Selected Tools for Internal Parasite Management in Sheep

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INTRODUCTION

GASTROINTESTINAL NEMATODES
- Trichostrongylus colubriformis
- Cooperia spp
- Ostertagia circumcincta
- Haemonchus contortus

Haemonchus contortus
(Barber Pole Worm)
- Sheep, goats, deer, exotic ruminants
- Blood-sucking parasite
- Highly pathogenic
- Causes severe anemia
- Causes low blood protein -- "bottle jaw"
- Most important parasite in sheep/goats raised in warm/wet (moist) environments such as in the southern USA.

Southern Consortium for Small Ruminant Parasite Control
A Research Group

Life Cycle of H. contortus
CONTROL MEASURES: Anthelmintics

- Multiple anthelmintic resistance in small ruminant GIN is a major problem in Australia, New Zealand, South Africa, South America, Great Britain, USA
- Cost of anthelmintics
- Concerns over drug residues in meat and milk products
- Environmental concerns

CONTROL MEASURES: Strategic deworming

- Smart drenching
- FAMACHA

ALTERNATIVE CONTROL MEASURES

- Vaccines
- Genetic resistance/tolerance
- Copper oxide wire particles
- Nematode-trapping fungi
- Use of forages/plants

HERBAL MEDICINE

- Plant compounds with in vitro and in vivo activity against *Haemonchus contortus*
  - Alkaloids
  - Triterpenoids
  - Benzyl isothiocyanate
  - Allicin
  - Oleanolic acid
  - Condensed tannins

HERBAL MEDICINE, cont.

- Condensed tannin (CT) — containing plants and forages
  - Grazed, or cut and fed green
  - Dried, fed as hay
  - CT extracts

BENEFICIAL EFFECTS OF CONDENSED TANNINS

- Increased net absorption of (dietary) essential amino acids (EAAs) = protein.
- Increased wool growth and growth rate
- Increased live weight gain
- Higher ovulation rate
- Higher milk yield
- Reduced bloat
- Apparent reduced detrimental effects of internal parasites
**CONDENSED TANNINS IN FORAGES**
- Vary in concentration
  - Alfalfa (none)
  - Birdsfoot trefoil (2-3%)
  - Big trefoil (4-5%)
  - Sericea lespedeza (6-7%)
  - Canary clover (14%)
- Vary in reactivity
  - Birdsfoot trefoil CT (low reactivity)
  - Sericea lespedeza CT (high reactivity)

**CT-CONTAINING FORAGES**
- Cool season legumes
  - Sulla
  - Birdsfoot trefoil
  - Big trefoil
  - Sainfoin
- Warm-season legumes
  - Sericea lespedeza

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**Sericea lespedeza**
- Perennial warm-season legume
- High in condensed tannins
- Tolerant to low pH (4.5)
- Grows well on infertile soils

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**Sericea lespedeza Distribution**

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**Forms of Sericea Lespedeza used in Experimental Studies**
- Hay – long stem and ground
- Pellets
- Grazed forage

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**MATERIALS AND METHODS in EXPERIMENTS**
- Samples collected every week or every two weeks
- Fecal samples analyzed for EPG
- Blood sample - PCV
Procedures, cont.

- At the end of each trial animals are slaughtered and worms collected from abomasum and intestines

PCV

Pre-trial | Trial period

FEC

Pre-trial | Trial

Effects on Adult Worm Species

Conclusions

- Feeding SL hay to goats (Terrill et al.) and lambs (Miller et al.) decreased FEC & improved PCV compared to BG hay

- % Haemonchus larvae & % larvae recovered were lower in lambs and goats fed SL hay

- Feeding SL hay reduced total worm count in both abomasum and small intestine of small ruminants.

Effects on Fecal Egg Counts
CONCLUSIONS

- Pelleting does not reduce the efficacy of sericea lespedeza hay against parasitic nematodes

- Further research is needed to evaluate CT forage as a component of an integrated parasite control program for small ruminants
Growth Rate

- Bermuda grass – non infected
- Bermuda grass – infected w/ larvae
- Sericea lespedeza – non infected
- Sericea lespedeza – infected w/ larvae

Blood Urea Nitrogen levels

Growth rate of growing goats

Conclusions

- Sericea lespedeza hay reduced parasitic infection levels and increased animal performance (ADG) of growing goats
- Condensed tannins in SL increased protein utilization efficiency in the animal

Future Research with Sericea Lespedeza for Parasite Control

- Grazing trials with sheep and goats
  - Pure stands
  - In combination with other forages
  - SL as deworming paddock
- Research with SL as dried feed
  - Leaf meal, pellets
  - Ingredient in complete feeds
  - Pasture supplement
  - Component of TMR for feedlot, confinement feeding
CT Forage/Browse Species

- Lespedeza
- Desmodium
- Desmanthus
- Neptunia
- Acacia
- Leucaena
- Calliandra
- Crotalaria (Sunn hemp)

Wrong Image of the Crop

Better Image and Correct Grazing Maturity