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SUMMARY OF CURRICULUM VITAE

A. PERSONAL DATA

Birth date: November 3, 1953

B. EDUCATION

University of Alberta - Ph.D. (Animal Genetics & Biochemistry), 1981; B.Sc. (Anim. Sci.), 1976;

C. EMPLOYMENT HISTORY

2023 – present Associate Professor, Livestock Genetics, University of Alberta, AFNS
2020 – 2023 Research Scientist, University of Alberta; Director of Beef Operations, Gentec
1998 - 2020 Senior Research Scientist, Alberta Agriculture and Forestry
1986 - 1998 Provincial Beef Management Specialist, Alberta Agriculture
1982 - 1986 Research Analyst, Alberta Agriculture

D. CORPORATE COMPETENCIES

Extensive experience in building partnerships, project leadership, big picture thinking, risk taking, problem solving and in developing innovative solutions to industry challenges

- Lead or team member on projects worth \$34.8 million (cash + in-kind) over last 16 years.
- Led the development of EnVigour HX™, first genomic service in Canada (2017 release).
- >165 full scientific and proceeding papers, >150 abstracts/posters; 89 final research reports
- Developed first greenhouse gas mitigating protocols (4) for beef cattle in Canada.
- Co-supervised 18 graduate students and mentored eight post-doctoral fellows.

E. COMMUNICATION SKILLS

- Presented more 250 seminars in Canada, USA, Mexico, Japan, China, New Zealand, and UK.
- Presented papers at more than 50 major conferences.
- Presented materials on radio, video and through > 190 extension and popular press articles.
- Teaching experience at the University of Alberta, Ministry of Agriculture-China and Mexico.

F. SELECTED APPOINTMENTS, ACCOMPLISHMENTS, AND AWARDS

- 2020, Don Matthews Memorial Award, Canadian Beef Breeds Council.
- 1993-2020, Adjunct Professor, University of Alberta
- H-Index=41; reads=42,474; citations=6,555; Res. Index Score=3,403 (>98% of ResearchGate)
- 2017 Recognition of 35 years of service with the province of Alberta
- 2015, 1999, 1996, 1995 - Group Achievement Award of Excellence.
- 2010 Canadian Animal Industries Award in Extension and Public Service
- 2008 Gold Harvest Award Pin, Year Round Grazing Research and Technology Transfer
- 2000 - Premier's Award of Excellence- Silver (Western Forage Beef Group)

G. MAJOR DATA BASES AND SOFTWARE PROGRAMS

- Detailed feed efficiency and fertility data and 50K genotypes on >13,000 cattle.
- Editor, Beef Herd Management Reference Binder; Co-developer of CowChip\$ & Cowbytes
- Book chapter 15 in "Feed Efficiency in Beef Cattle", Blackwell and Wiley, 2012.

H. CURRENT RESEARCH INVOLVEMENT

- Team lead or member on 11 approved projects worth \$20.4 million (cash>\$4.5 million)

A. PERSONAL DATA

Birth Date: November 3, 1953.

Birth Place: High Prairie, Alberta.

Raised: cow-calf farm near High Prairie.

Marital Status: Married with two children.

Activities: golf, curling, skiing, cycling

2022 Canada 65+ Mixed Curling Gold Medal Winner

Past President and Lifetime Member of Northern Alberta Curling Asc.

On-ice coach for Junior Curling Program, Lacombe Curling Club, 15 years

B. EDUCATION

Leaders in Agriculture (problem solving, project planning, management), Banff, 1998.

Ph.D.; Animal Genetics and Biochemistry. University of Alberta, 1981.

B.Sc.; Animal Science (first class honors in final year). University of Alberta, 1976.

Full Matriculation, E. W. Pratt High School, 1971.

C. EMPLOYMENT HISTORY

1. Research Scientist & Head of Beef Operations, Livestock Gentec – 2020 to 2023

Supervisor Graham Plastow; Professor, University of Alberta; CEO, Livestock Gentec.

Responsibilities:

- a. provide leadership, direction, and advice on beef genomic and production efficiency research programs while collaborating with academics, the provincial government, federal government, and industry scientists.
- b. design and conduct applied research projects on a provincial and national-wide basis for beef genetics/genomics, production and feed efficiency, carcass quality and greenhouse gas mitigation.
- c. develops packaged and integrated reference materials, software programs, and multimedia presentations in the areas of beef production and feed efficiency, carcass quality, greenhouse gas mitigation and genetic/genomic prediction.
- d. conducts educational programs in beef cattle genetics, management and research for staff and industry partners.
- e. coordinates national and provincial-wide research programs with research institutions, applied research associations, industry, and governments. This involves maintaining an effective and close liaison with these industry partners.
- f. develops and maintains effective partnerships with provincial, federal, and international scientific communities.
- g. co-supervise or support the supervision of graduate students and post-doctorate fellows. Effectively supervises technical and professional staff.

2. Research Scientist & Provincial Beef Management Specialist – 1998 to 2020

Alberta Agriculture and Rural Development (AARD), Lacombe Research Centre, Lacombe Alberta; Director – Jeff Millang; Director – Wesley Johnson; Director – Connie Phillips

Responsibilities:

- a. initiate and partnership on applied research programs and projects to demonstrate new and innovative technology in the field of cow-calf and feedlot management. These research programs support the goal of AARD.
- b. develops partnerships with major industry, research and government partners to support research and technology transfer programs.
- c. assist in the development of new, innovative knowledge for the beef industry.
- d. serves on major committees with importance to the beef industry.
- e. assist in the education of staff, college, university and industry personnel.

3. Beef Management Specialist - Feb. 1986 to 1998

Alberta Agriculture, Food and Rural Development; Beef, Dairy & Sheep Branch; Supervisor - Dale Engstrom

Responsibilities:

- a. advises on and/or initiate applied research trials to demonstrate new technology in the field of cow-calf and feedlot management.
- b. develops and coordinate a provincial beef herd management program.
- c. develops computer software support for a beef herd management program.
- d. develops and organize reference material for cow-calf managers.

4. Research Analyst - Feb. 1982 to Jan. 1986

Alberta Agriculture, Beef Cattle and Sheep Branch
Supervisor - Dr. B. Jeffery (1982-84); Ron Weisenburger (1985-86)

Responsibilities:

- a. design and analyses for all division research and development projects.
- b. data analysis and interpretation for all projects of the Animal Industry Division.
- c. assists in the writing for scientific and farm publications.
- d. maintains liaison and effective coordination with research institutions.
- e. Extension role in areas of technical seminars and staff training programs.

5. Sessional Lecturer - Sept. 1981 to Jan. 1982

University of Alberta, Edmonton
Supervisor - R.T. Berg

Responsibilities:

- a. Preparation and presentation of course material for Animal Population Genetics (AS 484).

D. CORPORATE COMPETENCIES

I have extensive experience in building partnerships, project leadership, big picture thinking, meeting department and industry goals, risk taking, problem solving and in developing new & innovative solutions to industry opportunities.

Creating Partnerships

Leader or support scientist on over 26 multi-institutional, interdisciplinary projects. Funding for these projects included cash and in-kind contributions estimated at \$2.2 million/yr over the last 16 years. Key examples are:

Period	PI	Co-PI	Project title and funder	Cash	Total
2022-2024	Plastow, G. & Basarab, J.A.		2022T001R/RES0058343 - Gentec Feeder Profit Index validation and deployment, RDAR/Genome Alberta	\$250 K	\$518 K
2021-2024	Li, C.	Basarab, J.A.	FDE.05.20 - Demonstrating the impact of genomics-enhanced whole herd genetic management platform on reducing beef greenhouse gas emissions, Emissions Reduction Alberta.	\$391 K	\$913 K
2021-2022	Basarab, J.A.		2022N031RC / RES0054869 - Herd DNA pooling tool: Using DNA pooling for breeding management in commercial cow-calf herds, RDAR/CAPP.	\$191 K	\$535 K
2018-2023	Basarab, J.A.	Li., C.	FDE.06.17 - Genetic analyses of feed intake, feed efficiency, female fertility, and cow lifetime productivity in beef cattle raised under two environments; BCRC/Beef Cluster	\$1,047 K	\$3, 756K
2015-2020	Basarab, J.A.	Berry, D., Li, C., Crowley, J.	RES0028243 - Development and deployment of MBVs/gEPDs for feed efficiency and carcass traits that perform in commercial beef cattle; Genome Alberta and Alberta Meat and Livestock Agency	\$871K	\$4,473K
2014-2017	Basarab, J.A.		2014R037R - Methane emissions from beef cattle bred for low residual feed intake; Climate Change, and Emissions Management Corporation, and Alberta Livestock and Meat Agency.	\$1,601K	\$2,656K
2011-2015	Basarab, J.A.	Ominski, K.	2011R006R - Using residual feed intake to improve lifetime productivity of beef cows under forage-based beef cattle production systems; Alberta Livestock and Meat Agency, MRAC, MAFRI, ABP, SCA, MBP.	\$1,364K	\$2,890K
2008-2012	Basarab, J.A.		2008F134R - Development of next generation genomic tools for the beef industry: Addressing the Phenomic Gap; Alberta Livestock and Meat Agency, Alberta Innovates BioSolutions.	\$2,384K	\$3,723K
2008-2012	Basarab, J.A.		2008L007R - Reducing Age at Slaughter in youthful beef cattle. Alberta Livestock Industry Development Fund, AAFC-MII funded.	\$342K	\$804K
2019-2021	Li., C.	Basarab, J.A.	GAB-A3GP37 - Development of functional genomic prediction platform for industry application; Genome Alberta.	\$230K	\$480K

2017-2019	Plastow, J.A.	Basarab, J.A.	2017F103R - Maximize and maintain level of heterozygosity in composite multi-breed and cross breed beef populations using genetic and genomic tools; Agriculture Funding Consortium.	\$244K	\$531K
2017-2019	Plastow, J.A.	Basarab, J.A.	2017R034R - New tool (GGP-F250) for improving accuracy of gEPDs for production efficiency in commercial beef cattle; Alberta Funding Consortium.	\$250K	\$1,108K
2016-2018	Fitzsimmons, C.	Basarab, J.A.	2016R033R - gGreenBeefCow: Identifying and evaluating genomic and fecal microbiome markers for low methane emissions in beef cattle; Alberta Livestock and Meat Agency.	\$600K	\$1,005K
2012-2015	Moore, S., Miller, S.,	Basarab, J.A. , co-lead Activity 6	2208GC - Genome Selection through Genome Wide Imputation in Beef Cattle; Genome Canada, Genome Alberta, Alberta Livestock and Meat Agency, AB BioSolutions, Western Economic Diversification.	\$8,241K	\$8,241K
2014-2019	Canovas, A.	Basarab, J.A.	G2016000107 - Value Chain Genomics toward Profitability and satisfied Consumers; AITP/BIO/Delta Genomics/NSERC/Ontario Innovation program.	\$702K	\$867K
2009-2010	Moore, S.	Miller, S. Basarab, J.A.	FDE.05.09 - Whole Genome Scan for Feed Efficiency in Beef Cattle. Beef Cluster/BCRC funded; \$431,000 over 1-2 years.	\$431K	\$431K
2010-2013	Li, C.	Basarab, J.A.	2010R038R - Identifying DNA Markers for Enhancing Beneficial Fatty Acids in Beef; Alberta Livestock and Meat Agency.	\$669K	\$1,890K
2008-2024		Total		\$19,808K	\$34,821K

Leadership

Demonstrated leadership in the development, understanding and transfer of new and innovative technology to the beef industry.

- **2017-2023** Co-led a project that demonstrated that “DNA pooling” can be used as a cost effective (\$5-8/sample) and accurate approach for quantifying average breed composition and retained heterozygosity, and contribution of a sire to progeny groups. This technology is presently under review for patent protection.
- **2015-2023** Leader of project that developed genomic or molecular breeding values (MBVs) for crossbred cattle with >35% accuracy for 14 traits and >30% accuracy for four additional traits. Further analyses of imputed sequence data for SNPs and structural variants will improve the accuracy of these MBVs. These MBVs are used in the development of multi-trait selection indices.
- **2015-2023** Leader of project that developed two multi-trait selection indices for crossbred cattle: 1) Feeder Profit \$ Index [FP\$I]; 2) Replacement Heifer \$ Index to assist with adoption of the technology. Each 100 units change in the sire’s FP\$I equaled \$154 per feeder in net income. These indices are presently being refined and validated with industry partners and at Olds College.

- **2015-2020** Led the development of the first “made in Canada” genomic tool for Canadian crossbred cattle producers. This tool provides parentage, breed composition, and a Vigour-Score that measures hybrid vigour an important trait for optimizing performance of beef production (EnVigour HX™). This test was released in 2017 and is now licenced to Neogen Canada (royalty of \$2.50/sample returned to Delta Genomics), who plan to market it in Canada, USA, Scotland, Australia, Brazil and China. The benefits associated with maintaining high hybrid vigour in the cowherd are about \$160/cow/year in the first five parities, as well as improved calf health and resilience and a reduced carbon footprint. Deployed sire assignment, genomic breed composition and genomic hybrid Vigor Scores on progeny, sires and dams to 14 commercial beef farms through the Herdtrax software program.
- **2018-2019:** Basarab and team were the first to quantify the reduction in the carbon intensity of beef production from maintaining high hybrid vigor in the cowherd as determined by genomic retained heterozygosity. Total GHG reductions from increasing hybrid vigor was 639 kg CO₂e/youthful animal slaughtered, worth \$19 assuming \$30/t CO₂e. This suggests that breeding for a high vigor cowherd using genomic tools would be one of the most beneficial management practices for reducing the carbon footprint of beef production.
- **2016-2019** Assisted in the development of Gentec’s small SNP panel for feed efficiency. Patent number: PCT/CA2018/051326. A list of 450 SNPs representing genomic variants for feed efficiency was generated and a small panel of 216 SNPs developed and tested on 768 animals previously measured for feed efficiency traits. The cost of this panel was \$30 per sample but is expected to be lower after refinement to the validated SNPs and with higher volumes. About 10-20% of the markers were positively associated with the different traits tested and up to 18, 18, 13, 12, 9% of the genetic variance in average daily gain (ADG), dry matter intake (DMI), midpoint metabolic weight (MMWT), residual feed intake (RFI), and residual feed intake adjusted for back fat (RFIf), respectively, were explained by the panel.
- **2017-2019** Lead project that combined mutations from the Gentec 200SNP panel (200 SNPs) with the top 10 significant mutations from GGP F-250 panel (250,000 SNPs) that explained 40 and 57% of the genetic variance of feed efficiency (as residual feed intake) and daily dry matter intake, respectively. These results create an opportunity for improving the accuracy of genomic selection in commercial cattle, and to further develop accurate, low-cost genomic testing to apply the technology on-farm.
- **2014-2017** Validated a non-invasive, remote sensing wireless system (GreenFeed Emissions Monitoring System) for measuring methane and carbon dioxide from beef cattle under grazing and drylot conditions in temperate environments. We also developed and validated an open path laser system for measuring methane from groups of cattle under grazing conditions.

- **2008-2010** John and colleagues developed the first **Greenhouse Gas mitigation protocols** for beef cattle in Alberta/Canada. The GHG protocols are: 1) Feeding edible oils to feedlot cattle, 2) Reduced days in the feedlot, 3) Reducing age at slaughter for youthful beef cattle and 4) Selection for low residual feed intake in beef cattle. Their results also revealed significant economic potential from selecting beef cattle for low RFI. After 7-10 years of selection, benefits are estimated at more than \$100 million annually for Alberta's feeder cattle industry. The benefits to cow-calf producers and seedstock operators are unknown but are estimated to be at least as high.
- **2005** This group of Alberta-based scientists and specialists released the first North American expected progeny difference (EPD) values for RFI and incorporated them into a multi-trait economic index.
- **1999-2001** John and colleagues were the first in North America to integrate the concept of residual feed intake (RFI), a genetically inherited trait, with new advances in radio frequency (RF) identification, wireless communication, RF detection, data acquisition and computer software integration. Their results were also the first in North America to show the relationships between RFI and carcass characteristics, body composition, heat production, and methane and manure production.

Big picture, innovation and risk

Projects such as:

- a) Cow Fertility DMI,
- b) Sustainable Beef,
- c) Methane RFI,
- d) gGreenCow,
- e) Canadian Cattle Genomics Project,
- f) Phenomic Gap,
- g) Enhanced Fatty Acid Profiles in Beef,
- h) Commercialization of Net Feed Efficiency,
- i) Greenhouse Gas Emissions Mitigating Protocols for Beef cattle, and
- j) Reducing Winter Feeding Costs and
- k) Reducing Age at Harvest in Youthful Beef Cattle

are focussed on the "big picture" issues facing the beef industry. These programs and projects take innovative approaches to resolving industry needs.

Results orientated

I am results orientated as evidenced by the numerous research projects successfully completed and 168 full scientific and proceedings papers, 150 abstract and posters at scientific conferences, 89 scientific reports to funders and industry partners and nearly 250 extensions publications. Other older examples include CowChip\$, Cowbytes, Beef Herd Management Binder (900-page), and CD on Calving Difficulty.

Industry needs

Continual contact with major industry players keeps me informed as to changing industry needs and opportunities. All projects are supported by industry partners such as Beefbooster Inc., Growsafe Systems Ltd., Neogen Canada, Delta Genomics, Herdtrax, Cow Calf Health Management Services, Cattleland, Namaka Farms, Thorlaksons Feedyards, Deseret Ranches, and Olds College. They are also supported by industry funders such as Beef Cattle Research Council, Canadian Cattlemen's Asc., Alberta Beef Producers, Saskatchewan Cattlemen's Asc., Manitoba Cattle Producer, Alberta Livestock and Meat Agency, Alberta Funding Consortium, Genome Alberta and Genome Canada.

E. COMMUNICATION SKILLS

I am well known for my presentations at major beef industry conferences, seminars and workshop with over 250 presentations to 5000-7500 cow-calf managers, veterinarians, government staff and industry personnel throughout North America (Appendix A). I have also conducted beef management courses in Mexico and China, and have consulted in Hungary, China and most recently New Zealand and Ireland. I have conducted many television and radio interviews, and recently, gave a Webinar on feed efficiency to cattle producers in the US and Canada. I have passion for teaching University students as evidenced through participation in courses on Beef Cattle Management and Understanding Animal Breeding.

Teaching Experience

Guest Lecturer- Animal Science 477/474/575 - 25 lectures (1989-2020)

- Animal Science 372 - four lectures (1990).
- Animal Science 385- 10 lectures (2002)

Teaching Assistant - Animal Improvement (An.Sc. 485)-one term;

- Animal Population Genetics (An.Sc. 484)-four terms;
- Applied Physiology of Domestic Animals (An.Sc. 310-311); 3 terms.

One week cow-calf short course in Zacatecus, Mexico (1993), Hungary (1998) and China (1996, 1999 and 2001).

Numerous one and two day workshops for staff in the areas of experimental design, beef herd management, and greenhouse gas mitigation

F. AWARDS, APPOINTMENTS AND COMMITTEES

2020, Don Matthews Memorial Award presented by the Canadian Beef Breeds Council.

Accepted by JA Basarab on behalf of Livestock Gentec.

1993 - 2020 - Adjunct Professor - University of Alberta

2017 Recognition of 35 years of service with the province of Alberta

2015, 1999, 1996, 1995 - Group Achievement Award of Excellence.

2010 APPEX Award for outstanding teamwork, Beef Life Cycle Analysis Phase 1

2010 Canadian Animal Industries Award in Extension and Public Service

2009 Special Extern Examiner at Doctoral level, National University of Ireland.

2008 Gold Harvest Award Pin, Year Round Grazing Systems Res. and Tech. Transfer

2007 - Silver APPEX Award – CLA Network.

2005 - Bronze APPEX Award – Commercialization of Net Feed Efficiency in Beef Cattle

2003-2007 Associate Editor, Canadian Society of Animal Science

2002 - Wrote articles for the Western Forage Beef Newsletter which received an award from the American Society of Agronomy for excellence in extension.

2000 - Premier's Award of Excellence- Silver (Western Forage Beef Group: WFBG)

1999 - AGCELLENCE - Contribution to the Agri-Food Sector Award (WFBG)

Committees

Assisted in establishing industry research needs, priorities and planning on numerous committees: Livestock Gentec, Alberta Beef Forage and Grazing Centre, Beef Cattle Research Council, Alberta Bovine Genomics program, Canadian Round Table on Sustainable Beef Production; Alberta Agriculture & Food's Biotechnology Technical Committee; Traceability Strategic Planning Team; Western Forage Beef Group; CLA Network; Animal Behaviour & Feed Efficiency Network; China Beef Team; Climate Change/Greenhouse Gas Technical Team; Beef Product Team; Canadian Beef Industry Development Research Review; Strategic Environmental Analysis Group; Animal Health Information Network; Canadian Beef Improvement; Canada Committee on Animal Production Services; Alberta Agricultural Coordination Committee; Animal Industry Advisory Committee (Secretary; Chairman); Animal Health Advisory Committee; Research Evaluation Committee - Farming for the Future.

Scholarships and Funding

Numerous awards from Beef Cattle Research Council, Alberta Funding Consortium, Genome Alberta, Genome Canada, Alberta Livestock and Meat Agency, Alberta Agricultural Research Initiative, Canadian-Alberta Beef Industry Development Fund, Alberta Livestock Industry Development Fund, Farm Business Initiative Program, National Research Council and National Science, Engineering Research Council.

Membership in Professional Associations

Alberta Institute of Agrologists.

Agricultural Institute of Canada.

American/Canadian Societies of Animal Science

G. MAJOR DATA BASES AND SOFTWARE PROGRAMS

The following data bases and software programs are valuable intellectual properties.

- **Phenomic Gap & CCGP Data bases:** Important phenotype/genotype data bases and reference populations were developed and supplemented with additional data: a) 50K SNPs, feed efficiency and carcass data on additional 6086 animals were compiled and consolidated with historical data, bringing the total number of animals with 50K SNPs, and feed efficiency traits to 11389, and total number of animals with carcass traits to 8455; b) 50K SNPs of above animals were successfully imputed to whole genome sequence variants of 57,665,943 with an average imputation accuracy>97%.

- **Purebred reference population:** The SNP panel data for breed composition prediction has been expanded and refined to include 14 major Canadian beef breeds (Black Angus, Red Angus, Charolais, Simmental, Hereford, Limousin, Gelbvieh, Salers, Maine Anjou, Shorthorn, Holstein, Brown Swiss, Jersey, and Galloway).
- **Genomic variants:** 43 million genomic variants (insertions/deletions and SNPs) screened for functional impact on traits of interest, and results incorporated into global initiatives to improve prediction of phenotype from genotype.
- **Copy Number Variants:** Paul Stothard led the development of a large comprehensive collection of cattle Copy Number Variants (CNVs) and presented them in a novel interactive visual database to assist use by researchers.
- **Female Fertility data bases** developed and maintained: a) Lacombe Research and Development cow fertility data base 2005-2019 (> 3500 mating opportunities); b) Roy Berg Kinsella Research Station cow fertility data base 2012-2019 (>4000 mating opportunities); c) Fertility haplotypes - This database contains whole genome sequences (20x coverage; Genome Quebec) from 11 bulls and 9 cows that showed high infertility rate (15+% open rate). Analyses (e.g., scan for infertility haplotypes) will provide more direct information on potential causative mutations in the population or associated infertility haplotypes, and improve the accuracy of imputation and identifying polymorphisms for our female fertility prediction index that includes both additive and non-additive genetic effects.
- Author of an interactive, multi-media CD on Minimizing Calving Difficulty.
- Editor and coordinator of the "Beef Herd Management Reference Binder and Study Guide" (over 900 pages). Published by Alberta Agriculture in 1987. More than 9,500 have sold at \$35 and \$65/binder.
- Developer and coordinator of the COWCHIP\$ software programs. Version 1.21 was released for public sale (\$150/copy) in August of 1991. More than 400 copies sold. Version 2.00 was released in March of 1994, with over 1000 copies sold (\$300/copy).
- Author of the COWCHIP\$ User's Manual. This 180 page manual contains instructions and information on the inner workings of COWCHIP\$.
- Developed the "Alberta Cow-Calf Audit" data base. This data base contains information on benchmark production levels, and management, quality assurance, health, marketing and pasture management practices for over 8,000 cow-calf herds. This data base spans the years from 1988 to 1998.

H. CURRENT RESEARCH INVOLVEMENT

Team lead or team member on 11 approved projects worth \$20.4 million (cash>\$4.5 million)

2022-2024: 2022T001R/RES0058343 - Gentec Feeder Profit Index validation and deployment, RDAR/Genome Alberta, cash=\$250k, total=\$518k, PI=Plastow and Basarab.

2022-2024: 2022T015R - Automating Replacement Heifer Selection – Demonstration Site, RDAR/Genome Alberta, cash=\$115.2k, total=\$473k, PI=Markus, team member=Basarab.

2021-2022: 2022N031RC / RES0054869 - Herd DNA pooling tool: Using DNA pooling for breeding management in commercial cow-calf herds, RDAR/CAPP, cash=\$191k, total=\$535k, PI=Basarab.

2021-2023 RES0053232 - Can cow/calf production efficiency be explained by maternal habitat selection and dietary composition in diverse pasture? cash=\$1,001k, total=\$1,816k, Alberta Funding Consortium/BCRC, PI=Bork, team member=Basarab.

2021-2024: FDE.05.20 - Demonstrating the impact of genomics-enhanced whole herd genetic management platform on reducing beef greenhouse gas emissions, Emissions Reduction Alberta, 2021-2024, cash=\$391k, total=\$913k, PI=Li, co-PI=Basarab.

2021-2023: RES0053225 - An Analytic App for Arm-Chair Ranching, Alberta Innovates, Smart Agriculture digitization and automation challenge, cash=\$481k, total=\$4,847k, PI=Wishart and Plastow, team member=Basarab.

2021-2024: RES0049089 - Increased ecosystem goods and services through improved public and genomic understanding of grassland function, \$6.1 million over 4 years, NSERC New Frontiers, PI=Carlyle and Plastow, team member=Basarab.

2018-2023: FDE.06.17 - Genetic analyses of feed intake, feed efficiency, female fertility, and cow lifetime productivity in beef cattle raised under two environments; BCRC/Beef Cluster, 2018-2023, cash=\$1,047k, total=\$3,756k, PI=Basarab.

2020-2023: 2021F072R - Remote monitoring of cattle performance: A path forward to long term sustainability. Proposed \$941,000 over 2 years but awarded \$196,500 (2021/23), Alberta Funding Consortium, RDAR, PI=Plastow, team member=Basarab.

2022-2026: Project Number=20210666 - Benchmarking imaging and sensor technologies for capturing novel phenotypes to improve sustainability of the beef industry. Agriculture Development Fund, cash=\$180k, total=\$324k, PI= Jaswant Singh, team member=Basarab.

2019-2023: Evaluating Sire-Progeny Links, Breeding Plans and Information Management in Multi-Sire Breeding Scenarios on Commercial Herds. Canadian Agricultural Partnership – Adapting Innovative Solutions in Agriculture Program, cash=\$116k, total=\$232k. Project manager= Melissa Freeman, West Central Forage Association; team member=Basarab, Head of Beef Operations, Livestock Gentec.

Other projects

2022-2025: Beef on Dairy: the GENOMICS and GE3LS of it. Genome Canada, Climate-Smart Agriculture and Food Systems - Interdisciplinary Challenge Teams. \$6 million over 4-years, PI=Basarab, University of Alberta; co-PI=Baes, University of Guelph. This project was registered, and then withdrawn due to our major industry partner not wanting to have their data placed in the public domain. Project leadership worked with the key industry partner to negotiate preliminary analyses on company animals and data, and using Livestock Gentec's proprietary genotype/phenotype reference databases. These analyses may result in an exclusive North American licensing agreement between Livestock Gentec and the company.

2022-2026: University of Lethbridge Hub for Neuro-engineering Solutions. Alberta Innovates & PrairieCan. PI=Majid H. Mohajerani, Canadian Centre for Behavioural Neuroscience, The University of Lethbridge. Team members=Basarab & Plastow.

I. REFERENCES

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Appendix A. Presentation, Scientific Meetings and Conferences

1. 2023 Basarab, J.A. Adoption of Genomic Technology. Recorded presentation by 4th year students Jacqui Gironella and Diego Martinez Mayorga followed by 2-hour Q & A by John Basarab and Clinton Brons to 65 4H students related to their Carcass Competition, Peace Country Forage Association, April 27, 2023. Organizers were Clinton Brons, Tracy Dietrich and Paul Franz.
2. 2023 Basarab, J.A. Development of Genomic tools for Beef-on-Dairy production system. GK Jim Farms and FHMS by Telus Agriculture, Okotoks, 24 April 2023, 15 participants.
3. 2023 Basarab, J.A. Genomic tools for Replacement Heifer Selection & Cow-based record keeping, 3-hr Kitchen Table session, Ashmont, in-person 19 April 2023.
4. 2023 Jacqui Gironella and Diego Martinez Mayorga. Adopting Genomic Technologies. Lakeland Agricultural Research Association, 4H carcass competition, 19 April 2023, pre-recorded 30 minutes, online, Basarab & Brons follow-up Q&A, 100 participants.
5. 2023 Basarab, J.A. Value of genomic tools for decision-making on commercial cow-calf operations, Lakeland Agricultural Research Association AGM, 14 March 2023, Spedden, 35 participants.
6. 2023 **Basarab, J.A.** RDAR Research Showcase, 5-minute pitch and poster, Beef Cattle Genomics, 10 January 2023, Edmonton.
7. 2022 **Basarab, J.A.** The value of genomic tools for decision-making on commercial cow-calf operations, West-Central Forage Association, 6 December 2022, Spruce Grove, 30 participants.
8. 2022 **Basarab, J.A.** The value of genomic tools for decision-making on commercial cow-calf operations. Innovations on the Ranch, Lakeland Agricultural Research Association, 23 November 2022, Ashmont, 80 participants.
9. 2022 **Basarab, J.A.** Beef Cattle Production Efficiency and Genomics, Replacement Heifer Challenge, Grey Wooded Forage Association, Livestock Roundup 2022, 22 June 2022, Lacombe County, Canada.
10. 2022 Diego Martinez Mayorga and **Basarab, J.A.** Feeder Profit Index: Selection Index for Commercial Cow-Calf Producers. Grey Wooded Forage Association, Livestock Roundup 2022, 22 June 2022, Lacombe County, Canada.
11. 2022 **Basarab, J.A.** Clinton Brons and Diego Martinez Mayorga. Lacombe 4H Carcass Competition, 29 May 2022, in-person discussion with 4H students and their family, 30 participants.
12. 2022 Clinton Brons and **Basarab, J.A.** Genomics Learn Session. Grey Wooded Forage Association, 27 April 2022, Webinar, in-person discussion, 10 participants.
13. 2022 **Basarab, J.A.** Gentec Beef Initiatives, Management Advisory Board meeting, 25 April 2022, Edmonton, Alberta, online.
14. 2022 Changxi Li, Michael Vinsky, **J.A Basarab.** Using genomics-enhanced tools to improve performance of whole beef cattle herds. 25 March 2022, Producer webinar.
15. 2022 **Basarab, J.A.** and Brons, C. New tools for livestock improvement. Grey Wooded Forage Association, 24 February 2022, 25 participants online.
16. 2022 **Basarab, J.A.** Herd DNA pooling tool: Using DNA pooling for breeding management in commercial cow-calf herds. Presentation to project team, 3 February 2022
17. 2021 **Basarab, J.A.**, Li, C., Stothard, P., Fitzsimmons, C., Guan, L., Goddard, E., Plastow, G.* (2021) BovReg: Identification of functionally active genomic features relevant to phenotypic diversity and plasticity in cattle. EAAP 72nd Annual Meeting, Session13b Davos, August 30 2021 (invited speaker Plastow).
18. 2021 **Basarab, J.A.** Use of genomic tools to improve production efficiency, health resilience and carbon footprint of beef production. Presentation, demonstration and Gentec booth at AgSmart, 10-11 August, 2021.
19. 2021 **Basarab, J.A.** Methane emissions from low and high RFI beef cattle (2014-2017). Emissions Reduction Alberta Lessons Learned Workshop, 20 April 2021, 200+ participants on-line.
20. 2021 **Lisa Szabo.** The Future of Beef is Resilient. For this industry, sustainability is more than a buzz word. And it's coming to our farms and dinner plates. New Trails, interview, May 2021.

21. **2019** McAllister, T., and **Basarab, J.A.** Strategies to improve the efficiency of beef cattle production. Presentation at the 2019 ASAS-CSAS Annual Meeting and Trade, July 8-11, Austin, Texas, USA.
22. 2019 M.K. Abo-Ismael, **Basarab, J.A.** et al. Genome-wide association studies for feed efficiency in beef cattle, International Plant and Animal Conference, 2019-01-12, International Plant and Animal Genome XXVII conference (PAG), Jan 12-16, 2019, San Diego, CA, poster.
23. 2019 G. Manafiazar, **Basarab, J.A.** et al. Genomic Prediction of Methane Production in Beef Cattle, International Plant and Animal Conference, 2019-01-12, International Plant and Animal Genome XXVII conference (PAG), Jan 12-16, 2019, San Diego, CA, poster
24. **2019** Case, J.E., L. Gamsjaeger, D. Nobrega, **Basarab, J.A.** and A.E. Cribb. 2019. Association of Genomic Retained Heterozygosity with Health Outcomes of Beef Calves from Parturition to Weaning. University of Calgary, UCMV, Western Canadian Association of Bovine Practicioners, Saskatoon, SK, 2019-01-18.
25. **2019 Basarab, J.A.** Sustainable Beef. Growsafe Systems Ltd., Dec 19, 2019, Invited presentation at Growsafe Systems employee seminar.
26. **2019 Basarab, J.A.** Sustainable Beef, Alberta Beef, Forage and Grazing Centre Annual meeting. Feb 6, 2019.
27. **2019 Basarab, J.A.** Feed efficiency and methane emissions. University of Alberta, Mar 29, 2019, Guest lecture to Animal Science 474/574 students
28. **2019 Basarab, J.A.** Future of genomics in the Canadian Beef Industry. Alberta Beef Producers, Jun 11, 2019, Invited presentation to Alberta Beef Producers AGM.
29. **2019 Basarab, J.A.** Future of Genomics in the Canadian commercial cattle sector. National Canadian Beef Industry Conference, CBBC, Aug 13, 2019. Invited presentation to CBBC Technical Forum, Canadian Beef Industry Conference.
30. **2019 Basarab, J.A.** Validating genomics tools used to select commercial replacement heifers. HerdTrax & CCHMS Producer Seminar, Dec 17, 2019, Invited presentation, Calgary, Alberta.
31. 2019 **Basarab, J.A.** Sustainable Beef, Agriculture and Agri-Food Canada, Alberta Agriculture and Forestry, Alberta Beef Producers, 2019-02-06, Alberta Beef, Forage and Grazing Centre Annual meeting
32. 2019 **Basarab, J.A.** Feed efficiency and methane emissions, University of Alberta, 2019-03-29, Guest lecture to Animal Science 474/574 students
33. 2019 **Basarab, J.A.** Sustainable Beef, Growsafe Systems Ltd., 2019-12-19, Invited presentation at Growsafe Systems employee seminar
34. **2019** Abo-Ismael, M.K., J. Crowley, G.M. Manafiazar, C. Li, M. Sargolzaei, P. Stothard, G. Plastow, and **Basarab, J.A.** 2019. Genome-wide association studies for female fertility and lifetime productivity in beef cattle. The Plant and Animal Genomic XXVII conference, San Diego, CA. USA, January 12-16, 2019. Poster.
35. 2018 T.S. Valente, **Basarab, J.A.** et al. Genetic correlation estimates between feeding behavior and feed efficiency traits in beef cattle, International Society for Applied Ethology, 2018-12-12, International Society for Applied Ethology, Chile, December 2018.
36. 2018 E.C. Akanno, **Basarab, J.A.** et al. Evaluation of a genome-based sorting system for feeder cattle, ASAS-CSAS JAM meeting, 2018-07-09, ASAS-CSAS JAM meeting, 8-12 July 2018, Vancouver, BC, Canada.
37. 2018 **Basarab, J.A.** Research Program Update, Alberta Beef Forage and Grazing Centre, 2018-02-07, Research program update to producer advisory and management committees and LRDC scientists

38. 2018 **Basarab, J.A.** and Miller, M. Genomic tools for commercial beef producers, University of Calgary, UCMV, 2018-02-08, Presentation to UCMV students
39. 2018 **Basarab, J.A.** Genomic tools for commercial beef herds, University of Alberta, Livestock Gentec, 2018-07-10, Livestock Gentec Conference
40. 2018 **Basarab, J.A.** Sustainable Beef, Alberta Agriculture and Forestry, 2018-10-04, Beef Genetics/genomics research update to livestock and crop directors and ADM
41. 2018 **Basarab, J.A.** Genomic tools to increase calf crop, feed efficiency and sustainable beef, Agri-Food and Bioscience Institute, 2018-11-12, 6th AFBI-initiated Fall Forum, Belfast, Ireland
42. 2018 **Basarab, J.A.** Genomic tools for commercial beef herds, Alberta Agriculture and Forestry, 2018-11-29, Farm Forum, Mayerthorpe, AB
43. 2017 Michelle Miller. Presentation on EnVigour HX™, Government of Saskatchewan, Sask. Beef producer, 2017-01-24, Saskatchewan Beef Industry Conference, Regina, SK
44. 2017 Michelle Miller, Presentation on EnVigour HX™, Alberta Cattle Feeders Association, Alberta Beef Producers, 2017-02-03, Alberta Cattle Feeders Conference.
45. 2017 Michelle Miller, Trautman, Brons, Li, Basarab. Extending genetic information to Alberta's producers, Alberta Agriculture and Forestry, 2017-05-08, Leduc ½ day participated in AB Ag Extension Meeting.
46. 2017 M.K. Abo-Ismael , **Basarab, J.A.** et al. Genomic profiles to assess accuracy of breed composition and hybrid vigor in crossbred beef cattle, International Society of Animal Genetics Conference, 2017-07-17, 36th International Society of Animal Genetics (ISAG) Conference, Dublin, July 16 to 21, 2017. Poster.
47. 2017 M.K. Abo-Ismael, Miller, Trautman, **Basarab, J.A.** Genomic indicators of heterosis, Canadian Beef industry Conference, 2017-08-15, Canadian Beef Industry Conference
48. 2017 J. Crowley and **Basarab, J.A.** Update on Canadian Agriculture Adaptation Project: Genotyping purebreds, Canadian Angus Association, 2017-08-01, Canadian Angus Convention. Brandon, MB. June 2017.
49. 2017 J. Crowley, **Basarab, J.A.**, et al. Genomic tools for commercial cattle producers, Canadian Beef Breeds Council, 2017-06-01, CBBC Technical forum at CBIC organizing committee (Crowley).
50. 2017 E.C. Akanno, **Basarab, J.A.** et al. Repeatability of maternal productivity of cows selected for post-weaning residual feed intake using molecular breeding values, University of Alberta, Livestock Gentec, 2017-10-18, Livestock Gentec Conference, 17-18 October, 2017, Edmonton, AB, Canada
51. 2017 E.C. Akanno, **Basarab, J.A.** et al. Evaluation of genomic selection in the Canadian Hays Converter Cattle breed, University of Alberta, Livestock Gentec, 2017-10-18, Livestock Gentec Conference, 18-19 October 2016, Edmonton, AB, Canada.
52. 2017 E.C. Akanno, **Basarab, J.A.** et al. Genomic tool for breed composition and hybrid vigor in crossbred beef cattle, University of Alberta, Livestock Gentec, 2017-10-18, Livestock Gentec Conference, 17-18 October, 2017, Edmonton, AB, Canada
53. 2017 Crowley and Basarab, J.A. Future of genomics in the Canadian Beef Industry, Canadian Beef industry Conference, 2017-08-15, 2nd Annual Canadian Beef Industry Conference.
54. 2017 C. Ekine-Dzivenu, Basarab, J.A. et al. Performance evaluation for feed efficiency and growth in progeny of parents selected for low residual feed intake - The "Kinsella Breeding Project", results following two years of selection, University of Alberta, Livestock Gentec, 2017-10-18, Livestock Gentec Conference, 17-18 October, 2017, Edmonton, AB, Canada

55. **2017 Basarab, J.A.** Genomic indicators of heterosis, Genome Alberta, 2017-03-31, Presentation to Genome Alberta Management Advisory Board including the CEO of Genome Canada on project results and newly commercialized EnVigour HX™.
56. 2017 Basarab, J.A. Genomic solutions for a changing climate, Genome Alberta, 2017-05-24, Strategic Planning workshop, Genome Alberta, Edmonton.
57. 2017 Basarab, J.A. Genomic tools for beef production, UCVm, University of Calgary, 2017-06-23, UCVm Beef conference, Calgary.
58. 2017 Basarab, J.A. Genomic tools for commercial beef producers, Livestock Gentec; Alberta Agriculture; Agriculture and Agri-Food Canada, 2017-08-22, Cow-Forage Gentec Tour, Lacombe Research and Development Centre
59. 2017 Basarab, J.A. Tools to build your cow herd, Alberta Agriculture and Forestry, 2017-10-01, Alberta Agriculture Fall Series of 10 presentation to producers. Features genomic indicators of heterosis and EnVigour HX™
60. ²⁰¹⁷ Basarab, J.A. Genomic tools for commercial beef cattle, University of Alberta, Livestock Gentec, 2017-10-17, Presentations to students
61. 2017 Basarab, J.A. Keep Your Cow Herd Vigour Up and EnVigour HXTM, Alberta Agriculture and Forestry, 2017-11-08, Joint presentation to Alberta Agriculture extension specialists
62. **2017 Basarab, J.A.** Sustainable Beef Production: Feed Efficiency Research, UK-Canada Research Meeting. University of Alberta, March 24, 2017
63. **2017 Basarab, J.A.** Role of Sustainable Beef. Global Challenge, 23-24 January 2017, University of Calgary, Alberta, Canada.
64. **2017 Basarab, J.A.** Genomic tools and residual feed intake. Alberta Feeders Association Conference, 4 February 2017, Red Deer, Alberta
65. **2017 Basarab, J.A.** Keep your herd vigor up: Genomic tools for beef production. Heifer Show case, Herdtrax Morning Seminar, Crossfield, Alberta. 17 February 2017.
66. 2017 Akanno, Basarab, J.A. et al. Impact of genomic selection for feed efficiency on heifer reproduction and calf performance traits, International Society of Animal Genetics Conference, 2017-07-17, 36th International Society of Animal Genetics (ISAG) Conference, Dublin, July 16 to 21, 2017. Poster.
67. **2016 Basarab, J.A.** gEPDs for commercial cattle. Livestock Gentec Conference, 18-19 October 2016, Edmonton, Canada
68. **2016 Basarab, J.A.** Feed efficiency (RFI) traits from beef: What can Dairy learn from Beef cattle. Livestock Gentec Conference, Edmonton, 18-19 Oct 2016.
69. **2016 Basarab, J.A.** Alberta Beef, Forage and Grazing Centre update, December 1, 2016.
70. **2016 Basarab, J.A.** FutureFare, October 13, 2016, Edmonton
71. **2016 Basarab, J.A.** BCRC Science Advisor Panel, October 28, 2016, Calgary
72. **2016 Basarab, J.A.** Alberta Beef, Forage and Grazing Advisory meeting, December 1, Lacombe
73. **2016 Basarab, J.A.** Canadian Beef Improvement Network Discussion with Alberta Agriculture and Forestry, December 9, 2016, Edmonton
74. **2016 Basarab, J.A.** RFI and Greenhouse Gases. Animal Science 474, University of Alberta, Edmonton, AB, 5 February 2016.

75. **2016** Manafiazar G., S. Zimmerman, and **Basarab, J.A.** Methane, CO₂, O₂ emissions variability and repeatability and feed intake comparisons in beef cattle, Workshop on Metabolic Gas Measurements for GreenFeed, Melbourne, Australia. February 13-14, 2016
76. **2016** Jay Cross, **Basarab, J.A.**, John Crowley, Tom Lynch-Staunton and Sandy Russell. Canadian Beef Improvement Network (CBIN), presented to Beef Value Chain Roundtable, Ottawa and to CBBC Annual General Meeting, Calgary, January 14 & March 23, 2016.
77. **2016** **Basarab, J.A.**, Mike MacNeil and Graham Plastow. Verified Sustainable Beef Pilot: Information Sharing Sub-pilot, Airdrie, Alberta, February 24, 2016.
78. **2015** **Basarab, J.A.** Selection for feed efficiency in cattle and Impact on climate change and methane production. Sustainable Agri-Food Production and Health – 21st Century Solutions, Edmonton, AB, Canada, 14-16 October 2015
79. **2015** **Basarab, J.A.** Making beef cattle more feed efficient: Impact on performance, carcass and meat quality and methane emissions, II Symposium of Animal Science and Food Engineering, Pirassununga/SP/Brazil, 21-23 Oct 2015
80. **2015** **Basarab, J.A.** Commercial Beef Cattle Genomics Project: Value of Genomics, Herdtrax and CCHMS Beef Producer Meeting, December 14, 2015, Calgary, Alberta
81. **2015** **Basarab, J.A.** Feed efficiency and greenhouse gas emissions in beef cattle, Masahito's class, University of Alberta; included Japanese exchange students. 29 September 2015
82. **2015** **Basarab, J.A.** Livestock Gentec Field Day, Lacombe Research Centre, 19 August 2015. Field presentations. Approximately 200 industry participants toured the RFI methane grazing trial site.
83. **2015** **Basarab, J.A.** RFI Methane Project, International Science Advisory Committee, Livestock Gentec, Edmonton, 24 February 2015 invited
84. **2015** **Basarab, J.A.** Beef Sustainability LSARP Project (see above), International Science Advisory Committee, Livestock Gentec, Edmonton, 24 February 2015 invited
85. **2015** **Basarab, J.A.** Feed Efficiency in Beef cattle, Beef 2025 – Moving Forward, 27-28 March 2015, Moncton, NB
86. **2015** **Basarab, J.A.** Research Program at the Lacombe Research Centre, Canadian Angus Field Day, 7 June 2015.
87. **2015** **Basarab, J.A.** Animal Science 474, University of Alberta, 9 February 2015. Improving Production Efficiency; Spring vs fall calving
88. **2015** **Basarab, J.A.** Animal Science 474, University of Alberta, 20 March 2015. Feed efficiency and Greenhouse Gas emissions from beef cattle
89. **2014** **Basarab, J.A.** Animal Science 474, Spring vs. Fall calving, 20 January 2014
90. **2014** **Basarab, J.A.** Kinsella Breeding Project, Industry steering Update, 30 January 2014, Lacombe, Alberta, Canada.
91. **2014** **Basarab, J.A.**, The Feed Efficient Cow herd, Peace Country Beef Cattle Days, Fairview, AB, 3 Dec 2014, invited
92. **2014** **Basarab, J.A.**, Research Update on RFI, Webinar series, Saskatchewan Beef Specialists, 12 November 2014
93. **2014** **Basarab, J.A.**, Residual Feed Intake, Roy Berg Kinsella Ranch, Staff appreciation, 10 December 2014
94. **2014** **Basarab, J.A.**, Beef Producer Roundtable, 29 October 2014, Lacombe

95. **2014 Basarab, J.A.** Livestock Genomics in Alberta: Ethical, Environmental, Economic, Legal and Social (GE³LS) Implications. 23 April 2014, Calgary, Alberta. (*panelist*).
96. **2014 Basarab, J.A.** Sustainable Beef, hosted by Jay Ingram, Impact Innovation 2014, Alberta Innovates Bio Solutions, 7 May 2014, Edmonton, Alberta, Canada
97. **2014 Basarab, J.A.** Panelist at Livestock Genomics in Alberta: Ethical, Environmental, Economic, Legal and Social (GE³LS) Implications. 4 June 2014, Edmonton, AB.
98. **2014 Basarab, J.A.,** E. Akanno, J. Crowley, B.D. Lu & G. Plastow. Genomics Approaches in Beef: Selecting for Efficiency & Managing for Finishing. Alberta Beef Industry Conference, 19 February 2014, Red Deer, Alberta, Canada.
99. **2014 Basarab, J.A.** Results from the Canadian Hereford RFI trail, NSERC Olds Producer Day, 23 January 2014, Olds, Alberta
100. **2013 Basarab, J.A.** Genomics 101, Innisfail High School students, Lacombe, 21 Nov. 2013
101. **2013 Basarab, J.A.** Residual Feed Intake Research, Rancher's Research Update, 18 Jan. 2013, Moose Jaw, SK
102. **2013 Basarab, J.A.** Results from the Canadian Hereford RFI trail, 2 August 2013, Brandon, Manitoba.
103. **2013 Basarab, J.A.** Roundtable on international trade, Edmonton, Northlands FarmFair, 6 Nov, 2013.
104. **2013 Basarab, J.A.** Residual feed intake (RFI): An indirect approach for reducing GHG emissions, Biological Solutions Forum, 9-10 October, 2013, Calgary, Canada.
105. **2013 Basarab, J.A.** Residual feed intake (RFI): An indirect approach for reducing GHG emissions, Greenhouse Gases and Animal Production conference, 25 June, 2013, Dublin, Ireland.
106. **2013 Basarab, J.A.** Addressing the Phenomic Gap: Next generation genomic tools in beef, FutureFare, 18 June 2013, Red Deer, Alberta.
107. **2013 Basarab, J.A.** Research Update on Feed Efficiency and GHGs, Grey Wooded Forage Association Annual General meeting, 2 May 2013, Leslieville, Alberta
108. **2013 Basarab, J.A.** Four national discussion on genomics, Washington DC, 12-15 November 2013.
109. **2012 Basarab, J.A.** The feed efficient cow, Cattlemen's Clinic, 20 November 2012, Oyen, Alberta
110. **2012 Basarab, J.A.** Canadian Cattle Genome Project. 3rd Annual Livestock Gentec Conference; Turning Local Production into Global Advantage. October 17th, 2012, Edmonton, Alberta.
111. **2012 Basarab, J.A.** Economic value of Genomics, Cow Calfenomics, 12 December 2012, Brooks, AB
112. **2012 Basarab, J.A.** Feed efficient cow herd, Western Can. Grazing Conference, 29 Nov. 2012, Red Deer, AB
113. **2012 Basarab, J.A.** Breeding for Improved Feed Efficiency in Beef Cattle. 3rd Annual Livestock Gentec Conference; The Fundamentals of RFI. October 16th, 2012, Edmonton, Alberta.
114. **2012 Basarab, J.A.** Livestock Gentec International Science Advisory Committee meeting, October 18, 2012, Edmonton, Alberta.
115. **2012 Basarab, J.A.** Feed efficiency, RFI and its Economic Benefits for the beef cattle industry, Manitoba Rancher's Forum, 27 November 2012, Brandon, MB
116. **2012 Basarab, J.A.** Beef Cattle Research Program, Livestock Gentec, International Scientific Advisory Board, 18 October 2012, Edmonton, AB
117. **2012 Basarab, J.A.** The Canadian Cattle Genomics Project, Livestock Gentec Conference, 17 October 2012, Edmonton, AB

118. **2012 Basarab, J.A.** Breeding for Improved feed efficiency in beef cattle, Livestock Gentec Conference, 16 October 2012, Edmonton, AB
119. **2011 Basarab, J.A.,** Baron, V.S., Aalhus, J.L., Robertson, W.M. and Okine, E.K. Reducing Age at harvest in youthful beef cattle. Improving Cattle Profits & Markets Seminar, Feb. 15-16, 2011, Dawson Creek & Grimshaw
120. **2010 Basarab, J.A.** Genomics 101. Deschambault, Quebec.
121. **2010 Basarab, J.A.** Review of Phenomic Gap Project. February 19, 2010, University of Alberta. Edmonton, Alberta.
122. **2010 Basarab, J.A.** Beef Research Program Overview. March 9, 2010. Edmonton, Alberta.
123. **2010 Basarab, J.A.** Overview of GHG emissions in beef cattle. Beef Guidance Document Workshop, April 29-20, 2010, Lacombe, Alberta.
124. **2010 Basarab, J.A.** Residual Feed Intake – the New Way to Improve Feed Efficiency. Manitoba Ag Days, Brandon, MB, Jan. 19-21, 2010.
125. **2010 Basarab, J.A.** Residual feed intake and related traits in beef cattle. Impact Through Biosciences, October 18-19, 2010, Edinburgh, Scotland.
126. **2010 Basarab, J.A.** Alberta's experiences with greenhouse gas: The beef protocols. Congres du bœuf Octobre 8, 2010, Victoriaville, Québec, Canada
127. **2010 Basarab, J.A.** Residual feed intake - A new way to improve feed efficiency. Congres du bœuf Octobre 8, 2010, Victoriaville, Québec, Canada
128. **2010 Basarab, J.A.** Gap Update: Impact of residual feed intake on other economic traits. Genomics and Livestock Quality Improvement: Bringing it all Together. May 11-13, 2010. Calgary, AB, Canada.
129. **2010 Basarab, J.A.** Alberta's experiences with greenhouse gas: The beef protocols. Joint Annual Meeting ADSA, PSA, AMPA, CSAS and ASAS. Denver, USA, July 11-15, 2010.
130. **2010 Basarab, J.A.** Phenomic Gap Update: Impact of residual feed intake on other economic traits. Genomics and Livestock Quality Improvement: Bringing it all together. May 11-13, 2010, Calgary, Canada.
131. **2009 Basarab, J.A.** Feed efficiency and Fertility: Can we have both? University College Dublin, Ireland, August 11, 2009
132. **2009 Basarab, J.A.** Initiatives to improve feed efficiency in beef cattle. Bozeman, Montana, USA, teleconference, July 24, 2009
133. **2009 Basarab, J.A.** Overview of GHG emissions quantification science in beef herds, Leduc, AB. March 17, 2009
134. **2009 Basarab, J.A.** Association between RFI and GHG in beef cattle. Breeding for GHG outcomes, Wellington, NZ, March 3-5, 2009
135. **2009 Basarab, J.A.** Reduced age at harvest in youthful beef cattle. Capturing Feed Grain and Forage Opportunities Conference, December 9-10, 2009, Red Deer, Alberta.
136. **2009 Basarab, J.A.** Feed Efficiency, Residual Feed Intake and Related Traits. Douglas Bull Test Station, Manitoba. December 8, 2009.
137. **2008 Basarab, J.A.** Knowing the entire Bovine Genome: The New 50K Chip. Annual Health Management Seminar, Calgary, Dec 17, 2008
138. **2008 Basarab, J.A.** Montana Livestock Forum and Nutrition Conference. 2008. Residual Feed Intake: Past, present and Future, April 15-16, 2008, Bozeman, Montana, USA.

139. **2008 Basarab, J.A.** Beef Cattle Breeders. Residual Feed Intake: Past, present and Future, January 22, 2008, Highwood Auction Market, AB, Canada.
140. **2008 Basarab, J.A.** Traits for genomic technologies: Fertility, cow lifetime productivity and behavioral traits. Alberta Bovine Genomics Program meetings, May3-6, Banff, AB, Canada.
141. **2008 Basarab, J.A.** Relationship between residual feed intake and cow productivity traits. Beef Improvement Federation, July 2-3, Calgary.
142. **2008 Basarab, J.A.** Relationship between residual feed intake and fertility in heifers. Canadian Society of Animal Science Annual meeting, August 11-14, Guelph, Ontario.
143. **2008 Basarab, J.A.** Season of calving: Spring vs. fall calving, University of Alberta, Oct 2008, Edmonton.
144. **2008 Basarab, J.A.** Feeding edible oils to feedlot cattle. Agriculture Carbon Offset Protocols Review, Aug. 8, 2008, Edmonton.
145. **2008 Basarab, J.A.** Residual feed intake: Past, present and future. Alberta Bovine Genomics Program meetings, May3-6, Banff, AB, Canada.
146. **2008 Basarab, J.A.** Reducing age at slaughter in beef cattle. Agriculture Carbon Offset Protocols Review, Aug. 8, 2008, Edmonton.
147. **2007 Basarab, J.A.** Canadian Nutrition Congress 2007. Relationships between progeny residual feed intake and dam productivity traits, June 18-21, 2007, Winnipeg, MB, Canada.
148. **2007 Basarab, J.A.** Grassland-Beef Value Chain 2007. Alberta Beef Production System Simulation Model. June 7, 2007, Lethbridge, AB, Canada.
149. **2007 Basarab, J.A.** Feedlot Health Management Services 21st Annual Research Seminar, June 11, 2007. Calgary, AB, Canada.
150. **2007 Basarab, J.A.** Alberta Agriculture and Food, Research Division. 2007. Residual Feed Intake: Past, present and Future, June 12-13, 2007, Edmonton, AB, Canada.
151. **2007 Basarab, J.A.** National Feeders Association. Residual Feed Intake: Past, present and Future, September 11, 2007, Airdrie, AB, Canada.
152. **2007 Basarab, J.A.** CLA Summit Harvesting the Future. Increasing bioactive lipid content in beef through pasture and feedlot management strategies. May 8-10, Kananaskis, AB, Canada.
153. **2007 Basarab, J.A.** Saskatchewan Beef Symposium. Technology Developments in Tracking the Age, Performance and Genetics of Your Cattle. Feb. 7-8, 2007, Saskatoon, SK, Canada.
154. **2006 Basarab, J.A.** International Beef Congress, July 14, 2006. Calgary, Alberta, Canada
155. **2006 Basarab, J.A.** Beef Theme, AAFRD, March 10, 2006, Leduc, AB, Canada.
156. **2006 Basarab, J.A.** Feedlot Health Management Services, 20th Annual Research Seminar, June 12, 2006. Calgary, Alberta.
157. **2006 Basarab, J.A.** Western Forage Beef Group: Goal, Strategies and Research Results. August 2006, Lacombe, AB, Canada.
158. **2006 Basarab, J.A.** Net Feed Efficiency – where are we at in defining EPDs for beef cattle feed efficiency. Clearwater County Cattlemen’s Day, Nov. 1, 2006, Clearwater County, AB, Canada.
159. **2006 Basarab, J.A.** Radio Frequency Identification (RFID) tags and their application in auction markets. Clearwater County Cattlemen’s Day, Nov. 1, 2006, Clearwater County, AB, Canada.
160. **2006 Basarab, J.A.** Evaluation of multi-panel RFID reader systems for value tracking in beef cattle.

161. **2006 Basarab, J.A.** Residual Feed Intake: Implications for feedlot cattle, heifer and bull selection and mature cows. Ohio Cattlemen's Beef Study Tour, July 19, 2006, Lacombe Research Centre, Lacombe.
162. **2006 Basarab, J.A.** Residual Feed Intake: Implications for feedlot cattle, heifer and bull selection and mature cows. Beef Cattle Research Council, June 21, 2006, University of Alberta, Edmonton.
163. **2006 Basarab, J.A.** Net Feed Efficiency and Sustainability of Alberta's Beef Industry.
164. **2006 Basarab, J.A.** Project Management: A Research Perspective,
165. **2006 Basarab, J.A.** Tools for Building Better Cows, Efficient cows - more money. February 1, 2006, Olds College, Olds AB.
166. **2006 Basarab, J.A.** Beef Industry Traceability: Fort Macleod Demonstration & Information Session, September 18, 2006, Fort Macleod, AB, Canada.
167. **2006 Basarab, J.A.** Agriculture Research, Livestock Production and Meat Quality Branch, AAFRD, April 26-27, 2006, Red Deer, AB, Canada.
168. **2006 Basarab, J.A.** Methane Emissions and Sustainability of Alberta's Beef Industry, Beef Theme, AAFRD, March 10, 2006, Leduc, AB, Canada. **2006 Basarab, J.A.** Tools for Building Better Cows, Efficient cows - less gas. February 1, 2006, Olds College, Olds AB. **2005 Basarab, J.A.** Allflex USA General Meeting, June 15, 2005. Future Applications of RFID in the Beef Industry. Invited (70 participants).
171. **2005 Basarab, J.A.** 11th Annual Provincial Beef Meeting, Trois-Rivieres, Quebec, June 2-3, 2005. Invited (250 participants)
172. **2005 Basarab, J.A.** Canadian Galloway Association General Meeting, July 15, 2005, Airdrie, Alberta. Research Update: Net Feed Efficiency and Enhancing the CLA and Omega-3 content of beef. (100 participants).
173. **2005 Basarab, J.A.** Commercialization of Net Feed Efficiency: Olds College NFE Test Facility – 2002-2005. Commercialization of NFE Bull Test Results meeting. Olds College, Olds, Alberta. June 9, 2005 (70 participants).
174. **2005 Basarab, J.A.** Net feed efficiency and its relationship to carcass quality of fed cattle and wintering ability of cows. New Technologies to Improve Feed Efficiency, Disease Detection and Traceability conference, January 13, 2005, Olds College, AB, Canada
175. **2005 Basarab, J.A.** Saskatoon, SK, Canada. Net feed efficiency: Implications for feedlot cattle and heifer & bull selection.
176. **2005 Basarab, J.A.** Western Canadian Association of Bovine Practitioners Conference, January 20-22, 2005, Saskatoon, SK, Canada. Net feed efficiency: Implications for feedlot cattle and heifer & bull selection.
177. **2005 Basarab, J.A.** New Technologies to Improve Feed Efficiency, Disease Detection and Traceability. January 13, 2005, Olds College, Olds, Alberta, Canada. Net feed efficiency and its Relationship to Carcass Quality of Fed Cattle, and Wintering Ability of Cows.
178. **2004 Basarab, J.A.** Feedlot Health Management Services 18th Annual Research Seminar, June 14, Calgary, Net Feed Efficiency in beef cattle.
179. **2004 Basarab, J.A.** Olds College 2nd Annual Open House on Net Feed Efficiency, Feb., 2004
180. **2004 Basarab, J.A.** CABIDF/National Beef Science Seminar, Eye on the Future, Nov. 15-17, 2004, Calgary, Alberta. Net feed efficiency differences in young cattle corrected for differences in body composition.
181. **2003 Basarab, J.A.** Fall vs. Spring Calving, Animal Science 474, Univ. of Alberta, September, 2003.

182. **2003 Basarab, J.A.** Olds College 1st Annual Open House on Net Feed Efficiency, Mar., 2003
183. **2003 Basarab, J.A.** Matching the cow to the environment, Pasture School, Jun. 2003, Lacombe
184. **2003 Basarab, J.A.** Beef cattle Research at LRC, UFA Feed & Tack Seminar, Aug. 2003, Lacombe
185. **2003 Basarab, J.A.** Net Feed Efficiency, Troy Drake's Annual Beef Seminar, Dec, 2003, Calgary
186. **2003 Basarab, J.A.** Net Feed Efficiency, Agricultural Extension and Research Council of Alberta, Oct., 2003, Red Deer, AB
187. **2003 Basarab, J.A.** Sorting Cattle for the market, Winter Cow-Calf Feeding School, October 2003, Lacombe, AB
188. **2003 Basarab, J.A.** Plains Nutrition Council Spring Conference, San Antonio, TX
189. **2002 Basarab, J.A.** Western Nutrition Conference, Edmonton
190. **2002 Basarab, J.A.** Canadian Society of Animal Science Conference in Quebec City
191. **2002 Basarab, J.A.** Bull Congress, Camrose
192. **2001 Basarab, J.A.** Canadian Society of Animal Science Conference in Guelph
193. **2001 Basarab, J.A.** National Beef Science Seminar in Lethbridge.
194. **2000 Basarab, J.A.** Great Plains Nutrition Conference, San Antonio, TX
195. **2000 Basarab, J.A.** Feed Intake and Behaviour Workshop, San Antonio, TX
196. **2000 Basarab, J.A.** Understanding Variation: The Key to Managing Chaos, San Antonio, TX
197. **2000 Basarab, J.A.** Genetics of feed intake and efficiency in beef cattle Workshop, Lethbridge
198. **1999 Basarab, J.A.** Mid Winter Conference , Alberta Veterinary Medical Association Practical, Application of Animal
199. **1998 Basarab, J.A.** 30th Annual Meeting and Research Symposium, Beef Improvement Federation, Use of ultrasound to sort incoming feeder cattle to improve carcass uniformity.
200. **1998 Basarab, J.A.** 2nd Annual National Beef Science Seminar, The use of ultrasound in sorting feeder cattle to improve carcass uniformity"
201. **1998 Basarab, J.A.** Lacombe Research Centre. Proc., Nutritional and Genetic Factors Affecting Meat Quality.
202. **1998 Basarab, J.A.** Composite Cattle Breeders International Alliance Meeting, Calgary, The Optimum Cow.
203. **1998 Basarab, J.A.** Composite Cattle Breeders International Alliance Meeting, Calgary, Net feed efficiency.
204. **1998 Basarab, J.A.** Manitoba Grazing School, Winnipeg, Manitoba, Matching cattle to grass; Calving on grass.
205. **1996 Basarab, J.A.** Heilongjiang, China. Topics in Beef Herd Management and beef quality
206. **1996 Basarab, J.A.** San Diego, California. CowChip\$
207. **1995 Basarab, J.A.** Saskatoon, Sask. Minimizing dystocia.
208. **1993 Basarab, J.A.** Zacatecus, Mexico. Cow-calf short course.
209. **1992 Basarab, J.A.** Phoenix/Calgary, Proceedings, Matching Beef Cattle to the Western Environment. How do you use management information?

210. **1992 Basarab, J.A.** Pittsburgh, PA., American Society of Animal Science. The efficacy of predicting dystocia in beef heifers.
211. **1992 Basarab, J.A.** Idaho Falls, Idaho. Western Regional Workshop. Alberta's COWCHIP\$ program
212. **1991 Basarab, J.A.** Calgary. Alberta Bovine Practitioners. COWCHIP\$-A beef herd management tool.
213. **1991 Basarab, J.A.** Winnipeg. Canadian Bovine Practitioners. Increasing efficiency in the cow-calf herd.
214. **1991 Basarab, J.A.** Great Falls, Montana. International Beef Symposium. Economic impact of calving season pattern.
215. **1990 Basarab, J.A.** Edmonton. All-Alberta Applied Statistics and Biometrics Workshop. Discriminant analysis using dystocia in beef heifers.
216. **1990 Basarab, J.A.** Kinsella, Alberta. University of Alberta Beef Day. Feeding and Managing the beef herd.
217. **1989 Basarab, J.A.** Grande Prairie, Alberta. Peace Country Beef Day. Genetic influences on calving ease.
218. **1989 Basarab, J.A.** Bozeman, Montana. Western sections of the American and Canadian Societies of Animal Science. Production levels of cow-calf producers in North Central Alberta.
219. **1987 Basarab, J.A.** St. Andrew, New Brunswick. National Sheep ROP meetings. Sheep ROP technical Report.

Appendix B. Publications: Journal, proceedings, abstracts and posters

1. 2023 Sood V., Rodas-González, A., Valente, T.S., Virtuoso, M.C.S., Li, C., Lam, S., López-Campos, O., Segura, J., Basarab, J.A., Juárez, M. 2023. Genome-wide association study for primal cut lean traits in Canadian beef cattle. *Meat Sci.*, <https://doi.org/10.1016/j.meatsci.2023.109274>.
2. 2023 Manafiazar, G., Riazi, M., Basarab, J.A., Li, C., Stothard, P., and Plastow, G. 2021. Use of machine learning algorithms to predict residual feed intake value and classification groups in commercial beef cattle Smart Agricultural Technology, Manuscript Number: ATECH-D-23-00180.
3. 2023 Bonifazi, B., G. Plastow, M. Heidaritabar, A. Bowman, L. Chen, P. Stothard, J.A. Basarab, C. Li, the BovReg consortium, B. Gredler-Grandl. Biology-driven genomic predictions for dry matter intake within and across breeds using WGS data. Preferred session: Session 41: "EuroFAANG: genotype-to-phenotype research across Europe and beyond". Abstract.
4. 2022. Shirzadifar A., Miar Y., Plastow G., Basarab J.A., Li C., Fitzsimmons C., Riazi M., and Manafiazar G. A machine learning approach to predict the most and the least feed-efficient groups in beef cattle. *J. Anim. Sci.* in preparation.
5. 2022 Shirzadifar A., Plastow G., Basarab, J.A., Miar Y., Li C., Fitzsimmons C., Riyazi M., and Manafiazar G. 2022. A machine learning approach for predicting the most and the least feed-efficient groups in beef cattle. World Congress on Genetics Applied to Livestock Production (WCGALP), Rotherdam, The Netherlands, July 3-8, 2022.
6. 2022 Khakbazan, M., Block, H.C., Huang, J., Colyn, J.J., Baron, V.S., Basarab, J.A., Li, C. and Ekine-Dzivenu, C. 2022. Effects of Silage-Based Diets and Cattle Efficiency Type on Performance, Profitability, and Predicted CH₄ Emission of Backgrounding steers. *Agriculture* 2022, 12, 277. <https://doi.org/10.3390/agriculture12020277>
7. 2022 Behrouzi, A., Carolyn Fitzsimmons, Lisa McKeown, John Basarab, and Edward Bork. 2022. Methane and carbon dioxide emissions from crossbred beef cattle grazing native pastures. 8th International Greenhouse Gas and Animal Agriculture Conference (GGAA), Orlando, Florida, June 5-10, 2022, abstract.
8. 2021 Manafiazar, G., Riazi, M., Basarab, J.A., Li, C., Stothard, P., and Plastow, G. 2021. Use of machine learning algorithms to predict residual feed intake value and classification groups in commercial beef cattle. ASAS/CSAS, Kentucky, USA. Abstract.

9. 2021 Vipasha Sood, Argenis Rodas-González, Stephanie Lam, Óscar López-Campos, Jose Segura, Timothy Schwinghamer, Michael Dugan, John Basarab, Jennifer Aalhus, Manuel Juárez. 2021. Understanding the influence of production factors on beef primal tissue composition.
10. 2021 Manafiazar, G., Riazi, M., Basarab, J.A., Li, C., Stothard, P., and Plastow, G. 2021. Investigating use of machine learning algorithms to predict days in herd in commercial beef cows. ASAS/CSAS, Kentucky, USA. Abstract.
11. 2021 Basarab, J.A., Li, C., Stothard, P., Fitzsimmons, C. and Plastow, G. 2021. Use of genomic tools to improve production efficiency, health resilience and carbon footprint of beef production. ASAS/CSAS, Kentucky, USA. Abstract.
12. 2021 Abo-Ismael, M.K., Akanno, E.C., Crowley, J., Manafiazar, G., Chen, L., Li, C., MacNeil, M.D., Stothard, P., Basarab, J.A., and Plastow, G.S. 2021. Assessing genetic diversity and selection signatures in Canadian beef cattle populations. New Frontiers. Abstract.
13. 2021 Manafiazar, G., Fitzsimmons, C., Zhou, M., **Basarab, J.A.**, Baron, V.S., McKeown, L., and Guan, L.L. 2020. Association between fecal methanogens with methane production and grazed forage intake from beef heifers previously classed for residual feed intake in drylot conditions. *Animal*, 15:1-10. <https://doi.org/10.1016/j.animal.2021.100304>
14. 2020 Hailemariam, D., Ghader Manafiazar, **Basarab, J.A.**, Paul Stothard, Filippo Miglior, Graham Plastow and Zhiqian Wang. 2020. Comparative analyses of enteric methane emissions and disease indicator traits in feed efficient and inefficient dairy cows. *Can. J. Anim. Sci.*, accepted, 5Oct2020.
15. 2020 Cook, N., Chabot, B., Liu, T., Froehlich, D., Basarab, J., and Juarez, M. 2020. Radiated temperature from thermal imaging is related to feed consumption, growth rate and feed efficiency in grower pigs. *J. Thermal Bio.* Available online 5 October 2020, <https://doi.org/10.1016/j.itherbio.2020.102747>
16. 2020 Manafiazar, G., Flesch, T.K., Baron, V.S., McKeown, L., Byron, B., Block, H., Ominski, K., Plastow, G., and **Basarab, J.A.** 2020. Methane and carbon dioxide emissions and grazed forage intake from pregnant beef heifers previously classified for residual feed intake under drylot conditions. *Can. J. Anim. Sci.*, 10.1139/CJAS-2019-0182.
17. 2020 Olson C.A., Changxi Li, Hushton C. Block, Lisa McKeown, **Basarab, J.A.** 2020. Phenotypic and genetic correlations of beef replacement heifer feeding behavior, feed intake, feed efficiency with cow performance and lifetime productivity. *J. Animal Breeding and Genetics*, accepted 4 October 2020.
18. 2020 Olson C.A., Changxi Li, Hushton C. Block, Lisa McKeown, **Basarab, J.A.** 2020. Phenotypic and genetic correlations between feeding behaviours and feed efficiency in crossbred beef replacement females. *Can. J. Anim. Sci.* published on the web 15 May 2020, <https://doi.org/10.1139/CJAS-2019-0212>.
19. Terry, S.A., **Basarab, J.A.**, Guan, L. and McAllister, T.A. 2020. Invited Review: Strategies to improve the efficiency of beef cattle production. *Can. J. Anim. Sci.*, <https://doi.org/10.1139/CJAS-2020-0022>.
20. 2019 Abo-Ismael, M.K., J. Crowley, G.M. Manafiazar, C. Li, M. Sargolzaei, P. Stothard, G. Plastow, and **Basarab, J.A.** 2019. Genome-wide association studies for female fertility and lifetime productivity in beef cattle. The Plant and Animal Genomic XXVII conference, San Diego, CA. USA, January 12-16, 2019. Poster.
21. 2019 Akanno, E.C., C. Ekine-Dzivenu, L. Chen, M. Vinsky, M. K. Abo-Ismael, M. D. MacNeil, G. Plastow, **Basarab, J.A.**, C. Li, C. Fitzsimmons. 2019. Evaluation of a genomic-enhanced sorting system for feeder cattle. *J. Anim. Sci.* 97, 1066-1075. doi: 10.1093/jas/skz026.
22. 2019 Zhang, F., Wang, Y., Mukibi, R., Chen, L., Vinsky, M., Plastow, G., **Basarab, J.A.**, Stothard, P., and Li, C. 2019. Genetic architecture of quantitative traits in beef cattle revealed by genome wide association studies of imputed whole genome sequence variants: I: feed efficiency and component traits. *BMC Genomics* GICS-D-19-01044R5.

23. 2019 Li, C., Yining Wang, Feng Zhang, Robert Mukiibi, Lihong Chen, Michael Vinsky, Graham Plastow, **Basarab, J.A.**, Paul Stothard. 2019. Genetic architecture of quantitative traits in beef cattle revealed by a genome wide association study of imputed whole genome sequence variants: II: carcass merit traits. BMC Genomics GICS-D-19-01045.
24. 2019 Manafiazar G., **Basarab, J.A.**, Li C¹, Ekine-Dzivenu C., Akanno E., Abo-Ismael M., Plastow G. and Fitzsimmons C. 2019. Genomic Prediction of Methane Production in Beef Cattle. The Plant and Animal Genomic XXVII conference, San Diego, CA. USA, January 12-16, 2019. Poster.
25. 2019 Manafiazar, G., Baron, V.S., McKeown, L., Block, H., Ominski, K., Plastow, G., and **Basarab, J.A.** 2019. Methane and carbon dioxide emissions from yearling beef heifers and mature cows classified for residual feed intake under drylot conditions. Can. J. Anim. Sci., <https://doi.org/10.1139/CJAS-2019-0032>.
26. 2018 Abo-Ismael, M.K., J. Crowley, G. Manafiazar, E. C. Akanno, D. Trautman, C. Li, M. MacNeil, M. Miller, D. Berry, P. Stothard, G. Plastow, **Basarab, J.A.** 2018. EnVigour HXTM for composite and crossbred beef cattle producers. Canadian Beef Industry Conference Poster Competition 2018, August 14-16, London, Ontario, Canada.
27. 2018 Abo-Ismael, M.K., N. Lansink, E. Akanno, B.K. Karisa, J.J. Crowley, S.S. Moore, E. Bork, P. Stothard, **Basarab, J.A.**, and G.S. Plastow. 2018. Development and validation of a small SNP panel for feed efficiency in beef cattle. J. Anim. Sci. 96(2): 375–397. Published online 2018 Jan 30. doi: 10.1093/jas/sky020.
28. 2018 Abo-Ismael, M.K., J. J. Crowley, D. Berry, C. Li, P. Stothard, G. Plastow, and **Basarab, J.A.** 2018. Genome-wide association studies for feed efficiency traits in beef cattle. The Plant and Animal Genomic XXVII conference, San Diego, CA. USA, January 12-16, 2019. Poster.
29. 2018 Akanno, E.C., C. Ekine-Dzivenu, L. Chen, L. McKeown, B. Irving, L. Baker, M. Vinsky, S. Miller, Z. Wang, J. Crowley, M. Colazo, D. Ambrose, M. Juarez, H. Bruce, M. K. Abo-Ismael, M. D. MacNeil, J. **Basarab, J.A.**, G. Plastow, C. Li, C. Fitzsimmons. 2018. Evaluation of a genome-based sorting system for feeder cattle. ASAS-CSAS JAM meeting, 8-12 July 2018, Vancouver, BC, Canada.
30. 2018 Akanno, E.C., Lihong Chen, Mohammed K. Abo-Ismael, John J. Crowley, Zhiquan Wang, Changxi Li, **Basarab, J.A.**, Michael D. MacNeil, Graham S. Plastow. 2018. Genome-wide association scan for heterotic quantitative trait loci in multi-breed and crossbred beef cattle. *Genet. Sel. Evol.* 50:48, <https://doi.org/10.1186/s12711-018-0405-y>
31. 2018 **Basarab, J.A.**, J.J. Crowley, M.K. Abo-Ismael, G.M. Manafiazar, E. C. Akanno, V.S. Baron, and G. Plastow. 2018. Genomic retained heterosis effects on fertility and lifetime productivity in beef heifers. Can. J. Anim. Sci., <https://doi.org/10.1139/CJAS-2017-0192>.
32. 2018 Callum, C., Ominski, K.H., Crow, G., Zvomuya, F. and **Basarab, J.A.** 2018. Relationship between residual feed intake classification as a heifer and lifetime productivity of beef cattle. Can. J. Anim. Sci., 99(1): 191-201, <https://doi.org/10.1139/cjas-2018-0002>
33. 2018 Flesch, T.K., Baron, V.S., Wilson, J.D., **Basarab, J.A.**, Desjardins, R.L., Worth, D., and Lemke, R.L. 2018. Micrometeorological Measurements Reveal Large Nitrous Oxide Losses during Spring Thaw in Alberta. *Atmosphere*, 9(4), 128; <https://doi.org/10.3390/atmos9040128>
34. 2018 Manafiazar, G., Baron, V.S., McKeown, L., Ominski, K., Plastow, G., and **Basarab, J.A.** 2018. Methane and carbon dioxide emissions from yearling beef heifers and mature cows classified for residual feed intake (RFI) under drylot conditions. Canadian Beef Industry Conference Poster Competition 2018, August 14-16, London, Ontario, Canada. 2017
35. 2018 Thompson, S., A.L. Schaefer, G.H. Crow, **Basarab, J.A.**, J. Colyn, and K. Ominski. 2018. Relationship between residual feed intake and radiated heat loss using infrared thermography in young beef bulls. J. Thermal Biology, 78:304-311; DOI: 10.1016/j.jtherbio.2018.10.007

36. 2018 Valente, T.S., M.K. Abo-Ismael, J. Crowley, **Basarab, J.A.** and G. Plastow. 2018. Genetic correlation estimates between feeding behavior and feed efficiency traits in beef cattle. International Society for Applied Ethology, Chile, December 2018.
37. 2018 Wang, Y., F. Zhang, L. Chen, M. Vinsky, J. J. Crowley, S. P. Miller, G. Plastow, **Basarab, J.A.**, P. Stothard and C. Li. 2018. Genomic Prediction for Residual Feed Intake and its Component Traits Based on 50K and Imputed 7.8 Million Whole Genome Sequence SNPs in Multiple Breed Populations of Canadian beef cattle. 2018 ASAS-CSAS conference, Vancouver July 8 to 12; poster.
38. 2017 Abo-Ismael, M.K., J. Crowley, E. C. Akanno, G. Manafiazar, C. Li, G. Plastow, M. D. MacNeil, D. Berry, P. Stothard, and **Basarab, J.A.** 2017. Genomic profiles to assess accuracy of breed composition and hybrid vigor in crossbred beef cattle. 36th International Society of Animal Genetics (ISAG) Conference, Dublin, July 16 to 21, 2017.
39. 2017 Akanno, E. C., Ekine-Dzivenu, C., Aboismael, M. K., McKeown, L., Irving, B., Baker, L., Vinsky M., Wang Z, Crowley J., MacNeil, M. D., Plastow, G, **Basarab, J.A.**, Li, C., Fitzsimmons C. 2017. Repeatability of maternal productivity of cows selected for post-weaning residual feed intake using molecular breeding values. Livestock Gentec Conference, 17-18 October, 2017, Edmonton, AB, Canada.
40. 2017 Akanno, E.C., C. Ekine-Dzivenu, M. K. Abo-Ismael, M. D. MacNeil, C. Li, C. Fitzsimmons, Z. Wang, **Basarab, J.A.** and G. Plastow. 2017. Impact of genomic selection for feed efficiency on heifer reproduction and calf performance traits. 36th International Society of Animal Genetics (ISAG) Conference, Dublin, July 16 to 21, 2017. Poster.
41. 2017 Akanno, E.C., L. Chen, M.K. Abo-Ismael, J.J. Crowley, Z. Wang, C. Li, **Basarab, J.A.**, M.D. MacNeil, and G. Plastow. 2017. Genomic prediction of breed composition and heterosis effects in Angus, Charolais, and Hereford crosses using 50k genotypes. Can. J. Anim. Sci., 97(3): 431-438, <https://doi.org/10.1139/cjas-2016-0124>
42. 2017 Alemu, A.W., Vyas, D., Manafiazar, G., **Basarab, J.A.**, and Beauchemin, K.A. 2017. Enteric methane emissions from low- and high-residual feed intake beef heifers measured using GreenFeed and respiration chamber techniques. J. Anim. Sci., 95(8):3727-3737. doi: 10.2527/jas.2017.1501.
43. 2017 Ekine-Dzivenu, C., E. C. Akanno, L. Chen, L. McKeown, B. Irving, L. Baker, M. Vinsky, S. Miller, Z. Wang J. Crowley, M. Colazo, D. Ambrose, M. Juarez, H. Bruce, M. D. MacNeil, G. Plastow, **Basarab, J.A.**, C. Li, C. Fitzsimmons. 2017. Performance evaluation for feed efficiency and growth in progeny of parents selected for low residual feed intake - The "Kinsella Breeding Project", results following two years of selection. Livestock Gentec Conference, 17-18 October, 2017, Edmonton, AB, Canada
44. 2017 Ekine-Dzivenu, C., E. C. Akanno, L. Chen, L. McKeown, B. Irving, L. Baker, M. Vinsky, S. Miller, Z. Wang J. Crowley, M. Colazo, D. Ambrose, M. Juarez, H. Bruce, M. D. MacNeil, G. Plastow, **Basarab, J.A.**, C. Li and C. Fitzsimmons. 2017. Improvement of cow feed efficiency using molecular breeding values for residual feed intake - The "Kinsella Breeding Project". World Congress on Genetics Applied to Livestock Production (New Zealand, February 11-16, 2018).
45. 2017 Ekine-Dzivenu, C., M. Vinsky, **Basarab, J.A.**, J. L. Aalhus, M. E.R. Dugan, & C. Li. 2017. Genetic correlations of fatty acid composition in the subcutaneous adipose tissue with meat quality and sensory attributes in beef cattle. World Congress on Genetics Applied to Livestock Production (New Zealand, February 11-16, 2018).
46. 2017 Ekine-Dzivenu, C., M Vinsky, **Basarab, J.A.**, J L Aalhus, M E R Dugan, C Li. 2017. Phenotypic and genetic correlations of fatty acid composition in subcutaneous adipose tissue with carcass merit and meat tenderness traits in Canadian beef cattle. J. Anim. Sci., 95(12):5184-5196; doi: 10.2527/jas2017.1966.
47. 2017 Flesch, T.K., **Basarab, J.A.**, Baron, V.S., Wilson, J.D., Hu, N., Tomkins, N.W., and Ohama, A.J. 2017. Methane emissions from cattle grazing under diverse conditions: An examination of field

configurations appropriate for line-averaging sensors. *Agricultural and Forestry Meteorology*, Available online 14 October 2017, <https://doi.org/10.1016/j.agrformet.2017.10.012>

48. 2017 Hailemariam, D., G. Manafiazar, **Basarab, J.A.**, F. Miglior, G. Plastow, and Z. Wang. 2017. Association of residual feed intake with disease indicator traits in Holsteins. ADSA 2017 (June 25-28 Pittsburgh, Pennsylvania).
49. 2017 Hailemariam, D., T. Yang, J. Li, **Basarab, J.A.**, C. Baes, G. Plastow, P. Stothard, F. Miglior and Z. Wang. 2017. Parameter estimation of milk Mid-infrared spectra in Canadian Holsteins. World Congress on Genetics Applied to Livestock Production (New Zealand, February 11-16, 2018).
50. 2017 Johnson, J.R., G. E. Carstens, S. D. Prince, K. H. Ominski, K. M. Wittenberg, M. Undi, T. D. A. Forbes, A. N. Hafla, D. R. Tolleson, and **Basarab, J.A.** 2017. Evaluation of fecal near-infrared reflectance spectroscopy profiling technology to predict forage intake estimated using -alkane markers in grazing cattle. *J. Anim. Sci.*, 95(supplement4):55, DOI: 10.2527/asasann.2017.112
51. 2017 Johnson, J.R., G.E. Carstens, S.D. Prince, K.H. Ominski, K.M. Wittenberg, M. Undi, T.D.A. Forbes, A.N. Hafla, D.R. Tolleson, and **Basarab, J.A.** 2017. Application of fecal near-infrared reflectance spectroscopy profiling for the prediction of diet nutritional characteristics and voluntary intake in beef cattle. *J. Anim. Sci.*, 95(1):447-454; doi: 10.2527/jas.2016.0845.
52. 2017 Manafiazar, G., **Basarab, J.A.**, McKeown, L., Stewart-Smith, J., Baron, V., MacNeil, M. D., and Plastow, G. 2017. Optimizing feed intake recording and feed efficiency estimation to increase the rate of genetic gain for feed efficiency in beef cattle. *Can. J. Anim. Sci.* 97: 456–465 (2017) [dx.doi.org/10.1139/cjas-2016-0118](https://doi.org/10.1139/cjas-2016-0118)
53. 2017 Valente, T.S., M.K. Abo-Ismael, J. Crowley, **Basarab, J.A.**, G. Plastow. 2017. Genomic insights for feeding behavior traits in crossbred beef cattle. World Congress on Genetics Applied to Livestock Production (New Zealand, February 11-16, 2018).
54. 2017 Zhang, F., Wang, Y., Chen, L, Vinsky M., Crowley, J. J., Plastow, G., **Basarab, J.A.**, Stothard, P. and Li, C. 2017. Genome wide association studies for feed efficiency traits based on imputed 7.8 million whole genome sequence SNPs in multi-breed populations of Canadian beef cattle. Livestock Gentec Conference, 17-18 October, 2017, Edmonton, AB, Canada.
55. 2017 Manafiazar, G., Zimmerman, S, and. **Basarab, J.A.**. 2017. Repeatability and variability of short-term spot measurement of CH₄ and CO₂ emissions from beef cattle using GreenFeed Emissions Monitoring System. *Can. J. Animal. Sci.* 97: 118–126 (2017) [dx.doi.org/10.1139/cjas-2015-0190](https://doi.org/10.1139/cjas-2015-0190).
56. 2016 Mahmood, S., **Basarab, J.A.**, W. Dixon, and H.L. Bruce. 2016. Can potential for dark cutting be predicted by phenotype? Relationships between sex, carcass characteristics and the incidence of dark cutting beef. *Can. J. Anim. Sci.* 96: 19-31.
57. 2016 Mahmood, S., **Basarab, J.A.**, W.T. Dixon, and H.L. Bruce. 2016. Relationship between phenotype, carcass characteristics and the incidence of dark cutting in heifers. *Meat Science*, 121: 261-271; DOI: 10.1016/j.meatsci.2016.06.020
58. 2016 Abo-Ismael, M.K., R. Khorshidi, E. C. Akanno, J. Crowley, S. P. Miller, A. Fleming, **Basarab, J.A.**, C. Li, P. Stothard, and G. Plastow. 2016. Understanding the genetic architecture of Hays Converter Cattle. 2016 Joint Annual Meeting (ADSA, ASAS, WSASAS, CSAS), Salt Lake City, Utah, July 19-23, *abstract*.
59. 2016 Abo-Ismael, M.K., E. C. Akanno, R. Khorshidi, J. Crowley, L. Chen, B. Karisa, X. Li, Z. Wang, **Basarab, J.A.**, C. Li, P. Stothard, and G. Plastow. 2016. Assessing genetic diversity in Canadian beef cattle populations using Illumina BovineSNP50 chip. 2016 Joint Annual Meeting (ADSA, ASAS, WSASAS, CSAS), Salt Lake City, Utah, July 19-23. *abstract*.
60. 2016 Abo-Ismael, M.K., J. Crowley, E. C. Akanno, G. Manafiazar, C. Li, M. MacNeil, M. Miller, D. Berry, P. Stothard, G. Plastow, **Basarab, J.A.** 2017. Genomic tool for breed composition and hybrid vigor in crossbred beef cattle. Livestock Gentec Conference, 17-18 October, 2017, Edmonton, AB, Canada.

61. 2016 Abo-Ismael, M.K., Lansink, N., Akanno, E., Karisa, B., Crowley, J., Moore, S., Miller, S., Stothard, P., Bork, E., **Basarab, J.A.**, and G. Plastow. 2016. Validation of a small panel for feed efficiency in beef cattle. Livestock Gentec Conference, 18-19 October 2016, Edmonton, AB, Canada.
62. 2016 Akanno, E., L. Chen, C. Li, M. K. Aboismail, **Basarab, J.A.**, and G. Plastow. 2016. Accuracy of genome-wide predictions of heterosis in beef cattle using 50K genotypes. ISAG conference, Salt Lake city, UT, USA. Poster.
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Appendix C. Reports

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Appendix D. Popular Press, Extension Publications and Newsletters

1. Presentation and heifer demonstration at AgSmart, August 10-11, 2021 & 2022, Olds College. The presentation is titled "Use of genomic tools to improve production efficiency, health resilience and carbon footprint of beef production".
2. Interviewed for an article on Value of hybrid vigour for commercial beef cattle. Dianne Finstad article "Re'invigor'ate Your Herd " for the Alberta Beef Producers, July 2021
3. 8. Interviewed on presentation at Joint ASAS-CSAS Annual Conference, Louisville, Kentucky, July 16, 2021. The presentation is titled "Use of genomic tools to improve production efficiency, health resilience and carbon footprint of beef production" by Basarab, Li, Stothard, Fitzsimmons and Plastow. Article will be written by Sylviane Duval for the July 2021 issue of the Gentec Newsletter.
4. Presentation to Emissions Reduction Alberta: Demonstrating the impact of genomics-enhanced whole herd genetic management platform on reducing beef greenhouse gas emissions. Li et al. January 27, 2021.
5. Presentation and panelist: Methane emissions from low and high RFI beef cattle. Emissions Reduction Alberta Lessons Learned Workshop, 20 April 2021, 200+ participants on-line.
6. Interview for New Trails feature article: The Future of Food Starts Now: The Future of Beef is Resilient by Lisa Szabo, May 2021.
7. Interview for television/radio with Diane Finstad, Agriculture reporter. Crossbreeding and EnVigour HX. May 4, 2021.
8. Invited presentation at ASAS/CSAS meeting, July 14-18, 2021, Louisville, Kentucky.
9. Contributed to five articles in the Livestock Gentec Newsletter: Feed Additives and Genomics. Can cows be made to produce less GHG? November 2020; New feed ingredients reduce methane emissions, December, 2020; Consistent genetic selection for RFI brings economic and environmental results! December, 2020; CBIN: If you build it, they will come, April 2021; Algae eating cows won't have a dramatic effect o GHG, May 2021.
10. **2019 Basarab, J.A.** Genome Alberta MLA Reception. Genome Alberta, Oct 28, 2019, David Bailey, CEO of Genome Alberta, introduced the Minister of Agriculture and Forestry, the honorable Devin Dreeshen, and recognized the accomplishments of the gEPD Sustainable Beef Team (J.A. Basarab, G. Plastow, M.Miller). Michelle Miller, director of Neogen Canada, told the story of how EnVigour HX™ was developed and commercialized.
11. **2019 Basarab, J.A.** Beef Project Gets to Meat of the Issue. Genome Alberta, Sept 4, 2019, <http://genomealberta.ca/livestock/beef-project-gets-to-meat-of-the-issue.aspx>
12. **2019 Basarab, J.A.** Project Outcome May Boost your Income. Genome Alberta, Oct 5, 2019. <http://genomealberta.ca/livestock/project-outcome-may-boost-your-income.aspx>
13. 2019 M.K. Abo-Ismael. Research Plays Matchmaker with Genes and Traits, 2019-01-01, <http://genomealberta.ca/livestock/research-plays-matchmaker-with-genes-and-traits.aspx>
14. **2019 Basarab, J.A.** Student Genome Research in a Class by Itself. Genome Alberta, Mar 1, 2019, <http://genomealberta.ca/livestock/student-genome-research-in-a-class-by-itself.aspx>
15. **2018 Basarab, J.A.** Using science to boost hybrid vigour, Canadian Cattlemen's Magazine, 2018-01-04, <https://www.canadiancattlemen.ca/sponsored/using-science-to-boost-hybrid-vigour/>

16. 2018 T.S. Valente. Genomic insights for feeding behavior traits in beef cattle, World Congress on Greenhouse Gas applied to Livestock Production, 2018-02-11, <http://www.wcgalp.org/proceedings/2018/genomic-insights-feeding-behavior-traits-beef-cattle>
17. 2018 Miller, M. New genomic tool aims to "EnVigour"-ate beef cattle, Genome Alberta, 2018-03-01, <http://genomealberta.ca/livestock/new-genomic-tool-aims-to-envigourate-beef-cattle.aspx>
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22. 2018 T.S. Valente. Research Plays Weighting Game with Carcass Traits, Genome Alberta, 2018-12-01, <http://genomealberta.ca/livestock/research-plays-weighting-game-with-carcass-traits.aspx>
23. 2018 Plastow, G. Genomic tools for crossbred cattle in the works, Canadian Cattlemen: The Beef Magazine, 2018-12-14, <https://www.canadiancattlemen.ca/2018/12/14/genomic-tools-for-crossbred-cattle-in-the-works/?module=carousel&pgtype=homepage&i=1>
24. 2017 Kirill Krivushin. In cattle genomics, variation is the spice of life, Genome Alberta, 2017-05-01, <http://genomealberta.ca/livestock/in-cattle-genomics-variation-is-the-spice-of-life.aspx>
25. 2017 **Basarab, J.A.** Using genomics to beef up meat quality, Genome Alberta, 2017-06-01, <http://genomealberta.ca/livestock/using-genomics-to-beef-up-meat-quality.aspx>
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49. 2014 Markus, S. and **Basarab, J.A.** Manitoba Beef Producers annual general meeting Brandon, MB February 4&5, Trade show area booth display with research posters and Brandon AAFC heifer cut-outs ("Can you tell by looking" which one is most efficient?)
50. 2014 Markus, S. and **Basarab, J.A.** Published in Alberta Beef magazine and Beef Illustrated newspaper March issues – 1. "Making Progress with RFI and 2. Frequently asked questions about RFI"
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65. 2013 Markus, S. and **Basarab, J.A.** Farm Fair International, Edmonton Alberta November 5-9, 2013 Genomics Showcase display with research posters on RFI , cow efficiency plus interactive display with Brandon AAFC heifer cut-outs ("Can you tell by looking" which one is most efficient?) Also at Farm Fair, Markus developed and executed a workshop with 80 4H members to show them the value of DNA collection and the future of cattle selection with genomics by creating their own DNA spit necklaces – this is also part of the cow efficiency project for youth awareness on the topic.
66. 2013 Markus, S. and **Basarab, J.A.** Canadian Western Agribition, Regina, SK November 11-16, 2013 "The Yards" display space with GrowSafe Systems of Airdrie AB to show research posters plus GrowSafe individual feed intake equipment and answer producer questions. We had discussions on the research and technology with delegations from US, Australia and Uruguay in addition to local cattle producers.
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Appendix E. Thesis

1. **Basarab, J.A. 1981.** Ph.D. thesis. Genetic and physiological characterization of the double muscled syndrome in cattle. University of Alberta. pp. 1-157.

Thesis Committees

1. **Amir Behrouzi.** 2021-2024, Ph.D. Genetic and phenotypic correlations between methane emissions and feed efficiency in dairy and beef cattle. Co-supervised with E. Bork and C. Fitzsimmons; University of Alberta.
2. **Nahid Bandi Kenari,** 2019-2023, Ph.D. Detection and validation of fertility haplotypes in large purebred beef populations using whole genome sequencing data. Co-supervised with Dr. Paul Stothard and Dr. Changxi Li.
3. **Ben Lahart, 2017-2020, Ph.D.** Improving efficiencies of dairy and beef cattle in pasture-based systems. Supervisors: Dr. Emer Kennedy, Prof. Frank Buckley, Prof. Tommy Boland; External JA Basarab
4. **Cameron Olson.** 2018-2022, Ph.D. Identification of feed intake traits related to beef reproductive improvement. Co-supervised with Dr. Changxi Li; University of Alberta. PhD Candidacy Exam for Cameron Olson, 18 September 2019; completed January 2022.
5. **Sheila Hadina,** PhD Thesis defense, 10 July 2019. Effect of Metabolizable Energy Intake on Metabolism and Reproduction of Broiler Breeders Fed by Precision Feeding System.
6. **Brittany L. Byron.** 2015-2018. MSc. co-supervised with Dr. Kim Ominski, University of Manitoba. Relationship between RFI classification and intake on pasture using: i) NRC calculation ii) NIR and iii) Greenfeed systems using alkane marked feed to measure intake on pasture

7. **Lindsey Doris Lippens.** 2015-2018. MSc. co-supervised with Dr. Kim Ominski, University of Manitoba. The phenotypic relationships between residual feed intake, feeding behaviour and temperament in Western Canadian beef cattle.
8. **Isaac Asante Aboagye.** MSc. candidacy Exam, 13th December 2017. Mitigating enteric methane production and nitrogen excretion from forage-fed ruminants
9. **Tawnya R. Ullenboom.** The Relationship between Enteric Methane Emissions and Feed Efficiency in Growing Angus Beef Bulls. M.Sc. Aug 2016. University of Manitoba. M.Sc Thesis completed.
10. **Carson Callum.** Relationship between RFI, fertility, and lifetime reproductive efficiency in beef heifers and cows. M.Sc. Aug 2016. University of Manitoba. M.Sc Thesis completed.
11. **Obioha Nnamdi Durunna.** 2009-2011. Ph.D., co-supervised with Drs. Wang and Moore; University of Alberta. GENETICS OF FEED EFFICIENCY AND FEEDING BEHAVIOR IN CROSSBRED BEEF STEERS WITH EMPHASIS ON GENOTYPE-BY-44 ENVIRONMENT INTERACTIONS.
12. **Peter Lawrence.** PhD Thesis defense, 27 January 2012. University College Dublin, Ireland. The effect of divergent selection for residual feed intake on the maternal productivity of suckler beef production
13. **Anne-Marie Clarke.** PhD. candidacy Exam, 19 May 2009. University College Dublin, Ireland. Validation of a genetic index for beef production in Ireland
14. **Galbraith, J. 2007-2010.** Ph.D., co-supervisor, Effects of pre-harvest traits on meat quality, University of Alberta
15. **Mujibi, D. 2006-2009.** Ph. D., co-supervisor, Harnessing quantitative trait loci for marker-assisted selection, University of Alberta.
16. **Anne-Marie Clarke. 2006-2009.** Validation of a genetic index for beef production in Ireland. Supervisors: Dr. Michael Drennan, Dr. Donagh Berry, and Dr. David Kenny; External JA Basarab.
17. **Colyn, J. 2006-2008.** M.Sc., co-supervisor, Relationships between infrared thermography and residual feed intake, University of Alberta
18. **Bourne, J. 2006.** M. Sc., co-supervisor, Evaluation of the NRC 1996 winter feed requirements for beef cattle, University of Saskatchewan
19. **Nkrumah, D.J. 2006.** Ph.D. thesis. Genomic and Metabolic Mechanisms Leading to Variation in Feed Intake, Feed Efficiency, and Behaviour of Beef Cattle. University of Alberta. Pp. 1-392.
20. **Pang, H. 1997.** Ph.D. thesis. Simulation studies on the effects of cow size, milk production and calving season on the bioeconomic efficiency of beef production. University of Alberta. pp. 1-193.
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