



THE GLOBAL STANDARD  
FOR LIVESTOCK DATA

# **DNA Working Group Meeting**

**Tuesday, 13 June 2017, 14h00 to 18h00**  
**Edinburgh International Convention Centre (EICC)**  
**Edinburgh, Scotland**

## **AGENDA**

1. Call to Order - Brian Van Doormaal
2. Review of Agenda
3. Summary of Previous Meeting held 19 May 2017 (Attachment)
4. DNA WG Report to ICAR Board - Sunday, 11 June 2017 (Attachment)
5. ICAR Accreditation of Genetic Laboratories for Parentage Testing in Cattle (Attachment)
6. GenoEx-PSE and ICAR Accreditation for DNA Data Interpretation Centres - Status Update
7. New Technologies - Presentation by Matt and André followed by Open Discussion
8. Other Topics
  - 8.1 ICAR Quality Assurance Guidelines when processing large genotype data sets
  - 8.2 Sex Prediction
  - 8.3 Breed Composition - Methods and Uses
9. Next Meetings via Webinar
10. Adjournment

# **DNA WG Meeting Notes**

## **19 May 2017 at 15.00 (Paris time)**

### **1. Call to Order**

Chair Brian Van Doormaal called the meeting to order and welcomed all present.

### **2. Roll Call of Participants**

Brian Van Doormaal (Chair), Andre Eggen, Suzanne Harding, Dariusz Kamola, Sandra Kipp, Raffaele Mazza, Matthew McClure, Romy Morrin-O'Donnell, Nilesh Nayee and Cesare Mosconi (ICAR).

Apologies were received from Carine Megneaud, Ezequiel Nicolazzi and Wim van Haeringen.

### **3. Review of Agenda**

Following a review of the proposed agenda, no items were added so it was accepted as circulated.

### **4. Summary of Previous Meeting held 21 April 2017 and Business Arising**

There were no corrections to the minutes and so they were accepted as circulated.

Review of Actions and Business Arising:

4.1 Item 4 Genetic Traits definition – The proposed background document is being worked on by Romy, Matt and Raffaele. It will be available for discussion at the June meeting.

#### 4.2 Item 6

4.2.1 Revised version of guidelines documents completed and sent out by Brian.

4.2.2 Brian still to contact experts involved with GenoEx-PSE requesting list of SNP to be excluded from the additional 354 for parentage discovery.

4.2.3 Romy has forwarded the document to ISAG and is awaiting comments.

### **5. ICAR Accreditation for DNA Data Interpretation Centres**

#### **5.1 ISAG Feedback Re: ICAR Guidelines for Parentage Verification and Parentage Discovery**

As stated above, the document has been circulated and Romy is now awaiting comments from ISAG.

**Action: Romy will send reminder to ISAG, to try and get comments in advance of the June meeting.**

As there were no additional comments from the WG members the current version is considered complete although it needs to be formatted in line with the current ICAR Guidelines.

**Action: Cesare to send the ICAR Guidelines template in Word to Brian**

#### **5.2 Analysis of Test Data Files for ICAR Accreditation**

Sandra, Matt and Brian's colleagues at CDN have been working on this point. Matt has prepared a series of excel files from ICBF data with genotyping results as a basis of the test files. Two files are needed; files for the applicant to test with and the answer keys.

When an organisation takes the Accreditation test, the answers should be the same as the answer key files. During development it has been found that even though the test files are standardised, the answer files currently did not lead to identical results across countries. The technical people are looking and discussing about why the results are inconsistent and not 100% matching.

The process of creating data files was described. To enable the accreditation process to use standard file formats, CDN created a conversion process to create file formats that look like the GenoEx-PSE exchange files. These test files went out in AB only format, so French colleagues couldn't join in for testing since they use TOP format.

We need to generate test files in a consistent way over time. Currently it is an ad-hoc process of generating the files. In the future we will need to have Interbull creating test files and issuing an accreditation approval decision to ICAR for each applicant, so the process needs to be automated. Brian has requested staff at CDN to develop this process.

Currently, the test files do not allow for testing a mating combination of sire and dam because no animals in the test file have both parents known and verified. Current test file just test for either sire or dam. The CDN automated process will lead to the creation of new test files with some cases like this.

Test files need to have all problems possible, so they will need to be created by CDN staff. Perhaps also need to have a check for the 4 SNP that should not be used. Test files for parentage discovery are also needed. Must allow for all possibilities, such as discovering near parents, these will be different to the verification scenarios.

If there are additional SNP excluded in the future, will new files be generated? When organisations who passed accreditation reapply to renew their accreditation, the list may have changed. Each test file to be created by the proposed approach to be developed at CDN should reflect the excluded SNP or added SNP, at the time the test file is created.

**Agreed: That organisations do not need to retest when the test files change.**

On an ongoing basis we may not want organisations using the same test files. Test files need to keep changing so that if an organization fails and reapplies a few months later, a different test file will be used. It is expected that there will be 2 or 3 available test files that can be sent out to applicants by Interbull Centre.

Service ICAR takes care of the administrative side of accreditation and will contract Interbull Centre as the technical body to send out files and interpret results. As the annex gets modified, via recommendations from this DNA WG, ICAR will inform the Interbull Centre, and they will exclude or add SNP accordingly.

Time lines – CDN staff are moving forward generating files for parentage verification, which can then be tested by the group of experts currently involved. Once complete CDN will develop files for parentage discovery.

**Action: Need to get update on development of the new test files for the ICAR meeting in Edinburgh and then for the Interbull meetings in Tallinn, Estonia in August 2017.**

## **6. New Technologies**

### **6.1 New Affymetrix 50K Chip**

The WG members were updated on news that Affymetrix has (or is planning to) introduce a new SNP medium density chip with about 40k in common with the Illumina 50k chip. It was clarified that this chip using current/longstanding technology. It was suggested, however, that the genotyping costs for this chip are expected to be significantly lower than current costs with a low density chip since a new genotyping

service provider is planning to enter the market space. Discussion ensued regarding the potential impact of a significantly lower cost low density genotyping chip on livestock improvement globally, including ICAR member organizations.

**Action: Raffaele agreed to acquire more information on this point and report back at a future meeting.**

The group were unsure if this is a chip based on new technology but it was clarified that it is an axion chip, which is the current technology also used by Illumina. There are two issues when genotyping and deciding which chips can be adopted – lab cost and chip cost – both need to be considered.

Illumina and Affymetrix can both be used for genomic evaluation, but for parentage other chips/technologies are also being used. Genotyping labs, such as Weatherbys, GeneSeek and Zoetis, purchase the technology in large numbers so they can get a discount, and they also developed customized chips for various reasons.

The new chip also involves a new lab entering into the market. Customers will need to assess the quality assurance and quantity/volume that can be delivered.

There can be differences in AB formatted genotypes from Affymetrix and Illumina chips. Once identified they can be aligned. If a new chip breaks into the marketplace the company and associated lab will need to resolve any issues arising.

## **6.2 Other Technologies for WG Information and/or Consideration**

Brian asked WG members if there are any other technologies we should be thinking about. One suggestion brought forward is genotype-by-sequencing and low-covered sequencing (i.e.: 1X or 2X instead of usual high coverage sequencing). If this technology become cheap enough, it will be used.

A second topic brought forward is gene editing. There has been much discussion on this topic, especially following a federal policy announcement in the United States. Part of the issue relates to being able to identify when an animal has been gene edited. There are methods that could be used. Need to understand how these technologies impact upon what ICAR and its members/customers do.

**Action: Andre and Matt agreed to give a teaching session during the meeting in June to go through gene sequencing, gene editing and other possible topics for the benefit of WG members.**

## **7. Future Meetings**

The next meeting was reaffirmed for Tuesday, 13 June and all meeting participants confirmed their intent to attend, with the exception of Nilesh Nayee.

**Action: Brian to organise projector and video equipment for June meeting.**

### **7.1 Recommended/Requested Agenda Topics**

1. Understanding gene editing, gene sequencing and other new technologies
2. Standards for sex prediction
3. Quality control measures looking at large data sets in detail. ICAR could recommend procedures to discover problems where genotypes may not be assigned to the correct animals
4. Breed composition – to do with herdbook qualification, done in ICBF for quality control. Also completed by CDCB via BBR value

## **8. Adjournment**

The meeting was duly adjourned at 16h10 Paris time.



## Report for DNA Working Group

<b>Date of report</b>	4 June 2017	
<b>SC/WG/TFI name</b>	DNA Working Group	
<b>Chair</b>	Brian Van Doormaal (Manager, Canadian Dairy Network)	
<b>Members (names)</b>	Brian Van Doormaal (Canada) Andre Eggen (France) Suzanne Harding (UK) Dariusz Kamola (Poland) Sandra Kipp (Germany) Raffaele Mazza (Italy) Matthew McClure (Ireland) Carine Megneaud (France) Romy Morrin-O'Donnell (Ireland) Nilesh Nayee (India) Ezequiel Nicolazzi (United States) Wim van Haeringen (Netherlands) Cesare Mosconi (ICAR support)	
<b>Members left since October 2016</b>	Not applicable - Created after meetings in Chile	
<b>Meeting(s) since October 2016</b>	First Meeting: 9 January 2017 20 February 2017 30 March 2017 21 April 2017 19 May 2017	<u>Planned:</u> 13 June 2017 (Edinburgh)
<b>Priorities addressed since October 2016 (last report)</b>	This first priorities of this newly created WG have included: <ol style="list-style-type: none"> <li>1. Consideration of nominations and selection of WG members representing different areas of expertise, organizations and geography</li> <li>2. Review of WG ToR and establishment of meeting protocols and procedures, including the establishment of a WG Discussion Forum through Interbull Centre</li> <li>3. Review actions and recommendations from the GenoEx-PSE Expert Group</li> <li>4. Establish recommended ICAR guidelines for Parentage Verification and Parentage Discovery as required for successful ICAR Accreditation as a DNA Data Interpretation Centre</li> <li>5. Monitor development of the GenoEx-PSE services to be offered through Interbull Centre including the establishment of test data files for ICAR accreditation</li> <li>6. Complete, in June 2017, the ICAR accreditation round of the genetic laboratories for parentage verification by STRs and SNPs for 2017</li> </ol>	

<p><b>Priorities for next year</b></p>	<p>The first priority for the coming months is to progress towards the introduction of the service for ICAR Accreditation of DNA Data Interpretation Centres. This will require development of an automated process for generating the data files to be used by applicants to analyze for demonstrating their ability to conduct parentage verification and/or discovery in accordance with the recommended guidelines.</p> <p>The WG will also oversee the introduction of the GenoEx-PSE service offered through the Interbull Centre.</p> <p>At the WG meeting in June, discussion will focus on new technologies likely to arise and impact livestock improvement and organizations that are members/customers of ICAR.</p>
<p><b>Issues which the Group wishes ICAR Board to consider</b></p>	<p>Draft recommended ICAR Guidelines for Parentage Verification and Parentage Discovery Based on SNP Genotypes (for initial feedback)</p>

DO NOT COPY

**Subject:** Instructions for the Remote Desktop, documents of the Working Group Meetings, evaluation process for the accreditations of the Genetic Laboratories for parentage testing in cattle  
**From:** "Cesare Mosconi - ICAR" <mosconi@icar.org>  
**Date:** 31/05/2017 9:42 AM  
**To:** <brian@cdn.ca>, <aeggen@illumina.com>, <carine.megneaud@bretagne.chambagri.fr>, <carine.megneaud@laposte.net>, <dariuszkamola@gmail.com>, <ezequiel.nicolazzi@uscddb.com>, <info@vhlgenetics.com>, <wha@vhladmin.nl>, <mazza.r@aia.it>, <mmclure@icbf.com>, <nileshn@nddb.coop>, <rmorrin@weatherbys.ie>, <sandra.kipp@vit.de>, <Suzanne@holstein-uk.org>, <worldholstein@gmail.com>  
**CC:** "Martin Burke - ICAR" <martin@icar.org>, "Brian Wickham \((ICAR)\)" <brian@icar.org>

**To:** Members of the ICAR DNA Working Group  
**Re:** Instructions to enter into the Remote Desktop;  
Documents of the Working Group Meetings on the web;  
Evaluation process for the accreditations of the Genetic Laboratories for parentage testing in cattle

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Dear Members of the ICAR DNA Working Group,

By this email, I am providing:

- A two steps instructions to enter into the Remote Desktop, a shared space on ICAR server, where documents can be shared and produced together. The Remote Desktop has been adopted to review the applications of the applicants genetic laboratories for granting the accreditation for parentage testing by SNPs and STRs
- The area and its URL (and its password) where documents of the past meeting of the DNA WG have been made available for future uses. This area could be also implemented for the future meetings in case that Brian van Doormaal will consider it feasible.
- Some indications to review the applications and the procedures to finalise the process

In the following paragraphs, I am passing some details for the above three different topics:

#### 1. INSTRUCTIONS REMOTE DESKTOP

In order to enter into the ICAR server restricted to the members of the DNA WG, a PDF file (called "Instructions Remote Desktop for DNA WG.pdf") is hereby attached. It contains the two step process and the necessary password to enter

#### 2. DOCUMENTS OF THE ZOOM MEETINGS OF THE DNA WG

In order to maintain all the documents of the WG in a unique place for a future consultations, a protected page has been produced within the ICAR web site. The page is available at: [www.icar.org/Documents/DNA-WG/](http://www.icar.org/Documents/DNA-WG/) . To facilitate you, username and password are the same of those used for the Remote Desktop and hereby recalled

Username: DNA  
Password = Working-Group2017

It is also possible to use these facility for the upcoming meetings, sharing the agenda and the documents linked to the agenda in order to avoid browsing among different files in searching of the specific document. This approach has been implemented in the ICAR Board meetings and the feedbacks have been positive

P.S.: To facilitate our memory, the passwords for the URL and the Remote Desktop are the same

### 3. EVALUATION OF THE APPLICATIONS FOR THE ICAR ACCREDITATION OF DNA LABORATORIES FOR PARENATGE TESTING BY SNPs AND SNPs

In the Remote Desktop, a folder in the Desktop (named "DNA WG Documents") is containing different directories and a Word file (called "1st evaluations of applications.doc). The file contains the presented documentation (as PDFs) by each applicants and a table in which the members of the WG can add their comments to evaluate the application and the related documents. The Edinburgh Conference will be the perfect place where a direct demonstration can be provided. In the meantime, I ask the Members of the DNA WG to become familiar with the structure. The necessary time for that is could be around 5-10 minutes

Best personal regards

Cesare



THE GLOBAL STANDARD  
FOR LIVESTOCK DATA

**Cesare Mosconi**

ICAR Executive

Via Savoia 78, Rome, Italy

T +39 06 85 237 237

[mosconi@icar.org](mailto:mosconi@icar.org)

[www.icar.org](http://www.icar.org)

— Attachments: —

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Instructions Remote Desktop for DNA WG.pdf

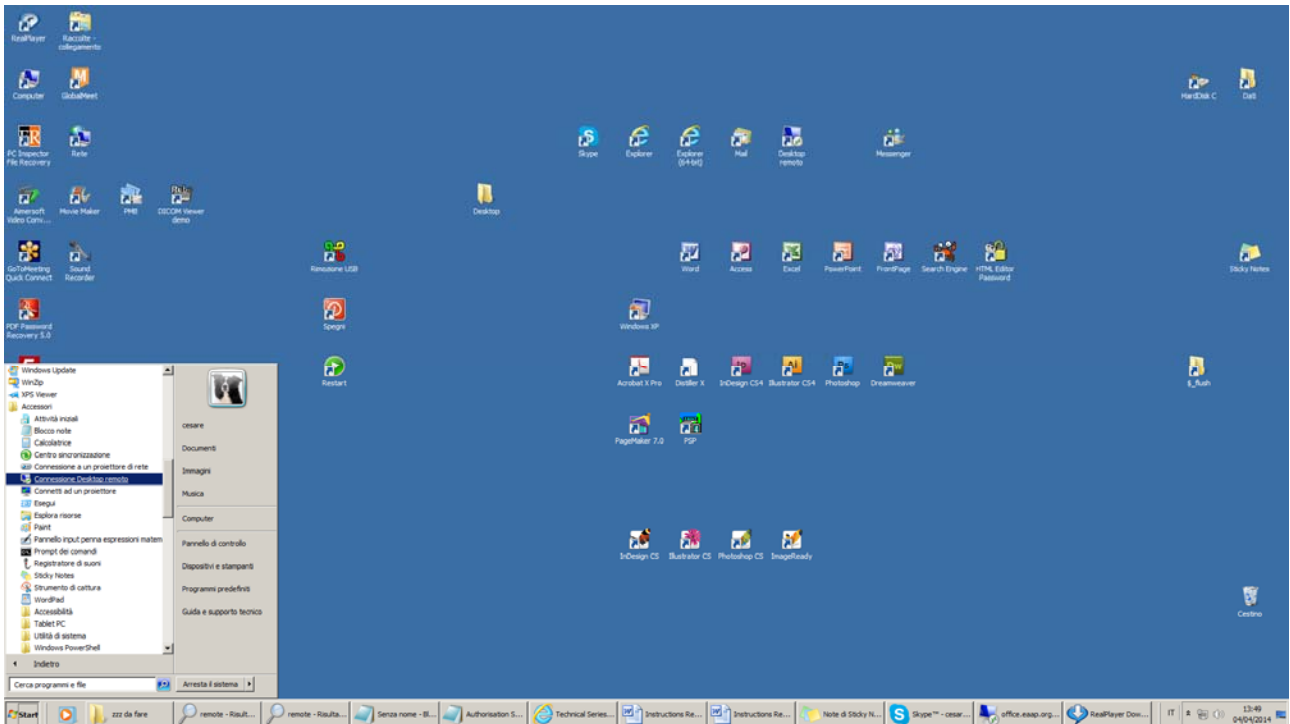
27 bytes



Dear Colleagues

To share files on ICAR server, the basic tool is a software equipped in all PCs and Macs: it is named "Remote Desktop Connection" (in English).

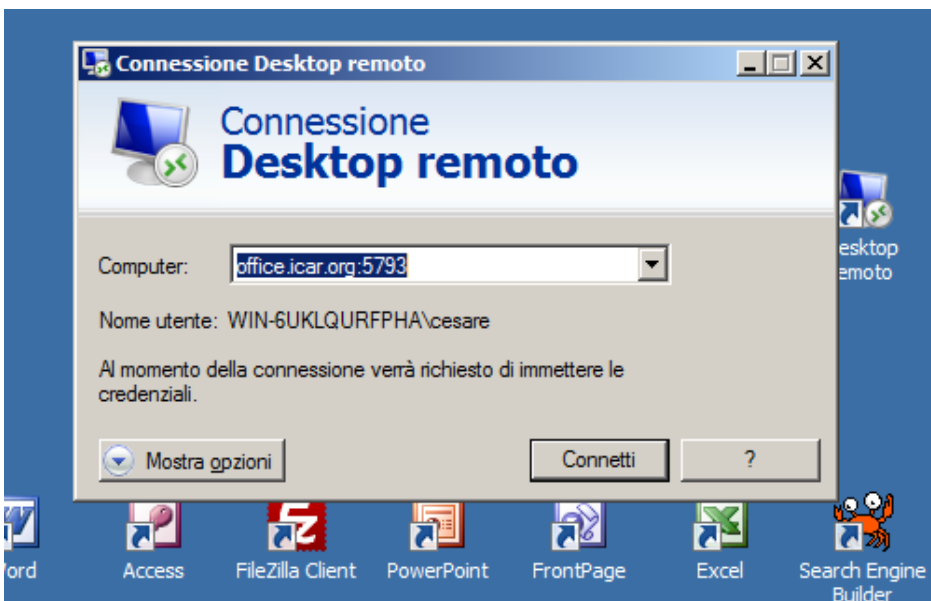
On PCs, it is listed in Start > Accessories > Remote Desktop Connection, below reported in the figure



Launch it and please follow the 2 steps as reported hereby:

### FIRST STEP

Please type the IP into the Remote Desktop Connection. It is: [office.icar.org:5793](http://office.icar.org:5793) (see the image below)

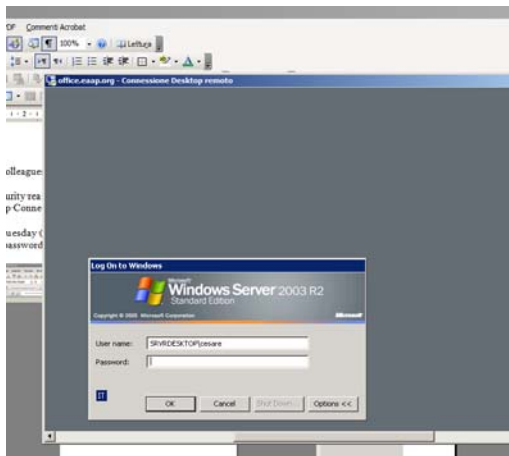


## SECOND STEP

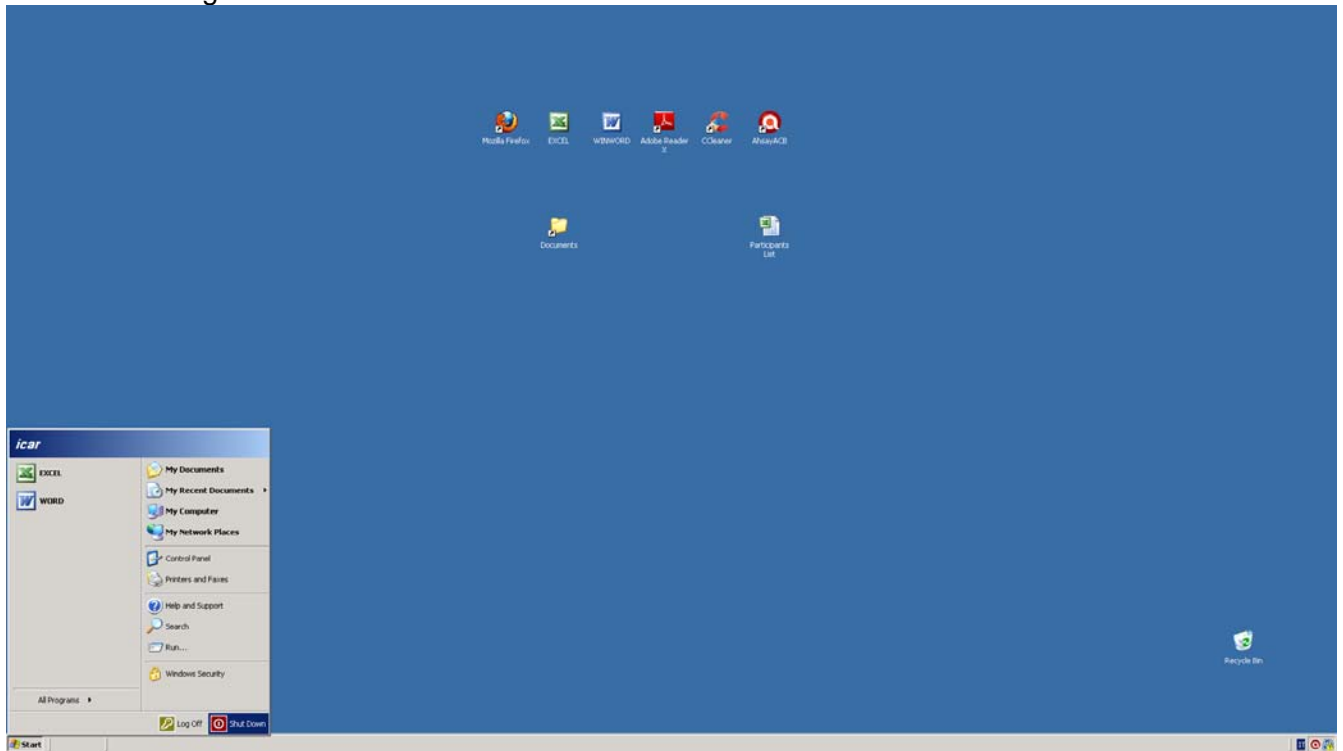
Please type the username and password as below reported

User = DNA

Password = Working-Group2017



You are now log on



**It is important that you close correctly the session by clicking on the "log off" button in the "Start" menu or on the Desktop**

Please give me a call or send an email in case of any possible trouble.

## **REASONS FOR THE USE OF THE “REMOTE DESKTOP”**

The “Remote Desktop” is a user friendly tool to share documents such as the document containing the revisions and the comments for the ICAR accreditation process of genetic laboratories for SNPs and STRs for cattle parentage testing

The Remote Desktop is equipped with the Office 2013 in English so it facilitate at the most the operations of the DNA Members

Regards

Cesare