

## Cattle Molecular Markers and Parentage Testing (CMMPT)

**Organized by a Standing Committee:** YES

### Meeting information

Date: 3 July 2023
Time: 14:00
Number of participants: ~95

### Chair

Name: Jiansheng Qiu
Affiliation: Neogen Genomics
Contact email: jqiu@neogen.com

### Agenda

2:00 PM	Welcoming remarks
2:05 PM	Cattle CT Overview – Emiliano Lasagna (Duty Lab).
2:15 PM	Cattle STR Results & Discussion - Emiliano Lasagna
2:45 PM	Cattle SNP Results & Discussion – Jiansheng Qiu
3:10 PM	Next Comparison Test (2024-2025)
3:30 PM	Tea/coffee break.
4:00 PM	Population genomics of indigenous African cattle inferred from 537 whole-genome sequencing. A. Tijjani, S. Kambal*, K. Marshall, and O. Hanotte (OP4).
4:20 PM	Low-density genotype panels performance for parentage verification in South African beef cattle breeds. Y. Sanarana*, D. Berry, A. Maiwashe, C. Banga, and E. van Marle-Köster (OP5).
4:40 PM	Genetic diagnosis of sex chromosome aberrations in cattle based on parentage test by microsatellite DNA, X- and Y-linked markers. L. Borreguero*, M. R. Maya, A. Trigo, I. Bonet, and J. A. Bouzada (OP6).
5:00 PM	Business Meeting and Closing Remarks.

### Summary of the meeting

#### 1. Duty Lab Report

One hundred and six laboratories from 37 countries participated in the comparison tests (CTs): 63 labs for STR only, 18 labs for SNP only, and 25 labs for both STR and SNP. However, only 88 labs (or ~83% of the participants) reported results. Overall, the DNA samples worked very well and only 6 additional sets of samples were requested.

## 2. STR CT Discussion

Of 12 required (for rank calculations) STR markers, Tgla53 had the highest (~2.6%) error rate whereas the others had greater than 98% accuracy (see table below). Based on the preliminary concordance results analysed and compiled by FASS, 80 labs (or 91% of the participants) achieved Rank 1 rating!

<i>Marker</i>	<i>Count of Genotypes</i>	<i>Genotype errors</i>	<i>Error rate</i>	<i>Marker accuracy (%)</i>
<b>BM1818</b>	1757	25	1.4434	98.58
<b>BM1824</b>	1760	5	0.2849	99.72
<b>BM2113</b>	1760	6	0.3421	99.66
<b>ETH003</b>	1760	10	0.5714	99.43
<b>ETH010</b>	1760	19	1.0913	98.92
<b>ETH225</b>	1759	30	1.7351	98.29
<b>INRA023</b>	1760	15	0.8596	99.15
<b>SPS115</b>	1760	5	0.2849	99.72
<b>TGLA053</b>	1756	45	2.6300	97.44
<b>TGLA122</b>	1760	32	1.8519	98.18
<b>TGLA126</b>	1760	6	0.3421	99.66
<b>TGLA227</b>	1758	20	1.1507	98.86

Forty-three labs reported data for additional markers, but these data were not included for rank calculations. Dr. Susana Alexandra Costa Lopes (CIBIO, Portugal) reported a new rare allele (135) for the extra marker INRA005 in the sample 22 (Zebu breed) included in the 2022-2023 cattle CT. This rare allele was also confirmed by another lab in Madrid (Laboratorio Central de Veterinaria), interestingly, this extra allele was only detected using a single mono-plex PCR.

## 3. SNP CT Discussion

All 43 labs participated in the SNP CT submitted results! Twenty-nine labs (or ~67%) utilized fixed arrays (either Illumina BeadArray or Applied Biosystems Axiom Technology), 5 labs (or ~12%) utilized GBS (genotype by sequencing), 1 lab used TaqMan, and the rest 8 labs (~19%) did not provide platform/assay information. Based on the preliminary concordance results analysed and compiled by FASS, 34 labs (or ~79% of the participants) achieved Rank 1 rating! The main reason that several labs who received lower rankings was due to missing data (which were treated as errors). Two labs indicated that the consensus genotypes for a few markers might not be correct. The CMMPT committee discussed the issue and will monitor the finding in the next CT test. Again, the results of 5 previously identified “troubled” SNPs ([https://www.isag.us/Docs/Workshop\\_report\\_CMMPT\\_2021.pdf](https://www.isag.us/Docs/Workshop_report_CMMPT_2021.pdf)) were excluded for the ranking calculations.

## 4. Business Meeting

The Chair presented the recommendation from the CMMPT committee on 14<sup>th</sup> Feb 2023 regarding additional Bovine CTs (STR and/or SNP) during gap years to new labs seeking ICAR lab accreditation, a collaborative effort between ISAG and ICAR since 2019. The additional CTs will be only available to the labs who did not participate in the latest ISAG bovine CTs. The motion was



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set to vote by the members at the workshop and was passed! The detail logistics is still under discussion between ISAG and ICAR executive members. Also, the committee has proposed Dr. Giovambattista's lab from the Universidad Nacional De La Plata in Argentina as the duty lab for the 2024-2025 bovine CTs and the approval from ISAG Executive Committee is pending.

### New Committee chair

Chair: Jiansheng Qiu
Term of service: first term of service 2017-2021, second term of service 2021-2025
Affiliation: Neogen Genomics
E-mail address: <a href="mailto:jqiu@neogen.com">jqiu@neogen.com</a>

### New Committee co-chair

Co-Chair: Emiliano Lasagna
Term of service: first term of service 2021-2025
Affiliation: Università degli Studi di Perugia, Italy
E-mail address: <a href="mailto:emiliano.lasagna@unipg.it">emiliano.lasagna@unipg.it</a>

### New Committee members

Other committee members	First term of service	Second term of service	Email address
Marcela Martinez	2019-2023	2023-2027	<a href="mailto:mmartinez@sra.org.ar">mmartinez@sra.org.ar</a>
Guillermo Giovambattista	2021-2025		<a href="mailto:ggiovam@fcv.unlp.edu.ar">ggiovam@fcv.unlp.edu.ar</a>
Rosina Fossati	2021-2025		<a href="mailto:fossati@genexa.com.uy">fossati@genexa.com.uy</a>
Yoshiyuki Miyazaki	2021-2025		<a href="mailto:y-miyazaki@liaj.or.jp">y-miyazaki@liaj.or.jp</a>
Paul Flynn	2023-2027		<a href="mailto:pflynn@weatherbys.ie">pflynn@weatherbys.ie</a>
Romy Morrin-O'Donnell	Ex Officio		<a href="mailto:rmorrin@weatherbys.ie">rmorrin@weatherbys.ie</a>

### SIGNATURES

Chair

Duty laboratory