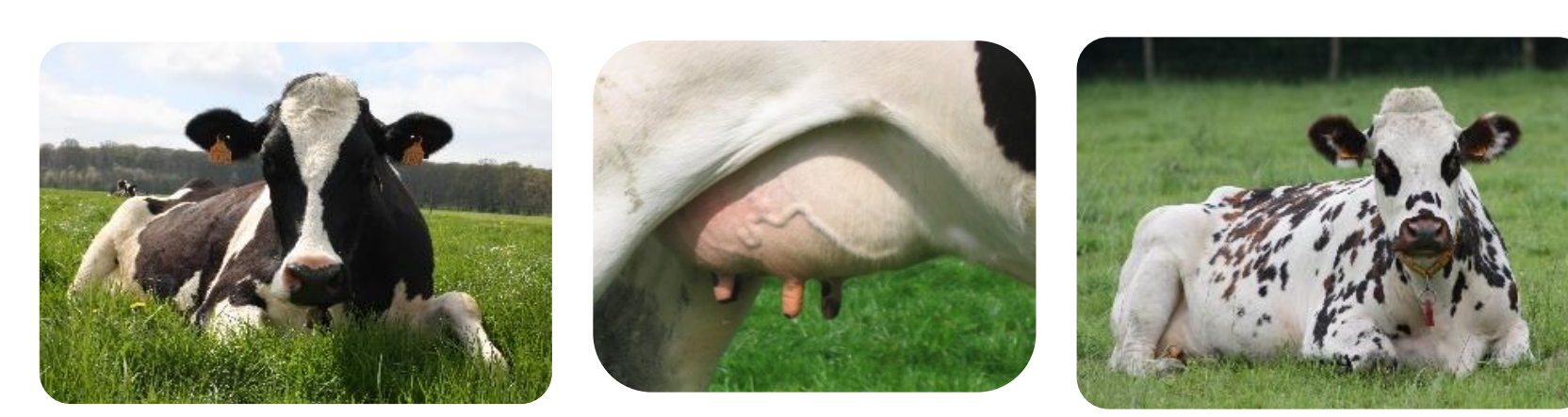


Association between udder health genomic breeding values and dairy and health traits in French cows



Mastitis resistance = main health issue
 French Udder Health (UH) genomic estimated breeding value (gEBV) = combination of Clinical Mastitis (CM) and Somatic cell score (SCS) gEBVs



What is the impact of UH gEBV on dairy and health traits throughout the lactation?

Animals, Traits & Model



596 Holstein cows **341 Normande cows**
 1470 lactations from parity 1 to 4

$$y(\text{DIM}) = \text{date} + \text{DGV} + \text{WIL}_i(\text{parity}) + \alpha * \text{gUH} + \beta * \text{gUH} * \text{sd} + \gamma * \text{gUH} * \text{sd}^2 + \delta * \text{gUH} * \text{sd}^3 + \epsilon$$

Perf at each DIM Fixed effects Within parity (primi vs. multiparous) Impact of UH gEBV (gUH)
 Wilink model of lactation curve: $\text{sd} = (\text{DIM} - 125) / 250$
 $a + b * \text{DIM} + c * e^{-0.06 * \text{DIM}}$

Milk yield (MY), fat (FC) and protein (PC) content and SCS within 250 DIM
 % of cows with CM within 100 DIM or metritis (MET) within 60 DIM, by 2-week period

Cows with UH gEBV $\geq +1.0$ = **RESISTANT** group
 ≤ -1.0 = **SENSIBLE** group
 (standard deviation, mean=0)

MY (kg)	28.2	18.1
FC (g/kg)	38.5	43.8
PC (g/kg)	31.5	33.7
SCS (point)	2.5	3.4
CM (%)	2.8	2.7
MET (%)	3.1	2.3

Impact of UH gEBV

PRODUCTION traits

HEALTH traits



Resistant cows produce less milk (total MY: -6% for Holstein cows and -13% for Normande cows) and barely **no difference in FC and PC**

Resistant cows have lower SCS (-1.5 pt, i.e. -80% cell count), **CM** (-5.2% for Holstein cows and -6.7% for Normande cows) and **MET** (-4.7 and -2.1%)

CONCLUSIONS

- ✓ Effects of UH gEBV agreed with the predictions, throughout lactation
- ✓ **NEW:** Metritis profiles were also impacted by UH gEBV

Genetic resistance to mastitis genetic resistance to metritis ? other health disorders...?