Workshop Report

SADC Regional Livestock Sector Training Workshop on Internal Quality Control and External Quality Assurance Programmes for Veterinary Laboratories

Bronte Hotel, Harare, Zimbabwe
24th September to 5th October 2001



SADC HUB Food Security and Rural Development

Department of Veterinary Services, Zimbabwe

International Atomic Energy Agency (IAEA)

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Editors

T.C. Katsande
Workshop Coordinator
Veterinary Laboratory Diagnostics & Research Branch
P.O. Box CY 551 Causeway
Harare

Janusz Paweska
Assistant Director
Head Virology
ARC-OVI
P O. Box X05
0110 Onderstepoort
RSA

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ABBREVIATIONS

Ab	Antibody
Ag	Antigen
AHS	African Horse Sickness
ASF	African swine Fever
c-ELISA	Competitive – Enzyme Linked Immunosorbent Assay
CVL	Central Veterinary Laboratory
CRP	Coordinated Research Programme
CBPP	Contagious Bovine Pleuro- Pneumonia
FMD	Foot and Mouth Disease
FAO	Food and Agriculture Organisation, Rome
EQAP	External Quality Assurance Program
HACCP	Hazard Analysis of Critical Control Points
IAEA	International Atomic Energy Agency, Vienna
IBD	Infectious Bursal Disease (Gumboro)
ILRI	International Livestock Research Institute
IQC	Internal Quality Control
LSD	Lumpy Skin Disease
ND	Newcastle Disease
OAU/IBAR	Organisation of African Unity/Inter-African Bureau for Animal Resources
OIE	Office International des Epizootiques, Paris
OVI	Onderstepoort Veterinary Institute
PACE	Pan-African Programme for Control of Epizootics
PCR	Polymerase Chain Reaction
QA	Quality Assurance
QC	Quality Control
RVF	Rift Valley Fever
SADC	Southern African Development Community
SOP	Standard Operating Procedure
TB	Tuberculosis
TBD	Tick-borne Disease
TCP	Technical Cooperation project

1. Introduction

The workshop was one of the activities of the IAEA funded SADC regional project, RAF/5/053, on Control and Eradication of major Epizootics which will run between 2001 and 2003. The overall objective of this project is to support national and regional animal disease diagnostics and surveillance needs within the framework of OAU/IBAR/PACE programme for establishing sustainable food security and development of rural agriculture-based economies. The workshop was designed by the SADC Livestock Sector sub-committee on Diagnostics.

This workshop focused on two main issues: 1) participants' views on production and distribution of diagnostic kits within the region; and 2) establishment of Internal Quality Control and External Quality Assurance Programmes (IQC/EQAP) and networking mechanisms within and among national veterinary diagnostics laboratories. The specific objectives of the workshop were:

1. To provide training in quality assurance procedures, their introduction and use with the eventual aim of international accreditation of the regions veterinary laboratories
2. To provide training in IQC for laboratory assays and to use the indirect ELISA kit for brucellosis antibody detection as an example for this exercise
3. To discuss and learn techniques and approaches for the sustainable production and distribution of diagnostic kits.
4. To establish a mechanism for networking laboratory practitioners

The overall aim is to harmonise diagnostic activities and attain accreditation among national veterinary laboratories in accordance with requirements of Office International des Epizootiques in Paris (OIE).

2. Opening Ceremony

The opening ceremony was officiated by the Principal Director of Agricultural Services, Director of Veterinary Services, Deputy Director of Veterinary Services (Field), Deputy Director of Veterinary Services (Diagnostics & Research) and Representatives from IAEA, private veterinary laboratories within Harare and Standards Association of Zimbabwe. Official speeches were presented by Deputy Director of Veterinary Services Diagnostics & Research, Dr U. Ushewokunze-Obatolu and Principal Director of Agricultural Services, Dr Chiteka (Appendix VII and VIII)

3. Workshop Content and Participants

The workshop comprised lectures and group discussions on IQC/EQAP, diagnostics kit production and distribution as well as practicals on the indirect ELISA assay for Brucellosis. A detailed workshop programme is on Appendix I. Below is a summary of the workshop content:

a) Individual Country presentations on current IQC/EQA programmes.

b) Discussions on production and distribution of ELISA kits.

c) Principles of ELISAs and Brucella ELISA practical

d) General Quality Control/Quality Assurance principles and Veterinary Laboratory Accreditation following the OIE guidelines

e) Development of time-bound individual national Quality Assurance Plans

f) Conclusions and Recommendations

Participants at the workshop came from 10 SADC countries namely Zambia, Malawi, Tanzania, Mauritius, Botswana, South Africa, Swaziland, Lesotho, Zimbabwe and Mozambique (see list of participants on Appendix II). These were laboratory scientists, either veterinary laboratory diagnosticians or senior laboratory technologists, working in these SADC national laboratories and involved in quality assurance.

4. Country Presentations

Participants gave presentations on the current IQC/EQA programmes at their respective national laboratories (Appendix VI). The presentations covered the following topics: role of the institution, source of reagents and kits, diagnostic kit requirements relating to priority diseases, QA systems available and benefits of accreditation.

Wide variations of the QA status quo in various national veterinary laboratories was noted, ranging from no formal QA system in some countries to various stages of implementation in others, with OVI Bacteriology laboratory having been accredited. All countries acknowledged that harmonization and accreditation of national diagnostic laboratories will have several local, regional and international benefits, the most important of which is the facilitation of trade in livestock and livestock products.

5. Kit production and distribution

This activity was done as group discussions. Issues raised by participants are reflected on Appendix IV and in section 9 of this report. The following were identified as constraints for production and distribution of Diagnostics Kits in the region

a) Limited availability or lack of diagnostic standards eg antigens and antisera for important veterinary diseases
b) Limited availability or lack of reference sera panels for validation of diagnostic tests
c) Technology change in diagnostic tests – adoption of Ab/Ag ELISAs, PCR, etc
d) Limited capacity – technology, infrastructure, financial, expertise
e) Current diagnostic kit production not business orientated
f) Lack of qualified Human Resources for kit production

6. Principles of ELISAs and Practicals

Lectures and printed materials on principles of ELISAs including issues of assay validation were given (see list of handouts on Appendix III). Participants did a practical on the indirect ELISA for Brucellosis. The practical gave participants an opportunity to familiarize themselves with technique and calculate and analyse the results, especially those who had never run an ELISA before. It was evident that all national laboratories in the region have the capacity to establish ELISAs for routine diagnostics of various diseases.

7. Internal Quality Control/Quality Assurance principles and Veterinary Laboratory Accreditation following the OIE guidelines

A series of lectures on IQC/EQA principles which were supported by printed materials were given (see list of handouts on Appendix III). Electronic copies of some of the lectures were distributed to participants. Sharpoint Consulting, a private consulting company on ISO/FDIS 17025, which is currently working with CVL in Harare, presented one lecture on the overview of implementation of quality in veterinary laboratories.

From the discussions during the workshop it was evident that some participants who initially had an elementary knowledge of IQC/EQA principles had developed a greater understanding and appreciation of the subject by the end of workshop. There is however need for participants to read widely on this subject and make use of printed materials that were distributed during the workshop in order to enhance their knowledge on quality management in their laboratories and work towards accreditation.

8. Development of time-bound individual national Quality Assurance Plans

The current QA status of each national laboratory was established and medium and long-term work-plans of implementing QA activities were established (Appendix V).

9. RECOMMENDATIONS & CONCLUSIONS

9.1 Kit Production & Distribution

Establishment of a sub-committee to determine the way forward taking the following options into consideration:

Option 1: Individual country-based kit production unit for all diseases

Advantages
a) Self reliance
b) Capacity building
c) Increased focus on local specific diagnostic needs (strains)
d) Competitiveness

Disadvantages
a) Limited capacity, infrastructure, financial, human resources
b) High cost per unit – limited market
c) Competition
d) Insecurity/suspicion – variation of strains

Option 2: Country-based disease focused kit production unit

eg. Kit for CBPP can be produced in Zambia, Brucellosis in Mozambique, FMD in Botswana etc

Advantages
a) Sharing of responsibilities – cooperation and goodwill
b) Increased and focused networking
c) Technology exchange
d) Increased market share - Revenue generation

Disadvantages
a) Risk of centralization in case of disasters
b) Limited capacity - financial, Human resources

Option 3: SADC regional kit production unit – with regional staff

Advantages
a) Shared investment cost
b) Maximization of current/existing regional resources
c) Increased chances of accessing donor funds
d) Career opportunities for region professionals
e) Increased access to new technologies
f) Increased R & D and reduction of associated cost
g) Collective ownership of property rights through joint funding
h) Facilitation of Validation process

Disadvantages

a) Risk of centralization with respect to disasters
b) Limiting the capacity building in individual countries
c) Ownership of infrastructure and generated final product

Conclusions

a) Assess and develop capacity for quality assured kit production unit at each laboratory
b) Where possible the production of diagnostic reagents especially those for traditional diagnostic tests should be maintained and developed at each national lab under QC/QA principles
c) Exchange of reference strains and use of standardised reagents should be undertaken
d) Each country should apply for TCP/CRP projects from IAEA
e) SADC sub-committee to seek financial support for Non IAEA member states
f) Continuous exchange of scientists/expertise within the region - scientific visits, study tours, attachments (Liaison between expert groups eg rabies, CBPP, Brucella)
g) Inventory of diseases, diagnostic reagents, kits used in SADC region is required

9.2 Laboratory quality Systems and accreditation

a) Individual work-plans for implementation of QC and QA in the SADC National Veterinary Laboratories were developed and accepted for implementation.
b) Follow-up workshop to evaluate implementation of QC and QA in the SADC National Veterinary Laboratories has been scheduled for March 200.3
c) Biannual reporting system from individual country – to be coordinated by Dr Charles Katsande and Dr Nyasha Munjeri (CVL Harare).
   - National Laboratories Quality Managers to write the reports by Dec and June of each year and submit them to Dr Katsande by 30 Dec and 30 June
   - Format of report to be as for individual work-plans designed at this workshop (Appendix V)
d) Training of QC managers and other staff – study visits, scientific visits
e) Creation of full-time QC manager post in each country – pre-requisite for successful implementation of QC/QA system

9.3 Future activities and support from IAEA to SADC

a) Capacity building
b) Study/Scientific visits
c) Training – internal auditors, Proficiency testing & QC data analysis
d) Equipment – (esp on ELISAs) , TCP, CRP
e) IAEA Membership
f) At site experts
g) Local consultancy
h) TCP project proposals to be submitted by individual countries.

A Planning Meeting for 2002 activities by Heads of Laboratories present at the workshop and Dr M.H. Jeggo was held during the workshop. Minutes of the meeting are on Appendix IX.

APPENDIX I: Workshop Programme

SADC/IAEA Regional Workshop

"Diagnostic Kit Production, and Related Quality Assurance Issues"

Bronte Hotel, Harare

24th September to 5th October

Day One (Monday 24th September)

08.00 - 0 09.00	Registration	
09.00 – 09.15	Opening Remarks	*U. Ushewokunze-Obatolu* *M.H. Jeggo*
09.15 – 10.00	Course Objectives and structure	*M.H. Jeggo*
	House keeping announcements	*T.C. Katsande*
10.00 – 10.30	*Reception and Coffee*	
10.30 – 11.30	Programmes of support of FAO/IAEA to SADC and AU/IBAR	*M.H. Jeggo*
11.30 – 12.30	Country Presentations	*T. C. Katsande*
11.30 – 1200	Tanzania	
12.00 – 12.30	South Africa	
12.30 – 14.00	*Lunch*	
14.00 – 17.00		
14.00 – 14.30	Botswana	
14.30 – 15.00	Malawi	
15.00 – 15.30	Mozambique	
15.30 – 16.00	*Coffee*	
16.00 – 16.30	Mauritius	
16.30 – 17.00	Swaziland	

Day Two (Tuesday 25th September)

08.30 – 13.00	Country Presentations (Contd.)	*T.C. Katsande*
08.30 – 09.00	Zambia	
09.00 – 09.30	Malawi	
09.30 – 10.00	Zimbabwe	
10.00 – 10.30	*Coffee*	
10.30 – 11.00	Discussion Summary and Conclusions from country presentations	*M.H. Jeggo* *T.C. Katsande*
13.00 – 14.00	*Lunch*	
14.00 – 14.30	Introduction to general kit production and distribution	*M.H. Jeggo*
14.30 – 15.30	Workshop on general kit production Groups Discussions	*M.H. Jeggo*
15.30 – 16.00	*Coffee*	
16.00 – 17.00	Workshop on general kit production Groups Discussions	*M.H. Jeggo*
18.00 – 20.00	Cocktail – Drinks and snacks	

Day Three (Wednesday 26th September)

09.00 – 10.00	Workshop on general kit distribution Groups Discussions	*M.H. Jeggo*
10.00 – 10.30	*Coffee*	
10.30 – 12.30	Workshop on general kit distribution Groups Discussions	*M.H. Jeggo*
12.30 – 14.00	*Lunch*	
14.00 – 15.30	Principles of ELISA	*J. Paweska*
15.30 – 16.00	*Coffee*	
16.00 – 17.00	Principles of assay validation	*J. Paweska*

Day Four (Thursday 27th September)

09.00 – 10.15	Official Opening	
10.15 – 10.45	*Coffee and snacks*	
10.45 – 12.30	Internal Quality Controls for ELISA	*J. Paweska*
12.30 – 14.00	*Lunch*	
14.00 – 15.30	Brucella kit production	*J. Paweska*
15.30 – 16.00	*Coffee*	
16.00 – 17.00	Coating of Brucella ELISA Plates *Practical in Laboratory*	*J. Paweska*

Day Five (Friday 28th September)
(all day practical in laboratory) __

09.00 – 10.00	Brucella ELISA	*J. Paweska*
10.00 – 10.30	*Coffee*	
10.30 – 12.30	Brucella ELISA	*J. Paweska*
12.30 – 14.00	*Lunch*	
14.00 – 15.30	Brucella ELISA	*J. Paweska*
15.30 – 16.00	*Coffee*	
16.00 – 17.00	Brucella ELISA Results (round table discussion	*J. Paweska*

Saturday 29th September

Field Trip Chinhoyi

Day Six (Monday 1st October)

09.00 – 10.00	The FAO/IAEA Quality Assurance Programme	*J. Paweska*
10.00 – 10.30	*Coffee*	
10.30 – 12.30	Development of time-bound individual national Quality Assurance plans	
12.30 – 14.00	*Lunch*	
14.00 – 15.30	Development of time-bound individual national Quality Assurance plans	
15.30 – 16.00	*Coffee*	
16.00 – 17.00	Development of time-bound individual national Quality Assurance plans	

Day Seven (Tuesday 2nd October)

09.00 – 10.00	Sharpoint Consulting Presentation	
		F. van der Kaars/ W Kamhanda
10.00 – 10.30	*Coffee*	
10.30 – 12.30	Individual quality documents needed	*J. Paweska*
	Preparation of SOPs	
12.30 – 14.00	*Lunch*	
14.00 – 15.30	SOPs (contd.) and quality manual	
15.30 – 16.00	*Coffee*	
16.00 – 17.00	SOPs and quality manuals (contd.)	

Day Eight (Wednesday 3rd October)

09.00 – 10.00	Equipment serving and maintenance	*J. Paweska*
10.00 – 10.30	*Coffee*	
10.30 – 12.30	Routine use of IQC	*J. Paweska*
12.30 – 14.00	*Lunch*	***Free Afternoon***

Day Nine (Thursday 4th October) *J. Paweska*

09.00 – 10.00	Guidelines for establishing Quality Systems in veterinary testing Laboratories
10.00 – 10.30	*Coffee*
10.30 – 12.30	Quality System manual
12.30 – 14.00	*Lunch*
14.00 – 15.30	SOPs for calibration and equipment Maintenance
15.30 – 16.00	*Coffee*
16.00 – 17.00	Logical Framework and Gantt Chart for implementing a quality system in a veterinary laboratory

Day Ten (Friday 5th October) *J. Paweska*

08.00 – 09.00	Presentation of National QA Programmes (individually)
09.00 – 10.30	Conclusions and Recommendations
10.00 – 10.30	*Coffee*
10.30 – 12.30	Conclusions and Recommendations
12.30-13.30	Closing Ceremony Issue of Certificates *T.C. Katsande & U. Ushewokunze-Obatolu*
12.30 – 14.00	*Lunch & End of Workshop*

APPENDIX II: List of Participants

SADC/IAEA Regional Workshop

"Diagnostic Kit Production, and Related Quality Assurance Issues"

Bronte Hotel, Harare

24 September to 5th. October

NAME	COUNTRY	JOB TITLE	ADDRESS	TELEPHONE	FAX	EMAIL
ARLANDOO, J.D LAVAL	MAURITIUS	Laboratory Technologist	Royal Road Vinson Lane Moka	+230 4666662 4541016-17 (office) 4330372 (home)	+ 230 4662210	vetser@bow.intnet.mu;
BANZE, Jacinto Gabriel.	MOZAMBIQUE	Laboratory Technologist	National Veterinary Research Institute (INIVE)	+258 1 475170 475161	258 1 475172	INIVE@cfmnet.co.mz INIVE@teledata.mz
BELEMU, Jim .M.	ZAMBIA	Veterinary Research officer	Central Veterinary Research Inst (CVRS) Box 33980, Lusaka, Zambia	+260-1-233444 mobile 096-766702	260-1-252608	cvri@zamnet.zm
CHOLA, Cathy .M.	ZAMBIA	Veterinary Research officer	CVRI P.O. Box 3398, Balmoval Lusaka, Zambia	+260-1-233444	260-1-252608	cvri@zamnet.zm
GWAZEMBA, R	ZIMBABWE	Secretarial Services	Central Veterinary Laboratory Box CY 551 Harare Zimbabwe	263-04-705885-7	263-04-707952	vetlabs@zarnet.ac.zw. vetlabs@africaonline.co.zw rgwazemba@yahoo.com
HLATSHWAKO, P	SWAZILAND	Head of Veterinary Laboratory	P O Box 30 Manzini Swaziland	268 505 2875 (h) 268 505 2204 (w)	268 505 2204 (w)	roland@africaonline.co.sz
JEGGO, M.H	AUSTRIA	Head Animal Production and Health Section FAO/IAEA	Wagramer Strasse 5 P O Box 100, A-1400 Vienna, Austria	(+43 1) 2600-26053	(+43 1) 26007	M.H.Jeggo@iaea.org

KATSANDE, T.C.	ZIMBABWE	Principal Veterinary Officer	Central veterinary Laboratory Box CY 551 Harare	263-04-705885-7 +263 91319286 (mobile)	+263 4 707952	vetlabs@africaonline.co.zw vetlab@zarnet.ac.zw
LEMA, B.E.	TANZANIA	Head Bacteriology	ADRI, Box 9254 Daressalaam	+255 22 864369 +255 22 2863104	255 51 8631104	lemabe_kn@yahoo.com
LEROTHOLI, L.	LESOTHO	Head Central National Laboratory	Private Bag NE: A82 Maseru-100 Lesotho	0266-317284	0266-311500 0266-324384	dpsagric@lesotho.com
MTIKA, W.G.K.	MALAWI	Head of Virology and Bacteriology	Central Veterinary Laboratory Box 527 Lilongwe	265 766341	265 766010	cttbdnldp@malawi.net dahi.cvl@malawi.net
MAKAYA, P.V.	ZIMBABWE	Chief Veterinary Research Officer	Central Veterinary Laboratory Box CY 551 Causeway Harare	263-04-705885-7 091 902 411	263-04-707952	vetlabs@africaonline.co.zw. pious@hotmail.com
MAROZVA, B.T.	ZIMBABWE	Principal Veterinary Laboratory Technologist. Quality Manager Designate	Central Veterinary Laboratory Box CY 551 Causeway Harare Zimbabwe	263-04-705885-7	263-04-707952	vetlabs@zarnet.ac.zw. vetlabs@africaonline.co.zw btafara@yahoo.com
MASARA, D	ZIMBABWE	Principal Veterinary Research Officer	Central Veterinary Laboratory Box CY 551 Causeway Harare Zimbabwe	263-04-705885-7	263-04-707952	vetlabs@zarnet.ac.zw. vetlabs@africaonline.co.zw dmasara@yahoo.com
MITALA, C.	ZIMBABWE	Trainee Veterinary Laboratory Technologist	Central Veterinary Laboratory Box CY 551 Causeway Harare Zimbabwe	263-04-705885-7	263-04-707952	vetlab@zarnet.ac.zw vetlabs@africaonline.co.zw
MONYAME, K.B.	BOTSWANA	Scientific Officer	National Vet Labs P I Bag 0035 Gaberone Botswana	267-328816	267-328956	kmonyame@gov.bw

MABIKACHECHE, L.	ZIMBABWE	Assistant Chief Veterinary Laboratory Technologist	Central Veterinary Laboratory Box CY 551 Causeway Harare Zimbabwe	263-04-705885-7	263-04-707952	vetlab@zarnet.ac.zw vetlabs@africaonline.co.zw
MUNANG'ANDU, H.etrone, M.	ZAMBIA	Principal Veterinary Research Officer	Central Veterinary Research Institute Box 33980 Balmoral Lusaka	260-1-233444	260-1-252608	cvri@zamnet.zm
MUNJERI, N	ZIMBABWE	Principal Veterinary Research Officer	Central Veterinary Laboratory Box CY 551 Causeway Harare Zimbabwe	263-04-705885-7	263-04-707952	vetlab@zarnet.ac.zw vetlabs@africaonline.co.zw nyashamunjeri@yahoo.com
NYANZUNDA, T.M.	ZIMBABWE	Principal Government Veterinary Officer	Box 3306 Paulington Mutare Zimbabwe	263-20-65748	263-20-67448	vetmuta@africaonline.co.zw
ORI, P.	SOUTH AFRICA	Quality Manager for Bacteriology: Senior Research Technologist	ARC-OVI Private Bag x05 Onderstepoort 0110 RSA	+2712-5299150/144	+2712-5299127	pra@moon.ovi.ac.za
PAWESKA, Janusz T	SOUTH AFRICA	Assistant Director Head Virology	ARC-OVI ADC-DVI P O Box X05 0110 Onderstepoort RSA	+27125299117	+27125299418	janusz@moon.ovi.ac.za
SIBANDA-MUCHENA. S.	ZIMBABWE	Veterinary Investigation Officer	P O Box RY 41 Raylton Bulawayo Zimbabwe	+263 9 68061/2 +263 (0) 91211399	+263 9 77658	sitsibanda@hotmail.com
SITHOLE, N	ZIMBABWE	Government Veterinary Officer	G.V.O Box 30 Masvingo	+263 39 62884 (H) +263 39 62146/7 (B)		
USHEWOKUNZE-OBATOLU, U	ZIMBABWE	Deputy Director Veterinary Services Diagnostic and Research	Central Veterinary Laboratory Box CY 551 Harare Zimbabwe	263-04-705885-7	263-04-707952	Vetlabs@africaonline.co.zw Newazvo@hotmail.com

APPENDIX III: WORKSHOP HANDOUTS

1. FAO/IAEA EQA PROGRAMME PAST, PRESENT AND FUTURE
   AXEL COLLING, EQA CO-ORDINATOR, VIENNA, 4-8 SEPTEMBER 2000

2. OIE STANDARD FOR MANAGEMENT AND TECHNICAL REQUIREMENTS FOR LABORATORIES CONDUCTING TESTS FOR INFECTIOUS ANIMAL DISEASES VALIDATION OF SEROLOGICAL ASSAYS FOR DIAGNOSIS OF INFECTIOUS DISEASES OIE GUIDELINES FOR INTERNATIONAL REFERENCE STANDARDS FOR ANTIBODY ASSAYS.

3. ORGANIZATIONAL, POLICY ENVIRONMENT, IMPORTANCE, RESPONSIBILITIES AND DUTIES OF A QUALITY/ASSURANCE MANAGER.

4. INTERNAL QUALITY CONTROL (IQC) OF COMPETITIVE ENZYME LINKED IMMUNOSORBENT ASSAY (C-ELISA) FOR THE MEASUREMENT OF ANTBIODIES AGAINST RINDERPEST AND PESTE DES PETITIS RUMINANTS (PPR) VIRUSES USING CHARTING METHODS.

5. INTERNAL QUALITY CONTROL (IQC) OF INDIRECT ENZYME LINKED IMMUNOSORBENT ASSAY (I-ELISA) FOR THE MEASUREMENT OF ANTIBODIES AGAINST BRUCELLA ABORTUS USING CHARTING METHODS.

6. PRACTITIONER'S REPORT
   BASIC STEP TOWARDS A SELF-SUSTAINABLE QUALITY SYSTEM AND LABORATORY ACCREDITATION.

7. REPORT ON VALIDATION OF AN INDIRECT ENZYME-LINKED IMMUNOSORBENT ASSAY FOR THE DETECTION OF ANTIBODY AGAINST BRUCELLA ABORTUS IN CATTLE SERA USING AN AUTOMATED ELISA WORKSTATION.
   ARC-ONDERSTEPOORT VETERINARY INSTITUTE, SERODIAGNOSTIC UNIT, P O BOX X05, 0110 ONDERSTEPOORT, REPUBLIC OF SOUTH AFRICA.

8. GUIDELINES FOR ESTABLISHING QUALITY SYSTEM IN VET DIAGNOSTIC TESTING LABORATORIES. JOINT FAO/IAEA PROGRAMME

APPENDIX IV:

GROUP DISCUSSIONS ON GENERAL KIT PRODUCTION & DISTRIBUTION

Dr M.H. JEGGO

1. FUNCTIONS OF VET LABORATORIES

1. Similar mandate
2. Very diverse levels of IQC/EQA programs.

Research
Diagnosis
Training
Export testing
Public health
Reference reagents
Vaccines
Specialist services
IT/IM knowledge

3. PRIORITISATION CRITERIA

1. Export
2. Commercial
3. Poverty alleviation (subsistence farming)
4. Public Health (zoonotic)

5. ISSUES ON KITS/REAGENTS

Quality
Locally appropriate
Strains
Cost
Time/distance - Arrival
Validation
Standardization
IQC/EQA - Wide range From beginning to end
Commitments
Resources; manpower and training, Financial; people and institutes
Calibration
Awareness
Maintenance
Government beauracracy

7. NEEDS

a) Describe function to meet a need – local and external
b) Evaluate and compare to existing kits
c) Evaluate costs – of kit and with other kits
d) Cost saving aspects of kit
e) Advantages of this kit technology
f) Market survey – heads of national labs
   - what diseases are of priority

2. PRIORITY DISEASES

Brucellosis
FMD
CBPP
ND
ASF
Rabies
TB
Anthrax
Trypanosomiasis
TBD
Salmonella
Gumboro (IBD)
AHS
LSD
RVF

4. KITS/REAGENTS

Botswana
Locally
OVI
Other SA suppliers
CVL UK
Pirbright
CIRAD IEVT
ILRI
IAEA
Queensland Australia

6. QA BENEFITS

Export trade
Availability of funds
Assurance and confidence to clients
Traceability
Reliability and validity of results
Credibility
Reduced costs
Demonstration of value for money
Improved equipment use
Regional standardisation
Transparency
Management of tool
Protection

8. DESIGN/DEVELOP

- demand for testing
- What the clients needs are.
- What tests you are currently using
- Speed - is it a problem?
- Can one afford a kit
- Suggest a price range
- What is the current kit situation
- What is the skill base
- Pay for training
- Equipment
- Control/eradication programmes (donor funds)
- Surveillance programmes (how long?)
- Does the current tests meet the needs.
- Can the clients afford it

g) Send also questionnaire to:-
- farmers
- veterinarians (private sector)
- FAO
- OIE
- OAU/IBAR – SADC
- WHO
- Local vet authorities (CVO)

9. VALIDATION

- against a gold standard
- against known positives and negatives
- sample – isolated organism
- inject animal
- vaccinated group
- international validation
- inter-laboratory variation

Define sera exactly
IQC data
Documentation

11. QA

- Reagents – quality sources
- process audit
- QA documentation – version control
- Calibration of equipment
- Sterility checks
- IQC data – run tests ourselves
- get IQC data

13. SUPPLY AND DEMAND/COST RECOVERY

Questionnaire/Feasibility study
Direct contact
Capacity to deliver/production capacity
Consider potential (maximum)
Advertise/ communications
Inform/WEB
Consider competition

1. Use existing assay or design new assays
2. Review literature on current assays
3. Protocol from literature
   predictive value
   sensitivity & specifity
4. Function of test
5. User friendly approach
6. Are there potential assays available?

10. RESOURCES

- financial resources
- equipment facilities (standards)
- reagents – availability – local, outside
  - Quantity & quality
- qualified personnel
- lab animals
- training needs
- high security environment
- suitable location for it
- storage facilities
- freeze drier

QUALIFIED PERSON
1. Technologist
2. Quality Manager
3. Marketing person
4. Washers
5. Equipment maintenance

Software

12. SOPs

Trouble shooting/ technical backup
Help-line

HACCP
Accreditation status
ISO 25 000

14. COST RECOVERY

Calculate Full Economic Cost Recovery
Make up 20-50%, 100% Recovery
Pay in advance
Pay on delivery
Contract
Credit – worthiness and trust
Trust workers both ways
Discuss in advance
Sort out payment in advance

Marketing kit
Quality
Contract – short and long term
Donor
Price issue
50c/test – donor and price issue

15. DELIVERY

Insurance
Delivery Manager
Communications – feed back
Cost secure containers
Stability in transit
Avoid breakages
Labeling
Design
Tracing
Couriers – need to work well
Language differences
Advance notice
Contact details
Import regulations
Proof of invoice
Customer must fall to customers
Local agents (costs)

17. SOFTWARE

Packages
Storage
Risk management

Credit management
Produce on demand
Economies of scale

16. QA

Packing – Presentation and labeling
Storage details - SOPs
Use qualified staff
Reliable transport
Batch numbers
Records system for traceability
Communication with clients
Care and commitment
Clear traceability of order
Expiry dates
Storage reagents
Good seals
HACCP
Batch testing of reagents
Internal audit
IQC

Employment opportunities: WEB references

http://missions.itu.int/~italy/vacancies/

http://www.fao.org/VA/EMPLOY.HTM

APPENDIX V

Current status of Quality Systems in National Veterinary Laboratories in the SADC member states

Activity	Tanzania (Bact.)	Botswana	Mauritius	Malawi	Lesotho	RSA	Swaziland	Zambia	Mozambique	Zimbabwe
Management Commitment	40%	50%	100%	40%	30%	100%	40%	40%	40%	100%
Quality Manager	0%	50%	0%	0%	50%	30%	0%	0%	0%	100%
Policy Statement	0%	0%	0%	0%	0%	100%	0%	0%	0%	90%
Quality Manual	0%	90%	60%	0%	0%	20%	0%	0%	0%	90%
SOPs	10%	60%	30%	25%	25%	30%	55%	20%	60%	75%
Working Instructions	5%	60%	20%	40%	90%	30%	50%	30%	50%	60%
Equipment Calibration	5%	20%	60%	30%	5%	20%	5%	5%	5%	5%
Equipment Maintenance	10%	60%	5%	5%	5%	20%	5%	5%	5%	80%
Specimen & Sample handling	70%	70%	30%	75%	60%	60%	50%	50%	80%	40%
Document Control	20%	10%	10%	60%	90%	35%	40%	30%	10%	40%
Internal Audits	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%
Estimated Overall Implementation (%)	15	42.7	29	25	32.3	41.4	22.3	16.4	22.7	56.4

Country Quality System Implementation Work-Plans

Tanzania

Activity	% Implementation	Deadlines/Comments
Management Commitment	40%	Quality Policy statement signed by November 2001 Establishment of Quality Committee by Jan 2002
Quality Manager	0%	The Head of Bacteriology will act as a quality manager, further training required
Policy Statement	0%	Compiled and signed by November 2001
Quality Manual	0%	Written by April 2002
SOPs	10%	Written by April 2002
Working Instructions	5%	Written by April 2002
Equipment Calibration	5%	Undertaken and maintained from April 2003
Equipment Maintenance	10%	Undertaken and maintained from April 2003
Specimen & Sample handling	70%	100% in place by April 2002
Document Control	20%	In place by March 2002
Internal Audits	0%	Initiated from April 2002

Activity	% Implementation	Deadlines/Comments
Management Commitment	50%	
Quality Manager	50%	Training required
Policy Statement	0%	Signed by January 2002:
Quality Manual	90%	Written by June 2002
SOPs	60%	Written by June 2002
Working Instructions	60%	Written by June 2002
Equipment Calibration	20%	Undertaken and maintained by December 2002
Equipment Maintenance	60%	Undertaken and maintained by December 2002
Specimen & Sample handling	70%	100% in place by April 2002
Document Control	10%	Established by April 2002
Internal Audits	0%	Initiated from 2002

Activity	% Implementation	Deadlines/Comments
Management Commitment	100%	Policy Statement Establishment of Quality Committee by Jan 2002
Quality Manager	0%	Appointed of QC Manager by April 2002. Establishment of Quality Committee by Jan 2002
Policy Statement	0%	Signed by Management by end of 2001
Quality Manual	60%	Written by June 2002
SOPs	30%	Written by June 2002
Working Instructions	20%	Feb 2002
Equipment Calibration	60%	March 2003
Equipment Maintenance	5%	March 2003
Specimen & Sample handling	30%	Written by July 2002
Document Control	10%	July 2002
Internal Audits	0%	Initiated from June 2002

Activity	% Implementation	Deadlines/Comments
Management Commitment	40%	Policy Statement signed by November 2001 Establishment of Quality Committee by Jan 2002
Quality Manager	0%	Appointed by December 2001. Participant will act as QC Manager
Policy Statement	0%	Policy Statement compiled and signed by November 2001
Quality Manual	0%	Written by December 2002
SOPs	25%	Written by June 2002
Working Instructions	40%	Written by April 2002
Equipment Calibration	30%	Undertaken and maintained from January 2003
Equipment Maintenance	5%	Undertaken and maintained from January 2003
Specimen & Sample handling	75%	100% in place June 2002
Document Control	60%	100% in place June 2002
Internal Audits	0%	Initiated from December 2002

Activity	% Implementation	Deadlines/Comments
Management Commitment	30%	Awareness training :November 2001 Establishment of Quality Committee by Jan 2002
Quality Manager	50%	Participant will act as quality manager
Policy Statement	0%	Signed by November 2001
Quality Manual	0%	At site consultant required to be written by April 2002
SOPs	25%	Written by June 2003
Working Instructions	90%	Written by March 2002
Equipment Calibration	5%	Undertaken and maintained from March 2004
Equipment Maintenance	5%	Undertaken and maintained from March 2004
Specimen & Sample handling	60%	100% in place June 2002
Document Control	90%	100% in place April 2002
Internal Audits	0%	Initiated from April 2002

S. Africa

Activity	% Implementation	Deadlines/Comments
Management Commitment	100%	Establishment of Quality Committee by Jan 2002
Quality Manager (within some departments)	30%	OVI Quality Assurance Manager appointed by the end of 2001
Policy Statement	100%	
Quality Manual	20%	Central QM written by July 2002
SOPs	30%	2002: 40%, 2003:60%, 2004: 100%
Working Instructions	30%	Written by July 2002
Equipment Calibration	20%	Undertaken and maintained from 2004
Equipment Maintenance	20%	Undertaken and maintained from 2004
Specimen & Sample handling	60%	100% in place September 2002
Document Control	35%	100% in place by May 2003
Internal Audits	10%	100% initiated throughout the whole institute from July 2002

Activity	% Implementation	Deadlines/Comments
Management Commitment	40%	Signed by November 2001 Establishment of Quality Committee by Jan 2002
Quality Manager	0%	Awareness training undertaken by November 2001. Participant will act as QC Manager
Policy Statement	0%	Complied and signed by November 2001
Quality Manual	0%	Written by April 2002
SOPs	55%	Written by April 2002
Working Instructions	50%	100% in place April 2002
Equipment Calibration	5%	Undertaken and maintained from September 2002
Equipment Maintenance	5%	Undertaken and maintained from September 2002
Specimen & Sample handling	50%	100% in place by the end 2001
Document Control	40%	100% in place September 2002
Internal Audits	0%	Initiated from April 2002

Activity	% Implementation	Deadlines/Comments
Management Commitment	40%	Policy statement by the end of November 2001 Establishment of Quality Committee by Jan 2002
Quality Manager	0%	Appointed by November 2001
Policy Statement	0%	Complied and signed by November 2001
Quality Manual	0%	Written by April 2002
SOPs	20%	Written by April 2002
Working Instructions	30%	100% in place April 2002
Equipment Calibration	5%	Undertaken and maintained from January 2003
Equipment Maintenance	5%	Undertaken and maintained from January 2003
Specimen & Sample handling	50%	100% in place by December 2001
Document Control	30%	100% in place September 2002
Internal Audits	0%	Initiated from April 2002

Mozambique

Activity	% Implementation	Deadlines/Comments
Management Commitment	40%	Policy statement signed by April 2002 Establishment of Quality Committee by Jan 2002
Quality Manager	0%	Appointed by March 2002
Policy Statement	0%	Compiled and signed by April 2002
Quality Manual	0%	Written by April 2002
SOPs	60%	Written by April 2002
Working Instructions	50%	Written by the end of 2002
Equipment Calibration	5%	Undertaken and maintained from April 2003
Equipment Maintenance	5%	Undertaken and maintained from April 2003
Specimen & Sample handling	80%	100% in place from April 2002
Document Control	10%	100% in place from September 2002
Internal Audits	0%	Initiated from April 2002

Activity	% Implementation	Deadlines/Comments
Management Commitment	100%	
Quality Manager	40%	Currently appointed Quality Manager trained and assessed by September 2002
Policy Statement	90%	Signed by November 2001
Quality Manual	90%	Written by October 2001
SOPs	75%	Written by December 2001
Working Instructions	60%	Written by the end of 2001
Equipment Calibration	5%	Undertaken and maintained from April 2002
Equipment Maintenance	80%	Undertaken and maintained from April 2002
Specimen & Sample handling	40%	100% in place by April 2002
Document Control	40%	100% established by December 2001
Internal Audits	0%	Initiated from November 2001

APPENDIX VI: COUNTRY PRESENTATIONS

1. BOTSWANA - THE NATIONAL VETERINARY LABORATORY

Kgobakano B. Monyame
National Veterinary Laboratory
Private Bag 0035
Gaborone, Botswana

Introduction

The National Veterinary Laboratory (NVL) is the only veterinary laboratory in Botswana. It is located in Sebele about 11 kilometers north of Gaborone on the main road to Francistown.

Organization and staffing

The NVL forms part of six divisions within the Department of Animal Health and Production (DAHP) of the Ministry of Agriculture. It is headed by a Principal Veterinary Officer (PVO) who reports directly to the DAHP. The laboratory has two divisions; the division of Diagnostic Services and the division of Quality Control. The former division consists of five sections namely, Pathology, Bacteriology, Virology, Parasitology and Biochemistry and the latter division is made up of two sections which are Food Hygiene and Residues sections. The sections in both divisions are headed either by veterinarian or a scientist. All heads of sections report directly to the PVO. There are 128 staff at NVL out of which about 48% are laboratory and 52% are supporting personnel (Table 1).

Table 1
Staff disposition at the National Veterinary Laboratory, Gaborone, Botswana.

	Cadre	Numbers
LABORATORY STAFF	Veterinary officers	10
	Scientific officers	13
	Laboratory Technicians	20
	Laboratory Assistant	19
	Subtotal	**62**
SUPPORT STAFF	Administration	4
	Supplies	4
	Library	1
	Typist	5
	Laborers	52
	Subtotal	**66**
TOTAL STAFF		128

MANDATE

- Diagnosis and/or research of diseases and other problems of veterinary interest pertaining to the welfare of domestic and wild animals.
- Assurance of quality of beef, milk, and other foodstuffs earmarked for external and internal markets.
- Update extension staff of the DAHP in new developments pertaining to the diagnosis, control or/and treatment of diseases of farm and pet animals.

Current sourcing of reagents/kits

Diseases that are currently being investigated by the enzyme-linked immunosorbent assay (ELISA) at the NVL are foot-and-mouth disease (FMD), contagious bovine pleuropneumonia (CBPP) and bovine brucellosis. ELISA reagents for FMD are obtained from the Botswana Vaccine Institute (BVI); this institute is also the regional reference laboratory for in Vienna, Austria.

Future laboratory requirements in terms of kits

It is planned to have ELISA kits for antigen/antibody detection for bovine viral diarrhoea (BVD), infectious bovine rhinotracheitis (IBR), bluetongue (BT), and African horse sickness (AHS). These tests are currently being done for us by the Onderstepoort Veterinary Institute (OVI), in Pretoria of South Africa. As part of a long-term campaign to eradicate tsetse flies and related disease in the Okavango area, it is planned also to establish at NVL the antigen ELISA for the surveillance of trypanosomiasis in livestock. Kits for this will be sourced from FAO/IAEA.

QA systems presently in place

- Inter-laboratory collaboration for FMD liquid phase blocking ELISA with the World Reference Laboratory for FMD in Pirbright, UK and with the Eastern and Southern Africa region Laboratory for FMD at the Botswana Vaccine Institute (BVI) in Gaborone has been established.
- Inter-laboratory collaboration with the OIE Reference Laboratory for avian influence and Newcastle disease at Padova, Italy and with other national laboratories involved in the diagnosis of these diseases within the SADC region is about to be established soon.

Value NVL would get from accreditation

Accreditation will demonstrate to the internal scientific community that the National Veterinary Laboratory in Botswana operates a quality system, is technically competent and is able to generate technically valid results. It will facilitate acceptance of testing results between Botswana and other countries within and outside the SADC region and

thus assisting in the exchange of information and experiences between laboratories/countries. Accreditation will also facilitate harmonization of standards and test procedures.

Other quality issues

- Laboratory rooms are furnished with air conditioners in order to keep the environment cool. A calibrated thermometer is available in each laboratory unit and ambient room temperatures are recorded twice a day.
- Temperature depend equipment (e.g. refrigerators, deep-freezers, incubators) are provided with calibrated thermometers and temperature records ate taken twice, daily in order to ensure that the equipment operators at the desired optimal temperature.
- Tests are performed by well-trained personnel. Well searched test procedures have been selected and standardized for routine use in various laboratory units. Standard operating Procedures (SOPs) and easy to follow instructions have been documented for the various tests.
- Any laboratory personnel can operate any of the simple, less sophisticated equipment items. All sophisticated equipment items are operated only by senior staff members (veterinary/scientific officers and/or laboratory technicians). Easy to follow operating instructions have been prepared and fixed to each equipment item. Equipment service books are available in each laboratory unit to record services done to each equipment.
- Equipment, test reagents and reference materials are procured from reputable firms/organizations. This together with the inter-laboratory testing of samples provides an assurance of the quality of test results.
- Evaluation and interpretation of test results is done by veterinary officers and to a limited extent by scientific officers. All reports are approved by the Head of Section or in his/her absence by the Deputy Head of section and therefore sent to respective clients.

2. KINGDOM OF SWAZILAND

The country is divided into four regions, Hhohho, Lubombo, Manzini and Shiselweni. The Veterinary Department is under the Ministry of Agriculture and cooperatives. The head of the department is the Director of Veterinary Services (DVS). The diagnostic laboratory falls under the Director of Veterinary Services.

The diagnostic laboratory serves farmers, Government and Private Veterinarians at no charge at the present moment. But there is talk to start charging in the near future. The laboratory is 100% funded by the Swazi Government.

LABORATORY PERSONNEL

1. Veterinary Investigation Officer, a veterinarian with qualification in laboratory technology in addition to Veterinary medicine.
2. Senior laboratory technologist
3. Three laboratory technologists
4. One technician
5. One laboratory assistant
6. Support staff – driver, cleaner, groundsman

RESPONSIBILITIES OF THE LABORATORY

Diagnostics and Research

SECTIONS OF THE LABORATORY ARE AS FOLLOWS:

Bacteriology
Haematology
Parasitology
Virology
Serology
Biochemistry
Pathology

DISEASES OF NATIONAL IMPORTANCE:

Cattle:
Rabies
Brucellosis
Anaplasmosis
Babesiosis
Tuberculosis
Heartwater – mastitis

All dairy cows are tested yearly for brucellosis and tuberculosis. All female calves are

vaccinated against brucellosis with S19-strain vaccine.

Poultry:

Newcastle
Gumboro

TESTS USED FOR DIAGNOSIS:

SAT
CFT
Rose Bengal
ELISA
FAT
HI

SOURCE OF REAGENTS:

OVI
Pharmaceutical companies in RSA and Swaziland.

Foot and mouth disease, cultures and serology are done at the exotic disease laboratory, Ondersterpoort.

Working instructions for laboratory equipment is there. Tests procedures for different sections are there but not 100% there is a lot to be done. The head of laboratory is the one who oversees the quality of the work done. There is a need to have a quality manager.

Samples are sent to OVI and Ministry of health laboratory for quality control purposes.

The counter used in haematology and the Vet test used for biochemistry known positive and negative controls are used whenever unknown samples tested. All tests are performed by qualified technologist under the supervision of the senior laboratory technologist.

Accreditation would be good for the laboratory because that would force Government to inject more funds to the laboratory budget. It would also ensure good animal products for the local market and for export.

3. LESOTHO

Lesotho is a small country with a population of about 2 million people.

The livestock population is roughly estimated at about more than one hundred thousand cattle, about eight hundred thousand small stock (sheep and goats), twenty thousand pigs, more than one million birds (poultry). NB! These figures have to be confirmed.

The veterinary laboratory work was set as early as 1920's by the British. It mainly focused on routine diagnostic work of current animal diseases. Research facility was later developed for helminthiasis. During the 70's and 80's the laboratory was fully equipped for diagnosis of animal diseases prevalent in Lesotho.

The functional departments of the laboratory were then; Pathology, Microbiology, Toxicology, Haematology and Parasitology.

For various reasons from the early eighties up to early 90's the laboratory services collapsed by losing qualified human resources, disruption and lack of maintenance of equipment, lack of finances and collapse of operations.

From 1996, the Government started to resuscitate and upgrade the functions of the laboratory.

Presently the laboratory is again at an infantile stage and is struggling to reach a functional stage.

DISEASE SITUATION IN LESOTHO

Lesotho is free of most epizootic diseases because of its climate and strict control measures on movement of livestock and livestock products into and out of the country.

The most important diseases of concern can be classified as follows:

Cattle:
Lumpy skin Disease
Brucellosis
Tuberculosis
Anaplasmosis
Babesiosis

Small stock
Sheep Scab
Blue tongue

Poultry:
New Castle Disease

Equine: Duorine and A.H.S.

DIAGNOSTIC WORK

The laboratory is primarily engaged in general routine Diagnostic Work for these diseases.

TESTS CARRIED

DISEASE	TEST	PLACE
Brucellosis	RBT CFT	Local
TB	Tubercullin	Local
L.S.D B.V.D/ and other viral Diseases	ELISA	ONDRESTEPOORT
FMD	ELISAs	ONDERSTEPOORT
AHS	ELISA	ONDERSTEPOORT
DUORINE	CFT	Local
Rabies	FAT	ONDERSTEPOORT
NEW CASTLE	ELISA	Local

General bacteriology by conventional plate inoculation and Sensitivity tests for Mastitis and other diseases is well developed and done locally.

Human resources

One Veterinarian
One Assistant technician
Three casual workers

This is a very serious problem

Equipment Status
Some equipment like modern ELISA Readers and computers have been purchased and some are due to come.

Quality Measures
- The head of the laboratory has to monitor implementation of quality measures.
- No fully documented quality procedures are available.

The basic quality measures taken now are:
i) Monitoring and adjustments of cold chains in freezers and refrigerators
ii) Monitoring and ensuring of accuracy of recording and timely processing of tests and release of results.

- Mostly dependent on the OIE – Diagnostic Manual and Protocols derived from OVI and U.P.

On the whole it is obvious that the laboratory in Lesotho has critical areas to be attended to: i.e.

i) Provision of qualified Technical personnel.

According to the current plans there is need for one more Veterinarian, three Technicians and five Assistant Technicians.
(There are no Institutions and finance for this activity)

ii) Provision of equipment and reagents.

Source of Reagents for all diagnostic work is in S.A.

SOPs

About 25% have been written so far.

BENEFITS TO BE REAPED FROM ACCREDITATION

Lesotho will benefit a lot by being accredited on diagnostic tests carried because it earns more than 40% of its exports from livestock products like wool and Mohair exported overseas and beef exported to South Africa. There are also plans to produce and export Pork at a large scale to overseas market, as the country is free from all epizootic swine diseases like FMD, and ASF. Importing countries can only accept tested products and the testing standards have to be accredited.

4. MALAWI

By Wezi C.K. Mtika

INTRODUCTION

Malawi has a population of about 11 million and the annual growth rate is estimated at 2% reduced from 3% in the previous decades. The livestock accounts for about 7% of agriculture GDP in Malawi. The current animal population estimates are relatively low, with cattle put at slightly less than a million, goats over a million, sheep over 100,000 and pigs over 200, 000.

The main livestock strategy is to expand production and productivity to satisfy the demand for animal protein in the domestic market. Subsections targeted for increased production include dairy, beef, poultry, pigs, sheep, goats, rabbits, fish and guinea fowls. The main focus of the strategy for both the ruminants and small stock is to improve the genetic material, primarily through cross breeding and upgrading, improved animal nutrition, both in terms of pastures and concentrates and improved animal health.

All the above strategies can be achieved if the laboratory activities are accredited.

The Malawi Central veterinary Laboratory situated along Likuni Road is under Department of Animal health and Industry. It is headed by the Deputy of Animal Health and Industry (Research and Investigation). It has 8 sections and the heads of sections are either Veterinarians or technologists. The sections are:

1. Bacteriology
2. Virology
3. Protozoology
4. Helminthology
5. Public Health
6. Biochemistry/Toxicology
7. Livestock Disease Evaluation Unit (LDEV)
8. Pathology GPL/Histopathology

ACTIVITIES DONE AT CVL ARE:

1. Testing of diagnostic samples/specimen
2. Adaptive Research of livestock diseases
3. Public health – (Inspection of dairy plants feed formulation plants, Dairy products, meat inspection, etc)
4. Veterinary advisory work
5. Disease Surveillance.

DISEASES OF ECONOMIC IMPORTANCE

DISEASE	ENDEMIC STATUS
FMD	Comes as outbreaks from neighboring countries
ASF	Endemic nearly in all districts
CBPP	Never reported in Malawi, though neighboring countries have got it
rabies	Endemic in the country
RVF	Is present throughout the country
NCD	Throughout the country
IBD (Gumboro)	Throughout the country
Lumpy Skin Disease (LSD)	Occurs in all parts of the country
FOWL POX	Less common in the country due to vaccination
Black quarter	Common outbreaks in north and central region of the country
Tuberculosis	Is common in the north and Central, but rare in the South
Brucellosis	At present it is throughout brucella is absent, although low titres of antibiotics have been isolated –could be due to vaccination reactions, but neighbouring countries have got it.
Dermatophilosis (senkobo)	Is widespread in the country
Mastitis	Is common throughout the country – Dairy Industry
Tick-borne disease (e.g. ECF, Babesiosis, anaplasmosis, heart water)	In all parts of the country except Southern region only one or two incidents occurred of ECF.
Trypanosomiasis	In some parts of the country, along game reserves.
Internal parasitism (roundworms or haemonchus)	In all parts of the country affecting calves and weaner.
Coccidiosis	In all parts of the countries

TEST REAGENTS AND SOURCE

DISEASE	TEST	REAGENT	SOURCE
FMD	DONE AT BOTSWANA INSTITUTE		
ASF	FAT	ASF CONJUGATE	ONDERSTEPOORT
RABIES	FAT	RABIES CONJUGATE	ONDERSTEPOORT
RVF	HAI	ANTIGEN-RVF	ONDERSTEPOORT
ND	HA/HAI	Ag, EGGS	LOCALLY
IBD	Immuno-diffusion agar gel test	Ag	ONDERSTEPOORT LOCALLY
LSD	Histology	ALCOHOLICS	LOCALLY
FOWL POX	Staining	DYES	LOCALLY
BQ	FAT	By conjugate	ONDERSTEPOORT
Tuberculosis	Cultures ZW Staining Typing	TB Media ZN Stains	LOCALLY OBTAINED
Brucellosis	SAT,MRT RBT,C ELISA	Ag	ONDERSTEPOORT
Senkobo	Staining	Stains	LOCALLY OBTAINED
Mastitis	Culture Sensitivity test	Teepol/NAOH	LOCALLY BOUGHT
TICK-BORNE DISEASE	Staining	GIEMSA	LOCALLY BOUGHT
Trypanosomiasis	Staining	GIEMSA	LOCALLY BOUGHT
Internal Parasitism	Worm egg count	Salt solution	LOCALLY FOUND
Coccidiosis	Wet smears	Dyes	Locally found

IQA SYSTEM

Inspection of Milking Bulking Group, Dairy Plants, Cold Storage, Feed formulations plants, hatcheries

ACCREDITATION

CVL has not been accredited yet.

The Government of Malawi wholly supports the activities of the diagnostic and investigation work at CVL through ORT (other related transactions).

5. MAURITIUS

The Animal Health Laboratory

Division of Veterinary Services of the Ministry of Agriculture, Food Technology and Natural Resources.

Virology section:

1. Vaccine production
2. Tissue Culture
3. Serology

ELISA-REAGENTS AND KITS

- Mauritian Market – Limited for high tech products
- Few users - Poultry Firms
- Imported from European Countries and U.S

Major Difficulties:

- Expensiveness of kits
- Procedural delays

Quality Assurance System and Accreditation

Since 1997 Quality Manual and
Procedural Manual

MAURITAS accrediting Body for Laboratories in Mauritius

Accreditation of a few tests in the pipe line:

- ELISA
- Microbiological Analysis – Food Hygiene

6. ZIMBABWE - QUALITY MANAGEMENT SYSTEM AT CVL,

Mrs B. Marozva
Quality manager

Activities at CVL

- Routine Diagnostics
- Research
- Vaccine production
- Implementation of ISO/FDIS 17025

Reagents and Kits

- International Suppliers through Local Agents (Pvt Companies)
- Brucella,
- Accreditation requirements

Priority Disease & Diagnostic Kits Requirements

- FMD,
- Rabies,
- Brucella,
- Toxicology
- Anthrax
- New Castle
- TBDs
- Viral disease eg RVF, LSD, BT, BVD, IBR, IBD

IQC/EQA programmes

IQC activities

- Policy Manual
- Procedures Manual
- SOPs
- Equipment records

EQA activities

- Proficiency testing
  - Zinqap
  - Vetsqap
  - UZ

Benefits of Accreditation

- Validity and reliability of test results
- National, Regional and International recognition (ISO certification)
- Regional and International trade
- Training and competency of staff

7. MOZAMBIQUE - NATIONAL VETERINARY RESEARCH INSTITUTE (INIVE)

By: Jacinto G Banze
AV de Mozambique, P O Box 1922, Km 1.5, Tel 475161/475170/1, Fax 475172
Maputo, Mozambique

Harare, 29th September 2001

INTRODUCTION

- The National Veterinary Research Institute (INIVE) is the only network of veterinary laboratories in Mozambique.
- INIVE comprises the Comprises the Comprises the Central Veterinary Laboratory located in Maputo, supported by 9 Provincial Laboratories

MANDATE

- To undertake multidisciplinary studies in the area of veterinary research and technology in coordination with other organizations and institutions.
- To provide specialized services to assist in the prevention of major disease causing morbidity and morbidity of livestock.

SERVICES OFFERED (1)

- Diagnostic of bacterial, fungal, parasitic and viral infections of domestic animals.
- Viral and bacterial vaccines for poultry, cattle and dogs.
- Antigen production (tuberculin and Brucella antigen).
- Quality control of pharmaceuticals and biologicals.

SERVICES OFFERED (2)

- Microbiological analysis of feed for animal consumption and food of animal origin for human consumption.
- Microbiological examination of seafood for export.
- Chemical analysis of milk, feed, water and pasture

SERVICES OFFERED (3)

- Analysis of deep fluids
- Toxicological analysis (aflatoxins, .. B1)
- Distilled and deionised water.
- Blood for cultured media for diagnostic purposes
- Destruction of biologicals waste and animal carcasses
- Training of basis and medium level Laboratory technicians

CURRENT ACTIVITIES

- Diagnostic and research of animal diseases including zoonoses
- Quality control and food hygiene
- Production of biologicals (vaccines and antigens)
- Quality control of biologicals and pharmaceuticals.

PRIORITY DISEASES

- Newcastle
- Gumboro
- Anaplasmosis
- Babesiosis
- Cowdriosis
- Trypanosomiasis
- FMD
- Brucellosis
- Tuberculosis
- Rabies
- Lumpy skin
- African Swine fever
- CBPP

SOURCE OF MATERIALS AND EQUIPMENT

- SIGMA LABORATORIES
- FLOW LABORATORIES
- DINATECH INC
- BYBBY STERILIN
- LABOTECH
- MILLIPORE
- BIO-RAD
- And others

KITS AND REAGENT NEEDS

- ELISA KITS AND REAGENTS FOR INDENTIFIED TRANSBOUNDARY DISEASES
- Ex: Brucellosis, CBPP, Newcastle Disease, African Swine Fever.... etc..

SOURCE OF REAGENTS AND KITS

- Regional Laboratory Ondesterpoort: Eg: FAT for Rabies, ELISA for ASF, Brucella abortus and B. melitensis antigens.
- Central Veterinary Laboratory (Weybridge) NCD, Gumboro, IB, ILT, Viral arthritis (Reoviris), Fowl Pox....., IBR

NEEDS IN TERMS OF KITS

- ELISA FOR NEWCASTLE
- ELISA FOR RVF AND CHLAMIDIOSIS
- ELISA FOR BABESIOSIS
- ELISA FOR COWDRIOSIS
- ELISA FOR CBPP
- ELISA FOR BRUCELOSIS

VALUE OF LABORATORY ACCREDITATION

- Use of standard techniques
- Having vigorous quality control established

Uniform monitoring and control of animal health in the region.

8. SOUTH AFRICA: ONDERSTEPOORT VETERINARY INSTITUTE

P. Ori
ARC-OVI

Agenda

- Overview of OVI
- Tests offered
- Benefits of a Certified QMS
- Bacteriology Laboratory and Accreditation
- How we maintain the system

The Virology and Residue Analysis Laboratories are in the process of Accreditation
The Bacteriology and Feed Pathogen Laboratory was Accredited in the year 2001.

VIROLOGY: VIRAL SEROLOGY

Indirect ELISA	Newcastle disease
Indirect ELISA	Para-influenza 3
Indirect ELISA	Rift Valley Fever
Indirect ELISA	Equine Influenza

Hemagglutination inhibition

- Avian influenza – H5
- Avian influenza – H7
- Equine influenza – Huguenot
- Equine influenza – Prague
- Newcastle disease
- Rift Valley Fever
- Wesselsbron
- Middelburg virus

Complement fixation tests:

- Bluetongue
- Enzootic haemorrhagic disease
- Bovine ephemeral fever
- Chlamydia
- Akabane virus
- African horse sickness

- Equine encephalosis
- Equine herpes virus 1
- Equine herpes virus 4

Agar Gel Immunodiffusion

- Bovine leukemia
- Equine infectious anaemia
- Johne's disease

BACTERIAL SEROLOGY

- Complement fixation test (CFT):
- Q-fever
- Contagious bovine pleuropneumonia
- Contagious caprine pleuropneumonia
- Dourine (Slapsiekte)
- Dourine antisera

Bacterial Serology

- *B abortus/ovis/melitensis*
- Johne's Disease (Paratuberculosis)
- Contagious equine metritis
- Microscopic agglutination test: Leptospirosis - canine
- Leptospirosis – other
- 8 serovars per sample (*L. canicola; L. icterohaemorrhagiae; L. grippotyphosa; L. hardjo; L. bratislava; L. pomona; L. szwajizak; L. tarassovi; L. muenchen; L. australis*)

- Serum Agglutination Test (SAT): *Brucella abortus*
- Milk Ring Test: *B abortus*
- Rose Bengal Test (RBT)
- SAT & CFT on RBT positives: *B abortus*
- Slide agglutination test: *B canus*
- Isolation: Leptospirosis

Benefits of a Certified Quality Management System

- Provides assurance to customers that the company is committed to Quality
- demonstrates that the laboratory has implemented procedures to:
- identify the requirements of its customers (ability to provide the required tests and deliver results timeosly)
- ensure that it is able to supply services in accordance with these requirements. (has the necessary reagents, equipment, standard operating procedures to perform the

tests).

- Ensure that the desired services conforms to the requirements (the client may require identification of an organism strain if the test was positive for that organism)
- The contract review helps to ensure that we are able to satisfy the requirements of the client. (for single case).
- For projects, before we accept the project we have to ensure that we are able to perform it by checking the man-hours that are required (do we have sufficient trained personnel, do we have equipment, do we understand the requirements and are we able to satisfy them, will the client be prepared to fund the extra equipment or personnel?)

Typical Benefits

- Satisfied & loyal customer: services always according to requirements, we are able to deliver test results timeously, it may be necessary to suggest actions that may be required to aid the client since all clients are not veterinarians etc.
- Reduced operating costs as wastes and non-conformances are eliminated. This results form preventative actions that are in place. A first-time, right policy is encouraged and this is accomplished by ensuring that only trained personnel perform tests, the SOP are followed, reduced errors, the equipment is maintained and calibrated - all these factors reduce the non-conformances that may arise from the tests or having to report tests because the equipment was not working correctly or there were no controls used (e.g. contamination of agar used for a standard plate count, but no negative control was plated out to ensure that the agar had no contaminants prior to testing). Significant amounts of time and money is spent on correcting mistakes.
- Improved competitiveness and profitability as operating costs are reduced. We are then recognized as a laboratory that provides accurate test results and would result in more clients requiring our services and thereby increasing our profits by our competitiveness as well as reduced costs (due to less wastage of having to repeat tests e.t.c)
- Improved morale as employees are able to work efficiently, and are involved in the working environment.

Bacteriology and Accreditation

- The manual was prepared in accordance with the requirements of ISO 25 & ISO 17025.
- One of the main ingredients of success of a QMS is the commitment of the MD. The benefits of this include: lab employees are more willing to accept the QMS as it comes from Management and the example that they are demonstrating on the importance of the QMS. The management would also be more willing to invest in the necessary skills and reserves to ensure the QMS is effective. An effective QMS would be achieved if Senior Management defines their requirements for it. (copy of signed commitment)
- Every employee was encouraged to become involved in the QMS and internal training was implemented so that everyone understood the QMS.
- Temperature monitoring and calibration of equipment were problems that were

encountered but have been overcome successfully.

- An equipment register that has all the details of the equipment (location, identification number, calibration and maintenance status e.t.c.).
- From this we are able to draw up a calibration and maintenance programme for the year and implement it.
- temperature monitoring is performed on all equipment, such as incubators, freezers, refrigerators, water-baths. We have a variance for these equipment e.g. incubators are ±1°C, freezers are between -15°C to -21°C, refrigerators are between 1° to 7°C. When temperatures are not within the limits, we are able to implement corrective actions.
- Internal calibration (verification) of balances, dispensers, and thermometers are performed. We have reference thermometers and weight that are calibrated externally by an accredited organization and these must have national or international traceable standards that are followed. The correction factor is incorporated into all data.
- Environment monitoring is done on a monthly basis to detect the level of air-borne contaminants.
- Internal audits are performed and these include (I) Vertical assessments (we take a few samples and follow it through the whole procedure (from arrival to the laboratory to the sending out the final report; to ensure that the SOP were followed, that the system is working correctly and effective for us)
- (2) Horizontal assessment- we take one aspect e.g. equipment and calibration and ensure that the aspect is working correctly. We are then able to identify problems or potential problem areas and implement corrective action or preventative action.
- A complaint book is available in which all complaints are recorded, as well as queries and sample booking e.t.c. This is very effective to implement actions to improve our systems.
- Compulsory testing forms are filled in by all personnel during training. This form allows for a third person (examiner) to examine that the trainee is competent by ensuring he/she is following the SOPs. If the trainer has taught the trainee incorrectly, one is also to correct the trainer as a result. Only people that were trained and found competent to perform a test may do so.
- Personnel records hold the qualifications, job descriptions, and training records of all personnel.
- We were accredited by the South African National Accreditation Systems in August 2000. We were accredited for the following tests:
- Microbiology:
- Detection of Salmonella
- Detection of Clostridium species and Bacillus anthracis
- Enumeration of E.coli
- Enumeration of coliform bacteria
- The aerobic plate count

- Diagnostic Bacteriology:
- the serotyping of E. coli
- the serotyping of and phage typing of Salmonella

- the accreditation is an ongoing process and a yearly basis we apply for accreditation for new test. This year, October 2001, we have applied to have three move tests Accredited.

Competency Testing

- Trainee :
- Trainer :
- Training period :
- Test/ Procedure :
- Laboratory no. of sample :
- (Used in procedure)
- Examined by :
- Laboratory no. of sample :
- (Used in procedure)
- Competent/need further training:
- Result :

Conclusion

"Quality is a journey and we are on our first step of a thousand miles!"

9. TANZANIA

A. Role of ADRI in Tanzania

The Animal Diseases Research Institute, (ADRI) is situated in Dar Es Salaam midway along the north-south coastal line to the east of the country. Technically, ADRI was and is the Central Veterinary Laboratory of Tanzania. The name ADRI came out in 1981 when the then CVL was placed under a parastatal organization (Tanzania Livestock Research Organization, TALIRO) whose mandate was mainly research. After desolution of TALIRO, the institute remained with the name of ADRI under directorate of agricultural research. However, even with these organizational changes over the past twenty years, ADRI (CVL) has remained with its mandate of doing its roles in:

1. research in animal diseases
2. diagnosis in animal diseases (VIC role) and
3. reference laboratory (central veterinary laboratory role) for Tanzania and
4. training of laboratory technicians at various levels for different institutions both in veterinary and human fields.

In fulfilling these roles, ADRI has six outposts (Veterinary Investigation Centres –VICs) which carter for six zones and ADRI serves the seventh zone. There is good communication through e-mail between ADRI and the VICs. Of recent, these VICs are being equipped and upgraded to effectively address the needs of the particular zone they are serving. Some tests like ELISA which were only available at ADRI are now being set up at VICs. ELISA for East Coast Fever is conducted at VIC Arusha, VIC Mwanza is setting up ELISA for various diseases including CBPP.

Summary of activities done by ADRI:

1. Research in animal diseases:

Most of the research activities conducted by ADRI are applied in nature and coordinated by the director of research and development under the Ministry of Agriculture and Food security. The research areas are determined between researchers and clients then approved by the directorate of veterinary services.
Currently, fields of research include CBPP and CCPP, bovine and human Brucellosis & Tuberculosis, tick and tick borne diseases (Babesiosis, ECF, Anaplasmosis), Newcastle disease/ Gumboro, other poultry diseases, meat and milk and medicinal plants.
However, there are other areas falling under coordinated research, collaboration etc.

2. Diagnosis of animal diseases:

ADRI acts as a zonal veterinary investigation centre (VIC) for the eastern zone. Of recent, there has been an increase in livestock keeping in urban and peri urban areas for different reasons. Animal kept are dairy cattle, poultry and pet animals. Various diseases and disease conditions are encountered.

3. Central Veterinary Laboratory role (reference lab).

There are tests which are performed or confirmed only at ADRI due to expertise and equipment involved, eg. virus and mycoplsmasma isolation, specific serology, and diseases of national importance (rinderpest, PPR, ASF, CBPP, Brucellosis).

4. Training of laboratory technicians:

ADRI is the only institution in Tanzania training Laboratory Technicians manning the various veterinary laboratories (VICs, SUA, research institutions, regional clinics).

B. Tests currently conducted at ADRI

	Disease	Tests	Source of reagents
1	Brucellosis	RBPT	BgVV, Vendors
		SAT	BgVV, Vendors
		CFT	ARC-OVI, EMVT, Vendors
		i-ELISA	IAEA
2	CBPP	CFT	ARC-OVI, EMVT
		c-ELISA	IAEA/EMVT
3	Rinderpest	c-ELISA	Pirbright
4	PPR		?
5	ECF	ELISA	?
6	Babesiosis	ELISA	Australia?
7 .	Newcastle D	ELISA	IAEA
		HI	?
8	Trypanosomiasis	Ag ELISA	?
		ELISA	?

C. Priority diseases

Some diseases had been of priority in the past but are now at various stages of eradication or due to recent trends are no longer at the top of the list. These include rinderpest and FMD. However, surveillance in the field and laboratory screening (kits!!) of rinderpest and related diseases (PPR, lineage 2?) are ongoing.

I. Animal diseases of priority at the moment are:

1. Contagious Bovine Pleuropneumonia, CBPP
2. African Swine Fever
3. New castle Disease/Gumboro
4. Brucellosis /Tuberculosis
5. FMD

II. Animal diseases of priorirty 2 (diagnosis fairly advanced):

1. East Coast Fever
2. Trypanosomiasis
3. Other tick borne diseases
4. Mastitis etc

D. Quality Assurance systems in place in Tanzania

None!

E. Value expected out of accrediting ADRI, Temeke.

At the moment there are no laboratories officially accredited to conduct such tests especially what concerns animals and animal products in Tanzania. There have been efforts but the conditions attached to ISO are difficult. The benefits for ADRI are huge especially when done stage by stage.

10. ZAMBIA

The Central Veterinary Research Institute (CVRI), Bamora is located at about 25 km from the Lusaka City Centre. It falls under the Department of Research and specialized services, Animal production and Health in the Ministry of Agriculture, Food and Fisheries.

CVRI HAS SEVEN SECTIONS NAMELY:

1. Pathology
2. Bacteriology
3. Virology
4. Parasitology
5. Epidemiology
6. Biochemistry and Toxicology
7. Vaccine production

IT ALSO HAS FIVE REGIONAL DIAGNOSTIC LABORATORIES FALLING UNDER IT:

1. Choma, Southern Province
2. Mongu, western province
3. Ndola, Copper belt Province
4. Isoka, Northern province
5. Chipata, eastern province

The role of CVRI is to compliment the disease control strategy designed to control and eradicate animal diseases in the country. To fulfill this role CVRI is mandate to carry out the following:

1. Animal disease research
2. Animal disease diagnosis
3. National reference Laboratory
4. Vaccine production

PRIORITY DISEASES

For the purpose of ease of funding and monitoring the Animal Health and Production prioritized diseases of National Economic importance (DNEI):

CBPP
Anthrax
FMD
Rabies
Trypanosomiasis

This list is flexible depending on the emergency of the situation. Also the emergency preparedness document was drawn to identify from boundary diseases where the Animal health department remains alert.

SOURCE OF REAGENTS

Disease	Test	Source
CBPP	SAT, CFT, C-ELISA	CRAD-EMVT, France
	Culture	Mycoplasma Experience, UK
Anthrax	Culture, Phage typing	Weybridge
FMD	ELISA	Pirbright
Rabies	IFAT	Centercor/CDC Atlanta (OVI Onderstepoort)
Trypanosomiasis	ELISA	Local, IAEA

QUALITY ASSURANCE PROGRAM

None, except the internal quality control on ELISA which is supervised by IAEA project.

BENEFITS OF LABORATORY ACCREDITATION

1. Improvement of diagnostic capability of the laboratory.
2. Increment in international trade opportunities.

COURSE CO-ORDINATOR'S REMARKS

Deputy Director of Veterinary Services (Diagnostics & Research)

U Ushewokunze-Obatolu

Official opening 27-09-2001

The SADC livestock sector IQC/EQAP workshop for veterinary lab scientists 24/9 – 5/10/2001

Bronte Hotel, Harare

- The Principal Director of Agricultural Services
  Ministry of Lands Agriculture and Rural Resettlement, Zimbabwe, Dr Chiteka

- The Director of Veterinary Services, Dr Hargreaves
- The Deputy Director of Veterinary Services, Dr Madzima
- (Other Agency Directors)
- IAEA Zimbabwe Desk – Mrs Katsande
- Standards Association of Zimbabwe Representative
- FAO/IAEA – Head of Division of Animal production and Health, Dr M Jeggo
- All other esteemed stakeholders
- Ladies and gentlemen

I will begin by explaining that Zimbabwe was asked to take the responsibility to chair and co-ordinate the Laboratory Diagnostics sub-committee under the auspices of the SADC Livestock Sector Co-ordination Unit which is based in Botswana. Over the last 4 years, the Diagnostics sub-committee has met and decided its first main objective is to work towards harmonizing laboratory diagnostic systems among veterinary testing laboratories towards attaining accreditation within the region, and internationally. In layman's terms this is simply a way by which we obtain confidence in each other's capabilities in animal disease testing by ensuring consistency and reliability. This benefits our region's needs first, and secondly helps us to meet internal trade requirements appropriately.

In short, we would like to reach a position as an SADC block where when any of our national reference laboratories declares results, there will be no need for other laboratories not to have faith in them.

- We want to be able to have in each laboratory, capabilities to adopt a procedure, be able to perform a diagnostic test once and reproduce the result with minimal variation using that same procedure;
- We would like to reduce complaints levels by our clients and have them want to come back over and over because we always satisfy their needs adequately.

This is in fact akin to an ISO system defining a way of performing laboratory diagnostic tests that guarantee a certain level of reliability and confidence. The sub-committee is thereby attempting to establish the adoption of ISO FDIS 17025 region-wide. This will be of immense value in improving efficiency in animal disease control in the region, informing and protecting our populations in the region of public health risks, protection of our physical environment and improving our earnings from international and inter-regional trade. This should be possible through sustainable and cost-effective means such as relying on regional human resources, local production of diagnostic kits within the region.

To this end, the sub-committee is beginning to implement a 4-year project to kick-start efforts aiming to harmonise and standardize laboratory based animal disease testing and diagnostic kit production. This will be with funding assistance and technical expertise from the FAO/IAEA, for various activities. These include;

- training for heads of laboratories;

- training of laboratory internal quality systems auditors, training of other laboratory staff through workshops and scientific visits;

- provision of basic equipment important to Internal Quality and External Quality Assurance management.

This workshop marks the beginning of the project's activities. It is aimed at equipping laboratory scientists with skills and knowledge to go and start implementing quality management systems in their laboratories.

Here, I present participants from 10 SADC countries, namely: Zambia, Malawi, Tanzania, South Africa, Mauritius, Mozambique, Lesotho, Botswana, Swaziland and Zimbabwe. From here we hope they will remain networked to see the success of our mission as a sub-committee and for the Livestock Sector in general.

I wish to thank our sponsors the IAEA, the SADC Food Security and Rural Development Hub and the Government of Zimbabwe for making it possible to start. I also wish to thank our resource persons. We look forward to be reporting positive progress in the course of the project. We also look forward to this concept cascading to other testing laboratories in our region's agricultural testing laboratories in line with zoo-sanitary and phytosanitary requirements.
Principal Director, all esteemed guests and stakeholders this is the summary of the purpose of our workshop.
At this juncture I invite the Director of Veterinary Services to address us.

Address by Dr Chiteka
Principal Director of Agricultural Services
Ministry of Lands Agriculture and Rural Resettlement

SADC Regional Training Workshop on Internal Quality Control and External Quality Assurance Programmes in Veterinary Laboratories - 24 September to 5th October 2001

Official Opening: 27 September 2001

The Workshop Co-ordinator Dr Ushewokunze-Obatolu

The Representative of the Internal Atomic Energy Agency Dr Jeggo

Workshop Participants

Invited Guests

Ladies and Gentlemen

It gives me great pleasure to welcome you all to this very important workshop. In particular, I would like to give our guest from the SADC region a special welcome. Amid your very busy schedule, it is my hope that you will find some time to explore the sunshine city of Harare. If the very serious organizers do not allow any daylight time for this, I am sure you will find nighttime Harare to be even more vibrant.

In today's business, there is no substitute to quality especially for food products. International markets are becoming more and more demanding more so for animals and animal products. It is one of the overall objectives to harmonise against this background that the SADC Region embarked on an exercise to implement Quality Management Systems in Veterinary Testing Laboratories. It is one of the overall objectives to harmonise diagnostic testing systems and to obtain international accreditation in accordance with OIE (Organisation International Epizootiques) requirements.

Regional laboratories would like to implement quality management systems along the lines of ISO 9001/FDIS 17925 guidelines. These are fairly new and complex concepts being adopted worldwide in response to trade sanitary and phytosanitary requirements.

A quality system in a diagnostic laboratory aims to reduce errors which may arise during laboratory operations. The quality management system would result in enhanced objectivity in the assessment of results supported by a solid background of record keeping for consistency despite staff turnover.

It also provides ease of trouble shooting on common problems, ease of repair and preventative maintenance of equipment. In this process a well-trained motivated and competent work force is a necessary pre-requisite. The establishment of a proficiency testing

and external quality control program will enable national laboratories to confidently compare their performance against that of other local, regional and international laboratories. This will provide evidence of competence and reassurance of quality, reliability and validity of results.

International trade rules are constantly changing and they now require that national veterinary testing abattoirs and that processing plants which support exports should be regionally and internationally accredited. The process towards accreditation requires evidence of a certified internal quality control systems and participation in external quality assurance programs.

This requirement enhances the credibility and validity if results that are generated by these laboratories thereby facilitating animal disease management and control, inter and intra regional movement of animals and animal products.

The sophistication of market requirements for trade in animals and animal products makes it imperative to accredit testing laboratories on some common fundamental principles. SADC Countries are already involved in and intend to increase production of livestock and their products.

This aims at meeting domestic demand while the surplus is traded internationally to generate much needed foreign currency. Systems with adequate capacity are therefore required which rely on resources already available within the region. However, few national laboratories within the SADC region have accredited quality management systems and none of them participate in any formal regional or international quality assurance programs. There is consensus on the need for a harmonised system of laboratory testing.

This project therefore aims at training staff within the region and utilise materials developed and generated in the region for cost effectiveness, relevance and sustainability. Success of the programme can however only be guaranteed if national governments play their part to provide financial and technical support and adopt policies that enhance quality assurance systems.

My government is committed to the support and maintenance of such quality assurance systems. They would maintain the necessary quality for our animal products for export on a sustained basis.

I note the coincidence in responsibilities for Zimbabwe. The SADC Food Security Co-ordinating Centre is based in this country, so too is the chair for the Laboratory Diagnostics Subcommittee of the SADC Livestock Sector Co-ordination Unit. We are honoured to host this training workshop. I understand this workshop is part of a 4 year program which will lead to accreditation of veterinary testing laboratories within the region and the regionalisation of production and supplies of kits for diagnostic tests for trans-boundary animal diseases.

It is my fervent hope that this exercise will cascade to other agricultural testing laboratories beyond the relm of animal diseases and translate into a strengthened quality assurance system that meets both our national, regional and international customer needs and for all SADC countries.

I would like to conclude by thanking the team that organised this workshop. On behalf of the Government of Zimbabwe, I would like to express our most profound gratitude to the FAO, the International Atom Energy Agency and the SADC food security Co-ordinating Unit for supporting this workshop. It will go a long way to improve our quality management and ensure sustained exports of animal products to lucrative markets. To our regional guest participants, once more, we welcome you to Zimbabwe and to everyone, I would like to wish you both interesting and fruitful deliberations.

With these few words, I would like to declare the SADC Regional Training workshop on Internal and External quality assurance programmes in Veterinary laboratories officially open.

I thank you.

APPENDIX IX

Minutes of a planning meeting of the SADC veterinary laboratory diagnostics sub-committee held at Bronte Hotel, Harare on 25 September 2001

Present

Dr Ushewokunze-Obatolu (Zimbabwe) (Sub-committee Chairperson)
Dr L.A. Lerotholi (Lesotho)
Dr P. Hlatshwako (Swaziland)
Dr M.H. Jeggo (IAEA)
Dr P.V. Makaya (Chief Veterinary Research Officer, CVL Harare)
Dr T.C. Katsande (Recorder)

This was an ad hoc meeting of Heads of Laboratories who were present at the workshop and Dr M. H. Jeggo from IAEA. The purpose of the meeting was to discuss and plan project activities that will be supported by IAEA in 2002. The following points were discussed and agreed upon pending ratification by IAEA:

- Heads of Laboratories workshop on IQC/EQAP awareness will be held during the first quarter of 2002. The duration of workshop will be 2 to 3 days and the workshop venue will be decided, mindful that the original venue had was South Africa.
- There is need for a baseline inventory study in all SADC national veterinary laboratories. A consultancy on this activity will be done by one of the Heads of Laboratory and will be supported by IAEA. The questionnaire is being revised by Dr Penrith of OVI.
- Training of laboratory internal auditors for the national laboratory was required.
- Scientific visits by veterinary laboratory Heads and senior diagnosticians was required. The entire visit can be about a month long and 2-4 laboratories can be visited. Each country can pursue this with IAEA separately. Application forms are available on the IAEA website.
- A follow-up workshop of national laboratories Quality Control Managers will be held in early 2003 at a venue to be decided.
- IAEA has a budget of about US$40000 for equipment for IAEA/SADC member states. Each member country should however apply individually for this activity. It is advisable to begin applying immediately.

Dr Jeggo undertook to get ratification of IAEA support for the above activities and give feedback to the Sub-committee chairperson for further consideration.



Group Photograph of Participants at SADC Regional Training Workshop on Internal Quality Control and External Quality Assurance Programmes for Veterinary Laboratories held at Bronte Hotel, Harare, Zimbabwe on 24 September to 5 October 2001



Group Photograph of Participants at SADC Regional Training Workshop on Internal Quality Control and External Quality Assurance Programmes for Veterinary Laboratories held at Bronte Hotel, Harare, Zimbabwe on 24 September to 5 October 2001. In action: Director of Veterinary Services, Zimbabwe, Dr Stuart Hargreaves



Participants at SADC Regional Training Workshop at the official opening ceremony. From left: Mrs Kotsanai Katsande (Colcom Foods – invited guest), Dr Cathy Chola (Zambia), Dr Martyn Jeggo (IAEA), Dr Charles Katsande (Zimbabwe, Workshop Director) and Dr Pious Makaya (Zimbabwe)



Lighter moments at SADC Regional Training Workshop. In front from Left: Dr J Paweska (South Africa, Workshop Facilitator, Mr K.B. Monyame (Botswana) and Mr W. Mtika (Malawi)



Lighter moments at SADC Regional Training Workshop. In front from Left: Dr L. Lerotholi (Lesotho), Mr G. Banze (Mozambique) Mr K.B. Monyame (Botswana) Dr U. Ushewokunze-Obatolu (Zimbabwe – Head of CVL), Dr P. Hlatshwako (Swaziland) and Mr W. Mtika (Malawi)