Summary of Agriculture Development Fund Livestock Projects for 2020

Institution	Number of Approved Projects	Total Amount Funded
Agriculture and Agri-Food Canada	3	$470,023
Prairie Diagnostic Services Inc.	2	$258,000
Prairie Swine Centre Inc.	1	$185,530
Royal Saskatchewan Museum	1	$125,500
University of Regina	1	$76,000
University of Saskatchewan (U of S)	10	$1,823,152
U of S – Livestock and Forage Centre of Excellence operating funds	1	$3,219,000
Vaccine and Infectious Disease Organization	2	$324,500
Western College of Veterinary Medicine	6	$827,294
Genome Prairie	1	$788,477
Total	**28**	**$8,097,476**

Commodity	Number of Approved Projects	Total Amount Funded
Beef and Dairy	13	$5,540,770
Swine	3	$717,030
Forages	5	$839,396
Poultry	2	$266,000
Bees	2	$201,500
General	3	$532,780
Total	**28**	**$8,097,476**

Livestock Projects Co-funders	Total Amount Co-funded
Western Grains Research Foundation	$76,000
Feedlot HEALTH Management Services	$439,184
Saskatchewan Cattlemen's Association	$137,200
Total	**$652,384**

The projects granted funding through the Agriculture Development Fund (ADF) are listed in detail throughout this document by lead organization.

Agriculture and Agri-Food Canada

Enhancement of shoot lipid content in non-GMO alfalfa and sainfoin for improved energy density and reduced methane emissions (*20190120)*

Principal Investigator: Dr. Surya Acharya
Agriculture and Agri-Food Canada
Objectives:

- Initiate multi-location field studies in western Canada with high TSLC genotypes of alfalfa and sainfoin;
- To improve forage quality of alfalfa and sainfoin in general and total shoot lipid content (TSLC) in particular;
- To further characterize the lipid and metabolite profile of selected genotypes of alfalfa and sainfoin;
- To decipher the genetic basis of high TSLC mutagenized alfalfa and sainfoin genotypes; and
- To assess various parameters related to fermentation in selected genotypes.

ADF Funding: $132,287

Improving water quality by precision application of manure and promising pollutant mitigation options (*20190306)*

Principal Investigator: Dr. Haben Asgedom Tedla
Agriculture and Agri-Food Canada
Objectives:

- To compare rainfall runoff nutrients losses from precision and blanket applied manure;
- Determine the effect of slope and aspect on rainfall runoff nutrients losses and contaminants from precision and flat applied manure;
- To assess the nutrient losses mitigation potentials and reduction of contaminants using biochars and gypsum; and
- Determine the effectiveness of willow riparian buffer on reduction of phosphorus, nitrogen losses and other contaminants.

ADF Funding: $197,736

Enhancing the bovine respiratory microbiome through promoting commensal bacterial growth (*20190346)*

Principal Investigator: Dr. Trevor Alexander
Agriculture and Agri-Food Canada
Objectives:

- Characterize the in vitro growth of bovine respiratory bacteria using prebiotic substrates;
- Evaluate the effect of intranasal prebiotics and probiotics on the respiratory microbiome of feedlot calves; and
- Assess the effects of intranasal prebiotics and probiotics on the respiratory microbiome of newborn calves.

ADF Funding: $140,000

Prairie Diagnostic Services Inc.

Understanding and controlling influenza D virus in cattle (*20190054)*

Principal Investigator: Dr. Yanyun Huang
Prairie Diagnostic Services Inc.
Objectives:

- Unveil the extent of influenza D virus infection in beef cattle in western Canada, and
- Produce a prototype vaccine for influenza D virus.

ADF Funding: $173,000

Genomic epidemiology of livestock production limiting diseases in Saskatchewan (*20190311)*

Principal Investigator: Dr. Anatoliy Trokhymchuk
Prairie Diagnostic Services Inc.
Objectives:

- Establish genomic epidemiology capacity at Prairie Diagnostic Services;
- Develop capacity for livestock pathogens genotyping at Prairie Diagnostic Services; and
- Establish Saskatchewan and Western Canada-specific whole-genome sequence databases for selected pathogens of concern.

ADF Funding: $85,000

Prairie Swine Centre Inc.

The role of dietary nitrogen on essential amino acid requirements and utilization (*20190042)*

Principal Investigator: Dr. Daniel Columbus
Prairie Swine Centre Inc.
Objectives:

- To determine effect of source of dietary protein/nitrogen on growth performance and carcass characteristics in growing pigs;
- To determine the effect of source of dietary protein on essential amino acid requirements and utilization; and
- To determine the effect of dietary protein content on essential amino acid requirements and utilization.

ADF Funding: $185,530

Royal Saskatchewan Museum

Bumble bee health in the Canadian prairies (*20190201)*

Principal Investigator: Dr. Cory Sheffield
Royal Saskatchewan Museum
Objectives:

- To determine if pathogens of native bumble bees increase with proximity to greenhouse operations/areas with non-native species;
- To continue to evaluate bee pathogen diversity and threats to native bumble bees in Saskatchewan;
- Determine the extent of the potentially problematic yeast affecting at-risk bumble bees through space and time;
- Develop monitoring program for Saskatchewan's native bumble bees usable in a Canadian context; and
- Develop and offer Saskatchewan specific workshops for bumble bee/pollination assessment.

ADF Funding: $125,500

University of Regina

Pesticide survey of beebread samples across different crop regions in Saskatchewan (*20190266)*

Principal Investigator: Dr. Renata Raina-Fulton
University of Regina
Objectives:

- To collect stored pollen and beebread samples from beehives in Saskatchewan, and analyze for the presence of fungicides and insecticides;
- Develop pesticide residue analyses methods that will expand the list of targeted pesticides; and
- To identify other potential factors that may be influencing honeybee health in Saskatchewan and Best Management Practices.

Western Grains Research Foundation: $76,000
ADF Funding: $76,000

University of Saskatchewan

Development of novel hybrid drugs for mastitis infections: from design to pre-clinical evaluations (*20190079)*

Principal Investigator: Dr. Meena Sakharkar
University of Saskatchewan
Objectives:

- Development of novel hybrid drugs from design to pre-clinical evaluations.

ADF Funding: $300,000

Stocking density and feed bunk space as a risk factor for liver abscesses (*20190122)*

Principal Investigator: Dr. Diego Moya
University of Saskatchewan
Objectives:

- Assess the role of stocking density and feed bunk space on growth performance, feed efficiency, animal welfare and carcass value.

Saskatchewan Cattlemen's Association: $20,000
ADF Funding: $171,090

Livestock and Forage Center of Excellence: Research and education for future generations (*20190147)*

Principal Investigator: Dr. Kris Ringwall
University of Saskatchewan
Objectives:

- Secure operating funds for management and operations of the Livestock and Forage Centre of Excellence (LFCE).

ADF Funding: $3,219,000

Improved manure utilization methods for feedlots in Saskatchewan (*20190165)*

Principal Investigator: Dr. Terry Fonstad
University of Saskatchewan
Objectives:

- Analyze economics of different manure management strategies from the producer's point of view;
- Determine the total greenhouse gas emissions associated with solid manure management;
- Investigate the characteristics of manure composted in pens versus composting at the site adjacent to the feedlot; and
- Assess any off-farm benefits of different manure management practices.

Saskatchewan Cattlemen's Association: Contributed $24,531
ADF Funding: $50,000

Hybrid fall rye as a new forage source for beef cattle (*20190198)*

Principal Investigator: Dr. Gregory Penner
University of Saskatchewan
Objectives:

- Determine the relative yield and quality of hybrid rye silage when compared to spring-seeded barley;
- Determine the feeding value of hybrid fall rye as a silage source for growing and finishing steers;
- Determine the feeding value and cost breakpoints of hybrid rye silage for backgrounding and finishing operations, and
- Determine the effect of hybrid fall rye silage on ruminal fermentation and nutrient digestion.

Saskatchewan Cattlemen's Association: Contributed $48,000
ADF Funding: $298,689

Strategies to address mineral nutrition in the face of poor water quality (*20190199)*

Principal Investigator: Dr. Gregory Penner
University of Saskatchewan
Objectives:

- Evaluate the dose-response of bismuth subsalicylate as a strategy to mitigate impacts of high-sulfate water;
- Evaluate the dose-response of bismuth subsalicylate as a strategy to mitigate the impacts of high-sulfate water;
- Use of bismuth subsalicylate to reduce the negative impact of high sulfate water; and
- Determine appropriate mineral feeding strategies to address high-sulfate water.

Saskatchewan Cattlemen's Association: $40,000
ADF Funding: $221,709

Characterization and optimization of visual pen checking criteria to improve BRD treatment outcomes in feedlot cattle (*20190234)*

Principal Investigator: Dr. Diego Moya
University of Saskatchewan
Objectives:

- To identify human and animal factors that have an impact on the identification of respiratory disease in feedlot cattle.

ADF Funding: $55,200

Development of forage wheat lines with high biomass yield and high quality (*20190255)*

Principal Investigator: Dr. Bill Biligetu
University of Saskatchewan
Objectives:

- Evaluate advanced forage wheat lines in replicated trials to collect forage yield, quality and other grain production;
- Advance the F3's generation and new crosses via single seed descent breeding (SSD) in the greenhouse;
- Compare the best forage wheat lines with forage barley and oat cultivars in replicated trials; and
- Evaluate the most promising line of forage wheat for silage production potential in a large scale trial at Agriculture and Agri-food Canada in Lethbridge.

Saskatchewan Cattlemen's Association: $30,000
ADF Funding: $160,684

Development of a modified live attenuated vaccine for broiler breeders to control variant infectious bursal disease (*20190288)*

Principal Investigator: Dr. Susantha Gomis
University of Saskatchewan
Objectives:

- Attenuation of vIBDV SK09 to develop a broiler breeder vaccine.

ADF Funding: $150,000

Increasing the use of air classified pea starch in grower pig diets (*20190261)*

Principal Investigator: Dr. Rex Newkirk
University of Saskatchewan
Objectives:

- To determine diet and animal factors which will allow maximal inclusion of air-classified pea starch in grower pig diets;
- Determine the optimal fibre and inclusion level and pelleting to prevent gastric ulcers in pigs fed air classified pea starch; and
- Determine optimal inclusion level and net energy content of air-classified pea starch in the diet of growing/finishing pigs.

ADF Funding: $323,000

Enhancing isolation of respiratory viruses from cattle and pigs for diagnostic, epidemiological investigation and applied use (*20190326)*

Principal Investigator: Dr. Matthew Loewen
University of Saskatchewan
Objectives:

- Develop porcine and bovine airway cell line bank through gene editing immortalization;
- Determine which porcine cell lines (from objective 1) are most effective for isolating influenza A in swine (IAV-S); and
- Determine which bovine cell lines (from objective 1) are most effective for isolating bovine respiratory syncytial virus.

ADF Funding: $92,780

Vaccine and Infectious Disease Organization

Universal vaccine development for influenza a virus in swine (*20190046)*

Principal Investigator: Dr. Yan Zhou
Vaccine and Infectious Disease Organization
Objectives:

- To evaluate the bivalent vaccine against swine influenza we recently developed in pigs.

ADF Funding: $208,500

Using DNA sequencing to track and predict virulence and AMR in organisms that cause colibacillosis on Saskatchewan broiler farms (*20190173)*

Principal Investigator: Dr. Aaron White
Vaccine and Infectious Disease Organization
Objectives:

- Collecting and characterizing *E. coli* isolates associated with colibacillosis in broiler flocks;
- Using whole genome sequencing to compare *E. coli* disease strains to *E. coli* strains from healthy birds in the same flock; and
- Developing a research database that can be used to track Saskatchewan *E. coli* strains.

ADF Funding: $116,000

Western College of Veterinary Medicine

Do novel neonatal calf prime and boost vaccine programs improve immunity and decrease respiratory disease at weaning (*20190022)*

Principal Investigator: Dr. Nathan Erickson
Western College of Veterinary Medicine
Objectives:

- Disease challenge of vaccine comparison groups;
- Enrollment of commercial ranch calves into field trial;
- Collation of data and statistical analysis of disease challenge data;
- Weaning and post-weaning monitoring of field trial calves; and
- Enrollment of calves into challenge trial.

Saskatchewan Cattlemen's Association: Contributed $17,250
ADF Funding: $62,000

A screen for drugs that reveal Mycoplasma bovis to the bovine immune system (*20190067)*

Principal Investigator: Dr. Antonio Ruzzini
Western College of Veterinary Medicine
Objectives:

- Identify and quantify the population of prolipoproteins released from *M. bovis* upon drug treatment;
- Develop a screen for molecules that inhibit the first step of lipoprotein maturation; and
- Identify a safe, commercially-available compound that inhibits the lipoprotein maturation enzyme Lgt.

Saskatchewan Cattlemen's Association: $24,200
ADF Funding: $218,200

Molecular analysis of BRD-associated pathogen interactions (*20190233)*

Principal Investigator: Dr. Antonio Ruzzini
Western College of Veterinary Medicine
Objectives:

- Evaluate cellular immune responses to single and co-infection with BRD pathogens;
- Establish tools to image BRD pathogens in established, immortal, bovine cell lines; and
- Study pathogen interactions within bovine cell lines.

ADF Funding: $70,000

Development of a novel testing program for Salmonella enterica serovar dublin (Salmonella dublin) in dairy herds (*20190265)*

Principal Investigator: Dr. Christopher Luby
Western College of Veterinary Medicine
Objectives:

- Estimate the performance of serology and fecal culture used in a novel sampling strategy to detect *Salmonella dublin* carriers.

ADF Funding: $37,494

Experiential discovery and learning through research in food animal veterinary medicine (*20190269)*
Principal Investigator: Dr. Liz Snead
Western College of Veterinary Medicine
Objectives:

- Enhance veterinary student training;
- Enrich experience with food producing species to encourage career interest;
- Support students pursuing joint DVM-MSc degrees or post-graduate training;
- Exploit investments in research infrastructure;
- Enhance research capacity; and
- Place Saskatchewan at the forefront of large and food animal research.

ADF Funding: $375,000

Additional funding for ADF funded project (20180361) entitled "Should livestock diet be tested for the levels of the epimers of ergot alkaloids? Are these epimers biologically active?" (*20190300)*
Principal Investigator: Dr. Ahmad Al-Dissi
Western College of Veterinary Medicine
Objectives:

- To examine the biological activity of the epimers of ergot alkaloid.

ADF Funding: $65,000

Genome Prairie

Genomic ASSETS (antimicrobial stewardship systems from evidence-based treatment strategies) for livestock *(20190350)*
Principal Investigator: Dr. Cheryl Waldner
Western College of Veterinary Medicine
Objectives:

- The project will develop pen-level precision diagnostics support network for large-scale application of leading-edge genomic technologies by the livestock industry. This strategy assists in combating the global challenge of antimicrobial resistence. The need for antimicrobial stewardship, animal healthcare providers require access to rapid diagnostic information to inform prudent antimicrobial selection; and
- Pen-level precision diagnostics will offer timely and practical support for prudent antimicrobial use decisions.

Feedlot HEALTH Management Services: $439,184
Saskatchewan Cattlemen's Association: $23,000
ADF Funding: $788, 477