

## Summary of ADF Projects, 2016

### Livestock and Forage Research Funding

26 Livestock and Forage-related research projects \$7,824,658

#### Breakdown by Commodity

Core funding (Prairie Swine Centre and VIDO)	\$3,150,000
Forage	\$1,745,652
Beef	\$1,245,191
Swine	\$787,065
Other Species	\$758,250
Miscellaneous	\$138,500
<b>TOTAL</b>	<b>\$7,824,658</b>

#### Breakdown by Organization

University of Saskatchewan (including VIDO & WCVM)	\$4,543,303
Prairie Swine Centre Inc.	\$1,738,640
Western Beef Development Centre - Prairie Agricultural Machinery Institute	\$1,083,889
Agriculture & Agri-Food Canada	\$210,826
Saskatchewan Bison Association	\$150,000
University of Regina	\$98,000
<b>TOTAL</b>	<b>\$7,824,658</b>

## 2016 Livestock and Forage Research Funding

### **Prairie Swine Centre Inc. (PSC) \$1,650,000**

#### ***Five-year core funding to PSC (20150348)***

The funding will be used to support communication and technology transfer activities, scientific expertise and activities that would enhance the competitiveness of the Saskatchewan swine industry. It assists PSC in support of their key activities or deliverables, including:

- to increase the net income of pork producers through the development of feeding programs that emphasize economic efficiency and final product quality;
- to maximize the economic value gained from feeding locally available ingredients and ingredient fractions by characterizing and modifying their nutritional and functional characteristics;
- to increase net income by developing housing systems that optimize pig performance considering both construction and operating costs;
- to ensure that animal care and welfare interests of pigs, producers and the marketplace are met in a productive and profitable manner through the development of acceptable housing and management systems and practices;
- to improve indoor air quality through the development of economical and practical techniques ensuring the health and safety of barn workers and animals; and
- to reduce odour and gas emissions or improve nutrient and water management by developing in barn operating systems and management procedures that ensure the long term environmental sustainability and acceptability of pork production.

**ADF Funding:** \$1,650,000

**Organization:** Prairie Swine Centre

**Contact:** Lee Whittington, (306) 667-7447

### **Vaccine and Infectious Disease Organization (VIDO) \$1,500,000**

#### ***Five-year core funding to VIDO (20150349)***

The funding will be used to support a number of activities that provide important support to the livestock industry, including:

- to provide support for communication at VIDO-InterVac, which is instrumental in developing these new mediums of communication, including a digital strategy, an improved website, and enhanced social media engagement
- The funding will ensure that cutting edge research is effectively translated to the livestock industry and to our other stakeholders through various communication channels.
- to continue to develop vaccines for infectious diseases affecting Saskatchewan livestock producers' herds and potentially affecting the safety of our food (i.e. campylobacter, salmonella).
- beef and swine technical groups that provide technical support and advice to VIDO and producers;
- beef and swine business development activities in support of the livestock industry; and
- communication activities including publications, participation at industry meetings, content for Beef Info Net and Swine Disease Net, vaccination guidelines, etc.

**ADF Funding:** \$1,500,000

**Organization:** VIDO - University of Saskatchewan

**Contact:** Andrew Potter, (306) 966-7484

## **Beef**

### ***Evaluating Core Body Temperature as an Indicator of Feed Efficiency and Nutrient Status of Beef Cattle Fed Forage Based Diets*** (20150015)

#### **Objectives:**

- Develop animal models that relate rumen temperature (RT) to residual feed intake (RFI), residual gain (RG) and nutrient status of beef cattle fed forage based diets.
- Determine the relationship between rumen microbial population with RT and feed efficiency profiles.
- Developing practical tools that will enable producers identify feed efficient cattle in forage grazing systems by measuring RT.
- Evaluate costs/expected benefits to cattle producers by investing in temperature monitoring technologies.
- Use results to make recommendations to Saskatchewan beef and forage industry personnel/producers with respect to feed efficiency
- Use study results to validate in industry scale field studies - with cattle consuming forage diets in pasture while measuring core body temperature (CBT).

**ADF Funding:** \$136,450

**Saskatchewan Beef Industry Development Fund:** \$15,000

**Organization:** Western Beef Development Centre

**Contact:** Bart Lardner, (306) 682-3139

### ***Genes Involved in Fat Deposition Are Affected by Vitamin A in the Diet of Feedlot Cattle*** (20150080)

#### **Objectives:**

- Sequence coding portions of each gene in 19 head both in the forward and reverse directions.
- Identify gene variants that could affect the bioactivity of the protein.
- Devise DNA test to distinguish alleles.
- Genotype populations of steers (2000 head and 1000 head).
- Perform association studies including gene interactions with carcass traits.

**ADF Funding:** \$171,000

**Organization:** University of Saskatchewan

**Contact:** Fiona Buchanan, Animal and Poultry Science, (306) 966-4160

### ***Role of Calving Period on Beef Cow Longevity and Productivity*** (20150160)

#### **Objectives:**

- Determine correlation between when heifers calve in first calving period and retention within the herd.
- Determine correlation between first calving period and lifetime pounds of calf weaned.
- Determine correlation between heifers' calving period at birth and her performance in the herd.

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

**Organization:** Western Beef Development Centre

**Contact:** Kathy Larson, (306) 930-9354

***The Cost of Production Performance and Profitability in Cow-Calf Operations*** (20150161)

**Objectives:**

- Compare industry recommended management practices (RMP) adoption with WBDC RMP adoption
- Compare industry production performance with WBDC production performance.
- Determine why RMPs not adhered to by cow-calf producer.
- Determine what RMPs are linked to profitability.
- Determine labour and cash cost of RMPs followed by WBDC.

**ADF Funding:** \$60,000

**Organization:** Western Beef Development Centre

**Contact:** Kathy Larson, (306) 930-9354

***Genetic Variability of Clinical Diseases Caused by Histophilus somni in Western Canadian Cattle*** (20150162)

**Objectives:**

- Analyze the shifts and trends in the disease presentation of H somni in Western Canadian cattle from 1990 to 2015.
- Detect the presence of virulence factors in different clinical syndromes caused by Histophilus somni.
- Develop and validate a new polymerase chain reaction (PCR) assay for the detection of H somni in formalin fixed tissue samples.

**ADF Funding:** \$42,675

**Organization:** Western College of Veterinary Medicine

**Contact:** Bruce Wobeser, Veterinary Pathology, (306) 966-8060

***Control of Viral and Bacterial Respiratory Pathogens in Weaned Calves*** (20150179)

**Objectives:**

- Optimize vaccination protocol to reduce risk of respiratory disease in “high-risk” fall weaned calves.
- Evaluate the efficacy of a new intranasal bacterial vaccine in fall-weaned calves.
- The effect of stress on bacterial growth in the upper respiratory tract following vaccination.

**ADF Funding:** \$246,000

**Organization:** VIDO

**Contact:** Philip Griebel, (306) 966-1542

***Novel Approach to Develop a Vaccine Against Mycoplasma bovis*** (20150180)

**Objectives:**

- Identification of M. bovis antigens by reverse vaccinology approaches.
- Ranking of the protein candidates.
- Assessment of the immune responses to the 60 proteins after vaccination.
- Proof of concept trial.

**ADF Funding:** \$350,920

**Organization:** VIDO

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

***An Assessment of the Impact and Risk Factors of Internal Parasites in Beef Cattle in Western Canada*** (20150268)

**Objectives:**

- To determine the herd-level internal parasite burden and species, and risk factors in cow-calf operations in Western Canada.
- To describe the epidemiology of internal parasites in cows and calves and yearling beef cattle on pasture in Western Canada.
- To measure the efficacy of current anthelmintic drugs in feedlot cattle in Western Canada.
- To determine the impact of parasite burden on productivity in feedlot cattle in Western Canada.
- To assess the impact of parasite burden on response to vaccination in feedlot cattle in Western Canada.
- To determine the effect of different parasite species on drug efficacy, production and immunity in feedlot cattle.

**ADF Funding:** \$198,146

**Merck Animal Health:** \$180,000

**Organization:** University of Saskatchewan

**Contact:** Fabienne Uehlinger, Large Animal Clinical Sciences, (306) 966-7062

## **Swine**

***Development of Novel Therapeutics and a Next Generation PRRSV Vaccine: Phase II*** (20150220)

**Objectives:**

- To evaluate novel nanoparticle therapeutics that harness the cellular autophagy pathway against Porcine Reproductive and Respiratory Syndrome Virus.
- To assess the potential of novel biotherapeutics.
- To evaluate lead vaccine candidates for commercial development.

**ADF Funding:** \$390,000

**Alberta Livestock and Meat Agency:** \$160,000

**Organization:** VIDO

**Contact:** Volker Gerdts, (306) 966-1513

***Practical Alternatives for Managing Castration Pain in Piglets*** (20150226)

**Objectives:**

- To evaluate the effect oral sucrose when used in combination with NSAIDs to treat castration pain.
- To evaluate the effect of piglet age on the response to castration pain.
- To compare the use of three NSAID drugs for the treatment of pain following castration.
- To evaluate the optimum timing of analgesic administration to minimize stress and pain at castration.

**ADF Funding:** \$88,640

**Sask Pork:** \$10,000

**Merial Canada:** \$2,000

**Organization:** Prairie Swine Centre Inc.

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

***Evaluation of Safety and Efficacy of a Swine Influenza Vaccine*** (20150263)

**Objectives:**

- Test safety of the vaccine.
- Test whether the vaccine can cross protect pigs.
- Test whether vaccine can protect pigs in a farm.

**ADF Funding:** \$184,425

**Organization:** VIDO

**Contact:** George Mutwiri, (306) 966-1511

***Field Trial for the Assessment of a Novel Vaccine for Porcine Epidemic Diarrhea Virus*** (20150345)

**Objectives:**

- Assess the safety of the vaccine, as required by the Canadian Food Inspection Agency (CFIA). Vaccine safety addresses any adverse reactions to the vaccine such as fever, behavioural changes (e.g. stop eating) or injections site reactions.
- Assess the immune response in vaccinated sows over a period of 18 months in total to determine the duration of immunity and the interval for subsequent booster immunizations (immunogenicity).
- Determine the efficacy of the vaccine using the challenge model for piglets that has been developed at VIDO-InterVac.

**ADF Funding:** \$124,000

**Sask Pork:** \$70,000

**Organization:** VIDO

**Contact:** Volker Gerdts, (306) 966-1513

## **Other Species**

***Development of a Live Diagnostic Test for Chronic Wasting Disease*** (20150060)

**Objectives:**

Overall Objective

- Independently assess the chronic wasting disease (CWD) status of high-risk elk and deer through a) traditional post-mortem testing and b) fecal PMCA.
- Establish infection status of animals with inconsistent post-mortem and PMCA results.
- Determine the sensitivity and specificity of fecal PMCA as a live diagnostic test for CWD.

**ADF Funding:** \$210,250

**Organization:** VIDO

**Contact:** Scott Napper, (306) 966-1546

***Project Extension - Benchmark Study for Cost of Production and Performance Measures For Bison, From Cow/Calf to Carcass*** (20150164)

**Objectives:**

- To increase the producers participating in the project from 48 to 80 producers.
- To develop viable farm benchmarks for use by stakeholders for decision making.
- To extend the Saskatchewan Bison Benchmarking project for another five years.

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

**Organization:** Saskatchewan Bison Association

**Contact:** Terry Kremeniuk, (306) 522-4762

***In Ovo Vaccination Platform to Reduce Salmonella and Campylobacter Bacteria in Poultry*** (20150241)

**Objectives:**

Part A: Vaccine delivered in ovo using a viral vector (Campylobacter)

- Clone genes expressing surface proteins of Campylobacter.
- Test immune response to Campylobacter proteins delivered in ovo using a viral vector.
- Test the efficacy of vaccine to reduce the level of colonization by Campylobacter in proof of principle trials.

Part B: Subunit vaccine delivered in ovo (Salmonella)

- Production and purification of Salmonella antigens.
- Salmonella vaccine formulation.
- Test immune response to Salmonella antigens delivered in ovo.
- Test the efficacy of vaccine to reduce the level of colonization by Salmonella in proof of principle trials.

**ADF Funding:** \$300,000

**Egg Farmers of Canada:** \$150,000

**Organization:** VIDO

**Contact:** Wolfgang Köster, (306) 966-7479

***Enhanced Low-Temperature Anaerobic Digestion of Manure for Biogas Heating at Remote Farms*** (20150255)

**Objectives:**

- Develop an effective dry digestion technology adapted to low temperatures.
- Use psychrophilic microbes to enhance the digestion of cattle manure.
- Conduct a cost-benefit analysis for the cattle manure digestion system based on multi-scale applications.
- Propose low-cost biogas utilization approaches for heating on farms.

**ADF Funding:** \$98,000

**Organization:** University of Regina

**Contact:** Gordon Huang, Environmental Systems Engineering, (306) 585-4095

**Miscellaneous**

***Develop Fast Screening Method for Feed Mycotoxin Testing for Livestock Producers*** (20150266)

**Objectives:**

- To test possibility of using non-destructive mid and near infra red spectroscopic techniques as a fast screening method for feed mycotoxin for livestock producers.
- To train highly qualified personnel (HQP) postdoctoral fellow as one of high priorities in this proposed research program.

**ADF Funding:** \$138,500

**Organization:** University of Saskatchewan

**Contact:** Peiqiang Yu, Animal and Poultry Science, (306) 966-4132

## **Forage**

### ***Evaluation of Contrasting Forage Pea Cultivars in Mixtures with Cereals for Greenfeed Production in Saskatchewan*** (20150040)

#### **Objectives:**

- Test different forage pea cultivars in mixtures with forage oat and barley for greenfeed production.
- Determine optimum proportion of forage pea in pea-barley or pea-oat mixture for greenfeed production.
- Determine animal preference, feed digestibility, and feed intake of pea-cereal mixtures.
- Determine forage pea N fixation rate in pea-cereal mixtures with or without N fertilizer.
- Conduct cost analysis of cereal-pea forage mixtures in comparison to barley and oat greenfeed production.

**ADF Funding:** \$292,450

**SaskPulse:** \$73,112

**Organization:** University of Saskatchewan

**Contact:** Bill Biliget, Plant Sciences, (306) 966-4007

### ***Development of Locally Adapted Alfalfa Cultivars in Saskatchewan*** (20150041)

#### **Objectives:**

- To create 5 new alfalfa synthetic populations by intercrossing alfalfa plants collected from several long-term grazing sites.
- To assess gene expression of alfalfa cultivars in response to grazing.
- Identify top yielding 15 alfalfa cultivars and top performing 10 creeping rooted alfalfa in Western Forage Test (WFT), and evaluate performance in SK.
- Intercrossing the best genotypes from top 15 performing alfalfa cultivars to create 4 new alfalfa breeding lines.
- Test forage yield and performance of new lines in the replicated field plots.

**ADF Funding:** \$177,301

**Western Grains Research Foundation:** \$62,500

**Organization:** University of Saskatchewan

**Contact:** Bill Biliget, Plant Sciences, (306) 966-4007

### ***Evaluation of New Triticale Varieties in Beef Cattle Backgrounding Programs*** (20150143)

#### **Objectives:**

- Determine intake and performance of beef calves in silage background programs evaluating triticale compared to barley.
- To determine economic feasibility of three silage crops in beef cattle backgrounding programs.
- To determine evidence of any mycotoxins in cereal silage forage.
- Determine feed selectivity issues when feeding triticale silage.
- To determine DM yield and nutritive value differences of triticale varieties compared to barley for backgrounding calves.

**ADF Funding:** \$279,939

**Saskatchewan Beef Industry Development Fund:** \$30,000

**Organization:** Western Beef Development Centre

**Contact:** Bart Lardner, (306) 682-3139



***Cicer Milkvetch: Good Grazing Legume or Unpalatable Species?*** (20150173)

**Objectives:**

- Compare grazing preference of 3 cicer milkvetch varieties with beef cows.
- Investigate grazing refusal of cicer milkvetch by cattle.
- Compare intake of 3 cicer milkvetch varieties to alfalfa.

**ADF Funding:** \$167,500

**Organization:** Western Beef Development Centre

**Contact:** Paul Jefferson, (306) 682-3139

***Increasing Forage Production with Perennial Legumes*** (20150177)

**Objectives:**

- Determine the nutritional profile of the mixtures and their potential time of nutritional benefit to livestock.
- Select genetic material for further development in increasing their range of utilization.
- Train future research professional.
- To examine combinations of legumes with a grass ability to improve biomass production in semiarid and humid environment.

**ADF Funding:** \$210,826

**South West Saskatchewan Forage Co-operative Association:** \$4,000

**Organization:** Agriculture & Agri-Food Canada

**Contact:** Michael Schellenberg, (306) 770-4478

***Breeding New Sainfoin Lines with Improved Forage Characteristics and Persistence in Saskatchewan*** (20150186)

**Objectives:**

- Evaluate 50 sainfoin varieties and breeding lines for agronomic performance under Saskatchewan growth conditions.
- Assess genetic diversity and winter hardiness of sainfoin accessions using molecular markers for selection of parental lines.
- Develop 10-15 new advanced breeding populations with high forage & seed yields, good forage quality, other desirable traits.
- Create 15-20 new sainfoin half-sib families by targeted crossing between Canadian varieties and elite lines.

**ADF Funding:** \$217,636

**Saskatchewan Forage Seed Development Commission:** \$5,000

**Organization:** University of Saskatchewan

**Contact:** Bill Biliget, Plant Sciences, (306) 966-4007

***Defining Agronomic Practices for Forage Corn Production in Saskatchewan*** (20150276)

**Objectives:**

Develop and refine seeding and fertility recommendations for corn silage production.

Evaluate the cost of production and feed quality of corn silage grown in western Canada.

**ADF Funding:** \$400,000

**Organization:** Prairie Agricultural Machinery Institute

**Contact:** Joy Agnew, (306) 682-5033 ext. 280