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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


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 kg ± 0.18 DM) and HM (6.71 ± 0.18 kg DM) lines. Intakes from the HG (6.99 ± 0.18 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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