measure of other carcass attributes such as muscle shape and distribution.

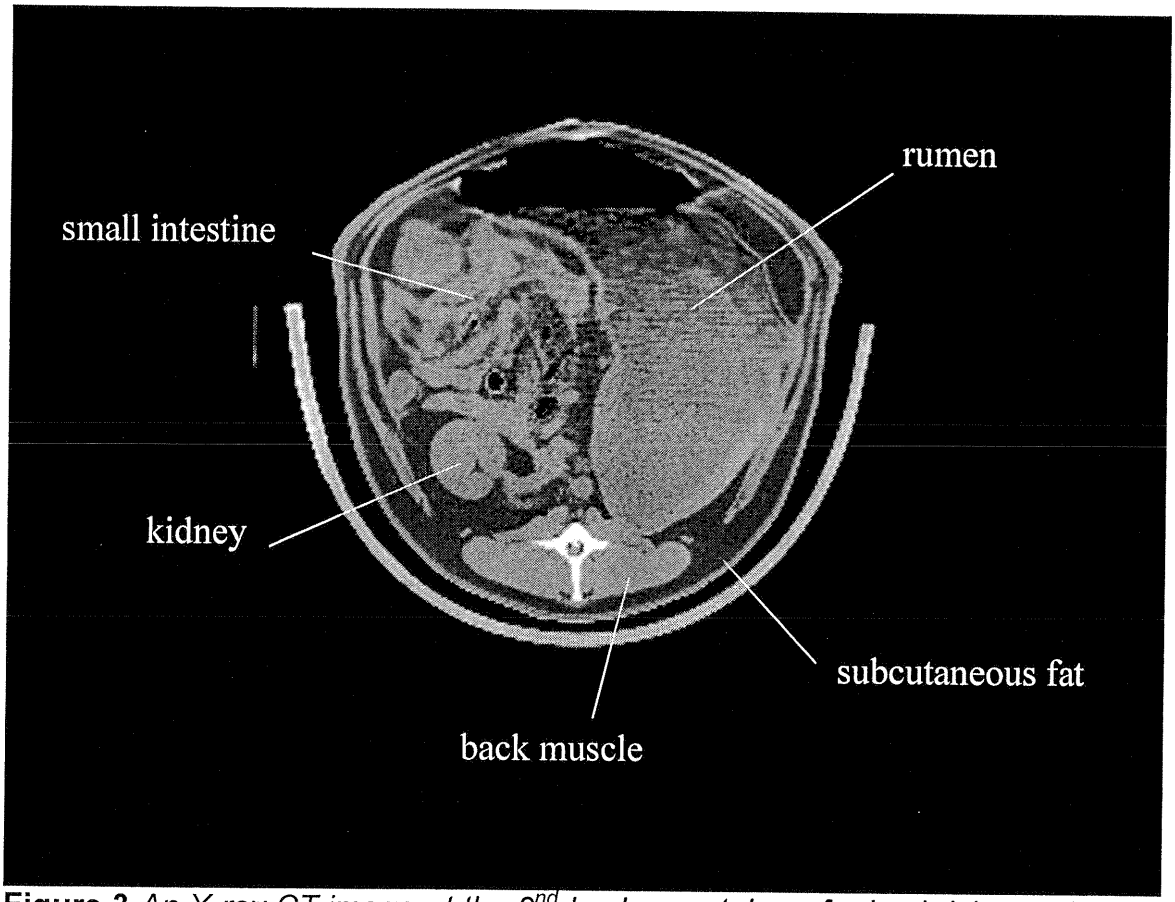


Figure 3 *An X-ray CT image at the 2nd lumbar vertebra of a lamb lying on its back in a scanning cradle*

As CT is expensive relative to ultrasound, it is not practical to CT scan all candidate lambs available for selection. However, much of the benefit of CT can be obtained at a fraction of the cost by the use of two-stage selection, where most animals are scanned ultrasonically with only those of higher genetic merit scanned by CT. Where used strategically in co-operative breeding schemes, with all recorded lambs being ultrasound scanned and only the 'best' 10 to 15% of ram lambs being CT scanned, we have found that genetic progress for lean growth rate is increased by 16 to 32% over that for ultrasound alone.

A commercial CT service is being provided to sheep breeders in the UK at the Scottish Agricultural College in Edinburgh. At the present, the prime users of the facility are terminal sire breeders, although uptake of this technology by hill and Longwool breeders is beginning.

Genetic evaluation
Besides providing a bureau service for collection of on-farm performance records, a central role of Signet and MLC is to use the information collected to provide sheep breeders with accurate assessments of the genetic merit of their sheep. The details of such evaluations are beyond the scope of this paper except to mention that the *Sheepbreeder* service utilises the latest analytical (Best Linear Unbiased Predicator or BLUP) and computer technology in its genetic evaluation. These same methodologies are used in the National Sheep Improvement Program here in the United States.

The choice of BLUP technology by Signet for undertaking genetic evaluation is crucial given the structure of the UK sheep industry. As mentioned earlier, the size of purebred flocks are small. Breeders often wish to compare the genetic merit of animals within their own flock to those in other flocks. However, since flocks often differ in their husbandry, this can be difficult to achieve in practice. Differences in housing and feeding systems between flocks may mask the true genetic merit of individual sheep. With the use of BLUP, such across-flock genetic evaluations are indeed possible although depend on the presence of relationships (or genetic links) among sheep between and within separate flocks. If the degree of linkage is adequate, that part of animals' performance due to their genetic makeup can be effectively disentangled from that due to non-genetic factors such as management and feeding. The genetic merit of sheep in separate flocks can then be directly and accurately compared. With more animals to choose among, selection can be more intensive allowing quicker rates of genetic progress. The introduction of cooperative breeding programs in the UK was in order to create such links, effectively enlarging the size of individual flocks to the sum total of the member's flocks in the scheme.

Sire referencing schemes

Sire referencing is a form of cooperative breeding scheme that has gained considerable popularity among sheep breeders in the UK. Such schemes have been formed in over 20 sheep breeds in Britain over the last decade including all of the major specialized meat breeds (see Table 1). About half of performance-recorded flocks in the UK now belong to these schemes.

Table 1 *Details of some sheep sire referencing schemes in the UK (data courtesy of Signet Farm Business Consultancy, Milton Keynes, England)*

Breed	Year scheme started (year of first lambing)	No. breeding ewes in 2003	No. lambs recorded in 2003
Suffolk	1990	4000	6319
Charollais	1990	1675	2921
Meatlinc	1991	936	1381
Texel	1992	4802	7497
Scottish Blackface	1994	4080	5872
Polled Dorset	1995	2826	4472
Bluefaced Leicester	1997	372	677
Border Leicester	1997	128	221

In sire referencing schemes a team of elite rams (or reference sires) is selected, typically from among member flocks. Each member of the scheme then picks some although not necessarily the same rams from this team to use within their own flock (usually by artificial insemination). If reference sires are themselves genetically superior, this superiority filters into the member's flocks. Progeny of these reference sires also serve as a benchmark against which progeny of other rams can be compared. That is, they provide a mechanism for establishing genetic links between flocks to ensure a sound across-flock genetic evaluation. A schematic diagram of a sire referencing scheme is given in Figure 4.

Lean growth index

In order for a sire referencing scheme to be successful, its members must share a common ethos with a wish to join together to more effectively pursue their breeding objectives. That ethos or vision is often personified as a selection index. A selection index combines into a single score an overall assessment of an animal's genetic merit for a combination of traits that are of economic importance.

In the late 1980's terminal sire breeders in the UK adopted a lean growth index as the central focus of their breeding programs. The index was designed by Geoff Simm at the Scottish Agricultural College and combined information on live weight, and ultrasonic fat and muscle depth, as collected and evaluated through the *Sheepbreeder* service. The breeding goal of this index comprised carcass lean and fat weight, with relative economic values of +3 and –1 respectively. These relative economic values were chosen to achieve 'desired gains' in the two traits in the breeding goal, rather than being based on actual market returns. This approach was chosen because of the weak relationship between carcass price and fatness in the UK at the time the index was derived.

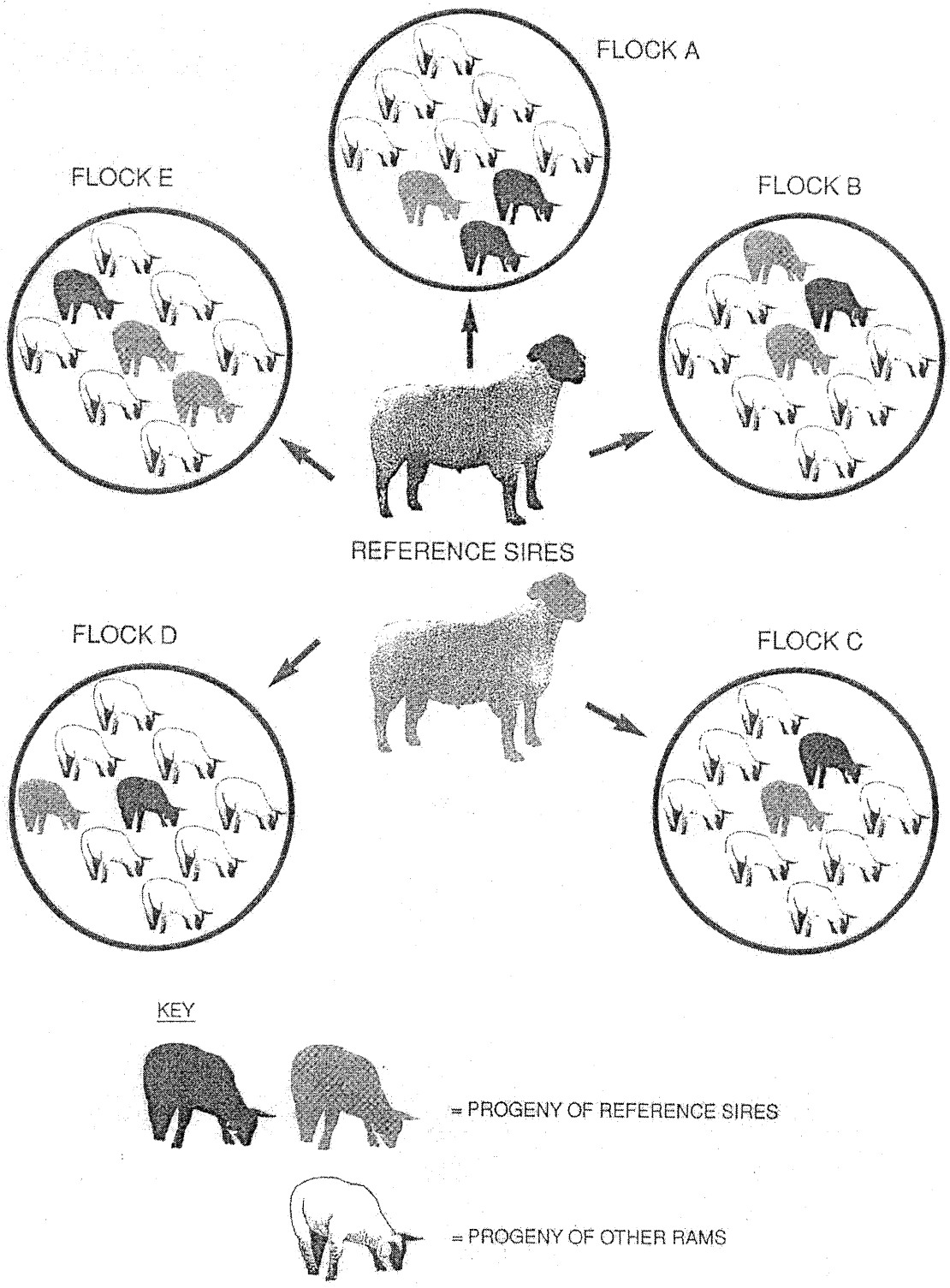


Figure 4 *Schematic diagram of sire referencing scheme in sheep where offspring of reference sires provide a benchmark for comparison across-flocks (diagram courtesy of the Scottish Agricultural College, Edinburgh, Scotland)*

In Figure 5, gains in lean growth index score in sire referencing schemes in several terminal sire breeds is shown. High rates of response to selection on the index are being achieved (about 1.75% per annum) in these industry schemes.

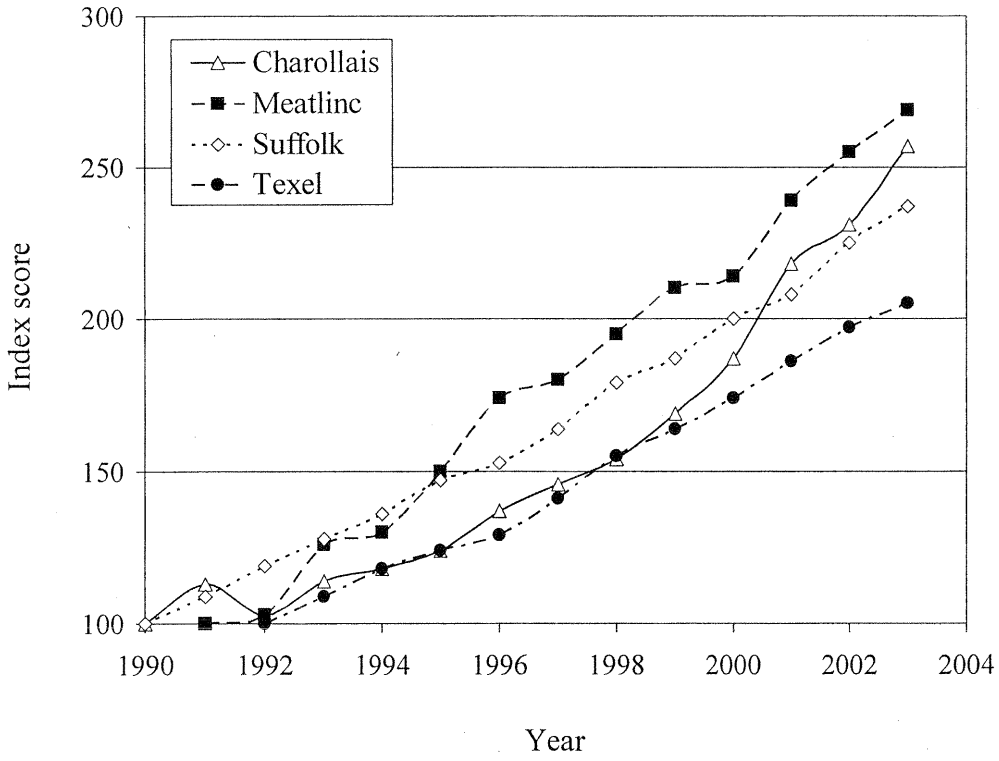


Figure 5 *Trends in lean growth index scores in sire referencing schemes in some terminal sire breed sheep in the UK (data courtesy of Signet Farm Business Consultancy, Milton Keynes, England)*

Confirming progress from selection

Over the past decade, several studies have been conducted to test whether the gains in lean growth index score achieved by industry were resulting in marketable improvements in carcass merit. The results of each of these tests have been very consistent and so I will focus on the largest of such studies which is currently underway.

The explicit aim of the study was to assess the effect of selecting terminal sire rams on index score on the lean content and saleable meat yield in the carcasses of their crossbred lambs. Thus far, nearly 4,500 lambs sired by 60 rams from three breeds (Charollais, Suffolk and Texel), half with high and half with low index scores, have been evaluated. The rams came from sire referencing schemes in each of these breeds and were mated to crossbred ewes in flocks in England,

Scotland and Wales. The results are unequivocal. Lambs produced by high index rams grew 2% faster and had more muscle and less fat at finished condition. Even so, they reached finish at the same age as lambs sired by low index rams. In addition, carcasses from high index lambs were nearly 1.1 lb heavier, and were estimated to have 3% less subcutaneous fat, than carcasses from low index lambs. They also had fat scores more in tune with UK and European market specifications.

About 550 of these carcasses underwent commercial retail cutting. The use of high index rams resulted in carcasses with 0.9 lb more saleable meat yield. If a commercial ram is used for three seasons, with 80 lambs marketed from a ram each season, this means about 215 lb of extra lean meat is produced from each high index ram. It is also important to know the economic worth of this increase in saleable weight. Using average UK figures for 2002, a pound of saleable meat was worth around £2.83, about $5. At that monetary value, use of one high index ram adds £600 (or $1,075) extra value to the retail product sold. Multiplied over the size of the UK prime lamb crop market, that gain is substantial.

Conclusions

For a variety of reasons, consumers in the UK and elsewhere are demanding leaner meat. Lamb has been particularly disadvantaged by this preference because of its relatively high fat content. In order to maintain the competitiveness of lamb in the marketplace, UK sheep farmers had adopted breeding strategies to improve the quality of their product. That choice in part was based on the fact that genetic improvement is a permanent and cumulative method of improving carcass composition, and is often highly cost-effective.

The uptake of genetic tools by UK sheep farmers has been supported by the availability of a national recording scheme, advancements in analytical and computing technologies for genetic evaluation, and developments in the design of cooperative breeding schemes. When combined with enthusiasm of groups of sheep breeders, these tools had lead to appreciable changes in the quality of lamb meat produced in the UK. Such opportunities, however, are not unique to producers in the UK. These same tools are relevant and generally available to sheep farmers elsewhere. The key is their uptake in practice.

Acknowledgements

The work described in this paper was funded by the Scottish Executive Environment and Rural Affairs Department, the Department for Environment, Food and Rural Affairs, the Meat and Livestock Commission (MLC) and the Biological Sciences Research Council (BBSRC). I am sincerely grateful to each of these sponsors. I am also thankful to the many colleagues that have contributed to this area of study, particularly Geoff Simm, Bill Dingwall, Gerry Emmans and Mark Young (Scottish Agricultural College), Will Haresign (Welsh Institute of Rural

Sciences), Mervyn Davies (ADAS Consultancy Inc), Samuel Boon (Signet Farm Business Consultancy), Gert Nieuwhof (MLC) and Alan Fisher (University of Bristol).

The success of this work is due to the unending support of sire referencing schemes and their members in the UK, for which I am deeply grateful. Their close involvement has ensured its relevance and value to UK sheep farmers.

Overview of National Wool Programs

VA - NC Shepherd's Symposium

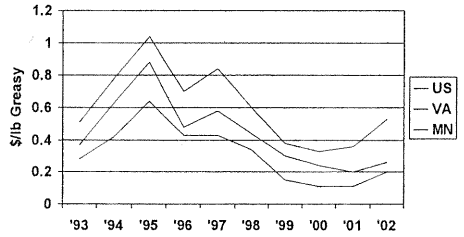
January 9, 2004

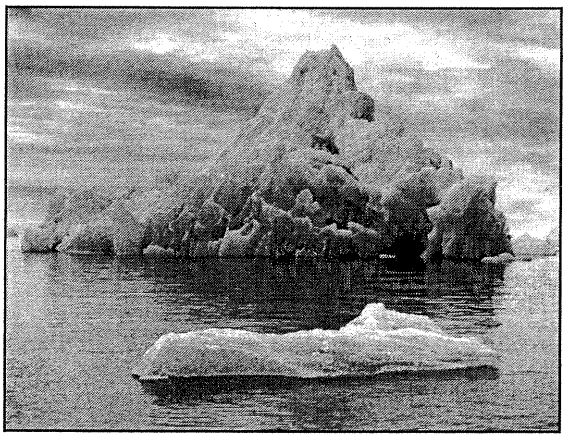
Robert J. Pudula
Wool Quality Improvement Consultant
American Wool Council

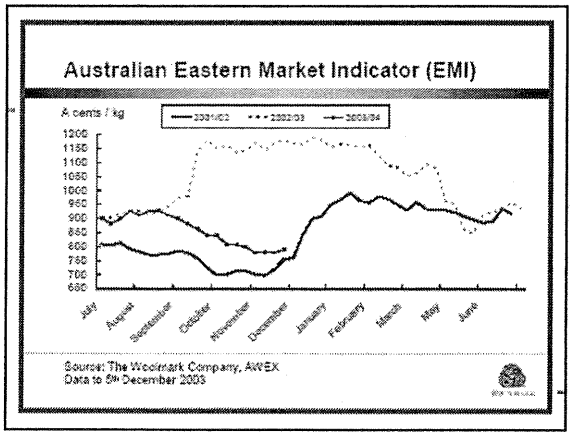
Wool Price Recovery

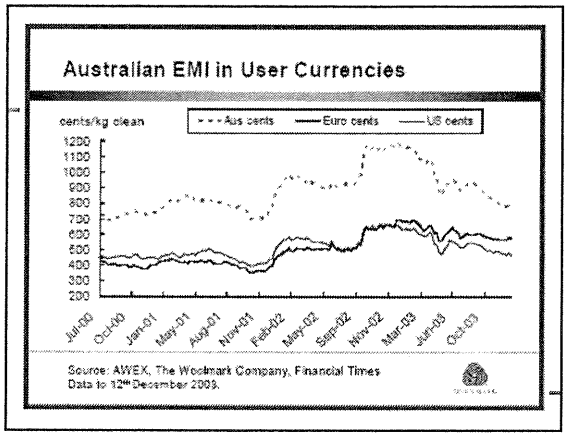
- Return from world-wide historical lows
- Currency exchange rates improving
- Demand for wool ???
- Decrease in world-wide production
- Lack of "stockpile"

Price recovery is not equal across all wool types









Higher Prices – The Good News

Approximate currency exchange rates

($USD = $1.00 AUD)

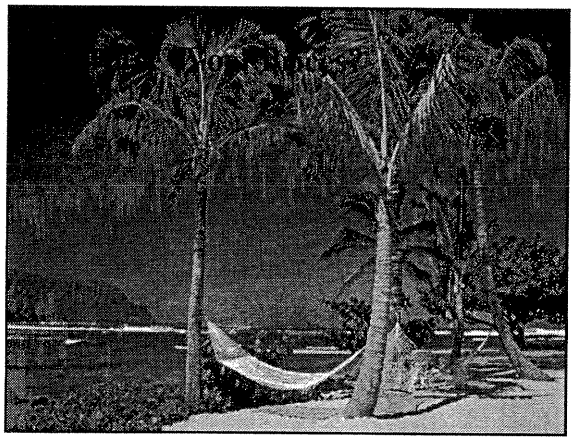
August 2001	$0.50	
January 2003	$0.58	+16%
July 17, 2003	$0.67	+13%
December 29, 2003	$0.744	+11%

(Since the low of ~48 cents US in the summer of 2001, the exchange rate has improved by 55%!)

Australian Production is Moving

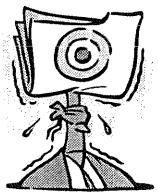
- Decline in sheep numbers
  - Wool prices, drought, lamb production
- Rapid move towards finer wool
  - Affordable in-field testing
  - Computer programs / consultants
  - Culling low $ generators

- Reduced supply of mid-micron wools



Wool Price Guess for 2004

- Prices will remain "Volatile"
- Lack of Mid-Micron Wools
- Decreased Production
  - Less wool, Finer wool (Australia)
  - Quality wool ?
  - Lamb production ?



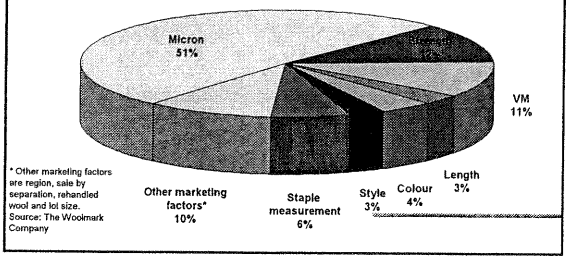
- World-wide Demand and Economies

Marketing the US Wool Clip

- Both domestic and international markets are important for our industry
- Price reporting – what is "Medium" Wool?
- Description of wool - "TYPING"
  - The AWEX ID system is going world-wide
  - Note: The most important parameters for price determination are objectively measured and therefore reported in the AWEX System

Auction Prices Show What the Market Wants

Value determining characteristics 2000/01 - 19.6-24.5um merino fleece wool



Marketing Infrastructure

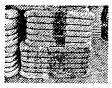
- Domestic infrastructure is fragmented
- The "C-Word"
  Consolidated, Centralized, Coordinated, Cooperative, Combining, Coalescing
- "Regional Centers" via attrition
- Future – think international marketing and realistically look at volume of US wool

Marketing US Wool - International

- Increased Competition
- Narrowing the price gap for US wool and other countries
- Nearly 60% of the 2003 US wool clip production will be exported in Raw, Scoured or Top form
  (includes production and carry over)

International Marketing Challenges

- Infrastructure
  "One stop shopping" for buyers?
- Local freight issues
  In-land freight is expensive
  Yield – shipping non-wool
  Pounds of wool per container



- Quality and Consistency are expected!

Military & Government Contracts

- In 2002 more than 10 million lbs (~25% of US wool clip) awarded or consumed by contracts
- Wool consumption has remained steady despite reductions in staff
- Uses both 100% wool and wool blends
- Through 2005 over $200 Million in contracts

Military & Government Contracts

- Not just fine wool is used
  Different wool for different products
- Blankets – home for some coarser wool
  Hard to tell how much US wool is used and what qualities (some recycled wool is used in relief blankets)
- "Civilian Uniforms" do use US wool, but it is not required

Military & Government Contracts

WOOL QUALITY IS IMPORTANT

We can't just rest on the Berry Amendment for taking our wool. Lack of quality translates into increased defects, leading to higher cost items – US mills lose competitiveness to compete.

Wool garments can not afford to be the next $500 ash tray!

Military and Product Development

- New wool blends in the making with high tech fibers (example Wool/Nomex)
  Battle Dress Uniforms ---BDU's (fatigues)
- Cold Weather Gear (undergarment layers)
- New fabric advances – modify the surface of the wool fiber so it can be used to create a more comfortable and effective chemical control suit

Product Development

- Takes time and money
- Military Wool/Nomex blend is already several years in the making
- New Treatments to make wool more consumer appealing and environmentally friendly are being developed and passed the initial testing phases in laboratory settings

Product Development

Many great ideas and uses
- Insulation
- Horticulture applications
- Filters for water treatment
- Value-added Ventures

- Do we want wool to be an inexpensive raw material in an industrial application?

Wool Quality Improvement

- Quality and Consistency are key words
- Contamination
  - Kemp and Hair
  - Colored Fiber
  - Polypropylene & VM
- Lack of quality control at shearing due to low prices for wool

Quality Improvement

- Classing and Skirting
  - Huge advances in the US since late 1980's
  - International standards
  - Length & Strength, not just Fiber Diameter
- Packaging
  - Bales and Nylon
  - Labeling – what's inside?
  - Efficiency for handling

New Technology - Testing

- Staple Length and Fiber Strength
- It's here to stay
- Buyers would like to have this information

- Will it be used as a "WMD" ?
  This is a big and very real concern

USDA Wool Marketing Loan

- Safety net for when prices are low
- Weekly price fluctuations based on international (Australian) prices
- Are you getting the posted Graded Repayment Rate for your wool?
  - Why not?
  - What are you doing about it?

USDA Wool Marketing Loan

- It is different than the old incentive program and emergency payments
- This presentation
  - Basic Overview for 2004 – 2007
  - Unshorn Pelts (slaughter lambs only)
  - "Thinking out of the Box" - Tomorrow

Wool Marketing Loan Overview

Ways to Participate in the program

1. Ungraded Loan at 40 cents
2. Ungraded Loan Deficiency Payment (LDP)
3. Graded Loan at variable loan rates
4. Graded Loan Deficiency Payment (LDP)

Loan rates are different for each region, this presentation uses Region 1 Loan Rates

Wool Marketing Loan Program Overview – LDP'S

- Forgo the option to take a loan on your wool
- Government will pay the difference between the loan rate and the announced repayment rate (posted wool prices) for the day of application
- There is NO LDP if the repayment rate is above the loan rate

Wool Marketing Loan Program Overview – LDP Examples

Ungraded Loan Rate (Grease Prices)	42 cents/lb
Announced Repayment Rate	18 cents/lb
Amount of LDP (42 – 18)	24 cents/lb
Graded Loan Rate (26.0 – 28.9 micron)	$1.52/lb clean
Announced Repayment Rate	$1.30/lb clean
Amount of LDP ($1.52 - $1.30)	$0. 22/lb clean

Wool Marketing Loan Program Overview – Beneficial Interest

- Beneficial Interest is lost at delivery to pool, broker or broker's intermediary (shearer)
- If beneficial interest is lost immediately after shearing, you need to fill out a **form CCC-709** *BEFORE* the wool is sheared and sold
- **This covers you in case you forget to fill out the other forms before losing beneficial interest if you sell later too!**
- See Notice LP-1891 for details

Wool Marketing Loan Program Overview - Paperwork

- Still have your wool for 2003?
  - CCC 633 WM –to take out a loan
  - CCC 633 LDP – after shearing, weigh the wool, store it, take the LDP when you want to, then sell the wool
  - Weight ? -- Notice LP-1891 used to determine maximum pounds (pay back extra $ if under)
- **LDP must be applied for before you lose Beneficial Interest**

Wool Marketing Loan Program Overview – Production Evidence

- Need some kind of statement or documentation verifying what you produced including quantity and a date
- Receipts with name, address, telephone number of buyer or marketing agency
- Wool that has been burned, buried or otherwise destroyed is not eligible for participation

Wool Marketing Loan Program Overview

- You must choose which option you want to participate in (Graded/Ungraded program and Loan/LDP) at sign up
- For 2003 and beyond, you can only take the rates available on the day you apply
- You have until January 31, 2004 to apply for wool harvested in Calendar year 2003

Wool Marketing Loan Program Overview – General Details

- Notices: 1878, 1891, 1894 & 1985 are available on the FSA Website:

http://www.fsa.usda.gov/dafp/psd/mohair.htm

Wool Marketing Loan Program Overview – Unshorn Pelts

- Details can be found in Notice LP 1907
  - Unshorn Slaughter Lambs only eligible
  - Only LDP's, no Commodity Loans on pelts
  - Ungraded wool LPD rate will be used
  - Set amount of wool per lamb
    - 6.865 lbs of wool per slaughter lamb

Wool Marketing Loan Program Overview – Unshorn Pelts

LDP rate for the day you lose beneficial interest in Unshorn Slaughter Lamb @ 6.865 lbs wool/lamb

Example-

6.865 lbs x LDP rate (24 cents) = $1.6476 per head eligible

If repayment rate on the ungraded wool is above loan rate, there will NOT be an unshorn lamb pelt LDP

Wool Marketing Loan Program Overview – Unshorn Pelts

- Eligible Lambs
  - UNSHORN
  - For immediate slaughter only
    - Slaughter within 7-10 calendar days after loss of Beneficial Interest
  - Personal use is acceptable if pelt is:
    - Preserved
    - Maintained
    - Stored for future marketing or processing

Wool Marketing Loan Program Overview – Unshorn Pelts

- Loss of Beneficial Interest – the earlier of of the following:
  - Invoicing of the unshorn lambs
  - Delivery of the unshorn lambs to the order buyer or butcher
  - Receipt of payment for the unshorn lamb
- "Acceptable Production Evidence" includes:
  (but not limited to)
  receipts for feed, kill sheets from slaughter company, veterinary records, IRS inventory records, farm credit balances, private insurance documents

Wool Marketing Loan Program Overview – Unshorn Pelts

- FORMS
  - **CCC – 709 PELT – Field direct**
    - Must be submitted by the producer ***before*** delivery or loss of beneficial interest in the unshorn lambs
  - CCC-633 PELT
    - for producers who maintain beneficial interest in the unshorn pelt

Wool Marketing Loan Program

- More Details are available from the USDA at the program web-site:

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- Be kind to your local staff!
  This is a new program and they do not have much experience with the program or many details

Wool Marketing Loan Overview

This is a LOAN Program

Producers are using the wool they produce as collateral for a loan from the USDA

Loan rates are set at:

- 42 cents/lb Ungraded Wool
- $1.00/lb Graded Wool

Wool Marketing Loan Overview "Graded Wool"

- Graded Wool = Core Tested Wool
  Must have Average Fiber Diameter & Yield
- $1.00 is the average rate on a greasy basis
- However, loan rates and repayment rates are reported on a ***Clean Basis***

  Clean Price X Yield % = Greasy Price

Wool Marketing Loan Overview "Graded Wool"

- 8 different rates for different quality wool based on micron categories
- Some wools are higher in value, therefore loan rates are adjusted for fiber diameter
- 2003 Loan Rates vary from $1.37 - 5.31

These are reported on a clean price basis!

Wool Marketing Loan Program Overview - Loans

- 9 month loan period (repay at any time)
- USDA interest rate (varies) + filing fees
- Take out a loan at the ungraded loan rate for your region per pound on your wool
- Repay loan at loan rate (42 cents) or at the announced repayment rate if lower
- Variable repayment rates for graded wool

Wool Marketing Loan Program Overview - Loans

- Repayment rates are announced weekly
- Calculated on a world price basis (Australian wool market prices)
- Adjusted for currency exchange rates
- Non-Recourse Loan
  - Instead of paying back loan you default on the loan and forfeit your wool production to the Government

Wool Marketing Loan Program Overview - Loans

- Deliver wool instead of payment at end of loan period (Defaulting)
- *Defaulting on Loan has strings attached!*
  - Wool is appraised for value if loan is defaulted on
  - Discounts applied to the wool if lacking quality
  - May end up owning Government refund
- You won't be able to take advantage of the Government

Wool Marketing Loan Program Overview - Loans

- Various Discounts will be applied for:
  - Preparation (Skirted and Classed is expected)
  - Offsort Lines (Belly wool, Pieces, Locks/Tags)
  - Wool Types (Blackface and Black wool)
  - Staple Length (Under 3")
  - Vegetable Matter (over 2% VM)
  - Damaged Wool – Non-merchantable
  - Polypropylene Contaminated

Wool Marketing Loan Program Overview - Loans

- Discounts will only be applied if you default on the loan
- Discounts apply for the graded AND ungraded wool loans if you default

Details of discounts are can be found in Notice LP-1908

Wool Marketing Loan Program Overview – Repayment Rates

- Announced weekly on Tuesday - 3:00 pm EST
- Go into effect on Wednesday 12:01 am
- Good for a one week period (Wed – Tues)
- Based on changes in world wool prices and currency exchange rates
- http://www.fsa.usda.gov/dafp/psd/mohair.htm

Wool Marketing Loan Program Overview – Repayment Rates

2003 Dates (Ungraded Rates)	Repayment Rate (cents)	LDP (cents)
Jan 1 – Jan 14	29	13
Jan 15 – Jan 28	31	11
Jan 29 – Feb 18	36	6
Feb 19 – Apr 8	38	4
Apr 9 – Apr 22	36	6
Apr 23 – May 6	21	21
Dec 24 – Dec 30	18	24

Wool Marketing Loan Program "Thinking out of the Box"

Look at using the loan for a value added venture or different marketing strategy

- Pool and collect wool as a group and take the higher clean program payment rate
- Use the USDA Loan to pay for costs:
  - Shipping
  - Scouring
- Pay off loan and sell scoured wool to the value added venture

Wool Marketing Loan Program "Thinking out of the Box"

Not getting the USDA announce repayment rate for your wool?

1. Why not?
2. What are you wiling to do about it?
3. Can the program be used to help you get those better prices?

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This is a new program and they do not have much experience with the program or many details

Fact Sheet

April 2003

USDA United States Department of Agriculture

Wool and Mohair Nonrecourse Marketing Assistance Loan and Loan Deficiency Payment Program

Overview

The Farm Security and Rural Investment Act of 2002 (the Act) provides 2002 through 2007 crop year marketing assistance loans and loan deficiency payments (LDP's) for wool and mohair to eligible producers who produce and shear wool and mohair from live sheep and goats. The LDP program is also available to eligible producers of nongraded wool in the form of unshorn pelts for the 2002-2007 crop years.

The wool and mohair nonrecourse marketing assistance loan and LDP program provides eligible producers with two forms of Federal assistance. Eligible producers can either 1) request a nine-month marketing assistance loan or 2) agree to forgo the loan and request an LDP. The program helps stabilize America's wool and mohair industry and ensures the well-being of agriculture in the United States. Nonrecourse marketing assistance loans are administered by the Farm Service Agency (FSA), on behalf of the Commodity Credit Corporation (CCC).

Wool and Mohair Nonrecourse Marketing Assistance Loans

Wool and mohair nonrecourse marketing assistance loans are nine month loans that provide eligible producers with interim financing on their production and facilitate the orderly distribution of loan-eligible crop throughout the year. Instead of selling the wool and mohair immediately after shearing, a nonrecourse loan allows a producer to store the production, pledging the crop itself as collateral. The loan helps an eligible producer pay bills when they come due without having to sell the wool or mohair at a time of year when prices tend to be lowest. When market conditions may be more favorable, a producer may sell the product and repay the loan with the proceeds of the sale. If the producer is unable to repay the loan, he or she can deliver to CCC the quantity of wool or mohair pledged as collateral as full payment for the loan at maturity.

Market loan repayment provisions specify that, under certain circumstances, producers may repay loans at less than principal plus accrued interest and other charges, with repayment of some portion of the relevant interest and principal being waived. Producers may also purchase commodity certificates and exchange the commodity certificate with outstanding loan collateral in repayment of marketing assistance loans.

Loan Deficiency Payment

LDP's are payments made to producers who, although eligible to obtain a CCC loan, agree to forgo the loan in return for a payment on the eligible wool, mohair, or unshorn pelt.

Eligibility

To be eligible for a loan or LDP, a producer must:

- Meet the definition of an eligible producer;
- Comply with highly erodible land conservation and wetland conservation provisions;
- Produce and shear eligible wool and mohair or produce an unshorn pelt from a slaughtered lamb for unshorn pelts;
- Have beneficial interest in the commodity;
- Own, other than through a security interest mortgage or lien, the sheep and goats that produce the wool and mohair for a period of not less than 30 calendar days before shearing, or in the case of unshorn lambs, 30 days prior to slaughter of the lamb;
- For unshorn pelts only, sell the unshorn lamb for immediate slaughter or slaughter the unshorn lamb for personal use.

To be eligible for a nonrecourse marketing assistance loan or LDP, the wool and mohair must:

- Have been produced and sheared by the eligible producer;
- Be in existence and in storable condition;

continues ►

- Be of merchantable quality suitable for loan;
- Be produced and shorn from live animals of domestic origin in the United States.

To be eligible for an unshorn pelt LDP, the unshorn pelt must:

- Have been produced by an eligible producer;
- Be produced from a live unshorn lamb of domestic origin in the United States at the time beneficial interest was lost.

Beneficial Interest

To be eligible for a loan or LDP, eligible producers must have beneficial interest in the applicable commodity. Beneficial interest must be retained by a producer from shearing or other specified term for special commodities continuously through:

- For LDP, the date LDP is requested;
- For loan, the earlier of the date the loan is repaid or CCC takes title to the commodity.

A producer is considered to have beneficial interest in a commodity if all of the following remain with the producer: 1) title to the commodity 2) risk of loss and 3) control of the commodity. When beneficial interest in the commodity is lost by the producer, the commodity remains ineligible for loan or LDP even if the producer regains beneficial interest.

Producers are required to provide acceptable production evidence, which indicates the date beneficial interest was lost with the LDP request.

Payment Limitation

Market gains and LDP's received by a producer for wool, mohair, and unshorn pelts are subject to one $75,000 payment limitation per crop year.

Final Loan Availability Date

The final loan availability date to request a marketing assistance loan or LDP for wool, mohair, and unshorn pelts is January 31 of the year following the year in which the commodity is sheared or the unshorn lamb is slaughtered.

Applicable Forms

When requesting a loan or LDP for wool and mohair or an LDP for unshorn pelts, producers must complete either a:

- CCC-633 WM for certified farm-stored loans;
- CCC-709 for field direct LDP's;
- CCC-633-LDP for basic LDP's;
- CCC-709-PELT, for field direct unshorn pelt LDP's; and
- CCC-633-PELT, for basic unshorn pelt LDP's.

Forms CCC-709 and CCC-633-LDP have been revised to accommodate wool and mohair LDP requests and must be completed according to instructions provided by CCC.

Forms CCC-709-PELT and CCC-633-PELT are new application forms to request LDP's for unshorn pelts and must be completed according to instructions provided by CCC.

CCC-633-WM is a new loan request form and must be completed according to instructions provided by CCC.

Producers applying for a loan or LDP on wool must indicate, "graded" or "ungraded," as the type of wool on the applicable loan and LDP forms.

Applications are available at local FSA offices and on the Internet at: http://forms.sc.egov.usda.gov/FormSearch.asp

Loan and LDP Rates

For graded wool, loans will be based on the statutory rate of $1.00, "grease basis," (directly off the animal) but will be issued to producers as "clean basis," using yield data from the core test report. Instead of obtaining a loan, producers may request LDP's on graded wool; LDP's are payable at the loan rate that would have been received for the lot of wool, less the announced repayment amount for wool of that quality that is applicable during the week. The graded wool loan rates are announced by regions according to eight specific micron ranges.

Ungraded wool offered as loan collateral will secure a nonrecourse loan made at a rate of 40 cents per pound. Instead of obtaining a loan, producers may request LDP's on ungraded wool, with the LDP rate being the difference between 40 cents per pound and the announced repayment amount applicable during the week. Regional

differentials will also apply to nongraded wool.

Producers who desire a nonrecourse loan for mohair will receive the statutory rate of $4.20 per pound. There are no regional differentials for mohair.

At loan maturity, if producers wish to forfeit the loan collateral, the loan amount may be adjusted based on a schedule of premiums and discounts applicable to the crop year.

Unshorn pelt payments will be based on the LDP rate for nongraded wool for the week in which beneficial interest was lost in the applicable region where the unshorn pelts were produced and where the producer's farm records are maintained. LDP's for unshorn pelts will be based on a standard weight of 6.865 pounds per pelt.

The following are the national loan rates for the 2002 through 2007 crop year for wool and mohair (grease basis):

Commodity	**Loan Rate**
Graded Wool	$1.00 per pound
Ungraded Wool	$0.40 per pound
Mohair	$4.20 per pound

Regional loan rates for wool and mohair will be announced at the beginning of each crop year.

All counties in the states listed in the following table shall use loan rates applicable to **Region 1** for graded and nongraded wool. **(See Chart 1)**

States and applicable counties listed in the following table shall use loan rates applicable to **Region 2** for graded and nongraded wool. **(See Chart 2)**

States and applicable counties listed in the following table shall use loan rates applicable to **Region 3** for graded and nongraded wool. **(See Chart 3)**

Core Tests

To obtain a graded wool loan rate, the wool must be core tested by a CCC-approved testing facility to be measured through laboratory analysis for fiber diameter (micron) and yield. A core test refers to a lab test where the thickness of the fiber is measured. The average fiber diameter provided on the core test report will indicate the micron applicable to the tested wool. A list of CCC-approved testing facilities for graded wool can be obtained from any USDA Service Center.

Repayment Rates and Posted Prices

The regional posted prices that are used to calculate the CCC-determined value to determine the LDP rate and the marketing loan repayment rates for wool, mohair and unshorn pelts will be announced each Tuesday at 3:00 p.m., Eastern time by press release. County Offices will calculate the CCC-determined value to determine the alternative repayment and LDP rate. The posted prices will become effective Wednesday at 12:01 a.m., Eastern time.

Regional loan rates, posted prices, and LDP rates for the 2002 and 2003 crop years are available at, USDA Internet, FSA Intranet, and PSD's Web site at: www.fsa.usda.gov/dafp/psd

For More Information

Further information on this and other FSA programs is available from local USDA Service Centers or on the FSA Web site at: www.fsa.usda.gov

NATIONAL PROGRAMS AND THEIR IMPACT ON VIRGINIA PRODUCERS

David Greene, ASI Region II Representative

1 The American Sheep Industry Association

1865-2003

2 ASI -- Producer Communications

- Monthly ASI Sheep Industry News
- Weekly ASI Newsletter -- provided electronically to more than 2000 producers, feeders and publications
- Press releases to media on regular basis
- ASI publications used by producers to keep neighbors and FSA offices informed of sheep programs

3 ASI, ALB and NSIIC

Partners for the Sheep Industry

Three very separate boards of sheep producers oversee their respective programs to serve the industry.

- ASI – American Sheep Industry Association. Wool and industry-wide legislative, regulatory, animal health, trade, and communications. Legislative funded by voluntary dues.
- ALB – American Lamb Board. All lamb marketing, promotion and research for American Lamb. Funded by assessment on sheep sales.
- NSIIC -- National Sheep Industry Improvement Center. Federal board with revolving fund to provide loans and some grant funds to help finance business opportunities in the sheep industry. Funded by federal appropriations.

4 Contact Information

- **American Sheep Industry Association**
  9785 Maroon Circle, Suite 360 – Englewood, CO 80112
  303-771-3500 – www.sheepusa.org
- **American Lamb Board**
  7900 E. Union Avenue, Suite 1003 – Denver, CO 80237
  303-217-7598 – www.americanlambboard.org
- **National Sheep Industry Improvement Center**
  1400 Independence Ave, SW – Washington, D.C. 20250
  202-690-0632 – www.nsiic.org

5 ASI

2003 ACTIVITIES

6 ASI in 2003

<u>To fill the void in national lamb promotion, ASI led the establishment of the American Lamb Board:</u>

- Separate Board of Directors appointed by the Secretary of USDA. They have completed first year of collections & programs.
- ASI formally donated American Lamb Council proprietary products to Lamb Board – lamb seal and slogan, recipes, nutritional data, etc.

7 ASI in 2003

Wool Marketing Loan Deficiency Payments:

- A priority of ASI and member states; implemented!
- 32 million pounds applied under the 2002 crop and 2003 wool sign up ends in January.
- The un-graded wool LDP is receiving most of the participation this year.
- All wool nationwide fits into this program to help stabilize revenue from wool. The program also helps manage risk from market fluctuations.

8 ASI in 2003

Scrapie Eradication:

- Funding increased FIVE FOLD this year to over $15 million.
- ASI carried federal funding for the program as the top priority in appropriations and succeeded with Congressional approval.
- Top priority for ASI again this next fiscal year to fund research, state cooperative programs and veterinary personnel.
- Over 50,000 sheep operations have signed up for premise ID with millions of tags distributed.

9 ASI in 2003

Sheep Safety & Quality Assurance:

- ASI is investing in the third phase of the program this year to promote education for increased quality and safety of our products.
- The program information is available at http://www.colostate.edu/programs/SSQA/
- Local and state organizations are urged to setup workshops for producers.

10 ASI in 2003

www.SHEEPUSA.com Website:

- Being revamped this year to improve navigation as well as update the design and content on this important communication tool for the industry.

Sheep Industry Development Handbook:

- Fully updated this year.
- New bound editions available August 2003.
- This process has taken 18 months utilizing industry sources with experts contributing from across the nation.

11 ASI in 2003 – Legislative Update

Country of Origin Labeling:

- Authorized in 2002 Farm bill and state leaders testified at USDA listening sessions this spring. ASI commenting in support of the November 2003 proposed rule for lamb. Comments due January 5, 2004. U.S. House passed a one-year moratorium on mandatory meat labels July 14, 2003 so Appropriations bill of November may impact labeling law.
- **Free Trade Agreement with Australia:**
- Lamb is already traded freely, so little Australia can take from lamb in an agreement. Tariffs do exist on wool imports and ASI has formally requested the Bush Administration to **oppose** elimination of the wool tariffs.

12 U.S. Consumption of Lamb

13 U.S. Consumption of Lamb

- U.S. consumption of domestic and imported lamb and mutton declined slightly from 383.0 million pounds in 1993, to 362.3 million pounds in 2002.

- The tonnage of lamb imports arriving into the United States can vary as much as 6.4 million pounds from month to month.

14 ▣ Imports Do Not Stabilize Supply

15 ▣ **ASI**

LOOKING FORWARD

16 ▣ Scrapie Control & Eradication

- Although the incidence of scrapie in the U.S. is relatively low, the fact that the disease occurs makes it an impediment to the U.S. sheep industry's global competitiveness.
- Slaughter surveillance results due shortly.
- The program is being implemented by state veterinarians throughout the United States.

17 ▣ Animal Identification

- Currently A Voluntary Program
- To Protect American Animal Agriculture
- Partnership with Industry, States & USDA
- Allow U.S. to Identify Animals Exposed to Disease & Stop Spread of that Disease
- Open for Public Comment in 2004
- Project Full Implementation in 2006

18 ▣ Canadian Border

- May 20, 2003 – Border shut down because of detection of one case of BSE in Alberta
- August 8, 2003 – Import Permit Applications for boneless beef and sheep meat
- ASI meeting with Canadian Sheep Federation this fall. USDA proposed rule allowing some live lambs to U.S. is open for comment until late December 2003.

19 ▣ Mexican Border

- Slow-down of sheep exports into Mexico
- Resulting in reduced prices for adult sheep
- Mexico recently issued proposed Scrapie requirements
- ASI & APHIS Working with Government Officials in Mexico regarding any new regulations
- September – ASI work with USDA indicates success in re-opening the border and trade as well as cull ewe prices have rebounded.

20 ▣ Risk Management / Insurance

- Identified Loss Protection Areas
  - Price/Market -- Yield
  - Whole Farm/Adjusted Gross Revenue
  - Forage -- Health & Disease
- ASI actively seeking a program for sheep in following areas:
  - Study / Pilot / Insurance Product

21 Long-Term Viability

- American Lamb Board
- Scrapie Eradication
- ASI Wool Trust Programs and Services
- Risk Management tool for the sheep industry
- International Wool Marketing & Military
- Homeland Security -- Animal Identification
- Minor Use Minor Species
- Wool Marketing LDP & National Sheep Center

EVALUATION OF HAIR SHEEP COMPOSITE BREEDS: SUMMARY OF RESULTS

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Introduction

High shearing costs, low prices for the medium wools that are characteristic of most U.S. meat sheep breeds, and a desire to capitalize on purported "easy care" characteristics such as resistance to internal parasites and high lamb and ewe vigor have led to interest in use of hair sheep in U.S. production systems. Little information on lamb growth, survival, and carcass merit of hair sheep composite breeds in comparison with traditional U.S. maternal breeds is available. This study, therefore, was designed to compare the growth and survival of lambs sired by Dorper and Dorset rams, and to compare carcass traits and response to both artificial and natural pasture challenge with *H. contortus* of Dorper and Dorset crossbreds with those of straightbred Katahdins and St. Croix x Barbados Blackbelly crossbred lambs.

Procedures

This experiment was conducted over 3 years (2000-2002) at the Southwest Virginia Agricultural Research and Extension Center in Glade Spring. The Dorset and Dorper crossbred lambs were produced by mating Dorset and Dorper rams to ewes of 50% Dorset, 25% Rambouillet and 25% Finnsheep breeding. In 2000, Dorper lambs were sired by four imported rams used by AI. In 2001 and 2002, two different Dorper sires were used in each year by natural service. These four rams came from two flocks and were offspring of four different sires. Thus a total of eight Dorper rams by eight different sires were represented. Three Dorset rams were used in each year. Seven Dorset rams were produced in the Virginia Tech Dorset flock from five different sires and were used for only one year each. An eighth Dorset ram was purchased and used for two years.

Unregistered, commercial Katahdin ewe lambs were purchased. Most were born in April, although six were born between March 20 and April 1. In each year, ewe lambs were purchased from four different flocks (two to six lambs per flock). In all, 10 flocks were represented, with two to 11 lambs per flock. In most cases, two sires were represented for each flock.

Wethers were evaluated only in 2001 and 2002, and no Caribbean hair sheep ewe lambs were tested. The Katahdin wether lambs were purchased in 2001 and 2002. In 2001, 15 lambs by two sires came from a single flock. In 2002, 15 wethers were sampled from four flocks (including a second sample from the flock sampled in 2001), with three to five wethers per flock. Barbados Blackbelly x St. Croix wethers (HH) were produced at the Virginia Tech Sheep Center in Blacksburg by rotational crossing of St.

Croix and Barbados Blackbelly ewes and rams. One St. Croix and one Barbados Blackbelly ram were represented in each year.

The Dorset and Dorper crossbred ewe lambs were weaned in mid-June at about 60 d of age in 2000 and 2001, moved to drylot, and fed a complete pelleted diet containing primarily corn, soybean meal and soybean hulls and with approximately 14.5% CP, 23% fiber, and 71% TDN. In 2002, ewe lambs were weaned at about 90 days after being creep fed for 1 mo before weaning. The Katahdin and HH lambs were weaned and delivered to the station at approximately 60 days of age, and all ewe lambs were maintained together in drylot after weaning. Wether lambs were maintained as contemporaries on pasture except in 2002, when purchased wethers were maintained in drylot until Dorset and Dorper wether lambs were weaned at about 90 days of age. Wethers were creep fed a ground corn and soybean meal diet after weaning at a level designed to maintain daily gains of approximately 0.5 lb. per day.

At 4 to 5 months of age, all lambs were dewormed with levamisole hydrochloride (Tramisol; Schering-Plough Animal Health, NJ) at a dosage of 8 mg/kg body weight. Ewe lambs were then dosed with approximately 10,000 infective larvae of *H. contortus* 2 to 4 days after deworming and subsequently remained in drylot. Wether lambs were returned to pasture after deworming and evaluated under natural infection. Jugular blood samples to estimate packed cell volume (PCV, %), rectal fecal samples to estimate fecal egg count (FEC, eggs/g), and body weights were obtained at 3, 4, 5 and 6 weeks after infection.

Wethers were moved to drylot in early September (following parasite study) and fed a high-grain diet ad libitum until harvest in early December at about 8 mo of age. Approximately 12 wethers of each breed group in each year (2001 and 2002) were delivered to the Virginia Tech Meat Laboratory in mid-December. Lambs were weighed after approximately 24 hr without food and harvested. Carcasses were weighed before chilling, and dressing percentage was calculated from the ratio of hot carcass weight to fasted slaughter weight. After approximately 24 h at 2 C, cold carcass weights were recorded, and cooler shrink was calculated. Fat thickness perpendicular to the longissimus dorsi, longissimus muscle area, and body wall thickness 12.5 cm off midline were measured between the 12^{th} and 13^{th} ribs. Yield and quality grades and leg conformation scores were assigned according to USDA standards (USDA, 1992). The percentage of boneless, closely trimmed retail cuts was estimated as 49.936 – (0.187 x hot carcass weight, kg) – (1.732 x 12^{th} rib fat thickness, cm) – (1.390 x body wall thickness, cm) + (0.381 x longissimus area, cm^2) (Tschirhart et al., 2002). Fore- and hindsaddles were separated, and kidney and pelvic fat was removed from the hindsaddle and weighed to determine percentage of internal fat.

Results

Means for body weights, fecal egg counts, and packed cell volumes over the measurement period are shown for ewe lambs in each year in Table 1. Consistent breed differences in body weight were not observed. Dorper crossbred lambs sired by

imported rams in 2000 were significantly heavier than lambs of other breeds, but this advantage in body weight was not observed for Dorper crosses in 2001 or 2002. In Katahdin ewe lambs exposed to artificial parasite infection in drylot (Table 1), average numbers of parasite eggs in the feces were 45% less than those observed in Dorset crosses and 62% less than those observed in Dorper crosses. Breed differences in fecal egg counts were quite consistent across years, even though considerably reduced under the low mean fecal egg counts observed in 2000. Breed differences in packed cell volume were likewise consistent in 2000 and 2001 but much-reduced in 2002.

Results for wether lambs exposed to natural infection by grazing of contaminated pastures in 2001 and 2002 are shown in Table 2. Severity of infection for wethers was less than in artificially infected ewe lambs. However, fecal egg counts in Katahdin wethers on pasture were still 45% lower than those observed in Dorper and Dorset crosses. Differences in fecal egg counts between Dorper and Dorset crosses were not observed in grazing wethers. Caribbean hair sheep crosses (St. Croix x Barbados Blackbelly) were evaluated only on pasture with natural infection. Comparisons of fecal egg counts between Katahdins and Caribbean hair sheep were not consistent across years. Caribbean hair sheep had lower egg counts than Katahdins in 2001 but not in 2002. Katahdin wether lambs in 2001 were notably smaller than in 2002. The 2001 Katahdin wethers came from only one flock, and a high proportion were out of yearling ewes, so the Katahdin breed is probably better represented by the 2002 wethers and by the ewe lambs, where four flocks were sampled in each year. Despite the lower body weights of Katahdin wethers in 2001, breed rankings for fecal egg counts were consistent across years in wethers, indicating higher levels of worm resistance in breeds with Caribbean hair sheep ancestry. Breed differences in packed cell volume were consistent with those in fecal egg counts in 2001. In 2002, low rainfall in late summer reduced the level of worm challenge and required an increase in level of supplemental feeding. Under these conditions, breed differences in packed cell volume were reduced and the apparently high baseline level for packed cell volume in the Dorper was evident.

Effects of parasitism on animal health are generally monitored by measurement of packed cell volume, which quantifies the percentage of red blood cells in a blood sample. The barber-pole worm affects its host by attaching to the gut wall and sucking blood. Animals become anemic with losses in production and, potentially, death resulting from blood loss in the gut. Low values for packed cell volume are thus indicative of anemia and are commonly associated with high fecal egg counts. Measures of packed cell volume in Katahdin lambs were generally equal to, or higher than, those of other breeds, confirming a level of resistance to parasitism. Interestingly, Dorper crosses exposed to either natural or artificial infection consistently had slightly, though not significantly, higher packed cell volumes than Dorset crosses, despite their generally higher fecal egg counts. Dorper crossbred wethers also had higher packed cell volume than Katahdin wethers under conditions of low parasite challenge in 2002.

This situation, in which an animal becomes infected by parasites but is still able to maintain reasonable health status, is sometimes referred to as *resilience* to infection.

Dorper crosses thus appeared to be somewhat less resistant to internal parasite than Dorset crosses, at least under the more challenging environment provided by the artificial infection, but their somewhat greater resilience to infection allowed them to maintain similar packed cell volume. In contrast, Katahdin and Caribbean hair sheep crosses were clearly more resistant to parasitism, and also tended to become less anemic.

Although the Dorper and the Katahdin are both derived from hair sheep crosses, differences in parasite resistance between the two breeds are not surprising. The Dorper and the Katahdin were derived from very different types of hair sheep. The Dorper originated in South Africa from crosses between the Dorset and the Blackhead Persian. The Blackhead Persian is a fat-rumped hair breed from the arid lands of the Middle East. In South Africa, the Dorper is likewise most commonly found in arid and semi-arid regions where parasite challenge is often low. There is thus nothing in the evolutionary history of the Dorper breed to suggest that these animals would have developed resistance to internal parasites. In contrast, the Katahdin was developed from the thin-tailed Caribbean hair breeds. These breeds originally came from the hot, humid, high-rainfall regions of West Africa, where parasite challenge is extremely high and where development of parasite resistance would have been advantageous. The results observed in the current study are thus consistent with the evolutionary history of the breeds involved.

Dorper-sired lambs tended to be lighter at birth than Dorset-sired lambs (Table 3). Significant breed group x year interaction was observed for weaning weight but not for other growth traits. In 2000, Dorper progeny of imported South African rams were significantly heavier at weaning than Dorset lambs, but differences in weaning weights for lambs produced in 2001 and 2002 by natural service using commercially available Dorper and Dorset rams were not significant. Postweaning growth rates did not differ between Dorset and Dorper lambs and were consistent across years. Across the three years, there were few indications of meaningful differences in growth potential between Dorper and Dorset-sired lambs. Lamb survival was much lower in 2002 compared to 2000 and 2001. Consistent differences in lamb survival to 14 d of age were not observed between Dorper and Dorset lambs, although Dorper lambs had considerably higher survival rates under the more challenging environment of 2002. However, survival rates for A.I.-sired Dorper lambs in 2000 were lower than those of Dorset lambs.

Means for carcass traits of Dorper, Dorset, Katahdin, and HH wethers produced in 2001 and 2002 are shown in Table 4 with and without adjustment for weight differences. Differences in carcass characteristics between Dorset and Dorper lambs were modest. At comparable weights, Dorper lambs had greater backfat and body wall thickness, and higher quality and yield grades. These results indicate a somewhat greater degree of maturity, with associated greater fatness, in Dorper lambs. The higher leg score of the Dorper suggests a favorable conformational characteristic relative to the Dorset. Katahdin lambs tended to be smaller than Dorper and Dorset lambs and HH lambs were smallest when all were harvested at similar ages. This

difference was consistent across years for HH lambs, but not for Katahdin lambs, which were much lighter than Dorper and Dorset wethers in 2001 but were similar in size in 2002. The 2001 KT came from a single farm, and many were progeny of 1-yr-old ewes. The weights achieved by Katahdin wether lambs in 2002 and by the Katahdin ewe lambs described previously may be more representative of the anticipated performance of Katahdin lambs.

For most carcass traits, HH lambs were consistently smaller than Dorset or Dorper lambs. The only exception was in kidney and pelvic fat weight, where HH lambs were similar to Dorset and Dorper lambs, with correspondingly higher kidney and pelvic fat percentages. Despite their greater percentage of kidney and pelvic fat, HH lambs had less backfat and body wall thickness, lower quality grades, and higher yield grades than Dorper and Dorset lambs. Many of the differences in carcass characteristics between HH lambs and Dorset or Dorper lambs could be explained by differences in live and carcass weights. After adjustment for weight differences, HH lambs had higher weight and percentage of kidney and pelvic fat, smaller longissimus muscle area, lower leg scores and quality grades, and lower retail cut percentage than Dorset and Dorper lambs. At the same weights, HH lambs also had somewhat lower dressing percentages. In contrast, observed differences in backfat and body wall thickness, and yield grade were primarily weight related. Results of this study therefore support the expectation of higher levels of kidney and pelvic fat, smaller longissimus muscle, lower quality grades, lower retail cut percentages, and smaller legs in HH lambs.

Conclusions regarding carcass characteristics of Katahdin lambs are conditioned by breed group x year differences. For most size-related traits, the smaller 2001 KT wethers were similar to HH wethers, whereas the 2002 KT wethers were generally not different from Dorset and Dorper wethers. Further discussion will focus only on traits for which this general observation does not hold, and particularly on differences involving Katahdin that were not removed by adjustments for weights in Table 4. Notable among these remaining differences are leg scores and quality grades, and weights and percentages of kidney and pelvic fat that are intermediate to those observed for HH *versus* Dorset and Dorper lambs, and often differ significantly from both. All of these differences are consistent with the contribution of Caribbean hair sheep to the formation of the Katahdin. The Katahdin can thus be described as an improved hair sheep type, but retains a number of characteristics of its progenitor breeds. The Katahdin lambs also had the lowest dressing percentages of all breeds. Most Katahdin lambs were not docked prior to delivery, and the tails of Katahdin lambs were notably larger than the thin tails of HH lambs.

Implications

These results confirm high levels of parasite resistance in Caribbean hair sheep and a moderate level of resistance in Katahdins. Dorper crossbred lambs were not more resistant that Dorset crosses, but the Dorper appears to express a degree of resilience to infection that may reduce symptoms of parasitism in moderately infected animals.

Lambs sired by Dorper rams were generally similar in growth rate and carcass merit to lambs sired by Dorset rams. Dorper-sired lambs were slightly fatter at similar weights, as expected from their anticipated smaller mature body size. Carcasses of Caribbean hair sheep were much lighter than those of Dorset- or Dorper-sired lambs, with greater fatness and less evidence of muscling at similar weights. Carcass traits of Katahdin lambs were generally intermediate to those of Dorset-sired and Caribbean hair lambs.

The authors would like to thank the Katahdin breeders who produced lambs for the study and to thank the American Dorper Sheep Breeders' Society for donation of the semen used to produce the 2000 Dorper crossbred lambs.

Table 1. Means and standard errors for body weights (lb), fecal egg counts (FEC; eggs/gram of feces) and packed cell volume (PCV; %) during infection for ewe lambs in drylot following artificial infection with barber-pole worm *(Haemonchus contortus)* over 3 years

Measurement	Breed group[a]	Year 2000	2001	2002	Average
Mean body wt	DO	91.8 ± 1.1	90.7 ± 0.8	86.8 ± 1.5	89.8 ± 0.7
	DP	103.3 ± 1.6	84.9 ± 1.0	89.7 ± 1.1	92.6 ± 0.7
	KT	90.7 ± 1.1	90.5 ± 1.2	85.2 ± 1.2	88.8 ± 0.7
Mean FEC	DO	897 ± 122	2835 ± 303	2490 ± 468	2074 ± 190
	DP	1064 ± 219	4064 ± 541	3866 ± 564	2998 ± 271
	KT	539 ± 79	1188 ± 188	1720 ± 265	1149 ± 114
Mean PCV	DO	27.9 ± .5	25.0 ± .4	26.1 ± .7	26.3 ± .3
	DP	29.5 ± .8	26.2 ± .5	25.5 ± .6	27.1 ± .4
	KT	30.8 ± .6	28.9 ± .6	26.2 ± .6	28.6 ± .3

[a]DO = Dorset crossbred, DP = Dorper crossbred, and KT = Katahdin.

Table 2. Means and standard errors for body weights (lb), fecal egg counts (FEC; eggs/gram of feces) and packed cell volume (PCV; %) during infection for wether lambs following deworming and return to contaminated pastures over 2 years

Measurement	Breed group[a]	Year 2001	2002	Average
Mean body wt	DO	69.6 ± 1.0	83.2 ± 1.3	76.4 ± 0.8
	DP	71.6 ± 1.1	81.1 ± 1.2	76.4 ± 0.8
	KT	50.3 ± 1.4	90.8 ± 1.6	70.6 ± 1.1
	HH	53.5 ± 1.4	65.5 ± 1.4	59.5 ± 1.0
Mean FEC	DO	1556 ± 151	953 ± 123	1255 ± 97
	DP	1556 ± 160	944 ± 108	1250 ± 97
	KT	1012 ± 135	351 ± 55	682 ± 73
	HH	437 ± 60	284 ± 39	83 ± 36
Mean PCV	DO	24.4 ± 0.6	33.9 ± 0.8	29.2 ± 0.5
	DP	25.9 ± 0.6	35.5 ± 0.7	30.7 ± 0.5
	KT	26.1 ± 0.8	32.8 ± 1.0	29.5 ± 0.6
	HH	27.4 ± 0.9	32.6 ± 0.9	30.0 ± 0.6

[a]DO = Dorset crossbred, DP = Dorper crossbred, KT = Katahdin, and HH = St. Croix x Barbados crossbred.

Table 3. Means for growth and survival of Dorset and Dorper-sired lambs

Item	Year	Dorset	Dorper	SE
No. born	All	262	181	
Birth weight, lb.	All	8.27	7.87[†]	0.18
No. weaned	All	164	126	
Weaning wt., lb.	2000	43.0	47.8*	1.8
	2001	43.2	42.8	1.1
	2002	35.3	31.5	2.0
	All	40.6	40.6	0.9
Lamb mortality to 14 days, %	2000	7.4	14.7	4.3
	2001	13.9	17.9	4.0
	2002	29.4	15.6	6.3
	All	16.9	19.4	4.5
Summer gain, lb./d	All	0.41	0.41	0.03
Drylot gain, lb./d	All	0.33	0.31	0.02

[†]Breeds differ ($P < 0.10$).
*Breeds differ ($P < 0.05$).

Table 4. Means for carcass traits for Dorset (DO) and Dorper (DP) crossbreds, Katahdin (KT), and St. Croix x Barbados Blackbelly cross (HH) wethers produced in 2001 and 2002

	Unadjusted for weight differences					Adjusted for weight differences				
Item	DO	DP	HH	KT	SE	DO	DP	HH	KT	SE
No. of lambs	26	23	24	23						
Live weight, lb.	93.9 [a]	93.3 [a]	68.6 [b]	82.0 [c]	2.0					
Hot carcass wt., lb.	54.9 [a]	54.2 [a]	39.5 [b]	46.5 [c]	0.4					
Dressing percentage, %	58.4 [a]	58.2 [ab]	57.5 [ab]	56.4 [b]	0.6	58.7 [a]	58.5 [a]	56.9 [ab]	56.3 [b]	0.7
Fat thickness, in.	0.19 [a]	0.22 [b]	0.11 [c]	0.15 [d]	0.01	0.15	0.19	0.16	0.16	0.01
Longissimus muscle area, in.^{2}	2.03 [a]	2.12 [a]	1.57 [b]	1.83 [c]	0.03	1.91 [ab]	2.00 [a]	1.78 [b]	1.89 [ab]	0.05
Body wall thickness, in.	0.78 [a]	0.91 [b]	0.65 [c]	0.68 [c]	0.02	0.68 [a]	0.80 [b]	0.83 [b]	0.72 [a]	0.03
Leg score	10.7 [a]	11.4 [b]	9.2 [c]	9.7 [d]	0.1	10.4 [a]	11.1 [b]	9.6 [c]	9.8 [c]	0.1
Quality grade	10.8 [a]	11.7 [b]	9.6 [c]	10.0 [d]	0.1	10.6 [a]	11.4 [b]	10.0 [c]	10.2 [c]	0.2
Yield grade	2.26 [a]	2.61 [b]	1.46 [c]	1.88 [d]	0.09	1.94	2.26	2.02	2.02	0.11
Kidney and pelvic fat weight, lb.	1.76	1.79	1.79	1.87	0.11	1.37 [a]	1.34 [a]	2.49 [b]	2.07 [c]	0.11
Kidney and pelvic fat percentage, %	3.29 [a]	3.35 [a]	4.62 [b]	3.97 [c]	0.20	2.86 [a]	2.88 [a]	5.39 [b]	4.17 [c]	0.23
Retail cut percentage, %	46.8 [a]	46.3 [b]	47.7 [c]	47.5 [c]	0.2	47.4 [a]	47.1 [ab]	46.6 [b]	47.2 [a]	0.2

Leg conformation score and quality grade based on a numeric score of 10 = low choice, 11 = average choice, 12 = high choice.

[a,b,c,d]Breed means with different superscripts differ ($P < 0.05$).

Opportunities for Value - added Wool Products

January 10, 2004

VA - NC Shepherds' Symposium

Robert F. Padula

Wool Quality Improvement Consultant

USDA Wool Marketing Loan

- Safety net when prices are low
- Weekly price fluctuations based on international (Australian) prices
- Are you getting the posted Graded Repayment Rate for your wool?
  - Why not?
  - What are you doing about it?

December 23, 2003 USDA Report

Posted USDA Repayment Rates:

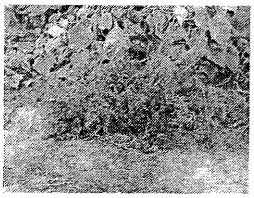
23.6 – 25.9 Micron	$1.99 clean
26.0 – 28.9 Micron	$1.30 clean
Over 29.0 Micron	$1.05 clean

What are you getting for your wool?

Wool Mulch Project

University of Minnesota, MN Dept of Ag, AURI and the American Wool Council collaborated on a project exploring adding value to low priced MN wool

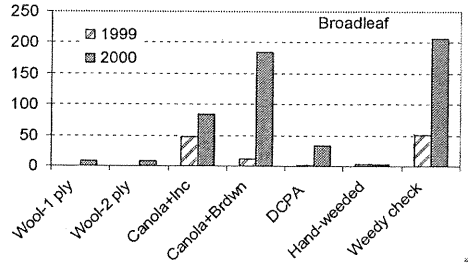
USDA Ungraded Loan Rate price of 40 cents was the minimum price for wool



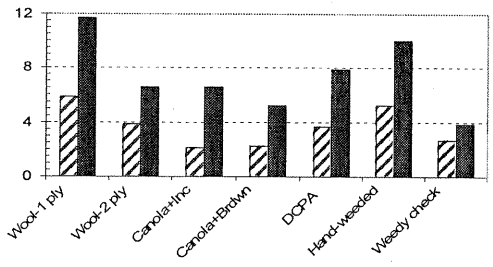
Wool Mulch Project

- U of M Research shows that the wool needle punch material is an effective weed barrier in a number of crops
- Price is too high for commercial application, but what about the home gardener?

Wool Mulch Project – (Weeds per square meter)



Wool Mulch Project – Strawberry Yields (Mg per hectare)



Wool Mulch Project

- Manufacture the product with MN wool
  - Small Trial - Appleseed Woolen Corporation
  - 909 Lbs of raw wool from WC-ROC
  - Scouring at Faribault ($0.48 cents grease wt.)
  - Shipping to OH and Back to MN
  - Needle punching cost at Appleseed ($1.00/lb)

Wool Mulch Project

- Small scale project costs:
  - Scouring ($0.48 Faribault) $ 436.32
  - Shipping to Ohio $ 317.00
  - Needle Punching $ 630.00
  - Shipping to Minnesota $ 230.00
  - **Cost with out wool** **$ 1623.32**
    - (4125 sq feet of product)
  - **909 lbs of wool ($0.40)** **$ 1976.92**

Wool Mulch Project

Small Scale Trial --- Pro's & Con's

- Scouring yield of 69%!
  Realistically this is too high for planning purposes – use 55%
- Weight of Needle Punch Fabric
  18 vs. 12 oz per sq ft
  Dramatic price increase
  36 to 48 cents per sq/ft!

Wool Mulch Project

- Estimated Commercial Costs
  (Hobbs Bonded Fiber in Texas)
- 5,000 lbs scoured wool --- minimum run
- Needle Punching @ $1.50 lb
- 60,000 Square Feet of Product
- Shipping Costs ??? $1000 to $2500+???

Wool Mulch Project Commercial

- Estimated Costs
  - 9,000 lbs of raw wool $ 3600
  - Scouring @ 28 cents $ 2520
  - Needle Punching $ 7500
  - Shipping to Texas $ 1000
  - Shipping within Texas $ 500
  - Shipping Back $ 1000

  $16,120 or ~27 cents per square foot
  (~ 21 cents without the wool cost)

Wool Mulch Project - Questions

- Can the product be marketed for 30 or 40 cents a square foot to home gardeners?
- Packaging, shipping & marketing costs?
- Only practical for low valued wool, can you find enough low priced wool?
- "Backlash" from current infrastructure?
- Does anyone want to pursue this?

What about other wool products?

- Blankets & Rugs
- Wool Bedding Products
  - pillows, mattress, comforters, quilt batting
- Some other wool based products / uses
  Archery targets? Erosion control?

Can you team up with someone else?

- Ingeo (corn based textile fiber)
- Special interest groups

Wool Blankets & Rugs

- It's being done already
  - The Colorado Wool Growers Association is making blankets out of blackface wool
  - Cornell University
- Are there people doing this in your area?

Who is going to make the contacts with organizations and market the blankets or rugs made with your wool?

Wool for the Bedding Industry

- Are there people already doing this in your area, but not using your wool?
- Can you contract your wool to businesses currently using "imported" wool?
- Need wool without a lot of vegetable matter and meat breed sheep with "white" wool works – as long as it is clean!

Thinking Out-Side the Box

- Can you find a mill to make fabric, then have someone else cut & sew a garment?
- Maybe it's a shirt, coat or sweater for the tobacco or turkey growers? Cotton?
  (Corn Growers with Ingeo and Wool)
- It's no longer the sheep producer doing this alone when you team up with someone else to make it happen

USDA Wool Loan Program and Marketing Cooperatives

- It is legal to have a cooperative take out a loan on your wool on your behalf
- You sign over consent to the cooperative to make marketing decisions for you
- 9 month loan and the cooperative repays at either the loan rate or repayment rate – which ever is lower --- before losing beneficial interest

USDA Wool Loan Program and Marketing Cooperatives

- Wool pools can be certified as marketing cooperatives for the USDA loan program
- Wool can be transported & scoured and you still maintain beneficial interest if it is in a marketing cooperative
- Private individuals or companies can not buy wool to participate in the USDA Wool Marketing Loan Program

USDA Wool Loan Program and Marketing Cooperatives

- 10,000 lbs of wool consigned to pool
- Core test indicates it is 28.5 micron and 55% yield
- Loan is taken out on 5,500 lbs at the USDA loan rate of $1.48 --- $8,140 loan
- Filing fee is $45 and interest rate at <3%
- Ungraded loan rate is 40 cents a pound or $4,000 on 10,000 lbs of wool

Further Out of the Box Thinking

- Apply for a National Sheep Industry Improvement Center loan for remaining processing charges
- Better yet – apply for one of the grants!

Local people that can help

- Are there already businesses that can use your wool but have never been approached?
- Department of Agriculture
  - "Made in XX"
  - Value-added programs
- Special interest groups – do you have the connections to make something happen?

Do sheep producers in your state want to participate?

- Require producers to be part of your "group" in order to participate in the pool
- Use low valued wool (belly wool, skirtings, tags) black wool, defect wool and wool from hair sheep crosses for wool mulch
- Market the better wool (fleece wool) to the other applications for higher prices

Future of Wool Marketing

?

It's up to you

LAMB GRADING AND EVALUATION

Mike Carpenter, VDACS

When evaluating live lambs for their potential slaughter grade, the most important factor is determining the amount of finish (fat thickness) a lamb has. We move our fingers back and forth across the lamb's backbone and ribs to determine if the lamb has enough fat cover to grade Choice (minimum is about .07 inch). The preferred area to evaluate fat thickness is in the middle of the back. With your finger find the last rib, then place your thumb on the lamb's backbone at this mid-point of the body. Now move your fingers forward and while applying moderate pressure, move your fingers across the ribs and your thumb across the backbone to determine fat thickness. It's important to use the tips of your fingers to penetrate the wool. With practice and follow-up you can become fairly accurate at estimating fat thickness. To give you some idea of what various amounts of fat thickness may feel like, try the following exercise. Make a tight fist with one hand. Now rub the index finger of the other hand across the back of your hand. If a lamb is this smooth, it is too fat. (Yield Grade 4 or 5). Now rub the index finger across the row of knuckles. This is what a lamb's backbone will feel like if it does not have enough finish. Now rub your finger across the row of the first joints of your fingers. This is what adequate finish would feel like on a lamb - approximately .1 - .25 inch of fat thickness.

USDA Choice is the preferred slaughter grade. There are no premiums for Prime lambs (as there are for Prime cattle) and Prime lambs are usually too fat.

USDA LAMB STANDARDS

USDA Quality Grades for slaughter lambs are:
PRIME, CHOICE, GOOD, UTILITY

The two factors that influence quality grades are:
Conformation - thickness of muscling
Quality - amount and distribution of fat, maturity

To be eligible for Choice or Prime, lambs must have a minimum of about .07 inch covering of fat.

USDA YIELD GRADES

Fat Thickness Plus .04 Times 10 = Final Yield Grade
(Example) .15 plus .04 * 10 = 1.9 yield grade

Y.G. 1	0.00 - .15 INCH
Y.G. 2	.16 - .25 INCH
Y.G. 3	.26 - .35 INCH
Y.G. 4	.36 - .45 INCH

FEEDER LAMB STANDARDS:

FRAME SIZE	EXPECTED SLAUGHTER WEIGHT AT OR ABOUT .2 IN. FAT
SMALL FRAME	100 LBS. AND DOWN
MEDIUM FRAME	100 – 120 LBS.
LARGE FRAME	OVER 120 LBS.

MUSCLING SPECIFICATIONS FOR FEEDER LAMBS

No. 1 Thrifty animals that are thick throughout. Lambs that are thick and full in the forearm and leg, showing a rounded appearance through the back and loin. Lambs which are wide between the legs, both front and rear.

No. 2 Lambs that are thrifty and are slightly thick through the forequarter and the middle part of the leg. The forearm and leg are slightly thick and the back and loin have a slightly thick appearance. The legs are set slightly wide, both front and rear.

No. 3 Feeder lambs included here are thrifty animals which have less thickness that the minimum requirements specified for the No. 2

Inferior: Animals that are unthrifty.

VIRGINIA LAMB GRADING SPECIFICATIONS

Lambs with a blue mark will be expected to grade USDA Choice or Prime and a red mark will indicate a feeder lamb or USDA Good grade slaughter lamb.

Lambs must have a minimum of about .07 inch backfat to grade Choice or Prime.

BLUE O LAMB: Choice, Few Prime, Yield Grade 1 2, Few 3
May be sorted into different weight groups;
90-100 lbs., 100-125 lbs., 125 lbs. and up

DOUBLE BLUE O LAMB: Choice & Prime, Yield Grade 3-4
Weighing 130 lbs and up

RAM LAMBS: Will be marked with a blue mark on the rump in addition to slaughter grade mark.

RED O LAMB: Heavy feeder lamb, or Good and Low Choice lamb weighing 85-100 lbs.

RED SHOULDER: Large and medium framed feeder lambs weighing 70-85 lbs. expected to finish at 100 lbs and up.

BLUE SHOULDER: Small framed feeder lambs weighing 70-85 lbs, expected to finish at less that 100 lbs. Many of these lambs may have enough fat thickness to grade Choice.

RED BACK: Large and Medium framed feeder lambs weighing 60-70 lbs., expected to finish at 100 lbs and up.

BLUE BACK: Small framed feeder lambs weighing 60-70 lbs. Expected to finish at less that 100 lbs.

RED TAIL: Large and Medium framed feeder lambs weighing 50-60 lbs. expected to finish at 100 lbs. and up.

BLUE TAIL: Small framed feeder lambs weighing less than 60 lbs. expected to finish at less that 100 lbs.

Ram lambs will be marked with red mark on the rump, in addition to feeder classification, i.e. Red Shoulder Buck Lambs.