Summary of ADF Projects, 2013
Livestock Research Funding

23 livestock-related research projects	$ 3,405,494

Breakdown by Commodity

Beef	$916,900
Forages	$848,424
Cervid	$463,000
Poultry	$247,700
Swine	$203,000
Sheep	$146,520
Other/General	$579,950

Breakdown by Organization

Vaccine and Infectious Disease Organization	$1,063,400
Agriculture and Agri-Food Canada	$655,874
University of Saskatchewan	$636,700
Pan-Provincial Vaccine Enterprise	$463,000
Prairie Diagnostics Services Inc.	$350,000
Saskatchewan Sheep Development Board	$146,520
Prairie Swine Centre	$45,000
Western Beef Development Centre	$45,000

Beef

Development of a Mycoplasma bovis Vaccine for Feedlot Cattle
Objectives:

- Test the experimental vaccine of novel triple adjuvant combination, developed by VIDO scientists that can elicit balanced humoral and cell-mediated responses. This combination is made of CpG oligodeoxynucleotides that can activate innate and adaptive immune responses in several species.
- Formulate the vaccines by mixing the M. bovis antigens with this adjuvant combination and administer this vaccine to young cattle in the field, followed by a boost injection.

Funding: $290,000
Contact: Jose Perez-Casal, Vaccine and Infectious Disease Organization, (306) 966-8870

Oral Vaccine Delivery Platform for Newborn Calves
Objectives:

To establish the effectiveness of an oral neonatal vaccine based on a novel vaccine delivery particle. The project will:

- Analyze the interaction between phage lambda display particles (LDPs) and DCs isolated from the small intestine of newborn calves. Identify specific sites in the small intestine where LDPs are absorbed and identify the dose required for efficient uptake of LDP.
- Analyze both local (mucosal) and systemic (blood) immune responses following LDP vaccine delivery to specific sites in the small intestine.
- Determine if LDP encapsulated in bacteria and purified LDP induce equivalent immune responses when delivered to the small intestine of newborn calves.
- Optimize LDP vaccine dose and formulation for oral immunization of newborn calves.

Funding: $169,700
Contact: Philip Griebel, Vaccine and Infectious Disease Organization, (306) 966-1542

Strategically Blended High-Fat Pellets for Pregnant Beef Cows Derived From Byproduct Feeds
Objectives:

The overall objective of this project is to evaluate the effects of supplementing mature beef cows during the second and third trimester of pregnancy with a high fat pellet derived from byproduct feeds and using flax or canola as fat sources.

Specifically: to determine over two annual calving cycles, the effects of feeding a blended byproduct feed pellet varying in fat source (i.e. flax or canola) on:

- Overwintering performance of gestating beef cows (body weight, body condition, rib fat);
- Physiological parameters including milk production, milk composition, serum progesterone and free fatty acid concentrations;
- Subsequent reproductive performance of mature beef cows and their calves; and
- Calf performance from birth to slaughter (birth and weaning weights, feedlot performance, carcass quality).

Funding: $69,200
Contact: John McKinnon, University of Saskatchewan, (306) 966-4137

Use of Canola Meal as a Protein Source for Dairy Calves

Objectives:

- To evaluate the effectiveness of canola meal as a protein source (and source of glutamine and glutamate) in pelleted starter mixtures for newborn calves and to determine suitable methods of increasing canola meal digestibility and palatability when fed to newborn calves.
- To compare canola meal and soybean meal in terms of their effectiveness to stimulate gastrointestinal development in calves at weaning.

Funding: $75,000
Contact: Gregory Penner, University of Saskatchewan, (306) 966-4219

DNA Tests in Aid of Replacement Heifer Selection
Objectives:

Determine whether a combination of two to three DNA tests can be reliably used to select replacement heifers in beef cattle that:

- Retain body condition through pregnancy;
- Produce first calves of average or better weaning weight via good lactation; or
- Produce additional calves of average or better weaning weight, suggesting longevity in the herd.

Funding: $70,000
Contact: Sheila Schmutz, University of Saskatchewan, (306) 966-4153

Needle-Free DISC (disabled infectious single cycle) Vaccines for Calves
Objectives:

- Construct and characterize recombinant bovine adenovirus-3 expressing the Bovine Viral Diarrhea Virus vaccine antigen, bovine herpes virus (BHV-1) -1 vaccine antigen, and single recombinant virus expressing both vaccine antigens.
- Test immunogenicity and protective efficacy of the vaccine in newborn calves.

Funding: $198,000
Contact: Suresh Tikoo, Vaccine and Infectious Disease Organization, (306) 966-7482

Producer-Friendly Cow-Calf Cost of Production Tool
Objectives:

- Evaluate the capabilities of cost of production tools currently available for cow-calf producers' needs/wants and determine if redesign or modification of existing programs is feasible.
- Develop a user-friendly cost of production program for commercial cow-calf producers.

Funding: $45,000
Contact: Kathy Larson, Western Beef Development Centre, (306) 930-9354

Forages

New Forage Barley Cultivars for Beef and Dairy Producers
Objectives:

- The objective of this project is to develop new cultivars of forage barley with improved yield and nutritive value by evaluating populations generated from crosses between CDC Cowboy, CDC Maverick and other forage barley germplasm.

Funding: $48,000
Contact: Bruce Coulman, University of Saskatchewan, (306) 966-1387

Development of Rough Fescue Grass Germplasm with Consistent Seed Production and Higher Biomass Yield
Objectives:

- To evaluate new populations of plains rough fescue for seed yield and forage quality under irrigated and non-irrigated field conditions.

Funding: $69,357
Contact: Michael Schellenberg, Agriculture and Agri-Food Canada, (306) 778-7247

Germination Response of Selected Grass and Legume Species Under Current and Predicted Temperature Increases
Objectives:

- To construct a thermal time model for various native species and their ecotypes based on data from a new germination experiment. This work will provide a better understanding of emergence under various temperature regimes, and will ultimately allow for the recommendation of select species and ecotypes for future breeding of locally adapted forages.

Funding: $58,700
Contact: Michael Schellenberg, Agriculture and Agri-Food Canada, (306) 778-7247

Determination of Appropriate Species for Diverse Annual Plantings Based on Their Contribution to Forage Yield and Soil Improvement
Objectives:

- Provide producers and researchers with detailed information on forage yield, forage quality, and changes to soil water and soil nutrients following mixed plantings (polycultures) using a diverse range of plant species.

Funding: $372,513
Contact: Michael Schellenberg, Agriculture and Agri-Food Canada, (306) 778-7247

Nutritional Evaluation of Forage Barley Varieties for Silage and Swath Grazing
Objectives:

- To compare feed quality characteristics of barley varieties grown for silage; evaluate ensiling characteristics of barley varieties; and evaluate performance (rumen function, digestibility, growth, carcass quality) of animals that have been fed barley silage selected for extremes in rate of cell wall degradability.

Funding: $144,550
Contact: John McKinnon, University of Saskatchewan, (306) 966-4137

Evaluating Forage Production and Stand Longevity of a New Sainfoin Germplasm
Objectives:

- Determine longevity and yield of new sainfoin selections alone and in mixture with alfalfa under grazing and simulated grazing.

Funding: **$**155,304
Contact: Alan Iwaasa, Agriculture and Agri-Food Canada, (306) 778-7251 ext.7251

Cervid

Field Testing of an Injectable Vaccine Candidate for Chronic Wasting Disease
Objectives:

- Generate field safety data with a sufficient number of animals of the target species (elk) to detect rare adverse events, and to generate data for inclusion in the Canadian Food Inspection Agency (CFIA) case file for this vaccine candidate, and to provide producers with a possible solution to chronic wasting disease.
- To acquire a Permit to Release (release vaccinated animals for sale, slaughter, etc.) from the CFIA.

Funding: $463,000
Contact: Gerald Brown, Pan-Provincial Vaccine Enterprise, (306) 966-1506

Poultry

Development of a Vaccine for the Control of Campylobacter jejuni Colonization in Broilers
Objectives:

- To study the overexpression and purification of CfrA and CmeC antigens of C.jejuni essential for the colonization of poultry. The genes encoding the selected antigens will be cloned into a plasmid vector encoding a His-tag. The antigens which have the His-tag will be purified using affinity chromatography. It will test for immunogenicity by immunizing the birds via ovo vaccination at 18 months of incubation.

Funding: $165,000
Contact: Brenda Allan, Vaccine and Infectious Disease Organization, (306) 966-1522

Improvement of Inclusion Body Hepatitis Vaccine Delivery in Chickens
Objectives:

- To develop and evaluate VIDO-EP2 adjuvant and microparticle based in-ovo delivery system to reduce vaccination cost and to enhance duration of immunity. This system will be based on a bio-degradable water soluble ajuvant polymer (polyphosphazene).
- Assessment of protection offered by new vaccines against challenge infection.

Funding: **$**82,700
Contact: Mohammed Arshud Dar, Vaccine and Infectious Disease Organization, (306) 966-1532

Swine

Can Dietary Omega-3 Fatty Acids Replace Antibiotics in Starter Feeds for Piglets?
Objectives:

- To determine if feeding sows diets enriched with omega-3 fatty acids can replace the use of antibiotics in starter diets when piglets are weaned at either three or four weeks of age.
- To determine if altering sow nutrition by including omega-3 fatty acids will produce healthier piglets at weaning, and how those piglets perform when compared to pigs fed a starter diet containing antibiotics

Funding: $45,000
Contact: Laura Eastwood, Prairie Swine Centre, (306) 667-7432

Incorporation of New Antigen to Develop a PRRSV Vaccine
Objectives:

- Evaluation of immunogenicity and protective efficacy of a novel PRRSV vaccine in pigs by the construction of recombinant adenoviruses presenting the PRRSV major neutralizing epitope B in one of the hexon hypervariable regions (HVRS).
- Such a vaccine will overcome problems associated with current modified live vaccines such as safety, efficacy, and DIVA (possibility to differentiate infected and vaccinated animals).

Funding: $68,000
Contact: Alexander Zakhartchouk, Vaccine and Infectious Disease Organization, (306) 966-1570

Development of a Control Strategy for Porcine Respiratory and Reproductive Syndrome Disease
Objectives:

- Identify the virus-specific microRNAs and the host specific microRNA.
- Determine the effects of mRNAs on production of induction of interferon alpha.
- Identify the molecules involved in reversing the detrimental effect of identified microRNA and test its efficacy in controlling PRRS virus replication.

Funding: $90,000
Contact: Suresh Tikoo, Vaccine and Infectious Disease Organization, (306) 966-7482

Sheep

Evaluating the Health of Saskatchewan Sheep
Objectives:

To investigate the prevalence of three diseases (Maedi-visna, Johne's disease and Bovine Viral Disease) which have been identified by the industry as a concern, and evaluate management practices having the potential for increasing herd health:

- Evaluate the current animal and herd-level sero-prevalence of MV, JD and BVD in the Saskatchewan sheep population, and
- Identify herd-level predictors of these diseases, i.e. management practices, which will help inform industry and to use as input into future disease control initiatives pertaining to Saskatchewan flock health.

Funding: $146,520
Contact: Gordon Schroeder, Saskatchewan Sheep Development Board, (306) 933-7166

Other Projects

Effects of Repeated Applications of Liquid Swine Manure on Gray Luvisolic Soils
Objectives:

- Determine the effects of 15 years of liquid swine manure application (annually, biannually, and once every three years) on soil conditions and crop growth on a Gray Wooded soil.

Funding: $34,600
Contact: Jeff Schoenau, University of Saskatchewan, (306) 966-6844

Improving the Energy Value of High-Protein Feedstuffs
Objectives:

- Identify the procedures for achieving efficient deamidation of canola meal and wheat DDGS, (resulting in canola meal or wheat and corn DDGS that have a final CP content of approximately 22 to 23 per cent CP without a loss in the gross energy content) with particular attention paid to efficacy, safety, and regulatory compliance.
- Establish the feeding value of deamidated canola meal and DDGS for ruminants using an in-vitro fermentation assay.
- Establish the feeding value of deamidated canola meal and DDGS for poultry using a broiler bioassay.

Funding: $195,350
Contact: Gregory Penner, University of Saskatchewan, (306) 966-4219

Diagnostic Test Development and Laboratory Investigation to Support Detection of Food Animal and Poultry Diseases

Objectives:

The overall objective is to improve laboratory investigation in order to identify novel agents, detect rare agents, define multi-agent diseases and determine the frequency of common agents in normal animals.

- Investigate novel syndromes for the presence of new or emerging agents or novel combinations of agents.
- Determine the prevalence of specific agents in common disease syndromes and healthy animals to improve the diagnostic significance of testing.
- Establish a pilot project for the surveillance of important viral infections in pigs.

Funding: $350,000
Contact: Marilyn Jonas, Prairie Diagnostic Services Inc., (306) 966-7248