



Proper Milking Practices: Avoiding Mastitis

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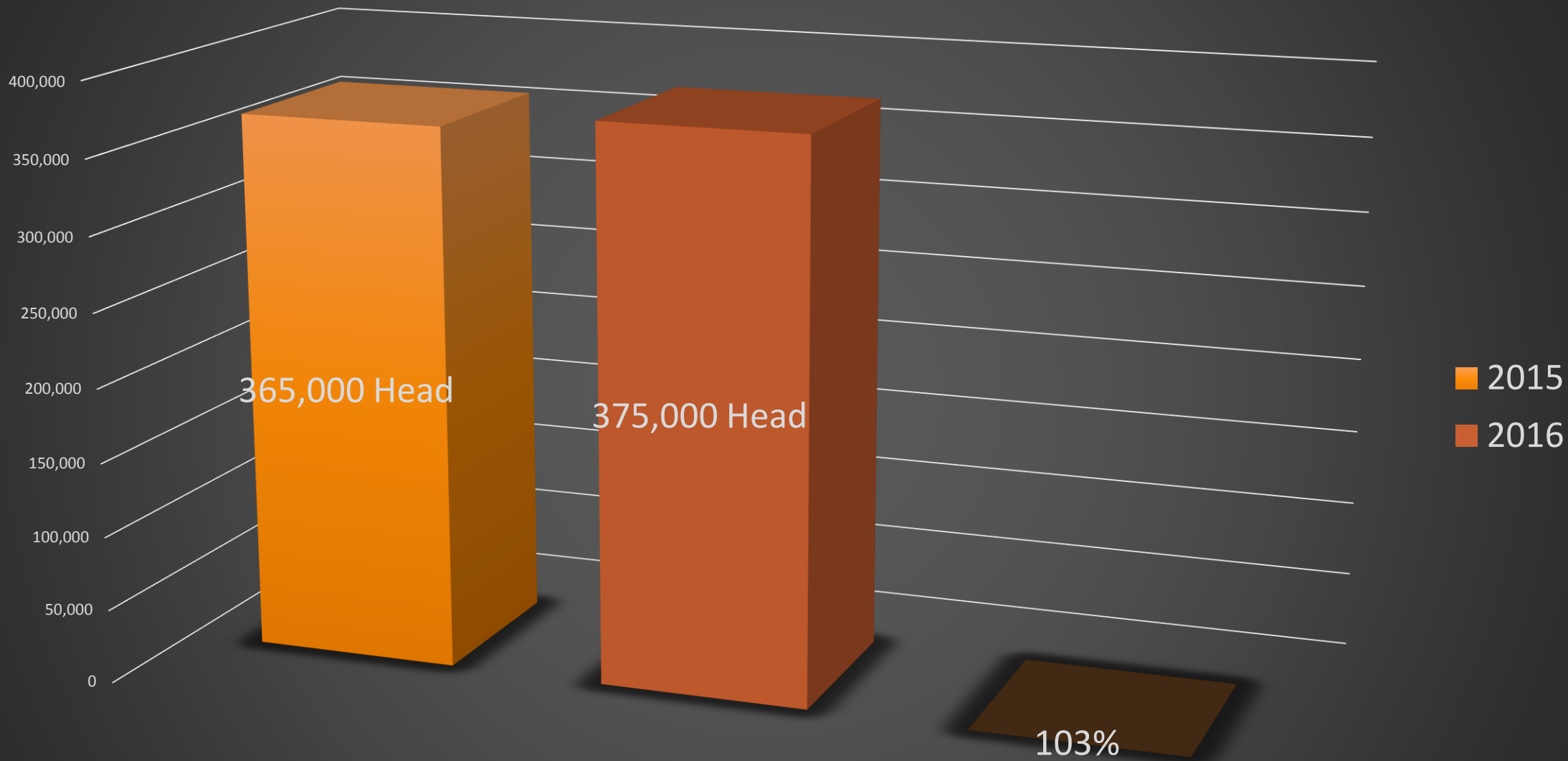
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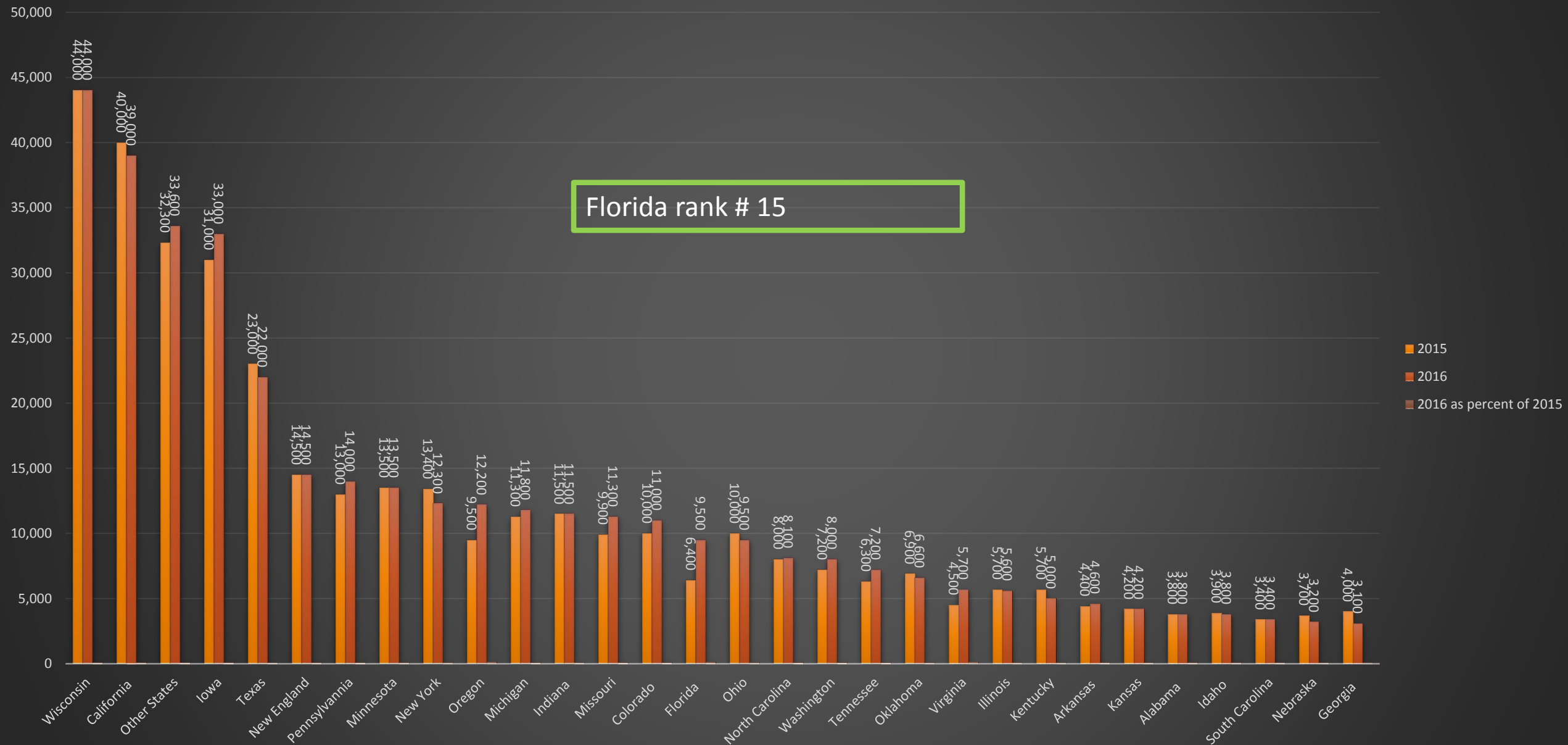
Objectives

- Define Mastitis
- Identify methods for detecting mastitis in goats
- Understand the effects of Mastitis in the milk
- Identify factors that affect milk quality and production
- Identify proper milking parlor practices
- Identify preventive practice for reducing the risk of mastitis in dairy goats

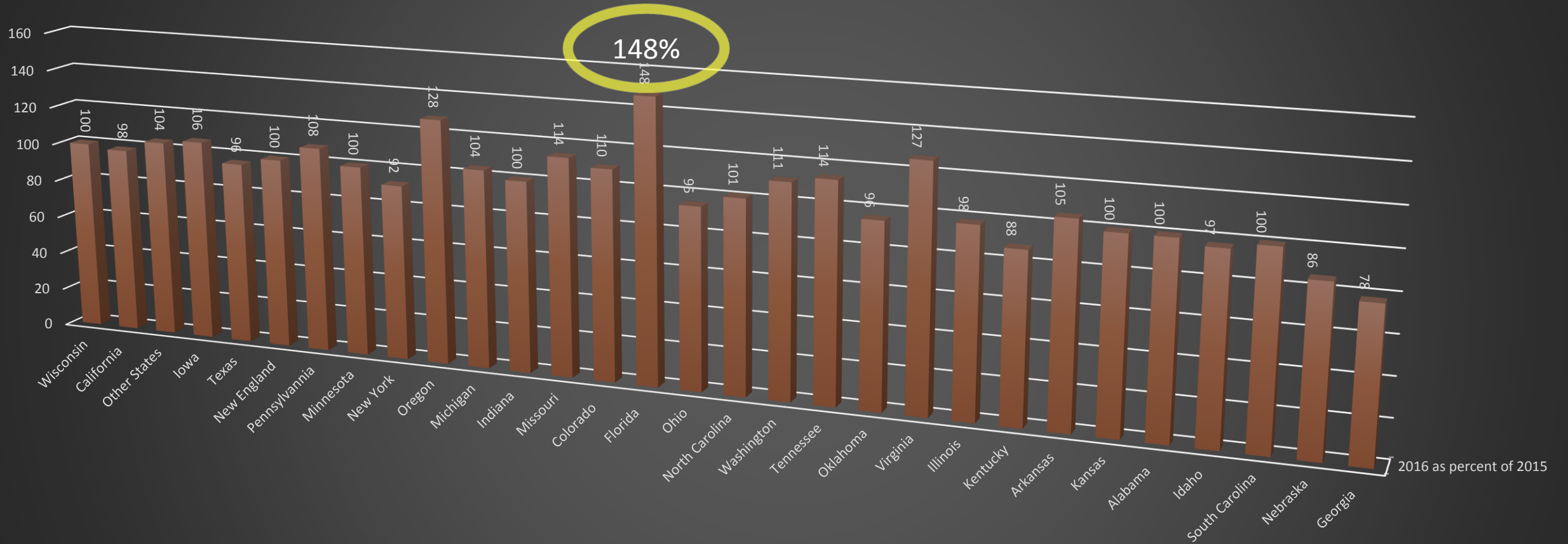
Milk Goat Inventory – United States: January 1, 2015 and 2016



Milk Goat Inventory – United States: January 1, 2015 and 2016



2016 as percent of 2015



2016 as percent of 2015

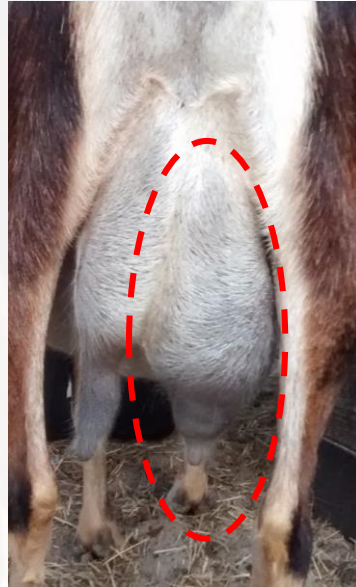
Introduction

Dairy goat milk products are considered specialty foods. Demand and product sales have grown steadily as consumers have become more aware of the potential health benefits of goat milk

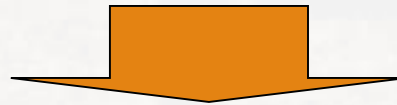
- **Higher protein content**
- **Lower allergens**
- **Lower cholesterol concentrations**

Mastitis Definition:

(Mastos = Breast; Itis = Inflammation of; Greek)



Inflammation of the mammary gland, usually caused by pathogenic bacteria



Decreases milk production (yield), milk quality (composition) and
profitability

All producers should aim for

- Productivity:
 - Produce the maximum quantity of high quality milk from their cows at lowest cost

Mastitis increases costs:

- Reducing milk quality
- Reducing milk quantity



Economic losses due to mastitis

Gestation: 5 month

Days in Milk production: 300 Days

Average production : 5 pound (0.5814 Gallons, 2.20L)

Conversion Gallon to pounds 1 gallon (3.8L) = 8.6 pounds (3.9kg)

300 days of lactation/year *0.5414 production/day = 162.42 gallons

1 gallon	5 pounds	=0.5814
8.6 pounds		Gallon/ daily per goat

Milk price estimate/gallons	Production per Gallons/ Year	Estimate Value of goat raw milk in Markets	Estimate Value of 100 Goat in the year	US DGO Estimate of Mastitis 20%	Estimate loss base in Inventory 375,000 Heads
\$4.00	162.42	\$649.68	\$64,968	\$12,993.60	\$48,726,000
\$6.00	162.42	\$974.52	\$97,452	\$19,490.40	\$73,089,000
\$8.00	162.42	\$1,299.36	\$129,936	\$25,987.20	\$97,452,000

Forms of mastitis

1. Subclinical

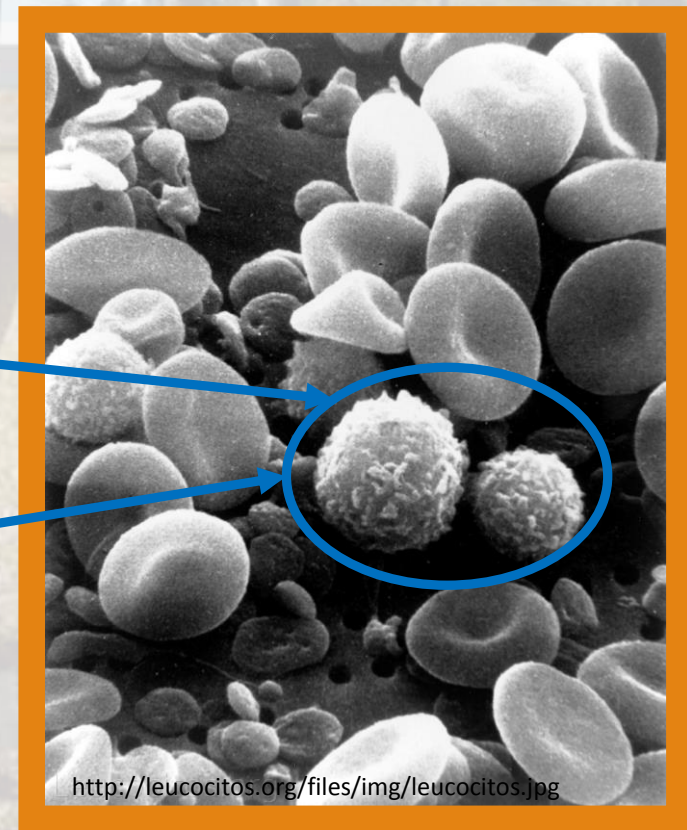
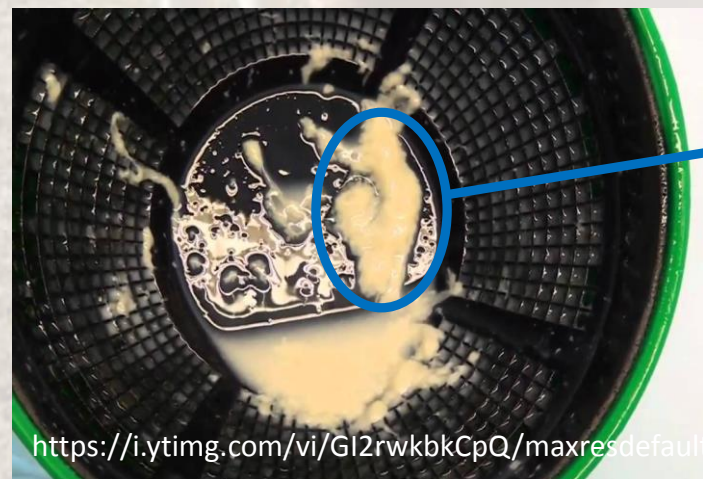
- Milk and udder appear normal but bacteria can be cultured from milk +/or milk has an elevated leukocyte (WBC) or somatic cell count.

2. Clinical:

- Milk shows abnormalities such as clots, flakes, blood, or is watery
- Udder is swollen, red, black, indurated, or painful to touch
- Pain, fever, depression, weakness
- Death

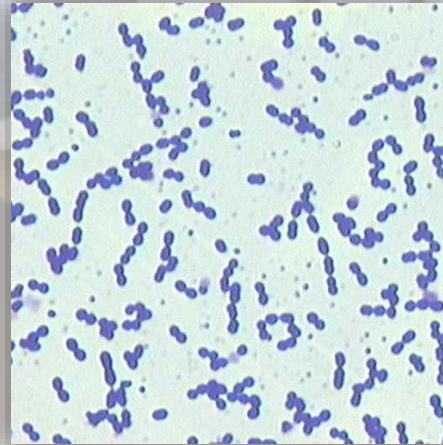


Abnormal milk

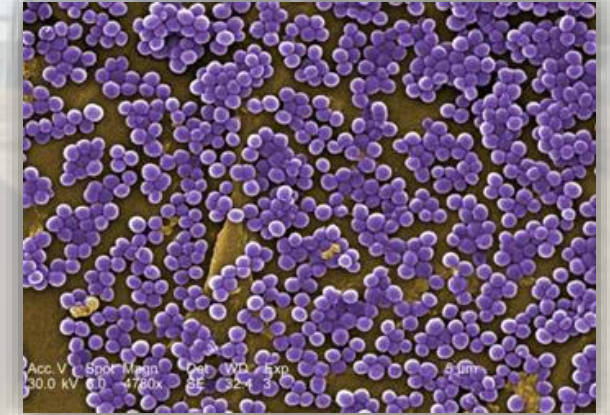


Bacterial Infection (microorganisms in milk)

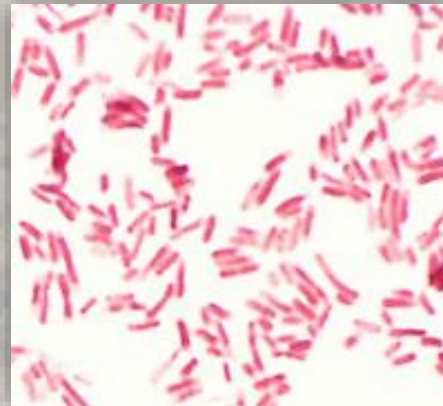
- *Enterococcus faecium*
- **Bacillus spp.**
 - Gram-negative Bacillus
 - Gram-positive Bacillus
- **Staphylococcus spp.**
 - Staphylococcus aureus
 - Staphylococcus caprae
- **Streptococcus spp.**
- **Corynebacterium spp.**
- **Mycoplasma spp.**



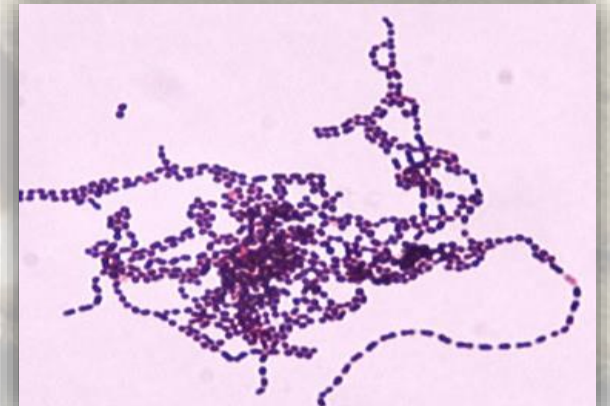
Enterococcus faecium



Staphylococcus spp.



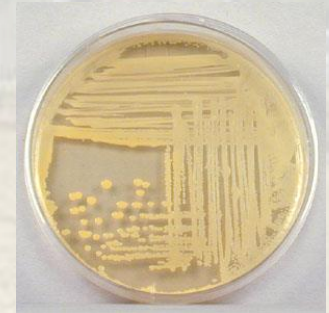
Bacillus



Streptococcus spp.

How is milk quality measured?

- **Bacterial count**
- **Somatic cell count**
- **Chemical residues**



Bacterial Count

Human illness

- Milk-borne diseases (Salmonella, TB)

Bad taste

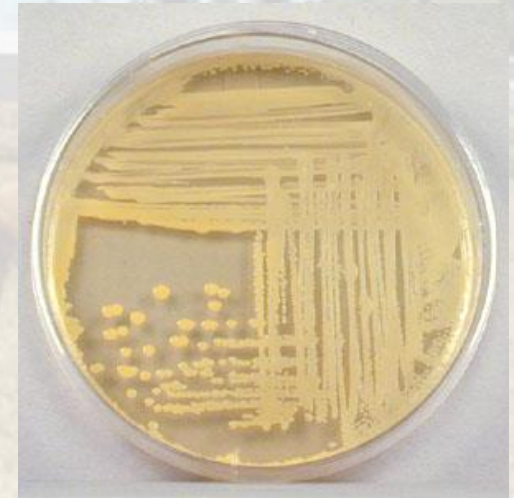
- Rancidity, saltiness

Reduces quality

- Lowered protein, butterfat, lactose

Reduces shelf-life

- Enzymatic breakdown of milk



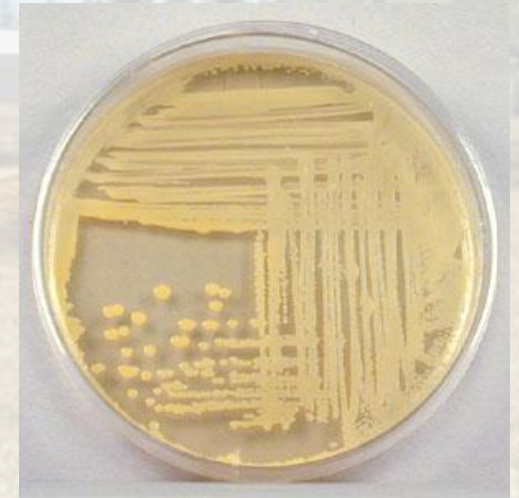
Exceeding Preliminary incubation limits

- **Preliminary incubation**

- I should remain below 25,000 to 50,000 cfu/ ml
- Maximum level **Grade A** 100,000 cfu/ml
- Grade B 300,000 cfu/ml

- **Generally a problem with:**

- Dirty milking equipment
- Lack of sanitizing the milk equipment
- Improper disinfection of teats before milking



Somatic Cell Count

When udder tissue is infected, significant numbers of white blood cells accumulate in the milk.

Grade A Standards

- 1,000,000 cells/ml
- Legal Limit 1,500,000 (Protein, Fat, SCC)

Most accurate method - California Mastitis Test (CMT)



Somatic Cell Count

SCC/ml	Interpretation
Less than 1,000	Healthy gland
500,000 – 2,000	Infection by weak pathogens
Over 1,500,000	Signals infection

Interpretation of California Mastitis Test scores on goat milk.

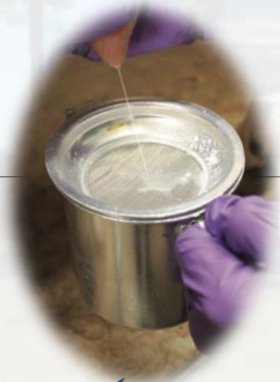
CMT Score	Reaction	Mean no. neutrophils per ml
0	No reaction	68,000
Trace	Slight slime, tends to disappear with continued swirling	268,000
1	Distinct slime but without gel	800,000
2	Immediate gel formation; moves as a mass during swirling	2,560,000
3	Gel develops a convex surface and adheres to the bottom of the cup	> 10,000,000

Schalm, O.W., Carroll, E.J., and Jain, N.C.: Bovine Mastitis. Lea and Febiger, Philadelphia, PA, 1971.

Proper Milking practice procedure



Examine three to four streams of milk from each teat before milking
Or do CMT



Provide a Low Stress Environment



Remove Unit and dip immediately



Wash Teat and/or pre-dip with disinfectant solution (30 second)



Dry Teats completely with individual Towel



Attach milking Unit 120 Second of pre-dip and adjust unit

Goal: milk clean, dry, sanitized teats

Checklist (11)

- Provide a low stress environment for dairy animals
- Check foremilk and udder for mastitis
- Wash teats with an udder wash solution or pre-dip teats in an effective disinfectant product
- Dry teats completely with an individual towel/animal
- Attach milking unit within 120 seconds after initiation of stimulation
- Adjust units as necessary for proper alignment
- Shut off vacuum before removing unit
- Dip teats immediately after unit removal with an effective disinfectant product
- Importance of hygiene
 - Mammary gland
 - Milking equipment
- Grouping and segregation
- Record individual production, treatments

National Mastitis Council revised 2013

Summary

Proper management practices include:

- Keep records
- Evaluation environmental stressors: pen cleanliness, overstocking, parasites, proper nutrition, etc...
- Monitor SCC (never go over 1.5 million)
- Culling problem animals
- Segregate animal with mastitis and milking after health animals will reduce the risk of contamination of herd.



Summary

Mastitis is the principal factor that affect the milk in Goats. Its presence could result in subclinical and clinical symptoms.

Generally, the lack of good management practice in the milking parlors is the principal factor of mastitis.

Environmental conditions can spread mastitis in your herd or flock.

In the United States the incidence of mastitis is 20% and represents a estimate of more than **\$50 million** loss/ year.



Questions?

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