

Livestock genomics for developing countries

Organised by a standing committee: **yes**

Date and meeting time: 26th of July 2016 at 8;30 to 12:00

Chair: Ntanganedzeni Mapholi, Agricultural Research Council, Irene, 0062, South Africa
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Agenda / programme attached

The “Livestock genomics for developing countries standing committee” conducted a workshop as part of the ISAG Conference. This aim was to highlight the economic, social and environmental benefits that genetic and genomic technologies can deliver to livestock production in developing countries, and often-different approaches which are necessary to ensure the technologies are effective in the low-input systems of those countries. The workshop specifically focused on a number of issues and provided examples of applications from a range of livestock species relevant to developing countries. The issues addressed in the workshop included:

- i) Genomic applications to livestock breeding and improvement and conservation of scarce genetic resource – this included genomic selection, its potential in developing countries and challenges and progress to date;
- ii) Genomic applications to characterize indigenous livestock genetic resources;
- iii) The value of SNP chips for use in extensively raised indigenous populations in the developing world; and
- iv) Opportunities to pool genomic resources, including funding and animal resource populations.

The speakers were scheduled as follows:

- 1) **Invited speaker (45 min):** *Dr J. M. Mwacharo (Presented by R. Elbeltagy)* “Indigenous stocks as treasure troves for sustainable livestock production in the 21st century: insights from small ruminant genomics” this talk, enlightened us on the important utilization of

indigenous stock in sustainable livestock production. This talk addressed major challenges faced in developing countries such as lack of recording phenotypic and pedigree information, breeding infrastructures and difficulty of implementing of the advanced reproductive technologies. He suggested that these challenges can be avoided by implementing community-based breeding programmers which can provide a framework to design and implement basic recording, mating schemes and the use of genomics technology, which may offer great opportunities to identify genomic regions with major gene effects and the potential for genomic selection and/or introgression.

- 2) **K. T. Ncube** (15 min): “Investigation of maternal lineages and genetic diversity of South African goat (*capra hircus*) populations using complete mitochondrial DNA sequences”
- 3) **W. Li** (15 min): “Temporal changes for genomic diversity for poultry conservation population based on genome-wide SNP data”
- 4) **E. Akanno** (15 min) “Opportunity for genome-based breeding programs in developing countries”
- 5) **N. R. Choi** (15 min) “Discrimination of native chicken breeds using SNP markers selected from the 600K chip data”
- 6) **P. G. Eusebi** (15 min) “Genetic diversity of Mexican cattle Lidia breed and its relationships with Spanish populations through bovine SNP 50K BeadChip”
- 7) **A. Tijjani** (15 min) “Comparative genomics reveal common diversity and signature of positive selection in West African taurine cattle populations”

Number of participants at meeting: 51

Summary of the meeting

About 20 attendees remained for the discussion, a majority of which were from African countries. It was suggested that for the next conference we should nominate at least three invited speakers from developing countries to focus on the key areas of the workshop with the hope of attracting more researchers from developing countries. It was noted that presentations in the current workshop mostly addressed genetic diversity. The lack of the other studies might be due to financial constraints. However, resources permitting, it would be desirable to have other applications such as genomic selections addressing developing countries challenges included in future meetings. The early career researchers and students from developing countries were urged

to apply for ISAG developing countries bursary for future conferences. The contact person is Professor Max Rothschild.

We initiated a discussion forum as platform to share the ideas and knowledge in livestock genomics to improve food security. This discussion forum was tasked to bring current issues and future development plans to the fore for consideration by all members using modern technological advances available today.

Comments: The support from the workshop coordinator and committee was outstanding. The workshop was successful and addressed the objectives of the workshop. The next election for the committee will be in Dublin, Ireland, 2017 and three people volunteered to join the committee (Raman Akinyanju (PhD student at University of Nottingham, Everestus Akanno (associate professor in University of Alberta) and Mostafa Nassar (Egypt), and additional suggested person was Fernando Cardoso (Embrapa).

Committee members

Current members	Term of service	E mail address:
Chair: Ntanganedzeni Mapholi (ARC- South Africa)	4 years	ntanga@arc.agric.za
Other members		
Farai C Muchadeyi (ARC- South Africa)	4 years	muchadeyif@arc.agric.za
Heather Burrow (CSIRO, UNE Armidale)	4 years	hburrow2@une.edu.au
Paul Boettcher (FAO)	4 years	Paul.Boettcher@fao.org
Max Rothschild (Iowa state university)	2 years	mfrothsc@iastate.edu
Victor Okoro (UNISA)	2 years	victor.okoro@futo.edu.ng
Olivier Hanotte (University of Nottingham)	2 years	Olivier.Hanotte@nottingham.ac.uk

SIGNATURES

Chair, Ntanganedzeni Mapholi:

