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# 2002 Goat Breeders Conference

**24<sup>th</sup> Annual Conference**  
**Saturday, January 19, 2002**

Minnesota Dairy Goat Association  
College of Veterinary Medicine,  
University of Minnesota

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Current information available from University of Minnesota Extension: <http://www.extension.umn.edu>.

# 24<sup>th</sup> Annual Conference

## Saturday, January 19, 2002

### **MEET THE CONFERENCE LEADERS**

#### **Karyl Dronen**

Body Shops Oberhasli, Boer and Nigerian goat breeder, breeder of Oberhasli National Champions. MDGA President, Grandy, Minnesota.

#### **Judy Marteniuk**

DVM, MS, Equine Medicine Department of Large Animal Clinical Sciences, College of Veterinary Medicine. Michigan State University. Longtime goat breeder.

#### **Gary Pusillo**

Ph D. P.A.S. Research scientist on goat nutrition, goat owner for 20 years. Marshalltown, Iowa

#### **Scott Haskell**

DVM, MPVM, Assistant Clinical Specialist, Small Ruminant Production Medicine. College of Veterinary Medicine. University of Minnesota,

#### **John Piehl**

DVM, USDA Animal and Plant Health Inspection Service (APHIS) Veterinary Medical Officer

#### **John Zack**

DVM, Veterinary Medical Officer, Scrapie Program Coordinator

#### **Joni Scheftel**

DVM, MPH, Epidemiologist with the Acute Disease Investigation & Control Section of the Minnesota Department of Health. Previously, mixed animal practitioner at Watertown Veterinary Clinic for 18 years.

#### **Steve Richter**

Chairman of the ADGA Type Committee, ADGA Linear Appraiser, ADGA National Show Judge.

#### **Mary Doerr**

Goat cheese producer, Bed and Breakfast operator, longtime goat breeder, Dancing Winds Farm.

Kenyon, Minnesota.

24<sup>th</sup> Annual Conference  
Saturday, January 19, 2002

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**Sponsored by:**

Minnesota Dairy Goat Association  
College of Veterinary Medicine, University of Minnesota

**Auction Animals:**

Alpine – Mellow Meadows Dairy Goats, Joann Mueller  
LaMancha – Old Farm LaManchas, Greg & Ginny Spurlock  
Nubian – Twin Oak Farms/Goatland’s Pride, Jeff and Marlys Anderson

**2002 Goat Breeders Conference Auction**  
**ALPINE**  
**MELLOW MEADOWS DAIRY GOATS**

SUNSHINE SEIGN SERAFIN A1117651

SUNSHINE SCHWARZEE CONINA  
A1055507

SUNSHINE CONINA CONDOR A1149772

MELLOW MEADOWS CLAIRITON

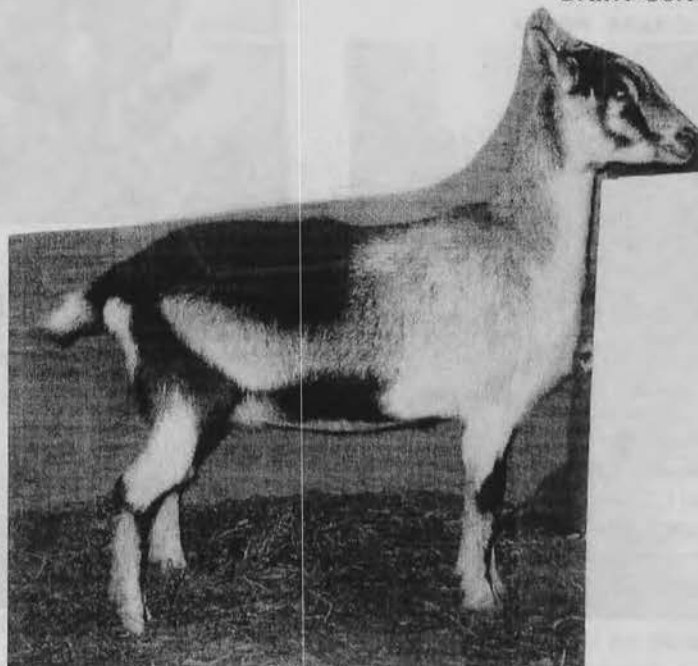
MELLOW MEADOWS JANE DOE GE I 10734

SUNSHINE REVIVE ROCHESTER  
A1117647

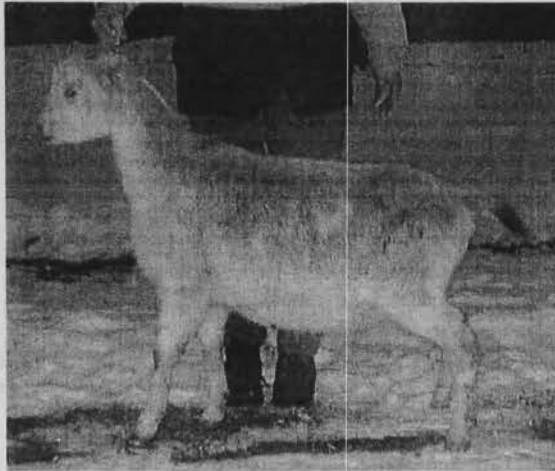
SPRING MIST JANET GE1055032

CLAIR WAS BORN MAY 5TH 2001. PLACED 2ND AT THE 2001 MINNESOTA STATE FAIR IN THE JR KID CLASS OF 31 ANIMALS. SHE ALSO PLACED IN THE UPPER 3RD OF ANY CLASSES SHOWN THIS SUMMER. SHE IS A FINE UPSTANDING DAIRY DOE. WITH A WONDERFUL TOP LINE, NICE ANGELATION TO THE BACK LEGS, A LONG DEEP BODY AND WIDE ESCUTCHIN AREA. SHE IS BRED TO KID IN APRIL TO MELLOW MEADOWS J BLOC. FULL BROTHER TO MELLOW MEADOWS CHANNEL 1ST PLACE YEARLING MILKER AT THE 2001 MINN STATE FAIR. ALSO HER MOTHER WAS JR CHAMPION RECORDED GRADE AS A JR KID AT THE 2000 MINN STATE FAIR. CLAIR HOLDS A LOT OF PROMISE TOGETHER WITH HER STYLE AND PEDIGREE. A MORE DETAILED PEDIGREE WILL BE SUPPLIED UPON REQUEST. CLAIR IS COU BLANC IN COLOR AND HAS A VERY WARM FRIENDLY PERSONALITY- I AM PROUD TO PRESENT HER AS THE ALPINE DOE FOR THE 2002 MINNESOTA DAIRY GOAT CONFERENCE.

SINCERELY, JOANN MUELLER  
MELLOW MEADOWS  
DAIRY GOATS



**2002 Goat Breeders Conference Auction**  
**LaMancha**  
**OLD FARM LAMANCHAS**



*Old Farm B Maimie*

*S: +++ B Winterwood's The Medicine Man*

*SS: +B GCH One\*Oak\*Hill Mac Tumbleweed*

*D: GCH One\*Oak\*Hill Harlequin Tullia*

*S: Old Farm Blacksmith*

*S: +\* B Redwood-Hills Ely Nucleus LA 91 EEE*

*SD: Old Farm Nu Ginger LA 88 VVEV*

*D: Old Farm Avonlea's PLA Donika*

**Old Farm B Maimie**

*S: +\* B Lucky\*Star's B Ely*

*DS: +\* B Redwood-Hills Ely Nucleus 6-05 LA 91 EEE*

*D: 4\*M Redwood-Hills Beau Nicolette*

*D: Old Farm Nu Thumbelina 1-05 LA 86*

*S: Promise-Land Nor Lars*

*DD: Old Farm L Mabeline 5-04 LA87 +EEV*

*D: Old Farm Avonlea's Demitria A*

If she follows in the steps of her outstanding ancestors, Maimie should be an asset in any herd. Bred to *Old-Farm DK Walker* for May kids. Futurity nominated. Herd is CAE and CL negative, tested annually. For more info, contact Spurlocks @ 952-492-3250 or [gspuri2298@aol.com](mailto:gspuri2298@aol.com)

*S: GCH \*B Rockspring ConDel Dark-nessVG89*

**Old-Farm DK Walker**

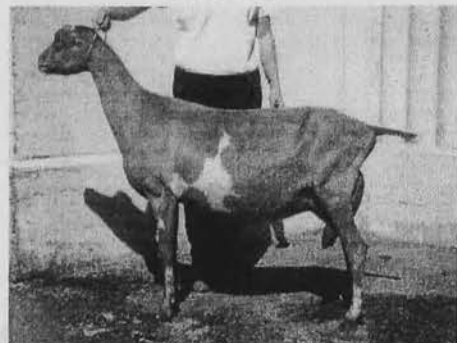
*D: Old-Farm Donika's PLL Sadie LA87+EEE*



*Dam: Old-Farm Nu Thumbelina*



*Dam's Full Sister: Ch Old-Farm Nu Cookie LA 90VEE*



*Sire's Dam: Old-Farm Nu Ginger*



*Old-Farm Donika's PLL Sadie  
 Dam of Old-Farm DK Walker*



**2002 Goat Breeders Conference Auction  
NUBIAN  
TWIN OAK FARMS/GOATLAND'S PRIDE**



**American Dairy Goat Association**



ADGA registry, based on original import records, is your warranty of good breeding and worldwide acceptance. Since 1904.  
P.O. Box 865 ■ Spindale NC 28160  
(828)286-3801 ■ Fax (828)287-0476 ■ adgajdw2@aol.com ■ www.adga.org

**Certificate of Registry  
PUREBRED NUBIAN**

NAME **TWIN OAKS PRINCESS MIRACLE** NO. **N1188418**

SIRE **N1151893  
SPLINTERS'-H.S. TANDY'S LADDIE**

SIRE'S SIRE **N1070888  
CAROL'S CRITTERS TANDY KEVIN**

SIRE'S DAM **N1103565  
THE WHAT NEXT'S LIGHTING**

DAM **N1151401  
7HI-HOBBY-HILL SWEET NECTAR**

DAM'S SIRE **N1083340  
7HI-HOBBY-HILL HUMMIN' LUCIFER  
\*B CL46**

DAM'S DAM **N1004279  
7HI-HOBBY-HILL SHAWNNE JUBILEE  
5\*M AR46 CL46,44**

DESCRIPTION **BLACK ROAN; BROWN TRIM**

SEX **DOE**

DATE OF BIRTH **03/10/2001**

HORN INFORMATION **DISBUDED**

TATTOO **RE: TWIN LE: P3**

BRED BY  
**ANDERSON, JEFFREY A  
1483234**

**NORTH BRANCH MN**

OWNED BY  
**ANDERSON, JEFFREY A  
1483234 03/10/2001**



**\*HIA NOS: \*DOB 031001 \*ANIMAL 001188418  
Under the rules of the American Dairy Goat Ass**

The herein described animal has been accepted for registry in the American Dairy Goat Ass and policies of the Association. This certificate is issued in reliance on the truth of the application for registry or transfer, but is in no event deemed a guarantee by the Ass ownership of the animal. If an animal has been admitted to entry or transferred through error, such entries or transfers are void, together with any entries and transfers that may have been such animals, and the American Dairy Goat Association assumes no liability for damages transfer. Alterations to this certificate except as made by the ADGA office, render it NULL AND VOID.

**CERTIFICATE**

I HAVE ON (M) \_\_\_\_\_ (D) \_\_\_\_\_ (Y) \_\_\_\_\_

SOLD THIS ANIMAL TO  
ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

**1483234 ANDERSON, JEFFREY A**

OWNER ID. \_\_\_\_\_ NAME \_\_\_\_\_

When this animal is sold, CERTIFICATE OF TRANSFER block must be completed and signed by seller. CERTIFICATE OF REGISTRY should then be returned promptly to ADGA at appropriate transfer fee.

**"Brrrrr- it's too cold for pictures! Where's my nice warm pen?"**





# Kidding Concerns

Judy Marteniuk, DVM,MS  
Large Animal Clinical Sciences  
Michigan State University  
Before Kidding

## ■ Proper nutrition of the doe

- pregnancy toxemia

## ■ Vaccinations

- Clostridium C&D and Tetanus
- 4-6 weeks before

## ■ Deworming

- before or at kidding
- product concerns
  - Meat
  - milk
- spring rise
- peril-parturient rise

## Toxoids vs Antitoxins

### ■ *Toxoid = vaccine*

- Long term immunity
- Active immunity
- Initial & booster dose required

### ■ *Antitoxin is not a vaccine*

- Short term protection
- Passive immunity
- Used in outbreaks

## Kidding

### ■ Present at the birth

- Ideal
- Necessary if on a CAE prevention program
- Reality is that this may not be possible due to other commitments - **work!**
- Decide how you can best manage kidding time in your situation

## Kidding

### ■ Induce kidding?

- Prostaglandin
  - 5-10 mg
  - Do not use if any chance of buck exposure after breeding
  - Give after 142-143 days – kid at 144-145 days
  - Attend birth

## **Kidding Kit**

- Bucket
- Soap – betadine, dish
- Lubricant – water soluble
- Towels
- Disposable gloves
- Nail clippers
- Stomach tube and syringe
- Syringes and needles

## **Freezables – separate**

- Bo Se
- Oxytocin
- Antibiotics – penicillin, tetracycline
- Navel dip? Iodine, nolvasan

## **At kidding Time**

### **■ Housing**

- doe(s) in separate pen
- draft free, but well ventilated
- well bedded with straw

### **■ Determining if doe is near/in labor?**

- known breeding dates?
- behavior
  - Pawing and digging
  - vocalization
  - seeks quiet area
  - Mucous plug
  - Udder increasing and shiny
  - Straining

### **■ Is labor progressing as it should?**

- Do I need to provide assistance?
- Should have kid in 30-60 minutes from presence of water bag
- Additional kids every 30-45 min.
- Is doe finished?
  - Pass after birth
  - Bump doe
    - Learn feel of uterus versus kid
- If questions, vaginal exam
  - Owner
  - Friend
  - Veterinarian

### **■ Vaginal exam**

- Wash doe with water and mild soap or betadine
- Wash your hands well and clip finger nails
- Wear disposable gloves
- Use a water soluble lubricant
- Is cervix open/closed?
- Are kid(s) in correct position
- Antibiotics?

### ■ **If kidding problems - Dystocia**

- Determine the problem
- Head back
- Leg back
- Posterior presentation
  - Direction of joints and feet
- Multiple kids coming at once
  - sort the right parts to the right kid
- Abnormal kid
- Antibiotics?

### ■ **If pulling kid:**

- Hands
- Soft nylon rope
- Commercial devices -rubber
- Break/clear membranes
- If using head, apply rope like a bridle

### ■ **Doe problems**

- Retained placenta
  - Abortions
  - Dystocia
  - Treatment:
    - Systemic antibiotics for at least 3 days
    - Oxytocin -24 hrs
      - 10-20 mg IM TID to QID
- Prolapsed uterus
  - Life threatening
  - Not heritable
    - Rebreed
    - Replacement kids
- Prolapsed vagina
  - Heritable? Sheep and cattle
  - Looks like tissue bubble
  - Occurs before kidding

### **Doe Care**

- Provide clean warm water
- Offer good fresh hay
- Milk as soon as possible
  - Oxytocin release
    - Pass additional kids
    - Pass placenta

### **Kid Care**

- Dry kid off immediately
  - CAE
  - Nubians - ears

- Provide colostrum
  - At least 2-4 oz or ad lib if available
    - dam
    - bottle
    - stomach tube
      - best if kid weak or cold
- Stomach Tube
  - Purchased
    - catheter tip syringe
  - Home made
    - 12-18 inch tubing and syringe
      - pliable
      - aquarium tubing
      - IV line tubing
    - Flame end of tube to smooth ends
    - Regular syringe - 2 oz
- Hypothermic kids
- Hypoglycemic kids
- Occurs:
  - Multiple births
  - Unattended birth
  - Poor mothering
    - Young doe?

### **Kid Care - Hypothermia**

- Warm kid
  - Mild
    - Towel rub down
  - Moderate
    - Warm area
    - 100 watt light bulb in box
    - Hair dryer
  - Severe
    - Heat lamp
    - Heating pad
    - Warm water bath
- Heat lamp
  - Fire hazard
  - Over heat lamb/kid
- Heating pad
  - Over heat lamb/kid
- Kid unable to move away from heat
- Acupuncture point
  - Stimulate heart and respiratory rate

### **Kid Care - Hypoglycemia**

- Feed kid
  - Use stomach tube
    - Keep kid sternal
    - Milk down trachea
  - If less than 24 hrs old
  - Do not use a bottle – aspiration pneumonia
- IP dextrose
  - If kid greater than 24hrs
  - Thin
  - Very hypoglycemic and hypothermic

### **Kid Care - Hypoglycemia**

#### **Kid Care - Feeding**

#### **Kid Care -Birth**

- Dip navel?
- Bo Se?
- Check kid
  - Male/female/ hermaphrodite
  - Anus
  - Horns
  - Extra teats
  - Two testicles

### **Kid Care - dehorning**

- 4 to 14 days
  - Dairy versus pygmy
  - Doe versus buck
    - Buck earlier and scurs
  - Electric
    - Do not hold dehorner on to long – brain damage
    - Adaptor and remove bud
  - Dehorning box
  - Anesthesia?
    - Local
    - General
  - Tetanus vaccination

### **Kid Care - castration**

- All bucks if kept greater than 3 mo.
- Do at time of dehorning or later?
- Surgical
  - Know job is done
- Bands
  - Increase chance of tetanus
- Tetanus vaccination
  - Antitoxin
  - Toxoid

### **Kid Care - identification**

- Tattoo
  - Ear
  - Tail
- Colored ribbon/yarn
- Neck tag
  - Milk jug
- Electronic ID
  - Must have reader

## **Questions**

## Kidding Concerns

Judy Marteniuk, DVM, MS  
Large Animal Clinical Sciences  
Michigan State University



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## Before Kidding

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  - pregnancy toxemia
- Vaccinations
  - Clostridium C&D and Tetanus
  - 4-6 weeks before
- Deworming
  - before or at kidding
  - product concerns
    - Meat
    - milk
  - spring rise
  - peri-parturient rise



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## Toxoids vs Antitoxins



- **Toxoid = vaccine**
  - Long term immunity
  - Active immunity
  - Initial & booster dose required
- **Antitoxin is not a vaccine**
  - Short term protection
  - Passive immunity
  - Used in outbreaks

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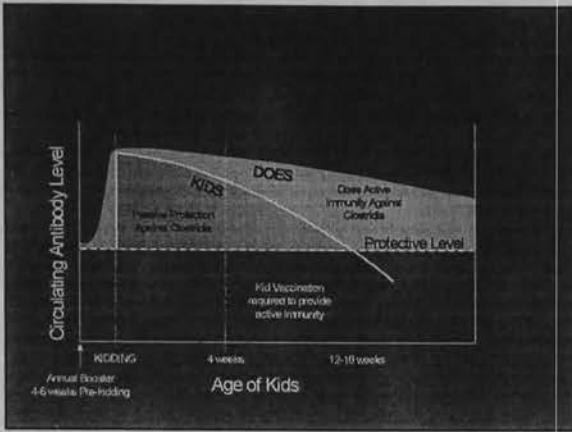
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## Kidding

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  - Ideal
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## Kidding

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## Kidding Kit

- Bucket
  - Soap – betadine, dish
  - Lubricant – water soluble
  - Towels
  - Disposable gloves
  - Nail clippers
  - Stomach tube and syringe
  - Syringes and needles
- Freezables – separate
    - Bo Se
    - Oxytocin
    - Antibiotics – penicillin, tetracycline
    - Navel dip? Iodine, nolvasan

## At kidding Time

- Housing
  - doe(s) in separate pen
  - draft free, but well ventilated
  - well bedded with straw
- Determining if doe is near/in labor
  - known breeding dates?
  - behavior
    - Pawing and digging
    - vocalization
    - seeks quiet area
    - Mucous plug
    - Udder increasing and shiny
    - Straining



## At kidding Time

- Is labor progressing as it should?
  - Do I need to provide assistance?
  - Should have kid in 30-60 minutes from presence of water bag
  - Additional kids every 30-45 min.



## At kidding Time

- Is doe finished?
  - Pass after birth
  - Bump doe
    - Learn feel of uterus versus kid
- If questions, vaginal exam
  - Owner
  - Friend
  - Veterinarian



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## At kidding Time

- Vaginal exam
  - Wash doe with water and mild soap or betadine
  - Wash your hands well and clip finger nails
  - Wear disposable gloves
  - Use a water soluble lubricant
  - Is cervix open/closed?
  - Are kid(s) in correct position
  - Antibiotics?



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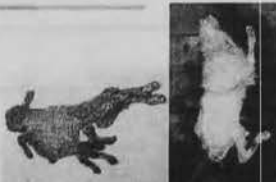
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## At kidding Time

- If kidding problems - Dystocia
  - Determine the problem
    - Head back
    - Leg back
    - Posterior presentation
      - Direction or joints and feet
  - Multiple kids coming at once
    - sort the right parts to the right kid
  - Abnormal kid
  - Antibiotics?



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## At kidding Time

- If pulling kid:
  - Hands
  - Soft nylon rope
  - Commercial devices -rubber
- Break/clear membranes
- If using head, apply rope like a bridle



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## At kidding Time

- Doe problems
  - Retained placenta
    - Abortions
    - Dystocia
    - Treatment:
      - Systemic antibiotics for at least 3 days
      - Oxytocin - 24 hrs
        - 10-20 mg IM TID to QID



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## At kidding Time

- Doe problems
  - Prolapsed uterus
    - Life threatening
    - Not heritable
      - Rebreed
      - Replacement kids
  - Prolapsed vagina
    - Heritable? Sheep and cattle
    - Looks like tissue bubble
    - Occurs before kidding



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## Doe Care

- Provide clean warm water
- Offer good fresh hay
- Milk as soon as possible
  - Oxytocin release
    - Pass additional kids
    - Pass placenta



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## Kid Care

- Dry kid off immediately
  - CAE
  - Nubians - ears
- Provide colostrum
  - At least 2-4 oz or ad lib if available
    - dam
    - bottle
    - stomach tube
      - best if kid weak or cold



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## Kid Care

- To encourage suckling
  - Rub
    - Body
    - Tail area
    - Face
  - Squeeze mouth on nipple
  - Select different nipple
  - Heat milk up warmer than usual
  - Warm up kid (if unable to tube feed)



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## Kid Care

### ■ Stomach Tube

- Purchased
  - catheter tip syringe
- Home made
  - 12-18 inch tubing and syringe
    - pliable
    - aquarium tubing
    - IV line tubing
  - Flame end of tube to smooth ends
  - Regular syringe - 2 oz




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## Kid Care

- Hypothermic kids
- Hypoglycemic kids
- Occurs:
  - Multiple births
  - Unattended birth
  - Poor mothering
    - Young doe?




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## Kid Care - Hypothermia

- Warm kid
  - Mild
    - Towel rub down
  - Moderate
    - Warm area
    - 100 watt light bulb in box
    - Hair dryer
  - Severe
    - Heat lamp
    - Heating pad
    - Warm water bath
- Heat lamp
  - Fire hazard
  - Over heat lamb/kid
- Heating pad
  - Over heat lamb/kid
- Kid unable to move away from heat
- Acupuncture point
  - Stimulate heart and respiratory rate

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## Kid Care - Hypoglycemia

- Feed kid
  - Use stomach tube
    - Keep kid sternal
    - Milk down trachea
  - If less than 24 hrs old
  - Do not use a bottle - aspiration pneumonia
- IP dextrose
  - If kid greater than 24hrs
  - Thin
  - Very hypoglycemic and hypothermic



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## Kid Care - Hypoglycemia



- 20 mls of 50% dextrose and 30 mls of water
- IP 40 cc/lamb
- Be clean and selective!
- 50% Dextrose soln
  - Dilute with warm sterile or distilled water to make 20% dextrose

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## Kid Care - Feeding

- Doe
  - Angora, pygmies, pets
- Individual bottle
  - 2-4 times per day
  - 20 to 25% of body weight
  - Milk or milk replacer
  - Consistent temperature
- Lamb/kid bar
  - Free choice
  - Feed cold to prevent over drinking and digestive problems
  - Use for convenience, but not free choice



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## Kid Care - Birth

- Dip navel?
- Bo Se?
- Check kid
  - Male/female/hermaphrodite
  - Anus
  - Horns
  - Extra teats
  - Two testicles



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## Kid Care

- Give all injections to kids SQ
- Nerve damage possible if use hind leg
- May or may not improve - "Murphy's Law"
- Muscle damage - meat



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## Kid Care - dehorning

- 4 to 14 days
  - Dairy versus pygmy
  - Doe versus buck
    - Buck earlier and scurs
  - Electric
    - Do not hold dehorner on to long - brain damage
    - Adaptor and remove bud
  - Dehorning box
  - Anesthesia?
    - Local
    - General
  - Tetanus vaccination



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## Kid Care - castration

- All bucks if kept greater than 3 mo.
- Do at time of dehorning or later?
- Surgical
  - Know job is done
- Bands
  - Increase chance of tetanus
- Tetanus vaccination
  - Antitoxin
  - Toxoid



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## Kid Care - identification

- Tattoo
  - Ear
  - Tail
- Colored ribbon/yarn
- Neck tag
  - Milk jug
- Electronic ID
  - Must have reader



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## Questions



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**Minnesota Goat Breeders Conference  
January 19, 2002**

**The Scrapie Eradication Program and Goats**

Jon Zack, DVM  
USDA, APHIS, Veterinary Services  
651 296 2942 (extension 17)  
john.zack@bah.state.mn.us

**What is Scrapie?**

Scrapie is a fatal degenerative disease affecting the central nervous system of sheep and goats. Scrapie was first recognized as a disease syndrome in Great Britain and Western Europe about 250 years ago. The disease is believed to have first entered the United States in 1947 by British sheep which entered Michigan through Canada.

Scrapie is caused by an abnormal protein (prion) that acts as the infectious and contagious agent. The incubation period is typically between two and five years for an animal exposed prior to weaning. The incubation period may be six to more than nine years for an animal exposed after weaning. Exposure to the disease typically occurs at the time of birth since the abnormal prion is shed in the birth fluids and afterbirth.

The abnormal prion agent is very difficult to destroy, since it is resistant to heat, light and most disinfecting agents.

Scrapie is classified as a Transmissible Spongiform Encephalopathy (TSE). Other spongiform encephalopathy diseases include:

Bovine Spongiform Encephalopathy (BSE)  
Feline Spongiform Encephalopathy (FSE)  
Chronic Wasting Disease of Deer and Elk (CWD)  
Kuru  
Creutzfeldt Jacob Disease (CJD)  
vCJD  
Fatal Familial Insomnia

**For goats, what are the official identification requirements for interstate commerce?**

The following categories of goats must have official identification for interstate commerce (including sales, exhibitions, show or slaughter) or for movement in federally approved livestock markets in Minnesota:

- All intact registered goats (bucks and does).
- All intact goats (buck and does) going to a show or exhibition.

- All intact goats used primarily for milk production.
- All sexually intact goats that have resided with sheep.
- All scrapie exposed, suspect, high risk, and test positive goats.

The following categories goats do not need official identification and have no interstate movement restrictions.

- All goats moving into slaughter channels ( goats that have not been exposed to scrapie).
- All castrated male goats ( wethers that have not been exposed to scrapie).
- All low risk commercial goats:
  - goats that are not registered or exhibited;
  - goats that are not from a scrapie exposed, suspect, test-positive or high risk flock;
  - goats that are not used for milk production;
  - goats that have not resided with sheep.

### **When is a health certificate required?**

A health certificate is required for any sexually intact goat moving interstate or in interstate commerce for breeding or exhibition that does not meet the definition of a low risk commercial goat. Note: any goats going to slaughter do not need to be officially identified.

### **How do I officially identify my goats?**

Request a flock ID number from the Minnesota Board of Animal Health. The contact person is Lindsey at 651 296 2942 (extension 30).

- Official identification for goats in the Scrapie Eradication Program can be either:
  - 1) USDA issued ear tags with assigned flock identification number.
  - 2) Ear, flank or tail fold tattoo with assigned flock identification number.
  - 3) Legible breed registration tattoos (breed tattoos must also be registered with the MN Board of Animal Health) when accompanied by their breed registration certificates or when the registration numbers are listed on a certificate of veterinary inspection.

### **What records do I need to keep?**

As a producer, when you apply tags or tattoos to animals that were born in your flock or were used for breeding purposes in your flock, your records must contain (and be retained for five years) the following information:

- The date when and address where the official identification was applied.

- The official flock identification number and serial numbers applied.
- The current owner's name, address, and telephone number.
- The flock of origin owner's name, address, and telephone number.
- Other identification tattoos and serial tag numbers on the sheep or goat.

If you are a dealer and apply tags or tattoos to animals that are not part of your flock, your records must contain (and be retained for five years) the following information:

- The date when and address where the official identification was applied.
- The official flock identification number and serial numbers applied.
- The person from whom the animals were received: name, address, and telephone number.
- The flock of origin owner's name, address, and telephone number.
- Please note: if the animal already has an official flock identification tag or tattoo, you do not put in another tag or tattoo. However, you do need to keep a written record as listed above.

### **If my goats are exposed to scrapie, what will happen?**

A federal or state veterinarian will do an investigation. Based on the exposure risk of the herd, applicable regulations, and the owners situation, the veterinarian will determine the cleanup and monitoring actions to be taken. If your flock is determined to be an infected or source flock some or all of your goats will be restricted to the premises except movements to slaughter until the cleanup plan is completed.

### **Where do I find additional information?**

The USDA Animal and Plant Health Inspection Service (APHIS) website for Scrapie can be found at <http://www.aphis.usda.gov/vs/scrapie/> Another excellent source for information on Scrapie and the National Scrapie Eradication Program is the National Institute of Animal Agriculture (NIAA) website, [www.animalagriculture.org/scrapie](http://www.animalagriculture.org/scrapie).

If you have questions regarding the program please call Dr. Jon Zack at 651-296-2942 (extension 17). If you wish to order USDA ear tags or register your goat tattoo as an official flock ID, please call Lindsey at the Minnesota Board of Animal Health at 651-296-2942 (extension 30) or toll free at 1-866-873-2824.

**Notes:**

# Foot and Mouth Disease

Dr. John Piehl

## Summary Slide

- ⇒ Foot-and-Mouth Disease:  
A Foreign Threat to U.S. Livestock

## FMD detected in U. K. in February 2001

- ⇒ To Date:
  - 2,030 confirmed cases
  - 3,949,000 animals destroyed
    - 3,206,000 sheep
    - 598,000 cattle
    - 140,000 pigs
    - 2,000 goats
    - 1,000 deer
    - 1,000 other animals

## What is Foot and Mouth disease?

- ⇒ A highly contagious, viral disease affecting cloven-hoofed animals (cattle, swine, sheep, goats, deer, Bison, Elk, etc.)
- ⇒ Not a threat to humans

## Why is FMD such a concern?

- Major economic impact on farmers
  - Virus can spread like wildfire

- ⇒ Prevention
- ⇒ Early Detection
- ⇒ Rapid Diagnosis
- ⇒ Coordinated Response

## Preventative Measures

- ⇒ Stepped up preventive measures at airports and other entry points
- ⇒ Decontamination and disposal of foreign garbage
- ⇒ Ban on import of used farm equipment from FMD countries
- ⇒ Ban on import of European animals and animal products
- ⇒ Veterinary officials sent to UK to help fight outbreak
- ⇒ Public education campaign

## Early Detection

- ⇒ Livestock Owners
- ⇒ Veterinarians





## Foot-and-Mouth Disease: A Foreign Threat to U.S. Livestock

John Piehl DVM VMO-MN  
USDA-APHIS-Veterinary Services

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### FMD Outbreak in the United Kingdom

- ⇒ FMD detected in U.K. in February 2001
- ⇒ 170 Deaths
- ⇒ 9,000 animals destroyed
- ⇒ 3,000,000 animals destroyed
- ⇒ 206,000 sheep
- ⇒ 200,000 cattle
- ⇒ 140,000 pigs
- ⇒ 2,000 goats
- ⇒ 1,000 deer
- ⇒ 1,000 other animals

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## What is Foot and Mouth disease?

- ⇒ A highly contagious viral disease affecting cloven hoofed animals (cattle, swine, sheep, goats, deer, Bison, Elk, etc.)
- ⇒ Not a threat to humans

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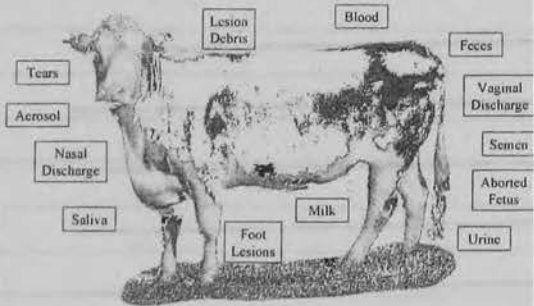
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## How is FMD Spread?



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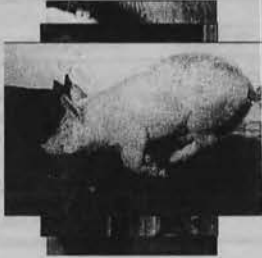
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## Why is FMD such a concern?

Major economic impact on farmers

- Virus can spread like wildfire
- Reduces the productivity of livestock
- Once the disease is present in an area
  - Continued production losses
  - Costs of controlling the disease
  - Loss of export markets



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## Keep Foot-and-Mouth Disease OUT of America

- Prevention
- Early Detection
- Rapid Diagnosis
- Coordinated Response

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## Preventative Measures

- Stepped up preventive measures at airports and other entry points
- Decontamination and disposal of foreign garbage
- Ban on import of used farm equipment from FMD countries
- Ban on import of European animals and animal products
- Veterinary officials sent to UK to help fight outbreak
- Public education campaign



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## Early Detection

- o Livestock Owners
- o Veterinarians
- o Foreign Animal Disease Diagnosticians



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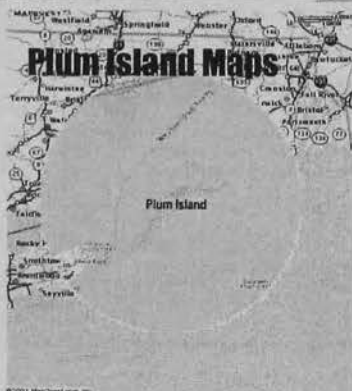
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## Rapid Diagnosis

- Preliminary diagnosis within 24 hours
- Confirmatory diagnosis within 48 to 72 hours



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## Coordinated Response



Minnesota Pollution Control Agency



- ⇒ Minnesota Emergency Response Plan
- ⇒ SEOC
- ⇒ Key State Agencies
  - Board of Animal Health
  - Department of Agriculture
  - Department of Public Safety
    - Division of Emergency Management
  - Pollution Control Agency
- USDA, APHIS, Veterinary Services



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## Board's Expanded Authority Under a Declared Emergency



- ⇒ Restrictions on the movement of:
  - People
  - Livestock
  - Machinery
  - Other personal property
- ⇒ Establishing quarantine zones

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# Notes:

***E. coli* O157 and Goat Milk**  
**What is the risk?**  
**Joni Scheftel DVM MPH**  
**Acute Disease Investigation and Control**  
**Minnesota Department of Health**

**Overview of Presentation**

- General info about *E. coli* O157:H7
- Specific cases of disease associated with goat milk
- Discussion!

**Generic *E. coli***

- Found as normal flora in the intestines of all animals
- Normally does not cause disease in healthy animals or people

**How does *E. coli* O157 differ from normal flora *E. coli*?**

- Produces powerful Shiga toxins
- Not part of normal flora of people
- Causes disease in healthy people
- First discovered in 1982
- 1992: fast food outbreak on West Coast caused 470 illnesses and 4 deaths

**Reservoir of *E. coli* O157**

- Reservoir is cattle and other ruminants.
- Does not cause disease in livestock.
- *E. coli* O157 has been isolated from cattle, sheep, goats, pigs, horses, deer, and other animals.
- Found in 5-10% of U.S. cattle herds
- Prevalence in Minnesota cattle herds is around 6% (Dr. Jeff Bender, unpub)

**Transmission**

**Fecal-oral:**

- Contaminated food and contaminated drinking or swimming water
- Animal contact
- Person-to-person transmission

**Contaminated Food**

- Undercooked ground beef
- Unpasteurized milk and juice
- Sprouts  
Alfalfa Sprouts  
Don't Eat Them!
- Fruits and vegetables



### **The Disease in People**

- Small infectious dose
- Incubation period is 1-8 days (typically 3 to 4 days)
- Watery diarrhea → bloody diarrhea
- abdominal cramps
- Fever not prominent
- Resolves in most people in 5-10 days, but the bacteria can be shed in stool for weeks
- Incidence rate of *E. coli* O157 infection in MN residents is among the highest in the nation
- 42% of MN cases are hospitalized

### **Diagnosis**

- Stool culture
- Outbreaks are identified by genetic fingerprinting of strains to link the cases together

### **Treatment**

- Tincture of time, rest and fluids
- Supportive care when hospitalized
- Antibiotics and anti-diarrheal agents may increase the risk of complications

### **Hemolytic Uremic Syndrome (HUS)**

- Complication of *E. coli* O157 infection in 5-10% of cases
  - Children < 5yrs and the elderly most at risk
- HUS triad
  - Microangiopathic hemolytic anemia
  - Thrombocytopenia
  - Acute renal dysfunction

### **Hemolytic Uremic Syndrome (HUS)**

- 5-10% of HUS cases are fatal
- 30% of cases-permanent kidney damage
- 23 cases in 2001; 4 deaths (3, 4, 6, and 73 yrs old)
- No specific treatment

## Prevention

- Cook ground beef to 160°F
- Avoid cross contamination in the kitchen
- Drink pasteurized milk and juice
- Wash fruits and vegetables well
- Avoid swallowing lake or pool water
- Wash hands after contact with livestock

## ***E. coli* O157 and Goat Milk:**

### Case 1

#### **“*Escherichia coli* O157 Outbreak Associated with the Ingestion of Unpasteurized Goat’s Milk in British Columbia”**

**Canada Communicable Disease Report  
Vol 28-01; 1 January, 2002**

#### **Case 1**

- Nubian goats co-owned by 18 families on Vancouver Island, B.C.
- Unpasteurized milk had been distributed to participating families for 10 years
- 3 siblings, ages 1, 2 and 7 became ill with bloody diarrhea around Aug 14, 2001. *E. coli* O157 was isolated from the 1 year old.
- 2 children of a visiting family also were infected.
- 2 of these 5 children were hospitalized with HUS.
- One of 2 bottles of goat milk purchased on August 5 tested positive for *E. coli* O157.
- The bacteria was present in very low numbers in the milk.
- The genetic fingerprint of the *E. coli* O157 from all 3 stool samples from infected children matched that of the goat milk sample.

#### **Case 2**

#### **“Human *Escherichia coli* O157:H7 Infection Associated with the Consumption of Unpasteurized Goat’s Milk”**

**M. Bielaszewska, J. Janda et al *Epidemiology and Infection* 1997; 119(3): 229-305**

- From June 15 to July 4 1995, four children from Northern Bohemia, Czech Rep were hospitalized for HUS preceded by diarrhea.
- All had +O157 serum titers.
- 3 of 4 drank raw goat’s milk from the same farm within the week before the disease.
- 5/15 of the farm’s regular goat milk customers had + O157 serum titers compared to 0/45 controls.
- Identical strains of *E. coli* O157:H7 were isolated from one goat, and from 1 of the asymptomatic goat milk drinkers.

### Case 3

#### “*Escherichia coli* O157 Outbreak in Scotland Linked to Unpasteurized Goat’s Milk”

##### Eurosurveillance Weekly Issue 24, June 10, 1999

- 33 cases of *E. coli* O157:H7 in the Grampian region of Scotland: 22 children in a grade school class, 3 teachers, 5 family contacts
- 1 case of HUS
- All ate cheese made from raw goat milk by the grandmother of one of the pupils
- *E. coli* O157 strains isolated from the goat and the children were identical.

##### Conclusion

- *E. coli* O157 exists in Minnesota livestock
- *E. coli* O157 is probably less common in goats than in cattle, but goats can carry the bacteria and it can spread to people from goats and unpasteurized goat milk products
- Raw goat’s milk is used as a nutritional substitute for cow’s milk particularly in young children; this is the group most susceptible to *E. coli* O157 infection and HUS
- We haven’t identified a case of *E. coli* O157 or HUS related to unpasteurized goat milk in Minnesota, yet.

##### Discussion

###### Is it a matter of time?

The product label on the distributed milk from the BC case read:

“Milked under the strictest sanitary conditions. If pasteurization is desired, heat at 72.8 ° C for 30 seconds then refrigerate”

What if we labeled goat’s milk with:

“Pure raw goats milk. Even though this milk is produced under the strictest sanitary conditions, it may contain pathogens that cause illness in people. We recommend **pasteurization by** heating to 165 ° F for 15 seconds, then cooling rapidly”

## ***E. coli* O157 and Goat Milk What is the risk?**

Joni Scheffel DVM MPH  
Acute Disease Investigation and Control  
Minnesota Department of Health

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## **Overview of Presentation**

- General info about *E. coli* O157:H7
- Specific cases of disease associated with goat milk
- Discussion!

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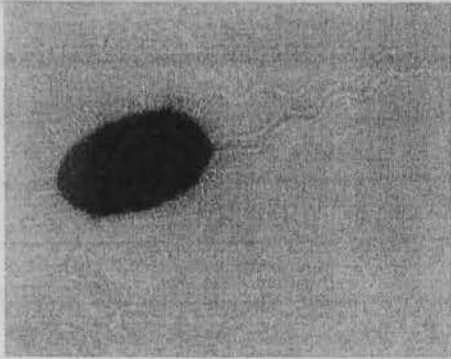
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### **E. coli**



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### **Generic *E. coli***

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- Normally does not cause disease in healthy animals or people

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### **How does *E. coli* O157 differ from normal flora *E. coli*?**

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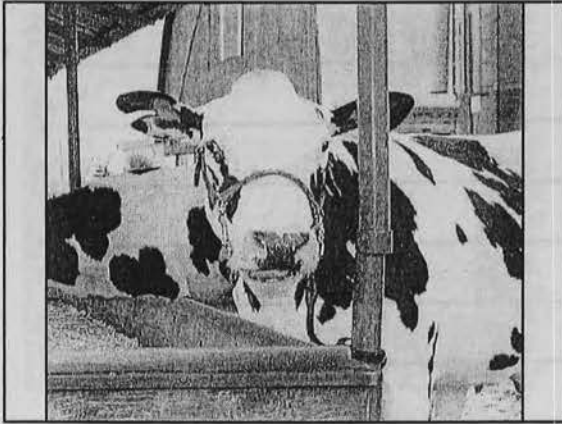
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### Reservoir of *E. coli* O157

- Reservoir is cattle and other ruminants.
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### Reservoir, cont

- Found in 5-10% of U.S. cattle herds
- Prevalence in Minnesota cattle herds is around 6% (Dr. Jeff Bender, unpub)

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## Transmission

### Fecal-oral:

- Contaminated food and contaminated drinking or swimming water
- Animal contact
- Person-to-person transmission

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## Contaminated Food

- Undercooked ground beef
- Unpasteurized milk and juice
- Sprouts
- Fruits and vegetables

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### The Disease in People

- Small infectious dose
- Incubation period is 1-8 days (typically 3 to 4 days)
- Watery diarrhea → bloody diarrhea
- abdominal cramps
- Fever not prominent

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### People, cont

- Resolves in most people in 5-10 days, but the bacteria can be shed in stool for weeks
- Incidence rate of *E. coli* O157 infection in MN residents is among the highest in the nation
- 42% of MN cases are hospitalized

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## Diagnosis

- Stool culture
- Outbreaks are identified by genetic fingerprinting of strains to link the cases together

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## Treatment

- Tincture of time, rest and fluids
- Supportive care when hospitalized
- Antibiotics and anti-diarrheal agents may increase the risk of complications

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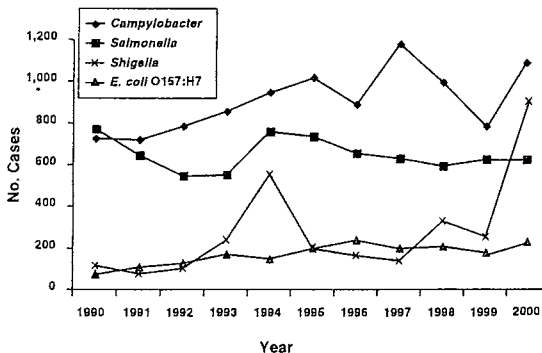
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Cases of *Campylobacter*, *Salmonella*, *Shigella*, and *Escherichia coli* O157:H7 Reported to MDH, 1990-2000



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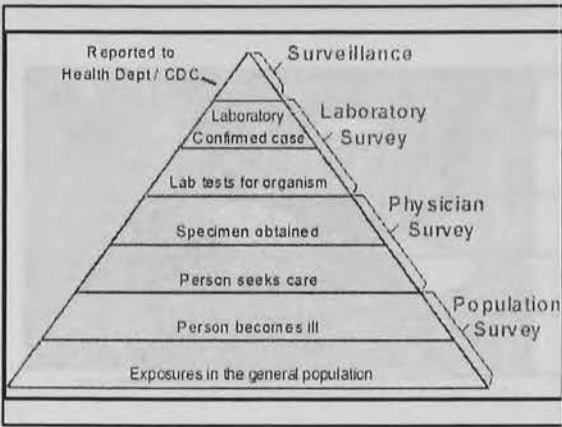
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**Jordan girl dies of E. coli-linked syndrome**  
**Tests have yet to confirm 6-year-old had foodborne disease**

**By Jill Barrow**  
**Star Tribune Staff Writer**

State health officials are investigating the death of a 6-year-old girl from Jordan, Minn., who developed a type of bloody diarrhea commonly caused by E. coli O157, a type of food-borne bacteria.

Minneapolis-based Vetschewsky at Children's Hospital of Minneapolis, hospital officials said. Two younger siblings have developed the same condition, lethally.

invasive syndrome (HUS), and an abo hospitalard.

State epidemiologist Dr. Thery Hill said that E. coli has not been implicated as the cause of this rare HUS case, but he added that the department had begun further testing to determine the cause.

A variety of other infectious diseases can lead to HUS, hospital officials say. They are investigating two other HUS cases in the state. E. coli has been confirmed as the cause of one case. However, Hill

and evidence gathered so far does not suggest an E. coli outbreak.

"We don't have anything that points to a particular source or points to a danger to the general public," Hill said. "There is just an outbreak occurring where we would need to take control measures . . . like removing meat from a commercial processor from the market."

There are typically between 10 and 20 cases of HUS in Minnesota each year, health officials said.

E. coli outbreaks often are linked to undercooked beef, according to the U.S. Centers for Disease Control and Prevention. The bacteria are commonly found in the intestines and feces of cattle and can get into meat during processing.

The main symptom of E. coli infection is bloody diarrhea. Proper cooking or medication kills any bacteria in meat.

— Jill Barrow is at [jbarrow@startribune.com](mailto:jbarrow@startribune.com).

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### Hemolytic Uremic Syndrome (HUS)

- **Complication of *E. coli* O157 infection in 5-10% of cases**
  - Children < 5yrs and the elderly most at risk
- **HUS triad**
  - Microangiopathic hemolytic anemia
  - Thrombocytopenia
  - Acute renal dysfunction

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### Hemolytic Uremic Syndrome (HUS)

- 5-10% of HUS cases are fatal
- 30% of cases-permanent kidney damage
- 23 cases in 2001; 4 deaths (3, 4, 6, and 73 yrs old)
- No specific treatment

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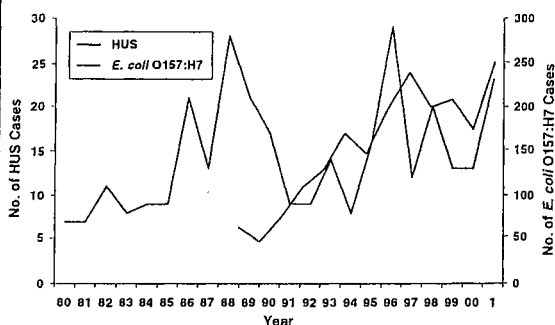
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Reported Cases of *E. coli* O157:H7 Infection and Hemolytic Uremic Syndrome, Minnesota, 1980-2001



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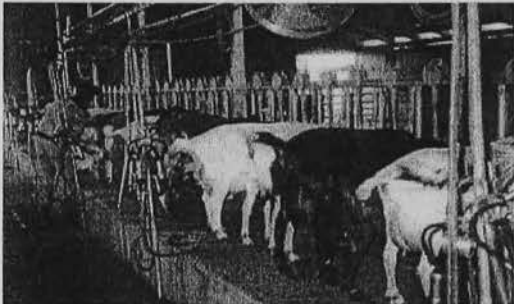
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## Prevention

- Cook ground beef to 160°F
- Avoid cross contamination in the kitchen
- Drink pasteurized milk and juice
- Wash fruits and vegetables well
- Avoid swallowing lake or pool water
- Wash hands after contact with livestock



## *E. coli* O157 and Goat Milk: Case 1

**"*Escherichia coli* O157 Outbreak  
Associated with the Ingestion of  
Unpasteurized Goat's Milk in British  
Columbia"**

Canada Communicable Disease Report  
Vol 28-01; 1 January, 2002

### Case 1

- Nubian goats co-owned by 18 families on Vancouver Island, B.C.
- Unpasteurized milk had been distributed to participating families for 10 years

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### Case 1, cont.

- 3 siblings, ages 1, 2 and 7 became ill with bloody diarrhea around Aug 14, 2001. *E. coli* O157 was isolated from the 1 year old.
- 2 children of a visiting family also were infected.
- 2 of these 5 children were hospitalized with HUS.

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### Case 1, cont

- One of 2 bottles of goat milk purchased on August 5 tested positive for *E. coli* O157.
- The bacteria was present in very low numbers in the milk.
- The genetic fingerprint of the *E. coli* O157 from all 3 stool samples from infected children matched that of the goat milk sample.

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## Case 2

**"Human *Escherichia coli* O157:H7 Infection Associated with the Consumption of Unpasteurized Goat's Milk"**

M. Bielaszewska, J. Janda et al  
Epidemiology and Infection 1997; 119(3):  
229-305

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## Case 2, cont

- From June 15 to July 4 1995, four children from Northern Bohemia, Czech Rep were hospitalized for HUS preceded by diarrhea.
- All had +O157 serum titers.

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## Case 2, cont

- 3 of 4 drank raw goat's milk from the same farm within the week before the disease.
- 5/15 of the farm's regular goat milk customers had + O157 serum titers compared to 0/45 controls.
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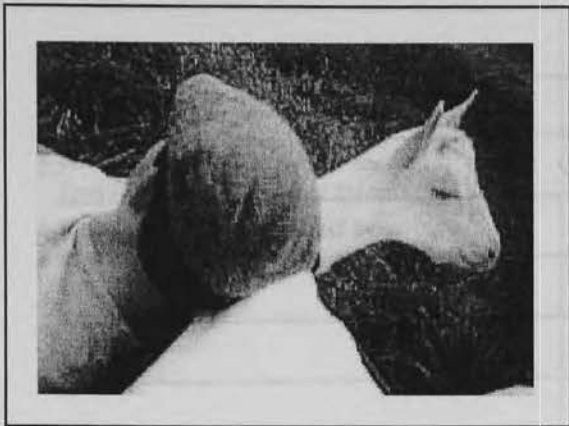
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### Case 3

**"*Escherichia coli* O157 Outbreak in Scotland Linked to Unpasteurized Goat's Milk"**

Eurosurveillance Weekly  
Issue 24, June 10, 1999

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### Case 3, cont

- 33 cases of *E. coli* O157:H7 in the Grampian region of Scotland: 22 children in a grade school class, 3 teachers, 5 family contacts
- 1 case of HUS

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### Case 3, cont

- All ate cheese made from raw goat milk by the grandmother of one of the pupils
- *E. coli* O157 strains isolated from the goat and the children were identical.



### Conclusion

- *E. coli* O157 exists in Minnesota livestock
- *E. coli* O157 is probably less common in goats than in cattle, but goats can carry the bacteria and it can spread to people from goats and unpasteurized goat milk products



### Conclusion

- Raw goat's milk is used as a nutritional substitute for cow's milk particularly in young children; this is the group most susceptible to *E. coli* O157 infection and HUS
- We haven't identified a case of *E. coli* O157 or HUS related to unpasteurized goat milk in Minnesota, yet.

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### Discussion

Is it a matter of time?

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### Discussion

The product label on the distributed milk from the BC case read:

"Milked under the strictest sanitary conditions. If pasteurization is desired, heat at 72.8 ° C for 30 seconds then refrigerate"

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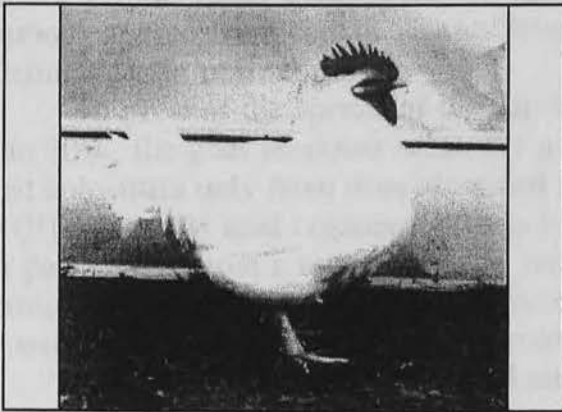
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## Discussion

What if we labeled goat's milk with:  
"Pure raw goats milk. Even though  
this milk is produced under the  
strictest sanitary conditions, it may  
contain pathogens that cause illness  
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pasteurization by heating to 165 ° F  
for 15 seconds, then cooling rapidly"



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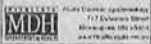
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Minnesota  
Foodborne  
Illness  
Hotline

Call to report  
foodborne illness

Toll free statewide:  
1-877-386-3455  
1-877-FOOD ILL



**Foodborne  
Illness Hotline**

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## Notes:

## KID NUTRITION "NOTES"

By: Gary M. Pusillo Ph.D. P.A.S.

Dairy goat kids should be removed from the dam at birth and hand fed colostrum. It is important to get 2 to 4 oz. of colostrum in a kid as quickly as possible after birth. Tube feeding 1 to 2 oz. of colostrum every 2 hours helps to stimulate kids that are too weak to stand and nurse on their own. Colostrum should be fed 3 times a day for at least 2 days with 3 days being more desirable. A small kid weighing 3 to 4 lbs. should be consuming approximately 8 oz. per day for the first 2 to 3 days whereas larger kids weighing 8 to 10 lbs. should be consuming 12 to 16 oz. with some consuming up to 20 oz. per day. Larger volumes of colostrum must be divided into multiple small feedings to help prevent scours due to overeating.

It is essential to make sure the kids receive colostrum within the first twenty-four hours after birth since the gamma globulin, which contains the kid's only source of antibodies, decrease their ability to be absorbed after this time. In addition to the antibodies, colostrum contains higher levels of total protein, milk solids, lactose, fat, and vitamin A than normal milk.

To prevent the spread of the caprine arthritis-encephalitis (CAE) virus, by more than 90%, the goat producer must, (1) not let the newborn kid nurse from the dam; (2) feed colostrum only from does identified as negative with the agar-gel immuno-diffusion (AGID) test; (3) feed colostrum that is heat-treated to 132° F for 1 hour; (4) raise kids on pasteurized goat's milk or a milk replacer; and (5) keep the kids in isolation from infected goats. There are also commercial colostrum supplements available that look promising as a replacement for goat colostrum.

Ideally a high quality direct fed microbial should be given right at or shortly after birth. Direct fed microbials afford a natural, biological approach to some of the problems of health and nutrition seen in newborn kids.

After the kids are removed from colostrum feeding, goat milk, cow milk or a commercially available milk replacer can be fed. If feeding goat milk is not a viable practice, kids will perform best on milk replacers specifically designed for goats. Milk replacers for kids should contain 16% to 24% fat and 20% to 28% milk-based protein on a dry matter basis. The higher the milk-based protein one can economically go, the better the performance one will see in the kids. The quality or value of the protein source is dependent on the way in which that protein has been processed. The milk proteins are products or by products of the milk processing industry, with skim milk historically used as a major source of protein in kid milk replacers. Currently whey protein concentrates are becoming more popular as a protein source since the demand for skim milk in the human diet has increased.

Milk replacers generally contain tallow or lard or combinations of these as their principle fat source. Fats that have been homogenized and emulsified during their

manufacture are regarded as having enhanced digestibility. Synthetic emulsifiers, including mono - and diglycerides, and natural emulsifiers, such as lecithin are suggested additions. The addition of lipase enzymes is highly recommended to aid the kid in the break down of the fat. Lamb milk replacers are usually too high in fat and can result in scouring if not diluted. Usually kids perform only satisfactorily on calf milk replacers if they are not overfed and if the fat contents are not too high.

Regular feeding of controlled amounts of milk or milk replacer will prevent scours and other digestive upsets. Multiple small feedings are best to reduce the incidence of bloat but may not be practical on many farms. The rate at which kids are switched to twice daily feedings varies with management goals. Table 1. indicates a schedule for feeding a dairy goat kid.

Table 1. Milk Feeding Schedule  
For A Dairy Goat Kid

	Number Of Feedings Per Day	Amount Of Milk Per Feeding(1)		Maxi- mum(2) Amt Per Kid Daily (OUNCES)
		Starting With (OUNCES)	Increasing To (OUNCES)	
1 to 2 days (colostrum)	4	3	4	16
3 to 7 days	3	6	7	21
1 to 8 weeks	2	9	16	32
2 to 4 months	2	16	20	40

- (1) Reconstituted milk replacer should be approximately 90-100° F.
- (2) The maximum amount of milk or milk replacer per day will vary with the size, weight, body condition, breed of the kid and with the environmental conditions of the facility in which it is raised.

From the first week of life, kids can be offered small amounts of starter feed. Forage should be offered to kids at the same time to aid in rumen development.

Milk and milk replacer can be discontinued if the kids are consuming hay and grain well. Kids suffer minimal weaning shock if they are consuming at least 1/2 lb. of a 16% protein goat starter daily, in addition to a quality free choice forage.

Kids can be weaned early (4 weeks of age) but this practice is not recommended for herd replacements. Six to 10 weeks of age is a more typical age to wean with some producers feeding milk up to 4 months of age. Kids have less weaning shock if they weight 20 to 25 lbs. at weaning. As the kids approach weaning, gradually add warm water to their milk diet to ease the stress of weaning.

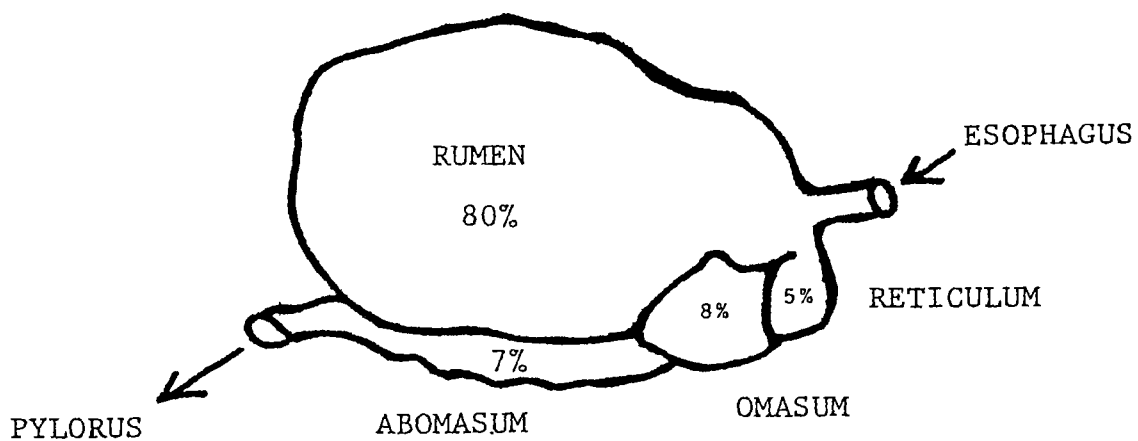
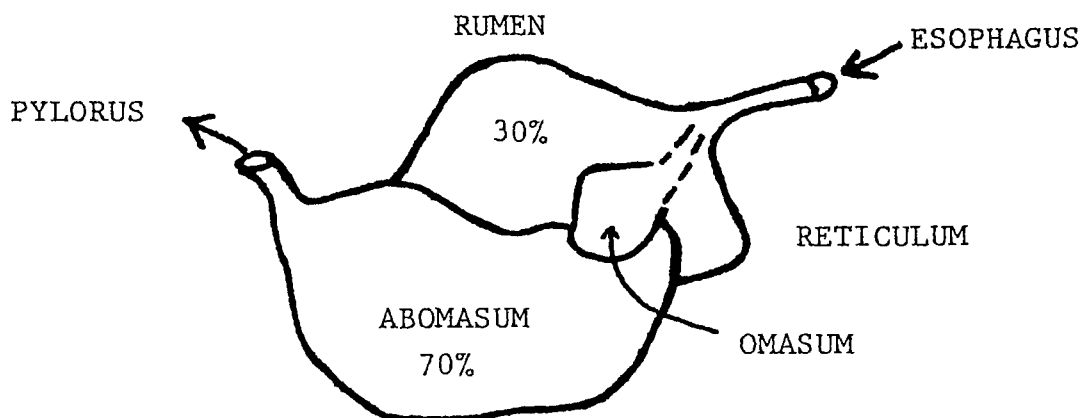
### Post Weaning Kids Through Yearlings

After the kids are weaned, feed them a quality forage free choice, plus 1/2 pound per day of a 16 percent protein grain mixture. From about 6 months to 12 months of age, animals should be fed 1 pound per day of a 16 percent protein grain mixture. If forage is of poor quality animals may require up to 1 1/2 pounds of grain daily. Replacement does should be watched carefully to prevent over fattening or under conditioning.

### Yearlings

Good quality forage (hay or pasture) fed free choice, plus 1/2 to 1 1/2 pounds of the same grain mix that is fed to the milking herd should be fed depending on the condition of the animal. Over fattening of does, resulting from over feeding of grain rations, causes damage to the liver, and to the future lactation of the doe. It also causes damage to the rumen in terms of parakeratosis and of sloughing of the rumen lining.

GOAT KID

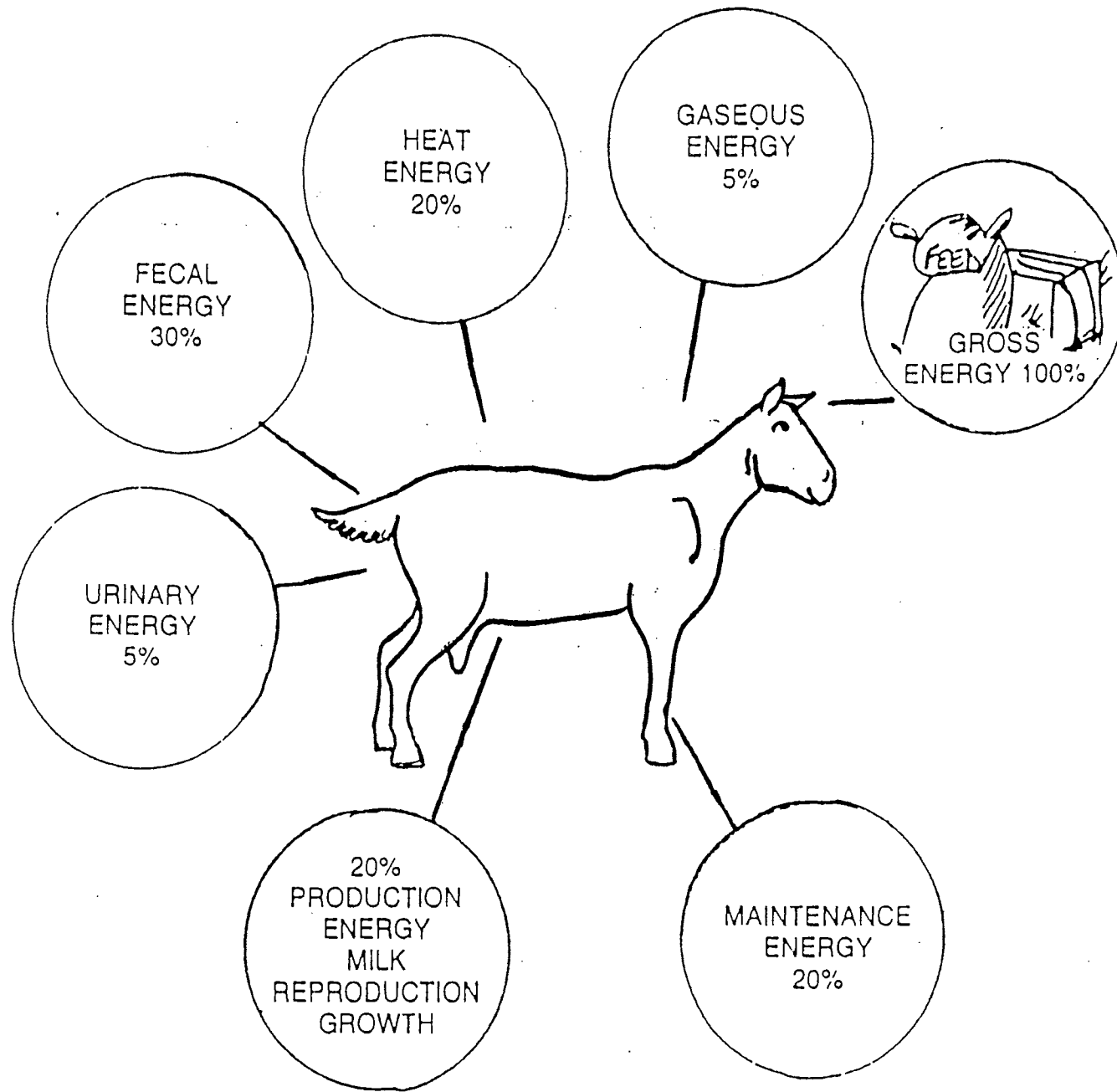


ADULT GOAT

*The four stomach compartments of young and adult goats, showing relative changes in dimensions from pre-ruminant to ruminant status.*







*Energy utilization by a lactating doe showing average partition of feed energy.*

# SBP GOAT MILK REPLACER FUNCTIONALITY PROFILE

## NUTRITION

### Consistent Ingredients

- "All Milk" Protein Sources
  - Added at levels vital to the support of critical physiological functions indispensable to optimum performance.
  - Actually included at rates which assure a definite biological function.
  - Rigidly screened for quality standards to assure consistency, stability, purity palatability and potency.
  - Easily digestible carbohydrate sources.
  - Reliable sources of energy (not
- Palatable
  - Excellent Flavor release
  - Pleasant Mouth Feel

### Live Direct-fed Microbials

- A source of Lactic Acid producing bacteria which are resistant to most antibiotics
- Offers digestive benefits
- Helps direct and enhance the natural symbiotic relationship between microbials and the Host animal
- Improved herd health and kid performance....Naturally
- Promotes homeostasis in the digestive tract

### Nutricines

- The crucial link between health and nutrition.
- Components that improve the digestion of the milk and help the absorption of nutrients from the gastrointestinal tract so as to provide nutrients for growth and development of the body.
- Components which exert a beneficial effect upon health rather than contribute directly to nutrition.
- Shifts in microbial population numbers and species
- Helps to improve feed utilization

### Critical Nutrients

- Bioavailable forms of Trace Minerals and Vitamins.
- Provides a Technological edge for kid performance
- Unique balance
- Offers a broad range of enzymatic activity which aids in the digestion of feedstuffs
- B-Vitamins at unequalled levels and ratios.
- Other Vitamins at levels designed for the neonatal goat.

## SENSOR

## SBP GOAT MILK REPLACER

- Positive Olfactory impact
- Visual uniformity
- Appropriate color
- Consistent intake
- Exclusive flavors

- Versatile feeding levels
- Consistent Ingredients
- Microencapsulation of Direct-fed Microbials
- User controlled percent solids
- Immediately Dispersible In water

### Processing/Preparation

- Packaging protects the viability of live cell cultures
- Adaptable
- Reconstitute as needed
- Convenient form

### Handling

- Stable through normal feed preparation
- Heat Stability
- Viability guaranteed
- Long Shelf Life when properly stored.

### Storage/ Stability

- No distressed ingredients are ever used
- consistent use of specific ingredients.
- Provides adequate allowances that assure proper intake of nutrients under most requirement periods.
- Formulations do not change so your kids do not experience digestive disturbances due to variations in its normal diet.
- no collective terms used on tags to cover up the use of products you would never feed your kids.

### Feed Safety

## PHYSICAL/

## SPB Goat Milk Replacer Features:

- \* All Milk source of Protein
- \* Enhanced with specific Amino Acids
- \* Reliable sources of energy (not just added fat)
- \* Contains M.C.T.s
- \* Emulsifiers to enhance digestibility of fats
- \* B-vitamins at unequaled levels and ratios
- \* Other vitamins at levels designed for the neonatal goat
- \* Vitamins and Minerals provided in highly bioavailable forms and at levels and proper balance necessary for rapid early growth and to maintain health
- \* Mineral levels are actually designed for the unique requirements of the neonatal goat
- \* Easily digestible carbohydrate sources
- \* Digestive enzymes
- \* First Milking Bovine Colostrum
- \* Flavor and appetite enhancers
- \* Nutricines

## **The Use of Mannan Oligosaccharides in Maintaining Balance in Goats**

by Gary M. Pusillo, M.S., Ph.D., P.A.S., A.C.A.N.

Goats are constantly besieged by stressors and changes within and around them so it is essential for their health to achieve a harmonious inner balance. Walking the tightrope of health, balance and stability can be hard to maintain. The balance point is non-dimensional but quite real. Lose it even slightly and the goat must put out tremendous effort to regain it. But when the goat rearing program is on target, there is little effort to be made in maintaining balance. The goat can then grow and develop under situations where all external forces cancel out, by virtue of precise arrangement, one against another thus improving overall performance. In balance there is harmony in the very midst of chaos. Mannan Oligosaccharides are an essential tool in today's goat rearing programs to help maintain a balance between pathogenic organisms and benevolent species.

The balance of health is dynamic. The elements and forces making up a goat and the changing environmental stressors impinging on them constitute a system so elaborate as to be unimaginable in its complexity. Goats are islands of change, subject to cycles of rest and activity, eating and fasting, of secretion of hormones, and of the rise and fall of powerful instinct, subject to noise, irritants, airflow, humidity, temperature, crowding, handling, odors, confined space, inoculations, agents of disease and physical trauma. The variables are infinite and all are in flux and motion. That equilibrium occurs even for an instant in such a system is miraculous, yet many goats are mostly healthy most of the time, their bodies always trying to keep up the incredible balancing act demanded by all the stressors from inside and out. Moreover, they do it dynamically, since equilibrium is constantly destroyed and recreated.

Mannan Oligosaccharides aids in the achievement of balance in the goat by flooding organs with free-floating oligosaccharide molecules designed to clog up sugar-seeking binding sites on invading disease-causing organisms. In theory the bacteria, unable to attach themselves to prey, will be flushed away. It has been demonstrated that when selected pathogens are inoculated with mannan, this complex carbohydrate does not support growth. However, benevolent species such as lactobacilli appear to have the enzyme complexes necessary to use this sugar. Mannan oligosaccharides also seem to assist the process of phagocytosis as this process increases in the presence of mannan oligosaccharides in some species of animals. A 1993 article in *Scientific America* by Janeway reports that oligosaccharides containing mannose may also affect the immune system by stimulation of the liver to secrete mannose binding protein. This protein binds to the capsule of bacteria and triggers the immune system to respond.

Veterinary medicine still focuses on disease, giving it a failure orientation. Its practitioners still act as though disease catches animals rather than understanding that animals catch disease by becoming susceptible to the seeds of illness to which animals are constantly exposed. Mannan Oligosaccharide is considered in the new class of substances I call Nutraceuticals, which are used to maintain a dynamic balance within an animal's body, naturally working with the natural processes in the animal, complimenting and enhancing an animal's ability to maintain balance in a changing environment. "Nutraceuticals" in no way denies the solid achievements of orthodox veterinary medicine. It would be foolish to seek alternative therapy for conditions that orthodox veterinary medicine treats very well. "Nutraceuticals" like mannan oligosaccharide give the farmer a valuable and efficient alternative to costly high-tech veterinary medicine. Prevention of costly problems is the goal of most "Nutraceuticals" rather than treatment as is the focus of pharmaceutical drugs. Certainly, there is a place for pharmaceuticals, particularly for the treatment of emergency conditions, where time is of the essence, but for the routine management of common

**Energy Source**

ADULTS AND WEANED KIDS

Omega Shake - two ounces/head/day

NURSING KIDS

Omega Shake - one ounce/head/day

**Electrolytes**

ADULTS, WEANED KIDS AND NURSING KIDS

Meadow Mate Electrolytes, Enzymes and Direct-fed Microbials added to water at 1/4 lb/gallon

**Nutraceuticals**

ADULTS AND WEANED KIDS

Capture 5 - 7 grams per head per day (divide into two feedings)

**During Period When Animal is Under Influence of Stressor**  
*(The day of experience and for 1 week following)*

**B Vitamins**

ADULTS, WEANED KIDS AND NURSING KIDS

Meadow Mate Soluble B Vitamins fed at 56.75 mg/lb body weight

**Vitamins and Minerals**

ADULTS AND WEANED KIDS

Meadow Mate #7 or #12 Free Choice

**Direct-fed Microbials**

ADULTS AND WEANED KIDS

Lactivate Dry - 2 ounces/head/day

OR

LactoGel - 15 mg/head/day

NURSING KIDS

Liquid Lactivate - 2 ounces/head/day

OR

LactoGel - 10 mg/head/day

**Energy Source**

ADULTS AND WEANED KIDS

Omega Shake - two ounces/head/day

NURSING KIDS

Omega Shake - one ounce/head/day

**Electrolytes**

ADULTS, WEANED KIDS AND NURSING KIDS

Meadow Mate Electrolytes, Enzymes and Direct-fed Microbials added to water at 1/4 lb/gallon

**Nutraceuticals**

ADULTS AND WEANED KIDS

Capture 5 - 7 grams per head per day (divide into two feedings)

illnesses, exclusive use of these strong drugs is technological overkill. Nutraceuticals" like mannan oligosaccharide also work very well as compliments to orthodox methods. In some cases combining therapies make good sense.

Rejection of simple natural methods in favor of reliance on technology is expensive. Orthodox treatments have now become so expensive that many livestock producers cannot afford it.

Healing and maintaining balance is a natural process, common to all life. If we want to foster healing, balance and promote health, we should pay attention to the ways of nature and learn to encourage the body's own innate mechanisms of self-repair and homeostasis. This is the basic principle of "Nutraceuticals". Far from being simply the absence of disease, health is a dynamic and harmonious equilibrium of all the elements and forces making up and surrounding an animal. Health is wholeness - wholeness in its most profound sense, with nothing left out and everything in just the right order to manifest the mystery of balance. Mannan oligosaccharides aid the goat in the achievement of balance, and it marks the beginning of a new perspective on health. Remember that the goat's body has remarkable powers of healing and self-repair. Nutraceuticals" begin and end with that simple truth. It is your job as an important part of the goat industry to make intelligent choices of methods to activate and enhance those powers. Mannan oligosaccharide is an encouraging alternative therapy that shows excellent potential in complimenting the natural process of maintaining a harmonious inner balance within goats.

## Cost Effective Goat Nutrition in Meat Production

by Gary M. Pusillo, Ph.D., P.A.S., A.C.A.N., Diplomat

Optimum performance and ultimately cost effective nutrition results from goats that are healthy, comfortable and fed an excellent diet. The variability among goats are caused by genetics, nutrition, disease, hormone and tissue-specific regulatory factors and the environment. A goat's potential for growth development and production is provided by heredity with maximization or minimization of this potential determined by the goat's environment. Environmental conditions to which goats are exposed are nutrition, climate conditions, disease levels and various management techniques. Holistic meat production views the whole picture of an operation and how each individual part effects the profitability of the total program.

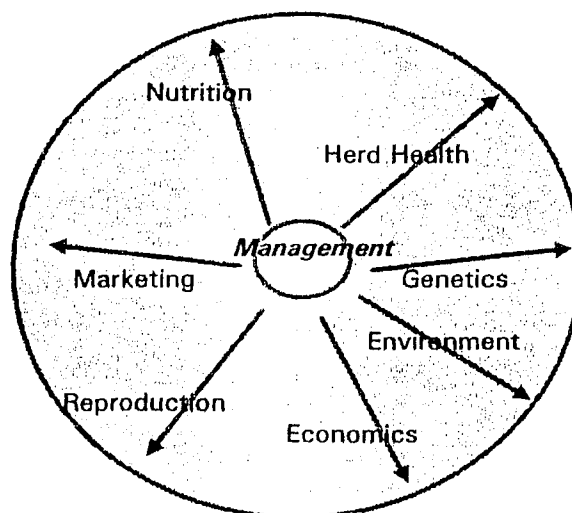
The goat industry is undergoing an increased awareness of the essentials for highly technical information, professional nutritional advise, knowledgeable veterinary care, productive management techniques and creative marketing that is geared to overcome the considerable volume of condemnatory abuse leveled at goats and their products. Along the journey to find this information the goat producer will come upon many situations and circumstances where they must make a decision as to what is cost effective, adaptable, profitable and logical to use in their particular operation.

The best management decisions are made by those who are in possession of the most facts. The facts can be used to create:

- The best type and genetic make-up of a herd to fit a particular need
- The best use of feed supplies
- The best use of capitol and labor supplies
- The optimum external environment for a chosen genetic make-up
- A ration best adapted to the conditions of the goat operation
- The most productive use of the land

The manager with the most facts will ultimately be able to improve the efficiency and productivity of the goats cared for.

The manager must always remember that maximum profitability can only be achieved through a well planned, holistic or total goat program. If we visualize the goat operation as a spoked wheel, management would be at the hub, with the spokes of nutrition, herd health, marketing, genetics, reproduction economics and environment completing the strength of the wheel. The wheel is only as strong as each of the individual spokes.



## **Omega 3 Fatty Acids “The Nutritional Missing Link”**

by Gary M. Pusillo, Ph.D., P.A.S., A.C.A.N., Diplomat

Fats in feed supply essential fatty acids which are necessary in the diet since the body cannot produce them independently and yet cannot do without them. The amount of *essential fatty acids* (EFA) needed is small. However, under many conditions, some animals still do not get an adequate amount of all EFA. It is generally accepted that linoleic, linolenic and arachidonic acids are dietary essentials.

Because corn and other vegetable oils used in typical animal diets are particularly rich in linolenic acid, supplying sufficient levels of this essential fatty acid in the regular ration is usually not problematic. However, another type of EFA, the Omega-3 EFA, is not always in sufficient amounts in many animal diets.

The general important functions of EFA in animals are as follows:

- Essential to young animals for proper growth
- Needed to prevent abnormal drying and flaking of skin and non-specific dermatitis
- Used to perform various metabolic roles
- Indispensable in the structure and functioning of cell membranes
- Raw material for hormone-like substances regulating nearly all body processes

Prostaglandins are extremely active biological substances made from EFA that regulate nearly every body function. Prostaglandins are just EFA with a knot in their carbon chains.

Prostaglandins help control:

- The inflammatory process
- The healing and repair process
- The immune system
- The neural circuits in the brain
- The cardiovascular system
- The digestive and reproductive systems
- Thermoregulation and calorie loss

A deficiency of EFA causes a variety of disorders. Some of those recognized classically are:

- Non-specific dermatitis, itching, flaking & peeling skin, hair loss
- Neurological disorders, restlessness and general weakness
- Easy bruising, pain, inflammation and swelling of joints
- Infertility, abortion and kidney problems

### **What is Omega-3 EFA?**

Most vegetable oils used in animal diets have a high content of the group of polyunsaturated fats called Omega-6 Fatty Acids. But most of the vegetable oils have very little Omega-3 polyunsaturated fat.

The work that is done by EFA in the body is done by both Omega-6 and Omega-3 EFA's. It now appears that for many purposes Omega-3 EFA actually does a much better job than does Omega-6. And the very best job is done when they are combined in the right proportions.



The difference between the Omega-3 and Omega-6 EFA is that the EFA belonging to the Omega-3 family are more polyunsaturated than those belonging to the Omega-6 family. (Omega, the last letter in the Greek alphabet, refers to the last carbon in the chain.)

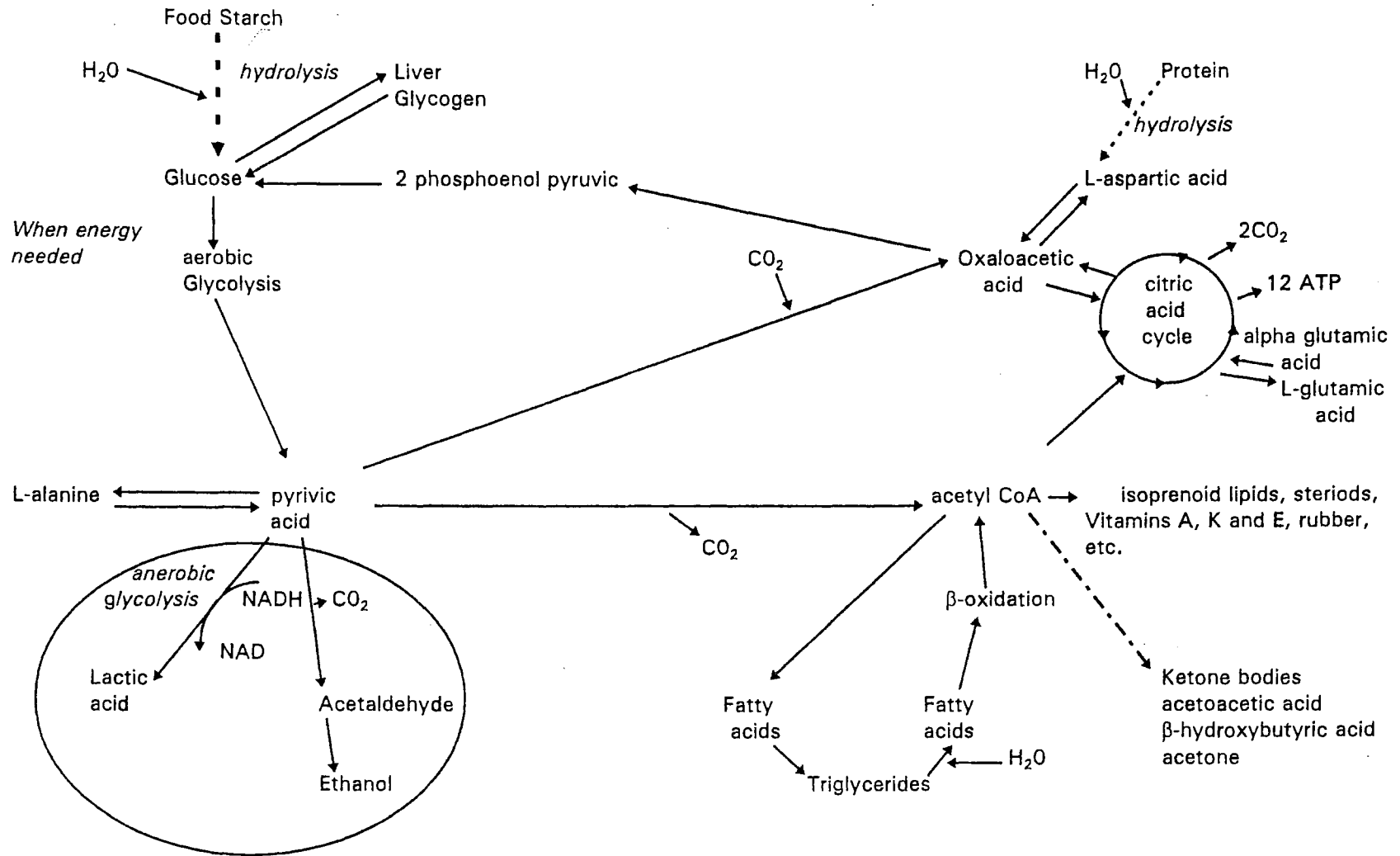
An Omega-3 EFA is one in which the unsaturation (indicated by a double bond between two carbons) begins only three carbons in from the Omega carbon, while an Omega-6 EFA is one in which the unsaturation begins six carbons in from the end. As a result, the Omega-3 EFA has more regions of unsaturation along the chain than does the Omega-6 EFA. In fact, the lowest member of the Omega-3 family, called alpha linolenic acid, has three regions of unsaturation or double bonds. Other Omega-3 members have four, five (EPA or eicosapentaenoic acid), and six (DHA or docosahexaenoic acid). In contrast, the lowest member of the Omega-6 family, called linolenic acid, has only two regions of unsaturation, while the other members have three (GLA or gamma linolenic acid) and four (AA or arachidonic acid).

### **Why use linseed oil for Omega-3?**

Even though fish oils are an excellent source of Omega-3 EFA, EPA and DHA, fish oils do not supply the simple alpha linolenic acid, which has special functions. Nutritional linseed oil, made from flax seed is very high in Omega-3 EFA and especially alpha linolenic acid, ALA. Alpha linolenic acid is the basic Omega-3 EFA – the body cannot make it – and the only one affecting certain enzymes regulating the production of specific types of prostaglandins. From ALA the body can then normally make the EPA and DHA found in fish oils.



# Integration of Metabolism



## Vitamin E Function and Deficiency Characteristics in Goats

*by Gary Pusillo, Ph.D., P.A.S.*

Vitamin E and selenium play an important role in efficient, profitable goat production and in maintaining optimum health. Vitamin E and selenium are usually considered together in discussions because both function as antioxidants and each has additional specific functions related to maintaining health. Because of the impact vitamin E has on the overall nutritional status of the goat, we will take a closer look at vitamin E and the causes and effects of vitamin E deficiency.

There is an important interrelationship between vitamin E and selenium. Vitamin E can substitute to a certain extent for selenium, and selenium can likewise substitute for some of the vitamin E, but neither one can substitute entirely for the other. Both of these nutrients are needed by the goat and both have a metabolic or nutritional role in the body. Vitamin E in cellular and subcellular membranes is the first line of defense against peroxidation of vital phospholipids. Selenium, in glutathione peroxidase, is the second line of defense which destroys these peroxides before they cause damage to the membranes (Scott, 1979). For complete protection, both vitamin E and selenium are required particularly when cells are in very active areas and dietary polyunsaturated fatty acid (PUFA) levels are high (Bieber-Wlaschny, 1989).

Vitamin E functions in at least two metabolic roles: 1) as a fat soluble antioxidant and 2) in a more specific role interrelated with the metabolism of selenium (Scott, 1979). Housed goats fed stored feeds with no access to green feeds are more likely to experience deficiency. The increasing use of fats or the utilization of feeds with unsaturated fatty acids which are susceptible to rancidity warrants the use of higher levels of vitamin E, since rancidity destroys vitamin E. Vitamin E also helps to maintain red blood cell levels and to act with selenium in prevention of exertion myopathy (Hintz, 1987).

Deficiency symptoms in goats are similar for vitamin E and selenium. The classic symptom of vitamin E deficiency is muscle degeneration (nutritional muscular dystrophy). An affliction of the muscle is evident when some of the goats in a herd are unable to rise or exhibit an uncoordinated, staggering gait. Degenerating muscles become edematous and white (white muscle disease). This syndrome is most common in young, fast-growing kids up to 6 months of age and less common in adults but may be seen occasionally at any age, including nursing kids or freshening does. Kids with nutritional muscular dystrophy show the following; too weak at birth to suckle, inhalation pneumonia due to muscle weakness of the larynx and pharynx, (milk will leak out from the nostrils), muscle stiffness after exercise, progressive degeneration of motor muscles resulting in clumsy, unsteady movements of the hind quarters. Also kids lie down a great deal and can hardly be made to stand and often have coffee colored urine because of myoglobin released from damaged muscle cells.

Other general symptoms suggesting marginal or advanced vitamin E deficiency are retarded growth, weakness or increased mortality of newborn kids, lameness or unsteady gait, poor reproduction, poor coordination or other nervous signs, reduced feed intake, anemia, increased incidence of hemorrhaging with trauma or surgery. These symptoms may be initially brought on following a period of unaccustomed exercise.

In the goat cardiac muscle, the diaphragm and other skeletal muscles may be affected. At the time of necropsy, special attention should be paid to muscles of the limbs, diaphragm, heart, tongue and pharynx. These will appear white to gray and lesions will be bilaterally symmetrical. Lesions may extend through the heart muscle into the papillary muscles as well. However, care must be given to consider other reasons for major internal muscle

paleness such as profound anemia from bloody scours, hemoparasitic diseases, gut parasites, external parasites, copper, cobalt or iron deficiency, just to name a few.

Clinical conditions characterized by cellular damage occur very often after a period of stress, such as change of feed or housing, transportation and weaning. Currently, marginal deficiencies may be observed more frequently than clinical ones. They are usually not visible but may impair production performance and reproduction because these depend on cellular structure and function (Bieber-Wlaschny, 1989).

It is important to remember that to the goat not all vitamin E is equal in its bioavailability. Vitamin E activity in goat feed is derived from a series of compounds, the tocopherols and tocotrienols. Eight forms of vitamin E are found in nature, four tocopherols and four tocotrienols. The alpha tocopherols have the greatest vitamin E activity for the goat and are therefore the most desired form to use when formulating goat feed. When a goat feed ingredient lists "Vitamin E Supplement", the type of vitamin E being used cannot be known by the consumer and may not be known by the feed salesman. Vitamin E supplement is "a feeding material used for its vitamin E activity". The only stipulation is that it must have at least 10,000 International Units of Vitamin E per pound. There are no restrictions or stipulations regarding the ability of the animal to actually utilize the nutrition (bioavailability). Therefore there is no stipulation on the form of Vitamin E that can be used when "Vitamin E Supplement" is the ingredient. Consumers need to read ingredient tags carefully and select those that actually specify alpha tocopherol as the Vitamin E source to insure their animals maximum bioavailability.

A summary of the factors that may influence the vitamin E needs of goats under production conditions include:

- Variable content of vitamin E and limited bioavailability of naturally-occurring sources of vitamin E (tocopherols) in feedstuffs
- Poor quality feedstuffs may supply limited amounts of vitamin E
- Poor stability of naturally-occurring sources of vitamin E (tocopherols) in feedstuffs during processing and storage
- Improved genetic potential of goats for enhanced productive and reproductive performance may increase their vitamin E needs
- Stress or disease may reduce feed intake and/or intestinal absorption of vitamin E, limiting availability of the vitamin to the animal
- Intense management causes stress and also reduces access to pasture which is a good source of vitamin E
- Restricted feeding practices and/or improved feed efficiency may lower intake of vitamin E by decreasing feed intake
- Amount of selenium in the ration
- Antagonists of vitamin E such as unsaturated fats in feedstuffs and complete feeds (Hoffman-La Roche, 1989)

Since many producers are beginning to feed higher levels of fat in the rations, I would like to expand on the effect of dietary polyunsaturated fatty acid (PUFA) levels on vitamin E requirements. In general, the higher the PUFA level in feed, the greater the requirement for vitamin E to prevent lipid peroxidation.

In 1977, Weiser and Salkeld reviewed the literature published on vitamin E research related to PUFA. They found that the amount of additional vitamin E required to protect each gram of PUFA in the diet varied from 1.0 to 3.0 mg for monogastric farm animals. Field experience indicates that the same pattern is evident in ruminants as well.

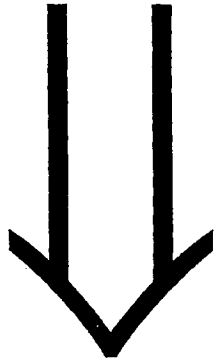
Optimum vitamin nutrition is a concept that pertains to all essential vitamins for goats. This concept, as it pertains to vitamin E for goats, is described as follows:

Optimum vitamin E nutrition means providing optimum vitamin E allowances in nutritionally-balanced diets to help permit optimum growth rate, feed efficiency and reproductive performance in goats under commercial production conditions. Optimum allowances of all other essential nutrients must also be supplied.

Vitamin E fortification affords the best assurance that the feed will provide optimum vitamin E nutrition.

## Vitamin E

General symptoms suggesting marginal or advanced vitamin E deficiency



Characteristic symptoms and conditions of advanced Vitamin E deficiency

### General Symptoms

- Reproductive disorders (testicular degeneration, atrophy of the ovaries)
- Poor uterine involution
- Retained placenta
- Kidney degeneration
- Reduced growth rate
- Reduced feed intake
- Decreased milk production
- Immunodeficiency
- Dry, Thin haircoat, general seborrhea and scales on skin
- Periorbital alopecia
- Increased mortality
- Poor coordination
- Anemia
- Weakness

### Characteristic Symptoms

- Nutrition muscular dystrophy (white muscle disease)
  - Inhalation pneumonia in kids due to muscle weakness of the larynx and pharynx (Milk will leak out from nostrils.)
  - Muscle stiffness in kids after exercise
  - Progressive degeneration of motor muscles resulting in clumsy, unsteady movements of the hind quarters
  - Kids lie down a great deal and can hardly be made to stand
  - Urine may be coffee colored because of myoglobin released from damaged muscle cells

## Addressing The Strain of Travel with Superior Nutrition

by Dr. Gary Pusillo

Whether showing or selling animals, transportation becomes a necessary part of many production facilities. Anyone who has ever transported animals can attest to the fact that animals typically have an adverse reaction to travel. Considering all the changes in the environmental stimuli, that response is not surprising. Most animals, being creatures of habit and highly sensitive to change, respond unfavorably to those changes. That adverse reaction can many times defeat the purposes for which the animal was transported in the first place. Whether being shown or sold, it is important that animals be able to demonstrate their best physical presence. Travel pressures very often diminish the animal's overall condition, a circumstance not overlooked by judges or potential buyers.

To speak of travel pressures, it is important to be able to correctly use the words "stress" and "strain". For most people, those two words could be used interchangeably and unfortunately, in our society, stress has become an overused buzz word utilized to convey anything from a general feeling of anxiety to tension, apprehension, trepidation, disquietude, or misgiving. While those synonyms are not entirely incorrect, for scientific purposes, a single, precise definition is needed.

In the scientific arena, a *stressor is defined as an individual environmental factor that contributes to the stressful nature of an environment or any environmental factor that provokes an adaptive response. Strain is any adaptive, functional, structural or behavioral reaction to an environmental stimulus.* An environmental stress is any environmental situation that provokes animal strain. Therefore, according to the above definitions, an animal in a state of stress is undergoing strain in order to cope with adverse aspects of its environment.

Most animals have become accustomed to familiar sights, sounds, smells, and handlers and to some sort of routine. Travel disrupts most, if not all that has become familiar. Consider the unusual noises a transported animal must encounter, sort out and respond to. Then add the probability of a confined space, crowding, the potential of physical trauma from being jostled around, continual movement, concentration of excrement, changes in temperature, humidity, air flow, lack of food and water, the length of the trip and the unavoidable contact with strangers and one can begin to understand the tremendous potential for strain.

All living organisms, livestock included, strive to achieve a state of homeostasis (balance). When the immediate environment changes radically with multiple factors involved, the maintaining of balance is greatly encumbered. There are a number of metabolic changes that occur when the animal is unable to meet all the physiological demands caused by the onslaught of stressors. These changes have a cascading effect, are interrelated and interactive. Some of the net results manifest as tissue catabolism (destruction), development of metabolic acidosis caused from ketoacidosis and increased lactic acid production with development of diarrhea, dehydration, rumen stasis, poleoencephalomalasia, laminitis, liver abscesses and increased aldosterone production to identify a few.



In an attempt to achieve homeostasis, the animal will utilize the following vitamins and minerals at a greater rate, often leading to deficiencies if proper supplementation is not given:

**Vitamins**

Vitamin D  
Pantothenic Acid  
Niacin  
Pyridoxine  
Riboflavin  
Thiamine  
Folic Acid  
Vitamin B<sub>12</sub>  
Biotin

**Minerals**

Calcium  
Phosphorus  
Potassium  
Magnesium  
Zinc  
Copper  
Salt

A thorough understanding of all the intricacies and interplays of nutrition is not necessary for a producer to successfully overcome the potential imbalances that are likely to occur with the strain of transportation. It is enough to determine that since certain vitamins and minerals are known to be utilized at a greater rate during these times, specific additional nutritional should be provided.

In addition to the vitamins and minerals, it is important to recognize and remember the impact on the pH of the digestive tract, of particular importance in the ruminant, and address it with a multitude of direct-fed microbials and their metabolites. The live cultures continually reinforce the ranks of the beneficial microbes that keep potential pathogens in check. The metabolites encourage a gut environment that fosters growth of beneficial microbes while maintaining hostility toward pathogens.

A third area that bears addressing is energy. During transportation, food is usually limited and yet tremendous energy is required to cope with adversities. An easily digestible, concentrated energy source should be used to supply the additional demands. Omega-3 and omega-6 fatty acids are an excellent choice when blended in the right combinations.

Field trials utilizing goats transported in temperature ranges from 60° to 105° F. show that when a stress reduction program is begun one month prior to transportation that involved the addition of:

- highly bioavailable B vitamins
- elevated levels of a vitamin/mineral mix developed and balanced for animals (bovine or sheep formulations are not adequate) using highly bioavailable vitamins and minerals
- a direct-fed microbial product with guaranteed levels of digestive enzymes, *Lactobacillus acidophilus*, *Lactobacillus fermentum*, *Lactobacillus casei*, *Lactobacillus fermentum*, *Streptococcus faecium*, *Bacillus subtilis*, *Saccharomyces cerevisiae* and *Aspergillus oryzae*
- an energy source using the omega fatty acids

then accelerating the usage of those products two weeks prior to transportation with maximum consumption during transportation and for seven days following, the outward manifestations of transportation stress

was markedly reduced and in many cases all but absent.

The conclusion that can be drawn from these facts and trials indicate that given specific superior nutrition in anticipation of a known stressful situation, the negative manifestations often seen can be minimized because the animal is able to draw upon adequate stores of nutrition to facilitate it's attempt to maintain homeostasis. It can also be noted that transportation is not the only strain that animals are exposed to. Anytime changes are made, the animal is forced to adapt. That adaptation can be made easier by supplying additional, specific nutrition known to facilitate the achievement of homeostasis.

# Notes:

## **CAPRINE DERMATOLOGY SIMPLIFIED FOR PRODUCERS**

**Scott R.R. Haskell, DVM, MPVM  
College of Veterinary Medicine  
University of Minnesota  
St. Paul, MN**

Caprine dermatology questions are probably the most commonly asked questions to the local veterinarian. There are a few things that goat owners can do initially in the simplified self-diagnosis and treatment of simple skin conditions. I say simple because there will always be conditions that the producer must turn for professional advice (after the “local goat specialist” has failed). However many conditions are easy to diagnose and treat without extensive diagnosis and expensive treatment.

Lets start with the basics.

### **The Basics:**

Does it itch?

Does it appear to be seasonal?

Is it found only in young stock? Adults? Males? Females?

Is it diffuse (most everywhere) or localized?

Is it crusting or scaling?

Are there ulcers? Erosions?

Are there bumps? Does the skin ooze with clear fluid?

Is the skin thickened?

Is there hair loss?

Is the skin reddened?

Is it acute (a recent condition) or chronic (long standing)?

Did an outside animal bring this condition into your herd?

Did the condition come back from the fair or show?

The next step is also fairly simple, that of determining body (anatomical) positions of the disease on the affected goat(s).

### **Diagnosis by body position:**

#### **HEAD AND NECK**

Orf (contagious ecthyma, virus)

Sun burn (common in Saanens)

Staphylococcal folliculitis (bacterial)

Mange (sarcoptes)

Fly strike

Ring worm (fungal, especially ears)

Frostbite (seasonal)

Photodermatitis (drug or plant related)

Ear Mites (Psoroptic mange)

Dermatophilosis (especially ears; secondarily nose, muzzle)

Dermatophytosis (fungal)  
Zinc deficiency (usually from feeding too much alfalfa)  
Caseous lymphadenitis (CLA, bacterial)  
Weird stuff (call the veterinarian)

**TOPLINE (neck and back)**

Staphylococcal folliculitis (bacterial)  
Lice  
Fly strike  
Fleas and Keds  
Ring worm (fungal)  
Weird stuff (call the veterinarian)

**ABDOMEN AND INNER THIGHS**

Staphylococcal folliculitis (bacterial)  
Dermatophilosis (scrotum, under tail)  
Fleas and Keds  
Fly strike  
Sarcoptes (mange mites)  
Chorioptic mange (scrotum)  
Weird Stuff (call the veterinarian)

**FEET AND LEGS**

Orf (contagious ecthyma, viral)  
Ring worm (fungal)  
Contact dermatitis  
Zinc deficiency  
Mange (Chorioptic, Sarcoptic)  
Staphylococcal folliculitis (bacterial)  
Dermatophilosis  
Fly strike  
Ticks (between claws)  
Urine scald  
Foot and Mouth disease (call the veterinarian)  
Weird Stuff (call the veterinarian)

**MAMMARY GLAND**

Caseous lymphadenitis (CLA)  
Orf (Contagious ecthyma, viral)  
Staphylococcal folliculitis (bacterial, mammary and under tail)  
Chorioptic mange  
Ticks  
Fly strike (moist skin folds)  
Udder warts  
Zinc Deficiency

Weird stuff (call the veterinarian)

How to treat initially:

### **Treatments:**

Isolate affected animal(s).

Chlorhexidine shampoo

Betadyne shampoo

Athletes foot topical sprays (-azole)

Amitraz (for dairy cows)

Permethrin (for dairy cows)

Sunblock topical lotion

0.05% bleach

Rotenone kitten flea powders

Coumaphos (Co-Ral spray): may contaminate milk, use only during the dry period

CLA and Orf vaccines

Hold off on topical or systemic antibiotics until proper veterinary advice is sought.

Treatments must be thorough and extend over adequate periods of time to solve the condition. Most treatments are not vigorous enough nor do they last long enough to be of therapeutic use. Special notation needs to be made as to extra label drug and product use in meat and lactation goats. It is essential that veterinary advice be sought for appropriate drug withdrawal times to insure clean meat and milk and to avoid residue violations. Generally drugs that are approved for the use in lactating dairy cows can be used on an extra label basis in goats. Read the label thoroughly.

**Veterinary diagnosis** is more advanced though still utilizes the anatomical diagnostic scheme. Once a general plan has been arrived at (called a differential diagnosis or diagnostic list) then other veterinary diagnostic tools are utilized.

### **Veterinary Tools:**

Physical exam

Tissue biopsy

Fungal culture

Bacterial culture (aerobic and anaerobic)

Antibiotic sensitivity testing

Cytology/tissue scrapings

Impression smears

Telephone consult

One aspect of Caprine dermatology that needs to be considered is the zoonotic disease (those diseases spread from animals to humans). It is imperative that proper protection for you and other animals is maintained. Wear gloves, wash thoroughly with soap and hot water after working the affected stock. Consult a health professional if there is any question as to human spread.

## **Notes:**

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# LINEAR APPRAISAL

ADGA recognizes the need for a linear appraisal system that evaluates individual type traits that affect structural and functional durability in order to take full advantage of the potential for genetic improvement through selection. ADGA's linear system:

- Evaluates each trait individually, rather than as part of a group of traits.
- Evaluates each trait from one observed biological extreme to the other.
- Includes traits that have economic importance and are at least moderately inheritable.
- Provides a system of evaluation that can be applied uniformly on a scale of 1 to 50 points (a 50-point range has been shown to distinguish differences in body measurements with acceptable accuracy).

The linear appraisal system includes 13 primary traits and 1 secondary trait that are used by the appraiser to evaluate functional conformation. To these linear traits have been added six structural and functional areas (head, shoulder assembly, legs, feet, topline, and udder texture) that are evaluated by the appraiser as exceptional, acceptable, or unacceptable. The appraisal system also includes room for the appraiser to notate up to three remarks and/or defects. The last part of the linear appraisal system is an evaluation of the animal in the four major categories (three for bucks) and the determination of a final score for the animal. Only the linear trait scores and the animal's final score are part of the computerized linear appraisal data base used to develop sire summaries; the other information is included to provide the herd owner with additional information about the individual animals that are appraised.

Dairy goat herds evaluated with the linear appraisal system will be instrumental in helping develop the data base needed to determine the heritability of structural traits in dairy goats and, eventually, their relationship to longevity and production.

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## Primary and Secondary Traits

The term "linear" in a linear appraisal system refers to the fact that traits are rated on a linear scale that goes from one biological extreme for that trait to the other. Scores for each primary and secondary trait are assigned by the appraiser within the 50-point range that represents the biological range for the trait. Evaluation of linear traits is, except during training or in situations where verification is desired, based on observations by trained appraisers, rather than on actual measurements for each trait. As is true with dairy cattle linear systems, experienced appraisers achieve equal or greater accuracy and consistency in evaluating linear traits in much less time and cost using evaluation techniques based on observation than they do trying to make actual measurements for every trait. The biggest problem associated with making actual measurements is the difficulty in trying to restrain an animal in a natural position long enough to make an accurate measurement, especially when the differences being measured are small.

The following guidance is provided to help the herd owner understand the evaluation system for the 13 primary traits and one secondary trait that are included in the linear appraisal system. The appraiser evaluates these traits without regard for age, management or environment, or stage of lactation. The primary traits are traits that are believed to have economic importance and enough variation to provide a basis for selection when the data is summarized by sire. The secondary trait has been included in order to gather research data for further evaluation of the trait's economic and genetic importance.



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Three general criteria were used in the selection of the linear traits to be included in ADGA's linear appraisal system:

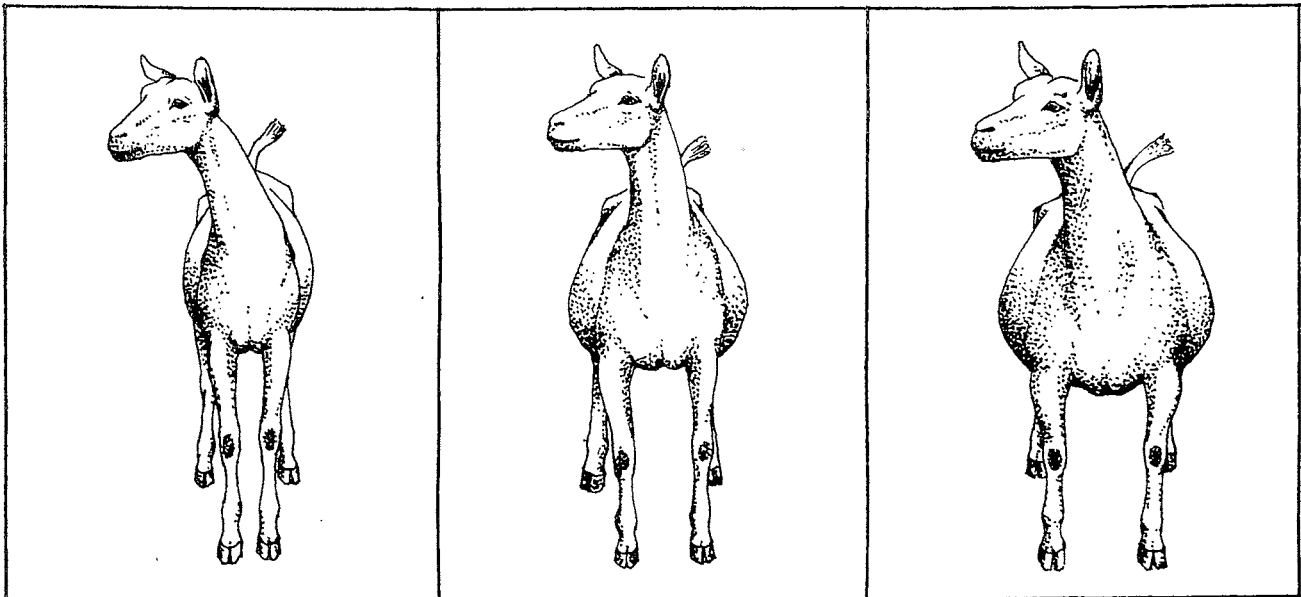
- (1) The trait must have some economic value, either in terms of increased herd life, which reduces culling rate, or in increased production.
- (2) The trait must be heritable (genetically-controlled) enough so that progress or improvement can be made at an acceptable rate through the selection of sires. Traits that are not at least moderately heritable are more effectively handled through herd management practices (such as culling) and are not suitable for inclusion in a linear appraisal system. Generally, a heritability of .15 or higher is accepted as indicating at least moderate heritability of a trait. Very little information exists on the heritability of traits in dairy goats. The heritability information that is available pertains mostly to production factors. The heritabilities used in the selection of traits for ADGA's linear appraisal system were based on 4 years of dairy cattle linear data. Although the absolute heritability of traits is not known or expected to be the same for dairy cattle and dairy goats, the relative indications of heritability of the various traits of interest should be the same or similar. One of the potential products of ADGA's linear appraisal system is the determination of the actual heritabilities of type traits for dairy goats when enough linear data has been gathered.
- (3) It must be possible to assign a value to the trait with acceptable repeatability among appraisers. This means that it must be possible to define the trait and all its components and the associated evaluation criteria precisely enough that the trait can be evaluated by appraisers with acceptable repeatability.

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**FORM — STATURE**

The appraiser's evaluation of stature is based on the distance from level ground to the top of the withers. Goats 26" or less are considered extremely short and assigned five points or less. Goats that are 30" tall are considered intermediate in stature and assigned 25 points, while goats at least 34" tall are considered extremely tall and assigned 45 or more points. For each 1" difference in height, plus or minus, the point assignment changes by five.

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**FORM — STRENGTH**

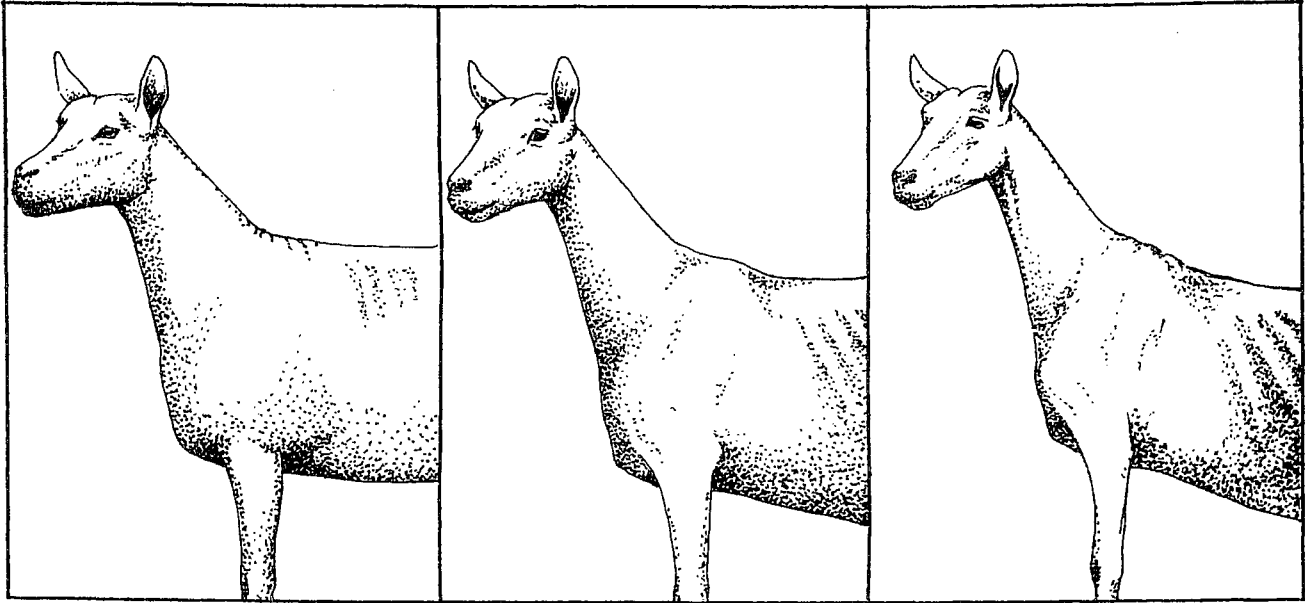
1-5 Points  
Extremely narrow and frail

25 Points  
Intermediate width and strength

45-50 Points  
Extremely wide and strong

The width and depth of the chest, the width of the muzzle, and the substance of bone in the goat's front end are used to determine the strength of the goat. The range for this trait is from extremely narrow and frail to extremely wide and strong. Width and strength is associated with the likelihood the goat can sustain high production and good general health. Strength is measured from weakness (less than 20 points) to strength (more than 30 points). The intermediate range is from 20 to 30 points.

## FORM — DAIRYNESS



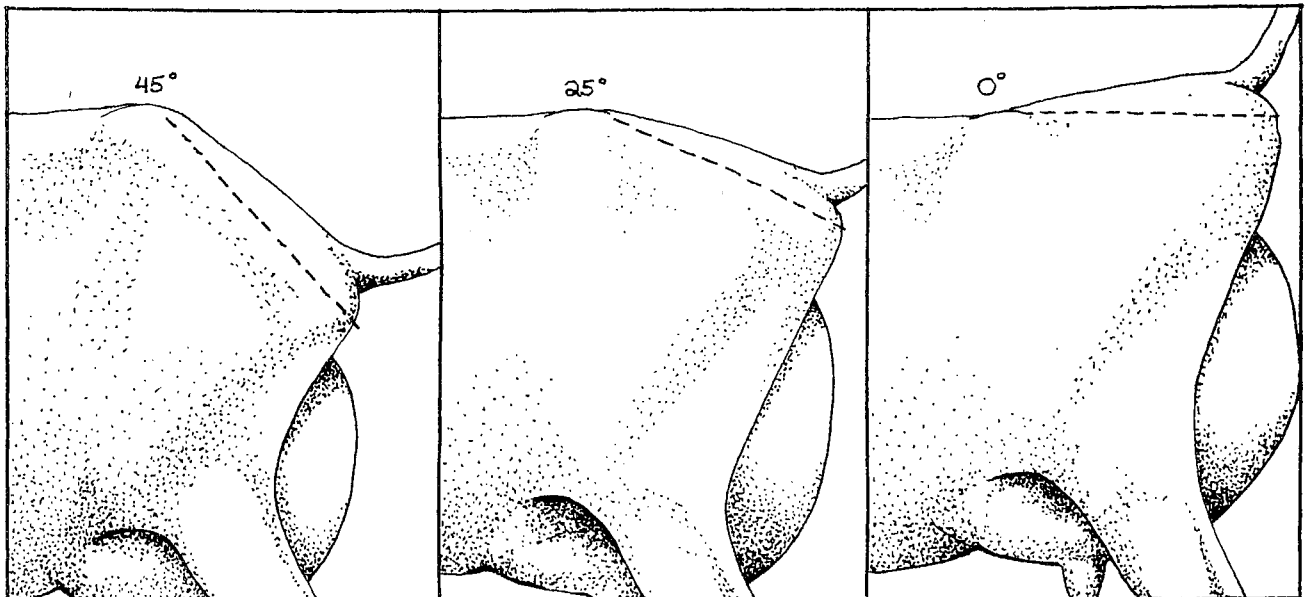
1-5 Points  
Extremely thick and coarse, round bone

25 Points  
Intermediate in angularity and flatness  
of bone

45-50 Points  
Extremely sharp and angular, flat bone

The appraiser must study a number of features before coming to a decision about the dairyness of an animal. Attributes considered include sharpness and flatness of bone, openness and angle of ribbing, length and leanness of neck, definition and sharpness of withers, depth and arch of the flank, amount of incurving of the thigh, degree of fleshing, femininity and refinement, fineness and texture of the skin, and height and shape of the escutcheon area. Dairyness is measured from coarseness, (which is assigned 10 or less points) to extreme sharpness (which is assigned 40 or more points).

## STRUCTURE — RUMP ANGLE



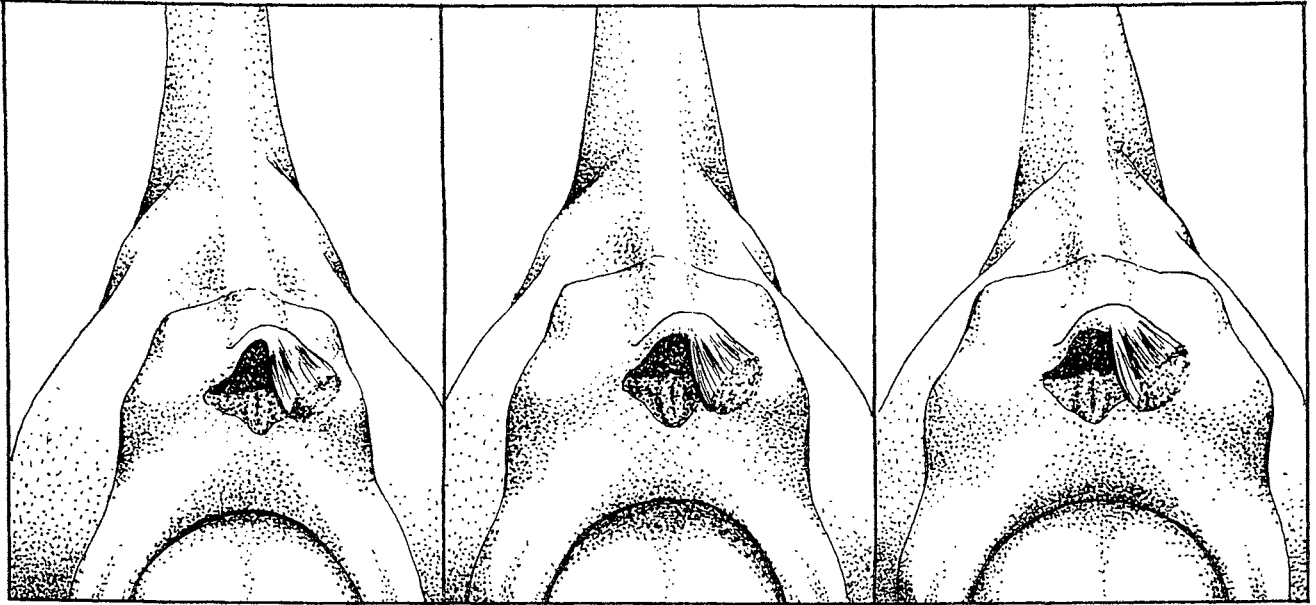
1-5 Points  
Extremely steep from hooks to pins

25 Points  
Intermediate slope from hooks to pins

45-50 Points  
Extremely level from hooks to pins

The angle of the rump or pelvis from hooks to pins has a direct bearing on the reproductive performance of a goat because it influences the ease of kidding and drainage of the reproductive tract. The angle of the rump is also related to the length of udder from fore to rear, strength of fore udder attachment, and udder depth. Observing the goat on the move from the side, the appraiser evaluates the angle of the rump from the hooks to the pins. Rump angle is measured from steepness, which is assigned 20 or less points, to levelness, which is assigned 30 or more points. Rumps intermediate in slope (30° to 20°) are assigned 20 to 30 points. Each difference of 5° in the rump angle, plus or minus, results in a difference in the score of 5 points. A rump angle of 50° or more is assigned 1 point.

## STRUCTURE — RUMP WIDTH



1-5 Points  
Extremely narrow

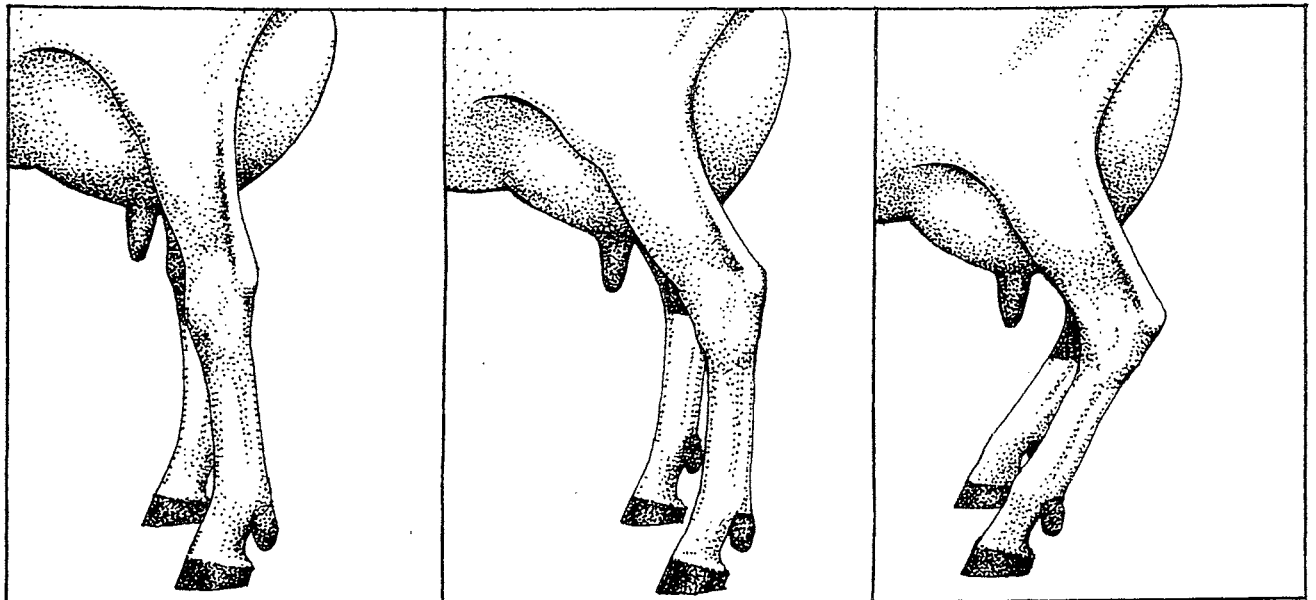
25 Points  
Intermediate in width

45-50 Points  
Extremely wide

The width of the rump is important for three reasons. The width of the rump relates to kidding ease; the wider the rump or pelvis, the easier the delivery of kids. The width of the rump also is an indicator of general body width throughout, as well as the potential for udder width. Rump width is determined as the width between the thurls; that is, the width of the pelvic girdle. An extremely narrow rump (5" or less) is assigned 5 points or less, a rump of intermediate width (7") is assigned 25 points, and an extremely wide rump (9" or more) is assigned 45 or more points.

The appraiser determines the width of the pelvic region with emphasis on the width from thurl to thurl. Each 1" difference in rump width, plus or minus, results in a difference in the score of 10 points.

## STRUCTURE — REAR LEGS, SIDE VIEW



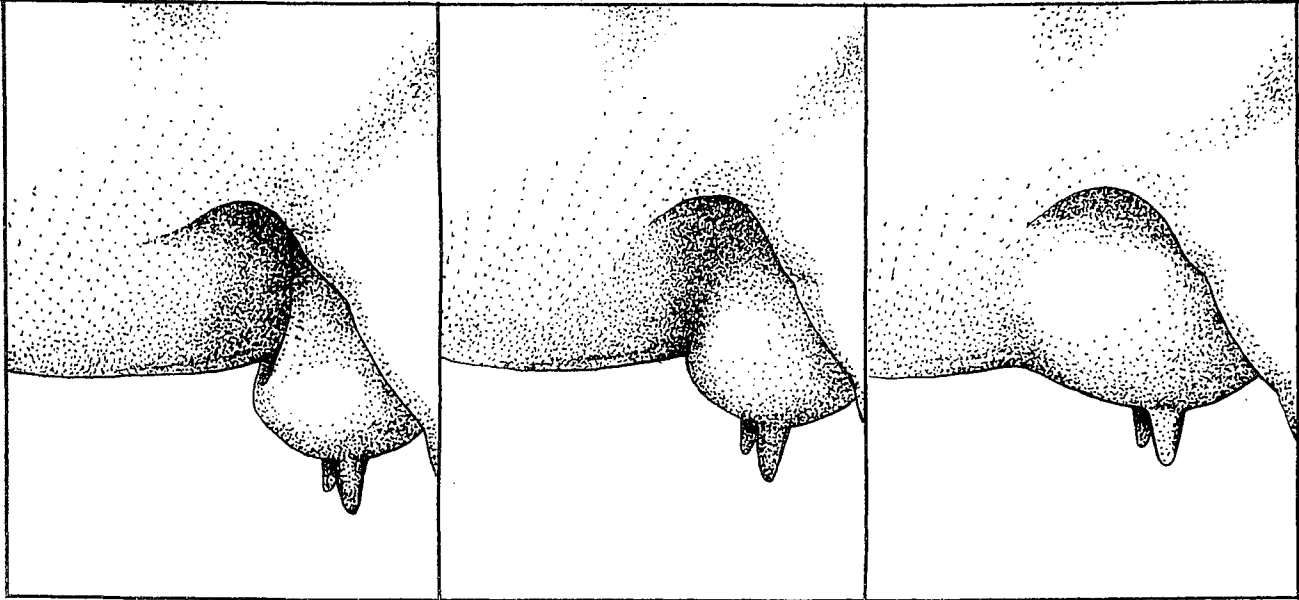
1-5 Points  
Straight-legged and posty

25 Points  
Intermediate angle to hock

45-50 Points  
Extremely angled (sickled)

This trait relates to the durability of the legs and feet, as reflected by the degree of angle of the hock. By looking at the goat from the side, the appraiser can evaluate the degree of angle of the rear leg. The less angle or postier the leg, the lower the score. An intermediate angle in the hock relates to the mid-point of the range. Legs that tend toward straightness (postiness) are assigned 20 or less points. Legs that tend toward a more angled or sickled condition are assigned 30 or more points.

## MAMMARY — FORE UDDER ATTACHMENT



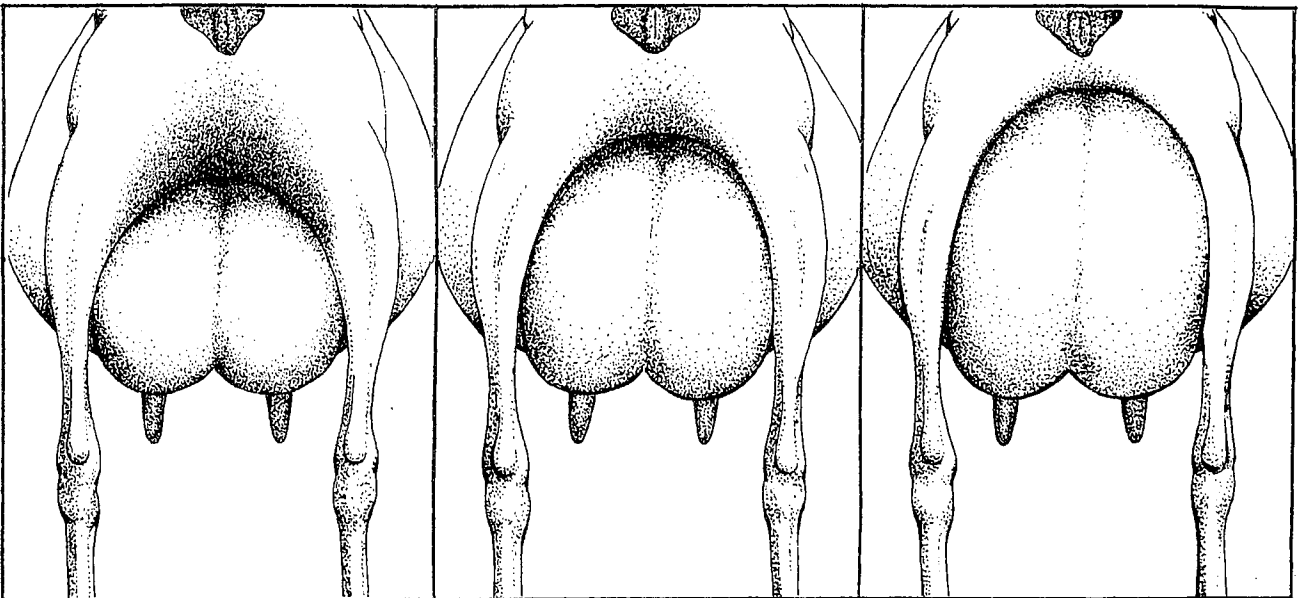
1-5 Points  
Extremely loose

25 Points  
Intermediate strength of attachment

45-50 Points  
Extremely snug and strong

In evaluating the fore udder attachment, the appraiser looks at the strength of the attachment of the lateral ligaments to the body wall. The scale ranges from an extremely loose attachment (5 points or less) to an extremely snug and strong attachment. Fore udders with lateral ligaments that are intermediate in strength and tightness are assigned 25 points.

## MAMMARY — REAR UDDER HEIGHT



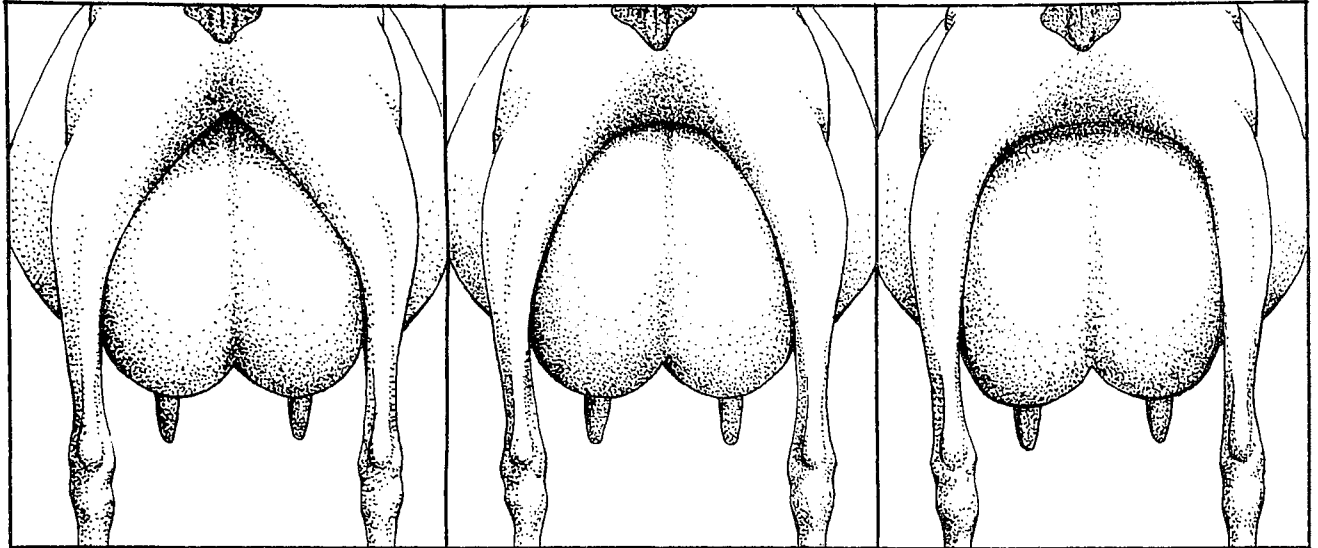
1-5 Points  
Extremely low

25 Points  
Intermediate in height

45-50 Points  
Extremely high

The height of the rear udder attachment is an indication of the goat's potential capacity for milk, in that it affects udder capacity, and of the udder's ability to hold its shape and position through repeated lactations. An extremely low attachment, 6" or more below the vulva, is assigned 5 or less points; udder attachments 7" or more below the vulva receive a score of 1. A rear udder of intermediate height (4" below the vulva) is assigned 25 points, while an extremely high attachment (2" or less) is assigned 45 or more points. Differences in hair and skin texture between the rear udder and the escutcheon are used to determine the point of attachment. Differences of 1" in rear udder height, plus or minus, result in a difference of 10 points.

## MAMMARY — REAR UDDER ARCH



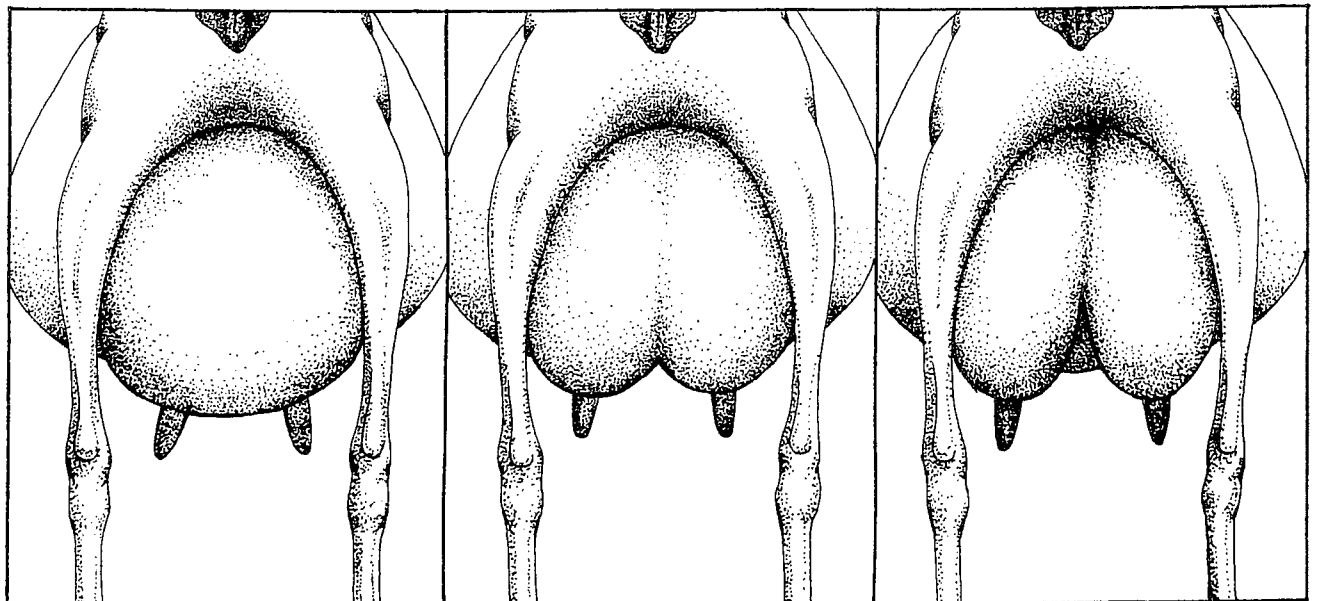
1-5 Points  
Extremely narrow and pointed

25 Points  
Intermediate width and curve

45-50 Points  
Extremely wide and curving

The evaluation of rear udder arch considers both the width and the shape of the attachment of the rear udder. The rear udder arch is an indication of the goat's potential capacity for milk, in that the width and shape of the rear udder attachment affect udder capacity, and of the udder's ability to hold its shape and position through repeated lactations. An extremely narrow and pointed rear udder arch is assigned 5 or less points, a rear udder intermediate in width and arch is assigned 25 points, and a rear udder that is extremely wide and arched is assigned 45 or more points. Rear udder arch is evaluated at the same spot as rear udder height. Differences in hair and skin texture between the udder and the escutcheon are used to determine the point of attachment.

## MAMMARY — MEDIAL SUSPENSORY LIGAMENT



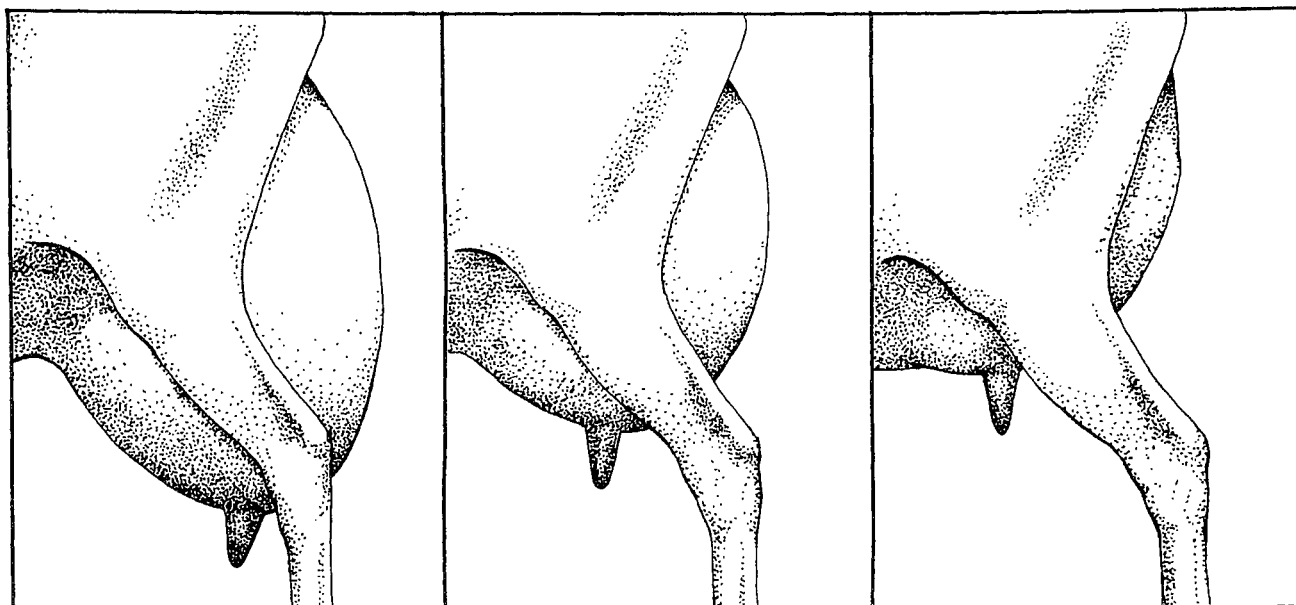
1-5 Points  
Bulging udder floor

25 Points  
Clearly defined halving, cleft, and support

45-50 Points  
Extreme cleft

The medial suspensory ligament is the primary support for the udder. A strong medial suspensory ligament affects a goat's production potential by keeping the teats in place and the udder elevated, reducing the potential for injury. An udder with a weak medial suspensory ligament, resulting in a negative cleft or bulge in the floor of the udder, is assigned 5 or less points. An udder with clearly defined halving and support (1" cleft) is assigned 25 points, and an udder with an extreme cleft (3" or more) is assigned 45 or more points. The assignment of an udder support score is based on the appraiser's evaluation of the amount of cleft in the floor of the udder attributable to the medial suspensory ligament. A difference of 1" in the amount of cleft, plus or minus, results in a difference of 10 points.

## MAMMARY — UDDER DEPTH



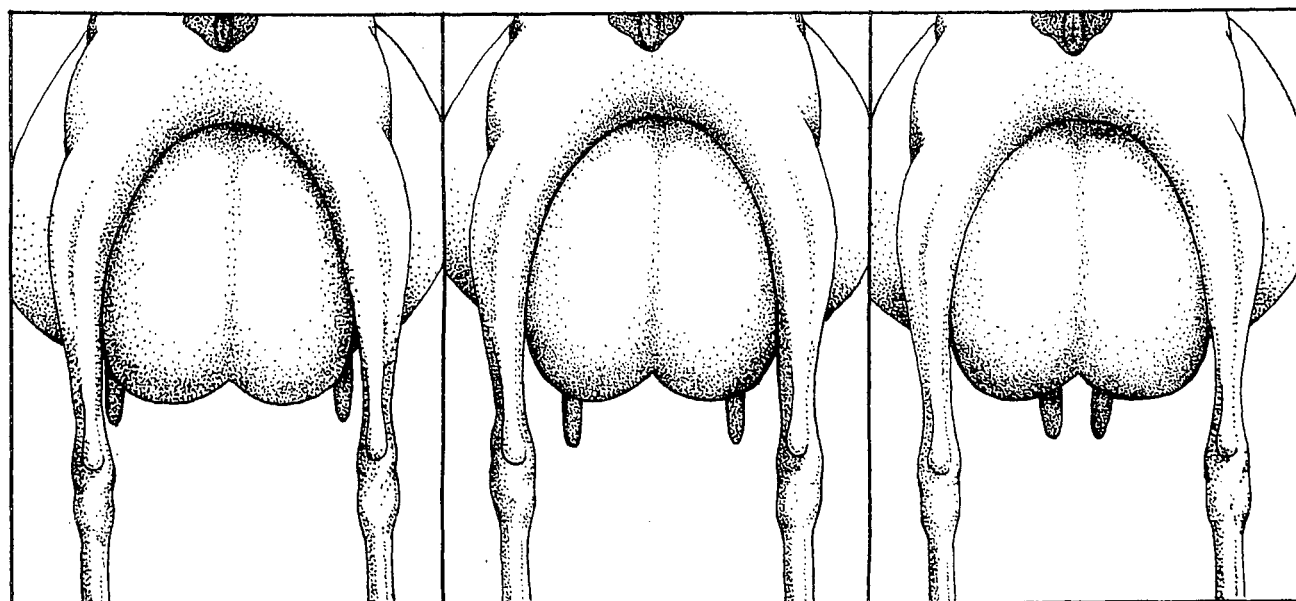
1-5 Points  
Floor well below hocks

25 Points  
Floor above hocks

45-50 Points  
Floor extremely high

The depth of the udder is measured relative to the hocks. While some degree of udder depth is necessary for capacity, an udder that is extremely deep is more susceptible to injury and mastitis infection. Udder depth is evaluated as the vertical distance between the floor of the udder and the point of the hock, when the rear leg is set in a normal position under the animal. A deep udder that is at least 2" below the hocks is assigned 5 or less points, an udder that is intermediate in depth (2" above the hocks) is assigned 25 points, and a shallow udder that is extremely high above the hocks (6" or more) is assigned 45 or more points. An udder that is 3" or more below the hock is assigned 1 point.

## MAMMARY — TEAT PLACEMENT, REAR VIEW

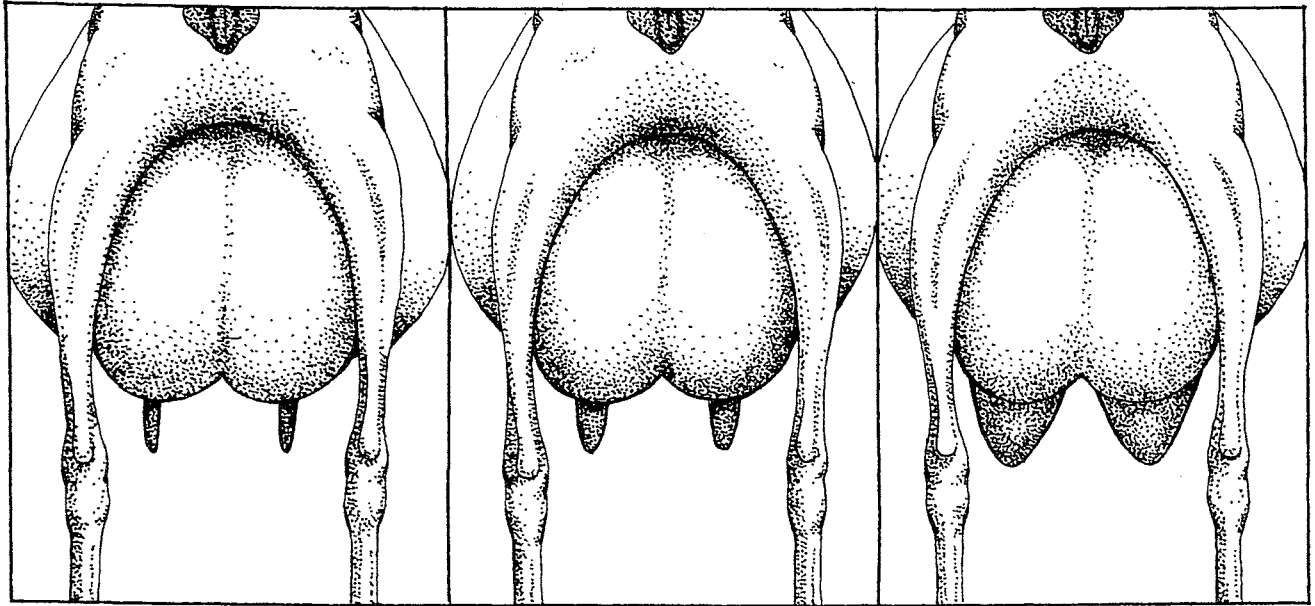


1-5 Points  
Extremely wide placement

25 Points  
Intermediate placement

45-50 Points  
Placement close to center of udder

Teat placement, as viewed from the rear, is related to both ease of milking and susceptibility to injury. Teat placement is measured from being on the outside third of the udder half (less than 25 points) to being less than two-thirds of the way out (more than 25 points). Teats that are located one-third of the way out on the udder half are assigned 45 points; teats that are less than one-third of the way out are assigned more than 45 points. Position is determined by the center of the teat at the point where the teat attaches to the udder.

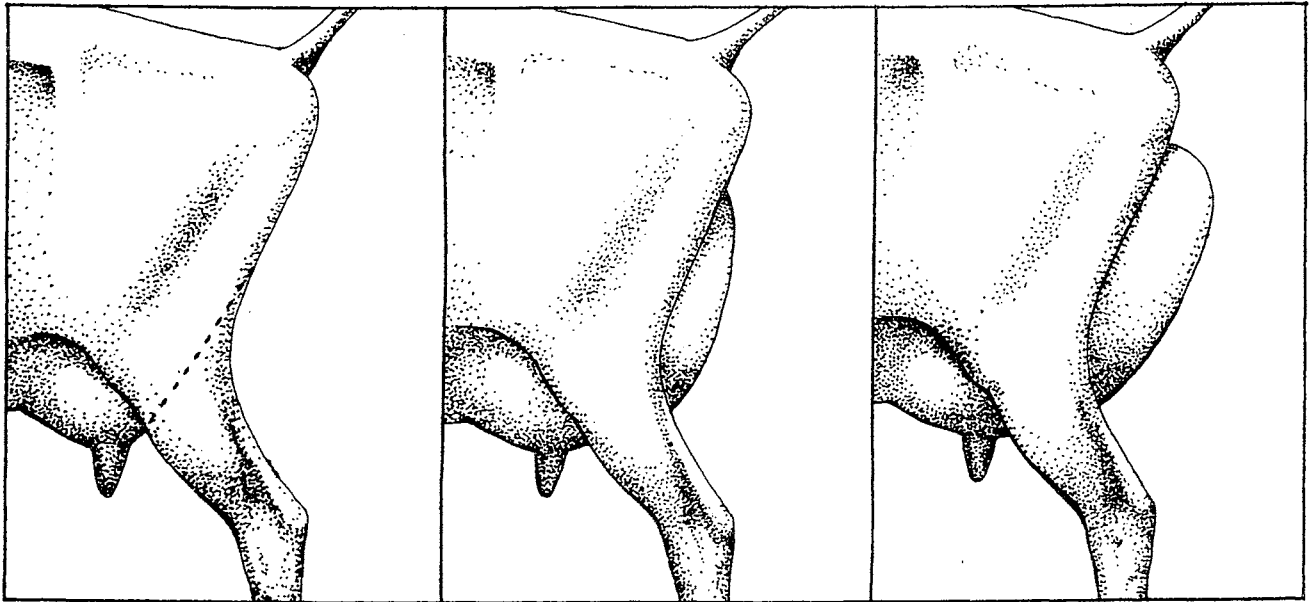
**MAMMARY — TEAT DIAMETER**

1-5 Points  
Extremely narrow

25 Points  
Intermediate diameter

45-50 Points  
Extremely wide

Teat diameter is evaluated as the diameter of the teat at its base where it meets the udder, as viewed from the rear. Both delineation of the teat from the udder and ease of milking are reflected in the evaluation of teat diameter. A very narrow teat,  $1/2''$  or less in diameter, is assigned 5 or less points; a teat that is intermediate in diameter ( $1-1/2''$ ) is assigned 25 points; and a teat that is very wide ( $2-1/2''$ ) or more in diameter, is assigned 45 or more points. A difference of  $1/2''$  in teat diameter, plus or minus, results in a difference of 10 points.

**MAMMARY — REAR UDDER, SIDE VIEW****SECONDARY TRAIT**

1-5 Points  
Extremely flat

25 Points  
Intermediate in fullness

45-50 Points  
Extremely bulgy

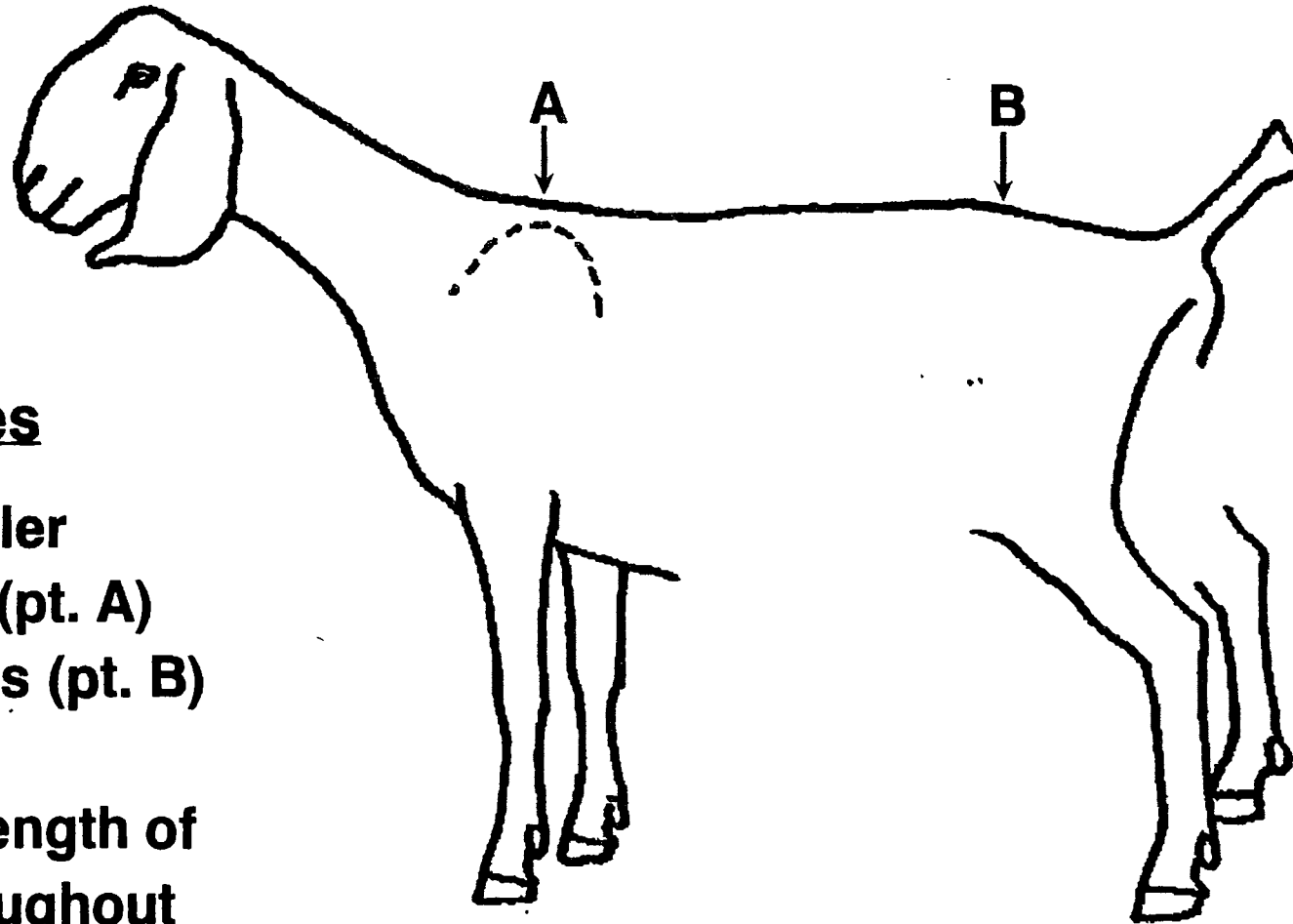
Rear udder, side view, is evaluated as the shape of the rear udder as it extends behind the rear leg when a goat is standing with her rear legs squarely beneath her. The shape of the rear udder from the teats to the rear udder attachment is an indication of the capacity of the rear udder for milk. Extremely flat rear udders, with little capacity, are assigned 5 or less points; rear udders with intermediate fullness are assigned 25 points; and rear udders that are extremely bulgy or protruding are assigned 45 or more points.





# GA - STATURE

2 Pts  
< 6% of GA



## Priorities

1. Slightly taller at withers (pt. A) than at hips (pt. B)
2. Height & length of bone throughout



# GA - Head & Breed Characteristics

5 Pts  
14% of GA

## Priorities

1. Clean cut, balanced in length, width & depth
2. Muzzle broad; full nostrils
3. Eyes well sculpted & alert
4. Jaw strong yet angular & lean to throat
5. Ears, nose & color appropriate for breed



← Too coarse



← Balanced



← Too frail

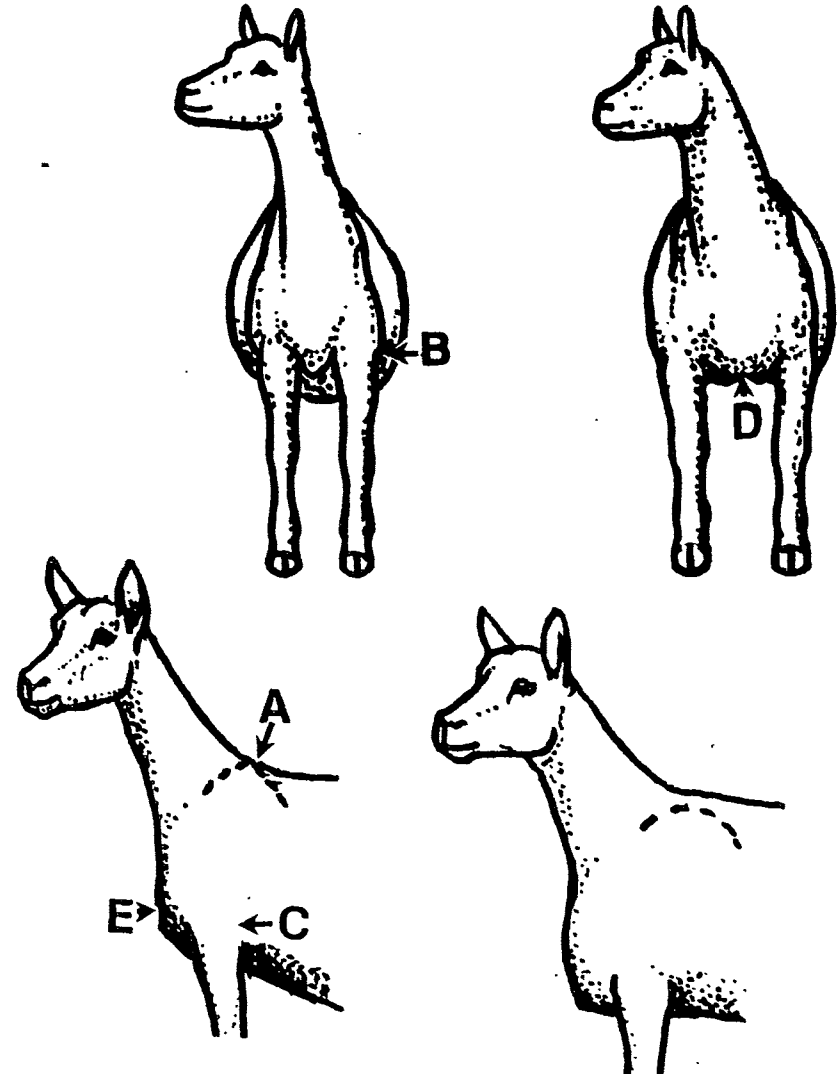


# GA - Front End Assembly

5 Pts  
14% of GA

## Priorities

1. Prominent withers (pt. A)  
arched to point of shoulder
2. Points of shoulder (pt. B)  
& elbow (pt. C) tight &  
smooth at rest or in motion
3. Deep wide chest floor (pt. D)
4. Moderate strength in brisket  
(pt. E)



93



AMERICAN DAIRY  
GOAT ASSOCIATION

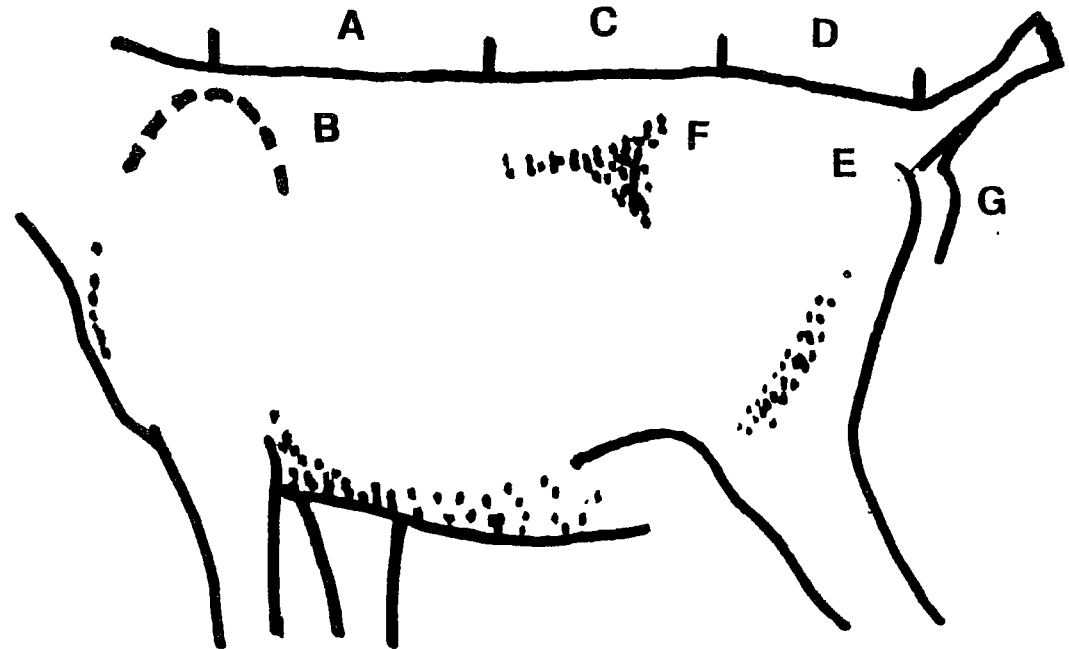


# GA - BACK

8 Pts  
23% of GA

## Priorities

1. Strong, straight, uphill; vertebrae well defined
2. Level chine (pt. A) with full crops (pt. B) into wide, straight loin (pt. C)
3. Rump (pt. D) wide & level thurls (pt. E) set 2/3 from hips (pt. F) to pinbones (pt. G)
4. Tailhead slightly above pinbones & symmetric
5. Reproductive tract normal



94

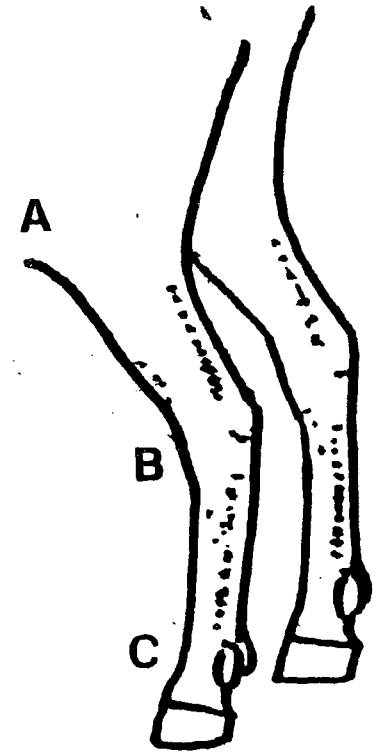
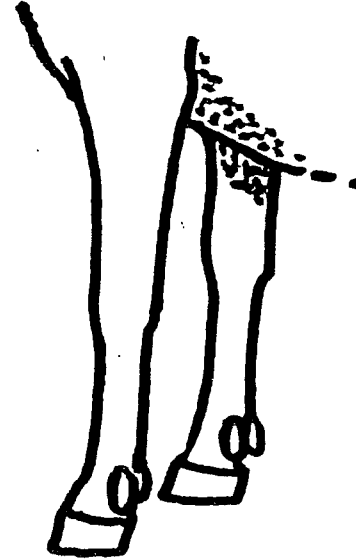


# GA - Legs, Pasterns & Feet

15 Pts  
43% of GA

## Priorities

1. Strong flat bone with smooth free motion
2. Front legs clean kneed, straight from front or side profile, wide apart & squarely placed
3. Rear legs set wide & straight from rear, well angulated through stifle (pt. A) to hock (pt. B); nearly perpendicular from hock to pastern (pt. C)
4. Flexible pastern of medium length
5. Strong feet with tight toes pointed forward; uniform in depth from toe to heel



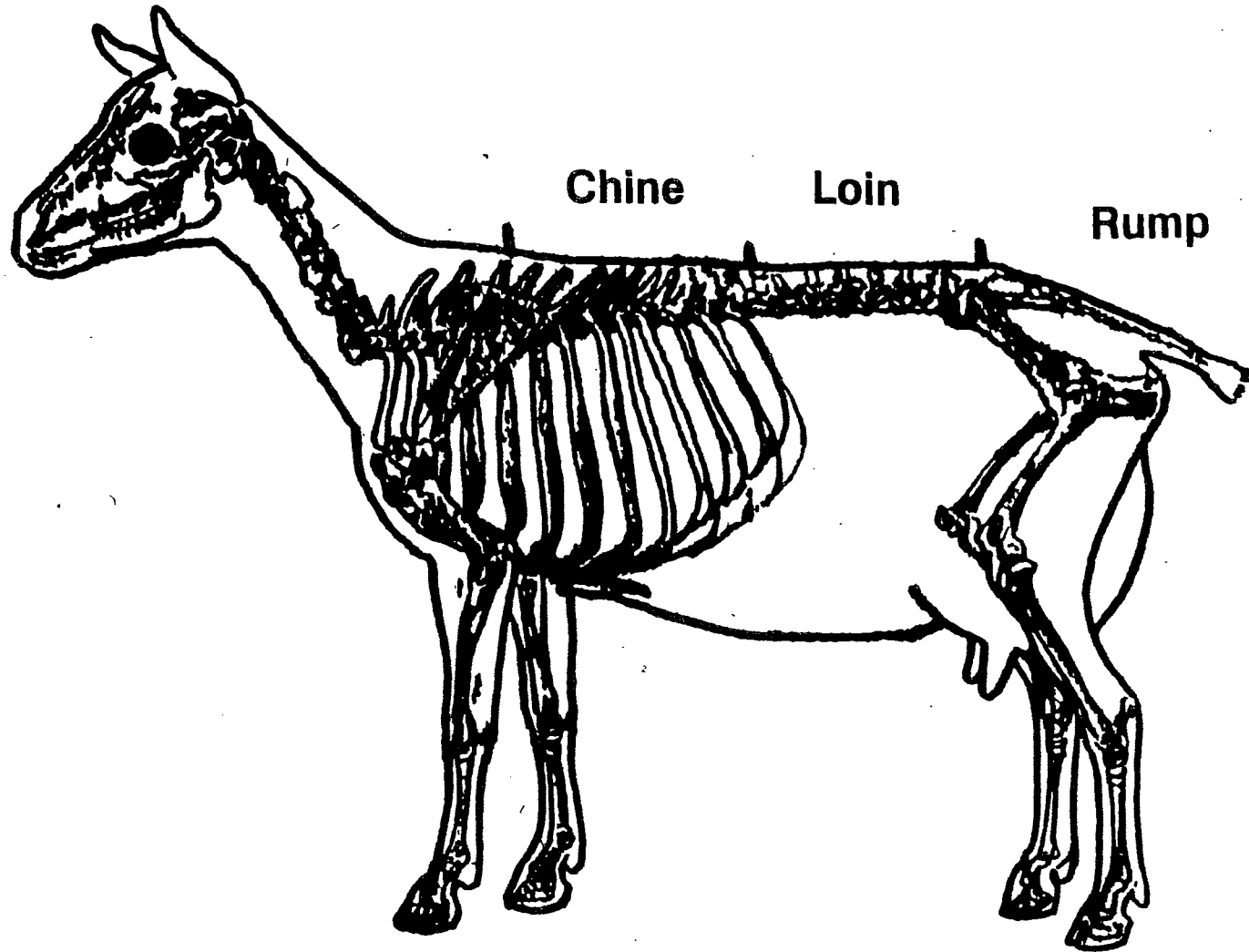
95



AMERICAN DAIRY  
GOAT ASSOCIATION



# #7 Skeletal Framework for General Appearance



916



AMERICAN DAIRY  
GOAT ASSOCIATION



# DC - Dairy Character

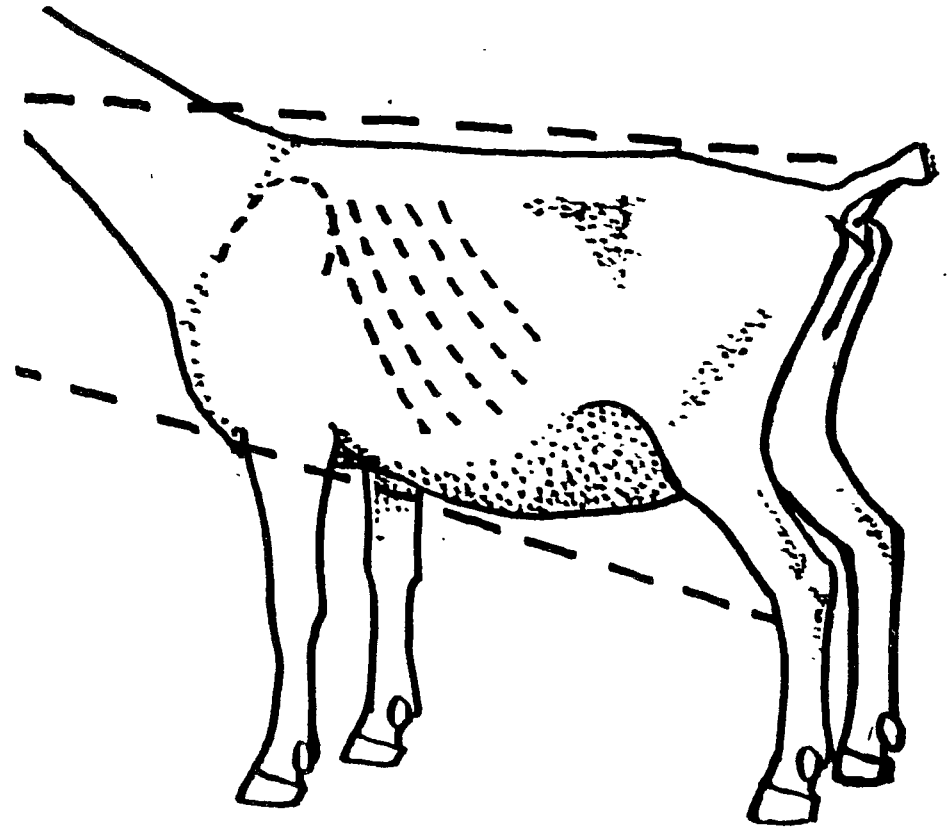
20 Pts

## Angularity & General Openness Due to strong, yet refined bone

### Priorities

1. Neck long, clean-cut
2. Withers prominent & wedge shaped
3. Ribs flat, flinty, wide, lower ends angle to rear & flank
4. Flank deep, yet arched & free of excess tissue
5. Thighs incurving in side profile; lean & arched, set wide from rear
6. Skin - loose, thin, pliable with lustrous hair

Dotted lines show proper dairy wedge



AMERICAN DAIRY  
GOAT ASSOCIATION





# Bone

**Round**



**Spherical**

**Less Porous**

**Thick Casing**

**Lower Body ph (acid)**

**Fat Animal Syndrome**

**Flat**



**Elliptical**

**More Porous**

**Less Encapsulating Tissue**

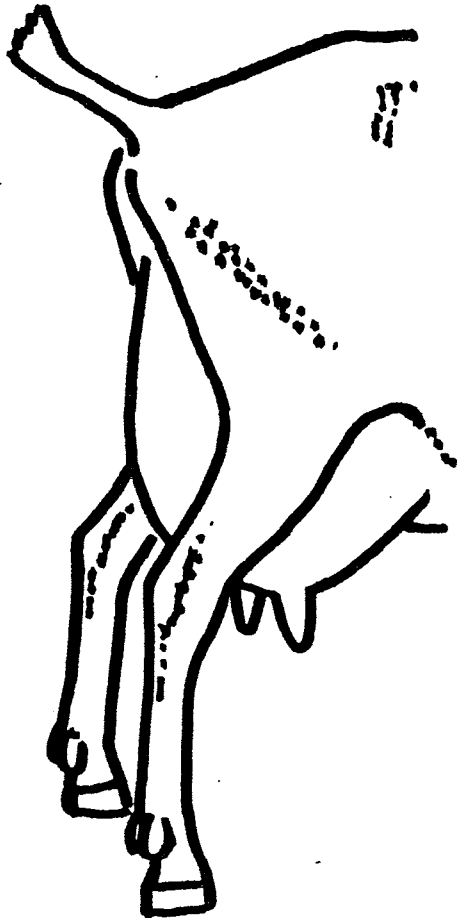
**Higher Body ph (alkaline)**

**Lactating Syndrome**



# Angularity of Thigh

**INCURVING**



**CORRECT**



**BULGY**



**INCORRECT**



AMERICAN DAIRY  
GOAT ASSOCIATION

#11

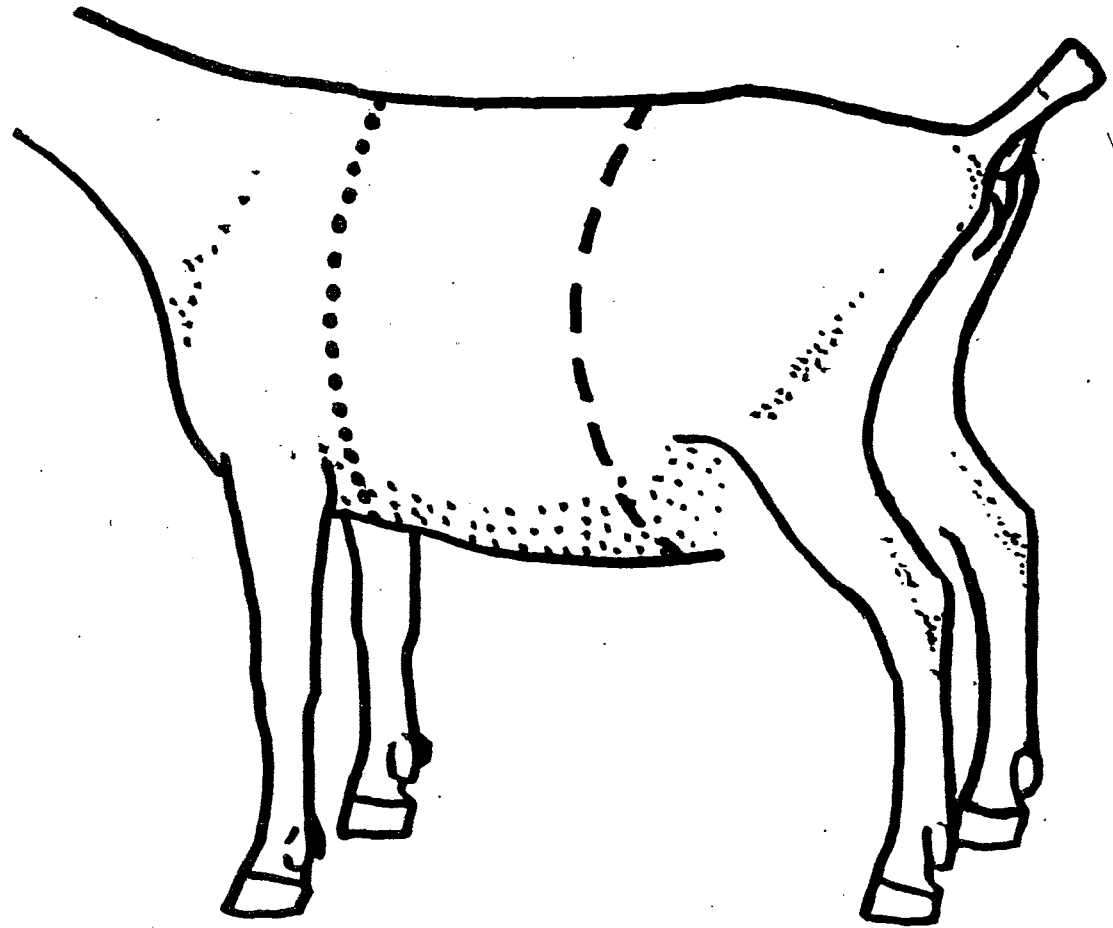
# BC - Body Capacity

**Qualitative - Shape**  
**Quantitative - Sheer Mass**

10 Pts

## Priorities

- 1. Chest (dots)**
  - 40% of mass
  - Deep & wide at elbow
  - Ribs well sprung
- 2. Barrel (dashes)**
  - 60% of mass
  - Strongly supported
  - Increasing in depth & width to rear with maturity, i.e. age & proven productivity



AMERICAN DAIRY  
GOAT ASSOCIATION

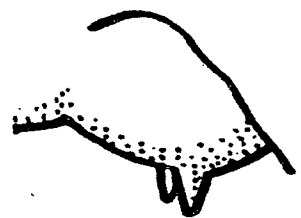


# MS - Udder Support

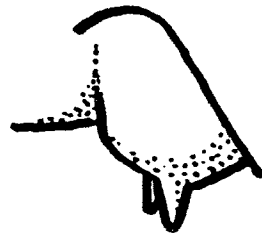
13 Pts  
37% of MS

## Priorities

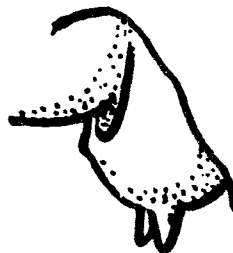
- 1. Medial Suspensory Ligament**
  - supports 60% of weight
  - clearly defined, holds udder well above hocks & snug to body
- 2. Fore, Rear & Lateral Ligaments**
  - support other 40% of weight
  - strong, wide & smooth



Very Strong



Moderate



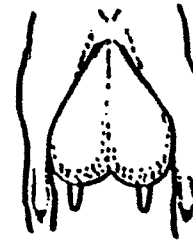
Weak



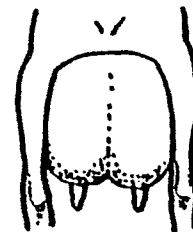
AMERICAN DAIRY  
GOAT ASSOCIATION



### Upper Rear

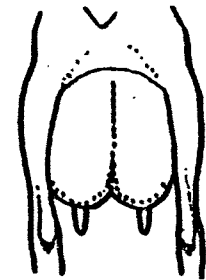


Weak

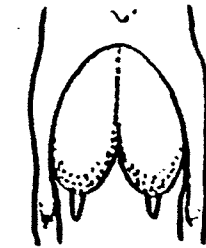


Strong

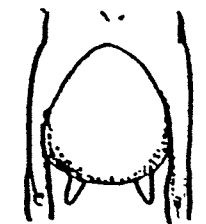
### Medial



Correct



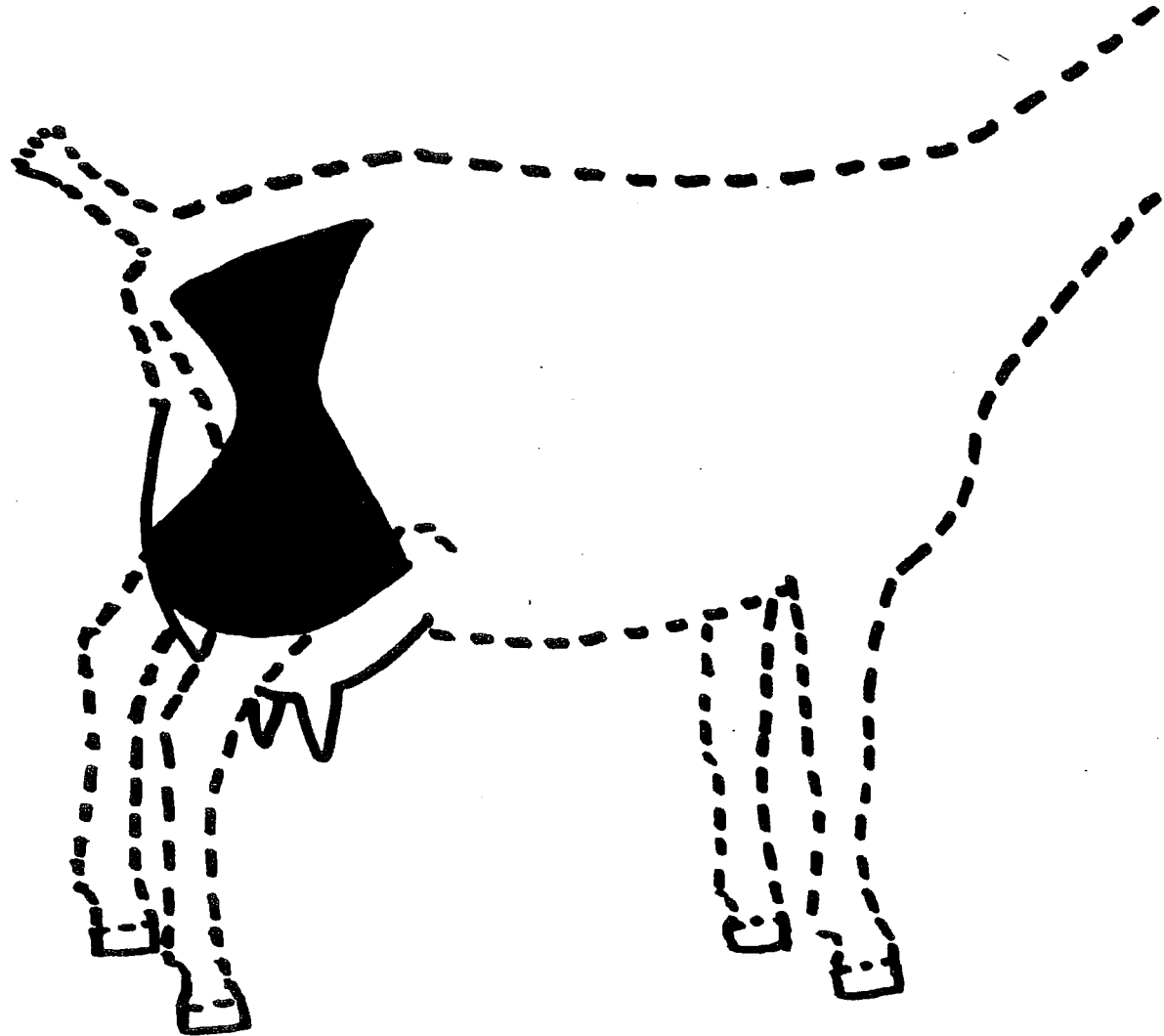
Too Short



Too Long

# Visualization of Medial Suspensory Ligament (side view)

Prevents  
Fluid  
Exchange  
Between  
Halves of  
Udder

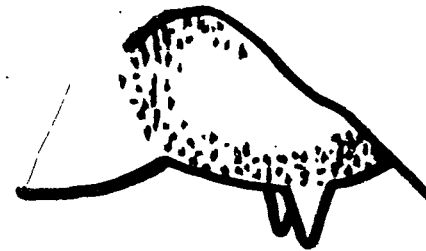


# MS - Fore Udder

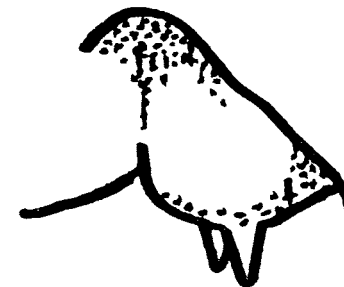
5 Pts  
14% of MS

## Priorities

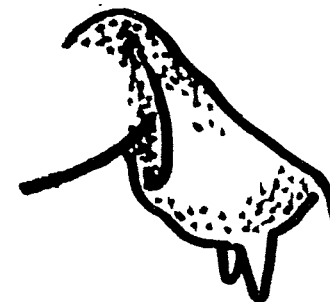
1. Wide, full to side under flank
2. Moderate forward extension
3. No non-lactating tissue  
i.e., dewlaps towards navel  
or stiff, fatty structure that  
does not collapse or milk out



Snug & strong



Moderately strong



Weak & loose



AMERICAN DAIRY  
GOAT ASSOCIATION



# MS - Rear Udder

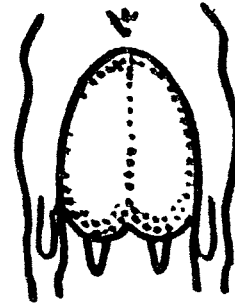
**7 Pts**  
**20% of MS**

## Priorities

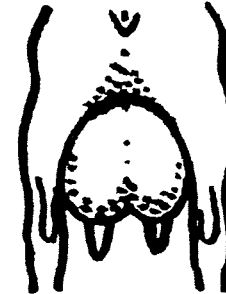
**1. Capacious, wide high with broad arch into escutcheon**

**2. Uniformly wide & deep to floor from rear profile**

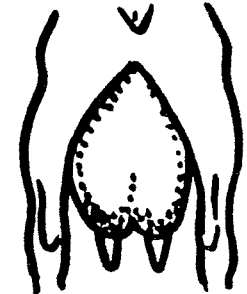
**3. Moderately curved in side profile, without protruding behind vulva**



Correct



Too Low



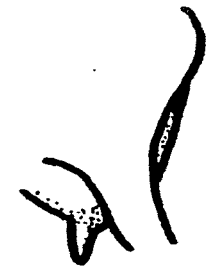
Not Enough Arch or Width



Correct



Bulges Too Much



Shallow, Flat



# MS - Balance, Symmetry & Quality

6 Pts  
17% of MS

## Priorities

- 1. In side profile at rest,  
1/3 front of leg  
1/3 under leg  
1/3 behind leg



Correct



Too Much Behind Leg

- 2. Well rounded, soft,  
pliable & elastic;  
free of scar tissue



Not Rounded



Too Much in Front of Leg

- 3. Halves evenly balanced



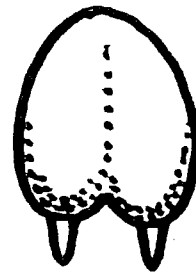


# MS - Teats

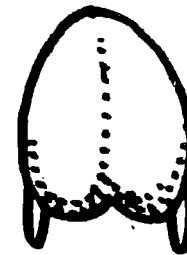
4 Pts  
11% of MS

## Priorities

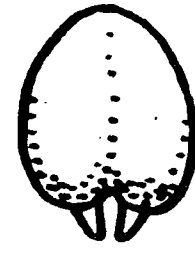
1. Uniform in size, medium length & diameter in proportion to capacity of udder
2. Pointing straight down rear profile; Slightly forward from side profile
3. In middle of udder from side profile; 2/3 distance from MSL to side in rear profile



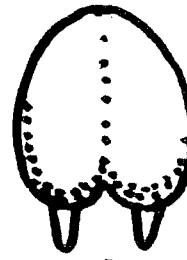
Correct Placing



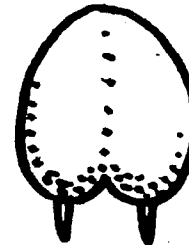
Too Far Out



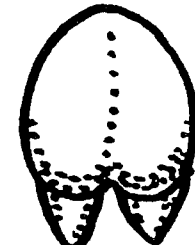
Too Close In



Correct Size



Too Narrow



Too Bulbous



Correct



Too Forward



Too Back



# Drug Considerations

## What Procedures Should You Know

Judy Marteniuk, DVM, MS  
College of Veterinary Medicine  
Michigan State University

### When should you consider drug therapy?

- Pros
  - Reduce death loss
    - Pneumonia
  - Shorten course of problem
    - Ringworm
    - Heat cycle
  - Improve performance
    - Feed antibiotics
    - Mastitis
- Cons
  - Adverse reaction
    - Death?
    - Organ compromise
      - NSAIDs – Kidney/GI
  - Drug residue
    - Milk
    - Meat

### What can you do to minimize drug residues?

- Practice healthy herd management
- Establish a veterinarian/client/patient relationship
- Use only FDA approved over-the-counter or prescription drugs with veterinary guidance
- Store all drugs correctly
- Administer all drugs according to label directions
- Identify all treated animals
- Keep written record of all treatments
- Implement employee/family training on proper drug use
- Use drug residue screening kits for meat and milk

### What drugs Are Available?

#### Drug groups for consideration

- Antibiotics/Antimicrobials
- Non-steroidals (NSAIDs)
- Steroids
- Hormones
- Vitamins/metabolic disorders
- Dewormers

## **Non Steroidal anti- inflammatory (NSAID)**

- Reduce fever (antipyretic)
- Lambing/kidding complications – bruising, pulled muscles (anti-inflammatory, analgesic)
- Off feed
- DO NOT affect pregnancy
- Kidney and GI concerns
- Keep animal eating – less toxic concerns

## **Non Steroidal anti- inflammatory (NSAID)**

### **Aspirin**

- A – Cattle
- NA – sheep and goats
- B. Dose – 50 mg/lb
- GI ulceration may occur

## **Non Steroidal anti- inflammatory (NSAID)**

### **Phenylbutazone (Bute)**

- NA – food animals
- B. Dose – 1 mg/lb BID
- Most toxic of the NSAIDs
- Withdrawal 30-40 days (1-3 doses)

## **Hormones - Oxytocin**

- Dose – 10 –20 mg (1/2 to 1cc)
- Milk let down
- Uterine contractions – retained placenta

## **Metabolic products –**

### **Vit E & SE**

- Dose – ½ to 1 cc per kid/lamb ( use less for pygmies) SQ
- 3 cc per doe/ewe
- Only gives a few days of Se
- Tx white muscle disease
- Better to use oral products – Salt
- Oral – 1 mg per day

## **Metabolic products – Thiamine Injectable Products**

### ***Vitamin B1***

- Tx of PEM (Polioencephalomalacia)
- Thiamine HCl injectable
  - 300 mg/ml
  - 500 mg/ml
  - B-complex variable conc.
- Feedlot lambs with neurological signs
- 500 mg - 1,000 mg SQ
- BID to TID for 3-4 days

## **Dewormers – Panacur/Safeguard**

Fenbendazole

Dose – 5-10 mg/lb

A – cattle

NA – sheep and goats

Resistance in some herds

Meat – 8 –16 days

Milk no hold

## **Dewormers - Valbazen**

Albendazole

- A – sheep and cattle
- NA goats
- Dose 5-10 mg/lb
- Do not use in first trimester – birth defects

# Questions

## Drug Considerations

*What Producers Should Know*



Judy Marteniuk, DVM, MS  
College of Veterinary Medicine  
Michigan State University

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## When should you consider drug therapy?



- Pros
  - Reduce death loss
    - Pneumonia
  - Shorten course of problem
    - Ringworm
    - Heat cycle
  - Improve performance
    - Feed antibiotics
    - Mastitis
- Cons
  - Adverse reaction
    - Death?
    - Organ compromise
      - NSAIDs -
      - Kidney/GI
  - Drug residue
    - Milk
    - Meat

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## When to reach for drugs?

### What are likely causes (rule-out)?

- Infection
  - Viral, bacterial, fungal
- Metabolic / nutritional disease
  - Mineral deficiencies or excess
    - Milk fever - Ca
  - Lactational or pregnancy ketosis/toxemia
    - Propylene glycol
    - Dextrose
- Parasitic infestation
- Trauma

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### What can you do to minimize drug residues?

- Practice healthy herd management
- Establish a veterinarian/client/patient relationship
- Use only FDA approved over-the-counter or prescription drugs with veterinary guidance
- Store all drugs correctly
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### What drugs Are Available?



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### Drug groups for consideration

- Antibiotics/Antimicrobials
- Non-steroidals (NSAIDs)
- Steroids
- Hormones
- Vitamins/metabolic disorders
- Dewormers

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**Antibiotics**  
**What are they?**

**Definition:**

Substance that **KILLS** microorganisms or **SUPPRESSES** their multiplication or growth.

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**Antibiotics**  
**What can you expect from their use?**

- Full recovery
- Partial recovery
- No response to treatment
- Adverse side effects
  - Toxicity
    - renal , GI, bone marrow
  - Death

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**Antibiotics**  
**When to reach for drugs?**

What system or systems are involved?

- Respiratory
- Gastrointestinal
- Musculoskeletal
- Neurological
- Mammary
- Other

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### Antibiotics

#### When to reach for drugs?

#### CLINICAL ASSESSMENT:



#### Observation

- Off-feed
- Depression
- Increased temperature

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### Antibiotics

#### When to reach for drugs?

#### PHYSICAL EXAMINATION?

#### Temperature, Pulse, Respiration

- Normal Temp. 101.5 to 103.5° F
- Normal Heart Rate 70 to 90 beats/min
- Normal Respiration Rate < 25 breaths/min

Dependant on environment and activity and excitement level

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**Antibiotics**  
**When to reach for drugs?**

**Diagnosis:**

- Acute Pneumonia
- Target organ = LUNGS
- Most likely ETIOLOGY = *Pasteurella sp.*

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**Antibiotics Selection**  
**Spectrum of antimicrobial activity**

- Spectrum of activity:
  - gram (+) - penicillin
  - gram ( - ) - spectinomycin
  - Broad - naxcel

**THERAPEUTIC GOAL:** Match the selected antimicrobial to the suspected infective agent

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**Antibiotics**  
**Selection (continued)**

- Is the drug approved for use in the species?
  - Food animals do not use Genocin, sulfas, chloramphenical, nitrofurans, entrofloxans
- What is the appropriate:
  - Dose – often higher than label dose - Penicillin
  - Dosing schedule (1x/day, 2x/day)
  - Route of administration (SQ, IM, IV)
  - WITHDRAWAL TIME – affected by animal, dose, route**

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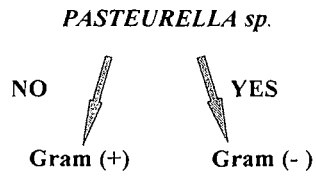
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**Antibiotics Selection**



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**Antibiotics Selection**

The following list is based on culture and sensitivity results for *Pasteurella sp.*:

- Ceftiofur (Naxel<sup>®</sup>)
- Oxytetracycline (LA 200, LA 100, others)
- Tilmicosin ( Micotil)
- Sulfa drugs – Albon (food animals)
- Florfenicol (Nuflor<sup>®</sup>)

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**Antibiotics  
Guidelines for use**

- Record temp **BEFORE** initial treatment
- Select appropriate therapy (drug, dose etc.)
- Goal: temp. decrease of 1 to 1½ ° in 24 to 48 hrs

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**Antibiotics**  
**Guidelines for use**

**TEMPERATURE**

Temp ↓ 	
Continue therapy as directed	No change after 24 to 48 hrs  Reconsider therapy plan

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**Antibiotics**  
**Guidelines for use**

**Reconsideration of therapeutic plan:**

- Increase dose
- Increase frequency of dosing
- Change therapy to a different class of antibiotics agent (different site of action)

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**Antibiotics**  
**Why they fail**

- Incorrect diagnosis
- Incorrect choice of antibiotics agents
- Organism is resistant to selected agent
- Infection is non-bacterial (viral, fungal)
- Chronic infection
- Compromised immune system

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### **Antibiotics**

#### **Culture and sensitivity?**

*Advantages:*

- Provides information for present AND future reference
- Bacterial resistance may develop overtime and farm/regional difference in resistance exist.
- Causative agent may change
- Results are usually available within 24 to 48 hrs - takes the guesswork out of "What to try next".

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### **Antibiotics**

#### **Summary**

- Understand the power and limitation of therapeutic agents.
- Let your thermometer be your guide.
- Match the drug to the bug
- Treatment of acute bacterial infection is usually more rewarding than attempts to correct chronic conditions.

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### **Antibiotics**

#### **Summary**

**KNOW WITHDRAWAL TIMES!**

- Avoid marketing products that contain residues.
- Avoid feeding milk with residues present to kids/pigs/calves if going to slaughter shortly.
- Residues potentially more of a problem in goats than cattle going to market +/- dilution factor.

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300,000 units/ml  
- 3,000 units/lb IM twice  
daily (BID)  
1cc/100 lbs - too light  
- sheep - goats  
9 day slaughter hold  
48 hr milk  
Give SQ @ 10,000  
units/lb once/twice daily (1cc/30  
lbs) - Increase slaughter hold  
\$0.05/ml (\$0.25/ewe)

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150,000 units/ml PenG  
150,000 units/ml Benza Pen  
- 2 ml/150 lbs  
Every 48 hrs  
- SQ in cattle 30 day hold  
- sheep, goats, dairy  
prevent pneumonia  
in NB lambs & kids  
(management issue)  
\$0.10 - 0.15/ml

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Inj. 100 & 200 mg/ml conc.  
- short acting  
- SQ @ 5mg/lb BID  
- long acting base  
- SQ @ 5mg/lb SID  
or 9 mg/lb every 48 hours  
- cattle 28 day hold  
- sheep, goats, dairy  
good 1st choice  
\$0.10 - 0.15/ml  
(\$1.00 per ewe/doe every 48hrs)

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- Swine & cattle respiratory disease (gram - pasteurella)
  - sheep
  - goats, no milk/meat hold, reconstitute
  - .5 - 1 mg/lb (1-2 ml/100 lbs) SID for 3 days
  - sheep/goats
- Freezer tips

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\$1.00/ml

- Cattle respiratory disease (gram - pasteurella)
  - cattle, SQ 10mg/kg once, 28 day hold
  - 1.5 ml/100 lbs
  - sheep, goats
  - fatal to horses, pigs and humans, preg.?
  - small safety range

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- Developed for respiratory disease in cattle but broad spectrum (gram + & -)
  - Beef cattle only
  - IM @ 20 mg/kg (3 ml/100 lbs) every 48 hrs
  - sheep, goats
- Good feedlot drug
- \$1.00/ml (\$5.00/ewe/doc)

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- Oral tabs 120, 480 or 960 mg
- Oral syrup 5cc = 240 mg
- 120-240 mg tab or 3-5 cc syrup /NB lamb SID
- WITHDRAWAL??? – 28 days

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- Oral pig scour medication
- Pig pump 1 ml/10 lbs & goats
- Convenient & cheap
- 50.10/NB lamb/kid
- 21 day hold in pigs

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- Oral pig pump 1.5 ml delivers 5 mg gentocin w/ 14 day hold
- Injection 50mg/ml or 100mg/ml – for NB pigs - 40 day hold  
Horses 3 mg/lb once daily

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**Non Steroidal anti- inflammatory  
(NSAID)**

- Reduce fever (antipyretic)
- Lambing/kidding complications – bruising, pulled muscles (anti-inflammatory, analgesic)
- Off feed
- DO NOT affect pregnancy
- Kidney and GI concerns
- Keep animal eating – less toxic concerns

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.5 mg - 1 mg/lb IM or IV  
(1 to 2 ml/100 lbs.)

- Cost \$0.25/ml - \$1/ml  
(-\$2.00/ewe/doe depends on amount purchased)

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**Non Steroidal anti- inflammatory  
(NSAID)**

**Aspirin**



- A – Cattle
- NA – sheep and goats
- B. Dose – 50 mg/lb
- GI ulceration may occur

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**Non Steroidal anti-inflammatory  
(NSAID)**

**Phenylbutazone (Bute)**



- NA – food animals
- B. Dose – 1 mg/lb BID
- Most toxic of the NSAIDs
- Withdrawal 30-40 days (1-3 doses)

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**Corticosteroids**



- Azium, Flucort, Vetalog
- Anti-inflammatory med.
- **Caution:** Many varieties can induce parturition if given during the last trimester.
- May be desirable to abort
  - ex: pregnancy disease
- Used to induce parturition
- Also pregnancy disease

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**Hormones - Prostaglandins**



\$2.50/ml (\$5.00 - \$7.50/doe)

- *Lutalyse*
- Can be used for mismating
  - Need CL present
  - CL forms 5-7 days after ovulation
  - 10mg -15 mg Lutalyse 7 to 10 days after mismating
- Used for synchronization
  - If cycling - not out of season
  - 2 doses 10 days apart
  - not as effective as sponges or implants

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## Hormones - Oxytocin



- Dose - 10 -20 mg (1/2 to 1cc)
- Milk let down
- Uterine contractions - retained placenta

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## Metabolic products - Vit E & SE



- Dose - 1/2 to 1 cc per kid/lamb ( use less for pygmies) SQ
- 3 cc per doe/ewe
- Only gives a few days of Se
- Tx white muscle disease
- Better to use oral products - Salt
- Oral - 1 mg per day

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## Metabolic products - Thiamine Injectable Products

### Vitamin B1

Tx of PEM  
(Polioencephalomalacia)



- Thiamine HCl injectable
  - 300 mg/ml
  - 500 mg/ml
  - B-complex variable conc.
- Feedlot lambs with neurological signs
- 500 mg - 1,000 mg SQ
- BID to TID for 3-4 days

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### Other metabolic products –

- Calf scour packs
  - \$2.00 - \$3.00/pack
  - tubed or drenched as conc.
- Cattle milk fever pastes
  - \$5.00/tube
  - usually 1 tube/cow
  - 1/6 cattle dose per ewe
- Milk fever solutions
  - \$3.00/500 ml bottle
  - 100 cc Cal/Dex solutions SQ




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### Other metabolic products

- 50% Dextrose solution
  - Dilute with warm sterile or distilled water to make 20% dextrose
- 20 mls of 50% dextrose and 30 mls of water
- 1P 40 cc/lamb
- Be clean and selective!




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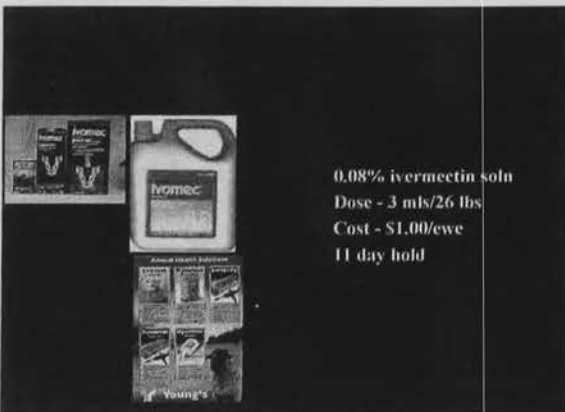
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0.08% ivermectin soln  
 Dose - 3 mls/26 lbs  
 Cost - \$1.00/ewe  
 11 day hold

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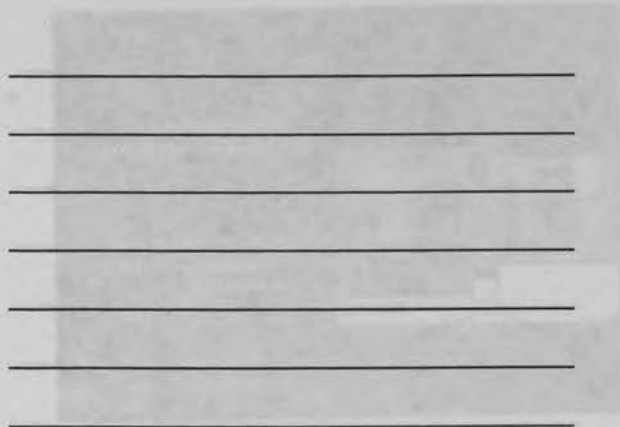


Pigs - 0.27% soln  
 Sows - 1.0% soln  
 Cattle- 1.0% soln

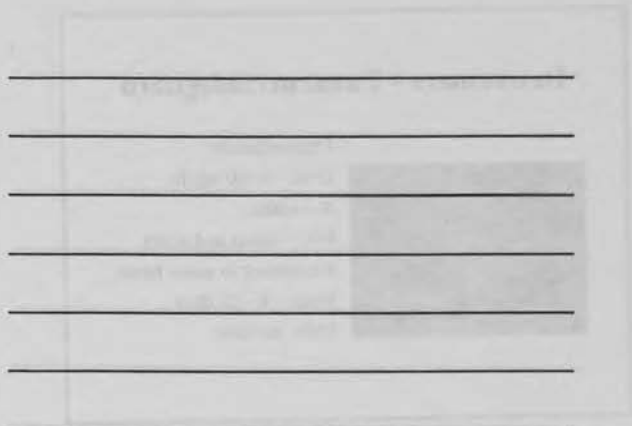
NA for  
 sheep/goats in USA

- 1% Cattle product used SQ @ 1cc/110 lbs
- Meat hold cattle -15 days, reindeer - 50 days
- Milk - not approved -fat binding

- contains Clorsulon



- Not Approved in sheep or goats
- Won't work in sheep & goats



**YOU'VE GOT MORE TO GAIN. CYDECTIN PARASITE CONTROL.**

**Beat it!**

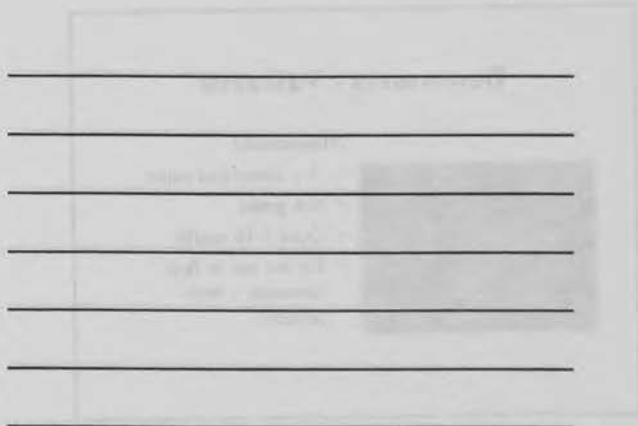
The ONLY injection that can treat and PREVENT Sea

5 mg/ml preparation

- beef cattle
- sheep & goats

No meat hold

7 ml/154 lbs pour-on





- 1% solution  
Dose 1cc/110 lbs SQ

- 35 day hold in cattle
- Similar to injectable Ivermec
- Cost \$1.00/ewe/doe
- Won't work in sheep & goats

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### Dewormers - Panacur/Safeguard



Fenbendazole  
Dose - 5-10 mg/lb  
A - cattle  
NA - sheep and goats  
Resistance in some herds  
Meat - 8 - 16 days  
Milk - no hold

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### Dewormers - Valbazen



- Albendazole
- A - sheep and cattle
  - NA goats
  - Dose 5-10 mg/lb
  - Do not use in first trimester - birth defects

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## Questions



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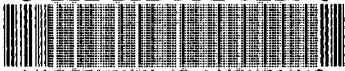
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## Notes:

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