Anil Sigdel, MS, PhD

Postdoctoral Researcher
University of Pennsylvania

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EDUCATION

Doctor of Philosophy • Animal Sciences……. transfer. Sep. 2020 – May 2022

Dept. of Animal and Dairy Sciences, University of Wisconsin-Madison

Dissertation: Developing novel genomic tools for reducing fetal loss and stillbirth in dairy cattle

Doctor of Philosophy • Animal Sciences…… Aug. 2018 – Aug. 2020

Dept. of Animal Sciences, University of Florida

Master of Science • Animal Sciences .....…. Jan. 2016 – May 2018

Dept. of Animal Sciences, University of Florida

Thesis: Genetic analysis of heat tolerance for production, reproduction, and health traits in US Holstein cows

Bachelor of Science • Veterinary Science & Animal Husbandry…… Aug. 2009 – Nov. 2014

Tribhuvan University, Kathmandu, Nepal

RESEARCH INTERESTS

- Developing statistical and computational tools for analyzing livestock data to enhance genetic improvement in agricultural food animals
- Integrating enviromics, genomics and machine learning algorithms for precision livestock farming
- Leveraging modern molecular technologies for enhancing the yields, profitability and sustainability of livestock production system

PROFESSIONAL EXPERIENCE

Postdoctoral Researcher…… June 2022- Present

School of Veterinary Medicine, University of Pennsylvania

- Advisor Dr. Gustavo Aguirre
- Projects with primary responsibility:
  - Investigate the genetic basis of inherited eye-disorders including cataract and retinal diseases
  - Identify the genetic causes of inherited blindness including finding causal mutations to disease

Graduate Research Assistant (PhD Candidate) ……. Sep. 2020 – May 2022

Dept of Animal & Dairy Sciences, University of Wisconsin-Madison

- Advisor Dr. Francisco Peñagaricano
- Project with primary responsibility:
  - Gene-mapping, gene-set analysis, and genomic prediction of fetal loss in US Holstein cattle

Intern …… May 2021 – Aug. 2021

Council on Dairy Cattle Breeding, Bowie, Maryland

- Advisors: Dr. Nick Wu & Dr. Kristen Parker Gaddis
- Project with primary responsibility
  - Genetic evaluations of stillbirth in five US dairy breeds – A historical data-oriented feasibility study

Graduate Research Assistant (PhD Student) …….. Aug. 2018 – Aug. 2020

Dept. of Animal Sciences, University of Florida

- Advisor Dr. Francisco Peñagaricano
- Project assisting international visiting scholars in the lab.
  - Genetic effects of heat stress on milk fatty acids in a Brazilian Holstein cattle
  - Direct, indirect, and pleiotropic genetic effects associated with calving ease, retained placenta, and metritis in US Holstein cows.

Graduate Research Assistant (MS Student) …… Jan. 2016 – May 2018

Dept. of Animal Sciences, University of Florida

- *Advisor: Dr.* Francisco Peñagaricano
- Project with primary responsibility
    - Genetic evaluation of milk production and reproduction traits under heat stress conditions in US Holstein cows
    - Genetic evaluation of post-partum health traits in US Holstein cattle

TEACHING EXPERIENCE

UW-Madison – Department of Animal & Dairy Sciences, Spring 2021 | **Introduction to Animal and Veterinary Genetics**

UW-Madison – Department of Animal & Dairy Sciences, Spring 2021 | **Principles of Animal Breeding and Genetics**

University of Florida – Department of Animal Sciences, Fall 2019 | **Reproductive Physiology and Endocrinology in Domestic Animals**

University of Florida – Department of Animal Sciences, Fall 2018 | **Applied Statistics in Animal Sciences**

University of Florida – Department of Animal Sciences, Fall 2017 | **Applied Statistics in Animal Sciences**

MENTORING EXPERIENCE

FALL 2019 – SPRING 2020

MENTOR to VISITING SCIENTIST from Brazil

- Developed and customized pipelines for genetic data processing
- Built statistical models for genomic association studies and genomic prediction.

FALL 2018

MENTOR to UNDERGRADUATE STUDENT from University of Florida

- Guided undergraduate student in high-dimensional genetic data analysis using computer clusters.

FALL 2017

MENTOR to UNDERGRADUATE VISITOR STUDENT from Brazil

- Introduced visiting student to basic animal breeding and statistics concepts.
- Facilitated student through basic data analysis/statistical processes.
- Produced one refereed publication and one abstract.

LEADERSHIP EXPERIENCE

Florida Dairy Extension | Annual Florida Dairy Production Conference, 2016 – 2019: Member, Organizing Committee

Family Day at the Dairy Farm | University of Florida, Department of Animal Sciences Extension Program, 2019 – Captain, Planning Committee

SCHOLARSHIP AND AWARDS

Department of Animal Sciences Teaching Award…….……. Nov. 2019

- *Dept. of Animal Sciences, University of Florida*

Department of Animal Sciences Top-up Award……. Oct. 2019

- *Dept. of Animal Sciences, University of Florida*

IFAS Dean's Office Top-Up Award…… Nov. 2019

- *Dean's office, IFAS, University of Florida*

Grinter Fellowship Award……. Sep. 2018

- *Graduate school, University of Florida*

William C. and Bertha M. Cornett Fellowship……Aug. 2018

- *College of Ag. & Life Sciences, University of Florida*

University of Florida Animal Sciences Matching Fellowship……. Aug. 2018-Aug. 2020

- *Awarded to a PhD student in the Animal Sciences program at the University of Florida to partially fund (50%) tuition and stipend.*

University of Florida Animal Sciences Matching Fellowship……. Jan. 2016-May 2018

- *Awarded to a MS student in the Animal Sciences program at the University of Florida to partially fund (50%) tuition and stipend.*

TRAVEL AWARDS

Travel Grant to attend Association for Research in Vision and Ophthalmology (ARVO) annual meeting……. Apr. 2023

New Orleans, Louisiana

- *Penn Postdoc Association Presidential Travel Award, University of Pennsylvania $500.00*

Travel Grant to attend 11th World Congress on Genetics applied to Livestock Production…… Feb. 2018

Auckland, New Zealand

- *Institute of food & Agricultural Sciences, University of Florida $350.00*
- *Graduate Student Council, University of Florida $250.00*

PEER-REVIEWED ARTICLES

(First Author)

1. **Sigdel, A.,** Bisinotto, R.S., and Peñagaricano, F. (2022). Genetic analysis of fetal loss in Holstein Cattle**.** Journal of Dairy Science 105, 9012-9020
2. **Sigdel, A.,** N. Wu, K. P. Gaddis, D. Norman, J. A. Carrillo, J. Burchard, F. Peñagaricano and J. Dürr (2022). Genetic evaluations of stillbirth for five United States dairy breeds: A data-resource feasibility study. Frontiers in Genetics 13
3. **Sigdel, A.,** Bisinotto, R.S., and Peñagaricano, F. (2021). Genes and pathways associated with pregnancy loss in dairy cattle. Scientific Reports 11, 13329
4. **Sigdel, A.,** Liu, L., Abdollahi-Arpanahi, R., Aguilar, I., and Peñagaricano, F. (2020). Genetic dissection of reproductive performance of dairy cows under heat stress. Animal Genetics 51, 511-520
5. **Sigdel, A.,** Abdollahi-Arpanahi, R., Aguilar, I., and Peñagaricano, F. (2019). Whole genome mapping reveals novel genes and pathways involved in milk production under heat stress in US Holstein cows**.** Frontiers in Genetics 10
6. **Sigdel, A.,** Bhattarai, N., Kolachhapati, M.R. and Paudyal S. (2015). Estimation of genetic parameters for productive traits of Murrah buffaloes in Kaski, Nepal. International Journal of research, 2(5)
7. **Sigdel, A.,** Bhattarai, N., and Kolachhapati, M.R. (2015). Impacts of climate change on milk production of Murrah buffaloes in Kaski, Nepal. Proceedings of International Conference on Climate Change Innovation and Resilience for Sustainable livelihood, 12-14 January 2015, Kathmandu, Nepal
8. **Sigdel A.,** Kolachhapati. M.R., and Bhattarai N. (2014). Effect of non-genetic factors on productive traits of Murrah buffaloes. Nepalese Journal of Agricultural Sciences 12: 148-152

(Contributing Author)

1.Dauria, B.D., **Sigdel, A.,** Petrini, J., Bóscollo, P.P., Pilonetto, F., Salvian, M., Rezende F.M., Pedrosa V.B., Bittar, C.M.M., Machado P.F., Coutinho L.L., Wiggans G.R. and G.B. Mourão (2022). Genetic effects of heat stress on milk fatty acids in a Brazilian Holstein cattle. Journal of Dairy Science 105, 3296-3305

2. Bhattarai, N., Poudel, J., Kolakshyapati, M.R., Sharma, M.P., Gorkhali, N.A., Sigdel, A., Upadhayaya, S., and Sapkota, S. (2022). Evaluation of reproductive performance and litter traits of Khari, Jamunapari and Sirohi crossbred goats in Surkhet district of Karnali province, Nepal. Journal of Agriculture and Forestry University 71-80

3. Pandey, A., Devkota, A., **Sigdel, A.,** Yadegari, Z., Dumenyo, K. and Taheri, A. (2021). Citiric acid/β-alanine carbon dots as a novel tool for delivery of plasmid DNA into *E.coli* cells. Scientific Reports 11. 23964

4. Sah, K., Karki, P., Shrestha, R.D., **Sigdel, A.,** Adesogan, A.T., and Dahl, G.E. (2020). MILK Symposium review: Improving control of mastitis in dairy animals in Nepal*. Journal of Dairy Science 103,9740-9747

5. Vatankhah, M., **Sigdel, A.,** and Abdollahi-Arpanahi, R. (2019). Population structure of Lori-Bakhtiari sheep in Iran by pedigree analysis. Small Ruminant Research 174, 148-155

6. Pacheco, H.A., Da Silva, S., **Sigdel, A.,** Mak, C.K., Galvão, K.N., Texeira, R.A., Dias, L.T., and Peñagaricano, F. (2018). Gene mapping and gene-set analysis for milk fever incidence in Holstein dairy cattle. Frontiers in Genetics, 9

SCIENTIFIC MEETING ABSTRACTS

1. **Sigdel, A.,** Niggel, J.K., Aguirre, G.D. and Murgiano, L. Whole-genome mapping unravels genetic etiology associated with complex phenotypes of collie eye anomaly. The Association for Research in Vision and Ophthalmology Annual Meeting, New Orleans, Louisiana, April 22-27, 2023.

2. Murgiano, L., **Sigdel, A.,** Niggel, J.K., and Aguirre, G.D. Phenotypic assessment and genetic dissection of cataracts in American Cocker Spaniel. International Conference on Canine and Feline genetics and genomics. Huntsville Alabama, October 2-5, 2022.

3. **Sigdel, A.,** Bisinotto, R.S., and Peñagaricano, F. Genomic prediction of fetal loss in US Holstein cattle. American Dairy Science Association Annual Meeting. Kansas City, Missouri, June 19-22, 2022.

4. **Sigdel, A.,** Bisinotto, R.S., and Peñagaricano, F. Genes and pathways associated with pregnancy loss in dairy cattle. American Dairy Science Association Virtual Annual Meeting. July 11-14, 2021.

5. **Sigdel, A.,** Bisinotto, R.S., and Peñagaricano, F. Alternative models for genetic analysis of fetal loss in dairy cattle. American Dairy Science Association Virtual Annual Meeting. June 22-24, 2020.

6. Teixeria, R.A., Dias, L.T., **Sigdel, A.,** and Peñagaricano, F. Direct, indirect and pleiotropic genetic effects associated with calving ease, retained placenta and metritis in US Holstein cows. American Dairy Science Association Virtual Annual Meeting. June 22-24, 2020.

7. **Sigdel, A.,** Vaca, A., Abdollahi-Arpanahi, R., Aguilar, I., and Peñagaricano, F. Genetic analysis of heat tolerance for conception rate in US Holstein cows. American Dairy Science Association Annual Meeting. Knoxville, Tennessee, June 24-27, 2018.

8. Pacheco, H.A., Da Silva, S., **Sigdel, A.,** Mak, C.K., Galvão, K.N., Texeira, R.A., Dias, L.T., and Peñagaricano, F. Gene mapping and gene-set analysis for milk fever in Holstein dairy cattle. American Dairy Science Association Annual Meeting. Knoxville, Tennessee, June 24-27, 2018.

9. **Sigdel, A.,** Liu, L., Abdollahi-Arpanahi, R., Aguilar, I., and Peñagaricano, F. Genetic analysis of heat tolerance for production and health traits in US Holstein cows. XI World Congress on Genetics Applied to Livestock Production. Auckland, New Zealand. February,11-16, 2018.

10. **Sigdel, A.,** Mak, C.K., Galvão, K.N., Texeira, R.A., Dias, L.T., and Peñagaricano, F. Genome wide association study for clinical mastitis, metritis and ketosis in US Holstein cattle. American Dairy Science Association Annual Meeting, June 25-28, 2017.

SKILLS

1. Programming languages: **R, Python, Shell Scripting**
2. Genetic analysis tools: **BLUPF90 family, ASReml, PLINK, GCTA**
3. Next generation sequencing data analysis, Bulk RNAseq, scRNAseq data analysis

PROFESSIONAL SERVICE

1. Ad-hoc reviewer, Frontiers in Genetics (2021 – present)
2. Ad-hoc reviewer, Frontiers in Microbiology (2021 – present)
3. Ad-hoc reviewer, Animals (2021 – present)
4. Ad-hoc reviewer, PeerJ (2021 – present)
5. Ad-hoc reviewer, BMC Genomics (2023 – present)

PROFESSIONAL MEMBERSHIP

1. Member, American Dairy Science Association, 2016-present
2. Member, Association for Research in Vision and Ophthalmology, 2023-present

PROFESSIONAL DEVELOPMENT CONFERENCES

1. 2023 The Association for Research in Vision and Ophthalmology, Annual Meeting – New Orleans, Louisiana
2. 2022 International conference on canine and feline genetics and genomics – Huntsville, Alabama
3. 2021 ADSA Annual Meeting – Virtual Meeting
4. 2020 ADSA Annual Meeting – Virtual Meeting
5. 2019 ADSA Annual Meeting – Cincinnati, OH
6. 2018 ADSA Annual Meeting – Knoxville, TN
7. 2018 World Congress on Genetics Applied to Livestock Production – Auckland, New Zealand
8. 2017 ADSA Annual Meeting – Pittsburgh, PA