Mission Statement

To serve the State of Montana by providing high quality, accurate, financially accessible and timely veterinary diagnostic testing, results and consultation; to assist state animal health officials in the diagnosis, control, and prevention of animal disease; and to contribute to state and national efforts to protect both animal and public health.
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<td>Pathology</td>
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Director’s Statement

The 2018 fiscal year was a period of transition, but also one of growth and opportunity. Our long serving Lab Director, Dr. Bill Layton, retired at the beginning of the fiscal year. Several other staff members retired during the year as well, necessitating the addition of new personnel. While the turnover in staff presented challenges, these changes forced us to evaluate new options and opportunities and resulted in a markedly strengthened cross-training program to ensure maintenance of laboratory services. In addition, we were able to take advantage of multiple open positions to initiate some restructuring of the laboratory and create new positions in the areas of most significant need.

We continue to strive to be at the cutting edge of laboratory and client service technology, and have recently developed multiple advancements in our Laboratory Information Management (LIM) System and client web portal, which will greatly enhance the client experience. I am excited to complete the final stages of testing, roll these new features out for our clients, and to hear the feedback.

This report contains a summary of test data from all sections of the Montana Veterinary Diagnostic Laboratory with the exception of the Montana Milk Laboratory, which is also housed within our facility.

We look forward to continuing to provide the highest quality diagnostic test services for disease diagnosis and surveillance in our great state in 2019 and beyond!

Sincerely,

Steve Smith, DVM, DACVP
Interim Director and Veterinary Pathologist
Montana Veterinary Diagnostic Laboratory
# Diagnostic Lab Staff

<table>
<thead>
<tr>
<th>Administration and Pathology</th>
<th>Clinical Pathology</th>
</tr>
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<tbody>
<tr>
<td><strong>Steve Smith, DVM, DACVP</strong></td>
<td><strong>Cecilia Esparza</strong></td>
</tr>
<tr>
<td>Veterinary Pathologist;</td>
<td>Clinical Laboratory Technologist</td>
</tr>
<tr>
<td>Interim Director</td>
<td>Katie Breen</td>
</tr>
<tr>
<td><strong>Jeff Marshall, BVSc, PhD</strong></td>
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<tr>
<td>Veterinary Pathologist</td>
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<table>
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<th>Administrative Support</th>
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<tr>
<td><strong>Tess Moore</strong></td>
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<td>Quality Manager</td>
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<tr>
<td><strong>Cathy Ortega</strong></td>
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<td>Front Office</td>
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<tr>
<td><strong>Michelle McReynolds</strong></td>
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<td>Front Office</td>
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<tr>
<td><strong>Lauren Larios</strong></td>
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<td>Pathology / Administrative Assistant</td>
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<thead>
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<th>Microbiology</th>
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<tr>
<td><strong>Jessica Rogers</strong></td>
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<td>Technician</td>
<td></td>
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<tr>
<td><strong>Kaylee Krantz</strong></td>
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<tr>
<td>Technician</td>
<td></td>
</tr>
<tr>
<td><strong>Diana Florian-Ospina</strong></td>
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<td>Biological Laboratory Aide</td>
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<tr>
<td><strong>June Pounder, PhD</strong></td>
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<table>
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<tr>
<td><strong>Antonio Fuentes Sanchez</strong></td>
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<table>
<thead>
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<th>Virology</th>
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<tr>
<td><strong>Sarah Horak</strong></td>
<td></td>
</tr>
<tr>
<td>Technician</td>
<td></td>
</tr>
<tr>
<td><strong>Bryan Tegner Jacobson</strong></td>
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<td>Technician</td>
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<th>Histology</th>
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<tr>
<td><strong>Dan Zou, PhD</strong></td>
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<td>Technician</td>
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<table>
<thead>
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<th>Milk Laboratory</th>
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<tr>
<td><strong>Julie Armstrong</strong></td>
<td></td>
</tr>
<tr>
<td>Technician</td>
<td></td>
</tr>
<tr>
<td><strong>Erin Burns</strong></td>
<td></td>
</tr>
<tr>
<td>Technician</td>
<td></td>
</tr>
</tbody>
</table>
**Staff Service Milestones**

15 Years of Service
Jeff Marshall

5 Years of Service
Jessica Rogers
Sarah Horak

Fig. 4—Stacked rocks (Pexels.com)
MVDL is funded by multiple sources including Fee Income from tests performed, Montana State General Funds, Montana State Special Revenue (livestock head tax), and Federal Grant funds. Fee Income of approximately 50% is typical for State-run diagnostic test laboratories. Although a substantial portion of MVDL’s budget is supplied by fee income, the ongoing support of the State of Montana, the livestock industry, and the National Animal Health Network (NAHLN) allow the laboratory to better fulfill our mission and serve the State of Montana.

![Budget categories diagram](image)

### 2018 Fiscal Year

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
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<tr>
<td>Fee Income</td>
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<td>General Fund</td>
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<td>Per Capita Tax</td>
<td>$509,284</td>
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<tr>
<td>NAHLN Grants</td>
<td>$120,693</td>
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</table>
MVDL is a member of the National Animal Health Laboratory Network (NAHLN). The NAHLN supports U.S. animal agriculture by developing and increasing the capabilities and capacities of a national veterinary diagnostic laboratory network to support early detection, rapid response, and appropriate recovery from high-consequence animal diseases. It is a nationally coordinated network and partnership of Federal, State, and university-associated animal health laboratories. NAHLN veterinary diagnostic laboratories provide animal health diagnostic testing to detect biological threats to the nation’s food animals, thus protecting animal health, public health, and the nation's food supply. The MVDL has the capacity to perform NAHLN testing for seven different high impact animal diseases.

These include:

- Foot and Mouth Disease
- Classical Swine Fever
- Vesicular Stomatitis
- Avian Influenza (IAV-A)
- Swine Influenza (IAV-S)
- Pseudorabies
- Newcastle Disease (Avian Paramyxovirus)

![Fig. 6—NAHLN map (USDA)](image-url)
An accession is a specimen or group of specimens from either a single animal or a herd, belonging to one owner, from a single submitter. Accessions are sometimes referred to as cases. Multiple individual tests may be performed on a single accession or specimen.

**Fig. 7—Accessions by Species**

**Fig. 8—Tests by Species**
## Accesion and Testing Demographics

Total Accession and Test Data:

<table>
<thead>
<tr>
<th>Species</th>
<th>Accessions</th>
<th>Tests</th>
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</thead>
<tbody>
<tr>
<td>Equine</td>
<td>8,262</td>
<td>13,595</td>
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<tr>
<td>Canine</td>
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<td>Bovine</td>
<td>4,521</td>
<td>130,651</td>
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<tr>
<td>Feline</td>
<td>1,211</td>
<td>4,132</td>
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<tr>
<td>Other</td>
<td>767</td>
<td>7,765</td>
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<td>Wildlife</td>
<td>311</td>
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<td>Bison</td>
<td>285</td>
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<tr>
<td>Ovine</td>
<td>152</td>
<td>1,512</td>
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<tr>
<td>Porcine</td>
<td>112</td>
<td>660</td>
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<tr>
<td>Caprine</td>
<td>79</td>
<td>543</td>
</tr>
<tr>
<td>Total</td>
<td>20,824</td>
<td>199,619</td>
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</tbody>
</table>

Total Referrals Sent to Other Laboratories: 966

### Historical Accession and Testing Data:

With our recent change in Laboratory Information Management (LIM) Systems, we have changed our methodology for counting some individual tests, so historical test data is not yet relevant, though accession data can be compared to previous years. **NOTE:** Accession data for FY 2016 is based on an eleven-month period, due to our transition to the new LIMS.

<table>
<thead>
<tr>
<th></th>
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<td>Total Accessions</td>
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<td>21,923</td>
<td>20,366</td>
<td>23,585</td>
<td>19,521</td>
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</table>
One very important public health function of the MVDL is rabies testing within the State of Montana. During Fiscal Year 2017, all positive rabies tests were in bats. The majority of rabies testing in bats and identification of positive samples occurs during warmer months, when bats are more active.

<table>
<thead>
<tr>
<th>Species</th>
<th>Positive</th>
<th>Negative</th>
<th>Unsuitable</th>
<th>Total</th>
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<td>18</td>
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<td>Badger</td>
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<td>1</td>
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<tr>
<td>Rodent</td>
<td></td>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>White-tailed deer</td>
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<td>1</td>
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<td>Equine</td>
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<tr>
<td>Canine</td>
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<td>Feline</td>
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<tr>
<td>Caprine</td>
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<tr>
<td>Coyote</td>
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<td>Skunk</td>
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<td>Bobcat</td>
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<td>Porcine</td>
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<tr>
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<tr>
<td>Wolf</td>
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<tr>
<td>Squirrel</td>
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<tr>
<td>Rabbit</td>
<td>1</td>
<td></td>
<td>1</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>11</strong></td>
<td><strong>460</strong></td>
<td><strong>27</strong></td>
<td><strong>499</strong></td>
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BRUCELLA SUMMARY

Several of our highest volume tests are for Brucella abortus, and these also serve our public health mission. The following table represents the five highest volume Brucella tests performed by the MVDL.

<table>
<thead>
<tr>
<th>Tests by Month</th>
<th>RAP</th>
<th>BAPA</th>
<th>CF</th>
<th>FPA</th>
<th>Card</th>
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<tbody>
<tr>
<td>July</td>
<td>1,633</td>
<td>388</td>
<td>58</td>
<td>42</td>
<td>12</td>
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<tr>
<td>August</td>
<td>1,612</td>
<td>373</td>
<td>160</td>
<td>711</td>
<td>135</td>
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<td>September</td>
<td>4,894</td>
<td>457</td>
<td>160</td>
<td>1,069</td>
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<td>October</td>
<td>22,662</td>
<td>312</td>
<td>228</td>
<td>1,002</td>
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<tr>
<td>November</td>
<td>21,900</td>
<td>451</td>
<td>48</td>
<td>1,814</td>
<td>109</td>
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<td>December</td>
<td>10,615</td>
<td>245</td>
<td>139</td>
<td>1,018</td>
<td>39</td>
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<tr>
<td>January</td>
<td>7,181</td>
<td>387</td>
<td>174</td>
<td>1,304</td>
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<td>February</td>
<td>1,355</td>
<td>360</td>
<td>86</td>
<td>1,750</td>
<td>10</td>
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<tr>
<td>March</td>
<td>2,253</td>
<td>490</td>
<td>196</td>
<td>781</td>
<td>50</td>
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<tr>
<td>April</td>
<td>1,779</td>
<td>740</td>
<td>236</td>
<td>774</td>
<td>92</td>
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<tr>
<td>May</td>
<td>3,337</td>
<td>281</td>
<td>95</td>
<td>77</td>
<td>3</td>
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<tr>
<td>June</td>
<td>1,697</td>
<td>375</td>
<td>94</td>
<td>85</td>
<td>11</td>
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</table>

RAP: Rapid Automated Presumptive Test
BAPA: Buffered Acidified Plate Antigen Test
CF: Complement-Fixation Test
FPA: Fluorescent Polarization Assay
Card: Standard Card Test

Fig. 10—Bison (Pexels.com)
MVDL performs routine proficiency testing as a means of maintaining compliance with applicable regulations and as a means of assuring the integrity of its testing methods and personnel. The following table summarizes the proficiency tests completed in FY2018.

<table>
<thead>
<tr>
<th>FY2018 MVDL Proficiency Testing Participation</th>
<th>Section</th>
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<tr>
<td>Heartworm Serology</td>
<td>Clinical Microbiology</td>
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<td>Inter-Laboratory Microbiology Quality Assurance Survey</td>
<td>Clinical Microbiology</td>
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<td>Microbiology Quality Assurance</td>
<td>Clinical Microbiology</td>
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<td>NVSL/NPIP Salmonella Group D Isolation</td>
<td>Clinical Microbiology</td>
</tr>
<tr>
<td>Chemistry Panel</td>
<td>Clinical Pathology</td>
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<tr>
<td>Endocrine Panel</td>
<td>Clinical Pathology</td>
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<tr>
<td>Hematology Panel</td>
<td>Clinical Pathology</td>
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<td>Urinalysis Panel</td>
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<tr>
<td>Urinalysis Identification</td>
<td>Clinical Pathology</td>
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<tr>
<td>Anaplasmosis Serology</td>
<td>Clinical Pathology</td>
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<tr>
<td>Avian Influenza AGID/ELISA</td>
<td>Clinical Serology</td>
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<tr>
<td>Bluetongue Virus</td>
<td>Clinical Serology</td>
</tr>
<tr>
<td>Brucella ovis Serology</td>
<td>Clinical Serology</td>
</tr>
<tr>
<td>Brucellosis Serology</td>
<td>Clinical Serology</td>
</tr>
<tr>
<td>Equine Infectious Anemia AGID</td>
<td>Clinical Serology</td>
</tr>
<tr>
<td>Equine Infectious Anemia ELISA</td>
<td>Clinical Serology</td>
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<tr>
<td>Johnes Serology</td>
<td>Clinical Serology</td>
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<tr>
<td>Vesicular Stomatitis Complement Fixation</td>
<td>Clinical Serology</td>
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<td>Bovine Leukosis Virus</td>
<td>Clinical Virology</td>
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<td>Rabies DFA</td>
<td>Clinical Virology</td>
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<tr>
<td>Messaging</td>
<td>Laboratory</td>
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<tr>
<td>Avian Influenza (AIV, NDV, SIV) Real Time RT-PCR</td>
<td>Molecular Diagnostics</td>
</tr>
<tr>
<td>Avian Paramyxovirus-1 Real Time RT-PCR</td>
<td>Molecular Diagnostics</td>
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<tr>
<td>Classical Swine Fever Virus rRT-PCR</td>
<td>Molecular Diagnostics</td>
</tr>
<tr>
<td>Foot &amp; Mouth Disease Virus rRT-PCR</td>
<td>Molecular Diagnostics</td>
</tr>
<tr>
<td>Influenza A Virus (Swine) Real Time RT-PCR</td>
<td>Molecular Diagnostics</td>
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<tr>
<td>NVSL/NPIP Salmonella Group D Isolation</td>
<td>Molecular Diagnostics</td>
</tr>
<tr>
<td>Vesicular Stomatitis rRT-PCR</td>
<td>Molecular Diagnostics</td>
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MVDL provides a comprehensive suite of serology test methods, the bulk of which serve to support the Brucellosis surveillance program managed by the Animal Health Bureau of the DOL and screening for Equine Infectious Anemia. The following table details the number of individual tests conducted in FY2018 by test type.

<table>
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<th>Test Type</th>
<th>FY17</th>
<th>FY18</th>
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<tr>
<td>B. abortus RAP</td>
<td>78,678</td>
<td>81,057</td>
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<tr>
<td>B. abortus FPA</td>
<td>8,043</td>
<td>10,184</td>
</tr>
<tr>
<td>EIA AGID (total)</td>
<td>6,098</td>
<td>6,282</td>
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<tr>
<td>B. abortus BAPA</td>
<td>4,474</td>
<td>4,970</td>
</tr>
<tr>
<td>EIA ELISA (total)</td>
<td>1,278</td>
<td>1,922</td>
</tr>
<tr>
<td>Brucella abortus/suis - CF</td>
<td>1,840</td>
<td>1,667</td>
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<tr>
<td>M. avium paratuberculosis ELISA</td>
<td>1,823</td>
<td>1,612</td>
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<tr>
<td>Bluetongue ELISA</td>
<td>1,333</td>
<td>1,069</td>
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<td>EHD AGID</td>
<td>1,324</td>
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<td>Anaplasma cELISA</td>
<td>959</td>
<td>939</td>
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<tr>
<td>B. abortus Card</td>
<td>888</td>
<td>788</td>
</tr>
<tr>
<td>B. ovis ELISA</td>
<td>938</td>
<td>723</td>
</tr>
<tr>
<td>B. abortus SPT (1:50)</td>
<td>579</td>
<td>393</td>
</tr>
<tr>
<td>B. abortus STT (1:50)</td>
<td>361</td>
<td>242</td>
</tr>
<tr>
<td>CAE/OPP cELISA</td>
<td>385</td>
<td>182</td>
</tr>
<tr>
<td>B. canis RSAT</td>
<td>113</td>
<td>78</td>
</tr>
<tr>
<td>B. canis 2ME-RSAT</td>
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<td>17</td>
</tr>
<tr>
<td>B. abortus Rivanol</td>
<td>12</td>
<td>13</td>
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<tr>
<td>Salmonella Pullorum</td>
<td>60</td>
<td>5</td>
</tr>
<tr>
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Fig. 14—Lab bench (MVDL)
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<td>EHV IHC</td>
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<td>Macchiavello</td>
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<td><strong>Total</strong></td>
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**Fig. 15—Tissue Blocks (MVDL)**
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<td>Ruminant Diarrhea Panel (&lt;30d)</td>
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<td>Insurance/Legal case hourly fee</td>
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<td><strong>35,072</strong></td>
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In FY2018, the MVDL processed 20,824 accessions representing a total of 199,619 individual diagnostic tests. Relative to FY2017, these totals represent a 5% decrease in the total number of accessions and a 5.4% increase in the total number of diagnostic tests.

As we move forward into fiscal year 2019, I sincerely believe that the MVDL is on the threshold of amazing growth and improvement. We have a streamlined organizational structure that will provide for expertise we’ve never had before, we have multiple new tests and panels in development, and we excitedly look forward to bringing new staff members on board and rolling out significant improvements in client service and accessibility.

Over the past year, the MVDL has been actively participating in a legislative laboratory study project and working with design consultants to complete the necessary programming and cost analysis steps for a new building project. This will address all of our current needs, and also pave the way for future growth and development.

As was also the case last year, much change is on the horizon, but we are excited about the potential that it brings. We will continue to do all that we can to provide the best possible veterinary diagnostic services to the State of Montana.

Once again, thank you for granting us the opportunity to serve you!

Sincerely,

Steve Smith, DVM, DACVP
Interim Director and Veterinary Pathologist
Montana Veterinary Diagnostic Laboratory