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**EVALUATION OF DEHORNING DISTRESS  
AND ITS ALLEVIATION IN CALVES.**

A thesis presented in partial fulfilment  
of the requirements for the degree of  
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## ABSTRACT

In this thesis, the pain-induced distress caused by the husbandry practice of dehorning cattle is assessed and methods to alleviate it are evaluated. At the time this work was conducted there were no comprehensive studies on the effects of amputation dehorning upon the welfare of the cattle. The aims of the study were to assess the distress response after dehorning and to explore the possibilities of alleviating that distress through the use of different dehorning tools, local anaesthetic and/or cauterization of the scoop wound. Changes in plasma cortisol concentrations and behaviour were used as indices of distress. It was anticipated that this research would provide scientific data to aid in the writing of welfare codes and advisory material concerning the dehorning of cattle.

The cortisol and behavioural responses of six-month-old male Friesian calves after treatment were studied. In the cortisol studies, blood samples were taken by venipuncture from the jugular vein of each calf prior to, for the first 9 hours and at 36 h after treatment. Behavioural responses were scored by point scan behaviour sampling for the first 10 h after and on day two between 26 and 29 h after treatment.

Amputation dehorning elicited a marked, biphasic cortisol response that lasted six hours. Dehorning elicited similar cortisol responses irrespective of the tool employed. ACTH bolus (i.v. 0.28 µg/kg) elicited a maximal cortisol response. The similarity of the magnitude of the dehorning and ACTH responses suggests that dehorning was extremely distressing. The plateauing of the plasma cortisol values between 1.5 and 3 hours after dehorning suggests the appearance of a second phase of pain, presumably from inflammation. Local anaesthesia virtually abolished the first three hours of the cortisol response after dehorning, after which cortisol concentrations rose transiently. Overall, this equated to a 50% reduction in the integrated cortisol response. Cauterizing the scoop wounds effected a marginal reduction in the cortisol response. The combination of local anaesthesia plus cauterizing the scoop wound virtually abolished the cortisol response to amputation dehorning. This striking result is reminiscent of pre-emptive analgesia. The destruction of, and the prevention of sensitization of, nociceptors in the wound is thought to contribute to this effect. The four behaviours of tail shaking, head shaking, ear flicking and rumination, met the criteria required to use behaviour as evidence of distress. The interpretation of the behaviour data corresponded with that of the cortisol data.

Taken together, the cortisol and behaviour data from this study, along with the subsequent work it generated, indicate that scoop dehorning is extremely noxious. If the cattle are older and amputation dehorning is necessary, it is recommended that local anaesthetic be given and if practicable combined with either ketoprofen (McMeekan *et al.*, 1998b) or wound cauterization. However, it is preferable to dehorn calves when they are younger by cauterization disbudding (Petrie *et al.*, 1996b).

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## TABLE OF CONTENTS

Title page.....	i
Acknowledgements.....	ii
Abstract.....	iii
Table of contents.....	iv
List of figures and tables.....	ix
<b>CHAPTER ONE General Introduction.....</b>	<b>1</b>
<b>1.0 History of this work.....</b>	<b>1</b>
<b>1.1 Introduction.....</b>	<b>1</b>
<b>1.2 Animal Welfare.....</b>	<b>2</b>
1.2.1 Ethics.....	2
1.2.2 Legislation.....	3
1.2.3 Animal welfare.....	4
<b>1.3 Stress.....</b>	<b>6</b>
1.3.1 Background.....	6
1.3.2 Terminology.....	7
1.3.3 Pain.....	8
1.3.4 The Stress Response.....	10
<b>1.4 Measurement of stress.....</b>	<b>12</b>
1.4.1 Cortisol and behaviour.....	12
1.4.2 Behaviour.....	12
1.4.3 Interpretative problems.....	14
1.4.4 Critique of analyses.....	15
<b>1.5 Alleviation of pain-induced distress.....</b>	<b>16</b>
1.5.1 Local anaesthetic.....	16
1.5.2 Cautery.....	16
<b>1.6 Aims and format of the thesis.....</b>	<b>16</b>
<b>CHAPTER TWO Critique of the analyses of the cortisol responses.....</b>	<b>19</b>
<b>2.0 Abstract.....</b>	<b>19</b>
<b>2.1 Introduction.....</b>	<b>19</b>
<b>2.2 Experimental overview.....</b>	<b>21</b>
2.2.1 Scientific method.....	21
Experimental design.....	21
Data transformations.....	21
Statistical theory.....	22

2.2.2	Cortisol data analyses .....	22
2.2.3	Assumptions and limitations of baseline transformations .....	23
	Raw data .....	23
	Adjusted data .....	24
2.2.4	The problem - 28% of the responses were unusual .....	25
	Changing baseline .....	27
	Refractory period to cortisol secretion .....	28
	Circadian rhythm.....	28
	Sensitive to pretreatment stress .....	28
2.2.5	Can post-treatment values be used as reference values? .....	29
2.2.6	Aims.....	31
<b>2.3</b>	<b>Materials and Methods .....</b>	<b>32</b>
2.3.1	Data transformations .....	32
2.3.2	Statistical analyses .....	32
2.3.3	Sample data .....	34
<b>2.4</b>	<b>Results .....</b>	<b>36</b>
2.4.1	Cortisol timecourse analyses.....	36
2.4.2	Integrated response analyses.....	37
<b>2.5</b>	<b>Discussion .....</b>	<b>40</b>
<b>CHAPTER THREE The acute cortisol responses of calves following four</b>		
	<b>methods of dehorning .....</b>	<b>42</b>
<b>3.0</b>	<b>Abstract .....</b>	<b>42</b>
<b>3.1</b>	<b>Introduction .....</b>	<b>42</b>
3.1.1	Dehorning and production studies .....	43
3.1.2	Dehorning and welfare studies .....	45
3.1.3	Aims of study .....	45
<b>3.2</b>	<b>Materials and Methods .....</b>	<b>47</b>
3.2.1	Experimental design .....	47
3.2.2	Blood sampling .....	48
3.2.3	Treatments.....	48
3.2.4	Plasma Cortisol Analysis.....	49
3.2.5	Statistical Analyses.....	49
<b>3.3</b>	<b>Results .....</b>	<b>54</b>
3.3.1	Pretreatment Cortisol Concentrations .....	54
3.3.2	Control Calves .....	54
3.3.3	Dehorned Calves .....	54
3.3.4	ACTH Calves .....	55

3.3.5	Cortisol timecourse gradients .....	55
3.3.6	36 hour cortisol sample .....	55
3.3.7	Integrated cortisol responses .....	55
<b>3.4</b>	<b>Discussion .....</b>	<b>60</b>
3.4.1	The response to dehorning .....	60
3.4.2	ACTH (maximal frame of reference) .....	61
3.4.3	Control (minimal frame of reference) .....	62
3.4.4	Biphasic pattern of response to dehorning .....	63
	Physiological and anatomical substrates of pain .....	63
	Components of the response to dehorning .....	65
3.4.5	Choice of dehorning method .....	67
3.4.6	Critique of the experimental design .....	68
3.4.7	Conclusions .....	69
3.4.8	Epilogue .....	69

## **CHAPTER FOUR Cortisol responses of calves to scoop dehorning with**

	<b>local anaesthesia and/or cautery of the wound .....</b>	<b>70</b>
<b>4.0</b>	<b>Abstract .....</b>	<b>70</b>
<b>4.1</b>	<b>Introduction .....</b>	<b>70</b>
4.1.1	Aims of study .....	72
<b>4.2</b>	<b>Materials and Methods .....</b>	<b>73</b>
4.2.1	Experimental design .....	73
4.2.2	Blood sampling .....	74
4.2.3	Treatments .....	74
4.2.4	Plasma Cortisol Analysis .....	75
4.2.5	Statistical Analyses .....	76
<b>4.3</b>	<b>Results .....</b>	<b>80</b>
4.3.1	Pretreatment Cortisol Concentrations .....	80
4.3.2	Data excluded from the analyses as outliers .....	80
4.3.3	Cortisol responses to treatment .....	80
	Control and LA-Control .....	80
	Scoop .....	81
	LA-Scoop .....	81
	Scoop compared to LA-Scoop and LA-Control .....	81
	Scoop+Cautery .....	81
	Scoop+Cautery compared to Scoop .....	82
	LA-Scoop+Cautery .....	82

	LA-Scoop+Cautery compared to LA-Scoop and LA-Control .....	82
	Comparison of the 36 h cortisol samples .....	82
	4.3.4 Test of duration of analgesia (skin prick test) .....	83
<b>4.4</b>	<b>Discussion .....</b>	<b>90</b>
	4.4.1 Local anaesthesia .....	90
	4.4.2 Cautery.....	92
	4.4.3 Combined regimes (LA-Scoop+Cautery).....	93
	4.4.4 Critique of the experimental design.....	95
	4.4.5 Conclusions .....	95
	4.4.6 Epilogue .....	95
 <b>CHAPTER FIVE Behavioural responses of calves to scoop-amputation dehorning with and without local anaesthesia .....</b>		
<b>5.0</b>	<b>Abstract .....</b>	<b>97</b>
<b>5.1</b>	<b>Introduction.....</b>	<b>97</b>
	5.1.1 Interpretative problems .....	99
	5.1.2 Aims of study .....	100
<b>5.2</b>	<b>Materials and Methods .....</b>	<b>101</b>
	5.2.1 Experimental design .....	101
	5.2.2 Treatments.....	101
	5.2.3 Behaviour measurements.....	102
	5.2.4 Data Analyses.....	103
<b>5.3</b>	<b>Results .....</b>	<b>107</b>
	5.3.1 Behavioural comparisons (Day one).....	107
	5.3.2 Summary of the behaviour of Control, Scoop and LA-Scoop calves (day one) .....	113
	5.3.3 Behavioural comparisons (Day two).....	114
<b>5.4</b>	<b>Discussion .....</b>	<b>125</b>
	5.4.1 Dehorning .....	126
	5.4.2 Local anaesthetic .....	127
	5.4.3 Differences between the behaviour and cortisol data.....	129
	5.4.4 Interpretation issues concerning specific behaviours.....	130
	5.4.5 Day two after treatment.....	132
	5.4.6 Critique and recommendations to experimental design .....	133
	5.4.7 Conclusions .....	135
	5.4.8 Epilogue .....	136



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---

<b>CHAPTER SIX General Discussion</b> .....	<b>137</b>
<b>6.1 Conclusions</b> .....	<b>137</b>
6.1.1 Dehorning .....	138
6.1.2 Local anaesthetic .....	138
6.1.3 Local anaesthesia and cauterly of the wounds .....	140
6.1.4 Recommendations.....	141
<b>6.2 Subsequent work</b> .....	<b>141</b>
6.2.1 Amputation dehorning.....	141
6.2.2 Disbudding .....	143
<b>6.3 Pain-induced distress - insights</b> .....	<b>143</b>
<b>6.4 Future directions and Critique of the experimental design.....</b>	<b>145</b>
<b>BIBLIOGRAPHY</b> .....	<b>147</b>
<b>APPENDICES</b> .....	<b>165</b>
<b>A Presentations and publications of this work</b> .....	<b>165</b>
Sylvester <i>et al.</i> , 1993 .....	166
Sylvester <i>et al.</i> , 1998b.....	167
Sylvester <i>et al.</i> , 1998a.....	171
<b>B Data excluded from the analyses.....</b>	<b>176</b>
<b>C The cortisol radioimmunoassay.....</b>	<b>179</b>

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**LIST OF FIGURES AND TABLES**

Table 1.1	Major attributes of pain .....	9
Fig 1.1	Schematic diagram of the major components of the hypothalamic-pituitary-adrenal axis .....	11
Fig 2.1	Schematic diagram showing the calculation of the integrated cortisol responses using raw and adjusted <sub>pre.tmt</sub> data.....	24
Fig 2.2	Schematic diagram of the cortisol timecourse of the subpopulation .....	26
Table 2.1	Sample data, data series 5, 3, 4 and 2 .....	34
Table 2.2	Statistics of the pretreatment and post-treatment cortisol reference values .....	36
Table 2.3	Integrated responses (ng.hr/ml) of data series "5", "3", "4" and "2" using raw, adjusted <sub>pre.tmt</sub> and adjusted <sub>post.tmt</sub> data (mean ± SEM).....	37
Fig 2.3	Cortisol timecourse of data series 5 and 3, using raw, adjusted <sub>pre.tmt</sub> and adjusted <sub>post.tmt</sub> data. ....	38
Fig 2.4	Cortisol timecourse of data series 4 and 2, using raw, adjusted <sub>pre.tmt</sub> and adjusted <sub>post.tmt</sub> data. ....	39
Fig 3.1	Dehorning equipment.....	51
Fig 3.2	Horn removal using the embryotomy wire.....	51
Fig 3.3	Horn removal using the scoop dehorner.....	52
Fig 3.4	The blood sampling procedure. ....	53
Fig 3.5	Relationship between the pretreatment cortisol concentrations and order in which the calves were sampled .....	56
Fig 3.6	Changes in plasma cortisol concentrations of calves in response to Scoop dehorning and Control handling and bloodsampling.....	57
Fig 3.7	Changes in plasma cortisol concentrations of calves in response to Scoop, Saw, Guillotine shears and Embryotomy wire dehorning .....	57
Fig 3.8	Changes in plasma cortisol concentrations of calves in response to ACTH bolus and Control handling and bloodsampling.....	58
Fig 3.9	Changes in plasma cortisol concentrations of calves in response to Scoop dehorning, ACTH bolus and Control treatment .....	58
Table 3.1	Characteristics of the cortisol responses for each group.....	59
Fig 3.10	Schematic diagram of the cortisol timecourse after dehorning .....	66
Fig 4.1	Injection of local anaesthetic.....	78
Fig 4.2	The cautery iron. ....	79
Fig 4.3	Relationship between the pretreatment cortisol concentrations and order in which the calves were sampled .....	84

Fig 4.4	Changes in plasma cortisol concentrations of calves in response to Control and LA-Control treatment.....	85
Fig 4.5	Changes in plasma cortisol concentrations of calves in response to Scoop dehorning and Control handling and bloodsampling.....	85
Fig 4.6	Changes in plasma cortisol concentrations of calves in response to LA-Scoop and LA-Control treatment .....	86
Fig 4.7	Changes in plasma cortisol concentrations of calves in response to LA-Scoop and Scoop treatment .....	86
Fig 4.8	Changes in plasma cortisol concentrations of calves in response to Scoop+cautery and Control treatment.....	87
Fig 4.9	Changes in plasma cortisol concentrations of calves in response to Scoop+cautery and Scoop treatment .....	87
Fig 4.10	Changes in plasma cortisol concentrations of calves in response to LA-Scoop+cautery and LA-Control treatment.....	88
Fig 4.11	Changes in plasma cortisol concentrations of calves in response to LA-Scoop+cautery and LA-Scoop treatment.....	88
Table 4.1	Characteristics of the cortisol responses for each treatment group.....	89
Table 5.1	Percentage incidence of all behaviours (day 1) .....	116
Fig 5.1	Number of calves ruminating (day 1) .....	118
Fig 5.2	Number of calves tail shaking (day 1).....	119
Fig 5.3	Number of calves head shaking (day 1).....	120
Fig 5.4	Number of calves ear flicking (day 1).....	121
Fig 5.5	Number of calves neck extending (day 1) .....	122
Fig 5.6	Number of calves leg scratching to face (day 1).....	122
Fig 5.7	The timecourse of the restlessness index of calves after Scoop, LA-Scoop and Control treatment (day 1) .....	123
Fig 5.8	Changes in the cortisol concentrations of calves after Scoop, LA-Scoop and Control treatment (day 1).....	123
Table 5.2	The percentage of calves head shaking, ear flicking, tail flicking or ruminating on day two after treatment .....	124
Fig B.1	The cortisol timecourse of calves with aberrant responses.....	178
Fig B.2	The cortisol timecourse of calves where the local anaesthetic did not work .....	178
Fig B.3	The cortisol timecourse of calves experiencing a pre-existing stress .....	178
Table C.1	The setting up of the radioimmunoassay and the appropriate controls .....	181