



# ISAG . 2019

37th International Society for  
Animal Genetics Conference

July 7 - 12, 2019 - Lleida, Spain

## Cattle Molecular Markers and Parentage Testing

Organised by a standing committee: YES NO

### Meeting information

Date: 09 July 2019

Time: 14:30-17:45

Number of participants: 85

### Chair

Name: Rikke Vingborg

Affiliation: VikingGenetics

Contact email: rivin@vikinggenetics.com

### Agenda

- 14:30 Welcoming remarks.
- 14:35 Cattle STR/SNP Comparison Test 2018-2019.
- 14:40 Presentation by Duty Lab – Amparo Martinez, Empresa de Base Tecnológica de la Universidad de Córdoba, Spain.
- 14:55 Presentation of STR results – Rikke Vingborg.
- 15:10 Presentation of SNP results - Rikke Vingborg.
- 15:25 Evaluation of the results by the chair.
- 15:40 Next Comparison Test (2020-2021).
- 16:00 Coffee break
- 16:30 OP107: Development of targeted GBS panels for breeding and parentage applications in cattle and swine. A. Burrell<sup>1</sup>, P. Siddavatam<sup>1</sup>, M. Swimley<sup>1</sup>, C. Willis<sup>\*1</sup>, M. de Groot<sup>2</sup>, R. Ferretti<sup>3</sup>, and R. Conrad<sup>1</sup>, <sup>1</sup>Thermo Fisher Scientific, Austin, TX, USA, <sup>2</sup>VHL Genetics, Wageningen, Netherlands, <sup>3</sup>Neogen GeneSeek, Lincoln, NE, USA.
- 16:50 OP108: Poll diagnostics, scur genetics, and production concurrence in naturally hornless cattle. I. A. S. Randhawa<sup>\*1</sup>, M. R. McGowan<sup>1</sup>, L. R. Porto-Neto<sup>2</sup>, B. J. Hayes<sup>3</sup>, and R. E. Lyons<sup>1</sup>, <sup>1</sup>School of Veterinary Science, University of Queensland, Gatton, QLD, Australia, <sup>2</sup>Agriculture and Food, CSIRO, St Lucia, QLD,



## INTERNATIONAL SOCIETY FOR ANIMAL GENETICS

Australia, 3Centre for Animal Science, Queensland Alliance for Agriculture and Food Innovation, University of Queensland, St Lucia, QLD, Australia.

- 17:10 OP109: Validation of the OpenArray SNP assays for cattle parentage control. A. Piestrzynska-Kajtoch\*, D. Rubis, A. Fornal, A. Gurgul, I. Jasielczuk, and A. Radko, National Research Institute of Animal Production, Balice, Poland.
- 17:30 Election of committee
- 17:40 Any other business

### Summary of the meeting

#### STR CT:

- 1) 107 labs requested samples but only 92 labs submitted data (84 in 2017)
- 2) 21 samples for CT were selected by the duty lab, which represented breeds from that area/country therefore unknown/rare alleles might be reported as “new”. BCT01 was used as a reference and results confirmed by three labs prior to including the results send to all participants. BCT03 was found to be problematic and was invalidated.
- 3) A major discrepancy was observed for marker ETH225: alleles “**158/160**” were reported in samples BC11, BCT14, BCT15, BCT16, BCT17, BCT18, BCT19 and BCT20. During the ISAG conference in Salt Lake City (July 23-27, 2016), it was decided that 158 is the correct ISAG nomenclature based on sequencing data (see the cattle STRBase table below). Considering quite a few labs were not aware of the table, the CMMPT agreed to accept the 160 call for this CT only.

Repeat number	BM1818	BM1824	BM2113	CSRM60	CSSM66	ETH3	ETH10	ETH225	HAUT27	ILSTS006	INRA023	SPS115	TGLA53	TGLA122	TGLA126	TGLA227
11																75
12		178	121													77
13	256	180	123								198					79
14	258	182	125	88			209		140		200			137	109	81
15	260	184	127	90	179	103			142		202			139	111	83
16	262		129	92	181		213		144	284	204			141	113	85
17	264	188	131	94	183		215		146	286	206			143	115	87
18	266	190	133	96	185	109	217		148	288	208			145	117	89
19	268		135	98	187		219	140	150	290	210		154	147	119	91
20	270		137	100	189	113	221	142	152	292	212		156	149	121	93
21	272		139	102	191	115	223	144	154	294	214	248	158	151	123	95
22			141	104	193	117	225	146	156	296	216	250	160	153	125	97
23			143	106	195	119		148	158	298	218	252	162	155		99
24				108	197	121		150		300	220	254	164	157		101
25	280				199	123		152		302	222	256	166	159		103
26					201	125						258	168	161		
27				114		127						260	170	163		
27.1												261				
28					205	129		158				262	172	165		
29						131							174	167		
30													176	169		
31													178	171		
32													180	173		
33													182	175		
34													184	177		
35													186	179		
36													188	181		
37													190	183		

- 4) CMMPT also agreed to accept ETH225 results of 140-141-142/154 for sample BCT-21, as this sample appears to be a “rare” breed to many labs in various countries.

**SNP CT:**

- 1) 37 labs submitted data (in TOP format) and the platforms used are shown below:

Platform	Amount
iScan Illumina	27
Sequencing platform (Axiom, Illumina, Thermo Fisher Scientific)	3
ION S5	3
Fluidigm	2
Others	2

- 2) Overall, a relatively high percentage of no calls and lower concordances were observed from the labs that utilized sequencing platform. Note that concordant genotypes are the most frequently reported genotypes but does not necessarily mean correct genotypes.
- 3) A summary of marker performance (the core ISAG panel) is shown below. Note that SNPs marked with Red overlapped between this and the last CT (2017) and SNPs marked in *Italic* were new ones with low (<98%) concordances.

SNPs	% Consensus
22	100.0
56	> 99.0
9	> 98.0
<b>ARS-USMARC-Parent-DQ786763-rs29020472</b>	<b>98.8/96.3</b>
ARS-USMARC-Parent-DQ888311-rs29017313	98.6/99.86
ARS-USMARC-Parent-AY844963-rs17871338	98.54/100
<b>ARS-USMARC-Parent-AY858890-rs29002256</b>	<b>98.2/97.72</b>
ARS-USMARC-Parent-DQ786757-rs29019900	97.39/99.85
ARS-USMARC-Parent-AY916666-no-rs	97.08/98.85
ARS-USMARC-Parent-DQ786766-rs29012070*	96.73/98.29
ARS-USMARC-Parent-AY761135-rs29003723+	96.67/99.85
<b>ARS-USMARC-Parent-DQ381152-rs29002408</b>	<b>94.6/96.29</b>
<b>ARS-USMARC-Parent-EF093512-rs29013546</b>	<b>91.88/95.75</b>
<b>ARS-USMARC-Parent-AY842474-rs29003226</b>	<b>88.8/97.44</b>
<i>ARSUSMARCPARENTDQ916057RS29009979</i>	<i>92.41</i>
<i>ARSUSMARCPARENTEF034084RS29016185</i>	<i>95.46</i>
<i>ARSUSMARCPARENTDQ470475NORS</i>	<i>96.01</i>
<i>ARSUSMARCPARENTAY842472RS29001941</i>	<i>96.44</i>
<i>ARSUSMARCPARENTDQ786761RS29012840</i>	<i>97.27</i>
<i>ARSUSMARCPARENTAY842475RS29002127</i>	<i>97.72</i>
<i>ARSUSMARCPARENTEF034081RS29009668</i>	<i>97.72</i>
<i>ARSUSMARCPARENTDQ647186RS29014143</i>	<i>97.86</i>

- 4) The CMMPT committee had two queries before deadline for delivery of data and provided them with guidelines.
- 5) Romy Morrin-O'Donnell (an ex Officio of CMMPT) presented an update from the ICAR meeting in June 2019 that a minimum of 200 SNPs would be required for parentage verification and ISO17025 would be required for labs seeking ICAR genotyping accreditation for SNPs (in 2020/2021) and STRs (in 2022). Here is a link to the ICAR guidelines <https://www.icar.org/index.php/icar-recording-guidelines/>

### Decisions taken and plans for future conferences

- For the next Comparison and beyond, the ISAG requirement for SNP genotyping is the 200 SNPs (ISAG core panel plus ISAG additional panel) in align with ICAR
- Cattle CT data will be available to the CMMPT committee six weeks before the workshop
- Only one member of an institutional member can vote

### Committee chair (the new chair)

Chair: Jiansheng Qiu
Term of service: 2017-2021
Affiliation: Neogen GeneSeek
E-mail address: jqiu@neogen.com

### Committee members (the new committee)

Other members	Term of service	E mail address
Leslie A Bickel, Univ California at Davis;	2017 – 2021;	labickel@ucdavis.edu
Amparo Martinez, Laboratorio de Genética Molecular Aplicada;	2014 – 2021;	amparomartinezuco@gmail.com
Luis Cancela, Identitas;	2017- 2021;	lcancela@identitas.com.uy
Marcela Martinez, Sub-Jefa de Laboratorio de Genética Aplicada Sociedad Rural Argentina;	2019 – 2023;	mmartinez@sra.org.ar
Joe Foster;	2019 – 2023;	jfoster-f@dnanexus.com
Laura Raagaard Nielsen, Eurofins Genomics;	2019-2023;	LauraRaagaardNielsen@eurofins.dk
Emiliano Lasagna, Ricercatore Universitario; the next Duty Lab;		emiliano.lasagna@unipg.it
Romy Morrin-O'Donnell, Weatherbys Scientific; an ex Officio;		rmorrin@weatherbys.ie

**COMPARISON TEST (2018-2019)**      YES    NO    (If no delete the rest of this page)

**Duty laboratory**

Contact person: Amparo Martinez
Affiliation: Laboratorio De Genética Molecular Aplicada Animal Breeding Consulting, S.L. Cordoba, Spain
E-mail address: amparomartinezuco@gmail.com

**Comments (issues rising)**

To post Cattle (Bovine) STRBase link <a href="http://www.cstl.nist.gov/strbase/cattleSTRs.htm">www.cstl.nist.gov/strbase/cattleSTRs.htm</a> directly under “the Cattle Molecular Markers and Parentage Testing Committee” section on the ISAG website
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**List of recommended markers with primer information**

N/A
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**Duty laboratory for the next comparison test with contact details**

Contact person: Emiliano Lasagna
Affiliation: Ricercatore Universitario, Dipartimento di Scienze Agrarie, Alimentari e Ambientali, Università degli Studi di Perugia, Italy
E-mail address: emiliano.lasagna@unipg.it

**SIGNATURES**




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**Chair**

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**Duty laboratory**