



## New Normande Paratuberculosis Resistance

### Struggle against Paratuberculosis: a complex fight

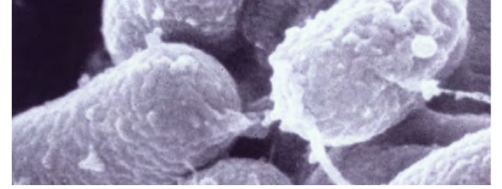
Paratuberculosis is an intestine inflammatory disease which evolution leads systematically to mortality.

The fight against paratuberculosis is complex and difficult:

- the bacteria is ingested during the first months of the calves' live from their dam or environment.
- the incubation is very long, various years.
- the illness appears only when adult, more often after calvings.

> Economical impact of Paratuberculosis is high: 13€/1000 L/year – between direct costs (analysis, treatments, vets and indirects (losses in milk, beef, sales, genetics).

> 30 to 70% of dairy herds do host the bacteria



### How genetic is a solution against Paratuberculosis ?

- Paratuberculosis sensitivity has a significant genetic component.
- Genomics has given the possibility of define natural genetic resistance in condition to get a consistent reference population.
- For more than 12 years, PARADIGM French consortium of research, sanitary, vets and genetic organizations have collected phenotypes and genotypes to reach the level required for proof calculation.
- In 2022, the new genetic indicator have been launched in Holstein thru genotyping. In 2024 the Normande breed gets also the new proof.

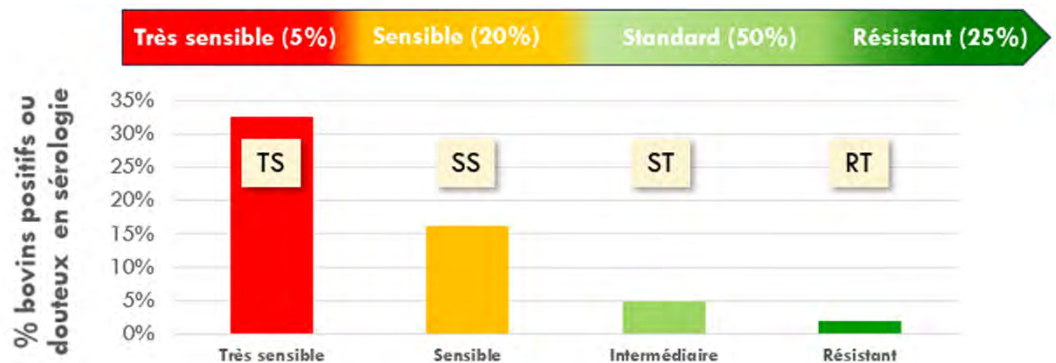
> Paratuberculosis resistance proof is a world exclusivity from French proofs



### How does it work for females ?

For females, ISU genotyping in Holstein and Normande delivers 4 status :

- very sensitive (TS)
- Sensitive (SS)
- Standard (SD)
- Resistant (RT)



According to her genetic status, the female will get **between 3 to 30 % of risk to get sick** in case of contact with the bacteria.

As the breeder is able with genotyping to know the resistance/sensitiveness at a young age, specific sanitary and mating management will be taken to avoid risk of disease.



### How does it work for bulls ?

Resistant bulls are identified in catalogs with a specific pictogram to be able to get more used.

Sensitive bulls are sorted from the breeding program to avoid to use in concerned herds.

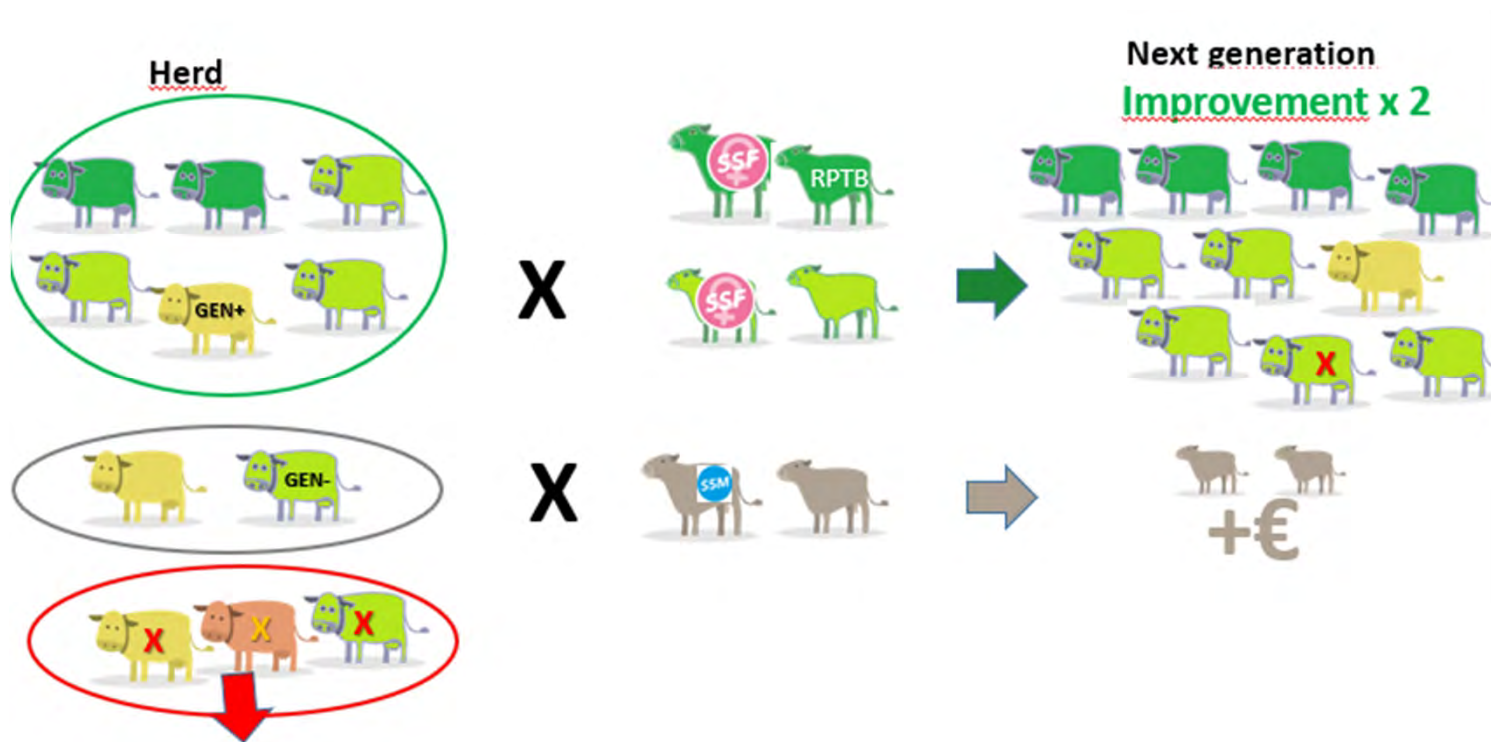


In Holstein, about 25% of French bulls are resistant, and 30% in Normande (even 50% of top 50 SYNETICS bulls).

### In practical, what benefits in a herd after 1 generation?

Setting-up a renewal strategy based on genotyped females to decide about their future and matings, combined with AI with RPTB bulls permits to **increase by 2 the resistance** of the herd in 1 generation.

Aditionnaly, a more resistant herd will express less paratuberculosis that will **decrease even more significantly the bacteria pressure on the herd** and then generate even less contaminations.



- Contaminated females and genetically very sensitive females are culled to avoid contamination.

- Healthy heifers but sensitive will be AI to beef sire to avoid to get sensitive progeny remaining.

- Healthy standard and resistant females will be AI with convenient RPTB bulls in sexed, fertimax or conventional semen.  
Some high genetic lines can be saved using absolutely RPTB bulls to get progeny.

In next generation, almost all females will be standard or resistant. It will be suitable to keep increase protection of the herd continuing optimized mating plans using adequate RPTB bulls.