# Summary of Agriculture Development Fund Livestock Projects for 2022

| Institution | Number of Approved Projects | Total Amount Funded |
|---|---|---|
| Agriculture and Agri-Food Canada | 2 | $412,085 |
| Alberta Biodiversity Monitoring Institute | 1 | $325,000 |
| Global Institute for Food Security at the U of S | 2 | $764,130 |
| Prairie Diagnostic Services Inc. | 2 | $347,261 |
| Prairie Swine Centre Inc. | 4 | $667,952 |
| Saskatchewan Forage Council | 1 | $27,291 |
| Saskatchewan Pork Development Board | 1 | $150,000 |
| University of Saskatchewan | 12 | $1,757,978 |
| VIDO | 3 | $650,500 |
| **Total** | **28** | **$5,102,197** |

| Commodity | Number of Approved Projects | Total Amount Funded |
|---|---|---|
| Beef | 8 | $1,325,022 |
| Beef /Dairy | 1 | $118,100 |
| Bison | 1 | $208,346 |
| Dairy | 2 | $434,828 |
| Forages | 5 | $1,171,070 |
| Honeybees | 1 | $149,000 |
| Pasture | 2 | $362,879 |
| Poultry | 1 | $165,000 |
| Swine | 7 | $1,167,952 |
| **Total** | **28** | **$5,102,197** |

| Livestock Projects Co-funders | Total Amount Co-funded |
|---|---|
| Saskatchewan Cattlemen's Association | $447,956 |
| Saskatchewan Forage Seed Development Commission | $3,478 |
| Sask Milk | $31,504 |
| **Total** | **$482,938** |

## Agriculture and Agri-Food Canada

**Whole Genome Sequencing of Sainfoin: An Invaluable Resource for a Future of Sustainable Beef and Dairy Production Systems** (*20210577)*

Principle Investigator: Stacy Singer, Agriculture and Agri-Food Canada
Objectives:

- Perform functional annotation of the assembled sainfoin genome
- Generate an open access, publicly-available sainfoin genome database for forage breeders
- Assemble the first high-quality draft sainfoin reference genome sequence to facilitate Canadian forage breeding research

Co-funded By: Saskatchewan Cattlemen's Association
**ADF Funding: $86,807**

**Exploring the Potential of Including Chicory in Pasture for Beef Cattle** (*20210673)*

Principle Investigator: Aklilu Alemu, Agriculture and Agri-Food Canada
Objectives:

- Assess the effects of forage chicory on soil health, soil organic matter, root biomass and nutrient accumulation in the root
- Investigate the impacts of grazing chicory as summer pasture on nutrient consumption and animal performance
- Assess the impacts of forage chicory on animal heath (nematode parasite load) and enteric methane production
- System cost-benefit analysis
- Assess plant survival and yield persistency of forage chicory over four years of production under grazing and cutting/harvest
- Characterize the yield and nutritional quality of forage chicory, as fresh biomass and conserved feed (hay or silage)

Co-funded By: Saskatchewan Cattlemen's Association
**ADF Funding: $325,278**

## Alberta Biodiversity Monitoring Institute

**Characterizing the Contribution of the Saskatchewan Beef Industry to Biodiversity** (*20210785)*

Principle Investigator: Majid Iravani, Alberta Biodiversity Monitoring Institute
Objectives:

- Characterize beef cattle land-use footprint throughout the Saskatchewan beef industry
- Characterize impacts of the Saskatchewan beef industry on local and regional biodiversity
- Communicate the contribution of the Saskatchewan beef industry to biodiversity
- Characterize land units and predictive habitat models for biodiversity assessment of the Saskatchewan beef industry

**ADF Funding: $325,000**

## Global Institute for Food Security at the University of Saskatchewan

**Genomic Analysis of Alfalfa for the Development of Drought and Salt Tolerant Germplasm for Breeding Programs** (*20210808)*

Principle Investigator: Andrew Sharpe, Global Institute for Food Security at the University of Saskatchewan

Objectives:

- Characterize salt and drought tolerance traits by phenotyping and deep genotyping
- Characterize alfalfa germplasm resources to investigate genomic diversity
- Identify allelic variation associated with salt and drought tolerance using genomic association analysis
- Use genetic markers and genomic selection in breeding programs
- Develop high-quality reference genomes for diploid and autotetraploid alfalfa and pangenome analysis

Co-funded By: Saskatchewan Cattlemen's Association

**ADF Funding: $392,391**

**Genomic Characterization of the Prairie Forage Crop Hybrid Wheatgrass (*Elymus Hoffmanni*) and its Parental Ancestors** (*20210933)*

Principle Investigator: Andrew Sharpe, Global Institute for Food Security at the University of Saskatchewan

Objectives:

- Genome-wide association studies (GWAS) of traits suitable for breeding programs
- Create foundational genomic resources for wheatgrass and quackgrass species
- Utilization of markers and genomic selection in breeding programs
- Characterization of germplasm resources to investigate genomic diversity
- Phenotypic and deep genotypic characterization for salt and drought tolerance traits

Co-funded By: Saskatchewan Cattlemen's Association

**ADF Funding: $371,739**

## Prairie Diagnostic Services Inc.

**Antimicrobial Control of European Foulbrood (EFB) in the Beekeeping Industry in Western Canada** (*20210569)*

Principle Investigator: Sarah Wood, Prairie Diagnostic Services Inc.

Objectives:

- To determine efficacy of antimicrobials for treatment of honey bee larvae with European foulbrood (EFB)
- To determine efficacy of antimicrobials for treatment of adult workers infected with *Melissococcus plutonius*
- To determine efficacy of antimicrobials for treatment of European foulbrood disease within a colony
- To characterize persistence of *Melissococcus plutonius* infection in adult worker honey bees

**ADF Funding: $149,000**

**Bovine Reproductive Syndromic Sequencing Panel** (*20210604)*

Principle Investigator: Yanyun Huang, Prairie Diagnostic Services Inc.

Objectives:

- Compare performance between BovReproSeq and PCR assays
- Cost analysis of BovReproSeq
- Design a bovine reproductive sequencing panel (BovReproSeq)
- Performance characterization of BovReproSeq in diagnostic samples

Co-funded By: Saskatchewan Cattlemen's Association

**ADF Funding: $198,261**

## Prairie Swine Centre Inc.

**Characterizing the Factors Related to Dietary Indigestible Protein Content that Reduce Performance and Health in Nursery Pigs** (*20210571)*

Principle Investigator: Daniel Columbus, Prairie Swine Centre Inc.

Objectives:

- To determine the effectiveness of dietary strategies to mitigate the negative effects of indigestible protein content
- To determine the factors affecting the response of nursery pigs to dietary indigestible protein content
- To validate key response variables for high and low indigestible protein diets in nursery pigs
- To determine the interaction of diet and intestinal pathogen on nursery pig performance and health

**ADF Funding: $273,202**

**Investigation of Novel Treatments for Management and Mitigation of Antimicrobial Resistance and Pathogens in Swine Production** (*20210616)*

Principle Investigator: Bernardo Predicala, Prairie Swine Centre Inc.

Objectives:

- Investigate novel measures to reduce the emergence and spread of antimicrobial resistance in swine production
- Assess impact of intervention measures on pig microbiota and performance, as well as pathogens and AMR prevalence
- Evaluate the economic benefits and develop recommendations for application of intervention measures in commercial pig barns

**ADF Funding: $186,950**

**Evaluation, Optimization, and Field Validation of a Rapid Detection Kit for Porcine Epidemic Diarrhea Virus (PEDv)** (*20210710)*

Principle Investigator: Bernardo Predicala, Prairie Swine Centre Inc.
Objectives:

- Develop comprehensive users guide and training materials for proper sampling and testing using the improved PEDv test kit
- Conduct field testing and validation of the improved rapid diagnostic test kit for PEDv
- Evaluation, optimization, and field validation of a rapid diagnostic test kit for Porcine Epidemic Diarrhea virus
- Conduct laboratory evaluation and further improvement of an existing rapid diagnostic test kit for PEDv

**ADF Funding: $151,800**

**Effective Enrichments for Piglets: Effects of Early Enrichment on Development and Reduction of Damaging Behaviours** (*20210908)*

Principle Investigator: Jennifer Brown, Prairie Swine Centre Inc.
Objectives:

- Determine if early enrichment has long-term effects on reducing damaging behaviours in market pigs
- Work with commercial pork producers to implement and evaluate enrichments
- Identify practical enrichments that are attractive to piglets
- Measure the effects of environmental enrichment on the behavioural development of piglets

**ADF Funding: $56,000**

## Saskatchewan Forage Council

**A Critical Review of Best Management Practices for Pasture Rejuvenation** (*20210890)*

Principle Investigator: Gregory Penner, Saskatchewan Forage Council
Objectives:

- Provide new knowledge and technology transfer information on pasture rejuvenation
- Conduct a meta-analysis on practices affecting success of pasture rejuvenation strategies

Co-funded By: Saskatchewan Cattlemen's Association
**ADF Funding: $27,291**

## Saskatchewan Pork Development Board

**Evaluating Antimicrobial Benchmarking on Saskatchewan Hog Farms** (*20210552)*

Principle Investigator: Ravneet Kaur, Saskatchewan Pork Development Board
Objectives:

- Evaluate current antibiotic usage on Saskatchewan hog farms
- Provide discussion platforms for creating awareness and reducing usage over time
- Compare antimicrobial usage over time with other producers in Saskatchewan and Canada

**ADF Funding: $150,000**

## University of Saskatchewan

**Impact of Weather Conditions on Post-Fire Grassland Production Recovery** (*20210563)*

Principle Investigator: Eric Lamb, University of Saskatchewan
Objectives:

- Measure post-fire weather impacts on forage recovery
- Identify how post-fire grazing decisions interact with weather conditions to influence vegetation recovery

**ADF Funding: $30,650**

**Clinical Investigation of Treatment Options for Joint Infections in Western Canadian Feedlot Cattle** (*20210572)*

Principle Investigator: Murray Jelinski, University of Saskatchewan
Objectives:

- Describe how antimicrobial therapy impacts the joints' microbial communities and resistomes following initial treatment for septic arthritis (SA)
- Describe the microbial communities and associated resistome found in normal joints
- Clinical field evaluation of three commonly used antimicrobial treatment options for SA in feedlot cattle
- Describe the microbial communities and associated resistome found in septic arthritis joints at time of first treatment

Co-funded By: Saskatchewan Cattlemen's Association
**ADF Funding: $96,446**

**The Impact of Foliar Fungicide Application on Barley Silage Quality and Performance of Lactating Dairy Cows** (*20210642)*

Principle Investigator: Timothy Mutsvangwa, University of Saskatchewan
Objectives:

- To determine the effects of foliar fungicide application on forage barley on production performance in dairy cows
- To determine the effects of foliar fungicide application on forage barley on forage yield and silage quality

Co-funded By: Sask Milk
**ADF Funding: $134,328**

**Benchmarking Imaging and Sensor Technologies for Capturing Novel Phenotypes to Improve Sustainability of the Beef Industry** (*20210666)*

Principle Investigator: Jaswant Singh, University of Saskatchewan
Objectives:

- Develop a roadmap for implementation of remote technologies in the Saskatchewan beef industry
- Determine the range of variation in physical attributes of economically important traits detected by the remote technologies
- Benchmark and select optimal sensor and imaging technologies for detecting phenotypic traits in beef cattle

Co-funded By: Saskatchewan Cattlemen's Association

**ADF Funding: $163,602**

**Control of Yolk Sac Infections Associated with Escherichia Coli and Enterococci Using Probiotics in Embryos** (*20210682)*

Principle Investigator: Susantha Gomis, University of Saskatchewan
Objectives:

- Introduction of probiotic bacteria to broiler chicken embryos to reduce incidence of *C. perfringens* infection
- Introduction of probiotic bacteria to embryos to reduce pathogenic bacterial infections in neonatal broiler chickens

**ADF Funding: $165,000**

**Motivations, Barriers, and Alternatives to Feed Testing and Ration Formulation By Cow-Calf Producers** (*20210763)*

Principle Investigator: Kathy Larson, University of Saskatchewan
Objectives:

- Gain insight into the motivations, barriers, complementary practices, and alternatives to feed testing and ration formulation
- Provide recommendations for tech transfer on feed testing and ration balancing
- Develop protocols for complementary and alternative methods
- Survey producers regarding their methods, motivations, barriers, and alternatives to feed testing/ration balancing

**ADF Funding: $44,000**

**Including Native Forages in Mixture to Enhance Late Season Forage Quality and Carbon Sequestration** (*20210800)*

Principle Investigator: Jonathan Bennett, University of Saskatchewan
Objectives:

- Determine how early cutting affects the persistence of native species
- Identify the economic value of incorporating native species into mixtures and whether this exceeds the added cost
- Identify mixtures of native and tame species that maximize late season forage productivity and quality
- Quantify the benefit of native-tame mixtures for soil carbon sequestration and nutrient retention

Co-funded By: Saskatchewan Forage and Seed Development Commission;
Saskatchewan Cattlemen's Association

**ADF Funding: $289,483**

**Investigation of AMR Transmission via Horizontal Gene Transfer in Mycoplasma Bovis** (*20210814)*

Principle Investigator: Murray Jelinski, University of Saskatchewan
Objectives:

- Evaluate the relationships between biofilms, antimicrobial resistance (AMR), and integrative and conjugative elements (ICE)
- Describe the epidemiology of M. bovis ICE
- Evaluate the transfer of AMR

- Characterization of ICE in Mycoplasma bovis

Co-funded By: Saskatchewan Cattlemen's Association
**ADF Funding: $103,848**

**Combining Herbicides and Fertilizers to Enhance Leafy Spurge Control** (*20210815)*
Principle Investigator: Jonathan Bennett, University of Saskatchewan
Objectives:

- Determine whether different fertilizers can reduce leafy spurge spread in rangelands while increasing rangeland productivity
- Determine an optimal combination of herbicide and fertilizer that extends leafy spurge control at the lowest cost to producers
- Determine which control methods maximize the ability of rangeland soils to sustain forage productivity

**ADF Funding: $335,588**

**Development of Prairie Environment Friendly and Value Added Pellet Products to Mitigate Ruminant Methane and Maximize Benefit** (*20210839)*
Principle Investigator: Peiqiang Yu, University of Saskatchewan
Objectives:

- To develop environment friendly and high value added pellet products (based on combination of pulse screenings, co-product from bio-oil processing (canola or carinata meal), and commercially available and affordable plant-based extract as feed additives [hydrolysable tannins-HT (or saponin)] to mitigate ruminant methane, reduce nitrogen excretion, and maximize extra benefit for prairie pulse and oil-crop producers, feed processing and livestock industries

**ADF Funding: $118,100**

**Effects of Dietary Starch on Behaviour, Stress Physiology, Growth Performance, and Carcass and Meat Quality of Finishing Bison** (*20210882)*
Principle Investigator: Diego Moya, University of Saskatchewan
Objectives:

- To characterize changes in rumen pH, bison behaviour, and biomarkers of stress caused by different levels of starch in the diet
- To evaluate the effects of the starch content in the diet on feed intake, feeding behaviour, and growth performance of bison
- To evaluate the effects of dietary starch on carcass characteristics, meat quality, and nutritional value of bison

**ADF Funding: $208,346**

**Genomic Variations Associated with Gestation Length in Beef Cattle** (*20210945)*

Principle Investigator: Mika Asai-Coakwell, University of Saskatchewan

Objectives:

- To identify sires of short and long gestation length through producer records in the purebred cattle sector
- Identification of genomic regions associated with gestation length in Canadian beef cattle breeds
- Increase our capacity to conduct genomics-based research at the University of Saskatchewan
- To screen cattle population for gestation length associated SNPs

Co-funded By: Saskatchewan Cattlemen's Association

**ADF Funding: $68,587**

## VIDO

**Salmonella Dublin Vaccine for Cattle** (*20210562)*

Principle Investigator: Wolfgang Köster, VIDO

Objectives:

- Vaccination will protect cattle against disease caused by Salmonella Dublin
- Vaccine strains/challenge strains selection
- Proof of principle vaccination trials
- Oral calf challenge model development
- Vaccine antigen preparation and formulation

Co-funded By: Sask Milk

**ADF Funding: $300,500**

**Optimize Intrauterine Vaccines Administered at Breeding to Protect Suckling Piglets Against Infectious Diseases** (*20210690)*

Principle Investigator: Heather Wilson, VIDO

Objectives:

- Establish optimal adjuvant combination for i.u. vaccination route to trigger robust immunity against PEDV
- Establish an optimal adjuvant combination for i.u. vaccination route
- Establish an optimal adjuvant combination using the intramuscular route for higher throughput

**ADF Funding: $210,000**

**Development of Fetal/Day Old Porcine Cell Line for Production of African Swine Fever Virus (ASFV)** (*20210884)*

Principle Investigator: Suresh Tikoo, VIDO

Objectives:

- Establishment of primary cell lines from fetal/day old porcine tissues
- Immortalization of fetal/day old porcine cells
- Growth of ASFV in transformed fetal/day old porcine cells
- ASFV growth in primary fetal/day old porcine cells

**ADF Funding: $140,000**