

## NSA Poster Presentations: Friday 13 August 2004

### The potential anthelmintic effect of *Calliandra calothyrsus* in lambs

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**Background** - Resistance to anthelmintic drugs by gastrointestinal (GI) worm parasites is a growing problem. Thus there is merit in the development of alternative systems of control of such parasites. Some high tanniniferous temperate forages have been shown to improve the resilience of animals to GI parasites; an effect that may be due to the presence of condensed tannins or to improvements in protein nutrition.

**Objective** - This study was undertaken as a pilot examination of the potential anthelmintic effects of *Calliandra calothyrsus* (Calliandra), a tropical legume high in tannin and protein.

**Design** - Eighteen three-month-old Merino lambs, in six groups of three, were infected with either *Trichostrongylus colubriformis* or *Haemonchus contortus*, and fed either *Astrelba lappacea* (Mitchell grass hay; low protein), *Medicago sativa* (Lucerne pellets; low tannin, high protein) or Calliandra. The Lucerne and Calliandra diets were modified to have similar concentrations of crude protein (CP; 200 g/kg DM) and rumen-undegradable protein (130 g/kg DM). Nitrogen balance (NB) was determined in the first week post-infection, and faecal egg counts (FEC) were performed weekly. Twenty-eight and 35 days post-infection, lambs infected with *Trichostrongylus* and *Haemonchus* respectively, were slaughtered and number of worms present in the GI tract determined.

#### Outcomes -

Worm species	<i>Trichostrongylus colubriformis</i>			<i>Haemonchus contortus</i>		
	Hay	Lucerne	Calliandra	Hay	Lucerne	Calliandra
Worm counts	5218 <sup>a</sup>	7101 <sup>a</sup>	5897 <sup>a</sup>	1012 <sup>a</sup>	1860 <sup>a</sup>	1932 <sup>a</sup>
FEC1	180 <sup>a</sup>	831 <sup>a</sup>	70 <sup>b</sup>	1340 <sup>a</sup>	1670 <sup>a</sup>	1210 <sup>a</sup>
FEC2	460 <sup>a</sup>	1080 <sup>b</sup>	160 <sup>c</sup>	3510 <sup>a</sup>	2940 <sup>a</sup>	1650 <sup>a</sup>

For each worm species, means with different superscripts within a row are different significantly ( $P < 0.05$ ).

Diet did not affect worm counts of either species ( $P > 0.05$ ). However, *Trichostrongylus*-infected sheep fed Calliandra had the lowest FEC ( $P < 0.05$ ). In *Haemonchus*-infected sheep, there was no difference in FEC between dietary treatments ( $P > 0.05$ ). There was no difference in CP intake and NB between animals fed Calliandra and Lucerne.

**Conclusion** - It is suggested that Calliandra could reduce FEC of lambs infected with *T. colubriformis*, and that such an effect is mediated probably by some direct toxic or physiological effect of the legume rather than by improvement in protein nutrition.

### Digestibility of pearl millet in broiler diets

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**Background** - New dwarf-grain pearl millet (*Pennisetum glaucum*) hybrids being evaluated as an alternative feed grain will complement sorghum in Queensland's dryland farming areas and deliver considerable benefits to the summer cereal value chain. The crop's short growth cycle will allow late-season opportunity cropping and remove grain growers from exposure to economic risks such as sorghum midge and sorghum ergot. Data on these Australian pearl millet (PM) hybrids to characterize their nutritive value has been inadequate.

**Objective** - To compare the energy and ileal digestibility of pearl millet hybrids with that of sorghum.

**Design** - Three pearl millet hybrids (PM31, PM3 and PM4) and sorghum were fed to 15-21 day old broilers in cages in a randomised block design of 4 replicates per treatment with 8 birds in each replicate. Diets containing 97% PM or sorghum plus minerals and vitamins and chromic oxide as an indigestible marker were prepared and offered *ad libitum*. Total excreta was collected over a seven day period and ileal digesta collected after birds were euthanased on day seven. Diet, excreta and digesta samples were dried and analysed for energy, protein and amino acids.

**Outcomes** - The crude protein content of the 3 new PM hybrids were 13.7, 14.8 and 14.3% respectively for PM hybrids compared to sorghum 12.0%. Protein digestibilities were 74, 78 and 80% respectively compared to sorghum 76%. The digestibility of amino acids in PM hybrids were similar to sorghum ( $> 70\%$ ). However, the individual amino acid content of the hybrids were different to sorghum with the mean lysine content of the PM hybrids being 3.45 g/kg compared to sorghum 2.3g/kg. Similarly, for; methionine (2.5 & 1.5), cystine (6.0 & 4.4) and threonine (5.1 & 3.5g/kg), respectively for the hybrids and sorghum. AMEs of the hybrids were at least 1 MJ/kg DM higher than sorghum (14.0, 14.3 and 14.2 compared to sorghum 13.3 MJ/kg DM).

**Conclusions** - Data suggest that the PM hybrids developed in Australia has higher energy and protein content than sorghum and digestibility of their amino acids are comparable to sorghum. These hybrids have the potential for providing an excellent source of energy and protein for the broiler industry.