



GenoCells®

Individual somatic cell counts of dairy cows by sequencing tank milk.

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Much more than just a drop of milk

THE PERFORMANCE OF YOUR HERD

GenoCell® is an everyday tool for the performance and genetics of tomorrow. Genotyping allows you to evaluate the genetic potential of your females and much more... GenoCell® is the service that helps improve milk quality and management of the herd renewal.

I prepare for the next generation

- I sort and select the best heifers for milking: pure breeds, crosses, mixed breeds.
- I can prioritize my selection criteria: milk, milking speed, fertility...
- I increase my income: e.g. up to + 50 €/cow per calf value point earned, sale of registered calves...

I improve the lifespan of my females.

GenoCell®

I control the quality of milk

- I take a single tank sample whenever I want to have a cell reading for each of cows.
- I save working time, weighing is simplified.
- I adapt my drying period practices to each cow.
- My cow turnover is reduced due to better LFL management.
- I preserve the health of my herd:
 - Less mastitis and infections
 - Fewer antibiotics
 - Better breeding rates
- I minimize milking infections.

I use genotyping

I manage nutrition

- I increase my milk production quality and performance.
- I'm able to anticipate and adapt the animal feed accordingly during periods of dietary transition.
- I'm able to anticipate precisely the functioning of the farm: less milk energy deficit, reduction of losses, etc.

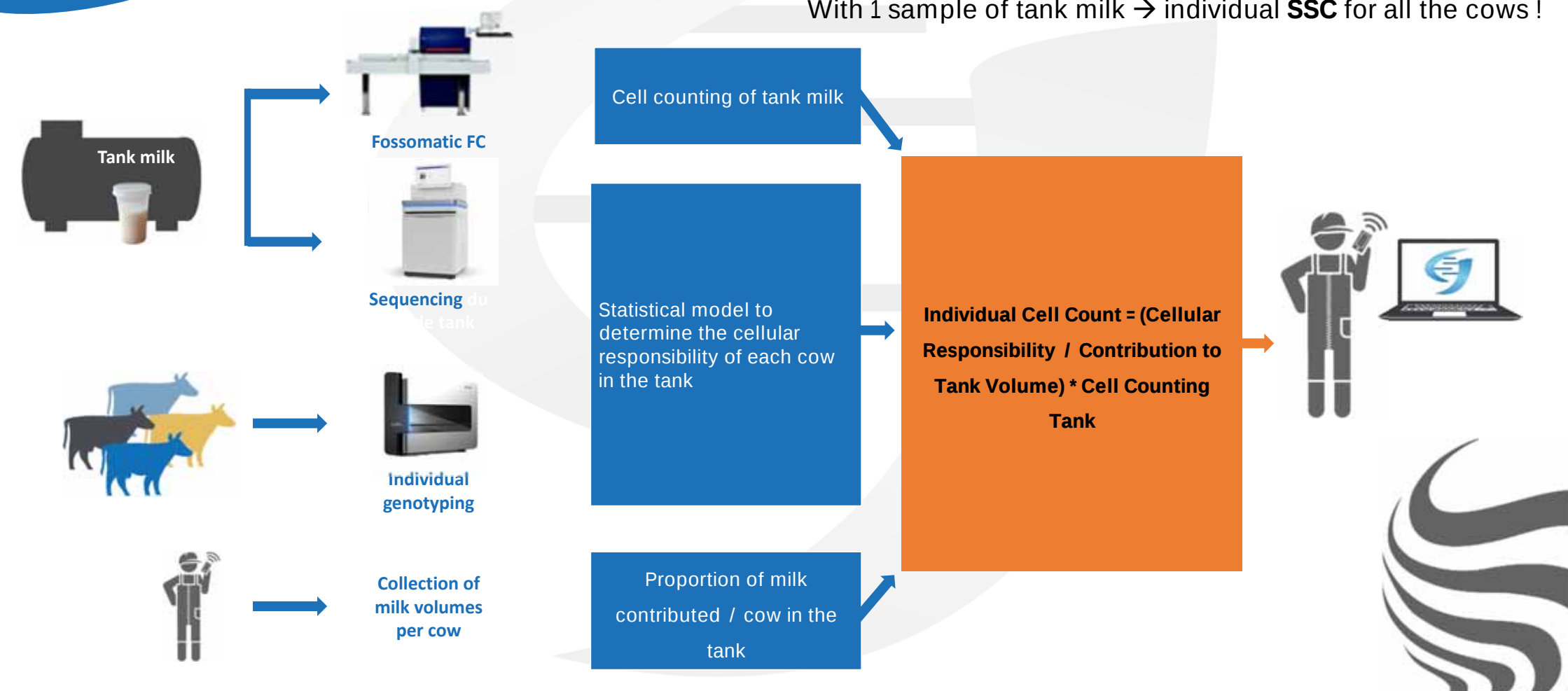
WHAT POWER FROM A DROP OF MILK

- Launched in 2018.
- 500 farms use it in France.
- Several major dairy countries use it under license.



Determination of individual cell counts by GenoCells[®]

With 1 sample of tank milk → individual **SSC** for all the cows !



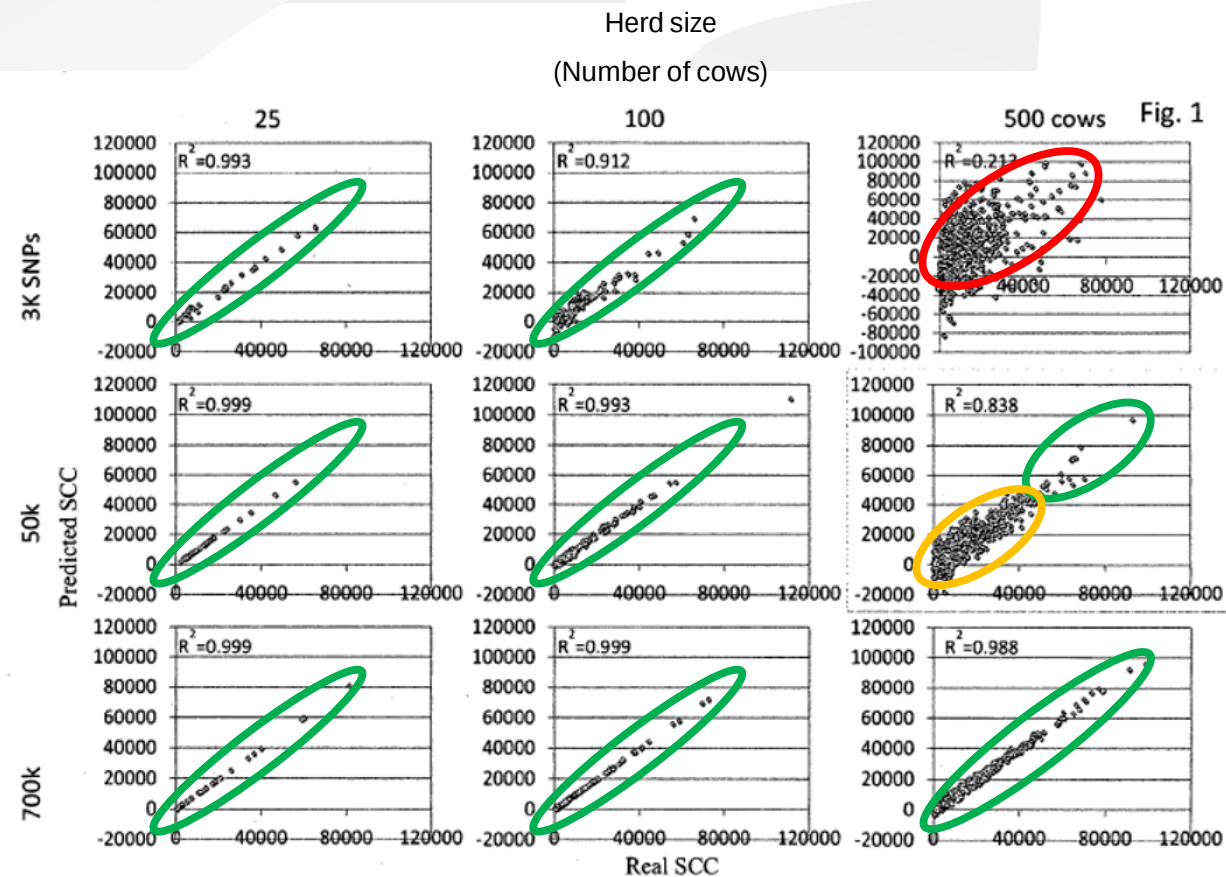


Accuracy of results depends on herd size and chip density.

- Increase the chip size according to the herd size.
- Not always easy to implement in the laboratory.
- High-density chips are expensive.



Does shallow sequencing allow for the accurate determination of cell counts for each cow?



From 50K to 10 millions markers

By genotyping

Animals: 50K SNP



Tank: 50K SNP



Calculation done on 50K SNP

≠

By sequencing

ANIMALS

COW INPUT · ONCE PER ANIMAL
50 K SNP array



Beagle imputation
imputation

against phased reference panel ↓

~20 Million SNP
imputed genotypes

TANK

NovaSeq WGS reads

Set of reads

Reference genome

Mapping

100 114 123
GATCAGCAACGTACCGCCAGATACCGGGAACATACCATACGA
TAAGCGACGTA TACCGATAGGTT GGGCCAACCTACC
Read1 Read2 Read3

~15 Million SNP
Tank sequencing

INTERSECTION · COW × TANK

overlapping markers → deconvolution

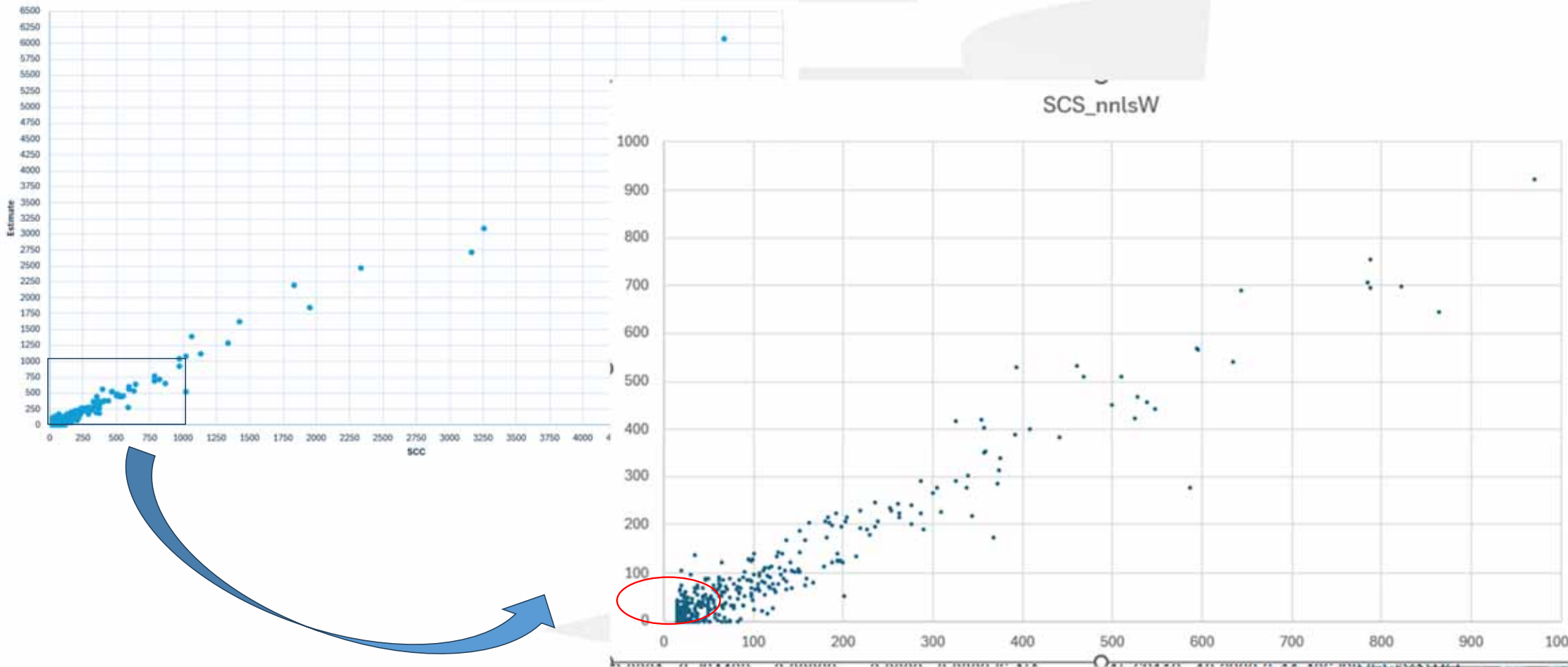
Common SNP ~10 Million
Million

Sequencing scales ~200× the markers vs
genotyping
→ Large herds



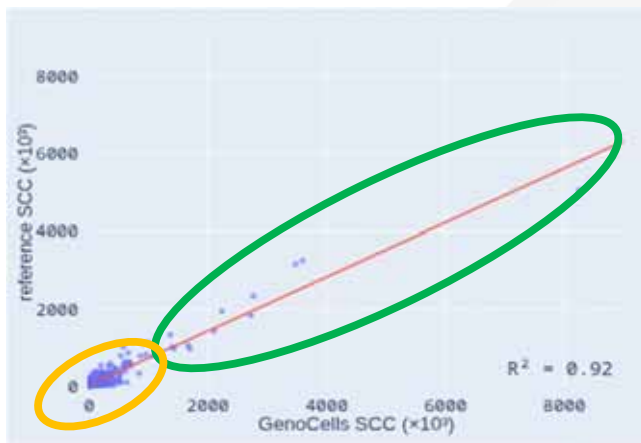
GenoCells by Sequencing: It works !!!

Very good results obtained in herd with 500 dairy cows





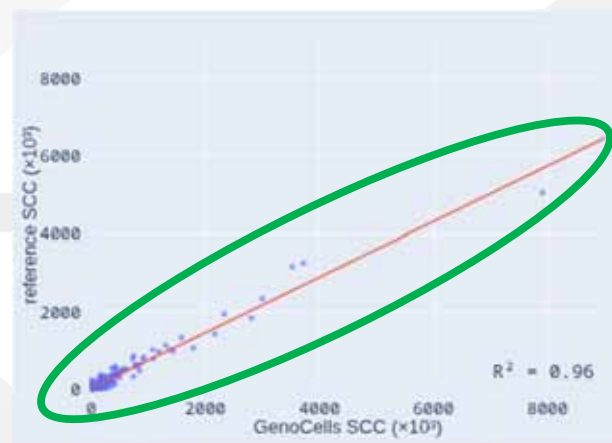
The same herd, different depths.



2x

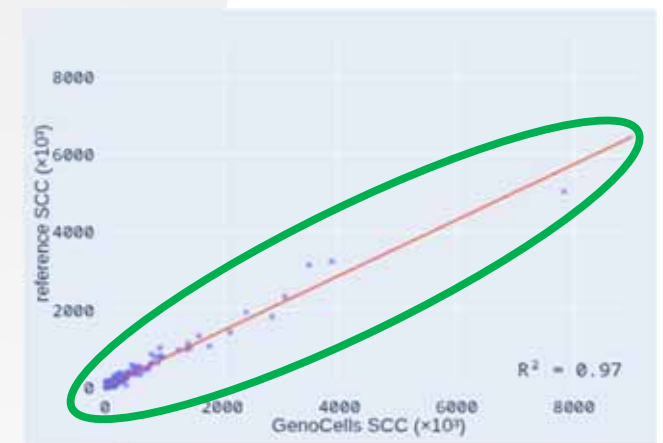
R^2 0.92

If you just want to determine the
Top 10 or 20 cows with highest SCC



3x

R^2 0.96



5x

R^2 0.97

If you want to be very accurate for
cows with lows SCC
(to manage dry period for example
: teat seal vs antibiotic





What it unlocks for recording organisations

i.



Leverages assets you already own.

50K cow genotypes from existing GS programs; tank SCC and milk-yield records from every routine visit.

ii.



Minimal additional on-farm sampling.

One tank tube on top of routine collection. No new equipment for the farmer, no per-cow draws.

iii.



Per-cow SCC at tank cadence.

Individual SCC phenotypes and **ranked alerts for subclinical mastitis** at the frequency of tank sampling — automated, compatible with routine pipelines.



One tank sample → cow-level SCC phenotypes for the whole herd. Now operational at 500 cows; scaling under test beyond 1 000.





Thank you.

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