

Part 1 – Agency Profile

Agency Overview

The WOI (WI) (originally Washington-Oregon-Idaho, but now Washington-Idaho) Veterinary Medicine Program is administered in Idaho by the Department Head of the Department of Animal and Veterinary Science, College of Agricultural and Life Sciences, University of Idaho. The WOI Program was established in 1974 as a cooperative program of University of Idaho, Washington State University (WSU), and Oregon State University (OSU). Oregon recently dropped out of the cooperative program. The Doctor of Veterinary Medicine (DVM) degree is awarded to Idaho students by Washington State University. The WI Program annually provides 44 Idaho residents with access to a veterinary medical education through a cooperative agreement between the University of Idaho and Washington State University. Idaho provides the cooperative program with the majority of veterinary students who have expressed an interest in production agriculture animals.

Core Functions/Idaho Code

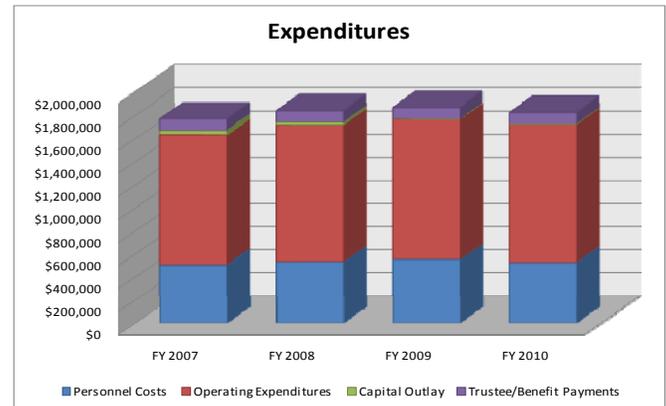
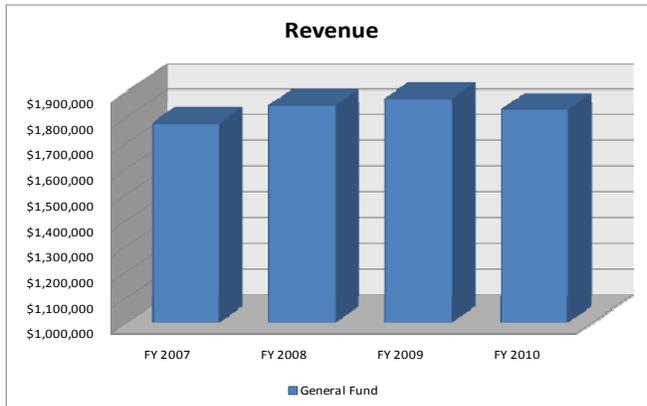
The University of Idaho provides educational opportunities for any senior student in the Washington State University College of Veterinary Medicine by providing the equivalent of 65, one-month teaching rotations in food animal production and clinical medicine at the Caine Veterinary Teaching Center (CVTC) in Caldwell. Faculty members at the CVTC also interact with Idaho veterinarians and livestock producers providing education and recommendations concerning animal production, diagnosis and clinical evaluation of disease situations.

1. Provide access to veterinary medical education at WSU for Idaho residents – the current WI contract reserves 11 seats for Idaho veterinary medicine students each year. A total of 44 Idaho students are enrolled in this program per year.
2. Assist Idaho in meeting its needs for veterinarians – provide Idaho-trained, Idaho-resident graduate veterinarians to meet annual employment demands for the State. On average, 65-75% of new Idaho resident graduates of the WI Program are licensed to practice veterinary medicine in Idaho annually.
3. Provide hands-on instruction opportunities for senior veterinary students – teaching rotations in food animal production medicine and clinical experience are offered year-round at the CVTC in Caldwell.
4. Provide access to referrals from Idaho veterinarians in the areas of food animal production, diagnosis, and clinical evaluation of diseases – a) accept approximately 600 hospital clinical referrals annually as student teaching cases; b) provide disease diagnostic testing on approximately 15,000 diagnostic samples annually, and; c) conduct on-farm disease investigations for herd problems as requested by Idaho veterinarians and livestock producers.

Washington-Idaho Veterinary Medicine Program

Revenue and Expenditures:

Revenue	FY 2007	FY 2008	FY 2009	FY 2010
General Fund	\$ 1,774,100	\$ 1,843,700	\$ 1,870,700	\$ 1,828,900
Total	\$ 1,774,100	\$ 1,843,700	\$ 1,870,700	\$ 1,828,900
Expenditure	FY 2007	FY 2008	FY 2009	FY 2010
Personnel Costs	\$ 504,800	\$ 536,300	\$ 555,400	\$ 528,000
Operating Expenditures	1,131,100	1,187,400	1,215,300	1,200,900
Capital Outlay	38,200	20,000	0	0
Trustee/Benefit Payments	100,000	100,000	100,000	100,000
Total	\$ 1,774,100	\$ 1,843,700	\$ 1,870,700	\$ 1,828,900



Profile of Cases Managed and/or Key Services Provided

Cases Managed and/or Key Services Provided				
	FY 2007	FY 2008	FY 2009	FY 2010
Number of Idaho Resident Students Enrolled Each Year	44	44	44	44
Number of One-Month Student Rotations (or equivalent) at the Caine Center Per Year	65	65	65	65
Number of Accepted Clinical Hospital Referral Cases	595	558	462	398
Number of Accepted Veterinary Diagnostic Samples	22,185	25,574	25,330	22,093

Performance Highlights:

1) Caine Veterinary Teaching Center (CVTC) faculty instructs senior veterinary students in production animal/food animal medicine and management. Areas addressed in this program include neonatal management through lambing and calving blocks, cattle reproduction through dairy and advanced reproductive technology blocks, basic herd management through dairy, beef cow/calf, feedlot, small ruminant and general production medicine blocks. For the upcoming academic year 2011, thirty-two students from WSU and 8 other veterinary schools are enrolled in 54 blocks at the Caine Center.

Students will participate in clinical experiences through CVTC hospital in/out-patient clinical care, field call services, disease investigations as well as limited formal presentations by Faculty. Experiences include palpation pregnancy diagnoses on two contract dairies, four contract cow/calf operations and ultrasound pregnancy diagnoses in both cattle and small ruminants. In/out-patient care includes infectious and metabolic diseases management; surgical procedures include caesarian sections, abdominal surgery and other management procedures such as castration, dehorning, vaccinations and nutritional analyses.

Students electing the cow-calf, feedlot, calving and lambing blocks spend the majority of their rotations on site/ranch participating in the management of those operations with direct supervision of a CVTC clinician with the owner/operator of the participating ranch or farm. In addition, students will be involved with any field disease investigations and field service calls to clients of the Center. Students may be placed with area practitioners for additional exposure/experience in food animal practice.

2) FY2010 Grants and contracts included \$34,320 in funding for the third year of the Northwest Bovine Veterinary Experience Program (NW-BVEP). The funding allowed the program to expand from 15 students in 2009 to 17 students in 2010. The primary objective of this program is to use an aggressive mentoring program to increase the number of food supply veterinarians graduating from veterinary school and practicing in Idaho. Additional objectives include a) providing positive exposure of modern animal agriculture to an increasingly suburban veterinary school demographic, b) increasing the amount of veterinary school graduates supported under the W-I veterinary education program that return to Idaho to

practice and, c) increasing the level of Spanish language skills in program participants. The hypothesis is early mentorship on farms and with food animal veterinarians in Idaho will accomplish these objectives.

3) FY2010 Grants/Contracts included \$100,000 appropriated through the Idaho Legislature for a cooperative project with Idaho Fish and Game entitled Etiology and Epidemiology of pneumonia in bighorn sheep, which is now in its fifth year. Recent achievements include, but are not limited to:

A) Not every contact between bighorn and domestic sheep results in pneumonia in bighorn sheep. One factor affecting the outcome of interactions may be the amount of contact between species. How much contact is required for transmission is currently unknown. At WSU, our collaborators co-pastured healthy hand-reared captive bighorn sheep with healthy domestic sheep. All animals were culture positive for Pasteurellaceae but were apparently free of *Mycoplasma ovipneumoniae*. All animals were collared with proximity collars to record when and for how long individuals are within approximately one meter. The upper respiratory tract (nasal and pharyngeal swabs) of all animals were sampled prior to co-pasturing and collected nasal and pharyngeal swabs post-contact.

B) We have tested several hundred different isolates of Pasteurella species for the presence of the genes for the virulence factors, leukotoxin (*lktA*) and superoxide dismutase (*sodC*) using polymerase chain reaction (PCR) methods developed in and published by the Caine Laboratory. The genes encode leukotoxin (LKT) or Cu⁺⁺Zn⁺⁺superoxide dismutase (SOD), respectively. Leukotoxin is secreted by *M. haemolytica* and is an important virulence factor that is cytotoxic for leukocytes of bighorn sheep and domestic sheep. The Cu⁺⁺Zn⁺⁺SOD is an important virulence factor of other pathogens and is present in *M. haemolytica*, but the significance of *sodC* in these bacteria is not well-established.

Our restriction endonuclease analysis of polymerase chain reaction (PCR) DNA product of the *lktA*⁺ or *sodC*⁺ gene segments detected a diversity of products from *M. haemolytica* isolates (manuscript for *sodC* in preparation). We have conducted experiments that measured killing of bacteria by a superoxide-generating system. Using a modification of the bactericidal assay described by others, we have shown that resistance of *M. haemolytica* isolates to killing by superoxide requires both bacterial CAT and the *sodC* gene. However, we have also shown that some CAT⁺*sodC*⁺ isolates exhibited an intermediate sensitivity and some of these isolates were very sensitive to killing by superoxide. We believe that studies of SOD expression will show differences that explain the results we have observed. The presence of genes does not always signify enzyme or toxin production and we have shown that the genes for LKT and SOD are structurally diverse. We propose that the expression of the *lktA* and *sodC* genes is quantitatively diverse and that this can be documented by measuring the mRNA for each gene by Real-time PCR. Importantly, we also propose that the expression of the *sodC* gene and susceptibility to killing by superoxide can be correlative and that the expression of *lktA* and *sodC* genes may aid our understanding of the pathogenesis of *M. haemolytica*.

C) The recently-named *Mannheimia* genus consists of five species, and a large “untypeable group”. A separate cluster based upon 16S rRNA and RNase P sequences in Pasteurellacea isolates from wild sheep in Alaska, Canada and Idaho has been identified and is undergoing further testing. Based on these results, we have proposed a new species, *Mannheimia acswardii*, named in honor of Dr. Alton Ward’s many contributions. Recent (2010) progress has been made in concluding the physiological parameters and the genetic analysis is nearly complete. A draft manuscript has been started. We are currently preparing to submit the type strain to the International Pasteurellaceae Committee for analysis.

4) The Mycoplasma DNA study that was initiated last year has produced results from one group of cases and samples have been prepared and are awaiting analysis from a large group of wild sheep from diverse habitats. Preliminary results indicate that most Mycoplasma species isolated from wild sheep may be “arginini.” Several significant observations regarding growth of the organisms have been made in 2010, and we have a manuscript in preparation. Our objective is to incorporate test procedures which will be successful, sensitive and specific for the detection of *Mycoplasma* spp. present in samples collected from bighorn sheep.

Teaching has also been an integral part of this project. Approximately 12 college seniors have completed research projects within the overall project in the last 12 years. They have been chosen by

their professors at Northwest Nazarene College or the College of Idaho as outstanding students and referred to the Wildlife Lab at CVTC. All but one has gone on to graduate (MS, PhD) or professional schools (MD, DVM, PA). Since the colleges have limited research activities, the experiences at CVTC are often the only exposure they get. Recently, one of the student projects was accepted as a refereed publication, which came into print in December 2009. Additionally, seven student projects have been presented as posters at the Conference of Research Workers in Animal Disease at their annual meetings.

5) Another project was initiated this year with combined funding of approximately \$87,000 from UI and USDA/ARS sources. The project, "Survey of the upper respiratory tract flora of domestic and bighorn sheep, U.S. Sheep Experiment Station (USSES)" is the largest survey study with domestic sheep pathogens conducted to date. We will follow the bacterial shedding characteristics of 125 sheep at USSES over a two-year period. Samples will be taken three times during each year. The major objective is to determine the extent of shedding by individual sheep for further study into the genetic and biochemical factors that permit disease transmission to other domestic sheep and possibly other species. Preliminary analysis indicates that individual sheep do indeed shed Pasteurellaceae potential pathogens at different rates. These animals will be useful in determining the genetic and physiological factors that control shedding, which is crucial to an understanding of disease transmission variable. Samples are also being collected for molecular, non-culture detection of novel pathogens.

Part II – Performance Measures

Performance Measure	FY 2007	FY 2008	FY 2009	FY 2010	Benchmark
1. Senior Veterinary Students Selecting Elective Rotations at the Caine Center.	40	41	62	80	40
2. Number/Percentage of Idaho Resident New Graduates Licensed to Practice Veterinary Medicine in Idaho.	7 students (64%)	8 students (73%)	4 students (36%)	7 students (64%)	7 students (65%)
3. Number of Disease Investigations Conducted by WI Faculty Members.	139	132	193	228	150
4. Number/Dollar Amount of Grants/Contracts by WI Faculty Members.	7 / \$381,382	7 / \$330,317	10 / \$240,273	10 / \$303,350	7 / \$300,000

Performance Measure Notes:

None.

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