OMAFRA-UoG Emergency Management Research Expo
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Veterinary Diagnostic Laboratory Emergency Preparedness

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1. Background: Emergency Preparedness in a Laboratory Setting

2. Part I: Laboratory Emergency Management Survey

3. Part II: Laboratory Emergency Management Financial Template

4. References & Acknowledgements
CAHSN established ~ 2006

- Network of federal, provincial and university animal health diagnostic labs
- Linked to Canadian Public Health Lab Network

Key outputs of CAHSN:
- Surveillance and early warning system for animal disease threats
- Rapid diagnosis in regional lab, confirmed by central reference lab
- Surge capacity to provide a rapid response and post-outbreak recovery surveillance testing

CAHSN Laboratories

CAHSN Legend:
- Partner Laboratories
- CFIA Laboratories

Background
CAHSN
Survey
Checklist
Financial Template
Survey Objectives:

- Investigate and provide a benchmark of the current emergency preparedness status of CAHSN university and provincial labs

- Generate a checklist that can be used to assist in developing a lab emergency response plan
Survey questions based upon guidelines developed by the Emergency Preparedness Workgroup of the American Association of Veterinary Laboratory Diagnosticians (AAVLD, 2003)

- 52 questions, LimeSurvey electronic format

Invited participants were the 10 provincial/university labs most likely to be responding to FAD outbreak (CAHSN)
A) General Operations

- Financial: funding agencies, revenue sources
- QA accreditation, containment facilities
- Staffing
- Test disciplines
- Lab Information Management System (LIMS)
- Surveillance reports
- Lab access
- Standard Operating Procedures
B) Emergency Management

- Lab Emergency Response Plan (FADES)
- Emergency funding
- Training: CAHSN, FAD, ICS
- Surge capacity: staff, supplies, tests (PCR, ELISA)
- Business continuity plan
- FAD test exercises
- What does the lab need to be ready for a FAD?
Emergency Response Plans

Does the lab have an emergency response plan?

- Yes (8)
- No (2)  

Has the lab identified funding sources to pay for staff and consumables during an emergency?

- Yes (4)
- No (6)

20% 80%
Have standing purchase orders been negotiated with major suppliers to permit rapid delivery of essential consumables and reagents?

- Yes (3)
- No (7)

Has the lab identified funding sources to pay for staff and consumables during an emergency?

- Yes (4)
- No (6)
**Pre-existing labour agreements to permit overtime, reassignment or hiring of contractors during an emergency?**

- Yes (4)
- No (6)

**Unionized Staff Categories**

- Laboratory Director or Manager (3)
- Laboratory Supervisors and Section Heads (6)
- Veterinarians and equivalent scientific professionals (7)
- Technologists (10)
- Administrative (9)

- Yes (40%)
- No (60%)
How would the lab manage surge testing demand during an outbreak?

- Overtime (9)
- Calling in part-time trained staff or students (2)
- Reassignment of staff from other university or government laboratories (4)
- Hiring outside contractors (0)
- Other (4)
How would the lab manage business continuity (routine testing) during an outbreak?

- Overtime or other increased staffing level (7)
- Routine samples will be referred to another laboratory as per prior arrangements. Results will be received, reported and invoiced by primary laboratory (4)
- Routine samples will be referred to another laboratory as per prior arrangements. Results will be reported and invoiced by the referral laboratory (3)
- Routine samples will not be accepted during an outbreak. Clients will be directed to forward samples to another laboratory (3)
- Other (1)
California 2002-03 Exotic New Castle Outbreak: Surge Testing Demand

Dr. Grant Maxie
CAHSN has accelerated the training, certification and equipping of partner labs to meet the demand for surge testing.

>70% of labs have:

- Lab Emergency Response Plan
- Biosafety Officer, containment level 2+ (FAD)
- QA Officer, SOPs (sample tracking, disinfection)
- Technical analysts certified for PCR and ELISA FAD tests
Survey Summary: Challenges & Opportunities for Enhanced Preparedness

- Human resources management (labour relations, staffing needs, overtime)
- Financial planning – who pays the bills?
- Suppliers
- Business continuity planning – managing routine diagnostic cases during the outbreak
- Advanced training needs: ICS, FAD lab exercises
Lab Emergency Management Survey

- Survey results presented at the 9th annual meeting of the Canadian Animal Health Laboratorians Network, Calgary, AB

- Survey results and Lab Emergency Management Checklist provided to participating CAHSN Lab Directors
Laboratory Emergency Management Checklist

- A. Laboratory Emergency Management Plan
- B. Laboratory Certification/Accreditation
- C. Personnel
- D. Biosafety
- E. Laboratory Biosecurity
- F. Laboratory Information Management System (LIMS)
- G. Laboratory Standard Operating Procedures
- H. Emergency Contact Lists
- I. Supplies
- J. Financial
- K. Business Continuity Plan
- L. Foreign Animal Diseases Exercises
**Objective:** Assist Veterinary Labs in Emergency Planning

**File Name:** Veterinary Lab Diagnostic Template Version 2.2 BETA Ready.xls

**Version:** v2.2 15-Nov-2012

**Audit Status:** Completed Draft

**Units (Currency):** Canadian Dollar (CAD)

Select:

- Management_Summary
- Emergency_Management_Plan
- Surge_Capacity
- Business_Continuity_Plan
- Standard_Formats_Map
### Financial Template Overview

<table>
<thead>
<tr>
<th>Mgmt. Summary</th>
<th>Emergency Mgmt. Plan</th>
<th>Surge Capacity</th>
<th>Business Continuity</th>
</tr>
</thead>
</table>
| • Consolidate all relevant outputs in one place  
• Quick, easy access to important info.  
• User-friendly | • Costs related to emergency preparedness  
• User can choose which costs to consider | • Designed to gauge lab’s capacity for PCR/ELISA  
• Allows user to gauge impact on capacity in emergency  
• Basic cost calculation for FAD testing | • User determines business strategy in emergency  
• Determines impact to lab under reduced routine capacity |
## Emergency Mgmt. Plan: Personnel

### Personnel Training

<table>
<thead>
<tr>
<th>Include CAHSN Training Costs</th>
<th>Real/In-Kind Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include CFIA-FAD Recognition Training Costs</td>
<td>Real/In-Kind Cost</td>
</tr>
<tr>
<td>Include Incident Command System (ICS) Training Costs</td>
<td>Real/In-Kind Cost</td>
</tr>
<tr>
<td>Include Media Training Costs</td>
<td>Media Training Cost</td>
</tr>
</tbody>
</table>

*Total Costs for Personnel Training*

$0.00
Surge Capacity: PCR Tests

**PCR Test Capacity**

- **Average Daily Number of PCR Test Batches (Normal Operation):** 6
- **Average Number of PCR Tests per Batch (Normal Operation):** 400
- **Average Daily Technician Staffing Level for Routine PCR Testing:** 6
  - **Average Routine PCR Test Daily Capacity at Staff Level of:** 2400
- **Planned Level of FAD PCR Testing (Daily):** 500
- **Planned Level of PCR Routine Testing (Daily):** 2000
  - **Daily PCR Testing Maximum Capacity:** 2500
- **Planned Level of PCR Business Continuity (%):** 83%

**Sensitivity Analysis: PCR Test Capacity**

Select a Level of FAD Testing (% of Maximum Capacity):

- 50%

![PCR Testing Capacity Graph](image-url)
### PCR Testing Levels During a FAD

**Normal Operating Capacity**

- **Move to Surge Capacity Level of: 2500 per 24 Hours**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number (#) of Technicians (Regular Salary):</td>
<td>5</td>
</tr>
<tr>
<td>Regular Technician Daily Cost per Employee:</td>
<td>$150.00</td>
</tr>
<tr>
<td>Total Regular Staff Daily Cost</td>
<td>$750</td>
</tr>
<tr>
<td>Number (#) of Technicians (Overtime):</td>
<td>5</td>
</tr>
<tr>
<td>Technician Overtime Daily Cost per Employee:</td>
<td>$150.00</td>
</tr>
<tr>
<td>Total Overtime Staff Daily Cost</td>
<td>$750</td>
</tr>
<tr>
<td>Non-Routine Staff Costs (Training, etc.) per Day:</td>
<td>$200</td>
</tr>
<tr>
<td>Administration &amp; Miscellaneous Costs per Day:</td>
<td>$200</td>
</tr>
<tr>
<td>PCR Reagent Cost per Test:</td>
<td>$0.50</td>
</tr>
<tr>
<td>PCR Reagent Cost per Day:</td>
<td>$250</td>
</tr>
<tr>
<td>Total FAD PCR Testing Cost per Day:</td>
<td>$2,150</td>
</tr>
</tbody>
</table>
**Business Continuity Plan**

**Business Continuity Strategy**

- Maintain all routine testing.
- Maintain proportion of routine testing.
- Discontinue routine testing.

**Business Discontinuity Strategy**

<table>
<thead>
<tr>
<th>Laboratory Sample Relay Costs</th>
<th>Client Sample Relay Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Driver</td>
<td>Cost (Daily)</td>
</tr>
<tr>
<td>Loss of Client Goodwill</td>
<td>INTANGIBLE</td>
</tr>
</tbody>
</table>
## Routine PCR & ELISA Test Cost & Profit Analysis

### Routine PCR Testing Cost Data

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average # of Routine PCR Tests Conducted Daily:</td>
<td>2000</td>
</tr>
<tr>
<td>Number (#) of Technicians (Routine):</td>
<td>5</td>
</tr>
<tr>
<td>Routine Technician Daily Cost per Employee:</td>
<td>$200.00</td>
</tr>
<tr>
<td>Total Regular Staff Daily Cost</td>
<td>$1,000</td>
</tr>
<tr>
<td>Administration &amp; Miscellaneous Costs:</td>
<td>$200</td>
</tr>
<tr>
<td>PCR Reagent Cost per Test:</td>
<td>$2.00</td>
</tr>
<tr>
<td>PCR Reagent Cost per Day:</td>
<td>$4,000</td>
</tr>
<tr>
<td>Total PCR Routine Testing Cost per Day:</td>
<td>$5,200</td>
</tr>
</tbody>
</table>

### Routine PCR Testing Profit Data

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine PCR Price Charged per Test:</td>
<td>$4.00</td>
</tr>
<tr>
<td>Routine PCR Cost per Test:</td>
<td>$2.60</td>
</tr>
<tr>
<td>Routine PCR Profit per Test:</td>
<td>$1.40</td>
</tr>
<tr>
<td>Routine PCR Revenue per Day:</td>
<td>$8,000</td>
</tr>
<tr>
<td>Routine PCR Cost per Day:</td>
<td>$5,200</td>
</tr>
<tr>
<td>Routine PCR Profit per Day:</td>
<td>$2,800</td>
</tr>
</tbody>
</table>

### Routine ELISA Testing Cost Data

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average # of Routine ELISA Tests Conducted Daily:</td>
<td>2000</td>
</tr>
<tr>
<td>Number (#) of Technicians (Routine):</td>
<td>5</td>
</tr>
<tr>
<td>Routine Technician Daily Cost per Employee:</td>
<td>$200.00</td>
</tr>
<tr>
<td>Total Regular Staff Daily Cost</td>
<td>$1,000</td>
</tr>
<tr>
<td>Administration &amp; Miscellaneous Costs:</td>
<td>$200</td>
</tr>
<tr>
<td>ELISA Reagent Cost per Test:</td>
<td>$2.00</td>
</tr>
<tr>
<td>ELISA Reagent Cost per Day:</td>
<td>$4,000</td>
</tr>
<tr>
<td>Total ELISA Routine Testing Cost per Day:</td>
<td>$5,200</td>
</tr>
</tbody>
</table>

### Routine ELISA Testing Profit Data

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine ELISA Price Charged per Test:</td>
<td>$4.00</td>
</tr>
<tr>
<td>Routine ELISA Cost per Test:</td>
<td>$2.60</td>
</tr>
<tr>
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<td>$5,200</td>
</tr>
<tr>
<td>Routine ELISA Profit per Day:</td>
<td>$2,800</td>
</tr>
</tbody>
</table>
BCP: FAD Impact on Profit

Select an Estimated FAD Outbreak Duration (Weeks): 25
Select the Number of Testing Days per Week: 7
Routine PCR Business Continuity (%) During a FAD: 83%
Routine ELISA Business Continuity (%) During a FAD: 83%

<table>
<thead>
<tr>
<th>Revenue (PCR)</th>
<th>Lost Revenue (PCR)</th>
<th>Profit (PCR)</th>
<th>Revenue (ELISA)</th>
<th>Lost Revenue (ELISA)</th>
<th>Profit (ELISA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,166,667</td>
<td>$233,333</td>
<td>$403,333</td>
<td>$1,166,667</td>
<td>$233,333</td>
<td>$408,333</td>
</tr>
</tbody>
</table>

FAD Impact on Routine PCR & ELISA Testing Revenue & Profit

- Lost Profit
- Profit
- Lost Revenue
- Revenue
## Surge Capacity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Result</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCR Test Capacity</td>
<td>Maintain normal operating capacity of: 2,500</td>
<td>Daily Routine PCR Tests: 2,000. Planned Routine Capacity: 83%</td>
</tr>
<tr>
<td>PCR FAD Testing Cost (Daily)</td>
<td>Daily Cost for FAD testing: $2,150</td>
<td>Based on estimated level of 500 FAD tests required daily</td>
</tr>
<tr>
<td>ELISA Test Capacity</td>
<td>Maintain normal operating capacity of: 2,500</td>
<td>Daily Routine ELISA Tests: 2,000. Planned Routine Capacity of: 83%</td>
</tr>
<tr>
<td>ELISA FAD Testing Cost (Daily)</td>
<td>Daily Cost for FAD testing: $2,150</td>
<td>Based on estimated level of 500 FAD tests required daily</td>
</tr>
</tbody>
</table>
## Business Continuity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Result</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Continuity Strategy</td>
<td>Maintain proportion of routine testing and lab will relay surge client samples</td>
<td>Note Laboratory Sample Relay Costs and Cost Driver</td>
</tr>
<tr>
<td>Business Discontinuity Strategy</td>
<td>Note associated costs with lab sample relay per day: $180</td>
<td>Costs associated with lab sample relay: Courier Charges and Administrative Costs</td>
</tr>
<tr>
<td>FAD Outbreak Impact on PCR Revenue &amp; Profit</td>
<td>Lost Revenue of $233,333 and Lost Profit of $81,667</td>
<td>Result based on a FAD outbreak lasting 25 weeks and a PCR routine testing continuity level of 83%</td>
</tr>
<tr>
<td>FAD Outbreak Impact on ELISA Revenue &amp; Profit</td>
<td>Lost Revenue of $233,333 and Lost Profit of $81,667</td>
<td>Result based on a FAD outbreak lasting 25 weeks and a PCR routine testing continuity level of 83%</td>
</tr>
</tbody>
</table>
Next Steps:

- Currently undergoing beta testing
- Revise and finalize financial template
- Present results at the 13th annual CAHLN meeting, St-Hyacinthe QC, June 2013
Lab Emergency Preparedness – All Hazards

Business Continuity???
References

Laboratory Exercises, Kris Clothier and Pat Blanchard, 2008 NAHLN Emergency Response Symposium, Greensboro, NC, USA


Developing Laboratory Response Plans, Ron Wilson, NAHLN/AAVLD Laboratory Emergency Management Subcommittee Joint Symposium, October 2006, Minneapolis, MN.
Thanks!

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- Dr. Mark Swendrowski  Manitoba
- Ms. Marilyn Jonas  Saskatchewan
- Dr. Ole Sorensen  Alberta
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