Summary of ADF Projects, 2015
Livestock Research Funding

30 livestock-related research projects	$3,758,917
Breakdown by Commodity	
Forages	$1,317,006
Beef	$925,812
Swine	$443,844
Poultry	$330,200
Dairy	$195,585
Other	$546,470
	$3,758,917

Breakdown by Organization	
University of Saskatchewan	$1,475,658
Western Beef Development Centre - PAMI	$1,063,195
Western College of Veterinary Medicine	$482,098
Vaccine Infectious Disease Organization	$356,780
Agriculture and Agri-Food Canada	$269,892
Prairie Swine Centre Inc.	$111,294
	$3,758,917

Forages

Development of crested wheatgrass lines with improved forage nutritive value (file # 20140046)
Objectives:
- Develop later maturing crested wheatgrass lines with high forage yields to extend the spring grazing season in Saskatchewan.
- Evaluate crested wheatgrass lines for nutritive value at mature stage to select populations with high nutritive value.
- Evaluate accessions/cultivars of hexaploid crested wheatgrass under Saskatchewan growth conditions to explore potential use.

ADF Funding: $60,702
Western Grains Research Foundation: $60,703
Saskatchewan Forage Network: $20,000
Organization: University of Saskatchewan
Contact: Bill Biligetu, Plant Sciences, (306) 966-4007

Efficacy of multispecies perennial forage crops for weed control (file #20140057)
Objectives:
- Evaluate the benefits of increased species diversity in annual and perennial forage mixtures for low-input weed suppression.
- Evaluate how increased trait diversity (i.e. combinations of growth forms) in annual and perennial forage mixtures influence.
- Test the benefits of planting species in closely offset rows in annual forage polycultures for low-input weed suppression.

ADF Funding: $17,107
Western Grains Research Foundation: $17,107
Organization: University of Saskatchewan
Contact: Eric Lamb, Plant Sciences, (306) 966-1799

Validating the stage of maturity at harvest for oat and barley for swath grazing (file # 20140092)
Objectives:
- Determine the effect of maturity at cutting on economics of swath grazing oat or barley.
- Determine the effect of oat and barley harvest maturity on nutrient yield, voluntary intake and cow performance.
- Determine the effect of maturity on yield of digestible nutrients of oat and barley.

ADF Funding: $227,560
Organization: Western Beef Development Centre - PAMI
Contact: Bart Lardner, (306) 682-3139

Growing winter annual forages in mixtures: assessment of agricultural impacts in a semiarid environment (file #20140128)
Objectives:
- Assess the agricultural and ecological benefits of integrating a winter forage polyculture into normal crop production.
- Provide producers and researchers detailed information on forage yield, forage quality, and soil nutrient changes.
- Assess the suitability of new winter forage crops for production in the semiarid region of southwestern Saskatchewan.

ADF Funding: $72,410
Western Grains Research Foundation: $72,410
Organization: AAFC
Contact: Michael Schellenberg, (306) 778-7247

Developing equipment for quick and efficient temporary fencing for crop residue grazing of ruminant livestock (file #20140140)
Objectives:
- Establish design criteria for prototype device or system to efficiently automate the erection and dismantling of temporary fence.
- Assess overall economic benefit of automatic fencing system.
- Develop and test the prototype device or system.

ADF Funding: $115,705
Organization: Prairie Agricultural Machinery Institute - PAMI
Contact: Joy Agnew, (306) 682-5033 ext 280

Development of best management practices for cost-effective and successful establishment of saline forages for Saskatchewan (file #20140152)
Objectives:
- Effects of seeding methods on AC-Saltlander forage establishment and production under different salinity levels and soils.
- Effects of different nitrogen fertilization rates on rejuvenating AC-Saltlander biomass production over three production years.
- Evaluating the flooding tolerance & regrowth of AC-Saltlander versus smooth bromegrass at different durations & salinity levels.
- Effects of different seeding rates on AC-Saltlander forage establishment and production under different salinity levels & soils.
- Effects of time of seeding on AC-Saltlander forage establishment and production under different salinity levels and soils.

ADF Funding: $197,482
Organization: AAFC
Contact: Alan Iwaasa, (306) 778-7251

Selecting Sainfoin for northern region adaptation and winter survival (file #20140174)
Objectives:
- Evaluate the persistence of selected sainfoin populations in field sites at WBDC Lanigan, SK.
- Screen for yield and plant density change in competition with alfalfa.
- Evaluate harvest management x cultivar interaction for forage yield, winter hardiness, and plant density persistence.

ADF Funding: $57,000
Organization: Western Beef Development Centre - PAMI
Contact: Paul Jefferson, (306) 682-3139 ext 272

Improving grazing capacity through introduction of bloat free legumes in existing pasture stands (file #20140193)
Objectives:
- Determine establishment success of sainfoin and CMV populations in mixed forage stands.
- Economic analysis of using new legume populations for pasture rejuvenation.
- Evaluate grazing animal performance and bloat incidence when grazing mixed legume pastures.

ADF Funding: $342,020
Alberta Beef Producers: $5,000
Organization: Western Beef Development Centre - PAMI
Contact: Bart Lardner, (306) 682-3139

Refining recommendations for grazing whole plant corn in Saskatchewan (file #20140194)
Objectives:

- Determine the effects of grazing corn either 3-d or 9-d period, with/without a supplemental fiber source on system economics.
- Determine the effects of grazing corn either 3-d or 9-d period, with/without a supplemental fiber source on grazing behaviour.
- Determine the effects of grazing corn either 3-d or 9-d period, with/without supplemental fiber on forage utilization/cow performance.
- Determine the effects of grazing corn for either 3-d or 9-d period, with or without a supplemental fiber source on rumen dynamics.

ADF Funding: $106,020
Dupont Pioneer: $10,000
Organization: Western Beef Development Centre - PAMI
Contact: Bart Lardner, (306) 682-3139

Comparison of Barley Forage with Highest, Intermediate, Lowest Digestible Fibre (NDF) with Corn Fibre in High Production Dairy Cattle (file #20140281)
Objectives:
Long-term objectives:

- To develop alternative feeding strategies based on NDF digestibility to efficiently utilize new developed forage barley and forage corn in sustainable dairy system for improving animal production and health.
- To increase basic knowledge of the nutritional relevance of forage barley and corn and to apply this information to the production of high quality feeding programs and to aid forage barley and corn breeding programs.

Short-term objectives:

- Chemically and nutritionally characterise the selected highest and lowest NDFD barley varieties (Cowboy, Xena) in comparison with Coperland (intermediate NDFD) and P7213R corn forage for dairy cattle.
- Evaluate performance of high producing dairy cows fed barley forage varieties selected for highest and lowest rate of NDF degradability (Cowboy and Xena) in comparison with Coperland (intermediate NDFD) and P7213R corn (selected based on best nutritive value from our previous ADF -cool season corn ADF project (ADF 2010-0108 with Dr. Peiqiang Yu as PI); This corn cultivar is the one that our previous ADF research has shown to be of best quality in feed corn variety evaluation, but no animal trial has been done for this best variety in the previous project).
- Evaluate metabolic and digestion kenetics on the selected highest and lowest NDFD barley varieties (cowboy, xena) for dairy cattle in comparison with Coperland and P7213R corn forage.
- Train a graduate student as one of high priority in this proposed research program.

ADF Funding: $61,000
Western Grains Research Foundation: $61,000
Saskatchewan Forage Network: $30,000
Organization: University of Saskatchewan
Contact: Peiqiang Yu, Animal & Poultry Sciences, (306) 966-4132

Development of new hybrid bromegrass lines with improved forage yield and regrowth (file #20140211)
Objectives:
- To select high seed yielding plants of hybrid bromegrass for new cultivar development.
- To combine the vigor and productivity of hybrid brome with the faster regrowth of meadow brome.
- To further evaluate and select lines of hybrid brome with adaptation to all production regions.

ADF Funding: $60,000
Western Grains Research Foundation: $60,000
Organization: University of Saskatchewan
Contact: Bruce Coulman, Plant Sciences, (306) 966-1387

Beef

Can we improve cow and calf performance by increasing the amount of protein provided during mid-to-late gestation? (file #20140062)
Objectives:
- Evaluate the role of dietary CP on passive immune transfer to the calf.
- Determine the impact of diets that are deficient, adequate, and in excess of dietary CP on the performance of the cow and calf.
- Determine net energy output in milk as affected by dietary CP supply pre-partum.

ADF Funding: $172,290
Alberta Beef Producers: $25,000
Organization: University of Saskatchewan
Contact: Gregory Penner, Animal & Poultry Sciences, (306) 966-4219

Establishing Caranita Meal as a Protein Supplement for Beef Cattle (file #20140138)
Objectives:
- To determine relative to other protein sources feed intake & nutrient utilization of carinata meal based diets in heifers.
- To establish carinata meal as a new protein supplement for beef cattle.

ADF Funding: $119,970
Organization: University of Saskatchewan
Contact: John McKinnon, Animal & Poultry Sciences, (306) 966-4137

Cow-Calf Production Records - CowChips Program Upgrade, Dissemination and Training (file #20140176)
Objectives:
- Increase competitiveness of SK cow-calf producers.
- Provide cost-effective option for managing and analyzing production records.
- Increase cost of production uptake by producers.

ADF Funding: $25,000
Organization: Western Beef Development Centre
Contact: Kathy Larson, (306) 930-9354

Ergot Poisoning in Ruminants: Detecting Ergot Alkaloids in Tissue and Serum to Diagnose Individual Cases of Poisoning (file #20140186)
Objectives:
- To utilize sophisticated diagnostic tools to provide producers with an early and accurate diagnosis of ergot poisoning.
- To examine tissues of aborted fetuses for concentration of ergot alkaloids to determine the organ with highest alkaloid concentration.

ADF Funding: $115,568
Organization: Western College of Veterinary Medicine
Contact: Ahmad Al-Dissi, Veterinary Pathology, (306) 966-7643

Optimizing calving outcomes in cow-calf herds through more effective management of micronutrient supplementation programs (file #20140189)
Objectives:
- Identify geographical regions at high risk for micronutrient deficiencies
- Evaluate impact of micronutrient status and supplementation practices on calving outcomes

ADF Funding: $199,900
Alberta Beef Producers: $25,000
Organization: Western College of Veterinary Medicine
Contact: Cheryl Waldner, Large Animal Clinical Sciences, (306) 966-7168

Using biomechanical testing and imaging techniques to investigate toe tip necrosis related claw lesions in feedlot cattle (file #20140206)
Objectives:
- Obtain real-time imaging of the bovine claw while it cycles between load bearing and non-load bearing phases.
- Measure the forces required to fatigue the “white line” of the bovine hoof.
- Imaging survey of the bovine hoof using high resolution quantitative computed tomography (HR-pQCT).

ADF Funding: $59,000
Organization: University of Saskatchewan
Contact: Murray Jelinkski, Large Animal Clinical Sciences, (306) 966-7166

Optimization of a novel BVDV vaccine by transdermal needle-free delivery and antigen sparing (file #20140232)
Objectives:
- Evaluate the duration of immunity induced by the E2-TriAdj vaccine formulation.
- We recently developed an E2 protein-adjuvant (E2-TriAdj) formulation that elicits complete protection from virulent BVDV-2 challenge.
- Evaluate needle-free transdermal delivery of a bovine viral diarrhea virus (BVDV) E2 subunit vaccine formulated with a novel adjuvant.
- Combine the BVDV-1 and -2 E2 proteins into one subunit vaccine formulation, and evaluate protection from BVDV-1 challenge.

Funding: $200,004
Organization: University of Saskatchewan
Contact: Sylvia Van Den Hurk, VIDO, (306) 966-1559

An assessment of the breeding potential of beef bulls using DNA genotyping (file #20140247)
Objectives:
- To ultimately demonstrate to cattle producers more efficient ways to capture the value of superior genetics.
- To demonstrate to producers that the current, widely used, recommended ratio of 1 bull to 25 to 30 cows can be reduced.
- To determine new directions for bull use research.

ADF Funding: $34,080
Organization: Western College of Veterinary Medicine
Contact: Colin Palmer, Large Animal Clinical Sciences, (306) 966-7150

Swine

Re-designing ventilation system of sow gestation barns converted from stalls to group housing system to reduce cost of production (file #20140045)
Objectives:
Overall goal is to re-design the ventilation system of a gestation barn converted from traditional stalls to group sow housing.
Specific objectives:
- Develop a set of recommended modifications to the ventilation system of a converted sow gestation barn.
- Assess the impact of the developed ventilation system design configuration in an actual converted gestation barn.
- Conduct feasibility analysis of the newly developed ventilation design.

ADF Funding: $111,294
Saskatchewan Pork Development Board: $32,000
Organization: Prairie Swine Centre Inc.
Contact: Bernardo Predicala, (306) 667-7444

Controlling Porcine Epidemic Diarrhea Virus (PEDV) by improving host resistance (file # 20140215)
Objectives:
- Validate the ANP receptor as a marker of PEDV resistance.
- Discover other biomarkers and genes of PEDV resistance.
- Further develop and expand a Rapid Lab test (bioassay) to detect animals resilient to PEDV and other pathogens.

ADF Funding: $150,000
Organization: University of Saskatchewan
Contact: Matthew Loewen, Veterinary Biomedical Sciences, (306) 966-4005

Surveillance and Characterization of Influenza A Viruses from Western Canadian Swine (file #20140241)
Objectives:
- To determine what FluA strain types (GENETIC AND ANTIGENIC) are circulating in Western Canada through both active and passive surveillance.
- To provide useful FluA strain analysis to veterinarians and producers and to work with veterinarians and producers to develop effective control strategies.
- Knowledge translation: In addition to regular dissemination of information during the project, the full results of the 3 years of study will be compiled for publication and presentations to veterinarians, producers and other researchers. Additionally, there will be submission of the sequences to GenBank with the publication of final results.

ADF Funding: $82,550
Organization: Western College of Veterinary Medicine
Contact: Susan Detmer, Veterinary Pathology, (306) 966-7346

Development of a New Generation of Modified Live Virus Vaccine for PEDV Using Reverse Genetics System (file #20140326)
Objectives:
- To construct a full-length infectious cDNA clone of a highly virulent North American PEDV strain;
- To introduce attenuating mutations into the viral genome;
- To characterize the humoral immune response to PEDV proteins with the purpose to construct a DIVA vaccine (A vaccine capable of differentiating infected verses vaccinated).

ADF Funding: $50,000
Organization: VIDO
Contact: Alexander Zakhartchouk, (306) 966-1570

Enhanced Molecular Diagnostics and Validating Genetic Resistance to PEDV in Pigs (file # 20140327)
Objectives:
- The goal of this proposed research is to provide novel diagnostic and control strategies to reduce the impact of PEDV in endemically infected farms, and help protect naïve farms from infection and devastating disease.
- This proposed research will lead to tools and knowledge leading to improved diagnosis and industry control of PEDV.
- This study will also provide new information to refine the methods by which we respond to farm outbreaks in a way that reduces losses and welfare issues.
- Molecular tools would be developed to enable screening of genetic nucleus populations to determine the feasibility of selecting resistant lines. If resistant alleles are confirmed they can be applied relatively quickly by selecting for boars homozygous for such alleles.

ADF Funding: $50,000
Organization: Western College of Veterinary Medicine
Contact: John Harding, Large Animal Clinical Sciences, (306) 966-7070

<u>Poultry</u>

Interference of maternal immunity and Marek's disease vaccine in performance of newly develop inclusion body hepatitis vaccines (file #20140181)
Objectives:
- To introduce two new vaccines to control IBHV infection.
- The major goal of proposed research is to fully characterize two (a single shot long acting in ovo vaccine and another vaccine for post hatch use) new vaccines to control inclusion body hepatitis virus (IBHV) infection in field. The objective will be achieved through following three specific aims:
    - Assessment of interference or support to immune responses activated by in-ovo and post hatch IBH vaccines in presence of maternal antibodies (in 18 old embryo or day old chicks) against IBH.
    - Evaluation of efficacy of in-ovo vaccine formulations prepared by mixing Marek's vaccine and IBH vaccine.
    - Evaluation of efficacy of IBHV in-ovo and post hatch vaccine followed by infectious bronchitis virus (IBV) vaccination in day old chicks.

ADF Funding: $100,200
Chicken Farmers of Saskatchewan: $22,000
Organization: VIDO
Contact: Mohammed Arshud Dar, (306) 966-1532

Control of Infectious Bronchitis Virus infection and "Shell-less egg syndrome" in the Saskatchewan table egg layer industry (file #20140185)
Objectives:
- Investigation of the efficacy of current IBV vaccination programs in the egg layer industry in Saskatchewan and Alberta.
- Molecular characterization and evaluation of the virulence of "variant" IBV infection in experimental birds.
- Definitive diagnosis of outbreaks of shell-less egg syndrome (SES) in the egg layer industry in Saskatchewan.
- Experimental reproduction of SES in SPF leghorns using infectious materials from SES cases.
- Disease surveillance in SK and AB egg industries.

ADF Funding: $230,000
Saskatchewan Egg Producers: $10,000
Organization: University of Saskatchewan
Contact: Susantha Gomis, Veterinary Pathology, (306) 966-7299

Dairy

Evaluating strategies to improve the feeding management of dairy cows housed in automated milking systems (file #20140063)
Objectives:
- Determine the impact of concentrate fermentability provided in an AMS.
- Develop and evaluate precision feeding management programs for dairy cattle in AMS.
- Determine the optimal amount of concentrate fed in an AMS.
- Determine the interaction between PMR energy density and concentrate allocation.

ADF Funding: $195,585
SaskMilk: $163,560
Organization: University of Saskatchewan
Contact: Gregory Penner, Animal & Poultry Sciences, (306) 966-4219

Other

Development of an Oral Vaccine for Chronic Wasting Disease (file #20140043)
Objectives:
Overall Objective: To develop an oral vaccine for the control of Chronic Wasting Disease.
- Development of a Panel of Oral, PrPSc-specific Chronic Wasting Disease Vaccines.
- Evaluation of the Specificity, Immunogenicity and Safety of the Oral CWD Vaccines in the Target Species.
- Evaluation of Vaccine Efficacy in a Large Animal Challenge Trial.

ADF Funding: $206,580
Organization: VIDO
Contact: Scott Napper, (306) 966-1546

Investigating Options for Recycling Plastic Baler Twine & Net Wrap (file #20140096)

- **Objectives:**
  Define producer challenges for recycling agriculture plastics including bale twine, net wrap, and grain storage bags.
- Develop and test methods for decontaminating bale twine and net wrap.
- Develop and test methods for removal and storage of bale twine and net wrap that are compatible with recycling
- Develop and test methods for packaging bale twine, net wrap, and grain bags that meet plastic recycler requirements.

ADF Funding: $189,890
Organization: Prairie Agricultural Machinery Institute - PAMI
Contact: Les Hill, (306) 682-5033

Mitigation of hydrogen sulphide, ammonia and odorous emissions from livestock operations using nanotechnology (file #20140246)
Objectives:
Overall: Development of a nanotechnology-based filtration system for application in livestock operations.

- Evaluating the capture of NH3.
- Evaluating simultaneous capture of NH3 and H2S.
- Assessing the performance of the developed filter system in semi-pilot scale and in a barn room setting.
- Cost analysis, implementation guidelines, and commercialization.

ADF Funding: $150,000
Organization: University of Saskatchewan
Contact: Mehdi Nemati, Chemical Engineering, (306) 966-4769