

Summary of ADF Projects, 2018

Livestock and Forage Research Funding

24 Livestock and Forage-related research projects **\$6,364,476**

Breakdown by Commodity

Beef and Dairy	\$3,286,845
Swine	\$1,113,400
Poultry	\$487,500
Other Species	\$384,591
Forages	\$1,092,140
	\$6,364,476

Breakdown by Organization

University of Saskatchewan	\$4,545,185
Prairie Diagnostic Services Inc.	\$211,000
Prairie Swine Centre Inc.	\$405,400
Western Beef Development Centre - PAMI	\$625,200
Agriculture & Agri-Food Canada	\$223,100
Saskatchewan Beekeepers Development Commission	\$354,591
	\$6,364,476

Funding Support for Livestock and Forage Centre of Excellence \$2,000,000

Livestock Related Projects - Co-Funders

Saskatchewan Cattlemen's Association	\$139,000
Saskatchewan Barley Development Commission	\$20,000
SaskMilk	\$5,000
Saskatchewan Forage Development Commission	\$22,500
	\$186,500

Beef & Dairy

Leveraging the Teat Microbiome of Resilient Dairy Cows as a Source of New Antibiotics to Treat Mastitis (20160504)

Improving our understanding of the bovine teat microbiome.
Discovery of new drugs to treat mastitis.

ADF Funding: \$85,330

Organization: University of Saskatchewan

Contact: Dr. Antonio Ruzzini, Veterinary Microbiology, (306) 966-7219

Enhanced Vaccine Adjuvant Platform for Nasal Administration in Livestock (20170024)

To develop immunostimulatory vaccine adjuvants based on the Triple Adjuvant developed by VIDO-InterVac.

To devise a mucoadhesive delivery system for the peptide vaccine TriAdj adjuvant combination.

To screen in vivo efficacy of nasally-administered lipid-encapsulated adjuvant carriers.

To test the efficacy of nasally-administered lipid-encapsulated adjuvant carrier and vaccine in pigs and cattle.

ADF Funding: \$205,000

Saskatchewan Cattlemen's Association: \$50,000

Organization: University of Saskatchewan

Contact: Dr. Ellen Wasan, Pharmacy & Nutrition, (306) 966-3202

Precision Cattle Manure Management For Agronomic and Environmental Benefit at the U of S Beef Cattle Research Unit (20170025)

To evaluate agronomic and environmental performance of cattle manure applications made at constant and variable rates.

ADF Funding: \$699,820

Organization: University of Saskatchewan

Contact: Dr. Jeff Schoenau, Soil Science, (306) 966-6884

The Forage-Efficient Beef Cow: Investigation into the Underlying Physiology (20170060)

Identification of whether the microbiome differs between forage efficient and inefficient cows.

Evaluation of underlying physiological causes determining forage efficient cattle.

Identification of genetic markers and candidate genes for forage use efficiency.

Detailed phenotypic characterization of cows efficient at converting forage for maintenance and productive functions.

ADF Funding: \$598,920

Saskatchewan Cattlemen's Association: \$45,000

Organization: University of Saskatchewan

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

Developing New Vaccine Strategies for Infectious Bovine Keratoconjunctivitis (Pink-eye) (20170098)

Analyze immunogenicity of a commercial pink-eye vaccine in the IBK disease model.
Determine if ocular vaccine prevents pink-eye.
Determine if IgA antibody in tears is required to prevent pink-eye.
Develop *M. bovis* and *M. bovoculi* challenge model.
Induce *M. bovis*- and *M. bovoculi*-specific IgA antibody in the tears of cattle.

ADF Funding: \$171,000

Organization: Vaccine & Infectious Disease Organization-International Vaccine Centre

Contact: Dr. Philip Griebel, Public Health, (306) 966-1542

Enhanced Management of Bovine Respiratory Disease (BRD) through Improved Vaccines and Vaccination Programs (20170127)

Evaluate the efficacy and duration of immunity of a Bovine Viral Diarrhea virus vaccine in young calves.
Develop novel vaccines for an expanded range of Bovine respiratory disease-associated pathogens.
Develop tools enabling more effective vaccination programs.

ADF Funding: \$393,275

Organization: Vaccine & Infectious Disease Organization-International Vaccine Centre

Contact: Dr. Sylvia Van Den Hurk, Vaccine & Infectious Disease Organization, (306) 966-1559

Role of Mannheimia haemolytica in Mycoplasma bovis Pneumonia (20170211)

Identify *M. bovis* proteases and lipases induced by host cell inflammatory factors.
Characterize the induction of the *M. bovis* proteases and lipases by inflammatory factors produced in lungs infected with *M. haemolytica*.
Proof of concept trial—test protection against a *M. bovis* challenge in cattle vaccinated with *M. bovis* proteases and lipases.
By investigating the synergy between *M. Haemolytica* and *M. bovis*, will understand the role of these two pathogens in severe clinical disease and lung lesions observed in feedlot cattle disease and to identify *M. bovis* products that can be used as targets for protective vaccines.

ADF Funding: \$346,700

Organization: Vaccine & Infectious Disease Organization-International Vaccine Centre

Contact: Dr. Jose Perez-Casal, (306) 966-8870

Evaluating Long Term Benefits of Genomic Selection Programs in Beef Cattle Breeding Programs (20170216)

To determine if sire parentage testing results, coupled with novel genomic information on male and female progeny, offers increased value when making cull and replacement decisions.

ADF Funding: \$386,300

Saskatchewan Cattlemen's Association: \$24,000

Organization: Western Beef Development Centre - PAMI

Contact: Dr. Bart Lardner, (306) 862-3139

Improving Water Security Through Sulfate Removal to Enhance Livestock and Dairy Production (20170247)

Pilot scale testing of fixed bed columns for sulphate removal.
Preparation of pelletized and granular materials for fixed bed columns.
Laboratory bench scale testing of sulfate adsorption properties.
Design of two classes of sorbent materials via two parallel strategies.
Field testing of packed bed system with Darian Farms.

ADF Funding: \$328,000

Saskatchewan Cattlemen's Association: \$20,000

SaskMilk: \$2,500

Organization: University of Saskatchewan

Contact: Dr. Lee Wilson, Chemistry, (306) 966-2961

Application of Nanopore DNA Sequencing in Rapid Diagnosis of Bovine Respiratory Disease (BRD) - A Pilot Project (20170301)

Evaluate nanopore sequencing as a rapid tool to diagnose bacterial bovine respiratory diseases.
Rapid determination of antimicrobial resistance genes associated with bacteria causing BRD.

ADF Funding: \$72,500

Organization: Prairie Diagnostic Services, Inc.

Contact: Dr. Kazal Ghosh, (306) 716-7256

Swine

Long-term Feeding of Graded Levels of Deoxynivalenol in Grower-finisher Pigs (20170002)

To determine the effect of long-term exposure to mycotoxin-contaminated diets on nutrient utilization, growth performance, and health status in grower-finisher pigs.
To determine estimates of mycotoxin exposure and absorption via biological samples.
To determine the effect of long-term exposure to mycotoxin-contaminated diets on carcass characteristics.
To determine the economic viability of feeding mycotoxin-contaminated diets in the grower-finisher period.

ADF Funding: \$160,000

Saskatchewan Barley Development Commission: \$20,000

Organization: Prairie Swine Centre, Inc.

Contact: Dr. Daniel Columbus, (306) 667-7432

Development of a Swine Dysentery Vaccine (20170059)

To develop a vaccine for swine dysentery associated with *Brachyspira hampsonii*.

ADF Funding: \$250,000

Organization: University of Saskatchewan

Contact: Dr. John Harding, Large Animal Clinical Sciences, (306) 966-7070

Investigating Intervention Measures to Reduce On-farm Use of Antibiotics in Pig Production (20170069)

To determine the effectiveness of measures to reduce antibiotic use and prevalence of antimicrobial resistance.

To accurately capture amounts and patterns of antibiotic use in pig production.

To monitor prevalence of antimicrobial resistance and pig pathogens.

To develop best management practices to reduce antibiotic use and the spread of antimicrobial resistance genes.

ADF Funding: \$245,400

Organization: Prairie Swine Centre Inc.

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

Intrauterine Immunization of Sows at Time of Artificial Insemination: Confirmation of Efficacy (20170174)

To confirm intrauterine vaccination of sows generates long-term immunity and passive protection for piglets against infection.

To confirm combining our vaccine with semen does not impact sperm function.

To confirm that intrauterine vaccination generates immunity against parvovirus without negatively impacting fertility.

ADF Funding: \$120,000

Organization: Vaccine & Infectious Disease Organization-International Vaccine Centre

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

Identifying New Vaccine Targets Against Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) (20170177)

Resolve the structure of the PRRSV glycoprotein complex gp2/3/4.

Incorporate these targets into our recently constructed PRRSV vaccine strain.

Identify new targets for vaccines.

ADF Funding: \$188,000

Organization: Vaccine & Infectious Disease Organization-International Vaccine Centre

Contact: Dr. Volker Gerdts, (306) 966-1513

Control and Characterization of Alpha H1N2 Influenza A Virus in Pigs (20170178)

To examine Alpha H1 virus growth properties in culture.

To examine cross-reactivity of antibodies from monovalent and trivalent stimulation.

To examine the effects of the 2 amino acid deletion in the hemagglutinin protein on the binding properties of the virus.

To examine current efficacy of autogenous vaccinations on farms to control endemic influenza infections in pigs.

ADF Funding: \$150,000

Organization: University of Saskatchewan

Contact: Dr. Susan Detmer, Veterinary Pathology, (306) 966-7346

Poultry

Dust Removal and Microbial Deactivation for Improving Air Quality in Livestock Barns (20170018)

Evaluate efficiency of electrostatic precipitation (ESP) based air cleaning technique in pilot- and full-scale poultry houses.

Investigate the performance of laboratory- and pilot-scale nanospray-based technology in deactivating microbes in swine barns.

ADF Funding: \$189,000

Organization: University of Saskatchewan

Contact: Dr. Lifeng Zhang, Chemical and Biological Engineering, (306) 966-4799

Converting Fusarium-infected Wheat Into a Safe Source of Protein for Poultry (20170053)

To convert salvage wheat or screenings high in Fusarium and mycotoxins into a safe source of protein for broilers.

Feeding trial – chickens fed mealworms that were fed wheat with a high level of Deoxynivalenol.

Feeding trial – yellow mealworms fed Canadian Western Red Spring Wheat.

Feeding trial – yellow mealworms fed Canadian Western Amber Durum Wheat.

Feeding trial – chickens fed mealworms.

ADF Funding: \$160,000

Organization: University of Saskatchewan

Contact: Dr. Fiona Buchanan, Animal & Poultry Science, (306) 966-4160

Prevalence and Antimicrobial Resistance Profile of Salmonella Serovars Isolated from Poultry Environment in Saskatchewan (20170299)

Describe antimicrobial susceptibility of different *Salmonella enterica* serovars.

Describe the temporal trend of antimicrobial susceptibility in Saskatchewan chicken *Salmonella enterica* isolates.

Describe prevalence and distribution of *Salmonella* from Saskatchewan chicken environmental samples from 2012 to 2018.

ADF Funding: \$138,500

Organization: Prairie Diagnostic Services Inc.

Contact: Dr. Anatoliy Trokhymchuk, (306) 966-8053

Other Species

Enzyme Supplements to Enhance Performance of Bison Fed for Meat (20170170)

Determine the effects of feeding bison diets with and without direct-fed microbial additives.

Evaluate the effect of using direct-fed microbials on in vitro digestibility on various fibre and starch sources.

ADF Funding: \$30,000

Organization: University of Saskatchewan

Contact: Dr. Murray Woodbury, Large Animal Clinical Sciences, (306) 966-7170

Exploring Prebiotic and Probiotic Feed Supplements for Honeybees and their Impacts on Colony Health (20170258)

Evaluate the impact of probiotic and prebiotic feed additives on colony health and productivity.
Evaluate the impact of probiotic and prebiotic feed additives on parasitism of honeybees.
Evaluate the individual biological response of honeybees to probiotic and prebiotic feed additives.

ADF Funding: \$354,591

Organization: Saskatchewan Beekeepers Development Commission

Contact: Ms. Hannah Neil, (343) 540-9008

Forage

Integrated Management Approach to Optimize Red Clover Seed Production in Saskatchewan (20170007)

Determine optimal seeding rate for seed production of red clover and nitrogen fixation.
Evaluate effectiveness of insecticides in controlling lesser clover weevils.
Evaluate the impacts of insecticide application on pollinators in red clover fields.

ADF Funding: \$215,300

Saskatchewan Forage Seed Development Commission: \$22,500

Organization: University of Saskatchewan

Contact: Dr. Sean Prager, Plant Sciences, (306) 966-8359

Enhancing Seed Yield and Profitability of Meadow Bromegrass (Bromus riparius Rehm.) Seed Crop in the Multiple Harvest Years (20170130)

Increase multi-harvest seed yield and quality of meadow bromegrass through plant growth regulation, nutrition & stand health.
Determine the economic profitability of meadow bromegrass seed crop management factors included in the study.

ADF Funding: \$223,100

Organization: Agriculture & Agri-Food Canada

Contact: Dr. Nityananda Khanal, Beaverlodge Research Farm, (780) 354-5111

Improving Yield and Quality of Forage Barley and Oat Varieties to Enhance Beef and Dairy Sector Competitiveness (20170230)

Forage quality evaluation.
NIRS calibration development for prediction of forage quality.
Produce improved forage barley and oat varieties.

ADF Funding: \$414,840

SaskMilk: \$2,500

Organization: University of Saskatchewan

Contact: Dr. Aaron Beattie, Crop Development Centre, (306) 966-2102

Mob Grazing Evaluation of New Forage Varieties (20170249)

Determine forage biomass, grazing capacity & quality of forages and assess if these indicators can explain grazing behavior.

Determine the persistence under grazing of new legume and grass monocultures and binary mixtures.

Estimate stand establishment costs on per ha/acre basis; determine benefits of forage yield valued at a suitable market price.

Identify and select persistent alfalfa and sainfoin plants for forage breeding

Compare grazing preference differences of new legume and grass monocultures and binary mixtures.

ADF Funding: \$238,900

Organization: Western Beef Development Centre - PAMI

Contact: Dr. Bart Lardner, (306) 682-3139

Livestock and Forage Centre of Excellence (20170348)

Secure operating funds for management & operations of the Livestock and Forage Centre of Excellence at the University of Saskatchewan.

ADF Funding: \$2,000,000

Organization: University of Saskatchewan

Contact: Dr. Mary Buhr