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**STUDIES OF THE EFFECTS OF "MIMOSA BARK EXTRACT"  
CONTAINING CONDENSED TANNINS ON MILK  
PRODUCTION BY GRAZING DAIRY COWS AND ON  
RUMINAL PROTEIN METABOLISM IN SHEEP**

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for the degree of  
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## ABSTRACT

Mashudi, 1996. Studies of the effects of "Mimosa bark extract" containing condensed tannins on milk production by grazing dairy cows and on ruminal protein metabolism in sheep. M.Agr.Sc. Thesis, Massey University, Palmerston North, New Zealand.

Tannins, particularly condensed tannins (CT), either added to the diet or occurring naturally in the forage are advantageous because they protect dietary protein from degradation in the rumen. The aim of this study was to measure the effect of Mimosa bark extract which contained approximately 70% CT on grazing dairy cow performance and on ruminal protein metabolism in sheep.

Two experiments were carried out over the spring season (September and October 1994). In experiment I, effects of CT in Mimosa bark extract upon blood urea concentration, milk yield and milk composition, liveweight and condition score of grazing dairy cows were evaluated. Thirty Friesian cows were allocated at random to 3 treatments : (1) Control : no Mimosa bark extract (no CT); (2) Low CT : 50 g/cow daily of Mimosa bark extract (2.4 g CT/ kg DM eaten); (3) high CT : 100 g/cow daily of Mimosa bark extract (4.8 g CT/kg DM eaten). Mimosa bark extract was given twice daily as a suspension by oral drenching during each milking. In experiment II, effects of CT in Mimosa bark extract on ruminal protein metabolism in sheep were evaluated. Six mature Romney sheep fitted with permanent ruminal cannulae were randomly assigned into 2 treatments in a cross-over design. The two treatments were (1) Control : no Mimosa bark extract (no CT); (2) High CT : 6.66 g/sheep daily of Mimosa bark extract (4.8 g CT/kg DM eaten). Mimosa bark extract was given twice daily as a suspension by oral drenching just after feeding. Dry matter intake, rates of DM disappearance by the *in sacco* method, rumen ammonia and blood urea concentration and apparent digestibility of dry matter and and nitrogen were measured.

In experiment I, liveweight and condition score as well as milk yield and composition, were not influenced by CT. Lactose concentrations were higher in the low CT group

than in the high CT group in all weeks of the experiment. Cows drenched with high CT had a lower ( $P<0.05$ ) blood urea concentration than cows in the control group, and, in week I they were lower ( $P<0.05$ ) than cows in the low CT group. In experiment II, rumen metabolism parameters, including dry matter intake, *in sacco* DM disappearance parameters (A, B, C and A+B) and apparent digestibility of DM and N were not influenced by Mimosa bark extract. However sheep drenched with high CT had lower rumen ammonia and blood urea concentrations ( $P<0.05$ ) than the control in the whole period.

These results indicate that Mimosa bark extract had no significant effect on milk production. However it did consistently and significantly reduce blood urea concentration in both cows (high CT group) and sheep and it reduced rumen ammonia concentration in sheep. This indicates that the CT did have some biological effect in the rumen namely, a reduced protein degradation in the rumen.

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## TABLE OF CONTENTS

		<b>Page</b>
	ABSTRACT	ii
	ACKNOWLEDGEMENTS	iv
	LIST OF TABLES	viii
	LIST OF FIGURES	x
1.	<b>INTRODUCTION</b>	1
2.	<b>REVIEW OF LITERATURE</b>	3
	2.1. Protein digestion in ruminants	3
	2.1.1. Protein in forages	5
	2.1.2. Protein digestion (degradation) in the ruminant	6
	2.1.2.1. Rumen ammonia	8
	2.1.2.2. Blood urea	10
	2.1.3. Measurement of protein disappearance by <i>in sacco</i> methods	11
	2.1.4. Outflow of dietary and microbial nitrogenous from the rumen	12
	2.1.5. Absorption of amino acids from the intestine	13
	2.1.6. Protein protection	15
	2.2. Tannins	16
	2.2.1. Chemical structure	16
	2.2.2. Occurrence in plants	18
	2.2.3. Reaction with plant constituents	22
	2.2.4. Enzyme and microbial inhibition	24
	2.3. Effect of CT on protein and amino acid digestion	25
	2.3.1. The effect of CT on N metabolism in the rumen	27
	2.3.2. The effect of CT on the post ruminal metabolism of N	29
	2.3.3. The effect of CT on absorption of amino acids	31
	2.3.4. The effect of CT on production by ruminants	32
	2.4. Scope and objectives of the present study	36

### 3. MATERIALS AND METHODS

Experiment I : Effects of Mimosa bark extract on milk production by grazing dairy cows	37
3.1. Experimental design	37
3.1.1. Location	37
3.1.2. Animal and treatments	37
3.1.3. Pasture	38
3.1.4. Mimosa bark extract (Condensed tannin source)	39
3.2. Measurements	39
3.2.1. Feed measurement	39
3.2.2. Animal measurements :	
3.2.2.1. Pasture intake	40
3.2.2.2. Milk production and its constituent	40
3.2.2.3. Liveweight and body condition score	41
3.2.2.4. Blood urea	41
3.3. Statistical analysis	42
Experiment II : Effects of Mimosa bark extract on aspects of rumen metabolism in sheep	44
3.4. Experimental design	44
3.4.1. Location	44
3.4.2. Animal and treatments	44
3.4.3. Feed	45
3.5. Measurements	45
3.5.1. Feed	45
3.5.2. Pasture intake	46
3.5.3. Digestibility of pasture	46
3.5.4. Rumen ammonia	47
3.5.5. Blood urea	47
3.5.6. Measurements of rates of disappearance ( <i>in sacco</i> )	48
3.6. Statistical analysis	49

4.	<b>RESULTS</b>	
	Effects on milk production by <i>grazing</i> cows (Experiment 1)	50
	4.1. Chemical analysis of the pastures and Mimosa bark extract	50
	4.2. Apparent dry matter eaten	51
	4.3. Blood urea concentration	51
	4.4. Yields of milk, milk fat, milk protein and milk lactose	52
	4.5. Milk composition	56
	4.6. Liveweight and body condition score	57
	Effects on rumen digestion in sheep (Experiment 2)	58
	4.7. Chemical analysis of the pastures fed to the sheep	58
	4.8. Dry matter intake	58
	4.9. Dry matter disappearance	59
	4.10. Rumen ammonia concentration	61
	4.11. Blood urea concentration	63
	4.12. Apparent digestibility of dry matter and nitrogen	65
5.	<b>DISCUSSION</b>	
	5.1. Chemical analysis of the Mimosa bark extract	67
	5.2. Concentration of condensed tannin administered to cows and sheep	67
	5.3. Dry matter intakes in cows and sheep	68
	5.4. Dry matter disappearance by <i>in sacco</i> method in sheep	69
	5.5. Rumen ammonia concentrations in sheep	70
	5.6. Blood urea concentrations in cows and sheep	71
	5.7. Apparent digestibility of dry matter and nitrogen in sheep	72
	5.8. Yields of milk, milk fat, milk protein and milk lactose in cows	73
	5.9. Milk composition in cows	75
	5.10. Liveweight and body condition score in cows	75
6.	<b>CONCLUSION</b>	77
7.	<b>REFERENCES</b>	79
	<b>LIST OF APPENDICES</b>	88



## LIST OF TABLES

	Page
2.1. Distribution of protein in leaves of temperate forages (adapted from Brady, 1976)	6
2.2. Condensed tannin found in some forages species (adapted from Kumar and D'Mello, 1995)	19
2.3. Nitrogen dynamics (based primarily on $^{15}\text{N}$ enrichment) in sheep fed <i>Lotus pedunculatus</i> with and without an intraruminal infusion of poly-ethylene glycol (PEG) (Adapted from Waghorn <i>et al.</i> , 1994)	28
3.1. The specification of Mimosa bark extract as source of condensed tannin	39
4.1.a. Data for the chemical analysis of the pastures	50
4.1.b. Data for the chemical analysis of the Mimosa bark extract	50
4.2. Mean values ( $\pm$ sem) for the amounts of the dry matter herbage apparently eaten by each cow in each week	51
4.3. Mean values (adjusted by covariance $\pm$ sem) for concentration of blood urea ( $\mu\text{M}/\text{ml}$ ) for the three treatments; control (no CT) and the low and high levels of Mimosa bark (low CT and high CT)	52
4.4. Mean values (adjusted by covariance $\pm$ sem) for yields of milk, milk fat, milk protein and milk lactose (kg/cow/day) for the three treatments; control (no CT) and the low and high levels of Mimosa bark (low CT and high CT)	53

- 4.5. Mean values (adjusted by covariance  $\pm$  sem) for concentrations of milk fat, milk protein and milk lactose (%) for the three treatments; control (no CT) and low and high levels of Mimosa bark (low CT and high CT) 56
- 4.6. Mean values ( $\pm$  sem) for initial weight, final weight, liveweight change (kg/period), initial condition score, final condition score and condition score change (unit/period) for three treatments; control (no CT) and the low and high levels of Mimosa bark (low CT and high CT) 57
- 4.7. Data for the chemical analysis of the pastures fed to the sheep 58
- 4.8. Mean values( $\pm$  sem) for dry matter intake (kg DM/day/sheep) for the two treatments; control (no CT) and the high level of Mimosa bark (high CT) 59
- 4.9. Mean values ( $\pm$  sem) for *in sacco* dry matter disappearance (%) from the rumen of fistulated sheep for the two treatments; control; (no CT) and the high level of Mimosa bark (high CT) 60
- 4.10. Mean values ( $\pm$  sem) for rumen ammonia concentration ( $\mu$ g/ml) for the two treatments; control (no CT) and high level of Mimosa bark (high CT) 62
- 4.11. Mean values ( $\pm$  sem) for blood urea concentration ( $\mu$ M/ml) for the two treatments; control (no CT) and the high level of Mimosa bark (high CT) 64
- 4.12. Mean values ( $\pm$  sem) for apparent digestibility of dry matter and nitrogen (%) for the two treatments; control (no CT) and the high level of Mimosa bark (high CT) 66
- 5.1. The effect of CT in pastures on apparent digestibility of dry matter and nitrogen 72

## LIST OF FIGURES

	Page
2.1. Factors influencing amino acid availability in ruminants (adapted from Wallace, 1994)	3
2.2. A model of the metabolism of nitrogen in the rumen (adapted from Leng and Nolan, 1984)	4
2.3. Schematic relationship between MP, crude protein, and NPN (adapted from Satter and Roffler, 1976)	9
2.4. Biosynthetic origins of lignins and condensed and hydrolysable tannins in plants (Swain, 1979 cited by Barry, 1989)	18
2.5. Free condensed tannin concentration as a function of total condensed tannin in macerates of fresh legumes (adapted from Barry, 1989)	21
2.6. Condensed tannins and protein protection in the rumen (after Mangan, 1988 adapted from D'Mello (1992)	25
2.7. Relationship between N intake and NAN passing the duodenum of sheep offered (a) fresh grasses and legumes (-), and dry feeds (-- ) and tannin containing legumes (....). sources: as cited by Waghorn and Barry 1987)	26
2.8. Milk yield (g/h) of twin rearing lactating ewes grazing <i>Lotus corniculatus</i>	34
2.9. Milk protein (A), lactose (B) and fat (C) yield (g/h) of twin rearing lactating ewes grazing <i>Lotus corniculatus</i>	35

- 4.1. Milk (A) and protein (B) yield (g/cow/day) of lactating dairy cow grazing Ryegrass and White clover pastures 54
- 4.2. Fat (C) and lactose (D) yield (g/cow/day) of lactating dairy cow grazing Ryegrass and White clover pastures 55
- 4.3. The actual percentage of DM disappearance from nylon bag at various times of incubation of pastures 61
- 4.4. The variation in rumen ammonia concentration between treatments at various times of measurement 63
- 4.5. The variation in blood urea concentration between treatments at various times of measurement 65