

# The North Dakota Sheep Industry

No. 48

Newsletter

www.ndlwpa.com

June/July 2007

A joint publication brought to you by the North Dakota Lamb and Wool Producers Association and the NDSU Extension Service

## President's Message

I hope this finds all of you doing well and enjoying the activities of summer. There are a lot of sheep activities coming up in the next few months: fairs, first RR Ram Sale and ewe lamb sale at NDSU, the ASI Board of Directors will be meeting in Medora, National Katadin event at NDSU, State Ram Sale in Hettinger and the Ewe Sale in Bowman Bred Ewe Sale. I would like to thank everyone involved in these activities for the tremendous leadership they provide to these activities, the sheep industry and the state. We are very fortunate to have so many people willing to step up to the plate and take the lead to ensure the success of everything we are doing.



Lyle Warner

As I have traveled throughout the central US this summer, people seem to be quite optimistic about the sheep industry. This in spite of being too wet, too dry, high feed costs, predation and any number of other complications to numerous to mention. It was great to drive thru the Big Horn mountains in central Wyoming and see the bands of sheep being tended in the same manner as they have for generations. Good to see that not all things are changing (but sheepherders do have nicer lodging than in the past).

As I have visited with people associated with breed associations, it appears as though the participation in Junior events is increasing in almost every breed of sheep. I find this very encouraging, we all have to work diligently to ensure that we continue to attract new and young producers to the business.

As we enter Preminger (after the 4th of July) we need to be looking forward to the breeding season and do all we can to ensure a tremendous lamb crop. If you have questions, Dr. Justin Luther, NDSU Sheep Extension Specialist, is there to help you.

If you have any issues you would like to discuss or have brought before the board of directors, please contact one of the representatives, it is your organization and we want to provide the services you desire.

Enjoy the rest of the summer and fall. Hope to see all of you at some of the sheep events.

Lyle Warner  
NDWPA President

## Editor's Note

It all starts with Mom and Dad. Parents play a huge role in developing their child's interests in sheep. Sometimes a parent's support comes in monetary form and other times it is delivered through a list of chores that represent a lesson in responsibility. As a young sheep enthusiast I received emotional, financial and decision-making support from my parents. They recognized that their knowledge in sheep production was important for my education and the success of my sheep project.

This past weekend I judged a sheep show in central Wisconsin. Even at 64 years of age, my Dad was very excited to come along, listen to my reasons, and watch me visit with the exhibitors. During the drive home he congratulated me on a job well done, but also provided



Justin Luther, 1979



Maria (Justin's daughter), 2007

constructive parental criticism, as usual. Even now, I appreciate

his involvement in my sheep activities. Although my parents' support has come in many forms, and was often disguised, it has been crucial to my development.

As Lyle mentioned in his president's message, there will be numerous opportunities during the next few months for you and your child to gain sheep production knowledge. Involvement in your child's project extends far beyond a successful sheep project. It seems like just the other day my Mom was teaching me how to feed bottle lambs (pictured above). Now I find myself enjoying these same activities with my daughter, Maria (also pictured above).

Justin Luther, Ph.D.  
NDSU Extension Sheep Specialist

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# Secretary Minutes from the North Dakota Lamb and Wool Producers Association Meeting

Seven Seas, Mandan  
June 25<sup>th</sup>, 2007

President Lyle Warner called the meeting to order.

Brent Kuss read the minutes from the Feb. 6<sup>th</sup>, 2007.  
Brent Stroh moved to accept the minutes. Paula Swenson seconds the motion. Motion carries.

President Warner handed out a copy of the treasurer's report. Mark Sheppard was not able to make it to the meeting. The Treasurer's report showed a balance of \$32,839.38 on 2/6/2007. Matt Benz moved to accept the Treasurers report. Second by Don Osborne. Motion carried. Mark had also reported that there were 51 responses from 96 letters sent out in Feb. for memberships. The board would like to thank Mark Sheppard for putting in the extra effort and time on the mailings and for the great treasurer's report.

## **Old Business:**

Dr. Luther discussed the agenda for the Fargo ram sale. Mark Sheppard will clerk. Burdell Johnson will auctioneer. There were some final details discussed and it appears things are coming together for a great sale.

Brent Stroh made a motion to use the balance of the scrapie outreach money at the Fargo RR ram sale. Paula Swenson Seconds the motion. Motion carries.

The next order of business was discussion on the Hettinger ram sale. Application deadline for consignors is July 15<sup>th</sup>. Lynn Frey will auctioneer this sale. There was also discussion on having a noon meal. Lyle Warner would look into the details for the noon meal and report back to the board.

The next order of business was the Bowman Ewe Sale. A committee of Brent Stroh, Wyman Scheetz and Chris Schauer was delegated to meet with Harry Kerr to address any concerns and how we may make this another very successful sale. The tentative date will be towards the end of September.

Jane Horner addressed the board for Make It With Wool. This is the 60<sup>th</sup> year for Make it With Wool. Jane asks that if there is anyone with pictures from previous contests to please contact her. She would like to put a billboard together for the national contest. For more information or any details with Make it With Wool feel free to contact Jane Horner, NDMIWW Director, 341Old Main, Devils Lake ND 58301 or at [NDMIWW@Yahoo.com](mailto:NDMIWW@Yahoo.com). The national contest is to be held in Las Vegas this year. Paula Swenson made a motion to use the balance of the Wool Outreach

money for the Make it With Wool. Brent Stroh seconds the motion. Motion carries.

Burdell thanked the board on behalf of the ASI Executive Board for covering the cost of the Medora Musical and Pitchfork Fondue.

Burdell also gave the board a short over view of his trip to England. They went to a sheep festival where 5,000 to 6,000 sheep producers attended the event. They have many of the same concerns as US sheep producers have.

Dr. Luther discussed the National Katadin Convention to be held in Fargo. Matt Benz made a motion to give the Katadin event \$500. Don Osborne seconds the motion. Discussion followed. President Warner called for a vote. Motion carries.

Burdell Johnson addressed the board on the wool packer and some of the problems they are having with it and what they need to do to get it working.

## **New Business:**

The Board was notified that there would be some money available to producers for scrapie genotyping again. Producers will be sent information. If you have not received information, you may contact Dr. Beth Carlson's office for more info. Producers need to contact Dr. Carlson Prior to testing. (701-328-2655)

Matt Benz made a motion to renew our membership to the ND Fur Takers Assn. Brent Stroh seconds the motion. Motion carries.

There was some discussion if John Gupman got paid for cooking at the convention. Matt Benz made a motion to pay John Gupman \$150.00 for his fine cooking. Curt Stanely seconds the motion. Motion carries

The board discussed holding some more sheep schools for producer education around the state. Dr. Luther would look into some details and the board will bring it up at a later date.

A motion to adjourn was made by Dr. Luther. Second by Curt Stanley. Motion carries.

Board members in attendance: Curt Stanely, Paula Swenson, Matt Benz, Dr. Justin Luther. Lyle Warner, Don Osborne, Past President Brent Stroh, Brent Kuss, Wyman Sheetz, Chris Schauer and Jane Horner-Make it With Wool

# Causes, Prevention and Treatment of Rectal Prolapse in Sheep

Justin S. Luther, Ph.D.  
NDSU Extension Sheep Specialist

When rectal tissue protrudes outside the anus, it is called a rectal prolapse. Rectal prolapsing occurs less often in goats than sheep. Prolapsing animals can be identified early by the presence of bright red rectal tissue that will protrude only during straining or coughing. If left untreated, 2 inches or more of rectal tissue will remain permanently outside the anus and become dry, cracked and bloody. Many sheep at this stage will refuse feed and appear lethargic. Sheep with severe cases are at risk of intestinal tract expulsion, shock and death.

## Causes of Rectal Prolapse

In almost all cases of rectal prolapse, multiple contributing factors can be identified. These factors may include coughing, tail docking length, genetic susceptibility, sex, age, condition, diet, chronic scours and pregnancy.

- ✓ **Coughing** - A primary cause of rectal prolapse in growing, dry-lotted lambs is coughing. Chronic cough can be caused by infectious agents that lead to pneumonia, as well as by dusty feeds and internal parasites. Prolapsing as a result of coughing first will appear as a minor problem, but it gets worse if left untreated.
- ✓ **Tail Docking Length** - Many purebred and club lamb producers use short docking lengths to make their sheep appear squarer rumped and heavier muscled in the leg. In 2003, Thomas and others reported on the length of docked tail and the incidence of rectal prolapse in 1,227 lambs. Tail dock treatments were *short* (tail was removed as close to the body as possible), *medium* (tail was removed midway between the attachment of the caudal folds to the tail) and *long* (tail was removed at the attachment of the caudal folds to the tail). Lambs subjected to *short* and *medium* docking lengths had a greater incidence of rectal prolapse when compared with lambs subjected to a *long* docking length (see table).

Lamb Dock Length	Incidence of Rectal Prolapse
Short	7.8%
Medium	4.0%
Long	1.8%

Thomas et al., 2003

necessarily a *primary* cause of rectal prolapse. Short docking simply may increase susceptibility to prolapsing. For example, short-docked lambs may have a rectal prolapse only during chronic coughing. The study of Thomas et al. (2003) did not consider factors such as increased coughing, increased body fatness, lack of exercise and diet components.

Regardless, researchers recommend that sheep producers adopt long docking practices to reduce the incidence of rectal prolapse in their flock. A national law regulating tail docking length must be developed, and an exact year of implementation should be determined. This would place all purebred and club lamb producers in the nation on an equal playing field within the same year.

- ✓ **Diet** - Feedlot lambs consuming a high-concentrate ration are at an increased risk of rectal prolapse. Furthermore, lush clover and other pasture legumes may increase the risk of rectal prolapse in sheep. These forages contain phytoestrogens that may cause relaxation of anal sphincter muscles, leading to expulsion of rectal tissue.
- ✓ **Age** - Postweaning lambs are much more susceptible than suckling lambs and adult sheep. The sheep producer should watch carefully for rectal prolapses during this time.
- ✓ **Scours** - Diarrhea will irritate the intestinal wall, causing the sheep to strain and become more susceptible to rectal prolapse.
- ✓ **Genetic Susceptibility** - Although Thomas et al. (2003) reported a low estimate of heritability (0.14), some sheep producers have reported an increased incidence of rectal prolapse in offspring from a newly purchased ram. Although many factors could contribute to this observation; ram buyers always should question the incidence of rectal prolapse in a seedstock producer's flock.
- ✓ **Sex** - Over conditioned ewe lambs are more prone to prolapsing than male lambs. Ewe lambs lay down more fat in their pelvic region, and when chronic coughing occurs, additional pressure is placed on the rectum.
- ✓ **Pregnancy** - The uterus and its contents during late pregnancy will cause additional pressure in the abdomen and pelvic cavity, thereby increasing the risk of rectal prolapse in ewes.

## Prevention of Rectal Prolapse

Sound flock management programs must be in place to reduce the incidence of rectal prolapse. Given the causative factors above, prevention of rectal prolapses

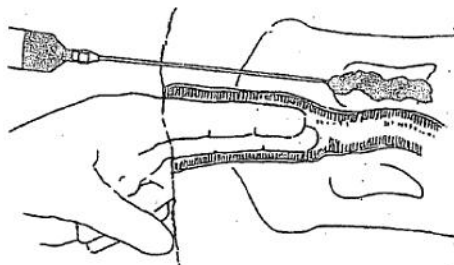
Although lambs with short docks had an increased incidence of rectal prolapse, dock length is not

should start by choosing the right genetics. Do not use rams that have shown signs of rectal prolapse and replace rams that sire a high percentage (>10 percent) of prolapsing offspring. Choose to dock lambs at the attachment of the caudal folds to the tail (i.e., just below the webbing of the tail). When lambs are weaned, providing them with a ration that is free of dusts and molds is important to reduce the incidence of coughing. Always use coccidiostats in the ration to prevent diarrhea and intestinal irritation.

Replacement ewe lambs should be managed separately from feeder lambs, and use the body condition scoring technique (see October/November 2006 issue of The North Dakota Sheep Industry) to ensure that they do not become excessively fat (body condition score >3). When possible, raise ewe lamb replacements on a pasture with <50 percent legumes and provide them with a supplement (~1 to 2 pounds of concentrate). Never use prolapsing ewe lambs as replacements.

### ***Treatment of Rectal Prolapse***

A veterinarian should be contacted to determine the proper rectal prolapse treatment in sheep and goats, but keep in mind that treatment can be cost- and labor-prohibitive, and in severe cases may require immediate slaughter of the animal. Proper treatment will depend on the stage at which the problem is identified because the level of irritation and amount of prolapsed rectal tissue increase with time. The Pipestone veterinary clinic previously described a very effective technique for early treatment of rectal prolapses (Pipestone Veterinary Supply Catalog, Page 52). In this technique prolapsed rectal tissue is washed returned to the rectum. The producer inserts one or two fingers into the rectum to hold rectal tissue in place and provide a guide for the upcoming injection. Approximately one ml of a counter irritant (Lugol's Iodine Solution) is injected along the rectal wall using a 2 inch 18 gauge needle. Ewe lambs are injected at the 12, 3, and 9 o'clock position of the anus, while male lambs are injected at the 12, 3, 6, and 9 o'clock positions. Injecting ewe lambs at 6 o'clock may form adhesions between the rectum and the reproductive tract.



Pipestone Veterinary Clinic

In more severe cases, prolapsed tissue is inserted and the rectum is sutured shut, resulting in a temporary fix until slaughter. Permanent repair of a severe rectal

prolapse requires a plastic rectal ring. The ring is inserted into the rectum and umbilical tape is used to tie a tourniquet around the protruding rectal tissue. The prolapsed tissue will slough in one to 1.5 weeks. For more information on this technique, visit [www.pipevet.com/photos/rectal\\_prolapse.htm](http://www.pipevet.com/photos/rectal_prolapse.htm).

Both of these treatment methods will require dosing with 2 ounces of mineral oil or another mild laxative each day to keep the animal's feces soft. A proper chronic cough treatment should always be applied in combination with these techniques to prevent further straining and protrusion of rectal tissue. Antibiotics also should be administered to prevent infection.

## **Fargo Ram Sale Saturday, August 4<sup>th</sup>, 2007**

The Fargo Ram Sale has been scheduled for Saturday, Aug. 4, in Shepherd Arena at North Dakota State University.

Thirty purebred ram lambs and yearlings and 40 purebred ewe lambs will be available. Breeds will include Hampshire, Suffolk, Dorset, Rambouillet, Columbia and Montedale.

"The Fargo Ram Sale event will combine relevant educational topics with the opportunity to purchase seed stock of the highest quality," says Justin Luther, NDSU Extension Service sheep specialist. "Since every ram sold at the sale will be RR at codon 171, producers will be able to make huge strides toward building a scrapie-resistant flock. To my knowledge, this is the only sale of its kind in the entire U.S."

Because all rams will test RR at codon 171, producers who make a ram purchase at this year's sale will be able to apply for the \$100 reimbursement that is available through the state veterinarian's office, he adds.

The ewe lambs will test QR or RR at codon 171.

Educational presentations will begin at 10:30 a.m. The sale starts at 1:30 p.m.

Featured presentations and the speakers are:

- \* Control of internal parasites and use of the FAMACHA Eye Anemia Guide to help determine the need for deworming individual animals – Brenda Postels, University of Minnesota Extension, Wright County
- \* The new livestock risk protection insurance program for lambs – Tim Petry, NDSU Extension livestock marketing economist

\* Ram management for better fertility and longevity – Luther

The NDSU Extension Service and North Dakota Lamb and Wool Producers Association are sponsoring this event.

For more information and to order a catalog, contact Luther at (701) 231-7993 or [justin.luther@ndsu.edu](mailto:justin.luther@ndsu.edu).

## Summer Management Tips

**Justin S. Luther, Ph.D.**  
**NDSU Extension Sheep Specialist**

It is all too easy to forget about the needs of your ewe flock when they are out on pasture and you are busy with other things this summer. Here is a short list of management tips that will keep your flock on the right track as we progress in to the fall.



1. Ewes should receive a complete mineral mix, specifically formulated for sheep, during the grazing season.
2. Consider grazing spring-born lambs on the ewes in to the fall if adequate pasture is available. Cheaper lamb weight gains will be achieved on forage. Replacement ewe lambs should be weaned, sheared, and placed on higher-quality pastures to optimize development prior to the breeding season. Monitor replacement ewe lambs often to ensure optimal body condition (Score 2.5 to 3) is maintained. Over conditioning ewe lambs will lead to health problems and decreased productivity.
3. Treat growing lambs for internal parasites every 3 to 4 weeks. Failure to do so will decrease lamb performance and may lead to unnecessary death losses.
4. Starting in August, stockpile pastures for late fall and winter grazing.
5. Assess ram inventory and begin developing your breeding plans. Decide if additional or new rams need to be acquired. Investigate potential sources of new rams. Acquire replacement ewe lambs if open females are to be brought into the flock prior to the breeding season. Sheep purchased from outside sources should be isolated and monitored for 2 to 4 weeks before placing with the existing flock.

## Sheep AI Research Project

This spring five producers enrolled in the sheep artificial insemination (AI) project with the Department of Animal & Range Sciences, NDSU. Dr. Justin Luther,

NDSU Sheep Extension Specialist, will continue to investigate commercially available gonadotropins for estrous synchronization and AI in sheep. Producers should enroll at least 20 ewes and have access to frozen ram semen. If frozen semen is not available to a producer, rams can be collected or Dr. Luther will aid in sourcing appropriate semen. Estrous synchronization, AI and pregnancy diagnosis procedures will be performed on each operation. Producers must sign an agreement form and pay a fee of \$30.00 per ewe to help cover the costs associated with the project. If you would like to enroll or simply learn more about this project contact Justin at 701-231-7993.



## Questions to Consider When Selecting a Ram

**Justin S. Luther, Ph.D.**  
**NDSU Extension Sheep Specialist**

Selection of a new ram is one of the most important management decisions in the sheep enterprise. The ram will contribute to half the genetic potential of the lamb crop and if replacement ewes are kept, the ram's genetic contribution will persist for years to come. The purpose of this article is to initiate some thought before selecting and buying a new ram. Answering the following three questions may provide direction to the ram buyer, while saving him/her time and money. More specific characteristics and records to consider when selecting a ram have also been included in discussion.

- 1) What is the **main purpose** of your flock?

Another way to ask this question is "What are you trying to produce?" If the main purpose of your flock is to produce fast growing, heavy muscled, good yielding market lambs, you will want to select a terminal ram with these characteristics. Average daily gain and muscling are two traits that can be easily identified and both are highly heritable. Ram performance tests are an excellent way to identify rams that possess these characteristics.

In another example, if the main purpose of your flock is to produce Rambouillet replacement ewes that will consistently breed out-of-season for your customers, then you will want to find a Rambouillet ram that was born out-of-season and confirm that his mother possesses good maternal characteristics. Research has shown that rams born out-of-season or "fall born" rams have higher fertility during the spring of the year. A number of sheep producers in North Dakota and at sales throughout the mid-west will offer fall born rams.

2) What are the **main strengths and weaknesses** of your flock?

Knowing the strengths and weaknesses of your own flock will help narrow the search and give you confidence during the selection process. Make a critical and accurate evaluation of your own flock before purchasing your next ram. It often helps to have an outside producer provide you with a fair evaluation. Furthermore, an outside producer may provide you with additional insights into the future of our industry.

Keep in mind that there is no such thing as a perfect ewe. Similarly, no ram is perfect and selecting for too many traits in one ram will only lessen the progress that can be made in a single trait. A general rule of thumb is to select a ram that has all the positive qualities possessed by your ewes, plus one additional feature that your flock is currently lacking.

3) What are your **flock goals** during the next 2 to 3 years?

The quality you can offer your customers during the next 2 to 3 years will largely be determined by the genetic contribution made by your newly selected ram. Therefore, it is wise to devise a clear vision of where you would like to see your flock in the near future. Do you have a growing niche market for spinning wool and want to expand your customer base by enhancing the quality of your wool? Would you like to make a strategic shift in your lambing season in order to sell finished market lambs when prices are at a seasonal high? Do you want to be the leading club lamb producer in the state of North Dakota? The ram you select now must fit the goals you want to achieve in years to come.

In conclusion, answering the above questions may provide the sheep producer with direction when searching for a new ram. It may be helpful for the producer to have his flock goals or mission statement at hand when answering these questions.

## Urinary Calculi (Water Belly)

**Nolan Hartwig, Extension Veterinarian  
Iowa State University**

Urinary calculi, or water belly, a common disease of male sheep, is caused by the formation of small stones, called calculi, in the urinary tract that cause retention of urine and rupture of the urinary bladder or urethra. The calculi usually lodge in either the sigmoid flexure, a large "s"-shaped curve of the penis just behind the scrotum, or in the urethral process, which

is an extension of the urethra that protrudes several centimeters beyond the end of the penis. A high incidence of urinary calculi is found in western lambs and in feeder lambs about four to six weeks after entry into the feedlot. In severe cases, up to 20 percent of a group of lambs may develop the disease.

Several factors contribute to the development of urinary calculi, most relating to a narrow calcium to phosphorus ratio. In feedlot lambs, this ratio should be approximately 2:1. Lambs are often fed very high levels of concentrate relative to roughage. Concentrates are generally high in phosphorus relative to calcium, so that calcium-phosphorus ratios of 1:1 are not unusual. Lambs with urinary calculi are depressed, off feed, and show a "humped up" appearance. The abdomen is often distended, especially if the bladder has ruptured.

If the urethra has ruptured, swelling along the penis will be observed, indicating the presence of urine in the tissues. Close examination of lambs affected with the disease will often reveal salt crystals adhered to the wool around the prepuce, or opening of the penis along the belly wall. Treatment of affected lambs may be rewarding, especially if the condition is diagnosed soon after onset. The most effective treatment is a surgical procedure called an urethrostomy, which involves amputation of the penis and suturing it to the skin in the area just below the pelvis. Chances of recovery are much less if rupture of the urinary bladder has already occurred. Amputation of the urethral process, a quick and simple procedure, is performed if the calculus is lodged in this structure.

Prevention of urinary calculi is much more rewarding than treatment. Call a veterinarian when the condition is suspected. The most important preventive measure is to have a proper calcium-phosphorus ratio of approximately 2:1 in the diet. Chemical analysis of the ration, especially in the forage in the ration, is advisable so the proper levels of calcium can be fed. Calcium levels are easily increased by the addition of calcium carbonate (limestone) to the ration. Acidification of the urine of lambs prevents the formation of most urinary calculi. This is accomplished by the addition of 0.5 percent ammonium chloride to the ration. In small groups of lambs, feeding of 1/4 ounce of ammonium chloride daily will help prevent the disease. An ample supply of fresh water at all times is also important for prevention. In severe outbreaks, veterinarians may also recommend the addition of up to 4 percent salts in the ration to increase urine output and thus dilute the mineral content of the urine. When this is done, it is especially important to make sure that plenty of clean fresh water is available at all times.

# NDLWPA Membership Form

This form is a membership application for the North Dakota Lamb and Wool Producers Association (NDLWPA) and American Sheep Industry (ASI) Association

*Please Print Clearly*

Name: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Zip: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

Email: \_\_\_\_\_

No. of Sheep/Goats: \_\_\_\_\_

Please check all that apply:  Commercial  Purebred  Club Lamb  Dairy

Lamb Feeder  Shearer  Allied Industry  Business

Please check membership type:

NDLWPA Annual Membership - \$20

NDLWPA Annual Junior Membership (under 18 years of age) - \$5

ASI Annual Membership - \$.04/head or \$25 minimum (whichever is greater)

Joint NDLWPA/ASI Annual Membership - \$40

Hardcopy of the ASI Weekly Newsletter - \$10

*Note: ASI Annual Membership will automatically get you an email copy of the ASI Weekly Newsletter.*

Total: \_\_\_\_\_

Please make checks payable to: NDLWPA

Send this application and your payment to: NDLWPA  
9463 86th St SE  
Fullerton, ND  
58441

Form more information call: 701-375-6971 or visit: [www.ndlwpa.com](http://www.ndlwpa.com)

# ~Upcoming Events~

- July 13th & 14th - *ASI Board of Directors Meeting in Medora, ND*  
July 22nd & 23rd - *ND State Fair Open Sheep Show in Minot*  
July 25th & 26th - *ND State Fair Junior Sheep Show in Minot*  
July 26th - *ND Sheep Junior Point Show in Minot*  
August 4th - *Fargo RR Ram Sale and Ewe Lamb Sale at NDSU*  
September 19th - *32nd Annual Hettinger Ram Sale*  
September 20th to 22nd - *National Katahdin Hair Sheep Expo at NDSU*  
September 29th - *Bowman Ewe Sale*  
Nov 30th & Dec 1st - *NDLWPA Annual Convention in Mandan*

## Hettinger Ram Sale

Adams County Fair Barn

200 Rams  
QR & RR



32nd Annual

September 19th, 2007 @ 1:00 p.m. MDT

Justin S. Luther, Sale Manager, (701) 231-7993

*A free lunch will be served!*

### The North Dakota Sheep Industry

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"NDSU is an Equal Opportunity Institution"

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