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**THE ONSET OF PUBERTY AND HERBAGE INTAKE IN
DIFFERENT SELECTION LINES OF ANGUS CATTLE**

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This thesis is dedicated to my parents

José Ramón Martínez and

Elisa Mercedes Marecos de Martínez

ABSTRACT

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Puberty onset and herbage dry matter intake was measured in four lines of Angus cattle selected for High and Low EBV-600 day weight (HG and LG respectively) and High and Low EBV-milk (HM and LM respectively). The heifers were generated on four industry farms in the North Island of New Zealand.

Heifers from the HG line were younger at puberty (438.6 ± 9.3 days $P < 0.01$) than heifers from the HM (459.4 ± 7.1 days) and LM (476.1 ± 7.8 days) lines. No difference in age at puberty between HG and LG (455.1 ± 11.8 days) lines were found. Average weight at puberty across all genetic lines was (349.6 ± 9.9 kg). There was no difference among the four genotypes for this trait.

Ninety-five percent of the animals reached puberty by the end of the trial and there was no difference in the percentage of animals reaching puberty by genetic line. Animals coming from Farms 1 and 3 tended to reach puberty earlier than animals coming from Farms 2 and 4. There was no differences in pregnancy rate among the genetic lines and the overall pregnancy rate was 90 %.

Intake was measured on two occasions using n-alkanes (M1 and M2 respectively) and the pre- and post-grazing technique (M3 and M4 respectively). Average liveweight (LW) and estimated herbage intake at M1 was 240.2 ± 0.4 kg and 3.47 ± 0.1 kg DM respectively. The values at M2 were 287.2 ± 1.9 kg LW and 6.50 ± 0.36 kg DM. No differences in estimated herbage intake among the genetic lines were detected in M1 or

M2. In M3 heifers had an average LW of 247.1 ± 0.7 kg and mean estimated intakes of 4.86 ± 0.26 ; 4.17 ± 0.26 ; 4.37 ± 0.26 and 3.00 ± 0.26 kg DM for the HG, LG, HM and LM lines. The LM line having a significantly ($P < 0.05$) lower estimated intakes than the other lines. Average LW at M4 was 272.5 ± 0.6 kg. Animals from the LM (7.28 ± 0.19 kg DM) line had significantly ($P < 0.05$) higher intakes than animals from the LG ($6.52 \text{ kg} \pm 0.18 \text{ DM}$) and HM ($6.71 \pm 0.18 \text{ kg DM}$) lines. Intakes from the HG ($6.99 \pm 0.18 \text{ kg DM}$) animals was not significantly different from intakes of the other genetic lines.

In general the HG heifers outperformed the heifers from the other lines in puberty onset and feed conversion efficiency. However, in a self-replacing beef cowherd, the higher maintenance cost and lower milk production of dams from the HG line should be considered. Combining the growth characteristics of the HG lines with an appropriate level of milk production into a selection index would produce animals with the adequate combination of genes for a self-replacing beef cowherd.

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TABLE OF CONTENTS

Abstract	iii
Acknowledgements.....	v
Table of Contents.....	vii
List of Tables.....	x
List of Figures.....	xiii
CHAPTER 1 INTRODUCTION.....	1
CHAPTER 2 LITERATURE REVIEW.....	3
2.1. THE IMPORTANCE OF AN EARLY PUBERTY	3
2.1.1. Raising animals to calve at two years of age	4
2.1.2. The relationship between puberty and pregnancy rate	5
2.1.3. Calving date and lifetime production	7
2.1.4. Improved pregnancy rates as heifers	9
2.2. PUBERTY DEFINITIONS	10
2.3. MECHANISMS REGULATING THE ONSET OF PUBERTY	11
2.3.1. Physiological mechanisms leading to puberty	11
2.3.2. Mechanisms related to the metabolic status of the animals	15
2.3.3. Ovarian development.....	16
2.4. HORMONAL MECHANISMS OF THE OESTROUS CYCLE	17
2.5. PUBERTY AND FIRST BEHAVIOURAL OESTRUS	19
2.5.1. Non-pubertal oestrus.....	19
2.5.2. Silent oestrus	21
2.6. INFLUENCE OF THE DAMS' GENETIC MAKE-UP ON THE SYSTEM.....	21
2.6.1. Mature size and reproduction	22
2.6.2. Milk yield and reproduction.....	25
2.7. MANAGING THE HEIFERS TO CALVE AT TWO YEARS OLD	27
2.7.1. Growth before weaning	27
2.7.2. Post-weaning growth	28
2.7.3. Time and rate of gain.....	29
2.8. MEASURING HERBAGE INTAKE	31
2.8.1. Intake measurement using the n-alkane technique.....	31
2.8.1.1. Using n-alkanes as markers.....	33
2.8.1.2. Advantages of n-alkanes over other markers	34
2.8.1.3. Choosing an n-alkane.....	35
2.8.1.4. Recovery of alkanes in the faeces.....	37

CHAPTER 3 MATERIALS AND METHODS	39
3.1. EXPERIMENTAL LAYOUT	39
3.2. BACKGROUND TO ANIMALS	40
3.3. ANIMAL MANAGEMENT	41
3.4. PUBERTY DETERMINATION	42
3.4.1. Tail painting and rectal palpation	42
3.4.2. Blood plasma progesterone	43
3.4.2.1. Elisa test	45
3.5. HERBAGE INTAKE MEASUREMENTS	47
3.5.1. Intake measurements using the n-alkane technique	47
3.5.1.1. Alkane capsules insertion	49
3.5.1.2. Faeces collection	50
3.5.1.3. Intake paddocks	51
3.5.1.4. Herbage sampling for alkane profiles	52
3.5.2. Intake measurement using the pre-post grazing technique	53
3.5.2.1. Regression equations	54
3.5.2.2. Pasture area allocation	55
3.6. SWARD MEASUREMENTS	58
3.6.1. Botanical composition	58
3.6.2. Herbage nutritive value	58
3.7. STATISTICAL ANALYSIS	59
CHAPTER 4 RESULTS	61
4.1. LIVWEIGHT	61
4.2. AGE AND WEIGHT AT PUBERTY	64
4.3. PREGNANCY RATE	71
4.4. INTAKE ESTIMATION USING N-ALKANES, FIRST MEASUREMENT	71
4.4.1. Herbage measurements	71
4.4.1.1. N-alkane profiles and sampling procedure	72
4.4.2. Intakes	73
4.5. INTAKE ESTIMATION USING N-ALKANES, SECOND MEASUREMENT	75
4.5.1. Herbage measurements	75
4.5.1.1. N-alkane profiles and sampling procedure	76
4.5.2. Intakes	77
4.6. INTAKE ESTIMATION USING PRE- AND POST-GRAZING, THIRD MEASUREMENT	79
4.6.1. Herbage measurements	79
4.6.2. Regression equation and intakes	80
4.7. INTAKE ESTIMATION USING PRE- AND POST-GRAZING, FOURTH MEASUREMENT	82
4.7.1. Herbage measurements	82
4.7.2. Regression equations and intakes	84

CHAPTER 5 DISCUSSION.....	87
5.1. PUBERTY.....	88
5.1.1. Age and weight at puberty	88
5.1.2. Genetic make-up and its effect on age and weight at puberty	89
5.1.3. Environmental effects	91
5.1.4. Environmental x genetic interactions	95
5.1.5. Regression curves	96
5.2. INTAKE ESTIMATIONS	96
5.2.1. Intakes using the n-alkane technique.....	97
5.2.1.1. Herbage sampling procedure.....	98
5.2.1.2. Herbage drying procedure.....	99
5.2.2. Intakes using the pre- and post grazing technique.....	100
5.2.3. Intake measurements implications	102
 CHAPTER 6 CONCLUSIONS.....	 103
 REFERENCES.....	 107

LIST OF TABLES

Table 2-1	Cumulative performance of cows managed to calf first at two or at three years of age.....	4
Table 2-2	Initial and subsequent calving group of cows, weaning weights, weaning age and average daily gain of their calves (19 years average data).....	7
Table 2-3	Pregnancy rate, age and weight at puberty and at breeding for heifers bred at their first or third oestrus.	9
Table 2-4	Least squares means for different reproductive and productive traits of Brahman heifers and cows of different mature size.	24
Table 2-5	Puberty onset as influenced by different rates of gain and different periods of growth.....	29
Table 2-6	Comparison of known herbage intake of sheep and cattle with estimated intakes using dosed C ₃₂ alkane and natural C ₃₃ alkane as markers.	35
Table 2-7	Alkane recovery values from different animal species and different diets.	38
Table 3-1	Number of animals by genetic line and farm of origin.....	40
Table 4-1	Liveweight increase (kg) and liveweight gain (kg day ⁻¹) during the experimental period (243 days) (means ± SEM).....	63
Table 4-2	Age (days) and weight (kg) at puberty by genetic line (means ± SEM).	65
Table 4-3	Age (days) and weight (kg) at puberty by farm of origin (means ± SEM).	65
Table 4-4	Number of heifers per line and number of heifers reaching puberty.....	67
Table 4-5	Equations and statistics from the regressions relating age at puberty (age) to weight at puberty (lw) by genetic line.	70
Table 4-6	Percentage of pregnant heifers by mating cycle.....	71
Table 4-7	Herbage botanical composition of the paddocks used in the First (18-21 June) and Second (22 –25 June) Collection Periods.....	72

Table 4-8	Herbage nutritive value from the First (18-21 June) and Second (22-25 June) Collection Periods.	72
Table 4-9	Alkane concentration (g/kg DM) of herbage samples collected by taking a single or pooled herbage sample. Average of First (18-21 June) and Second (22-25 June) Collection Periods.	73
Table 4-10	Liveweight (kg), herbage intake (kg DM) estimates using a single (S) and pooled (P) grass sample and the C ₃₂ :C ₃₃ alkane pairs plus theoretical (T) intake (kg DM) based on published formulae for the different selection lines of heifers (means ± SEM).	74
Table 4-11	Herbage botanical composition of the paddocks used in the First (24-27 September) and Second (28 September –1 October) Collection Periods.	76
Table 4-12	Herbage nutritive value from the First (24-27 September) and Second (28 September –1 October) Collection Periods.	76
Table 4-13	N-alkanes concentration in herbage obtained by a single or pooled sampling procedure and freeze- or oven-dried.	77
Table 4-14	Liveweight (kg) and herbage intake (kg DM) estimates using the C ₃₂ :C ₃₃ alkane pairs and single (S) or pooled (P) grass sample oven-dried (O) or freeze-dried (F). Theoretical intake (kg DM) based on published formulae for the different selection lines of heifers (means ± SEM).	78
Table 4-15	Herbage botanical composition of the lanes used in the pre- and post grazing trial.	79
Table 4-16	Herbage nutritive value from lanes 18-A, 18-B, 18-C and 18-D.	79
Table 4-17	Liveweight, liveweight gain, estimated herbage intake and theoretical herbage intake plus difference between estimated and theoretical values for the selection lines of heifers (means ± SEM).	81
Table 4-18	Botanical composition of the lanes used in the pre and post- grazing trial.	83
Table 4-19	Herbage nutritive value from lanes 18-A, 18-B, 18-C and 18-D.	83
Table 4-20	Regression equations, r-square and coefficient of variation (CV) for the pre- and post-grazing models.	84

Table 4-21 Liveweight, liveweight gain, estimated herbage intake and theoretical herbage intake plus difference between estimated and theoretical values for the different genetic lines of heifers (means \pm SEM)..... 85

LIST OF FIGURES

Figure 2-1	Sire expected progeny difference (EPD) for pregnancy rate (up to five mating years) related to standardised age at first oestrus in daughters... 6
Figure 2-2	Schematic representation of the reproductive axis showing neuronal and endocrine interactions. 12
Figure 2-3	Hormonal mechanisms of the oestrous cycle. 17
Figure 2-4	Distribution of pubertal and non-pubertal oestrus. 20
Figure 2-5	Average concentration of alkanes in tropical and temperate grasses. 33
Figure 2-6	Relationships between the estimated faecal recoveries of n-alkanes and their carbon chain lengths in sheep (a) and cows (b). 36
Figure 3-1	Experimental layout. 39
Figure 3-2	Blood sampling procedure to determine time of first ovulation. 44
Figure 3-3	Schematic representation of the procedures used in the first and second herbage intake measurements using n-alkanes. 48
Figure 4-1	Monthly liveweight (kg) of the High EBV-600 day (--●--), Low EBV-600 day (--▲--), High EBV-milk (--◆--), and Low EBV-milk (--■--), heifer lines. Vertical bars represent standard errors of the means. 62
Figure 4-2	Liveweight gain (kg/day) of the High EBV-600 day (--●--), Low EBV-600 day (--▲--), High EBV-milk (--◆--), and Low EBV-milk (--■--), genetic lines. Vertical bars are the standard errors of the means. 63
Figure 4-3	Weight at puberty (kg) of the High EBV-600 day (HG), Low EBV-600 day (LG) and High EBV-milk (HM) by farm of origin. Vertical solid lines are the standard errors of the means. 66
Figure 4-4	Cumulative percentage of animals attaining puberty by farm of origin. 68
Figure 4-5	Quadratic regression between liveweight (kg) and age (days) at puberty for the High EBV-600 day, Low EBV-600 day, High EBV-milk and Low EBV-milk lines. 69

Figure 4-6	Simple linear regression between the rising plate meter readings and herbage mass (kg DM/ha).	80
Figure 4-7	Simple linear regression between the rising plate meter readings and herbage mass (kg DM/ha) for the pre- and post-grazing events.	84