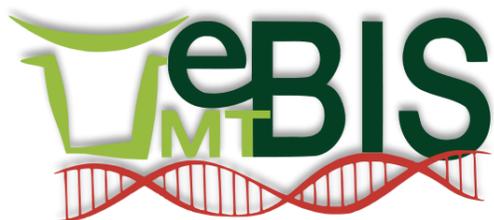


Genetic parameters and single step evaluation of sexual precocity traits in Charolais Beef Cattle

R. Saintilan, M. Gicquel, A. Baur, H. Leclerc and F. Guillaume



Plan of the presentation

- **Context**
- **Dataset**
- **Phenotype**
- **Results**
- **Discussions and perspectives**

Context

- **Breeding a cow is an expensive process (especially due to nonproductive periods)**
- **Few indexes about reproductive traits in beef breeds in France in Charolais and especially about sexual precocity**
- **Decreasing age at first calving could reduce a non productive period and improve economic efficiency of beef farms**
- **Project Ferti38 in Charolais in France with Charolais Univers AI firm**

Objectives:

- **Produce new indexes about sexual precocity and reproduction**
- **Integrate these tools in order to improve farm performances**

The Ferti 38 Network

- **Start in 2018**
 - **15 farms**
 - **Around 100 calving per year**
 - **Birth and weaning phenotypes collected**
 - **More than 80% of AI**
 - **Small reproductive periods**
 - **1st calving between 24 and 30 months**
 - **Neck tags for all cows and heifers**
- (HEATIME® - MSD Animal Health Intelligence)**



The Ferti 38 Network

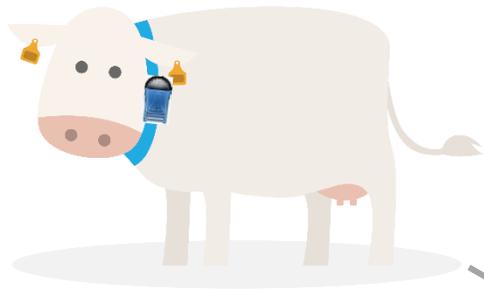
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(HEATIME[®] - MSD Animal Health Intelligence)



- Information collected each 2 hours. Farmers implicated in the validation/correction of the phenotypes

Data collection

2092 females with neck tags since 2018-2019



Rumination, activity, detection of heat and health events

→ Software HEATIME PRO +



Calving and pregnancy diagnosis



Genotypes



New Indexes

- Sexual precocity
- Cows reproduction

2022

2023/24



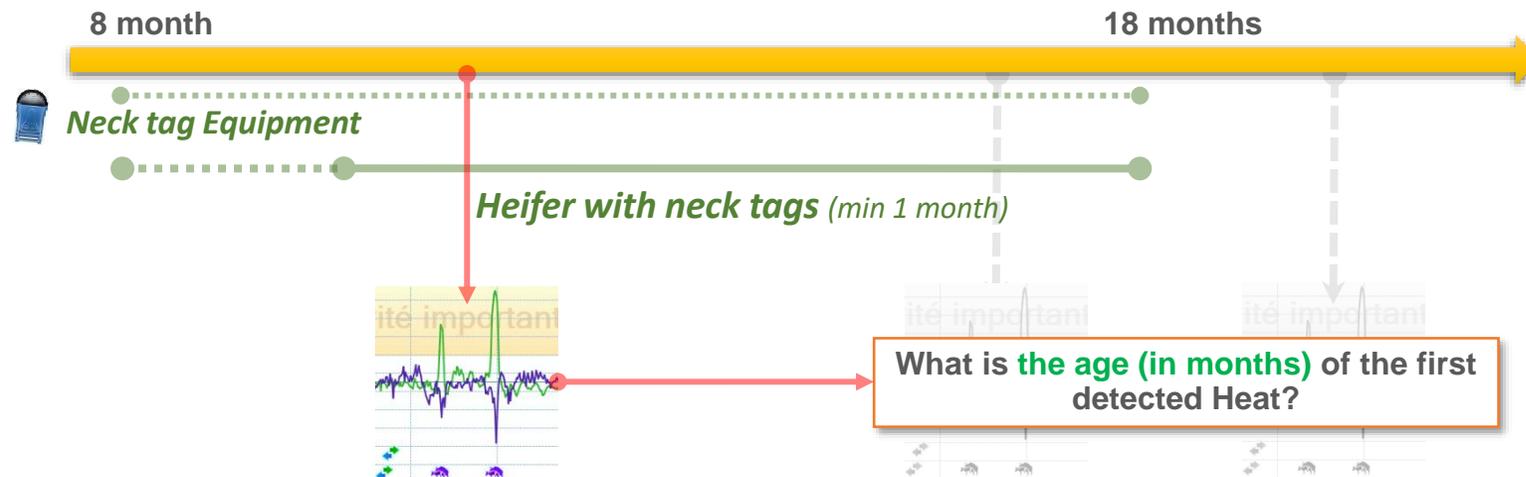
Heifer management advices



Objective to get 1 calf/cow/year

Phenotype studied: Age at first Heat

Age Heifer



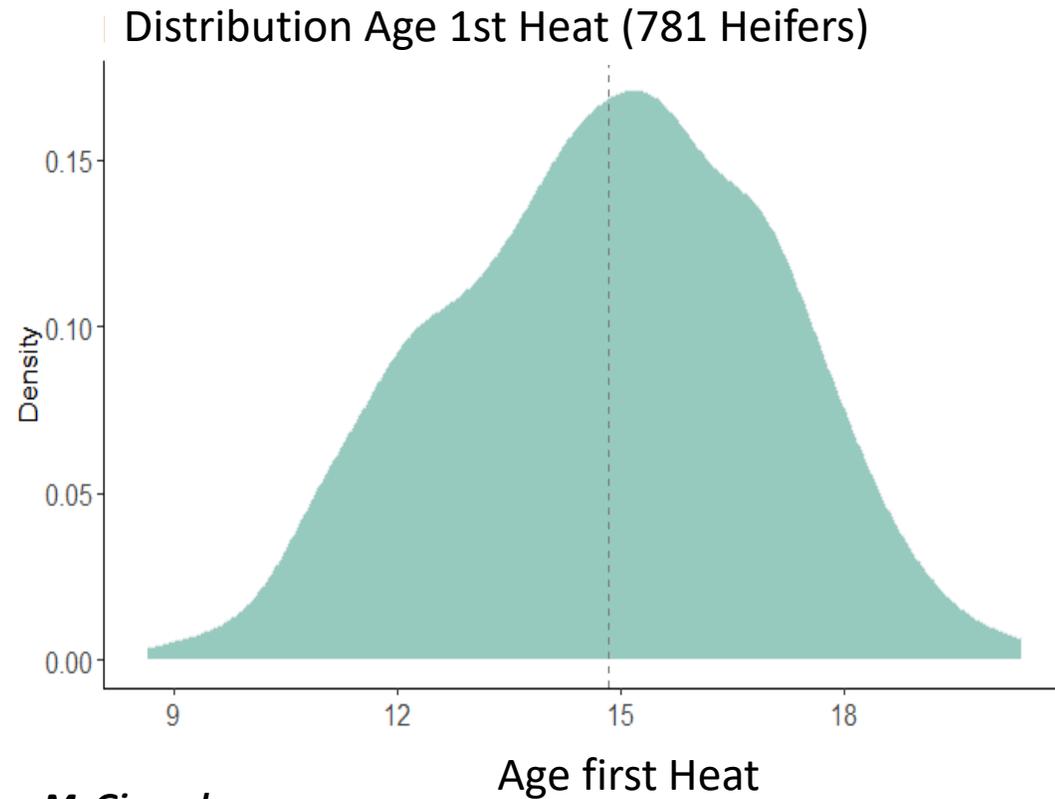
M. Gicquel

Genetic parameters calculation using WOMBAT software in a animal model.

Fixed effects: Herd and birth year

Regression age Neck tag equipment

First phenotype: Age at first Heat



M. Gicquel

Trait	Mean	Sd	min	max
Age 1st Heat (in month)	14.6	2.2	8.6	20.4

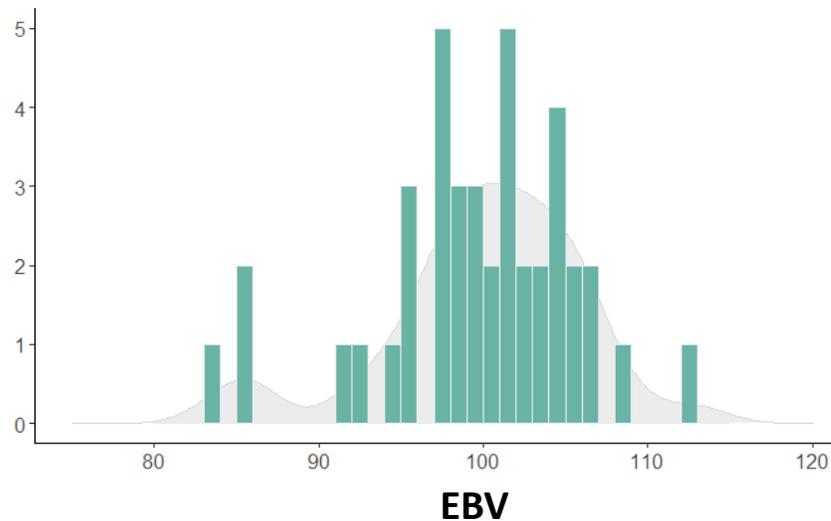
Genetic parameters:

- **Heritability: 0.36 (0.12)**
- **Genetic variance: 0.50**

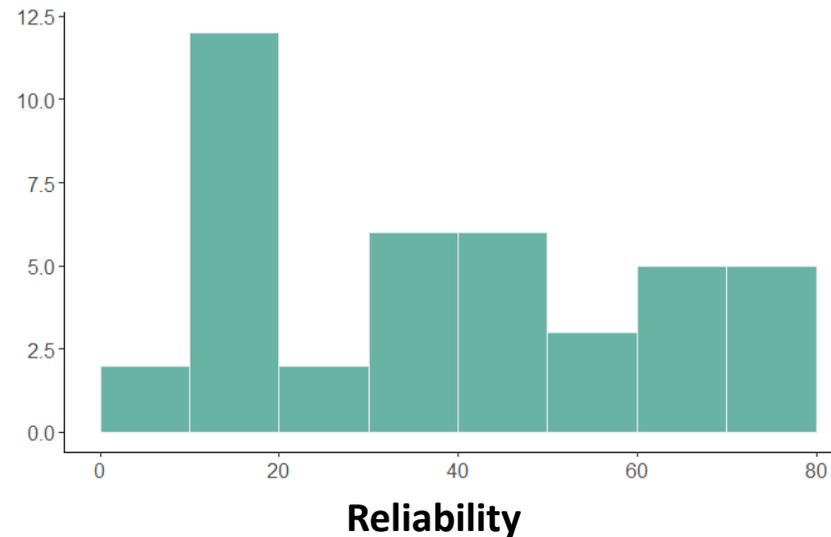
Single Step evaluation results

- Single trait single step evaluation: 106 genotyped males, 1,472 genotypes females with 781 with phenotypes
- HSSGBLUP Software developed by INRAE
- EBV expressed in basis 100 (14.8 months) with 10 points equal to a genetic sd (21.6 days)
- Higher EBVs mean a decrease of the age at first calving

Number of bulls



Number of bulls



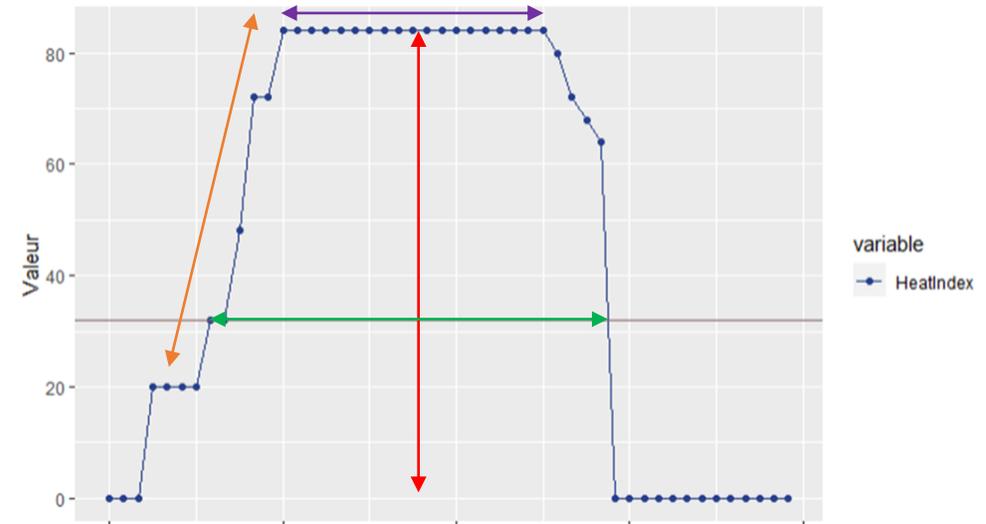
M. Gicquel

Discussions and perspectives

- **Dataset with regular phenotypes collected in farms since 6 years and continue**
- **New traits evaluated in France for the Charolais breed, one of the first sstep evaluation for beef cattle**
- **Study more synthetics traits in a first time**
- **Heritability age at first heat moderate: 0.36**
- **For the 25 bulls with reliability higher than 0.30, EBVs ranged from 85 to 113 and the mean reliability is 0.52 (max 0.76)**
- **Age at first calving few/not related to other indexes currently produced in France, allow to work on this traits without negative impact on current selection criteria**

Discussions and perspectives

- Current work to study the phenotypes that describe the Heatindex profile: **heat duration**, **max intensity**, **max duration**, **acceleration** at a genetic levels
- Repetition of the phenotypes per cow
- First results show small heritabilities for these traits
- Calculation of genetic correlations with age at first calving and other traits



Acknowledgments

