



## Using SNP analysis results to certify parentage: French organization

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# I. FRENCH ORGANIZATION



- ▶ **FGE:**
  - ▶ Interprofessional association of various French organizations which contribute to the animal genetic progress.
  - ▶ Cattle, sheep and goat
  - ▶ 250 organizations linked to FGE
- ▶ **Represented activities:**
  - ▶ Identification
  - ▶ Parentage
  - ▶ Inseminations
  - ▶ Meat and milk performance recording
  - ▶ Genetic evaluations
  - ▶ Information system

# I. FRENCH ORGANISATION



- ▶ The bovine genetic information system:
  - ▶ A national database with every data used for genetics evaluations
    - Breeders members
    - Animals identification
    - Certified parentage
    - Artificial inseminations
    - Birth data (weight, provided birth ...)
    - Zootechnic performances
    - Genetic analysis
    - Embryo transfer

# I. FRENCH ORGANISATION



- ▶ **Parentage certification in France (1/2):**
  - ▶ Open to all breeders and all cattle breeds.
  - ▶ Voluntary approach linked to compulsory calve birth declaration.
  - ▶ The same process to all bovines, regardless of the breed.
  - ▶ 61 local agencies, called EdE, are in charge of the animal identification and parentage certification on the field.
  - ▶ National rules decided by FGE.

# I. FRENCH ORGANISATION



- ▶ **Parentage certification in France (2/2):**
  - ▶ The parentage certification is based on informations given by breeder and the record of all fecondation events before the birth.
  - ▶ Compulsory analyzis for all bulls including natural service.
  - ▶ Parentage certification is used for genetic evaluations and quality certification of meat and milk.

# I. FRENCH ORGANISATION



- ▶ 30 000 parentage verifications each year for:
  - ▶ parentage certification if doubt,
  - ▶ check the reliability of the device (3000 per year),
  - ▶ secure breeding programs.
  
- ▶ EDE are responsible to confirm a parentage or decertify a parentage. It informs the breeder of the verification result and consequences.

## 2. CHANGE TO SNP ANALYSES



- ▶ Since July 2014, SNP analyses are used for parentage verification.
- ▶ Each sample is SNP analyzed and Micro Satellites only if needed.
- ▶ Why?
  - ▶ Many analyses produced for genetic evaluation.
  - ▶ More reliable technique.
  - ▶ Ability to automate the reading of the results and parentage verifications.
  - ▶ Decrease costs for the system at term.
  - ▶ Reducing the time with 2 methods of analysis.



## 2. CHANGE TO SNP ANALYSES

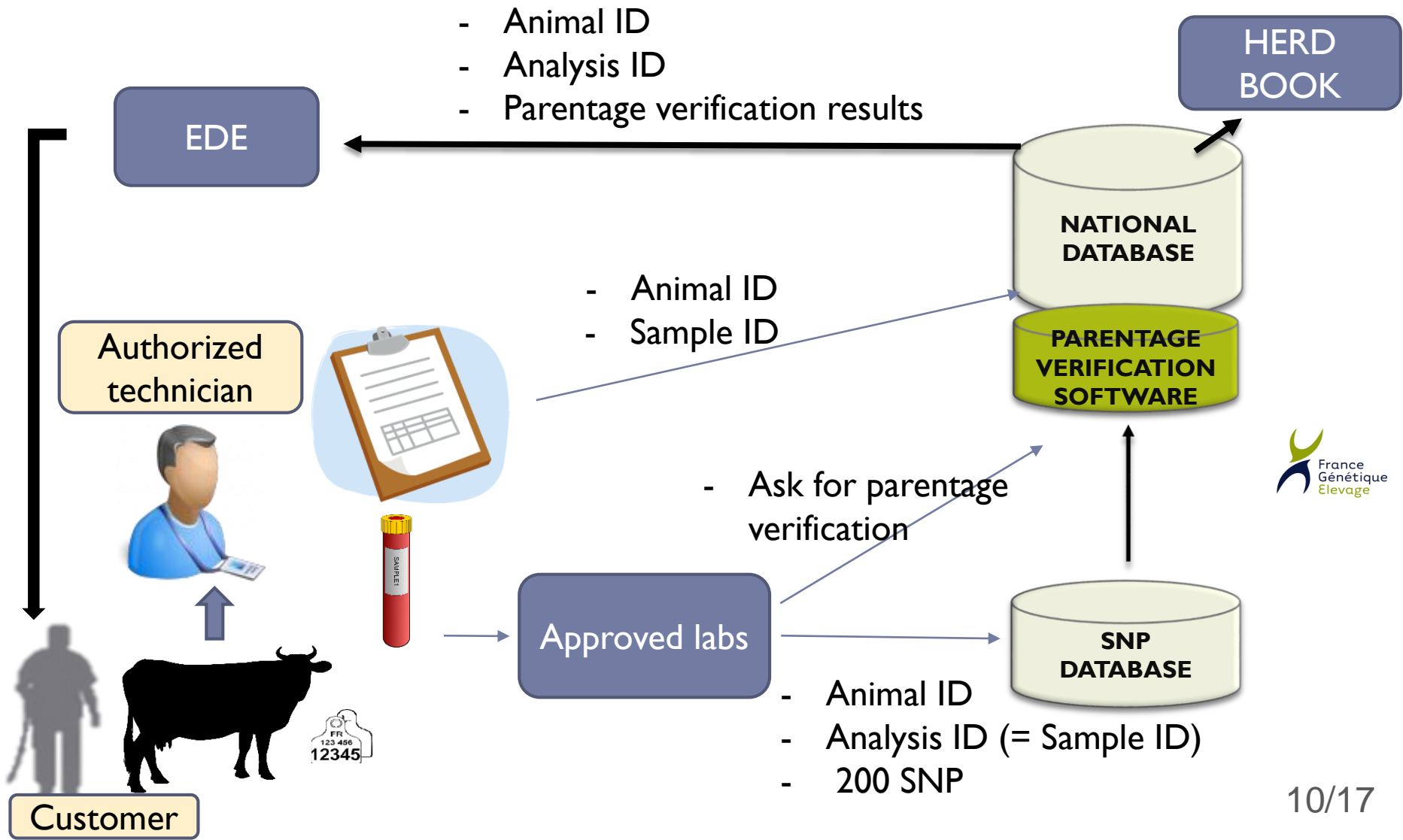


### ▶ How?

- ▶ Based on the 100 + 100 ISAG SNP.
- ▶ Parentage verification in accordance with the ISAG recommendations.
- ▶ Creation of the French SNP database based on the genetic information system.
- ▶ A software development by FGE to give the result of the verification.
- ▶ Financial help from FGE.



# 3. CURRENT OPERATING



## 3. CURRENT OPERATING



- ▶ 6 approved labs in France to send SNP analysis to the national data base based on:
  - ▶ a demand with administrative and technical details
  - ▶ the ICAR accreditation based on the ISAG ring test results
  - ▶ the results of tests on data exchange between the lab database and the national database
- ▶ Some genomic organisms are also approved to load SNP analysis from ICAR accredited foreign laboratories.
- ▶ FGE approves labs and genomic organisms

## 3. CURRENT OPERATING



### ▶ Parentage verifications

- ▶ The parentage verifications are on demand of the EDE or the breeder or any interested organizations.
- ▶ The results of parentage verifications are calculated with a national software provided by FGE as recommended by ISAG.
- ▶ Only approved laboratories can use this software.
- ▶ The results of parentage verifications are recorded in the genetic database for the EDE and other organizations
- ▶ No discovery is used today for any parentage.

## 4. OUTCOMES

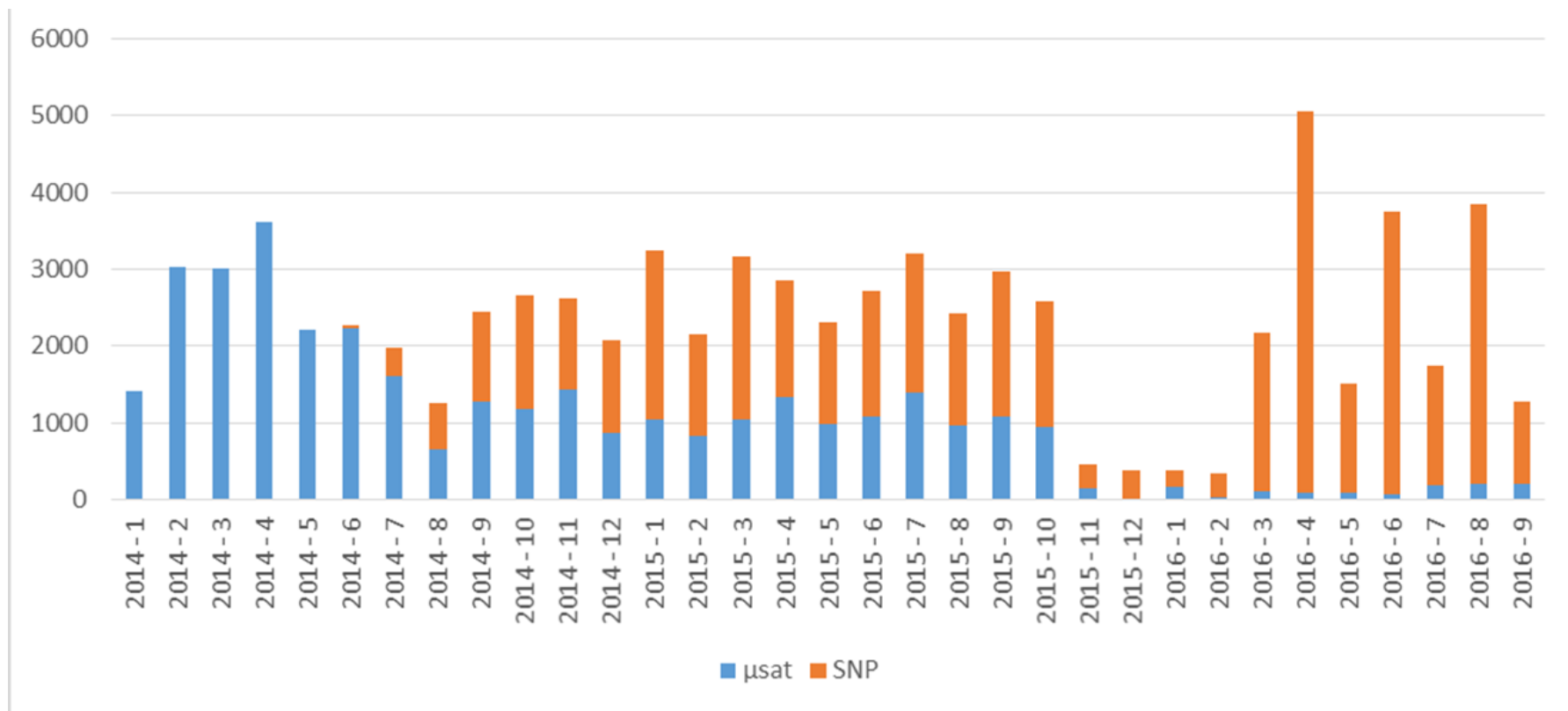


- ▶ 2000 approved technicians by EDE to take samples
- ▶ 150 000 analyses per year, 99% in SNP
- ▶ 25 000 parentage verifications per year, 92% in SNP

# 4. OUTCOMES



## ► Technic of analysis for parentage verification



## 5. BENEFITS OF SNP ANALYSIS



- ▶ Decline in cost of parentage verification.
- ▶ Best traceability between animal, sample and analysis.
- ▶ SNP analysis and parentage verifications can be automated for most of them. At the end, there will be more parentage verification so more reliability in the parentage certification system.



## 6. PROSPECTS

- ▶ A general and automatic sampling at birth would be more profitable, an official eartag could be used for take sample and keep it frozen.
- ▶ Use of parentage discovery for certification.

The future depends on the SNP analysis costs for the breeder.





Thanks for your attention