

# Metabolic and endocrine status in heifers from two breeds submitted to different rearing dietary treatments

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## OBJECTIVE

To evaluate the consequences of 2 dietary treatments calculated to promote 0.6 or 0.8 kg/d gains during rearing period (6-15 months) on the onset of puberty and physiological status of heifers from 2 breeds

## CONCLUSIONS

- ✓ Heifers from both breeds and growth rates reached puberty early enough to be bred at 15 months and advance their first calving at 24 months
- ✓ Urea and IGF-I levels could be use to identify the more precocious heifers, but not the expectable leptin hormone

PIRENAICA  
Beef breed



PARDA DE MONTAÑA  
Dual purpose breed

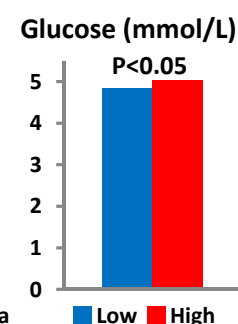
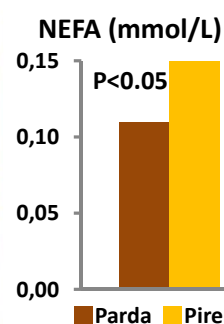
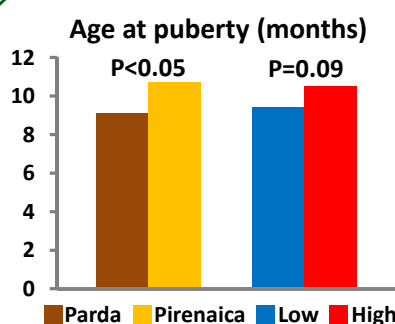


## MATERIAL AND METHODS

(2 x 2 factorial design)

- ✓ 13 Parda de Montaña and 12 Pirenaica autumn-born-heifers submitted to **two growth rates** during **REARING PERIOD** (6-15 months): LOW (0.6 kg/d) vs HIGH (0.8 kg/d) obtained from alfalfa hay *ad libitum* + 4 vs 10 g concentrate/kg BW, respectively
- ✓ Bleeding • weekly to determine the onset of puberty from progesterone plasma concentration
  - quarterly to assess glucose, NEFA, cholesterol, urea, IGF-I and leptin plasma levels

## RESULTS



- ✓ Similar BW at puberty: 322 ± 38 kg; 55.5% mature BW
- ✓ Cholesterol, urea, IGF-I and leptin not affected by breed or growth rate during rearing phase
- ✓ The nadir of cholesterol was found when heifers had started cycling
- ✓ The precocious heifers had greater urea level at 6 months and IGF-I in the whole trial
- ✓ Leptin level increased during the rearing phase, but it was not related with onset of puberty



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**Metabolic and endocrine status in heifers from two beef breeds submitted to different rearing diets***J.A. Rodríguez-Sánchez, I. Casasús, J. Ferrer and A. Sanz**Centro de Investigación y Tecnología Agroalimentaria de Aragón, Avda. Montañana, 930, 50059, Spain;**asanz@aragon.es*

Thirteen Parda de Montaña (PA) and 12 Pirenaica (PI) autumn-born-heifers were used to evaluate the consequences on the onset of puberty and metabolic and endocrine status of 2 dietary treatments calculated to promote different body weight (BW) gains. Two feeding management (0.8 [HIGH] vs 0.6 [LOW] kg/d) were applied on beef heifers from 2 breeds (PA vs PI) during the rearing phase, from weaning at 6 months of age to breeding at 15 months of age. The heifers were bled weekly to determine their progesterone level, to estimate the onset of puberty, and every 3 months to assess the glucose, NEFA, cholesterol, urea, IGF-I and leptin plasma levels. All the heifers reached puberty at similar BW ( $322 \pm 38$  kg; 55% mature BW), but at different ages depending on the breed, since PA heifers were more precocious than PI ones (9.1 vs 10.7 months, respectively,  $P < 0.05$ ). Heifers from the HIGH treatment tended to be pubertal earlier than those from the LOW one (9.4 vs 10.5 months,  $P < 0.09$ ). Glucose level was affected by the feeding management (5.04 vs 4.85 mmol/l, in HIGH and LOW respectively,  $P < 0.05$ ) and NEFA by the breed (0.11 vs 0.15 in PA and PI heifers respectively,  $P < 0.05$ ), whilst cholesterol ( $3.40 \pm 0.86$  mmol/l), urea ( $6.13 \pm 1.13$  mmol/l), IGF-I ( $206.4 \pm 85.2$  mmol/l) and leptin ( $2.68 \pm 1.42$  mmol/l) were not affected by any treatment. The nadir of cholesterol level was found at 12 months of age ( $2.89 \pm 0.44$  mmol/l), when the heifers had started cycling. The heifers with greater level of urea ( $r = -0.58$ ,  $P < 0.01$ ) at 6 months, and IGF-I ( $r = 0.43$ ,  $P < 0.001$ ) in the whole trial, were more precocious. The circulating leptin increased through the rearing phase (2.39 vs 3.38 ng/ml, at 6 and 15 months of age,  $P < 0.01$ ), along with fat deposition, but it was not related with the age at puberty. In conclusion, the heifers from both breeds reach the puberty early enough to be bred at 15 months, even with gains of 0.6 kg/day during the rearing phase. The urea and IGF-I levels could be used to identify the more precocious heifers.

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