6. Young scientist career development: a global discussion on challenges, opportunities and solutions

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Abstract

Attracting, supporting, and retaining the next generation of young scientists into the field of animal breeding and genetics is important for the future of global livestock systems. The introduction of a Young Scientist Career Development session at the 12th WCGALP provides an invaluable platform to discuss the challenges, but more importantly, opportunities and solutions to foster the development of our next generation of animal breeders. A highlight of this session will be a facilitated panel discussion with Assoc. Prof. Daniela Lourenco (University of Georgia), Prof. Jennie Pryce (Agriculture Victoria Research and LaTrobe University), Prof. John Hickey (Bayer Crop Science) and Prof. Johan van Arendonk (Hendrix Genetics). These challenges will not be solved through a single panel discussion, or conference session. However, providing a platform for the WCGALP community to come together and work collaboratively on solutions to support young scientist career development is an important first step.

Introduction

Livestock industries are of utmost importance in modern society. This positioning has in part been achieved due to advances in the biological sciences – including nutrition, genetics, physiology and disease control. Today, livestock systems globally are facing numerous challenges and the field of animal breeding can play a role in meeting these challenges. Collectively, Animal Scientists, animal breeding companies, universities and governmental institutions need to ensure that the necessary young professionals are attracted and retained to the sector given the type of future leadership and research that the livestock industry requires.

Achieving this requires knowledge of challenges and opportunities that young animal breeders face as well as awareness of what constitutes a desirable career pathway for today's university graduates. The major factors determining the appeal for a particular career that were proposed some years ago (Harwin, 1979) included:

1. vocation/job opportunities;
   a. public sector;
   b. private sector;
   c. self-employed persons;
2. remuneration or earning power;
3. job satisfaction.

A number of other considerations are important to today's early career professionals. This includes job stability, career development, University/company recognition and reputation, work location, work-load and flexibility, parental leave arrangements and alignment between personal and organisational values. The benefits of mentoring, and access to career development for job satisfaction are well documented (Sinha,

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2020) and are also applicable to the field of animal breeding. Conversely, lack of career stability and long-term or permanent job contracts as well poor work-life balance are key reasons given for early and mid-career animal scientists to leave research positions (Mayberry *et al.* 2021).

Historically, marginalised groups have been underrepresented across STEM disciplines (Wanelik *et al.* 2020) so any conversation about career development should also consider the work still needed in diversity equity and inclusion, including gender equity. While some progress has been made, in part due to initiatives like the Athena Swan Charter (United Kingdom & Ireland) and similar schemes in North America and Australia, there is a long way to go in achieving STEM and animal breeding communities that embody best practice Diversity, Equity and Inclusion. Just 40% of respondents in *Nature's* 2021 salary and job satisfaction survey felt their employers were doing enough to promote diversity (Woolston, 2021). In addition, survey respondents who did not identify as white were more likely to report experiences of discrimination, bullying and harassment in the workplace (Woolston, 2021). Ethnicity and socioeconomic background have also been shown to impact early career progression in STEM (Wanelik *et al.* 2020). In Australia, in 2020 women who graduated with postgraduate STEM qualifications in agricultural and environmental studies earnt $AU 23,000 less than male graduates (Australian Government, 2021). In addition, only ~25% of all agricultural scientists in Australia are women with women also underrepresented in senior leadership roles.

The aim of introducing a Young Scientist Career Development session at the 12th WCGALP in Rotterdam, the Netherlands, 2022 is to provide a platform for a global discussion on the challenges and opportunities for young scientist career development.

Panel discussion

Given the diversity of career pathways in animal breeding available to young scientists, the inaugural Young Scientist Career Development session at the WCGALP 2022 will feature a panel discussion. Panellists will be asked to reflect on both the challenges and opportunities for young scientist career development. During the discussion, panellists will be asked to consider defining moments in their own careers, advice for young scientists, solutions to the challenges faced by young scientists and what they see as the key opportunities for the next generation of animal scientists.

A shortlist of potential panellists was identified by session co-chairs based on a number of criteria including; contribution and profile in the field of animal breeding and genetics, experience across academia, industry and government, diversity in geographical location, gender, experience and research/work focus areas.

Panellists

In this workshop, we will include 4 panellists to discuss their experience in the animal breeding sector, Assoc. Prof. Daniela Lourenco, Prof. Jennie Pryce, Prof. John Hickey and Prof. Johan van Arendonk. Brief biographies are given below.

Assoc. Prof. Daniela Lourenco, Associate Professor, University of Georgia, United States of America.
Assoc. Prof. Daniela Lourenco, is an Associate Professor in Animal Breeding, Genetics, and Genomics at the University of Georgia in the United States. She was born and raised in Brazil, where she earned her MS and PhD degrees in animal breeding and genetics from Maringa State University. She has been working in this field since 2004, and her current interests include the use of genomic information to increase rates of genetic progress, the development of methods for genomic evaluations, and the use of computational algorithms to analyze large data. Her research is focused on genomic selection in beef and dairy cattle, swine, poultry, and fish. Daniela's group has developed and implemented single-step genomic evaluations for several breeding companies and breed associations. She has published over 360 scientific papers and

proceedings, including over 125 refereed journal publications. Daniela has served as advisor or co-advisor for 12 Masters and PhD students, committee member for 18 graduate students at The University of Georgia and 14 at international universities, has received 27 visitors from several countries, and has supervised 9 postdocs. Highly active in all projects developed by the animal breeding group at University of Georgia since 2012, and has been a principal investigator in research projects with budgets up to $500,000.

Prof. Jennie Pryce, Principal Research Scientist, Agriculture Victoria Research and Professor, School of Applied Systems Biology, La Trobe University, Australia. Professor Jennie Pryce is a geneticist who is well known for her work in dairy genetics and genomics. Jennie is principal research scientist for Agriculture Victoria and Professor of animal genetics at La Trobe University. Jennie has dedicated her life to dairy herd improvement and is very passionate about research. She grew up on a dairy farm in Shrewsbury (UK) where at a young age she bred pedigree Holstein dairy cattle under Severnvale Holsteins prefix. Jennie received her BSc (Hons) first class and PhD from The University of Edinburgh (UK). Prior to her work in Australia, she was employed as a dairy geneticist by the Scottish Agricultural College (UK) and as a scientist by the dairy breeding company Livestock Improvement Corporation (New Zealand). In 2008 Jennie made Melbourne her home and started a research position with the Department of Primary Industries (now Agriculture Victoria Research). Jennie now leads the DairyBio animals research program and is responsible for the animals' program. This innovation is critical to the dairy industry – regional Victoria's largest employer and a $1 billion export industry for the state. Jennie is instrumental in development and delivering of successful research, working to build industry groups' understanding and adoption, and led development of tools for direct benefit on farm by most farmers. Her position closely aligns with her main research interests of genetic improvement of traits associated with health, welfare and environmental impact in dairy cows.

In 2016 Jennie was the first non-North American recipient of the prestigious American Dairy Science Association J.L. Lush Award for Animal Breeding and Genetics and in 2019, 2020 and 2021 was named as Australia's top researcher in the field of animal husbandry by research analytics firm League of Scholars; this award is based on number of citations for research papers published in the top 20 journals in each field over the past 5 years.

Prof. John Hickey, Bayer Crop Science, Spain. Prof. John Hickey did his PhD studies in Wageningen University and Research, the Netherlands, on genetic evaluations of multiple breed cattle populations followed by post-doctoral positions in Australia (University of New England) and Mexico (International Maize and Wheat Improvement Centre – CIMMYT). In Australia he developed methods and algorithms, with accompanying genotyping strategies to impute genotype data in livestock populations. This work has subsequently been implemented in some of the largest animal breeding programs globally. In Mexico he researched aspects of genomic selection in plant breeding programs. Subsequently, John held the Chair of Animal Breeding at The Roslin Institute which is part of The Royal Dick School of Veterinary Studies at the University of Edinburgh in the United Kingdom. While at the Roslin Institute, his research group worked on breeding projects in pigs, chickens, cattle, groundnut, forest trees, strawberry, maize, wheat and other species. Software and algorithms developed by John Hickey and colleagues underpin aspects of several of the largest breeding programs globally. Since 2020, John joined Bayer Crop Science as Head of Corn Product Design, based in Barcelona, Spain.

Prof. Johan van Arendonk, Hendrix Genetics, the Netherlands. Prof. Johan van Arendonk received his PhD-degree at Wageningen University in 1985. From 1985 onwards, he worked at the Department of Animal Breeding of the Wageningen University. From 1985 until 2015, he worked in different roles at Wageningen University in the domain of animal breeding and genetics. In 1998, he was promoted to

personal chair and in 2002 he became full professor in Animal Breeding and Genetics In that period, he (co-) supervised around 90 PhD students and (co-)authored 350 papers in scientific journals. The emphasis in his career at Wageningen University changed from doing research himself, to training and coaching the new generation, to building and managing a team of professionals. During the last 5 years at Wageningen, he combined his role as chair of the animal breeding and genetics group with that of Dean of Science, in which he had a university-wide responsibility. In January 2016, he started as Chief Innovation & Technology Officer at Hendrix Genetics a global multi-species animal genetics and technology company. In that role, he contributes to strengthening the research and product development activities for the different species. In April 2020, he joined the executive committee of the company where he is responsible for Research & Development, the company's Sustainability Program and Innovation portfolio.

Conclusions

Given the many challenges young scientists face globally, not just in the field of animal breeding and genetics, the young scientist career development session represents a valuable addition to the WCGALP 12th Conference Program. We are indebted to our panellists for donating their time to participate in this session. The challenges in attracting, retaining and supporting the next generation of animal breeders will not be solved through a single panel discussion, or conference session. However, by creating space for these important discussions we are providing a platform for the whole of the WCGALP community to come together and work collaboratively on solutions to addressing these challenges.

References

Australian Government (2021). STEM Equity Monitor. Data Highlights 2021. Australian Government Department of Industry, Science, Energy and Resources, Australia

Harwin G.O. (1979). S. Afr. J. Anim. Sci 9:157-162

Mayberry D., Hatcher S., and Cowley F. (2021) Anim. Prod. Sci. 61(3):201-207. https://doi.org/10.1071/AN20115

Sinha R. (2020) In: Career Development and Job Satisfaction. IntechOpen, Chapter 2.

Wanelik K.M., *et al.* (2020) Ecol. Evol. 10(14): 6870–6880. https://doi.org/10.1002/ece3.6423

Woolston C. (2021) Nature. 600:177-179. https://doi.org/10.1038/d41586-021-03043-y