

CASE STUDY 7

Diversity trends and selection signatures in Asturiana de los Valles bovine breed

Leading IMAGE partner: UCM

Other IMAGE partners involved: INRA

Other non-IMAGE partners and actors involved: Asociación Española de criadores de ganado vacuno selecto de la raza Asturiana de los Valles (ASEAVA) (Asturiana de los Valles Breed Association)

IMAGE WP and Task: WP6 / Task 6.4, deliverable 6.2

Objectives and expected results/output:

Asturiana de los Valles breed is the bovine breed with higher census and number of breeders in Spain. The breeder association manages a germplasm bank collection (semen and embryos), genomic collection of blood samples (>200,000), phenotypic database of beef traits and the genealogical information. Whole genome sequencing has been performed within IMAGE on 15 bulls from the latest information. Analysis of the trend in the diversity of gene bank collections since 25 years and detection of selection signatures related to beef traits (myostatin, fatty acids, meat quality traits).

Material and methods

Selection signatures: INRA partner performed analysis according to two methods: the one specifically developed in IMAGE (PhD of Cyriel Paris) for the detection of recent selection event by an analysis of time series, and a classical method of detection of selection signatures based on single sampling time. Results are shown in D6.2 and were presented at EAAP session organized by IMAGE in Ghent, on August 28, 2019.

Detection of selection events with this method (Cyriel et al., 2019) with the Asturiana data based on whole genome sequencing (NGS), HD and 50k BeadChips, has identified different genome regions bearing relevant genes associated with beef traits. A scientific paper has been published which describes the method.

Contact for further information

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References :

Cyriel Paris, Bertrand Servin and Simon Boitard, 2019. Inference of Selection from genetic Time Series Using Various Parametric Approximations to the Wright-Fisher Model. G3: Genes, Genomes, Genetics.
<https://doi.org/10.1534/g3.119.400778>