

Healthier Animals → Safer Food

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OMFRA – UofG Partnership

Lunch and Learn Series
September 24, 2008

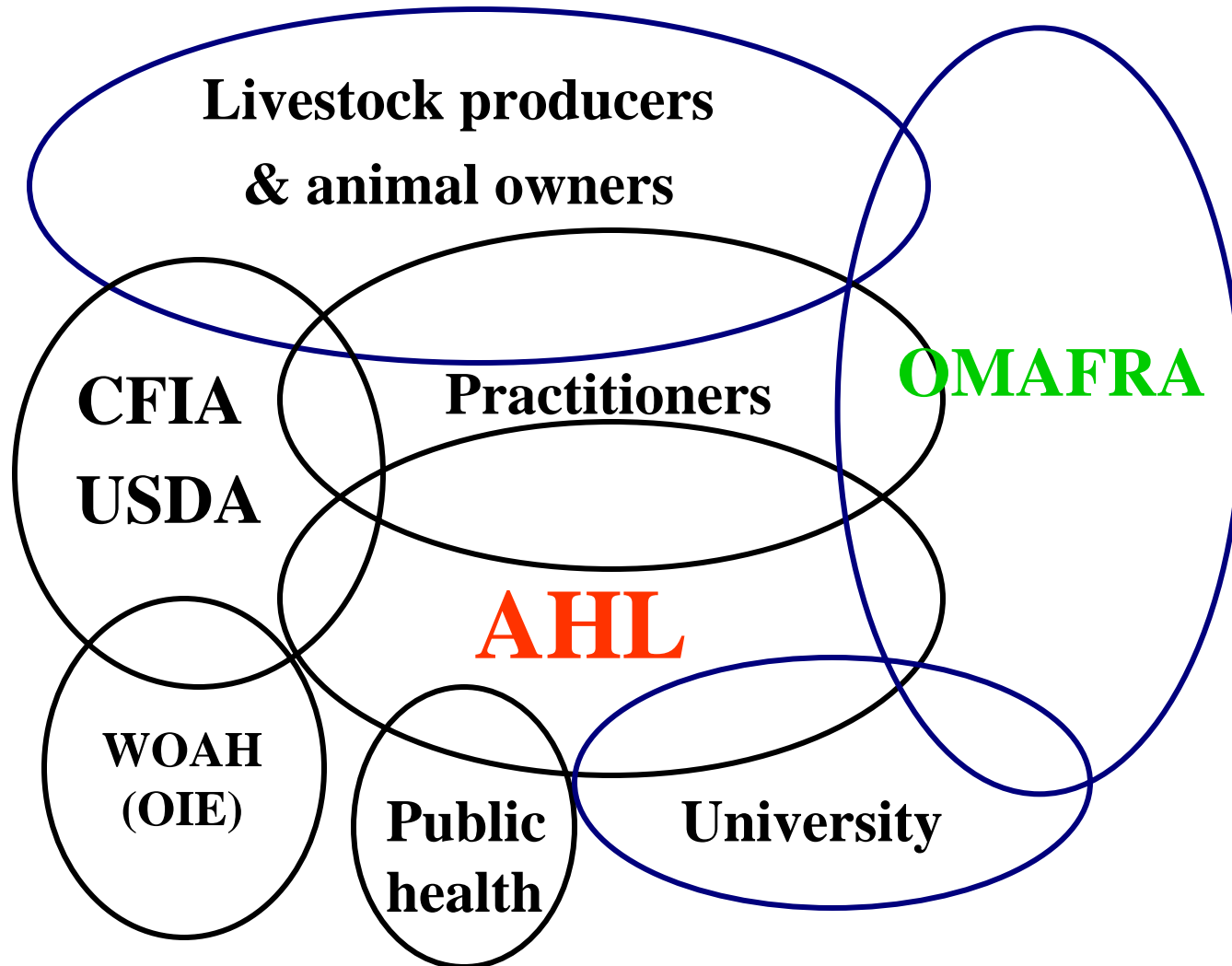
**UNIVERSITY
of GUELPH**
LABORATORY SERVICES
Animal Health Laboratory



Provincial & laboratory needs for surveillance & emergency preparedness

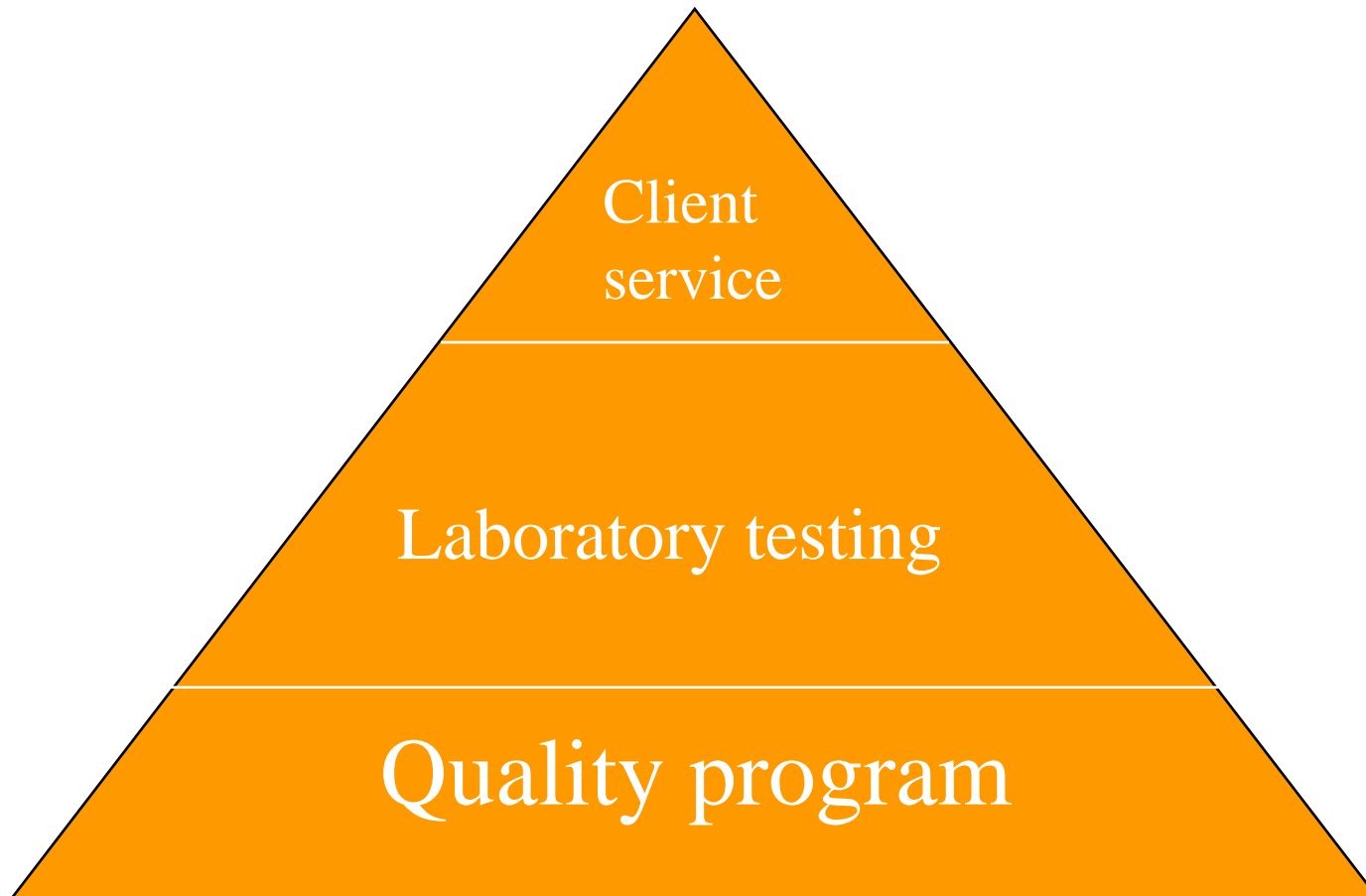
- Foundation = agreements + ongoing funding
 - balance with the budgetary need for fee-for-service testing
- Quality program
 - “say what you do, do what you say, prove it, improve on it”
- Facilities – biosafety, biocontainment
- Equipment
- Staff – training, ongoing competence
- Information technology (IT) interfacing
- Coordinated planning
 - TEST THE PLAN!

Stakeholders/partners of the AHL





AHL function and structure





Quality system framework

- Vision
- Mission
- Values
- Quality goals and objectives
- Quality manual
 - standard operating procedures
 - test validation
 - ensure continuing staff competence
 - corrective/preventive actions
 - foster a culture of continuous improvement



Objectives of OMAFRA for the AHL within the new agreement

<http://www.omafra.gov.on.ca/english/infores/releases/2008/042808.htm>

- ❑ support veterinarians and livestock organizations
- ❑ contribute scientific and diagnostic expertise to support business decisions
- ❑ help in the development of government policies and programs to mitigate threats to animal health



Animal Health Strategic Investment

“This includes activities aimed at providing Ontario with improved methods to address an animal health crisis:

- new tests for emerging diseases
- baseline surveillance for the early detection of emerging hazards
- development and testing of emergency and business continuity plans for the Animal Health Laboratory”



a. Potential new tests for emerging diseases

New molecular tests

Particle-associated nucleic acid amplification for unknown viruses

Chlamydophila psittaci PCR

Multiplex ELISA

Mycoplasma gallisepticum PCR

Giardia assemblage typing

Coxiella burnetii real-time PCR

Avian leukosis virus PCR

Detection of multiple bacteria and DNA viruses

Detection of multiple RNA viruses

Pyrosequencing of bacteria, fungi, parasites

PCR tests for production-limiting diseases of cattle (IBR, PI3, BRSV, BCV, BRV, Breda)

Bacterial molecular typing (PFGE, MLST)

Improvement of anaerobic culturing and mycology culture/ID

PCR detection of different fungi

Salmonella serotyping microarray

Botulinum toxin

Anthrax

Immunohistochemistry tests

Equine herpesvirus 1

Rotavirus

PRRSV cocktail

Coxiella burnetii

Rabies virus

EEEV

Porcine / bovine respiratory coronavirus

BRSV

Mycobacterium avium subsp *paratuberculosis*
(MAP, Johne's disease)

Sarcocystis neurona

Caprine arthritis-encephalitis virus

Borrelia burgdorferi

Adenovirus, all species

Coccidia speciation

- 
- new tests supported by new equipment and staff

b. baseline surveillance for the early detection of emerging hazards

- collaborations

c. development and testing of emergency and business continuity plans for the AHL

- jointly with OMAFRA, CFIA, and other cooperators



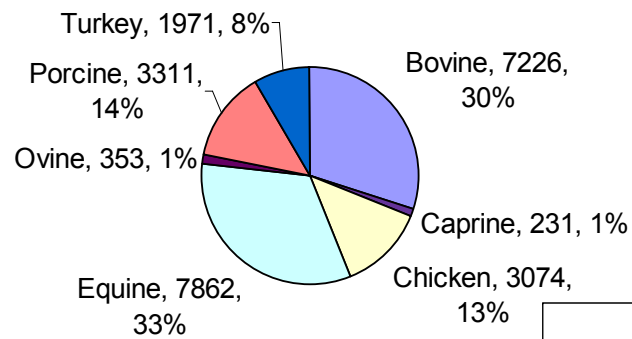
Services provided by the AHL

- anatomic pathology – Guelph and Kemptville
- bacteriology
- clinical pathology
- immunology/serology
- avian and mammalian virology
- molecular biology
- mycoplasmaology
- parasitology
- toxicology/soil & nutrient
- surveillance

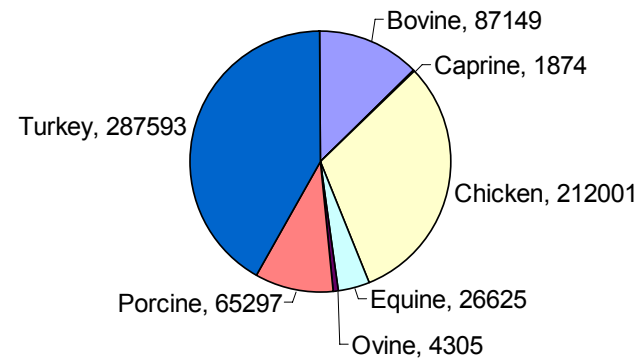
AAVLD-accredited + ISO 9001 + ISO 17025 registered

AHL caseload, fiscal 07/08

AHL, food/fiber/equine cases, 07/08



AHL food/fiber/equine tests, 07/08





Ongoing challenges for AHLs

- maintain an appropriate test spectrum
 - faster, more accurate, more definitive, at an economic price
- deal with identification of changing agents
 - mutating agents - PRRSV, PCV2, IVA
 - emerging agents - prions, *Neospora*
 - re-emerging agents - BVDV, *Leptospira*
- increasing demands for test validation, both analytical and field validation - ongoing QC
- short cycle times on new technology, esp. molecular
- funding of equipment replacement
 - including generation of reference intervals and interfacing
- acquire and maintain appropriate space – new buildings!

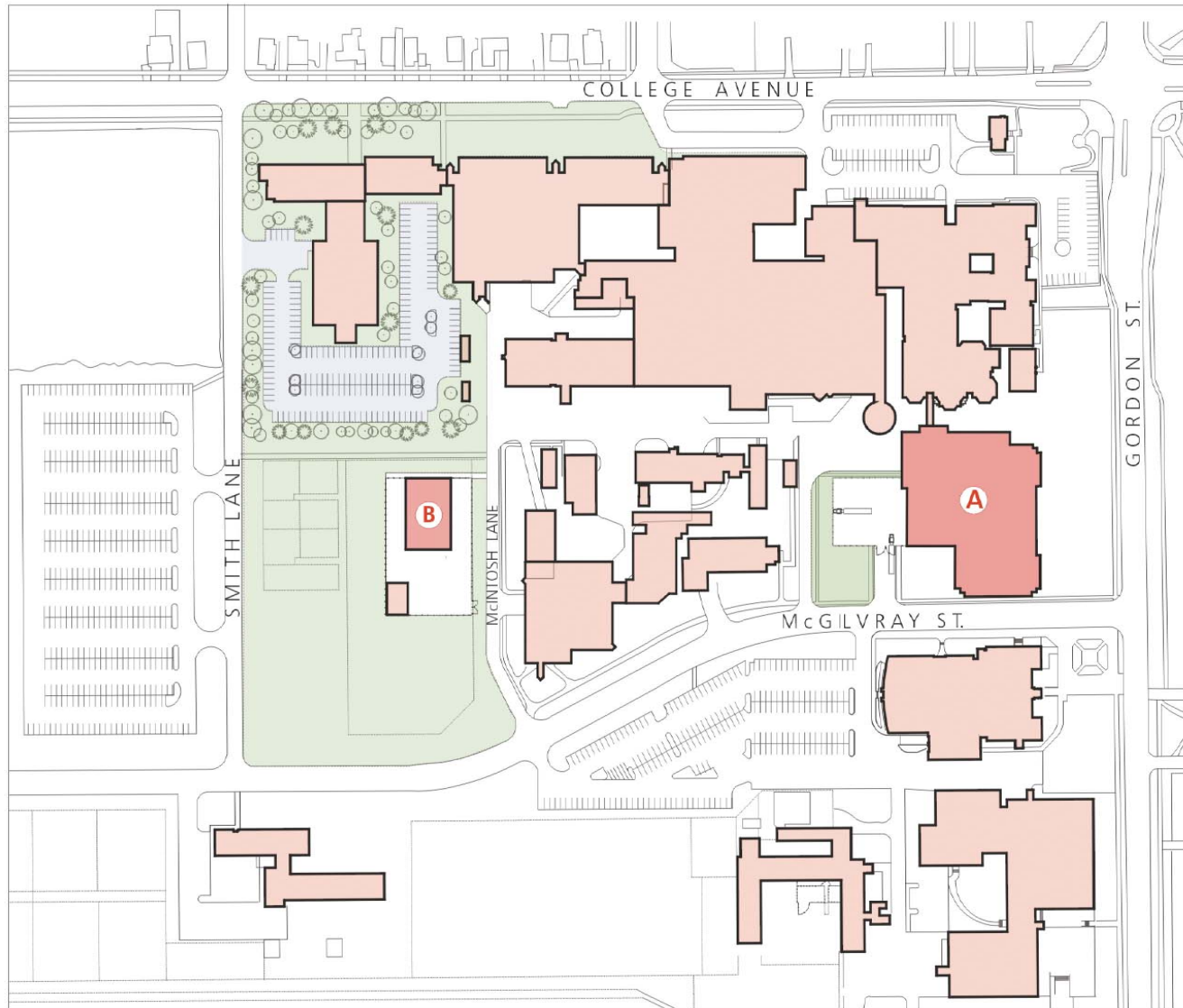
Facilities - Going from this

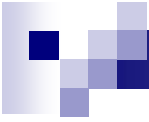


To this New Pathobiology-AHL building

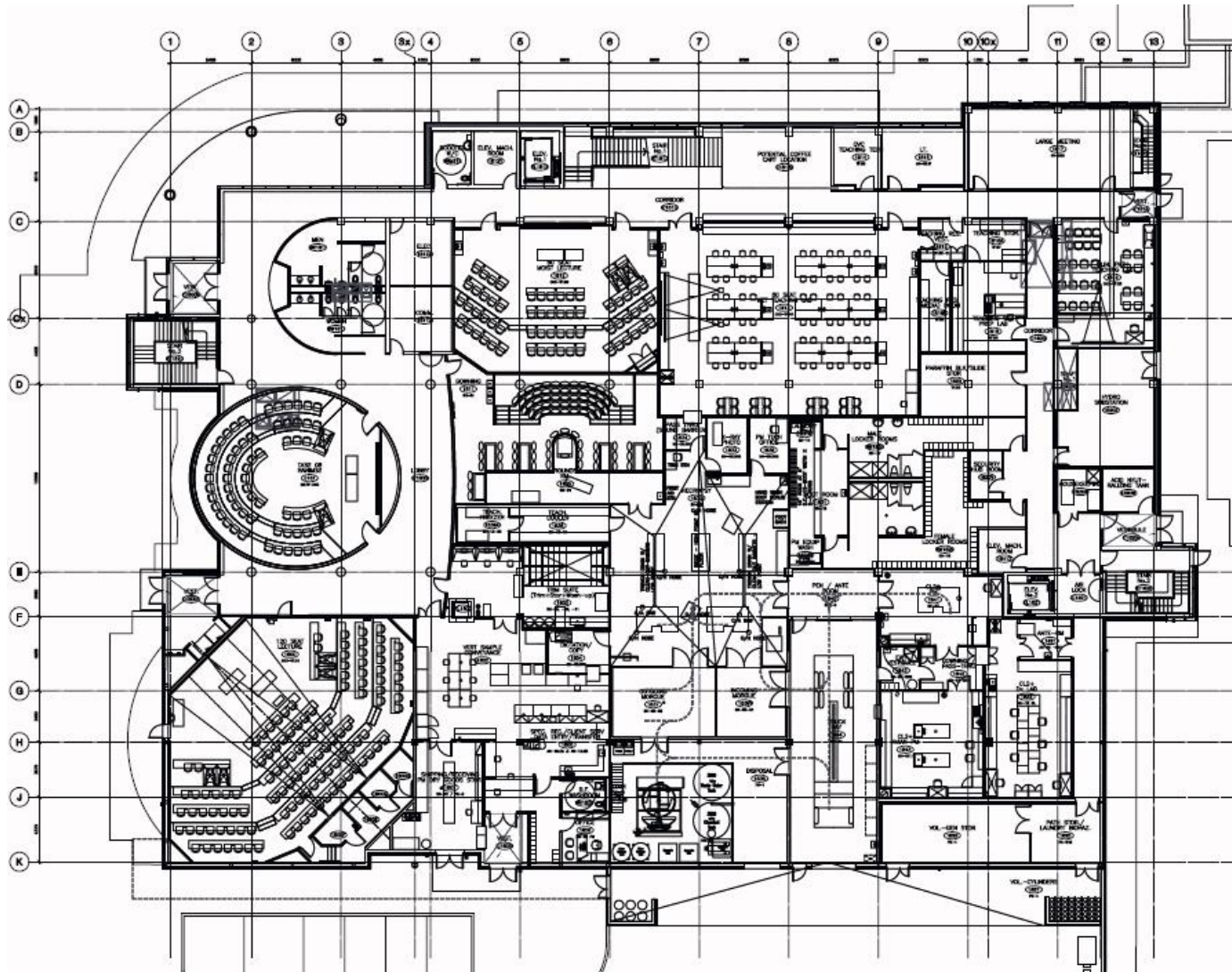


New Pathobiology-AHL building - site plan





First floor



Improve biosecurity & biosafety

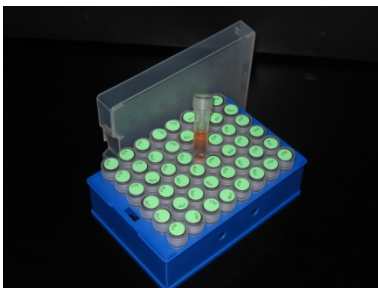


High-throughput equipment

LightCycler 480 real-time PCR



Biomek NX NA extraction



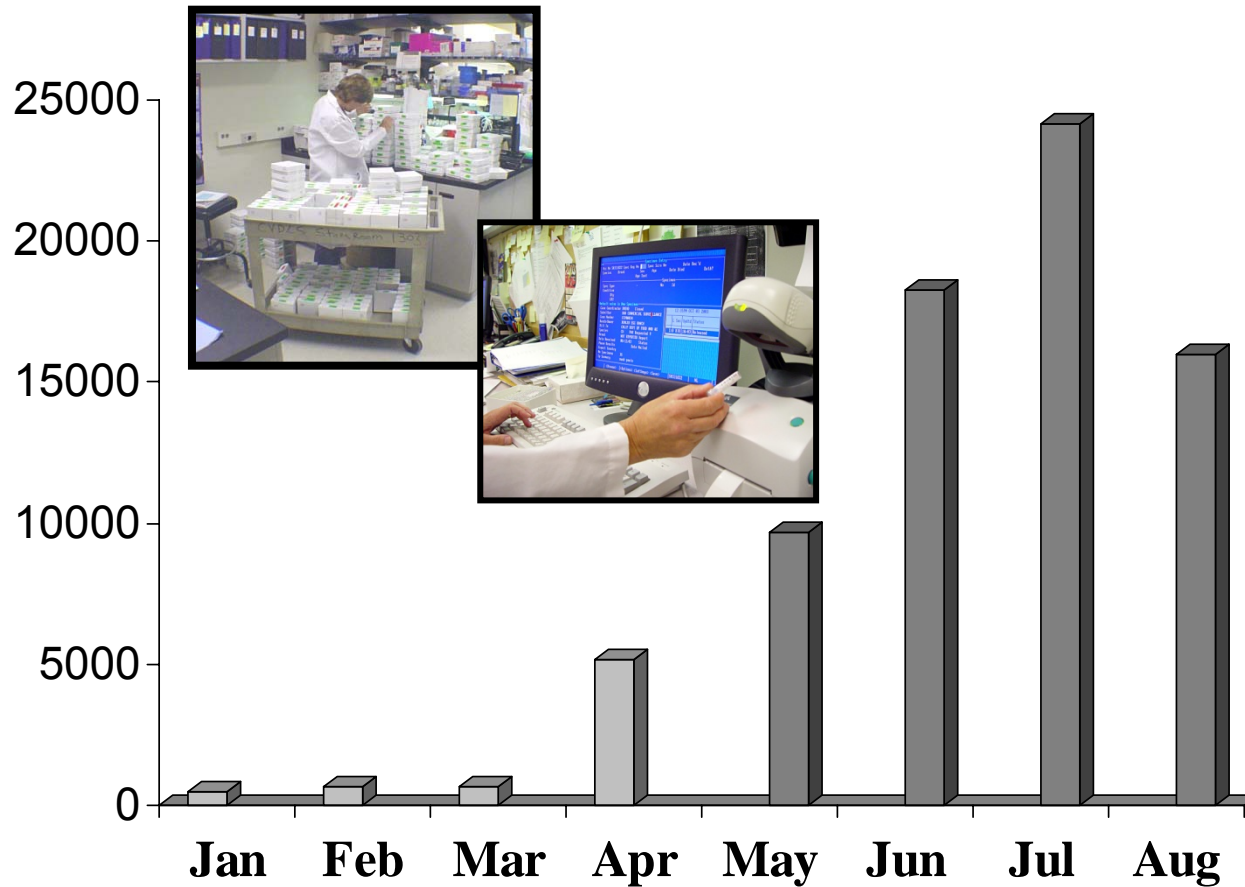


Ensuring staff competence

“ 5.2.1 The laboratory shall ensure the initial and ongoing competence of all laboratory personnel to do their assigned work.”

- job descriptions, expectations
- recruitment and hiring (and retention)
- ongoing training
- proficiency testing – VLA, NVSL, CFIA, etc.
- for subjective areas – peer review

Challenges in dealing with an FAD outbreak

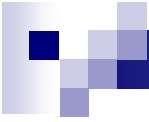


2002-03 California Exotic Newcastle Disease Outbreak

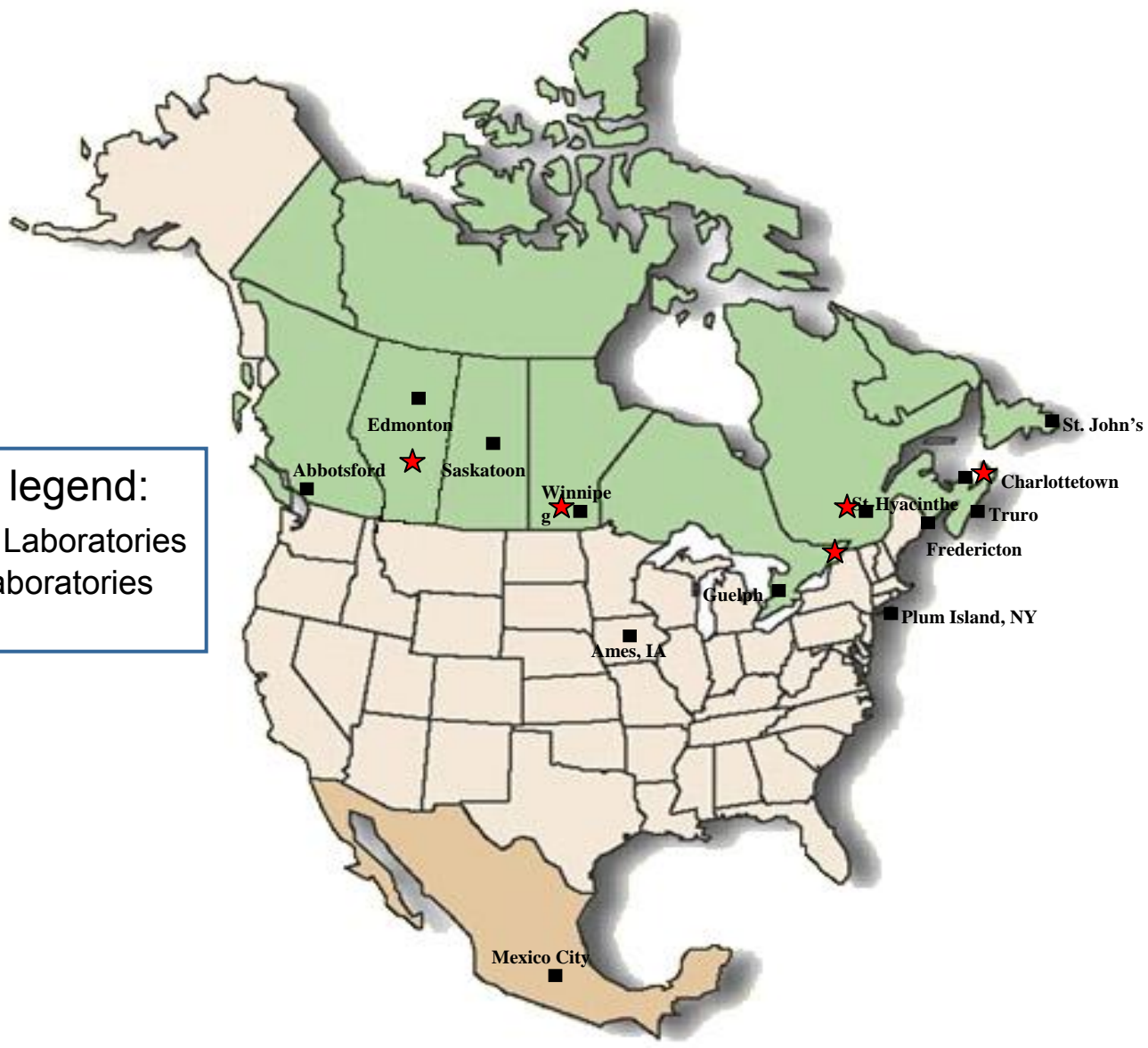


CAHSN/CAHLN

- Federal – provincial – university partnership
- Canadian Animal Health Surveillance Network (CAHSN)/Canadian Animal Health Laboratorians Network (CAHLN)
 - CFIA – NCFAD
 - Federal/provincial/university laboratories
 - <http://www.inspection.gc.ca/english/anima/surv/surve.shtml>
- National Animal Health Laboratory Network (NAHLN) – USA
 - USDA
 - Animal and Plant Health Inspection Service (APHIS)
 - Cooperative State Research Education and Extension Service (CSREES)
 - AAVLD
 - NAHLN laboratories
 - http://www.aphis.usda.gov/animal_health/nahln



CAHSN legend:
■ Partner Laboratories
★ CFIA Laboratories



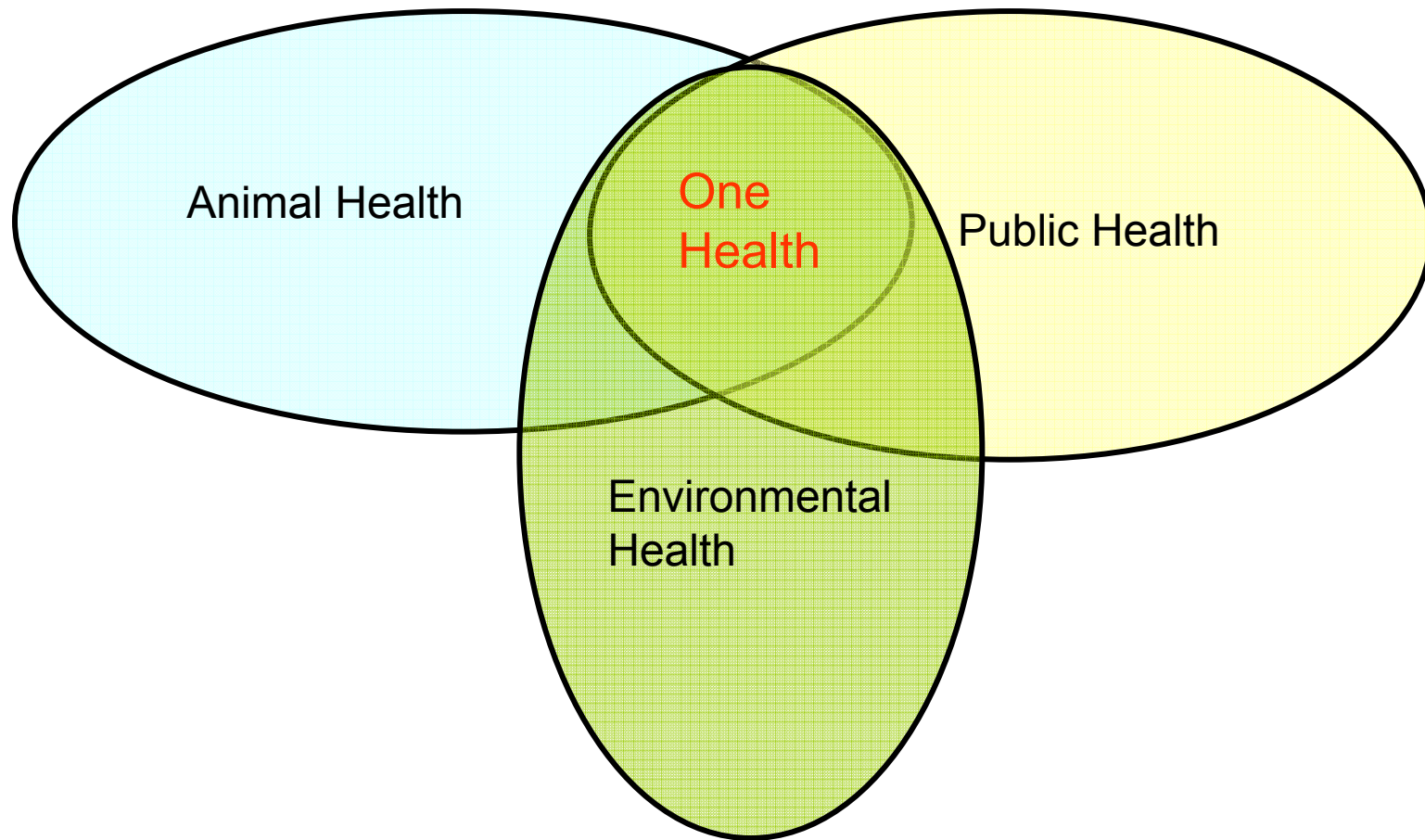


Progress of CAHSN

- Established distributed networks of strategically placed, competent labs:
 - 10 provincial/university animal health laboratories across Canada
- Standardization provided through:
 - standardized SOPs, upgraded quality programs
 - standardized reagents, proficiency panels
 - initial set of high priority agents – AIV, ENDV, CSFV, FMDV, BSE prion
 - compatible equipment for real-time PCR and ELISA
 - training of certified analysts
 - new or upgraded facilities – CL3, FAD (CL2+)
 - IT links in place for secure electronic messaging
- Safeguard animal health through:
 - routine surveillance capability
 - **early detection**, with confirmation by central reference lab
 - **surge capacity**
 - rapid response
 - appropriate recovery

The “One Health” concept

One Health has been defined as the collaborative efforts of multiple disciplines working locally, nationally, and globally, to attain optimal health for people, animals, and the environment <http://www.avma.org/onehealth/default.asp>





Summary of AHL status, Sept/08

- well-staffed and well-equipped
- strong, ongoing intake of submissions across all species and areas of Ontario
- collaborative targeted surveillance projects (BSE, WNV, CWD, etc.), sentinel swine practices
- staying at the forefront of technological change
- adding to our emergency preparedness capacity
- moving into a new building with a 30-yr horizon of flexibility built in

bottom line of “healthier animals and safer food”



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