GENOEX

International Genotype Exchange Platform

# Experience with GenoEx-PSE

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Interbull Centre

THE GLOBAL STANDARD FOR LIVESTOCK DATA

SLU

Network. Guidelines. Certification.

# Interbull Centre Data Platforms


’Classic’ data for Evaluations:

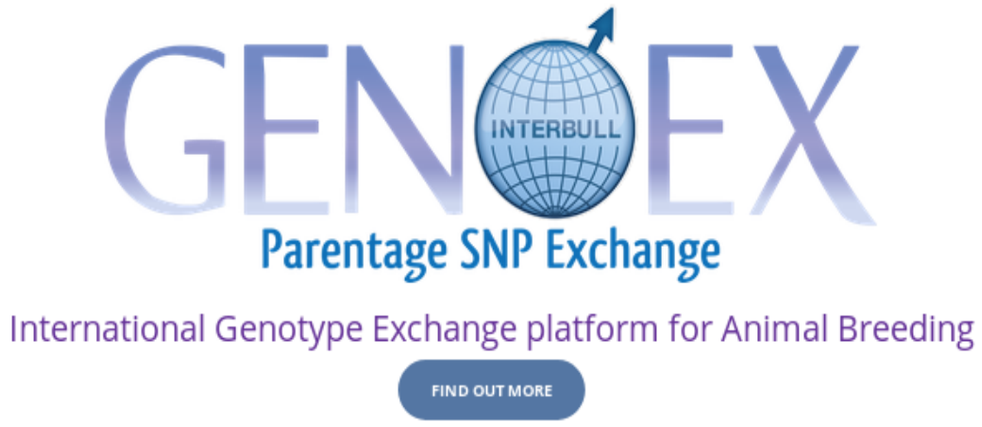
→Pedigree, Phenotypes

# GENOEX

## International Genotype Exchange Platform

- Genomic Information: SNP, Genotypes
- Multilateral exchange of genotype data

# https://genoex.org




## About the Service

The main purpose of the Genotype Exchange Parentage SNP Exchange (GenoEx-PSE) database is to provide a service for exchanging standardised sets of SNP for genotyped animals to facilitate and streamline parentage analysis activities carried out by organisations that are responsible and/or active in parentage integrity.

## Service Users

Organisations wishing to join GenoEx-PSE services shall:
1. Be member of **ICAR** or be nominated by an ICAR member;
2. Have a valid **"ICAR Accreditation for DNA Interpretation Centres"**;
3. Sign a **Service User Agreement** with the Interbull Centre.

## Documentation

The version in use is GenoEx-PSE v1.0 (December 2017).

- **GenoEx-PSE Manual**
- **GenoEx-PSE Code of Practice**
- **GenoEx-PSE SNP list details**

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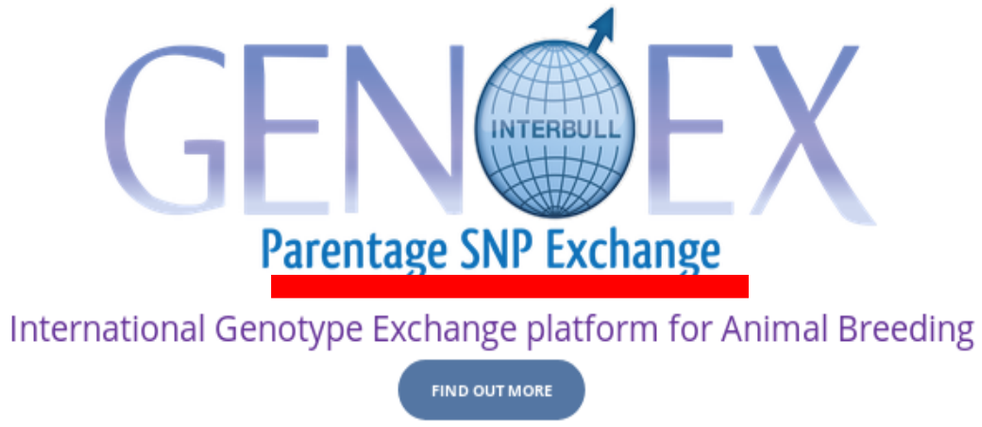


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International Genotype Exchange platform for Animal Breeding

FIND OUT MORE

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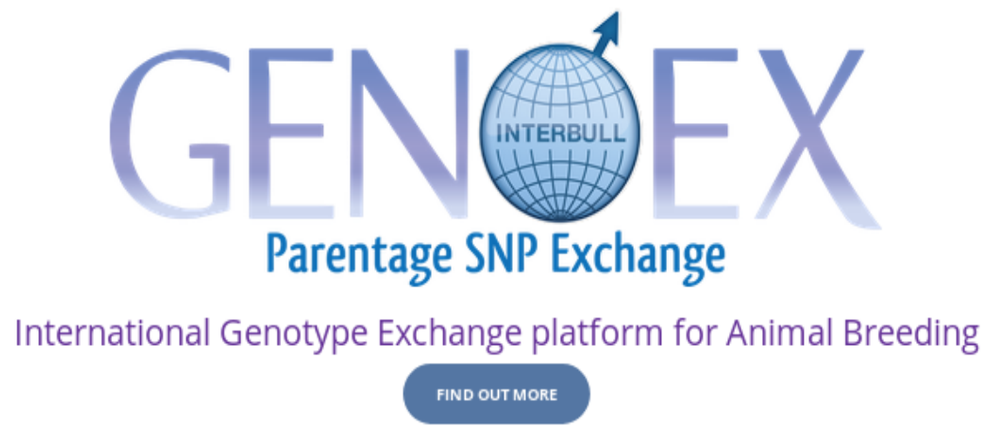


- **Parentage SNP Exchange:**
- **200 SNPs for successful parentage verification**

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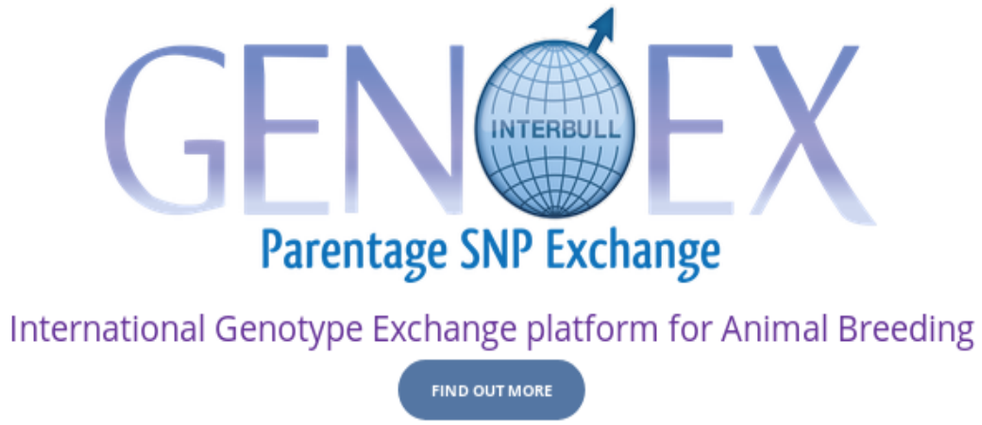


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# ICAR ACCREDITATION FOR DNA DATA INTERPRETATION

**ICAR Accredited DNA Data Interpretation Centres** is a pre-requisite for organisations joining GenoEx-PSE

Make sure that the organisation has tools to correctly perform parentage verification

ACCREDITED DNA DATA INTERPRETATION CENTRE
for Parentage Verification by SNP
Exp.: March 2021

# ICAR ACCREDITATION FOR DNA DATA INTERPRETATION

**ICAR Accredited DNA Data Interpretation Centres** is a pre-requisite for organisations joining GenoEx-PSE

**20** accredited organisations.

**9** joined GenoEx-PSE:

Poland (**NRIAP**)
Norway(**GENO**)
Germany (**VIT**, **GAU**)
Italy (**ANAFI**, **ANAPRI**, **ANARB**)
Ireland (**ICBF**, **Weatherbys**)
Slovenia (**AIS**, Univ. of Ljubljana)
Denmark (**SEGES**)
Japan (**LIA**)

Switzerland (**QUALITAS**)
Austria (**ZuchtData**)
The Netherlands (**CRV**)
USA (**CDCB**)
Canada (**CDN**)
Sweden (**Växa**)
Finland (**Faba**)

ICAR
ACCREDITED DNA DATA INTERPRETATION CENTRE
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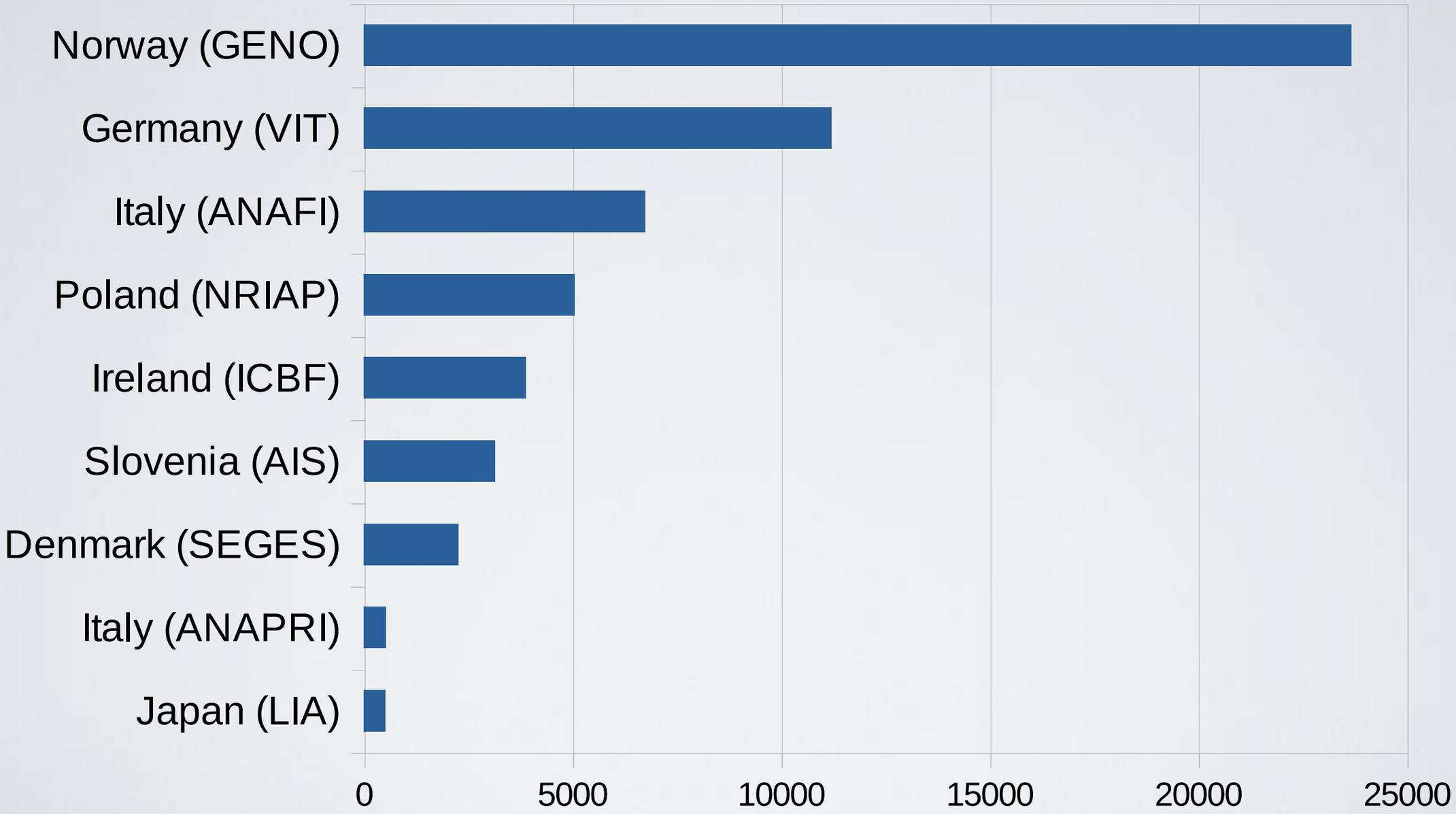
Exp.: March 2021

# GenoEx-PSE: current data

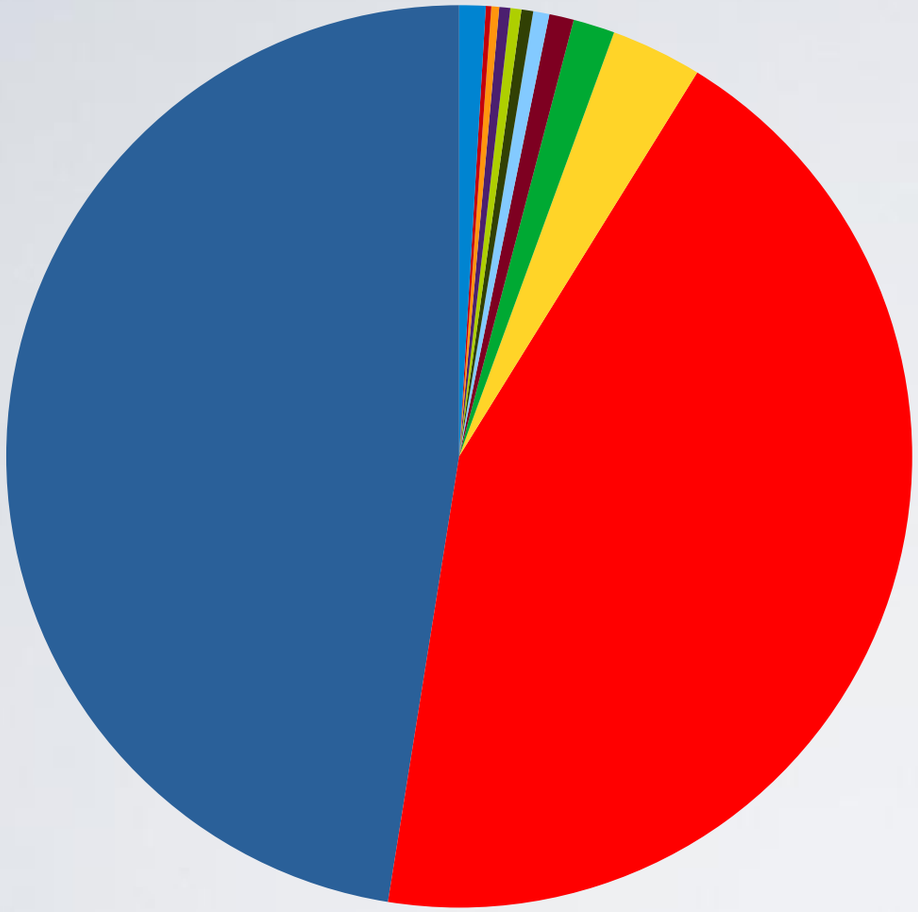
**57021 records**

**= 56739 unique individual IDs**




Only 282 records from two organisations

# GenoEx-PSE: current data

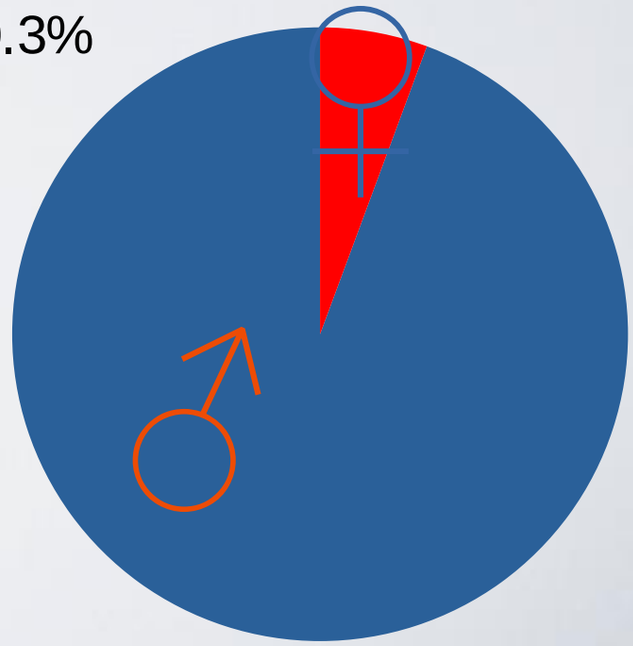


- Holstein 51%
- Red Dairy Cattle 43.7%
- Brown Swiss 3.3%
- Simmental 1.5%
- Jersey 0.9%
- Charolais 0.6%
- Belgian Blue 0.4%
- Aberdeen Angus 0.4%
- Limousin 0.4%
- Meuse Rhine Yssel 0.3%
- Hereford 0.2%
- Other * 0.9%

2.7 % pure **beef** breeds

4.2% beef use

MALES 94.3%



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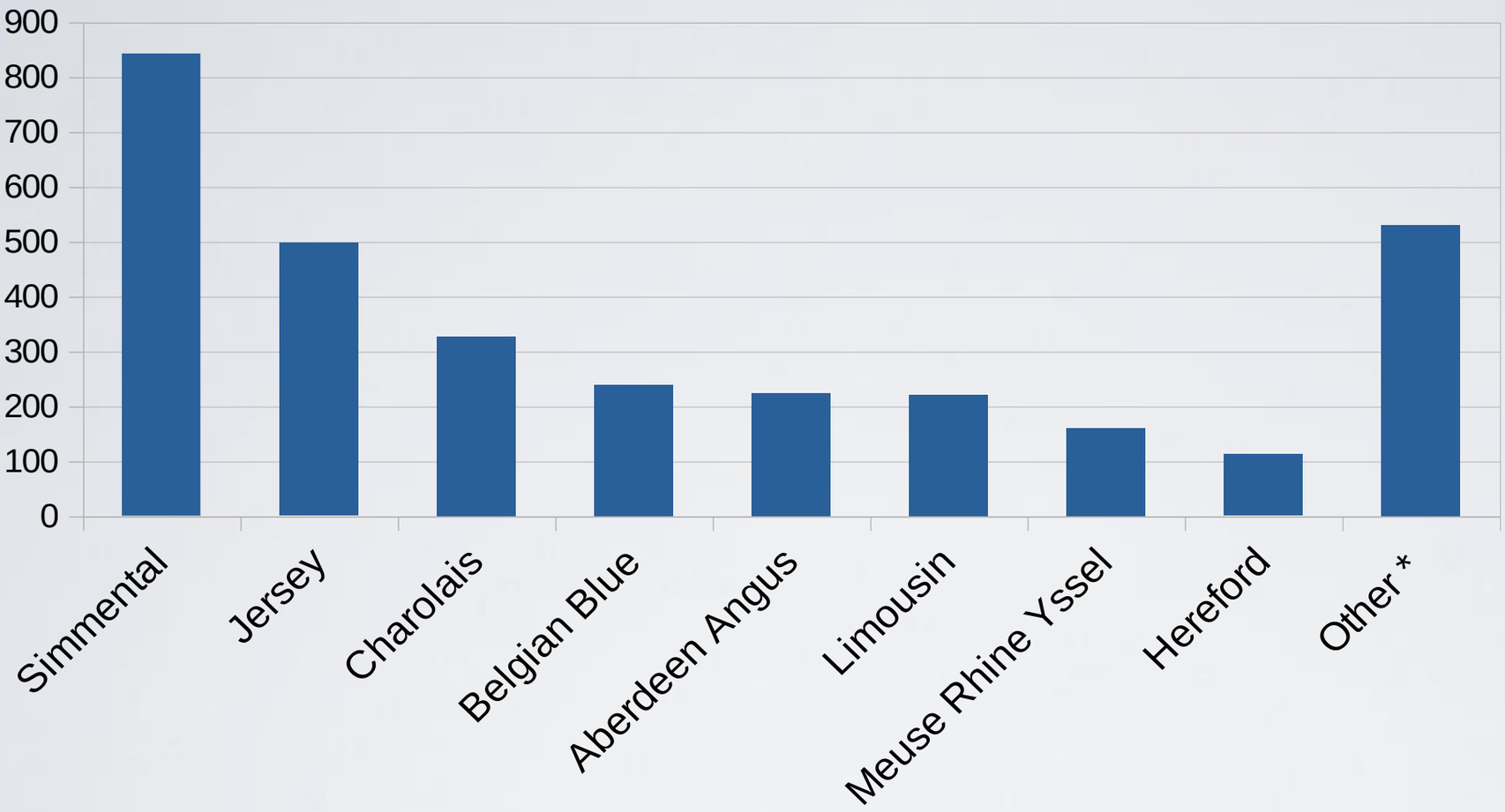


HOL
51%

RDC
43.7%

BSW
3.3%

* Other breeds include: Dairy Shorthorn (84), Duch Frisian (77), Salers (55), Blonde d'Aquitaine (50), British Frisian (50), Aubrac (46), Montbéliard (45), Parthenaise (41), Piedmont (29), Dexter (13), Normandy (11), Uckermärker (6), Wagyu (5), Kerry (4), Galloway (3), Highland Cattle (3), Romagnola (3), Rouge des Pres (2), Belgium Red & White (1), Murray-Grey (1)

# GenoEx-PSE: current data

## DATA QUALITY

Genotype length: 26-200

| | |
|---|---|
| 196-200 | 42.9 % |
| 191-195 | 13.5 % |
| 186-190 | 9.8 % |
| <186 | 33.8 % |

| | |
|---|---|
| 150-185 | 18067 |
| 100-149 | 124 |
| 26-99 | 1072 |

# GenoEx-PSE: Target Animal Groups

**GenoEx-PSE – Code of Practice:**

*A Service User may be authorized to carry out parentage analysis services for multiple breeds and/or multiple countries and/or both groups of registration status. For each such population, "Targeted" animals for uploading genotypes to GenoEx-PSE must minimally include:*

***a. Sires** in the authorized population that are born in the authorized country and known to be in **A.I.***

**All organizations 9/9 included SNPs for this category**

Genotyped locally

Best available genotype, high call rate

Confirmed parentage /ancestry test

***b. Sires** in the authorized population that are not born in the authorized country for which the Service User has permission to share the required genotype for GenoEx-PSE services.*

***c. Dams** of all known A.I. sires in the authorized population for which the Service User has permission to share the required genotype for GenoExPSE services.*

***d.** Known embryo transfer **(ET) donors** within the authorized population for which the Service User has permission to share the required genotype for GenoEx-PSE services.*

***e.** Known **parents** of animals born in the authorized country for which a genotype was downloaded/received from GenoEx-PSE for which the Service User has permission to share the required genotype for GenoEx-PSE services*

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***a.*** ***Sires*** *in the authorized population that are born in the authorized country and known to be in* ***A.I.***

- **9/9**

***b.*** ***Sires*** *in the authorized population that are not born in the authorized country for which the Service User has permission to share the required genotype for GenoEx-PSE services.*

- **7/9**

***c.*** ***Dams*** *of all known A.I. sires in the authorized population for which the Service User has permission to share the required genotype for GenoExPSE services.*

- **3/9**

***d.*** *Known embryo transfer* ***(ET) donors*** *within the authorized population for which the Service User has permission to share the required genotype for GenoEx-PSE services.*

- **3/9**

***e.*** *Known* ***parents*** *of animals born in the authorized country for which a genotype was downloaded/received from GenoEx-PSE for which the Service User has permission to share the required genotype for GenoEx-PSE services*

- **4/9**

- * Some organizations do not have permission to share some categories of data

# GenoEx-PSE; in progress

## ICAR DNA WG met on 17 June 2019
## Proposals:

- Set minimum number of SNPs per record to 95
- Address countries not meeting minimum requirements of sharing target group animals
- Investigate low quality genotypes

# GenoEx-PSE: Expectations and Benefits reported

- Pedigree corrections for animals descending from other countries' bulls
- Correcting genotypes
- Verification of daughters;
  - Faulty records: may be removed from genetic evaluation.
  - Missing records; If discovered, may be included in genetic evaluation.

# GenoEx: Key plans and expectations

## GenoEx-PSE; Parentage Discovery

- Interest from several organisations
- Development of Parentage Discovery as part of the ICAR DNA Data Interpretation Centre Accreditation:
- The ICAR DNA WG to work on test cases and proceed with the development od Cuckoo
- Implement up- and download for additional (354) SNPs for discovery in GenoEx-PSE

# GenoEx: Key plans and expectations

## GenoEx-GDE:

- Full genotypes
- Manage authorization.
  - Sharing: Data exchange between organisations as defined by them
  - Pooling: Use of genotypes at Interbull Centre (i.e. InterGenomics-HOL)
- Link to IDEA-Pedigree

# Thank you


GOOD GIRLS
GO TO HEAVEN
BAD GIRLS
GO TO THE CASTLE BLACK
WITH
JON SNOW
Joanna