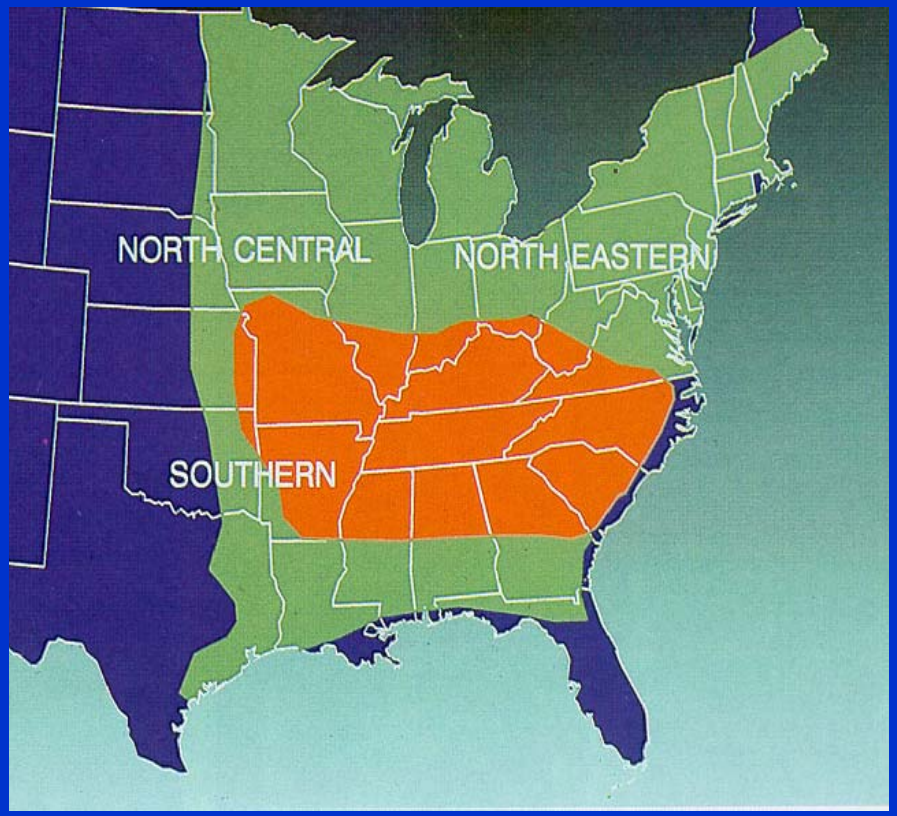
Fescue Toxicosis, Footrot & Pinkeye

Jim Floyd, DVM
NC State University

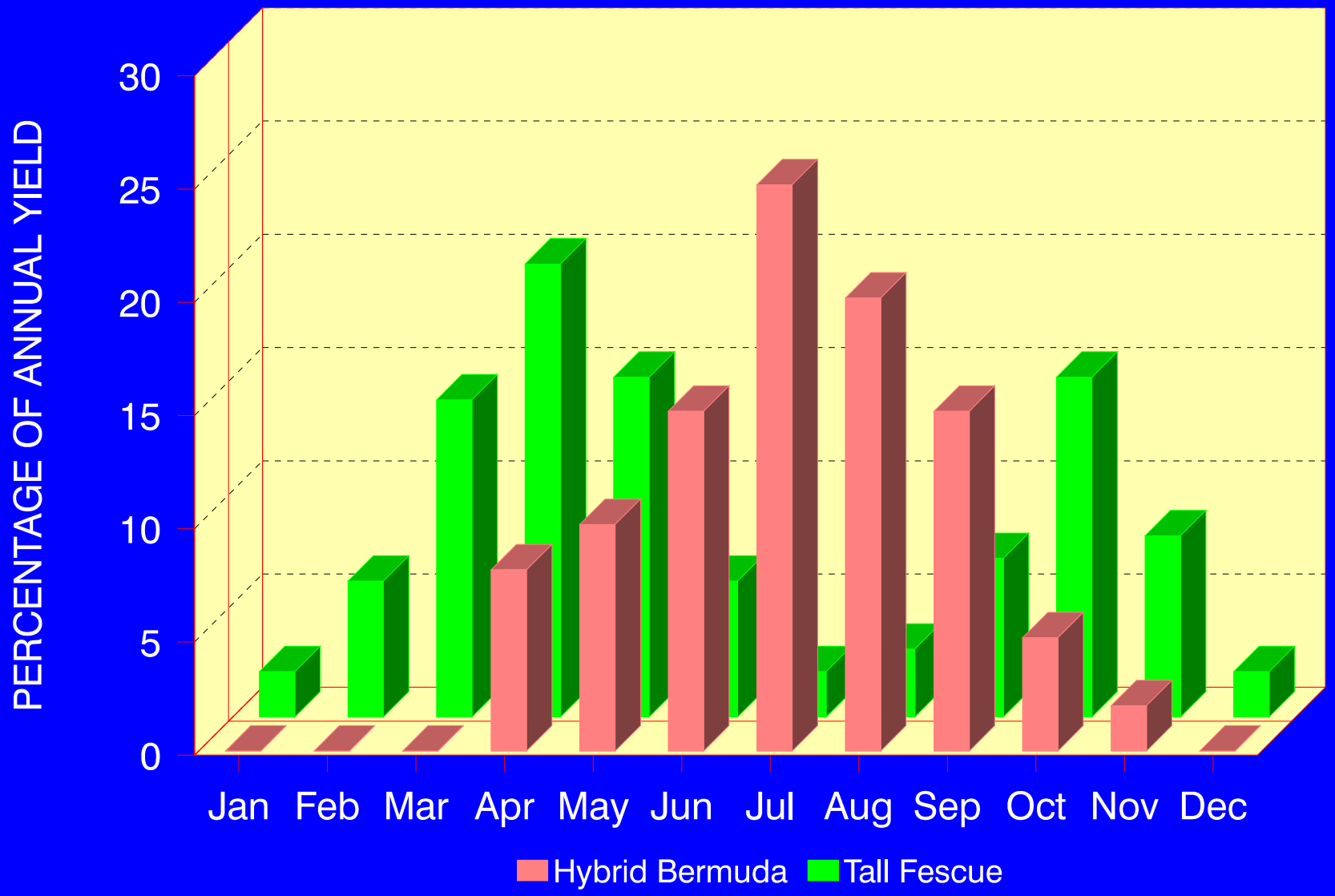
NC State University College of Veterinary Medicine

Tall fescue is widely distributed across the mid and eastern US making up over 14 million ha of pasture and hay land



Dr. Matt Poore, NCSU

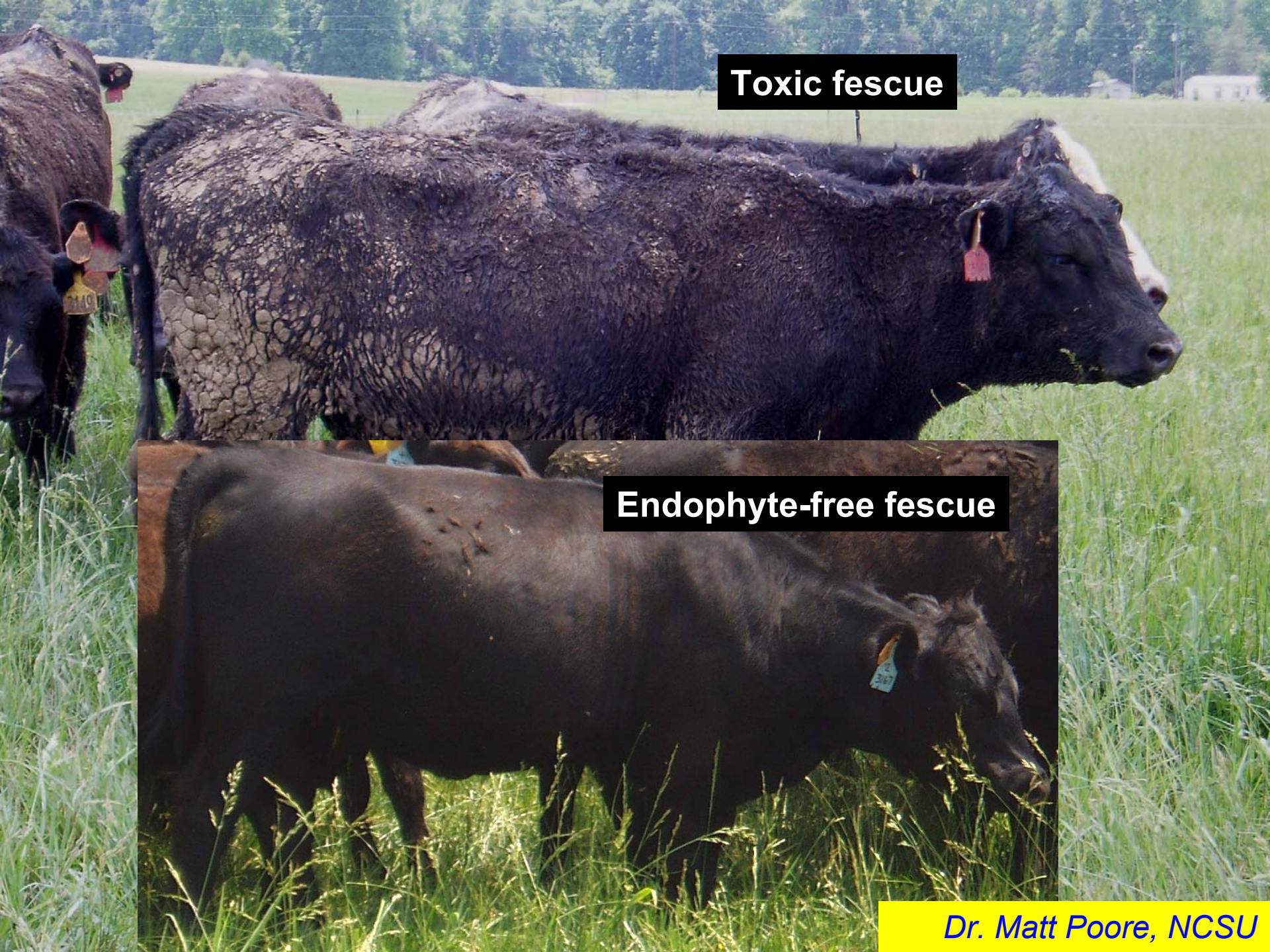
Seasonal Distribution of Forage



Dr. Matt Poore, NCSU

Fescue Toxicosis

- Much of the total tall fescue is endophyte (fungus) infected KY31
- Endophytes produces alkyloids toxic to gazing animals
- Forms of toxicity:
  - Fat necrosis
  - Fescue foot
  - Summer syndrome


Toxic fescue
Endophyte-free fescue
Dr. Matt Poore, NCSU

For each 10% increase in endophyte infection

~ 5% reduced calving %

~ .10 lb/day reduced steer gain

Fescue Toxicosis

- **Residual effect:**

  consume high alkaloid concentrations in spring = severe heat stress worsened by hot summer temperatures

- **Nitrogen fertilization:**

  including poultry litter makes toxicosis worse

- **Effects on other species:**

  sheep, horses

- *Endophyte free fescue* has been around for several years. *Novel endophyte-infected, non-toxic fescue* (or *Max* Q) is a relatively new type.

- Endophyte-infected, but does not produce ergot alkaloids (that are most the toxic substance)

- **The real question is:**
  - **Is it worth it to replant Non-toxic infected fescue?**

Dr. Matt Poore, NCSU

Non-Toxic Infected Fescues

- Georgia-5 with MaxQ
- Jesup with MaxQ
- ARK Plus – "quashed"

Dr. Matt Poore, NCSU

Heifers on toxic fescue

Heifers on MaxQ fescue

Dr. Matt Poore, NCSU

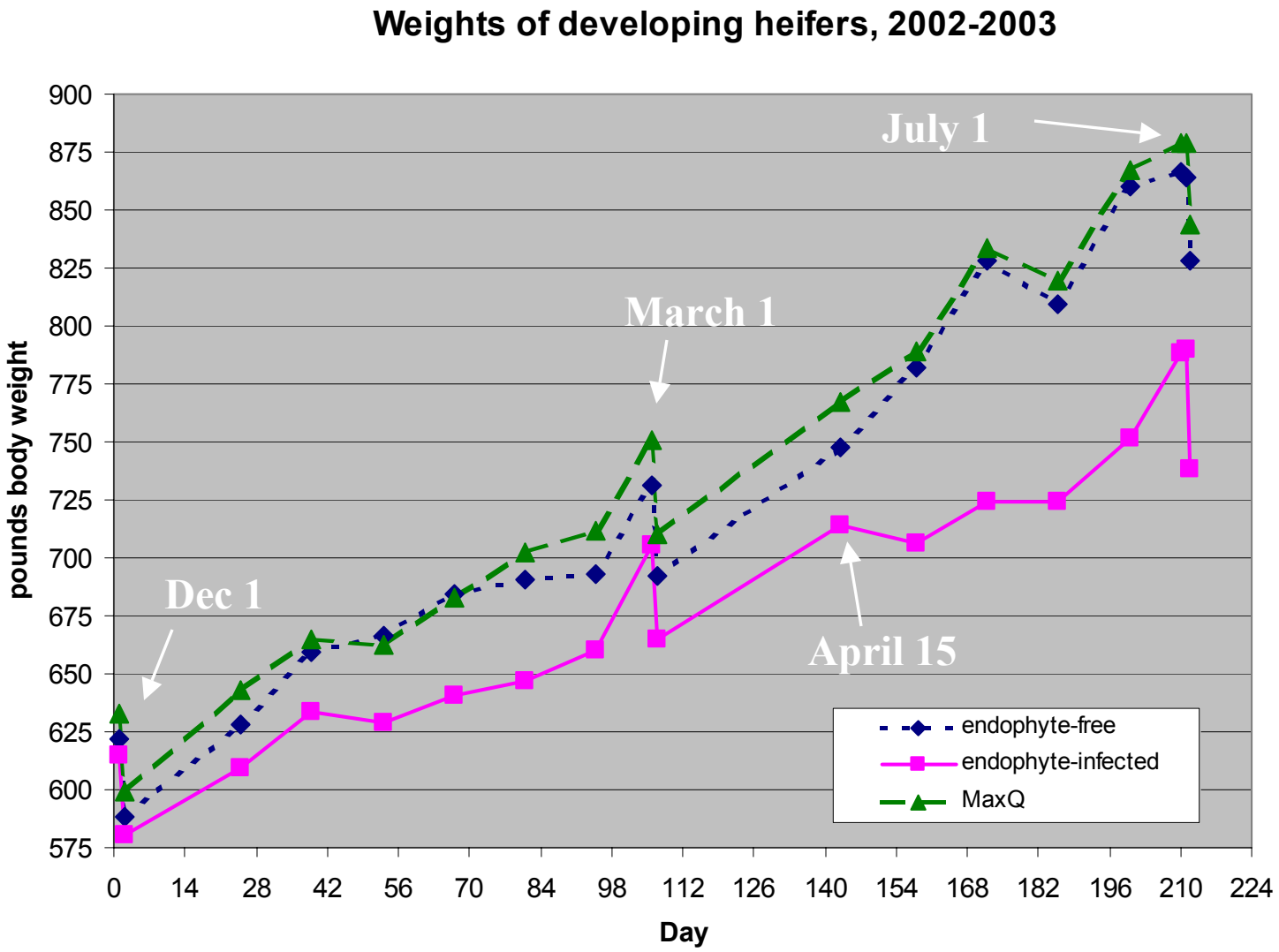
Dry Matter Intake on Toxic Endophyte Infected, Endophyte-Free or MaxQ infected Fescue *Hay*

	TE	EF	MaxQ	SEM
Ad lib DMI kg/d	10.98[b]	12.41[a]	12.47[a]	0.040
Ad lib DMI %BW	1.84[d]	2.07[c]	2.12[c]	0.040

[a,b] Means within a row with different superscripts differ ($P < 0.01$).
[c,d] Means within a row with different superscripts differ ($P < 0.05$).

Dr. Matt Poore, NCSU

Weights of heifers grazing fescue with varying endophyte status



Dr. Matt Poore, NCSU

Summary of MaxQ Research and Economic Evaluation of Replacing Ky-31 with MaxQ

Stacey Gunter and Paul Beck
University of Arkansas

Dr. Matt Poore, NCSU

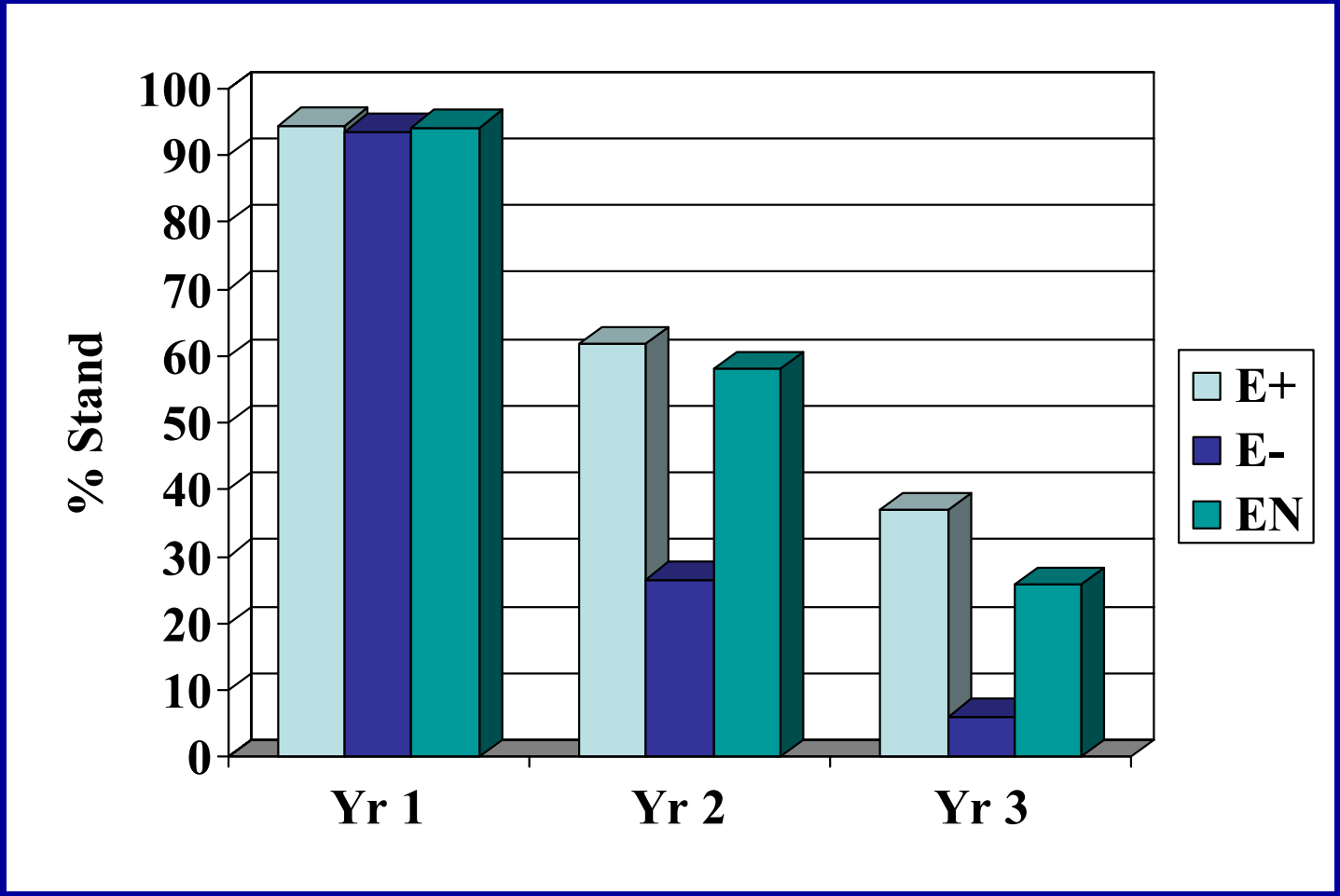
Performance of cattle grazing fescue with or without endophytes, summary of 6 trials

Item	E+	E-	EN
ADG, lb/d	1.34	2.11	1.84
Gain, lb/acre	209	291	270

Endophyte-free and non-toxic were not different in 4 of the 6experiments.

Dr. Matt Poore, NCSU

Stand survival of MaxQ Fescue. Average of Jesup and Ga5 at 2 locations in Georgia



Dr. Matt Poore, NCSU

Net return by year of establishment of MaxQ with or w/o a discount expected on fescue cattle

Year	No discount	$7.5/cwt discount
1	-371	-371
3	-249	-48
5	-140	+240
7	-43	+496
15	+250	+1269
21	+395	+1654

Dr. Matt Poore, NCSU

Non-toxic endophyte fescue

- Seems to have good potential
- Seed is still expensive
- Takes 3-7 years to pay off establishment costs
- Performance of cattle and grass will be acceptable

Dr. Matt Poore, NCSU

Managing Fescue Toxicosis

"Alkaloid management" (Roberts & Andrea, 2004)

1. Replacement of endophyte infected pastures
   - Endophtyte ***free*** varieties
   - Endophyte ***friendly***, novel/introduced ***non-toxic endophyte*** varieties

Managing Fescue Toxicosis

"Alkaloid management" (Roberts & Andrea, 2004)

2. Management of endophyte infected pastures
   - Have dedicated warm season grasses
     - Annuals
       - Sorghum-sudan
       - Millet
       - Crabgrass
     - Perennials
       - Bermudagrass
       - Dallisgrass
       - Natives: Gammagrass, switchgrass, bluestems, etc.

Dr. Matt Poore, NCSU

Managing Fescue Toxicosis

"Alkaloid management" (Roberts & Andrea, 2004)

2. Management of endophyte infected pastures *(cont.)*
   - Dilute toxic fescue with legumes or other grasses
   - Feed supplements
   - Fertilize with low levels of Nitrogen
   - Control seed heads
   - Use heat tolerant cattle species

Dr. Matt Poore, NCSU

Dealing with Fescue Toxicosis

"Alkaloid management" (Roberts & Andrea, 2004)

3. "Remedies"
   - Tasco – *seaweed based*
   - Endo-Fighter (ADM)
   - FEB-200 (Alltech)

FEB-200 - Alltech

- Yeast cell wall product (glucomanan)
- Binds toxins in the gut
- Data shows that when cattle are fed endophyte infected fescue with FEB-200 more of the toxins are excreted in the feces
- Production studies have shown that body temperature may be lowered and weight gain increased in cows grazing infected fescue
- There has been no consistent effect on weaning weights

Dr. Matt Poore, NCSU

Conclusions

- **Best solution is to get cattle off infected fescue during hot weather (use warm season forages)**
- **Non-toxic infected fescue and perhaps other cool-season grasses for new plantings (“Persist Orchardgrass”)**
- **Other remedies have limited research support but may help in some situations**

Dr. Matt Poore, NCSU

1997 Beef Cow-Calf Health & Management Monitoring System (NAHMS), USDA-APHIS-VS

Footrot (0.8 infection rate)

Pinkeye (1.3% infection rate)

. . . the two most prevalent conditions affecting all breeding beef females.

Foot Rot

Dr. Geof Smith, NCSU

Foot Rot

- "Foul in the foot"
- Bacterial infection with inflamed, painful foot and deep tissue invasion
- bacteria
  - *Fusobacterium necrophorum* (Biotypes A & AB)
  - *Dichelobacter nodosus* (*Bacteroides*)
  - *Arcanobacterium pyogenes*
  - *Porphyromonas* species

Dr. Geof Smith, NCSU

Dr. Geof Smith, NCSU

Foot Rot – Clinical Signs

- Mild lameness
- Oily discharge at skin-horn junction – primarily between the bulbs of the heel
- May have mild to moderate swelling
- Foul odor, painful to the touch
- Tissue between claws is dead with proliferation of tissue in an attempt to heal

Dr. Geof Smith, NCSU


Dr. Geof Smith, NCSU

Foot Rot

- Most common in BEEF cattle, particularly yearlings
- Bacteria invade through damaged skin, cause tissue destroying, deep invasive infection
  - Water softened interdigital area (standing in mud or other moisture)
  - Traumatic injury to interdigital area
  - Occurs in dry summer pasture with stubble

Dr. Geof Smith, NCSU

Foot Rot – Treatment

- In some areas may disappear in summer w/o treatment when the feet dry out
- Mild cases: clean foot, apply drying agent (copper sulfate 5%)
- Wrap feet with topical antibiotic dressing??
- Moderate or more severe cases: most effective treatment is injected antibiotics EARLY
  - Drugs of choice include oxytetracycline (LA-200), ceftiofur (Naxcel), procaine penicillin (20,000 IU/lb), and florfenicol (Nuflor)

Dr. Geof Smith, NCSU

Foot Rot – Prevention

- “Avoid damage to feet from mud or coarse grazing stubble”
- Footbaths (2% formalin, 5% copper sulfate)
  - Become contaminated almost immediately
  - May serve as means of spreading problems
- Feed organic iodine (EDDI) 10-15 mg/hd/day in loose salt mix
- Feed zinc methionine (Zinpro)- may help
- Avoid mineral deficiencies (copper, selenium)

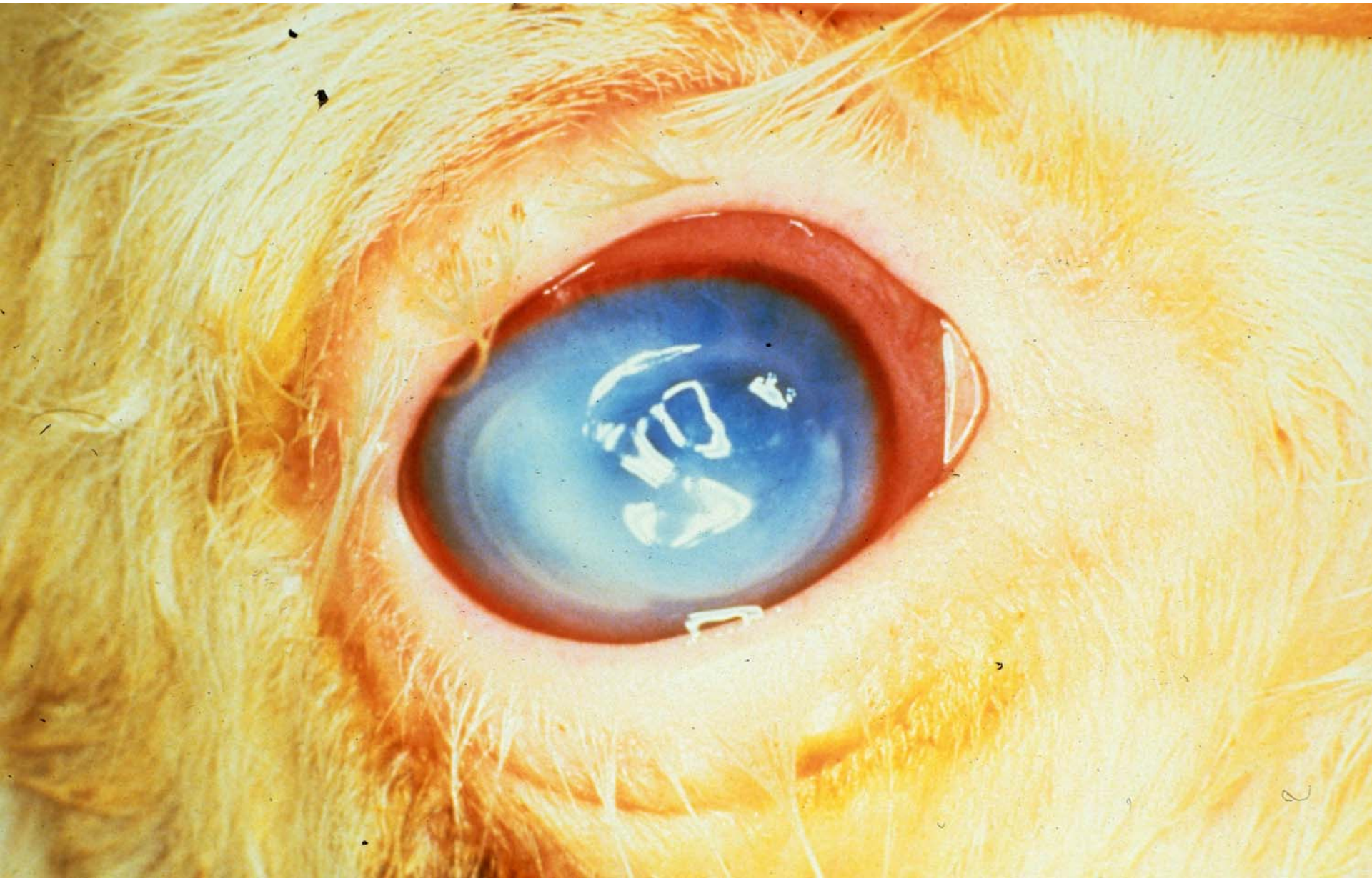
Foot Rot – vaccination

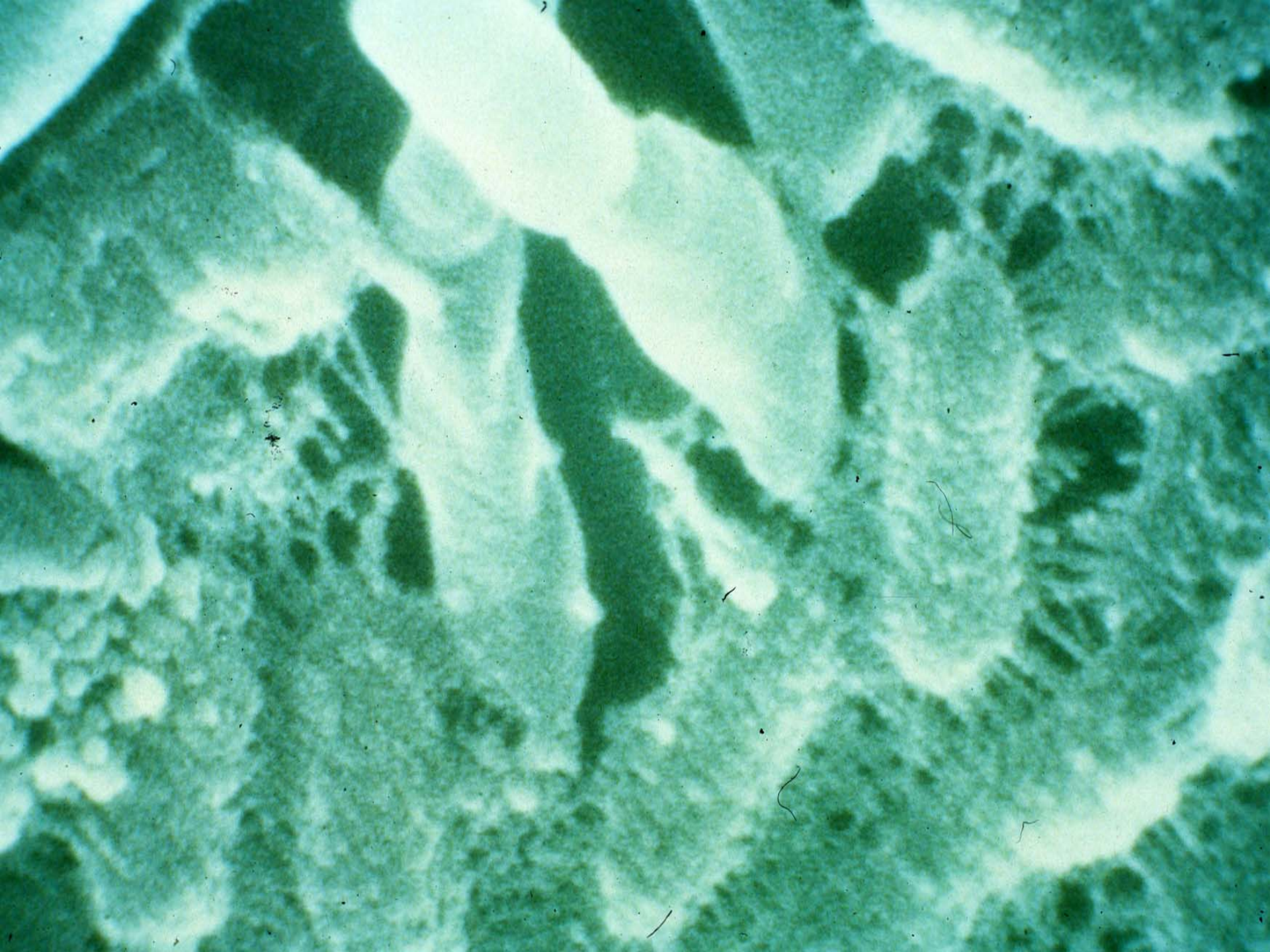
- *Volar (Intervet)*
- *Fusogard (Novartis)*
  - *Initial and booster (3-4 weeks later)*
  - *Booster annually or when conditions favorable*
- May be of some value but often of limited effectiveness
- Use strategically to cover times most at risk

Pinkeye

- Highly contagious infection
- *Moraxella bovis*
- Most common in summer & fall
- In a herd, severity and amount of infection may vary from year to year
- Outbreaks may affect 80% or more!!


78





Pinkeye: Some Treatments

- **Long acting oxytetracyline** injectable (LA-200, Biomycin, etc.)
  - 4.5 ml/cwt (9 mg/lb) repeated 72 hrs later
- **NuFlor** (requires DVM prescription)
  - 3 ml/ cwt (9 mg/lb) IM repeated 24 hrs later
  - 6 ml/cwt (18 mg/lb) SQ once
- **Sprays**
- **Procaine Penicillin G** injected subconjunctival in each eye (under the thin membrane covering the white of the eye)
  - 1 ml once a day for 3 days

Pinkeye: Effective Trt Protocol

JAVMA Feb 1998. 212[4]:560-563

- **Long acting oxytetracycline injection (LA-200, Biomycin, etc.)**
  - **4.5 ml/cwt (9 mg/lb) IM repeated 72 hrs later**
- **Combined with oral oxytetracycline**
  - **2 grams per head per day for 10 days in feed (alfalfa pellets, etc.)**

This combination resulted in fewer calves affected after 1-3 weeks than treatment with subconjunctival penicillin

Pinkeye: Prevention

- Fly control
- Grass, weed, and brush control
- Hay and bunk feed management
- Solid annual immunization program for viral diseases (IBR, BVD)
- Breed for eyelid pigmentation

Pinkeye vaccines ??

20/20 Vision 7 with Spur (Intervet) Alpha 7 MB (Boehringer Ingelheim) Alpha 7 MB-1 (Boehringer Ingelheim) Piliguard Pinkeye + 7 (Schering Plough) Cattle-Vac Pinkeye 4 (Durvet) I-Site (Agrilabs) Maxi/Guard Pinkeye Bacterin (Addison) Ocu-Guard MB (Boehringer Ingelheim) Ocu-Guard MB-1 (Boehringer Ingelheim)	Piliguard Pinkeye-1 (Durvet) Piliguard Pinkeye-1 Trivalent (Schering-Plough) Piliguard Pinkeye TriView (Schering-Plough) Pinkeye-3 (Aspen) Pinkeye Shield XT4 (Novartis(Farm Animal)) Resist Pinkeye (Agri Pharm) Trust Guard M3 (Vedco)

Thank you!

Questions?