

## Summary of ADF Projects, 2019

### Livestock and Forages Research Funding

34 Livestock and Forages-related projects \$5,560,256

#### Breakdown by Commodity

Beef and Dairy (includes SFP project)	\$1,833,296
Swine	\$942,612
Poultry	\$277,000
Other Species	\$195,000
General	\$402,000
Forages	\$1,910,348
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	\$5,560,256

#### Breakdown by Organization

University of Saskatchewan	\$4,410,114
Lakeland College	\$119,992
National Research Council Canada	\$511,408
Prairie Swine Centre Inc.	\$438,742
University of Regina	\$80,000
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	\$5,560,256

## **Livestock Related Projects - Co-Funders**

Saskatchewan Cattlemen's Association	\$181,780
Saskatchewan Pork Development Board	\$4,000
Alberta Beef Producers	\$28,888
Saskatchewan Canola Development Commission	\$87,500
Saskatchewan Forage Seed Development Commission	\$18,500
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	\$320,668

## **Beef and Dairy**

### ***Feeding Garlic Powder to Cattle: Effects on Mineral Intake, Fly Repellence and Cattle Performance (20180049)***

To estimate the economic impact of flies on the western Canadian beef industry.

To determine if feeding garlic products help improve growth, feed efficiency and health performance of growing calves.

To determine if intake variability of garlic products are related productivity outcomes i.e. are garlic products dose-dependent.

**ADF Funding:** \$119,992

**Organization:** Lakeland College

**Contact:** Dr. Obioha Durunna, (780) 581-3232

### ***An Interactive Tool to Inform Johne's Disease Control in Beef Herds: What Test, When and How Often (20180128)***

Describe the typical progression of Johne's in infected beef herds and inform control strategies within affected herds.

Evaluate changes in Johne's prevalence to monitor disease spread in the beef industry and the ongoing need for control strategies.

Create a web-based interactive tool to inform Johne's disease testing options in cow-calf herds.

Conduct a dynamic risk assessment to compare testing options for control of Johne's disease in western Canadian beef herds.

**ADF Funding:** \$85,200

**Saskatchewan Cattlemen's Association:** \$9,775

**Alberta Beef Producers:** \$4,888

**Organization:** University of Saskatchewan

**Contact:** Dr. Cheryl Waldner, Large Animal Clinical Sciences, (306) 966-7168

### ***Treatment Guidance for Bovine Respiratory Disease: Optimizing Prudent and Economical Antimicrobial Decision (20180129)***

Generate culture and anti-microbial resistance (AMR) data to be used as a reference standard for future evaluation of emerging tools and testing strategies.

Evaluation of respiratory microbial pathogens in feedlot cattle and the association with clinical respiratory disease.

Development and validation of diagnostic tools to assist in selection of treatment protocols for newly arrived feedlot cattle.

**ADF Funding:** \$348,000

**Saskatchewan Cattlemen's Association:** \$23,000

**Organization:** University of Saskatchewan

**Contact:** Dr. John Campbell, Large Animal Clinical Sciences, (306) 966-7158

***Quantifying Greenhouse Gas Emissions from Beef Cattle Urine and Dung in Grazed Pasture Sod-Seeded with Non-Bloat Legumes (20180169)***

Obtain accurate estimates of N<sub>2</sub>O-N losses from beef cattle urine and dung in grazed pastures.  
Develop Saskatchewan-based emission factors for N<sub>2</sub>O-N losses from grazed pastures.

**ADF Funding:** \$140,101

**Organization:** University of Saskatchewan

**Contact:** Dr. Richard Farrell, Soil Science, (306) 966-2772

***Investigating the Role of Flooring in the Development of Toe Tip Necrosis Syndrome (TTNS) (20180191)***

Biomechanically evaluate the effects of the flooring on the integrity of the bovine foot, specifically the white line region.

Compare the flooring systems of feedlots having a low or high incidence of toe tip necrosis syndrome (TTNS).  
Assess the effects of different flooring on the claws of feedlot cattle in vivo in a typical feedlot environment.

**ADF Funding:** \$94,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Murray Jelinski, Large Animal Clinical Sciences, (306) 966-7166

***Rumen Protected Butyrate as a Novel Functional Ingredient for Feedlot Cattle (20180199)***

Understand how the forage-to-concentrate ratio of the diet interacts with the dietary supply of rumen protected butyrate.

To determine the optimal dose of rumen protected butyrate for finishing feedlot cattle.

To compare growth performance of cattle and the economic opportunity of using rumen protected butyrate.

**ADF Funding:** \$201,540

**Saskatchewan Cattlemen's Association:** \$34,500

**Organization:** University of Saskatchewan

**Contact:** Dr. Gregory Penner, Animal and Poultry Science, (306) 966-4219

***Genetic and Genomic Factors Influencing Gestational Length in Beef Cattle (20180238)***

Collect gestation length (GL) data from beef cattle operations in Saskatchewan.

Evaluate dam and calf records from herds that use artificial insemination (AI).

In vivo study at the University of Saskatchewan to assess the inheritance of gestation length in beef cattle.

Conduct a cost-benefit analysis on gestation length.

**ADF Funding:** \$137,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Mika Asai-Coakwell, Animal and Poultry Science, (306) 966-4153

***Genetic Screening of Rickettsiales Bacteria in Dermacentor Variabilis Ticks, the Vectors of Bovine Anaplasmosis (20180263)***

Determine the identity and prevalence of rickettsiales bacteria in *D. variabilis* using the 16S rRNA gene. Develop species-specific polymerase chain reactions (PCR) assays for the detection and identification of rickettsiales bacteria.

Develop a quantitative real-time PCR (qPCR) assay to determine the relative abundance of rickettsiales bacteria in ticks.

Knowledge transfer.

**ADF Funding:** \$89,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Neil Chilton, Biology, (306) 966-4407

***Feed Processing to Reduce Ergot Toxicity (20180270)***

The overall objective of this proposal is to determine the impact of hydrothermal processing on ergot toxicity. Determine the impact of processing ergoty grain on production parameters and nutrient digestibility in swine and poultry.

Evaluate the economic potential of processing ergoty grain to be used as animal feed.

Determine the impact of processing ergot infected grain samples on alkaloid content and epimer profile.

Determine if alkaloid and/or epimer ratio of ergot can be used to predict toxicity.

**ADF Funding:** \$253,954

**Organization:** University of Saskatchewan

**Contact:** Dr. Denise Beaulieu, Animal and Poultry Science, (306) 966-4104

***Bovine Fetal Sexing Utilizing Cell-Free Fetal DNA in Maternal Peripheral Blood (20180280)***

To validate the sex-chromosome specific genes for polymerase chain reaction (PCR) based detection of fetal sex in pregnant cattle.

Assess the accuracy of the sex-chromosome specific genes in predicting fetal sex in cattle at different stages of gestation.

**ADF Funding:** \$37,100

**Organization:** University of Saskatchewan

**Contact:** Dr. John Campbell, Large Animal Clinical Sciences, (306) 966-7158

***Investigating the Use of a Probiotic (Mycoplasma bovirhinitis) to Control Mycoplasma bovis Infections (20180294)***

The overarching objective is to identify a probiotic for controlling *Mycoplasma bovis* infections in feedlot cattle.

Identify *M. bovirhinitis* and/or *Lactobacillus spp.* strains that inhibit *M. bovis* growth and adherence.

Determine if the probiotics identified in Phase 1 will inhibit the growth and colonization of *M. bovis* in feedlot cattle.

**ADF Funding:** \$124,500

**Organization:** University of Saskatchewan

**Contact:** Dr. Murray Jelinski, Large Animal Clinical Sciences, (306) 966-7166

***Genomic Epidemiology and Rapid Detection of Mycobacterium paratuberculosis Infections (Johne's disease) in Saskatchewan Cattle (20180305)***

Develop Genomics-based molecular tools required to overcome current limitations of Johne's disease tests.

**ADF Funding:** \$80,000

**Organization:** University of Regina

**Contact:** Dr. Andrew Cameron, Biology, (306) 337-2568

***Should Livestock Diet be Tested for the Levels of the Epimers of Ergot Alkaloids? Are These Epimers Biologically Active? (20180361)***

Identify whether or not there is more that needs to be considered in regards to ergot alkaloids and the biological activity of their epimers

**ADF Funding:** \$40,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Ahmad Al-Dissi, Veterinary Pathology, (306) 966-7643

***Water Sulphate Project #1 - The Effects of Sulphates in Water on beef Cattle Performance and Feed Intake (20180427)***

Livestock extension staff have identified the lack of confirmed guidelines as a major impediment to their ability to support the industry with advice on this matter. This project directly addresses that knowledge gap. This project will evaluate the impact of drinking water sulphate levels on the rate of gain and trace mineral status of beef cattle.

**SFP Funding:** \$82,909

**Organization:** University of Saskatchewan

**Contact:** Dr. Gregory Penner, Animal and Poultry Science, (306) 966-4219

## **Swine**

***Establishing Protective Efficacy of New Lawsonia intracellularis (Ileitis) DIVA Vaccine (20180009)***

Establish a *Lawsonia intracellularis* (LI)-DIVA vaccine that triggers robust immunity in piglet.

Establish that LI-DIVA vaccine protects against infectious *Lawsonia intracellularis*.

Establish that LI-DIVA vaccine is immunogenic and protective if delivered to piglets orally or intranasally.

**ADF Funding:** \$199,500

**Organization:** Vaccine and Infectious Disease Organization

**Contact:** Dr. Heather Wilson, (306) 966-1537

***Development of Improved Inactivated DIVA Vaccines Against Porcine Epidemic Diarrhea Virus (PEDV) (20180101)***

To develop next generation inactivated DIVA PEDV vaccines targeting non S-INDEL and S-INDEL PEDV strains.

**ADF Funding:** \$210,000

**Organization:** Vaccine and Infectious Disease Organization

**Contact:** Dr. Qiang Liu, (306) 966-1567

### ***Enhanced Biosecurity Measures to Control Growth of Pathogens in Antibiotic-Free Pig Production (20180172)***

Overall goal: develop enhanced biosecurity measures for antibiotic-free pig production and for all-inclusive disease prevention.

Specific objectives:

Compile information on existing and potential biosecurity measures applicable for swine barns.

Assess the effectiveness of selected biosecurity measures under actual pig barn conditions.

Assess the feasibility of the most promising measures and develop recommendations and guidelines for its application in barns.

**ADF Funding:** \$135,500

**Organization:** Prairie Swine Centre Inc.

**Contact:** Dr. Bernardo Predicala, (306) 667-7444

### ***Ear-Tip Necrosis in Pigs: Understanding the Disease to Improve Welfare (20180176)***

Determine if ear-tip necrosis in pigs is an infectious disease.

Identify potential bacterial and viral agents, as well as histopathology for characterization of lesions.

**ADF Funding:** \$34,680

**Organization:** University of Saskatchewan

**Contact:** Dr. Matheus Costa, Large Animal Clinical Sciences, (306) 966-7237

### ***Validation of Infrared Technologies for Identification of Market Pigs at Risk of Transport Stress, Death Loss and PSE Meat (20180226)***

Validate the reliability of two digital infrared thermography cameras for recording ocular temperature in market pigs.

Determine if thermographic images obtained on-farm are predictive of pigs' response to transport.

Determine if DT images collected at the packing plant are predictive of pig's stress response and PSE meat traits.

**ADF Funding:** \$125,778

**Organization:** Prairie Swine Centre Inc.

**Contact:** Dr. Jennifer Brown, Ethology, (306) 667-7432

### ***The Potential of Hybrid Rye as an Alternative Feed for Finishing Pigs (20180287)***

Determine the potential for dietary rye to reduce aggression in finishing pigs.

Determine if a multi-carbohydrase enzyme improves energy digestibility of hybrid rye for growing/finishing pigs.

Determine feeding value of hybrid fall rye for growing swine.

Determine standardized ileal digestible amino acid and net energy values of fall hybrid rye for finishing swine.

**ADF Funding:** \$59,690

**Organization:** University of Saskatchewan

**Contact:** Dr. Denise Beaulieu, Animal and Poultry Science, (306) 966-4104

### ***Enhancing the Biosecurity and Welfare of Livestock Animals During Transport (20180345)***

Overall goal: improve livestock trailer design to address emerging biosecurity risks and enhance welfare during transport.

Specific objective

Enhance and optimize current prototype trailer design.

Assess performance of the improved trailer.

Conduct economic analysis and develop recommendations for commercialization.

**ADF Funding:** \$177,464

**Organization:** Prairie Swine Centre Inc.

**Contact:** Dr. Bernardo Predicala, (306) 667-7444

## **Poultry**

### ***Development of a Subunit Vaccine to Control Avian Reoviruses in the Broiler Chicken Industry in Saskatchewan (20180256)***

Development of a multivalent recombinant subunit vaccine to control avian reoviruses (ARVs) in broiler chickens.

**ADF Funding:** \$150,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Susantha Gomis, Veterinary Pathology, (306) 966-729

### ***Improvement of Camelina Meal through Hydrothermal Processing to Increase Efficacy and Inclusion Level in Omega 3 Egg Rations (20180362)***

To improve the palatability and nutritional value of camelina presscake meal for laying hens through heat processing.

To improve the nutritional value of camelina press cake for use in Omega 3 egg production through dehulling.

To develop prediction equation for Omega 3 enrichment by camelina meals as affected by oil content of the meal.

To determine if the inclusion rate of camelina meal can be increased above 10% and generate data for CFIA submission.

**ADF Funding:** \$127,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Rex Newkirk, Animal and Poultry Science, (306) 966-6611

## **Other Species**

### ***Surveillance and Improved Control of American Foulbrood (AFB) in Honey Bees in Saskatchewan (20180249)***

Surveillance of American foulbrood (AFB) in Saskatchewan.

Prevalence of antibiotic resistance in AFB positive isolates and genotypic characterization.

Standardization of honey sampling.

Establishment of reliable prognostic reference ranges for AFB in Saskatchewan.

**ADF Funding:** \$195,000



**Organization:** University of Saskatchewan

**Contact:** Dr. Elemir Simko, Veterinary Pathology, (306) 966-7307

## Livestock General

### ***Engineered Permeable Bio-Barriers for Protection of Ground and Surface Waters from Agricultural and Livestock Run Off (20180278)***

Development of engineered bio-barriers for removal of ammonia and nitrate from livestock and agricultural run offs.

Design of a large scale bio-barrier, implementation in an intensive livestock operation, and long term performance evaluation.

**ADF Funding:** \$150,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Mehdi Nemati, Chemical Engineering, (306) 966-4769

### ***Utilizing Pulse-Protein and Canola Oil-Based Emulsions in Meat Products (20180330)***

Development of pulse protein-stabilized canola oil-in-water emulsions tailored for meat formulations.

Characterization of mechanical properties, microstructure, chemical and thermal stability of pulse protein-based meat emulsion.

Preparation of meat products by replacing animal fat with pulse protein-based canola oil emulsion.

Characterization of stability, shelf-life, microstructure, texture and sensory properties of the meat products.

Scale-up operation and feasibility study.

**ADF Funding:** \$252,000

**Saskatchewan Canola Development Commission:** \$87,500

**Organization:** University of Saskatchewan

**Contact:** Dr. Supratim Ghosh, Food and Bioproduct Sciences, (306) 966-2555

## Forages

### ***Forage Production Recovery Following the Burstall Wildfires (20180159)***

Monitor the postfire recovery of forage biomass production and forage quality on native grasslands.

Test the benefits of short-term grazing deferments for post-fire forage recovery.

Evaluate the utility of remotely sensed images for measuring forage recovery.

**ADF Funding:** \$70,150

**Saskatchewan Cattlemen's Association:** \$21,505

**Organization:** University of Saskatchewan

**Contact:** Dr. Eric Lamb, Plant Sciences, (306) 966-1799

***Enhancing Seed and Biomass Production and Drought Tolerance of Plains Rough Fescue Using Novel Seed Treatments (20180173)***

Determine effects of seed priming treatments on germination and seedling vigor of Plains Rough Fescue in the controlled environment.

Determine effects of optimal seed priming treatments on drought tolerance and biomass/seed production and their variations of Plains Rough Fescue.

Identify seed collections/lines with frequent, high seed production after treatments for future variety development.

**ADF Funding:** \$71,003

**Saskatchewan Cattlemen's Association:** \$34,500

**Saskatchewan Forage Seed Development Commission:** \$3,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Yuguang Bai, Plant Sciences, (306) 966-4955

***Evaluation of Forage Galega ( Galega orientalis LAM.) as a New Forage Legume in Pure and Grass- Legume Mixed Stands (20180184)***

Evaluate the establishment, yield, persistence, and nutritive value of forage Galega at four soil zones for forage yield and nutritional value.

Evaluate seed production of forage Galega in the different soil zones of western Canada.

**ADF Funding:** \$117,915

**Saskatchewan Cattlemen's Association:** \$34,500

**Saskatchewan Forage Seed Development Commission:** \$7,500

**Organization:** University of Saskatchewan

**Contact:** Dr. Bill Biligetu, Crop Development Centre, (306) 966-4007

***Hybrid Fall Rye (HR) as a New Forage and Grain Source for Cattle (20180201)***

Determine the optimal severity of processing for hybrid fall rye as a grain source for cattle.

Determine the feeding value of hybrid fall rye as a grain source for growing and finishing steers.

Determine the effect of hybrid fall rye grain on ruminal fermentation, nutrient flow to the small intestine, and total tract digestibility for finishing cattle.

**ADF Funding:** \$289,972

**Organization:** University of Saskatchewan

**Contact:** Dr. Gregory Penner, Animal and Poultry Science, (306) 966-4219

***Economic Impact Assessment Methodology for Leafy Spurge in Elbow Pasture, Forsythe Grazing Co-op and Douglas Provincial Park (20180259)***

Compare and validate the effectiveness of different high resolution imagery capture approaches on estimating the distribution of leafy spurge.

Determine the economic value of lost grazing capacity as well as the indirect costs from leafy spurge infestation on forage lands in the targeted areas.

Provide recommendations for future assessments.

**ADF Funding:** \$221,000

**Organization:** University of Saskatchewan

**Contact:** Ms. Kathy Larson, Agricultural and Resource Economics, (306) 930-9354

***Effects of Annual and Perennial Forage Systems on Plant, Soil and Water Parameters, Grazing Animal Performance and System Economics (20180267)***

Determine soil water balance, C and N cycling, and biophysical and biochemical characteristics of soils under perennial or annual pasture systems under western Canadian growing conditions.

Determine green house gas emissions grazing either annual or perennial forage pasture systems.

Evaluate animal performance, and forage persistence under either perennial or annual forage systems utilizing improved cultivars.

Determine systems costs and net returns for annual and perennial forage systems.

**ADF Funding:** \$494,900

**Saskatchewan Cattlemen's Association:** \$24,000

**Alberta Beef Producers:** \$24,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Bart Lardner, Animal and Poultry Science, (306) 966-2147

***Performance of New Fall Rye Cultivar as a Double Cropping Forage (20180346)***

Determine the forage biomass and quality of the hybrid fall rye varieties managed in a single and double cropping system with barley.

Determine the N use efficiency of fall rye varieties in double cropping systems, compared to single cropping systems.

Determine systems costs and net returns for the each annual forage in the study.

**ADF Funding:** \$134,000

**Organization:** University of Saskatchewan

**Contact:** Dr. Bart Lardner, Animal and Poultry Science, (306) 966-2147

***Doubled Haploidy Methodology for the Forage Grasses (20180351)***

Evaluate three forage grasses for microspore culture response using three standard protocols.  
Select the most responsive forage grass and evaluate factors influencing microspore embryogenesis.  
Convert microspore-derived embryos to plants.  
Evaluation of doubled haploid plants under greenhouse or field conditions.

**ADF Funding:** \$511,408

**Saskatchewan Forage Seed Development Commission:** \$8,000

**Organization:** National Research Council Canada

**Contact:** Dr. Alison Ferrie, Plant Biotechnology Institute, (306) 975-5993