Summary of Agriculture Development Fund Livestock Projects for 2021

Institution	Number of Approved Projects	Total Amount Funded
Agriculture and Agri-Food Canada	2	$309,600
Global Institute for Food Security	1	$331,869
Prairie Diagnostic Services Inc.	2	$288,754
Saskatchewan Beekeeping Development Commission	1	$465,000
Saskatchewan Bison Association	1	$32,000
University of Regina	1	$279,125
University of Saskatchewan (U of S)	18	$2,395,387
U of S – Prairie Swine Centre operational funds	1	$1,900,000
U of S – VIDO operational funds	1	$1,576,900
Total		**$7,578,635**

Commodity	Number of Approved Projects	Total Amount Funded
All Species	1	$1,576,900
Beef	6	$1,011,746
Beef and Dairy	2	$429,125
Bees	1	$465,000
Bison	1	$32,000
Dairy	1	$109,328
Forages	4	$832,206
General	1	$241,000
Poultry	2	$422,500
Sheep	1	$105,496
Swine	6	$2,353,334
Total	**26**	**$7,578,635**

Livestock and Forage Projects Co-funders	Projected Co-funding
Alberta Milk	$15,000
Saskatchewan Alfalfa Seed Producers Development Commission	$125,000
Saskatchewan Cattlemen's Association	$162,350
Saskatchewan Forage Seed Development Commission	$9,130
SaskMilk	$31,504
Total	**$342,984**

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

Evaluating AAC Trueman Alfalfa in Saskatchewan (*20200308*)

Principal Investigator: Bill Houston, Agriculture and Agri-Food Canada
Objectives:

- Evaluate ST1 Timothy as a potential flood tolerant variety that can be mixed with AAC Trueman in higher soil moisture landscapes;
- Develop knowledge and technology transfer products that will benefit the Saskatchewan agriculture industry with an emphasis on economics;
- Evaluate forage production, forage quality, and persistence of AAC Trueman alfalfa in the Brown, Dark Brown, and Black Soil Zone;
- Determine the adaptability of AAC Trueman under three field moisture conditions: excess water, irrigated and dryland; and
- Evaluate the flooding tolerance of AAC Trueman at the AAFC Swift Current Salinity Tolerance Testing Laboratory.

Co-funded by: Saskatchewan Alfalfa Seed Producers Development Commission
ADF Funding: $68,600

Development of a Bacterial-Based Additive to Degrade Mycotoxins in Contaminated Feeds (*20200369*)

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

- Perform an in vivo sheep study to evaluate the efficacy of candidate bacteria to mitigate Deoxynivalenol (DON)-contaminated feed;
- Isolate and characterize bacteria that can degrade the mycotoxin DON; and
- Test the ability of isolated bacteria to metabolize DON in simulated gastrointestinal environments.

ADF Funding: $241,000

Global Institute for Food Security

Identifying New Diversity and Developing Genomic Resources for Bromegrass (Bromus Spp.) Forage Crop Breeding (*20200420*)

Principal Investigator: Andrew Sharpe, Global Institute for Food Security
Objectives:

- Create foundational high-quality reference genome for bromegrass forage breeding research;
- Cytogenetic characterization of accessions for ploidy and chromosome number;
- Implementation of a core set of germplasm and identified markers in pre-breeding activities; and
- Identify and characterize diverse germplasm resources for genotypic and phenotypic attributes.

Co-funded by: Saskatchewan Forage Seed Development Commission and Saskatchewan Cattlemen's Association
ADF Funding: $331,869

Prairie Diagnostic Services Inc.

Does the Diversity of Bovine Enteric Coronavirus Affect Vaccine Efficacy? (*20200120*)

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

- Compare sequences between field isolates and vaccine strains to estimate vaccine efficacy; and
- Obtain whole-genome sequences from field isolates of bovine enteric coronavirus.

ADF Funding: $126,254

Development of a Novel, Rapid Tool for Non-Typhoidal Salmonella Detection and Risk Assessment for Livestock and Poultry (*20200211*)

Principal Investigator: Musangu Ngeleka, Prairie Diagnostic Services Inc.
Objectives:

- Develop a rapid diagnostic workflow and database as a foundation for rapid metagenomics-based Salmonella risk profile matrix; and
- Identify and characterize *Salmonella* serovars prevalent in Western Canada using Oxford Nanopore sequencing platform.

ADF Funding: $162,500

Saskatchewan Beekeeping Development Commission

Development of Novel Mitcides to Control and Manage the Resistance of Honey Bee Varroa Mites (*20200104*)

Principal Investigator: Medhat Nasr, Saskatchewan Beekeeping Development Commission
Objectives:

- Test the toxicity to mites and safety to bees in mini colonies (nuclei);
- Test toxicity to mites and bees and accumulated residues in honey and beeswax in full size colonies; and
- Assess the toxicity of potential miticides on varroa mites and honey bees under laboratory conditions.

ADF Funding: $465,000

Saskatchewan Bison Association

Project Extension- Benchmark Study for Cost of Production and Performance Measures From Cow/Calf to Carcass (*20200254*)

Principal Investigator: Terry Kremeniuk, Saskatchewan Bison Association
Objectives:

- To improve the quality of the financial and production benchmark data while reducing data collection costs;
- To develop production and financial benchmarks to be used by stakeholders; and
- To improve the quality of the financial and production benchmark data while reducing data collection costs.

ADF Funding: $32,000

University of Regina

Sulfate Removal from Agricultural Ponds for Improved Cattle Health: Evaluating Regional and Local Controls (*20200080*)

Principal Investigator: Kerri Finlay, University of Regina
Objectives:

- Identifying local and regional regulators of agricultural pond sulfate concentrations;
- Evaluate the conditions under which dugout dredging and re-filling adequately mitigates sulfate concentrations; and
- Test the effectiveness of riparian and floating native plants for sulfate removal from surface water.

Co-funded by: Saskatchewan Cattlemen's Association
ADF Funding: $279,125

University of Saskatchewan

Impact of Dietary Protein Source and Functional Amino Acid Supplementation on Pig Response to Disease Challenge (*20200056*)

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

- To provide recommendations on the use of plant-based diets and functional amino acids in the nursery period;
- To determine the impact of protein source in nursery diets on disease susceptibility; and
- To determine the impact of functional amino acid supplementation and protein source on pig performance during disease challenge.

ADF Funding: $70,500

Investigating the Role of GDF11 in Muscle and Fat Deposition in Beef Cattle (*20200073*)

Principal Investigator: Mika Asai-Coakwell, University of Saskatchewan
Objectives:

- To determine the effect of the GDF11 variant on the carcass in crossbred- and purebred-cattle populations;
- To determine the meat quality differences associated with GDF11 genotypes;
- To determine if the GDF11 variant affects feed intake, growth performance and feed efficiency of finishing beef cattle;
- To train one graduate student in bovine genetics; and
- To examine the role of GDF11 variants in cow-calf production.

Co-funded by: Saskatchewan Cattlemen's Association
ADF Funding: $254,819

Development of Green and Sustainable Processes for Surface Decontamination of Shell Eggs (*20200094*)
Principal Investigator: Lifeng Zhang, University of Saskatchewan
Objectives:

- Develop a lab-scale continuous operation of surface decontamination for the egg industry;
- Investigate the efficiency of electrosprayed water nanostructures in deactivating microbes on shell eggs; and
- Investigate the efficiency of nonthermal plasma technique in deactivating microbes on shell eggs.

ADF Funding: $260,000

Value of Record Keeping for Decision-Making on Canadian Cow-Calf Operations (*20200087*)
Principal Investigator: Kathy Larson, University of Saskatchewan
Objectives:

- Determine how cow-calf producers are storing and analyzing production and financial records;
- Determine performance and profitability of cow-calf producers who collect, analyze and apply data in decisions;
- Determine how cow-calf producers are using production and financial records to make management decisions; and
- Determine the extent that production and financial records are collected and maintained among cow-calf producers.

ADF Funding: $50,500

Improving Triticale: Identification of Core Accessions with Favorable Nutrient Composition and Agronomic Traits (*20200392*)
Principal Investigator: Tim Sharbel, Global Institute for Food Security
Objectives:

- Seed composition analyses;
- Data storage, management, visualization and analysis;
- Establishment of core-collection panel; and
- Genomic characterization of a core set of diverse lines.

ADF Funding: $263,000

Towards 1-Step Testing – Rapid Identification of Bovine Respiratory Disease (BRD) Viruses to Inform Vaccine Use and Development (*20200097*)
Principal Investigator: Cheryl Waldner, University of Saskatchewan
Objectives:

- Define role of known and emerging viruses in clinical BRD and associated pathogens (bacteria and viruses);
- Advance and refine rapid metagenomic sequencing and bioinformatics protocols for diagnosis of viral BRD;
- Describe respiratory viruses in calves at arrival and associated vaccination gaps; and
- Evaluate the potential contribution of metagenomic data to inform the development of new vaccines.

Co-funded by: Saskatchewan Cattlemen's Association
ADF Funding: $212,230

Comprehensive Evaluation of the Effect Of Extended-Term Delivery of Local Anesthetic on Mitigating the Pain Caused By Castration (*20200111*)

Principal Investigator: Diego Moya, University of Saskatchewan
Objectives:

- Develop a standardized pain evaluation protocol to facilitate the development and registration of future pain mitigation tools; and
- Evaluate the effects of the extended-term delivery of anesthesia on the pain caused by castration in one and six-month old calves.

Co-funded by: SaskMilk
ADF Funding: $150,000

Investigating Treatment Options for Disease-Induced Hypothyroidism in Pigs (*20200119*)

Principal Investigator: John Harding, Western College of Veterinary Medicine
Objectives:

- Identify pathogens associated with disease-induced hypothyroidism and evaluate treatment options for this condition.

ADF Funding: $100,000

Prairie Swine Centre - Applied Swine Research and Knowledge Transfer Program (*20200149*)

Principal Investigator: Murray Pettitt, University of Saskatchewan
Objectives:

- Contribute to the sustainability of the Saskatchewan pork value chain through Prairie Swine Centre's applied research results.

ADF Funding: $1,900,000*
**Note: Operational support*

Using Watering Bowls to Monitor the Respiratory Bacterial Resistome in Cattle by Location and Time in Feedlots (*20200187*)

Principal Investigator: Murray Jelinski, University of Saskatchewan
Objectives:

- Determine if the antimicrobial resistance (AMR) profiles of the bovine respiratory disease (BRD) pathogens derived from the nasopharyngeal (NP) and lung samples are correlated to the AMR profiles;
- Determine if the resistomes of the NP and lung samples are correlated to resistomes of the watering bowls;
- Describe how AMR profiles of the four main bacterial pathogens of BRD vary over time; and
- Determine if the geographical location of the pens within the feedlot and the timing of the sampling (days on feed and month of year) affect the resistomes.

Co-funded by: Saskatchewan Cattlemen's Association
ADF Funding: $184,875

Nutritional Evaluation of New Forage Barley and Oat Varieties As Silage Sources for High-Producing Dairy Cows (*20200182*)

Principal Investigator: Timothy Mutsvangwa, University of Saskatchewan
Objectives:

- To determine the ensiling characteristics of Conlon, Falcon, FB209 and CDC Arborg forage varieties.
- To compare the effects of feeding Conlon, Falcon, FB209, and CDC Arborg as the major forage sources in dairy cows.

Co-funded by: Sask Milk and Alberta Milk
ADF Funding: $109,328

Enhancing Diagnostic Methods for Rapid and Accurate Detection of Macrolide Resistance in *Mannheimia Haemolytica* (*20200206*)

Principal Investigator: Janet Hill, University of Saskatchewan
Objectives:

- Identify novel genomic markers of macrolide resistance in *Mannheimia Haemolytica* isolates from Western Canadian feedlots.

Co-funded by: Saskatchewan Cattlemen's Association
ADF Funding: $183,068

Updating the Ram Breeding Soundness Evaluation Guidelines for Accelerated Lambing Programs In Western Canada (*20200237*)

Principal Investigator: Dinesh Dadarwal, University of Saskatchewan
Objectives:

- Determine the scrotal circumference ranges for rams by breed and age; and
- Determine season specific breeding soundness evaluation guidelines for rams of different breeds and age.

ADF Funding: $105,496

Evaluation of a Multivalent Swine Dysentery Vaccine (*20200276*)

Principal Investigator: John Harding, Western College of Veterinary Medicine
Objectives:

- Develope a vaccine for swine dysentery associated with strongly hemolytic *Brachyspira* spp.

ADF Funding: $59,501

Tools to Mitigate Disease Associated With *Streptococcus Zooepidemicus*: An Emerging Threat to the Canadian Pork Industry (*20200280*)

Principal Investigator: Matheus Costa, University of Saskatchewan
Objectives:

- Characterize how *S. zooepidemicus* causes disease in pigs;
- Investigate the development of immunological tools to mitigate lesions following infection by *S. zooepidemicus*; and
- Investigate the development of non-antibiotic treatment and prevention alternatives to mitigate disease severity.

ADF Funding: $80,000

Development of Salt Tolerant Alfalfa Cultivar Adapted to Western Canada (*20200342*)

Principal Investigator: Bill Biligetu, University of Saskatchewan

Objectives:

- To develop new salt tolerant alfalfa breeding lines;
- To evaluate agronomic performance of salt-tolerant alfalfa breeding lines;
- To evaluate salt tolerance of the new alfalfa breeding lines in the field and at the AAFC Swift Current salt-testing lab;
- To evaluate water logging tolerance of the new alfalfa lines; and
- To validate molecular markers in the breeding populations to develop markers for screening salt tolerance in alfalfa.

Co-funded by: Saskatchewan Cattlemen's Association and Saskatchewan Alfalfa Seed Producers Development Commission

ADF Funding: $168,737

Mitigating Mycotoxin Contamination From Grains Used in Swine Feed By Adapting Nanotechnology Strategies (*20200363*)

Principal Investigator: Bernardo Predicala, Prairie Swine Centre Inc.

Objectives:

- To mitigate mycotoxin contamination in feed grains used in swine diets by adapting nanotechnology techniques;
- Evaluate the feasibility and develop recommendations for application of anti-mycotoxin treatments in swine and grain industry;
- Establish optimum operational requirements and application conditions for selected nanomaterials; and
- Assess the efficacy of nano-mitigation techniques in in-barn tests.

ADF Funding: $143,333

Enhancing Producer Knowledge Translation and Communication Through Core Funding to the Vaccine and Infectious Disease Organization (VIDO) (*20200377*)

Principal Investigator: Volker Gerdts, VIDO

Objectives:

- Increase productive relationships with livestock and poultry producers;
- Continue key research and development for the livestock sector; and
- Enhance knowledge translation.

ADF Funding: $1,576,900*

**Note: Operational support*