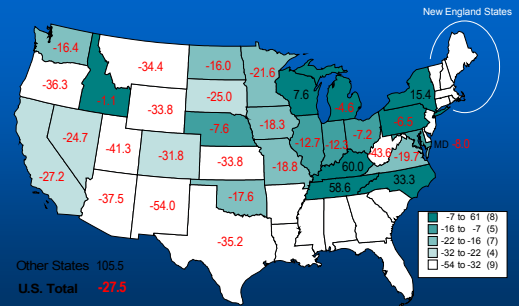


Modern Sheep Production in Virginia

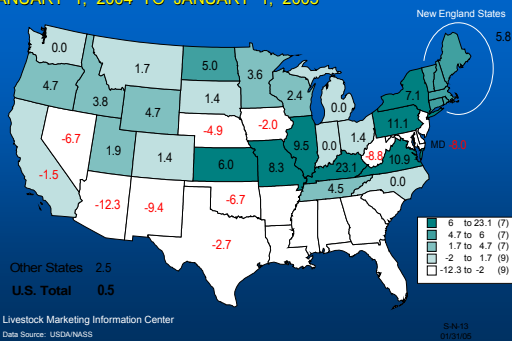
S.P. Greiner

Department of Animal & Poultry Science
Virginia Tech

% CHANGE ALL SHEEP & LAMBS
JANUARY 1, 1996 TO JANUARY 1, 2005



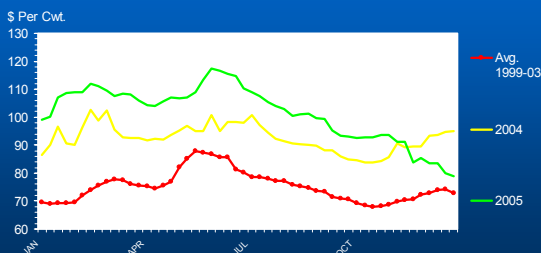
% CHANGE ALL SHEEP & LAMBS
JANUARY 1, 2004 TO JANUARY 1, 2005



Challenges to Sheep Production in Virginia

- Parasites
- Predators
- Wool
- Marketing
- Management and labor requirements

SLAUGHTER LAMB PRICES
3-Market Average, Weekly



Modern Sheep Producers

- Influx of new producers
- Diverse interests, motivations
- Well-educated
- Limited agricultural/husbandry experience
- Hungry for information

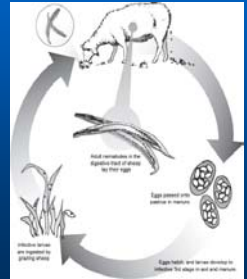
Sheep Internal Parasites

- Most important is barber pole worm, *Haemonchus contortus*
 - Blood sucking parasite
 - Anemia (pale) and bottle jaw
 - Other, similar parasites contribute but not usually a problem by themselves



Parasite Control Challenges

- Climate
 - Long, warm, humid summers perfect for life cycle of *Haemonchus*
 - 300 worms → 1.5 million eggs/day
 - All the common worms have the same life cycle
 - Sheep infected when ingest larvae on pasture
- Management
 - Stocking density, small paddocks
- Drug Resistance



Dewormers

- 3 major categories
 - Tramisol, Levasole
 - Valbazen
 - Ivomec drench, Cydectin drench
- Resistant barber pole worm can be found for all drug groups

Drug Resistance

- Defined
 - Genetic ability of worm to withstand the effects of a drug
- Causes
 - A few worms have the genetic ability to resist a drug before you use it
 - Use of a drug gives those worms an advantage
 - Gradually the number of resistant worms increases
- Contributing Factors
 - Frequent treatments
 - Mass treatments, indiscriminate treatments
 - Sheep do not get full drug dose
 - Under-dosing
 - Improper administration

Methods to Slow Resistance

- Use dewormers correctly
 - Dosage
 - Annual rotation
- Don't bring in resistance
 - Deworm new sheep with drugs from 2 major groups and quarantine
- Practice strategic parasite control measures:
 - Rotational grazing
 - Resting pastures (3 or more months)
 - Alternation of sheep with cattle or horses (and co-species grazing)
- Reduce Number of Deworming Treatments

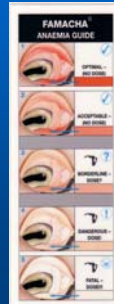
Reducing Deworming

- “Selective deworming”- deworm only wormiest animals
- i.e. FAMACHA system
 - Others
 - Good nutrition
 - Put most susceptible animals on safest pasture (lambs vs. ewes)
 - Reduce stocking density
 - Mixed or alternate grazing
 - Genetics
 - Cull highly susceptible animals

Principles of Selective Deworming

- Opposite of previous recommendations (deworm all animals at the same time)
- 20-30% of sheep have most of worms, and deposit 80% of total eggs
- Not all worms exposed to drug treatment, slows development of resistance
 - Susceptible worms in untreated animals reproduce
 - Helps dilute out resistant worms

The FAMACHA® System



- Eye color chart with five color categories
- Compare chart with color of mucous membranes of sheep or goat
- Classification into one of five color categories:
 - 1 - not anemic
 - 5 - severely anemic

Using FAMACHA®

- General criteria for deworming
 - If in doubt, score at paler category
 - Score 1 or 2-- don't deworm
 - Score 4 or 5--deworm
 - Score 3-?
 - If lambs--deworm
 - Adults--it depends
 - Lactating or stressed or high parasite challenge-- consider deworming
 - Consider deworming if want maximum effect on egg production



FAMACHA® SYSTEM

- WHAT IT WILL DO
 - Slow accumulation of resistant worms
 - Save expense on dewormers
 - Allow you to identify and cull susceptible sheep, retain highly resistant sheep
 - General management tool
- WHAT IT WON'T DO
 - Be the answer to parasite problems by itself
 - Eliminate drug resistant worms
- CHALLENGES
 - Labor intensive
 - Not silver bullet

Precautions

- Only properly trained persons should apply the FAMACHA® system
 - In U.S. must attend a workshop with hands on exposure to sheep with different eye colors to get card
- The card is an AID in the control of *Haemonchus* only
- Only part of a parasite control program, remember other management strategies

Hair sheep

- Hair sheep genetic resources
 - Caribbean origin: *Barbados Blackbelly*, *St. Croix*
 - South Africa: *Dorper*
 - U.S.: *Katahdin*



Virginia Tech Hair Sheep Research: Project Summary

S.P. Greiner, D.R. Notter, H.B. Vanimiseti,
A.M. Zajac, and M.L. Wahlberg

Virginia Polytechnic Institute and State University
Blacksburg, VA

Glade Spring Project Objectives



- Evaluation of hair sheep composite breeds in easy-care production system
 - Lamb growth and survival
 - Parasite resistance
 - Carcass composition and product sensory attributes
 - Maternal performance

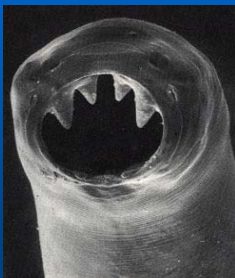
Experimental Design--Phase I Crossbred Lamb Production 1999-2002

- Produce ~50 Dorset and ~50 Dorper crosses/year for 3 years
- Purchase 20 Katahdin ewe lambs/year from 10 to 15 flocks
- Purchase Katahdin and Hair cross (St. Croix x BB) wethers
- Evaluate lamb growth, carcass traits, parasite resistance, palatability

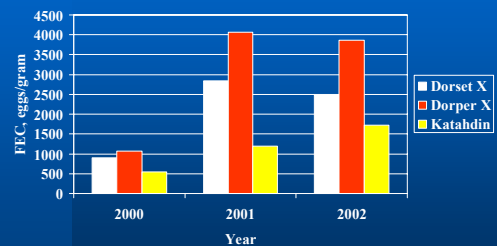
Growth of Dorset and Dorper-sired lambs

Item	Year	Dorset	Dorper
No. born	All	262	181
Birth weight, lb.	All	8.27	7.87 [†]
Weaning wt., lb.	2000	43.0	47.8*
	2001	43.2	42.8
	2002	35.3	31.5
	All	40.6	40.6
Summer gain, lb./d	All	0.41	0.41
Drylot gain, lb./d	All	0.33	0.31

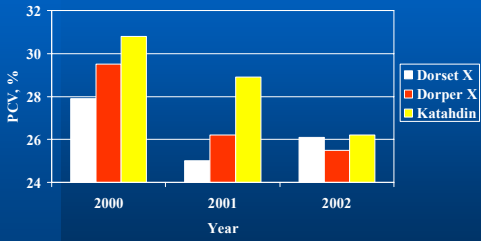
Parasite Resistance



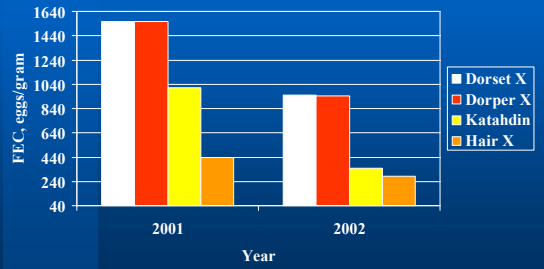
Ewe lambs – Fecal Egg Counts



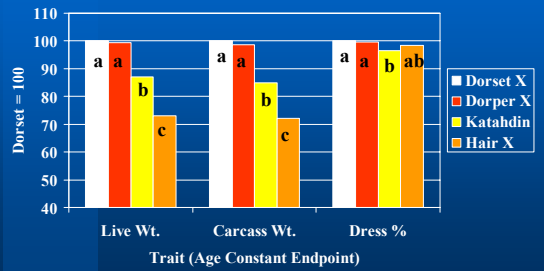
Ewe lambs – Packed Cell Volume



Wethers: Fecal Egg Counts

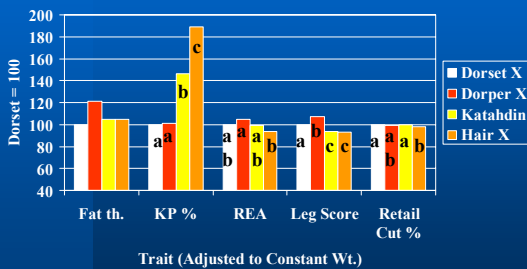


Carcass Composition



^{a,b,c,d}Breed means with different superscripts differ ($P < 0.05$).

Carcass Composition

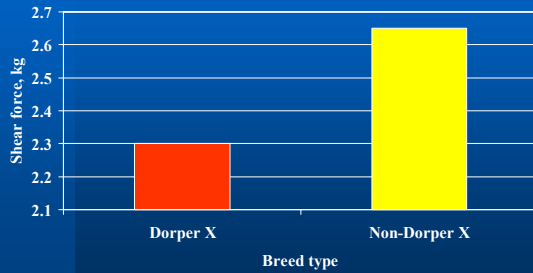


^{a,b,c,d}Breed means with different superscripts differ ($P < 0.05$).

Lamb tenderness and flavor



Shear force of longissimus muscle by breed type



Breed types differ (P<0.01)

Sensory panel tenderness ratings by breed type

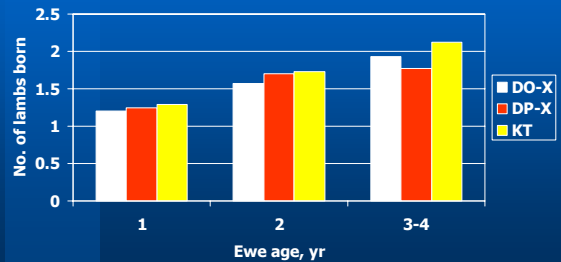
Trait ¹	Breed type				SEM
	Dorset crossbred	Dorper crossbred	Katahdin	Hair crossbred	
Initial tenderness	5.29	5.17	5.56	5.30	0.19
Overall tenderness	5.21	5.22	5.61	5.32	0.20
Juciness	4.93	4.95	4.96	5.11	0.15
Lamb flavor	4.40	4.29	4.48	4.35	0.11
Off-flavor	0.09	0.07	0.10	0.13	0.04

¹ Tenderness scale: 1 = extremely tough to 8 = extremely tender. Juciness and lamb flavor scale: 1 = extremely dry or bland to 8 = extremely juicy or intense. Off-flavor scale: 0 = none to 8 = extremely intense.

Experimental Design--Phase II Crossbred Ewe Evaluation 2000-2005

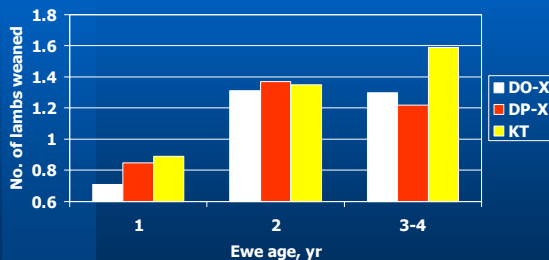
- Establish flocks of ~50 each of Dorset crosses, Dorper crosses, and Katahdins
- Mate to Suffolk rams for 3 years
- Evaluate ewe size, reproduction, parasite resistance, and coat characteristics.
- Evaluate lamb growth, carcass traits, and parasite resistance, palatability

Numbers of lambs born to Dorset crossbred, Dorper crossbred, and Katahdin ewes of different ages



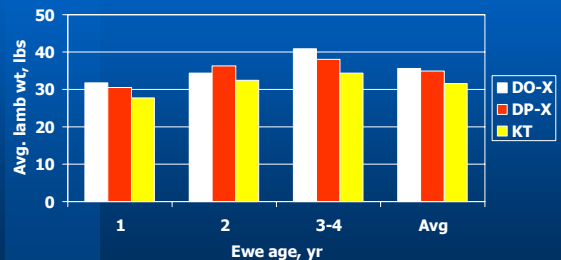
DO-X and DP-X ewes are both 1/8 Finnsheep; KT ewes are purebred Katahdin

Numbers of lambs weaned per ewe lambing for Dorset crossbred, Dorper crossbred, and Katahdin ewes



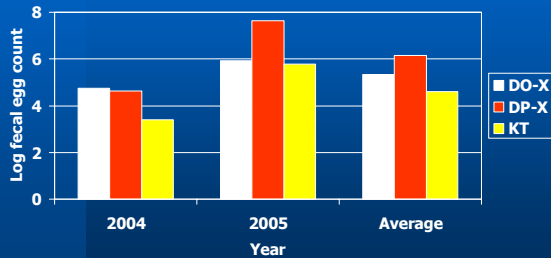
DO-X and DP-X ewes are both 1/8 Finnsheep; KT ewes are purebred Katahdin

Average 60-day lamb weaning wt for lambs from Dorset crossbred, Dorper crossbred, and Katahdin ewes



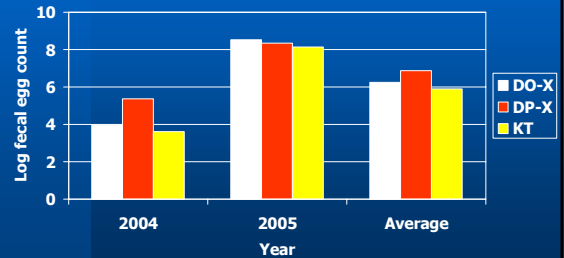
DO-X and DP-X ewes are both 1/8 Finnsheep; KT ewes are purebred Katahdin

Fecal egg counts for adult Dorset crossbred, Dorper crossbred, and Katahdin ewes



DO-X and DP-X ewes are both 1/8 Finnsheep; KT ewes are purebred Katahdin

Fecal egg counts for lambs out of Dorset crossbred, Dorper crossbred, and Katahdin ewes



DO-X and DP-X ewes are both 1/8 Finnsheep; KT ewes are purebred Katahdin

Where do they fit??

- Extensive production systems
- Maternal performance
 - Productivity, parasite resistance
- Katahdin
 - Maternal
 - Moderate parasite resistance
 - Growth/carcass intermediate to wool and Carribean hair
- Dorper
 - Terminal or cross with other hair breeds
 - Little parasite resistance
 - Growth/carcass more similar to wool breeds
- Carribean breeds (St. Croix, Blackbelly)
 - Maternal- cross with other breeds
 - Most parasite resistant
 - Unimproved breeds

Challenges to Sheep Production in Virginia

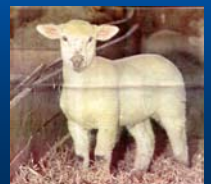
- Parasites
- Predators
- ~~● Wool~~
 - ~~- Finding shearers~~
 - ~~- Wool prices~~
- Marketing
- Management and labor requirements

Lamb Marketing Options

- Livestock auctions
- Special sales
- Cooperative marketing entities
- Direct marketing
- **ALL DRIVEN BY THE ETHNIC MARKET**

Defining the Ethnic Lamb

- Wide range in acceptable weights
- Adequate finish- not extremely fat or thin
- Generally prefer males
- Less discriminate
 - "old crop"
 - tails, horns
 - hair sheep



Successful Marketing

- Product offering must be compatible with marketplace
- Match marketing scheme
 - Genetics
 - Production System
 - lambing date
 - nutrition/feeding program

Ethnic Holiday Calendar

Holiday	2005	2006	2007	2008	2009	2010
Eid al-Adha Festival of Sacrifice	January 21	January 10	December 20	December 8	November 28	November 17
Muharram/ Islamic New Year	February 10	January 31	January 20	January 10	—	December 8
Mawlid al-Nabi Prophet's Birthday	April 21	April 11	March 31	March 20	March 9	February 26
Start of Ramadan Month of Fasting	October 5	September 24	September 13	September 2	August 22	August 11
Eid al-Fitr Festival of Fast Breaking	November 4	October 24	October 13	October 2	September 21	September 10
Pasover/Pesach	April 24-May 1	April 13-21	April 3-10	April 20-27	April 9-16	March 30-April 6
Rosh Hashanah	October 4	September 23	September 13	September 30	September 19	September 9
Chanukkah	Dec 26-Jan 2	December 16-23	December 5-12	December 22-29	December 11-19	December 2-9
Western Roman Easter	March 27	April 16	April 8	March 23	April 12	April 4
Eastern Orthodox Easter	May 1	April 23	April 8	April 27	April 19	April 4
Christmas	December 25					

Marketing Considerations

- Management
 - Parasites
 - Predators
- Current value vs. future value
 - Cost of gain (feed/forage, death loss, performance)
 - Predicting future market
- Local market vs. PA vs. direct marketing

