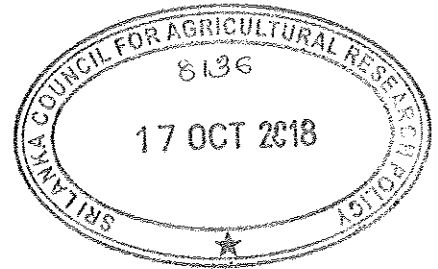


THE REPORT ON THE EXTERNAL REVIEW OF THE VETERINARY RESEARCH INSTITUTE

A Review commissioned by the Sri Lanka Council for
Agricultural Research Policy (SLCARP)



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September 2018

REPORT ON EXTERNAL REVIEW OF VETERINARY RESEARCH INSTITUTE

Submitted by

Prof. S.P. Gunaratne



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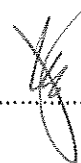
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REPORT ON EXTERNAL REVIEW OF VETERINARY RESEARCH INSTITUTE

SUMMARY

This review was commissioned by the Sri Lanka Council for the Agricultural Research Policy (SLCARP) to assess the quality, relevance and impact of scientific program and services provided by the Veterinary Research Institute (VRI) of the Department of Animal Production and Health. The review considered all aspects of the VRI functions during the 5-year period from 2013 to 2018.

The review team which consisted of four members made a several visits to the VRI and its affiliated units, centers and laboratories during April to September 2018. During the visits, the review team met The Director General/DAPH, Director VRI, Deputy Directors, Divisional Heads, and Scientific, administrative and support staff. The review team also perused a number of relevant reports and records that were made available and made visual observations. A stakeholder survey was carried out to assess the quality and relevance of services of the VRI and a SWOT analysis was carried out.

The review team found that the research program of the VRI is in line with the National priorities as well as with 2030 Sustainable Development Goals. The institute has handled 78 research projects covering diverse applied and basic research topics. More than 20 active research projects have been recorded for each year while the great majority of projects were completed on time. Research accomplishments of the scientists are reflected in 166 quality research communications during the review period. The main service functions of VRI include production of veterinary vaccines and biologicals, provision of laboratory services for disease diagnosis, investigations and analytical services as well as advisory and training to stakeholders. The VRI supports the implementation of statutory functions of the DAPH.

The review team observed that the VRI had made a satisfactory financial progress during the review period. However, a significant number of senior scientific cadre positions were not filled for a long time and most of the administrative positions including the Director/VRI and majority of the divisional heads were on acting basis for extended periods. The VRI had met the targets given by the DAPH in terms of vaccine production. According to the stakeholder opinion, the VRI provides a satisfactory laboratory service yet improvements are needed to enhance the quality of services.

The review team has made recommendations to overcome current constraints and to improve the services and functions through proper planning and implementation of its future programs and activities.

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1. INTRODUCTION

1.1. Review team:

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Dr. W.P.P. Samarasinghe - Chairman/ Managing Director, Super Feed (Pvt) Ltd.

1.2. Terms of Reference for Review (TOR): Please see the Annex 1.

2. REVIEW PROCESS

2.1 Meetings, Discussions and Site Visits: Review team had discussions with Director General, Department of Animal Production and Health, Acting Director, VRI (Dr.S.S.P. Silva, Till June 2018), Director, VRI (Dr. K.P.G.K. Badralatha, From July 2018), Deputy Directors and Divisional Heads. The team also met sectional heads of VIC, CPRS (Kundasale) and Vaccine Production Section (Polgolla). Team made about 15 visits to the VRI and affiliated Units, Laboratories, Centres and Sections.

2.2 Reports & Records: The Director's self- evaluation report as instructed by the CARP was not available. The Annual reports of VRI for last five years were available and perused. The VRI administration and financial divisions provided reports on cadre positions and annual financial progress. All the reports with respect to the services provided by VRI made available through information technology division. Some information available at VRI & DAPH websites were also used.

2.3 Stake holder survey: Review team conducted a stakeholder opinion survey with respect to services provided by the VRI using a structured questionnaire.

SWOT analysis was carried out using the information provided through documents and gathered during discussions.

Strengths:

- One and only national level research institute mandated to carryout animal production and health research in Sri Lanka

- Availability of best laboratory and infrastructure facilities for livestock research, provision of laboratory services, consultancy and expertize services
- Function as national and international reference laboratory
- Supporting services for implementation of statutory and regulatory activities related to subject of animal production and health
- Long term stake holder base and their confidence on services
- Demand and availability of facilities for production and supply of biological products, vaccines etc.
- Reasonably adequate funding through government regular budget and extra funding for research through national and international projects

Weaknesses:

- Difficulty of retaining qualified scientific staff due to lack of incentives for qualifications and merit
- Existing typical government model administrative and financial system tend to cause delays in many aspects of progress
- Deficiencies in reporting system

Opportunities:

- Demand for laboratory services from stake holders are increasing
- Expanding demand for supporting services for statutory and regulatory work

Threats:

- Inadequate qualified scientific staff may lead to drop in quality of research and services

3. VETERINARY RESEARCH INSTITUTE (VRI)

3.1. Background/ introduction:

Veterinary research Institute (VRI) is the one and only national level Research Institute involve in veterinary research, diagnostic, consultancy, training and technology transfer activities. In view of improving animal health and livestock production in the country a number of innovative livestock products have been produced by the VRI to the farming community and other stakeholders of the industry. On the other hand diagnostic testing, laboratory and advisory services are produced by the VRI with the intention of uplifting socioeconomic status of the livestock farming community. Basic and applied researches are conducted in order to explore the novel concepts and knowledge in the profession.

3.2. Vision and Mission:

Vision:

“To be a center of excellence in research and development for the livestock industry”

Mission:

“Be the leading institute for conducting research and providing technological services and products for the livestock industry to the satisfaction of clients and other stakeholders and thereby contribute to the livestock industry”

Specific Comments:

- The DAPH & VRI are national level organizations serving Animal Production and Health sector in Sri Lanka. However, only livestock industry is included in the vision.
- Term “Industry” generally refers to an economic activity. Therefore better to use word “sector” rather than industry. The DAPH vision use term “livestock sector”.

3.3 Mandate/Functions:

Followings are the main functions of the VRI.

- Conduct animal production & health research
- Production of Veterinary vaccines
- Supply of biologicals
- Laboratory disease diagnostics & investigation
- Provide analytical facilities
- Provide referral laboratory facilities for the livestock industry and other institutions, both nationally and internationally
- Provide inputs for Dairy and Poultry Sector
- Provide technology expertise
- Support implementation of regulations and legislative enactments related to livestock sector

3.4 Governance and administrative structure:

The Veterinary Research Institute is the Research arm of the Department of Animal Production & Health, which falls under the Ministry of Fisheries and Aquatic Resources Development and Rural Economy.

The following institutes related to subject of Animal Production & Health comes under the Ministry of Fisheries and Aquatic Resources Development and Rural Economy.

1. Department of Animal Production and Health (DAFH)
2. National Livestock Development Board (NLDB)
3. Milk Industries of Lanka Co (MILCO)
4. Sri Lanka Poultry Development Company (Pvt) Ltd
5. Mahaweli Livestock Enterprises Ltd.

3.5 Department of Animal Production & Health (DAFH):

The Department of Animal Production and Health (DAFH) is the state organization which is responsible for providing technical leadership to the livestock industry and its stakeholders in Sri Lanka. The DAFH was established under the Ministry of Rural Industrial development in September 1978. The department was created by the then Government which came into power in 1977 realizing the importance of the livestock sector in socio economic development in Sri Lanka.

The DAFH presently operates through its five (05) technical divisions such as Animal Health, Animal Breeding, Veterinary Research, Human Resource Development, Livestock Planning and Economics and two (02) support services divisions (Administration and Finance). In addition to provision of technical expert service, the DAFH implements a range of statutes as well, pertaining to the livestock sector.

With the establishment of Provincial Councils in 1988 most of DAFH's field level functions were devolved to nine (09) Provincial Departments of Animal Production and Health (PDAPH) headed by Provincial Directors. 287 divisional veterinary offices scattered throughout the country, which are functioned under PDAPH handle delivery services. Divisional Veterinary Offices managed by Veterinarians are the main functional units of the DAFH. The DAFH provides technical expertise and back-up services to provincial DAFH.

3.6 Organizational Structure of the VRI:

As shown in Figure 1, the Director is the head of the VRI and is assisted by three Deputy Directors (DDs) namely, DD Research, DD Veterinary Research and DD Technical Services. The divisions and units comes under each DD is shown in Figure 1 and further elaborated below.

The Administration and Finance sections are under Director VRI and two divisions are managed by an Administrative Officer and Account management Assistant respectively. Deputy Director Research (Animal Production Research): The following divisions and units come under DD (Research).

- Animal Breeding Division: Central Poultry Research Station (CPRS) and Animal Experimental Farm (AEF) also comes under this Division
- Animal Nutrition Division
- Pasture and Fodder Crops Division
- Farming Systems and Livestock Economics Division
- Dairy Technology Laboratory

Deputy Director Veterinary Research (Animal Health Research): The following divisions and units come under DD (Veterinary Research).

- Bacteriology Division: Animal house is also managed by this division
- Parasitology Division
- Pathology Division
- Virology Division: Animal Virus Laboratory, Polgolla and Disease free poultry unit is maintained by this division.
- Molecular Biology Division

Deputy Director (Technical Services): The Head of this Division, the DD (Technical Services) is an acting position at present. The following divisions and units come under DD (Technical Services).

- Supply Division
- Central Veterinary Investigation Centre (CVIC)
- Vaccine Production Centre
- Information Technology Division

Specific Comments & recommendations:

- There is an Additional Director General/Veterinary Research, representing DG/DAPH and participating in some meetings of the VRI including divisional heads meeting, but his/her role is not very clear.
- It is also noticed that there is no clear job description or duty list for many positions including ADG/VR. Therefore it will be useful to prepare duty lists for all positions when 5S system or a management system is introduced to VRI.
- Although certain information management systems were introduced from time to time for workload calculation, time management, research prioritization, many of those systems seems to be not fully utilized.
- Director/VRI post was vacant for many years. This has affected day to day activities and overall progress of VRI.
- Many divisions are headed by acting Heads (e.g. Pathology, Breeding, Pasture etc.). Some of these acting heads are not experts in that particular subject handle by the division. Some divisions do not have even a single officer specialized in the subject (i.e. Breeding, Pasture).

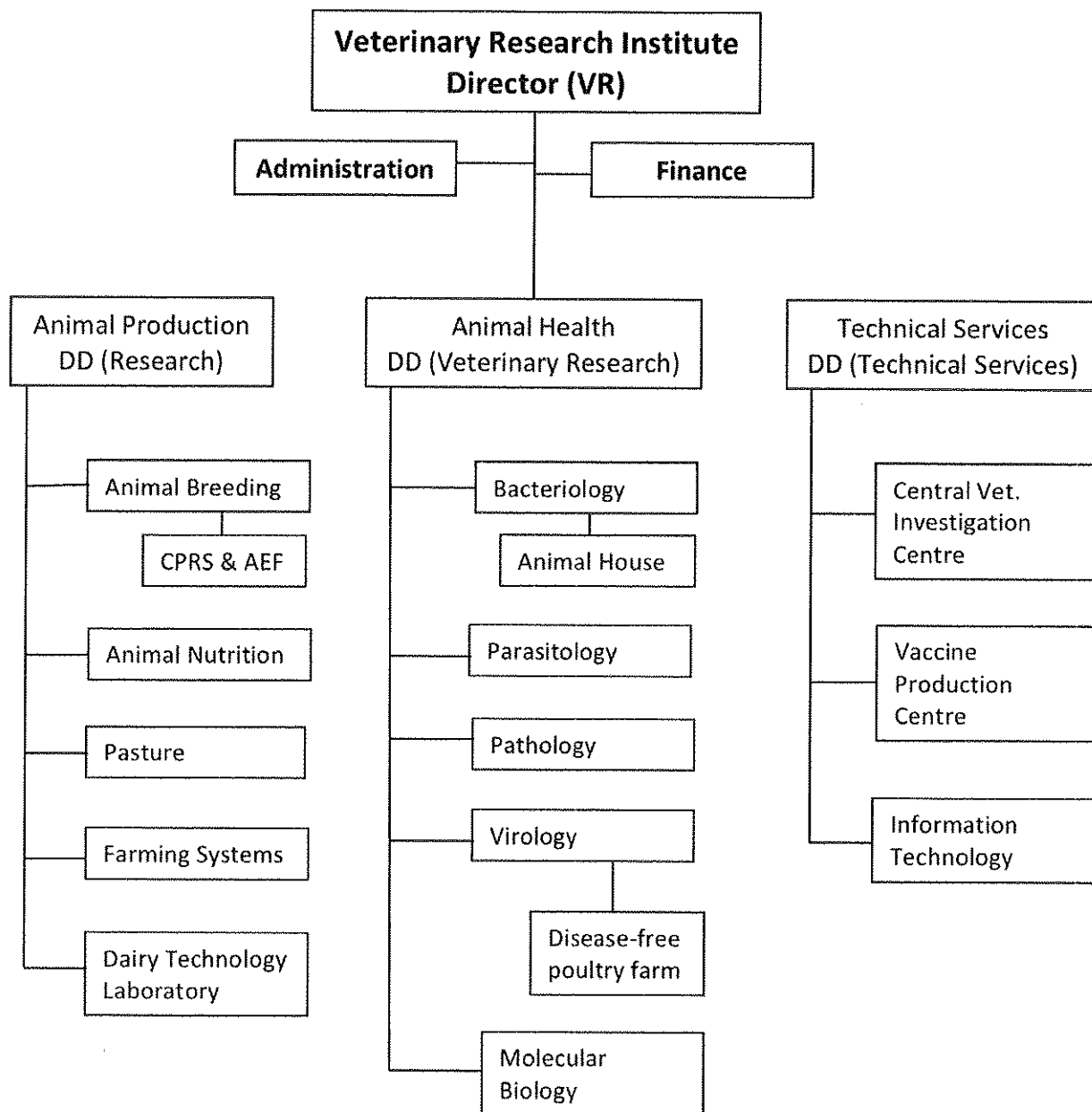


Figure 1: Organizational structure of the VRI

4. DIVISIONS AND UNITS OF THE VRI

4.1. Animal Breeding Division:

The Central Poultry Research Station (CPRS) at Karandagolla, Kundasale and Animal Experimental Farm (AEF), Gannoruwa, also comes under this division.

This division has been managed by acting heads for a long time. As there was no senior officer available in the division, very often acting heads had come from other divisions. At present there is no even a single trained/ qualified scientific officer in the division. One Research Officer has gone overseas for postgraduate training but tendered resignation. Only one veterinary surgeon is available to look in to service functions. One Veterinary Research Officer just recruited recently is now assigned to this division (from July 2018).

Animal breeding division provides following services:

1. Species identification using PCR methods: Buffalo, Cow, Goat, Pig (boar), Dog and Deer meat could be able to identify.
2. Day Old Chick Production: Day old chicks of village chicken varieties are available from Karandagolla farm (CPRS).
3. Training programs: CPRS undertake training programs on poultry management for different stakeholders.

Specific comments:

- There are no qualified scientific staff to carryout planned research program.
- It is essential to fill the vacancies in scientist cadre.

4.1.1. Central Poultry Research Station (CPRS), Karandagolla:

The CPRS is managed by a Farm manager (Diploma holder with specialized training) under the supervision of Head/Animal Breeding. At present, Station maintains an indigenous cross-bred line (CPRS), bred and selected for the village level backyard egg production.

About 2000 day old chicks (DOC) are produced per week and directly sold to small scale farmers with farm capacity ranging from 5 to 500 birds. There is a good demand and average waiting period is about 2 months. The present price of day old chick is pullets Rs.70/= and cockerel Rs.10/= each. At the time of issuing DOC, farmers also get the DAPH recommended health program for their chicks. The average reported egg production of CPRS bird is around 60-65%.

Regular training programs are conducted for farmers on poultry management. The number of training programs conducted during year 2017 is 15. This Station also provides training facilities for University students, Students from farm schools and students from technical colleges undergoing NAITA training.

Specific comments:

- Capacity of Setter in the hatchery is not sufficient to cater present demand of DOC

4.2. Animal Nutrition Division:

The Research staff in this division comprises of three Senior VROs and six RAs. There is one RO allocated from the new recruitments in July 2018. Recently, one senior VRO was promoted as the Animal Feed Registrar and assumed duties at DAPH.

There is a relatively better planned and evaluated research program with no limitations of research funding. According to the annual research plan, VROs and ROs spend 70% of their time on research and 30% on services.

The performance appraisal of officers required for promotion purpose is regularly carried out in this division.

The division is well equipped for animal feed analysis. However, some equipment are underutilized. There is a feed mill used for preparation of feed for research purpose and to conduct feed milling training programs.

Animal nutrition division provide following services:

1. Analysis of animal feed samples for farmers and feed millers.
2. Reference laboratory for analysis of samples for statutory purpose. Samples received through Authorized officers, Animal Feed Registrar.
3. Feed mill audit, as members of certification of feed mills (SLSI etc.).
4. Training on feed milling.

Special Treasury funded project is presently given to this division for the purpose of expansion of Reference Laboratory facility to support Implementation of Animal Feeds Act. This project will enhance the laboratory space and also help to purchase new equipment essential for a reference lab.

Specific comments:

- Difficulty of retaining senior research officers due to lack of promotion prospects. Senior officers with Ph.D. level training have left the division and VRI to take up senior positions in the DAPH.

- Training of senior laboratory staffs for handling, maintenance and repair of specialized equipment is required.

4.3. Pasture and Fodder Crops Division:

This division has also been managed by an acting head for about one and half years. There is no qualified VRO or RO in this division. One RO is just allocated from newly recruited batch (July 2018). One RA and one Field Assistant carry out the services of the division.

Following services are offered:

- Soil and plant analysis for minerals, Soil PH testing, Silage analysis (for acidity and fermentable CHO).
- Advisory service for pasture establishment and fertilizer recommendation.
- Maintenance of Pasture Nursery at TECHNO Park, Gannoruwa.
- Conduct in-vitro digestibility for raw materials, mainly as a support service for research.
- TMR formulation and training.

Specific comments:

- Shortage of qualified research staff
- Actions should be taken to fill the vacancies in the cadre

4.4. Farming Systems and Livestock Economics Division:

This division has only one Research Officer who functions as the Head of the division and one Laboratory Assistant. Due to lack of human resources, only one research project is carried out.

Following services are offered through this division:

- Maintenance of Azolla demonstration plots for the purpose of farmer training
- Advisory services on production of Vermi- compost.

Specific comments:

- A Booklet on Azolla and Vermi-culture titled “ Trash into cash through worm friends” is published.

4.5. Dairy Technology Laboratory:

This is a newly established unit of the VRI to cater the demand for expanding dairy industry. There is one VRO and three RAs allocated to this unit and DD (Animal production research) being a dairy specialist directly involved in day to day activities. This unit carried out dairy research, provides laboratory services and conducts training programs. This laboratory was established as a direct government funded project (5 year duration) and funding would be ceased at the end of 2018.

This laboratory is now well equipped to conduct milk analysis and quality testing. It also conducts training programs for VIC officers and NAITA trainees. One of the significant achievements of the unit is the development of a mobile milk adulteration test kit, which could be used in VICs for routine milk adulteration tests. This test kit can detect following adulterant; Salt, Sugar, Starch, Urea, Formalin and Neutralizers.

Specific Constraints:

- Government funded 5 year project given to establish this unit will be over by end of 2018. Therefore, it is an essential need to ensure regular funding from annual budget of the VRI for continuation of present activities.

4.6 Bacteriology Division:

This division is run by four VROs including two senior scientists and sufficient support staff. The division carries out applied research and number of important service functions. The VRI animal house is managed by this division.

List of service functions:

1. Function as a FAO Regional Reference Laboratory for Haemorrhagic Septicaemia (HS).
2. Production of Fowl Cholera vaccine.
3. Production of Udder infusion.

Specific Comments:

- Although there is an increasing demand for statutory and regulatory services, the laboratories of the division are not adequately expanded.

4.7 Parasitology Division:

There are two VROs, four RAs, one laboratory assistant and a field assistant attached to this division. According to the division Head, there is sufficient funds to conduct research program of the division.

This division provides following services:

- Tick fever vaccine production.
- Regular sample testing for parasites.
- Parasitological investigations referred through VICs, Veterinary Hospitals and private veterinary clinics.
- Testing of quarantine samples.

Specific comments:

- Research-Extension link is weak. This link is important to get a feedback.

4.8 Pathology Division:

The Head, Bacteriology Division is functioning as the acting head of Pathology Division. However, there are two VROs, two RAs, one Lab Assistant and one Field Assistant in the division. There are two research projects at present on immuno histochemistry of Bovine TB and PRRS.

Following services are provided by this division;

- Histopathology of field samples
- Post mortem examinations
- Wild life disease surveillance

4.9 Virology Division:

Virology division, Animal Virus laboratory and Disease free poultry unit come under virology division and located in Polgolla. This division undertakes research on viral vaccines, Produce FMD vaccine and maintain vaccine seed cultures of Ranikhet, Fowl Pox and BVD (Bovine Virus Diarrhea). Some of the recent research findings had helped to upgrade FMD vaccine, Vaccine schedule etc.

4.9.1 Animal Virus Laboratory, Polgolla:

Functions:

- Production of vaccine for Foot and Mouth Disease (FMD), killed vaccine using local strain. About 250,000 to 300,000 doses of vaccines, which represent around 30% of local requirement is produced annually. Requirement of by-annual vaccination is a problem related to this vaccine.
- Quality assurance of local and imported FMD vaccine.
- Supply of seed virus for production of New Castle Disease (NCD) and testing quality of vaccine.
- Clean egg production for NCD vaccine production. For clean egg production 3 flocks of 80 birds each is maintained.
- Sample testing for National surveillance program for HPAI and for quarantine purpose.

Constraints:

Although the available cadre numbers are satisfactory, there are problems associated with human resources;

1. No VROs trained after 2009
2. Lack of specialized training for laboratory staff to maintenance and calibration of specialized equipment located in this laboratory.
3. There is no effort taken to expand the vaccine production or to improve the facilities available, although the demand is increasing.

Financial allocation is generally adequate as FMD is an identified item in the annual budget.

4.10 Molecular Biology & Biotechnology Division:

This division was established in 2015, realizing the importance of molecular biology in livestock research. Division is in the process of establishing laboratories through the funds received from DAPH regular budget. The division is headed by a senior VRO and new VRO and Livestock Development Officer assigned recently. There is also one Development Officer in the division.

At present the division is involved in molecular biology related research studies on following topics;

1. Mastitis- Resistance Bacteria, molecular epidemiology
2. TB- Genetic Profile of animals

Constraints & Comments:

1. Difficulty of getting leave for young officers to proceed for Ph.D. Some senior administrators believe that Ph.D. level training is not essential for Researchers.
2. Availability of leave and funds for short term training and attending conferences to present research papers and updating knowledge.
3. Suggested to establish a revolving fund for VRI, using part of the money collected from services to support travel grants for attending seminars.
4. Increase the number of Senior Scientist positions to create more opportunities for scientists for promotion.
5. Many scientists encountered difficulties in claiming Research Allowance.

4.11 Supply Division:

One of the important functions of this division is the preparation of tender documents and assisting DAPH tender boards (Department Tender Board and Minor Tender Board) in purchasing items for VRI. Although meeting of DAPH tender board is not very frequent, the Minor Tender Board or Minor Procurement Committee (limit LKR 2.0million) meets every week. In addition to Acting DD, this division also got Chief Management Assistant (CMA), 02 Development Officers and 02 Office Assistants.

Constraints:

1. The majority of Senior staff complaint about long delays in tender process. Due to lack of manpower in supply division, research staff had to spend lot of time, especially in technical evaluation committees (TEC).
2. Tender documents had to go through tender board twice before its approval. First submission for funds allocation and second submission for tender approval.

Suggestions:

1. Propose a separate Minor Procurement Board for VRI.
2. Appoint Division Head and increase manpower.

4.12 Central Veterinary Investigation Centre (CVIC):

This division is headed by an acting Chief Veterinary Investigation Officer (CVIO). He also worked as the acting Deputy Director (Technical Services). There are five Veterinary Investigation officers with postgraduate qualifications (VIOs, 02 Ph.D. and 03 M.Sc.) to assist CVIO.

At present there are 24 Regional Veterinary Investigation Centres (RVICs) in the country managed by Veterinary Investigation Officers and they report to Director, Animal Health at DAPH. Day to day disease investigations at regional level are conducted by these

centres. However, as regional facilities are limited, they refer samples to CVIC for detail investigations. The samples received through RVICs and Veterinary Offices are investigated free of charge and other samples are tested on paid basis. The reports on all notifiable diseases are copied to Director/ Health, Provincial Director and clients.

The CVIC is the accredited laboratory for quarantine purposes of import/ export of ornamental fish. CVIC is preparing documents for accreditation of ISO-17025. Laboratory also got on going PT testing with CSIRO (Australia) and ITI (Sri Lanka).

4.13 Vaccine Production Centre:

Present Status:

The vaccine production center is headed by Superintendent of Vaccine Production (SVP). At present the SVP is on pre-retirement leave. The SVP post is not filled yet, but division is handed over to an acting Head of Division.

The Vaccines produced at present and target given for 2018 is as below;

<u>Vaccine</u>	<u>Doses</u>
HS Oil	350,000
Alum	60,000
BQ	225,000
Ranikhet –Liquid	Primary 3,600,000
	Secondary 3,000,000

Fowl Cholera and Swine Pasturellosis vaccines are produced only on request. Fowl Pox vaccine is not produced for many years. The vaccine quality assurance work is done by Virology Division and Bacteriology Divisions.

Realizing the importance of upgrading and expansion of vaccine production facilities, a special 4 year development project has been approved by the treasury and commenced in 2018. The allocation for 2018 is LKR 94.00 million and estimated budget for 2019 is LKR 115 million. The project will refurbish the buildings, Upgrade the equipment and machinery, develop the road network, landscaping and security fencing and also undertake training of staff. It is expected that main constraints will be addressed with this project. The title of the project is 'Production of compatible and high quality animal vaccines locally for substitution of vaccines imported'.

Constraints:

1. Equipment used for vaccine production are more than 30 years old
2. Cadre positions are not sufficient.

3. Due to long delays in tender procedure, even the funds are allocated through special project, progress in utilizing funds is not satisfactory at all. This may affect future funding to the project.

4.14 Information Technology Division:

This unit is managed by Information and Communication Technology Officer, a newly created cadre position comes under the Deputy Director (Technical Services). The division maintains the VRI website and keeps records on services. The sample receiving and issuing reports are handled by this division.

5. AVAILABILITY OF HUMAN RESOURCES

The approved cadre positions of the VRI and the present situation in relation to filling of cadre is given in Table 1. It is revealed that a number of senior scientific positions are vacant while most of the support staff positions are filled. Distribution of scientific staff among different divisions and their academic qualifications are presented in Tables 2 and 3. It is revealed that some of the divisions do not have qualified scientific staff. A significant proportion of the scientific staff have not obtained a postgraduate training with a sufficient research component which can affect the research output and the quality of services of VRI.

Table 1: Cadre Positions of Veterinary Research Institute (as at 14.06.2018)

Se. No.	Service Type	Veterinary Research Institute Gannoruwa		Animal Virology Lab Polgolla		Central Poultry Research Station Karandagolla		Total Vacant
		Approved Cadre	Available	Approved Cadre	Available	Approved Cadre	Available	
1	Director*	01	01	-	-	-	-	00
2	Principal Scientist**	06	-	-	-	-	-	06
3	Veterinary Investigation Specialist**	01	-	-	-	-	-	01
4	Chief Vaccinologist**	01	-	-	-	-	-	01
5	Deputy Director	03	01	-	-	-	-	02
6	Superintend of Vaccine	01	01	-	-	-	-	-

	Production							
7	Veterinary Research Officer***	19	13	04	03	01	-	08
8	Research Officer***	05	01					04
9	Livestock Officer	01	-	-	-	-	-	01
10	Veterinary Surgeon	08	10	-	-	-	-	-
11	Administrative Officer	01	-	-	-	-	-	01
12	Information and Communication Technology Officer	01	01	-	-	-	-	01
13	Livestock Development Officer(Special)	01	01	-	-	-	-	01
14	Livestock Development Officer(Technical Service)	04	01	01	-	01	03	03
15	Livestock Development Officer	-	-	-	-	02	-	-
16	Development Officer	06	09	02	02	02	-	-
17	Development Assistant	01	01	-	-	-	-	-
18	Programme Assistant (Archives)	01	-	-	-	-	-	01
19	Programme Assistant (Human Affairs)	01	-	-	-	-	-	01
20	Coordination Assistant	01	-	-	-	-	-	01
21	Programme Assistant	01	-	-	-	-	-	01
22	Programme Assistant (Media)	01	-	-	-	-	-	01
23	Public Management	07	08	01	-	01	01	02

	Assistant							
24	Research Assistant (Special)	06	01	01	-	-	-	05
25	Research Assistant	24	30	06	06	06	-	-
26	Driver	07	07	01	01	01	01	01
27	Laboratory Assistant	12	11	01	02	01	-	01
28	Technician	01	-	-	-	-	-	01
29	Boiler	-	-	01	-	-	-	01
30	Carpenter	02	-	-	-	-	-	02
31	Electrician	01	01	-	-	-	-	-
32	Peon	02	02	01	-	01	-	02
33	Livestock Assistant	03	04	0-	-	-	-	-
34	Sanitary Labor	-	-	01	01	-	-	-
35	Field Assistant	19	20	06	07	05	09	-

*Director post was filled only in June 2018, after long period of acting Directors covering the duties.

**Many cadre positions remained unfilled for many years, e.g. Principal Scientist, Veterinary Investigation specialist, Chief Vaccinologists.

*** Four VRO positions and two RO positions were filled in July 2018 and not included in the Table 1.

Table 2: Animal Production & Health Service Staff of VRI (As at 14.06.2018)

Se. No.	Name	Designation	Division	Qualification	Status
1	Dr. KPGK Badralatha	Director (VRI)	Directorate	MVSc/MSc	On duty
2	Dr. SSP Silva	DD (VR)	Directorate	PhD	Left VRI Promoted as D/LPE
3	Dr. ULP Mangalika	DD	Directorate	PhD	On Duty
4	Dr. N Priyankarage	VRO	Animal Nutrition	PhD	Left VRI Promoted as Feed Registrar
5	Dr. PS Fernando	VRO	Bacteriology	PhD	On Duty Promoted as D/ Veterinary Public Health (Ministry of health)

6	Dr. HMCK Herath	SVP	Vaccine	MVSc/MSc	On Leave prior to retirement
7	Dr. H Kothalawala	VRO	Virology	MVSc/MSc	On Duty
8	Dr. W M D C Bandara	VS	Animal Breeding	MVSc/MSc	On Leave
9	Ms. IK Lewkebandara	RO	Farming Systems	MSc	On Duty
10	Dr. GA Guanawardana	VRO	Molecular Biology	PhD	On Duty
11	Dr. N D Senasinghe	VRO	Parasitology	MVSc/MSc	On Duty
12	Dr. S Puwanendiran	VRO	Virology	PhD	On Duty
13	Dr. WMPB Weerasinghe	VRO	Animal Nutrition	PhD	On Duty
14	Dr. WMCD Palliyaguru	VRO	Animal Nutrition	PhD	On Duty
15	Dr. N Liyanagunawardana	VRO	Bacteriology	MVSc/MSc	On study Leave
16	Dr. JKH Uberathne	VS	CVIC	MVSc/MSc	On Duty
17	Dr. GIS Perera	VRO	Pathology	MVSc/MSc	On Duty
18	Dr. SMTS Manchanayake	VRO	Pathology	MVSc/MSc	On Duty
19	Dr. KMSG Weerasooriya	VRO	Bacteriology	MVSc/MSc	On Duty
20	Dr. MAR Priyantha	VRO	Bacteriology	PhD	On Duty
21	Dr. KHDT Kasagala	VS	CVIC	PhD	On Duty
22	Dr. SS Iddamaldeniya	VRO	Parasitology	MVSc/MSc	On Duty
23	Dr. WMP Bandara	VS	CVIC	BVSc	On Duty
24	Dr. AP Wickramasinghe	VS	Vaccine	PhD	On Duty
25	Dr. UKSP Alexender	VS	Vaccine	MVSc/MSc	On Duty
26	Dr. APDG Pathirana	VRO	Animal Nutrition	MSc	On Duty
27	Dr. SAE Aberathne	VRO	Virology	BVSc	On Leave
28	Dr. MND Munasinghe	VS	CVIC	MPhil	On duty
29	Dr. NADEM Gunasekara	VS	CVIC	BVSc	On Duty
30	Dr. MDD Lakmalee	VS	Animal Breeding	MVSc/MSc	On duty

Table 3: Distribution of scientific Staff of the VRI between different divisions (As at 25.08.2018)

	HOD	VRO/RO	Vet. Surgeon	Research Assistants	Lab Assistants	Field Assistants
Animal Nutrition	VRO/ Animal Nutrition	RO-1 VRO-1 (HOD/Pasture)	0	6	1	2
Animal Breeding	HOD/AN covering up duties	VRO -1	1	1	1	
Farming systems	RO/Farming Systems	0	0	0	1	0
Pasture & fodder	VRO/AN as HOD/Pasture	RO - 1	0	1	0	1
Dairy Technology	HOD (Deputy Director (Research))	VRO-1	0	3	2	
Bacteriology	VRO/ HOD Bacteriology	VRO -03	0	5	1	3
Pathology	HOD/ Bacteriology covering up duties	VRO- 2	0	2	1	1
Virology	VRO / Virology	VRO- 2	0	6		
Parasitology	VRO/ Parasitology	VRO - 2	0	4	1	1
Molecular Biology	VRO / Molecular Biology	VRO - 1	0	Livestock Development Officer	0	0
Veterinary Investigation Centre	HOD (VS - Deputy Director (Technical Services))	0	4	4	2	2
Vaccine Production Centre	VS (Vaccine Production)	0	1 (SVP will retire in September)	4	0	3

5.1 Staff development from year 2013 to 2018:

According to the information available, there is no planned staff development program for the institute.

6. INFRASTRUCTURE FACILITIES

Establishment of dairy technology laboratory was one of the important infrastructure development undertaken during the recent period. Molecular Biology Laboratory is also started during this period.

7. RESEARCH PROGRAMME

Serving as a national centre for the excellence in research and development in veterinary science, the institute has handled 78 research projects covering diverse applied and basic research topics. More than 20 active research projects have been recorded for each year (Table 4) and the duration of research projects ranges from 1 to 4 years. Of the 78 research projects, 18% (n=14) were of one year duration and all other projects were of minimum of two years. A total of 61 (78%) research projects have been completed during the review period and notably more than 95% of the completed research has been concluded on time as scheduled while only three research project have got extended time for completion. Only three research projects has been either terminated or discontinued between year 2013 and 2017. Research accomplishments of the institutional scientists, collaborators and students are reflected in 166 quality research communications during the review period. The Research Management Committee (RMC) appointed by the Director, Veterinary Research, oversees the research program of the institute. This RMC consists of six selected senior VRI scientists but there are no external experts included.

Table 4: Yearly breakdown of the research program of VRI

Number of research projects	Year				
	2013	2014	2015	2016	2017
Continued to the next year	15	14	13	12	07
Completed	11	15	10	11	14
Discontinued	02	00	00	01	00
Total	28	29	23	24	21

Specific comments and recommendations:

- In relation to limited number of scientists, adequate number of research projects had been conducted with satisfactory number of scientific publications.
- National level awards have been received yet records are not maintained to reflect the achievement.

- Underreporting of individual scientists achievement, national level contribution and collaborations hinders the institutional research outlook.
- Formalization and monitoring of the RMC activities is a top priority as its smooth functioning determines the entire research program of the institute.
- RMC composition must including outside expertise especially from the universities and industry to increase the transparency and accountability.
- Adopt appropriate standard research progress monitoring, evaluation and impact assessment models and methods.

7.1. Research problem identification and prioritization:

Research problem identification and prioritization has been entrusted on the RMC (Annex 2). The TOR of the RMC clearly indicates that due consideration should be given for the research priorities identified by the CARP, NSF and the livestock sector development plan when deciding on the research agenda. Though it is not clear how RMC prepares research agenda, the research projects conducted by the VRI scientists seem to be well aligned with 2030 sustainable development goals in particular with the goals 2 and 3. Thus the research agenda of the institute is geared to address emerging challenges in animal production and health in future. However, stakeholder survey particularly from the industry, revealed a lack of consultations by the institute in research problem identification and prioritization which need to be given due consideration.

Specific comments and recommendations:

- Though most of the researches conducted by VRI scientist are well aligned with 2030 sustainable development goals number 2 and 3, no research projects are focused on goal number 13 (climate action) and 15 (life on land).
- Need to have a clear policy and mechanism on research problem identification and prioritization.
- Adequate stakeholder consultation before problem identification and prioritizing should be considered as a must.

7.2. Research proposal evaluation and research project progress monitoring mechanism:

Research proposal evaluation and monitoring mechanism is in place and is being done by the RMC. Once research agenda is finalized, RMC organizes research proposal presentations by the principle investigators. During the proposal presentations, RMC evaluates the research proposals and makes recommendations for further improvements. Criteria used by the RMC for evaluation of proposals are not clear and thus the institute requires a clear and transparent mechanism. RMC also organizes half yearly and year-end research progress review meetings where principle investigators

are needed to submit and present the progress of respective research works. The monitoring and evaluation mechanism during these two reviews are also not clear. Apparently these progress reviews are in-house meetings without involvement of any outside experts.

Specific comments and recommendations:

- Need to have a clear policy and mechanism on research proposal evaluation and progress monitoring including outside reviewers.
- The mechanism must incorporate into a proper recording and reporting system.

7.3 On going research projects:

Seven research projects that are continued from 2017 are being carried out during the first half of 2018. Additionally 12 number of new research project has been commenced during the first half of the year 2018. The details of the ongoing research are given in Table 5.

Table 5: Details of the ongoing research projects

	Research project title	Principal Investigator	Collaborating Scientists
1	Determining the prevalence of Neospora Caninum in bovines in Central and Uva province.	Dr. N. D. S. Dissanayake	Dr. S. S. Iddamaldeniya
2	Introduction of oil adjuvant vaccine against Newcastle disease for Layers.	Dr. H. Kothalawala	Dr. S. Puwanendiran
3	Efficient utilization of minerals in raw materials used in poultry feed; Calcium & Phosphorus	Dr. N. Priyankarage	Dr. W. M. B. P. Weerasinghe, Dr. A. P. D. G. Pathirana, Dr. M. W. C. D. Palliyeguru
4	Examine the efficacy of selected probiotics and Photobiotics to replace antibiotics in poultry feed	Dr. M. W. C. D. Palliyeguru	Dr. N. Priyankarage
5	Immuno Histopathological Study on Porcine Reproductive and Respiratory Syndrome (PRRS) and Porcine Parvo Virus (PPV) infection	Dr. T. Manchanayake	Dr. S. Puwanendiran, Dr. G. I. S. Perera, Dr. P. Bandara, Dr. K. G. J. S. Disnaka

6	Study on Use of Histopathological and Immuno Histochemical Techniques for Detection of Bovine Tuberculosis	Dr. G. I. S. Perera	Dr. T. Manchanayake, Dr. P. S. Fernando, Dr. H. R. N. Jinadasa.
7	Identification of reliable method for laboratory diagnosis of tuberculosis using nasopharyngeal swabs and saliva of PPD positive cattle and buffalo	Dr. P. S. Fernando	Dr. N. Liyanagunawardena, Dr K. M. S. G. Weerasooriya Dr. C. D. Gamage
8	Occurrence of Ethanol unstable milk and its relation with physico-chemical characteristics of milk	Dr. U.L.P. Mangalika	
9	Development of strip based methods for detection of common adulterants in milk	Dr. U.L.P. Mangalika	
10	Characterization of six isolates of A.marginale found from Sri Lanka to obtain the best isolate for cell culture vaccine inoculum	Dr. S.S. Iddamaldeniya	
11	Development of an A. marginale blood vaccine to control the infection at Ridiyagama farm	Dr. S.S. Iddamaldeniya	
12	PCR based detection of cow milk adulteration with fresh goat milk in Kandy district	Dr. A.P.D.G. Pathirana	
13	Detection and characterization of MRSA, ESBL and carbapenem resistant E. coil among isolates in bovine mastitis	Dr. M.A. Roshan Priyantha	
14	Characterization of ESBL producing E.coil and fluoroquinolone resistant Salmonella species in commercial broilers	Dr. M.A. Roshan Priyantha	
15	Isolation, Identification and characterization of strains of contagious ecthyma(orf)	Dr. S Puvanendiran	

	virus from goats for development of vaccine		
16	Establishment of fatty acid profiles of animal feeds and products	Dr. W.M.P.B. Weerasinghe	
17	Identification of native wild life species in extinction to prevent illegal slaughtering	Dr. MWCD Palliyeguru	
18	Community based activity survey of dog rabies in Karuwappenkerny Grama Niladari Division in Bataloa District in Sri Lanka	Dr. J K H Ubeyrathne	
19	Molecular detection and genetic characterization of Theileria parasites among cattle in Sri Lanka	Dr. N A D E M Guanasekara	

Specific comments and recommendations:

- Research collaborations are inadequate.
- Ongoing research projects targeting diverse animal species including companion and wildlife species is noteworthy.

7.4. Research projects completed during 2013 to 2017:

Details of the research projects completed during the review period are given in Annex 3. A total of 61 (78%) research projects has been completed during the review period and notably more than 95% of the completed research has been concluded on time as scheduled while only three research project have got extended time for completion. Only three research projects have been either terminated or discontinued between year 2013 and 2017.

Specific comments and recommendations:

- Though 78% of the research projects are completed their output, outcome and the impact are not documented.
- Underreporting of the research achievements and collaborations are of a grave concern.

7.5. Research papers and scientific communications:

Research accomplishments of the institutional scientists, collaborators and students are reflected in 166 quality research communications during the review period (Table 5). There is slow increase in the total number of research communications per year. However limited number of high impact journal publications per year is a concern. Most of the research communications are done in local scientific forums and conferences as abstracts. Very limited publications have been made targeting the general public and the industry.

Table 5: Yearly breakdown of the research publications by the VRI scientists

Publication type	2013	2014	2015	2016	2017	Total
Peer reviewed journal articles - international	05	06	02	14	10	37
Peer reviewed journal articles - local	00	00	01	01	01	03
Symposia proceedings - International	02	00	00	02	03	07
Symposia proceedings - Local	25	17	27	21	26	116
Other	01	02	00	00	00	03
Total	33	25	30	38	40	166

Numbers of new products are developed but the institution has not given due thought on intellectual property rights and patenting of the products. Apparently no attempt has been made on commercialization of research outcome. Further stakeholder awareness on the products developed by the VRI is scanty.

Specific comments:

- Limited number of high impact journal publications per year is a concern.
- Exposure to the international research conference is not adequate. This may be linked to inadequate research collaborations with foreign R & D institutes and scientist.
- Very limited publications have been made targeting the general public and the industry.
- Numbers of new products are developed but the institution has not given due thought on intellectual property rights and patenting of the products.
- Apparently no attempt has been made on commercialization of research outcome as there is no institutional mechanism.

7.6. Dissemination of R & D information:

Dissemination of R & D information has been entrusted upon the RMC through liaison with the D/HRD, DAPH. Proper implementation and efficiency of this mechanism is questionable as stakeholder survey indicates little or no dissemination of R & D

information to them. No evidence provided on dissemination of R & D findings to the general public through print and electronic media. However R & D findings are disseminated to the scientific community through the abstract presentations at various scientific forums and through journal publications. VRI day seem to provide some avenue for R & D dissemination and there is a lot of room to formalize this important aspect.

Specific comments and recommendations:

- Inadequate or lack of knowledge transfer to the general public through print and electronic media is a problem.
- Formalization of the dissemination of R & D information through liaison with the D/HRD, DAPH.
- Establishment of a separate division within the VRI for this purpose could be more effective.

7.7. R & D links with other divisions/institutes:

Data on R & D links are not readily available. Yet detailed analysis of the research projects and publications indicate existence of research collaborations between VRI scientists and other R & D institutes and Universities. There is strong R & D links among different divisions of the VRI and the DAPH but according to the data available the R & D links with other institutes including local and foreign universities are not strong. Apparently there is only one international research collaboration currently exists according to the data provided. Only five collaborative research involving the academic staff of Sri Lankan Universities are reported. R & D links with other national research institutes are not available.

Specific comments and recommendations:

- Inadequate research collaboration and underreporting of existing collaborations is a concern.
- Research collaborations need to be built into the institutional annual action plan.

7.8 Contributions to national level development projects, national level organizations:

Number of VRI scientist make contributions to the national development through their participation in national level meetings and national level organizations. Such contributions are not recorded in a satisfactory manner. Selected national steering committees where VRI scientist contribute is listed below.

National Animal Breeding Committee.

Sri Lanka's National Strategic Plan for Combating AMR.

Food Advisory Committee.

Contribution by the VRI scientist to the following professional associations is noteworthy.

Sri Lanka Veterinary Association.
 Sri Lanka Veterinary Council.
 Sri Lanka Collage of Veterinary Surgeons.
 Sri Lanka Association of Animal Scientists.
 World Poultry Science Association- Sri Lanka Branch.
 Sri Lanka Association of Laboratory Animal Scientists.

Specific comments and recommendations:

- Underreporting of the national level contribution by the VRI scientists impedes the institutional research outlook.
- A systematic and proper research reporting and recoding system is a must.

8. SERVICES PROVIDED BY THE VRI

The VRI provides various services to the stakeholders as one of their mandatory functions. Production of vaccines for various infectious diseases prevailing in the country is an important function that helps preventing economically important animal diseases. The types of vaccines and the amounts to be produced are decided by the Department of Animal Production and Health (DA&PH) while some vaccines are produced on requests of the private sector. The VRI had always met the targets in producing vaccines. The amount of doses of vaccines produced and the amount of doses issued to the stakeholders are given in Table 6. During the review period, the VRI has produced vaccines against HS, BQ, FMD, ND, Tick fever, Brucellosis and Fowl cholera while Swine Pasturellosis Vaccine and Wart vaccine have been produced since 2015. From the year 2013 to 2017, a significant increase in the production can be seen only for HS vaccine.

Table 6. Amount of vaccines produced and issued to the stakeholders during 2013 to 2017

Type of Vaccine	Doses produced and issued				
	2013	2014	2015	2016	2017
Hemorrhagic Septicemia (Oil/Alum) Vaccine	69,300 (69,301)	23,100 (23,100)	129,910 (129,910)	147,290 (147,290)	322,520 (322,520)
Black Quarter (BQ)	211,233	149,622	142,692	193,842	197,142

Vaccine	(250,008)	(156,981)	(142,692)	(193,842)	(197,142)
Foot and mouth disease (FMD) Vaccine	501,000 (501,000)	175,780 (121,780)	3,260 for trial only	178,395 (178,395)	171,900 (171,450)
Tick fever Vaccine	17,060 (7,546)	5,000 (2,200)	0 (3,815)	13,500 (3,620)	420 (720)
Brucella S19 Vaccine	1,500 (1,400)	2,600 (5,600)	28,000 (7,900)	15,000 (13,500)	0 (8200)
New castle Disease (ND) (Primary/Booster) Vaccine	6,492,800 (6,376,300)	1,443,000 (2,827,100)	4,858,200 (4,858,200)	5,873,200 (5,873,000)	4,979,600 (4,979,600)
Fowl cholera Vaccine	234,960 (234,960)	286,110 (286,110)	356,730 (356730)	356,400 (356,400)	179,190 (179,190)
Swine Pasturellosis Vaccine	0	0	8,500 (8,500)	4,000 (4,000)	3,000 (3,000)
Wart vaccine	0	0	8 (8)	5 (5)	4 (4)

(): values within the parenthesis are doses issued.

As shown in Table 7, various diagnostic agents, therapeutic agents and yoghurt/curd starter cultures had been produced and issued to stake holders by the VRI. Pullorum antigen is the mostly produced antigen which has had an increasing demand during the past 5 years. On the other hand, Brucella antigen was issued only during 2014. Udder infusion base was issued only during 2013 but udder infusion vials had been issued through out with an annual increase. The number of yoghurt culture vials issued to stake holders was reduced annually to 52 vials during 2017 but the curd culture vials issued has been increased from 92 vials in 2013 to 352 vials in 2017.

Table 7. Diagnostic agents, Therapeutic agents and Starter cultures issued to stake holders

Reagent	Quantity issued				
	2013	2014	2015	2016	2017
Diagnostic reagents:					
CMT reagent (L)	22	18	35	42	34.7
Brucella antigen (doses)	0	6,500	0	0	
Pullorum antigen (doses)	72,300	78,759	104,711	196,367	158,362
RBPT antigen (doses)	1,700	1,400	185	210	165
Therapeutic reagents:					
Teat dip solution (L)	257	24.5	51.5	245	70.5
Udder infusion base (Vials)	363	-	-	-	-
Udder infusion (vials)	5,000	1,705	8,155	19,478	24,348
Starter cultures:					
Yoghurt culture vials	115	73	195	56	52
Curd culture vials	92	162	180	363	352

CMT: California Mastitis Test

RBPT: Rose Bengal Plate Test

Central Poultry Research Station (CPRS):

The Central Poultry Research Station has been established by the VRI to support research in poultry. The facility consists of poultry cages and a hatchery and was used to conduct a breeding program on village chicken. The Station is located next to the poultry breeder farm and hatchery belonging to the National Livestock Development Board (NLDB) which was started in 1954.

In the first instance, selection of the location for the research station is not ideal as there is a problem of bio-security to the NLDB breeder farm. By keeping village chicken birds collected from all over the country in this location can be a disease threat to the Breeder Farm.

Currently, the facility is not fully utilized and a part of the sheds/cages are abandoned. There is a modern egg incubator machine which runs under capacity because of insufficient setter space and insufficient hatching eggs. A flock of a village chicken type developed by the CPRS is maintained at the station to produce village chicken day-old chicks. Even though there is a high demand for village chicken chicks, the station is not utilizing the resources fully to take the advantage. The total flock including chicks, pullets, hens and cockerels consists of 1804 birds and the station is currently producing about 2,300 chicks (both male and female) per week (Table 8). The hatchery capacity is 8,400 eggs and eggs are set weekly.

Apart from the production of day-old chicks, there are no research programs or any other major activity going on at the Station. It should be noted that there is an experimental farm maintained by the VRI at a location closed to the VRI at Gannoruwa. Poultry feeding experiments are usually carried out at this location as there are sufficient cages and other facilities.

Table 8. Number of day-old chicks issued from the Central Poultry Research Station (CPRS), Kundasale

Type of chicks	Quantity issued				
	2013	2014	2015	2016	2017
Day old chicks	82,497	104,687	108,867	120,920	110,250
Day old parent chicks	-	-	500	-	-
Two week old chicks for Research	1,384	892	-	-	-
One month old chicks for Animal Park	97	177	-	-	-

Other services provided on request:

The VRI caters to various requests coming from livestock farmers. These include investigation of various samples for disease diagnosis, quality testing of feed, milk/milk products, soil, water, plants and seeds, postmortems and feed ration formulation. The amount of work done in this regard is summarized in Tables 8 and 9. As shown in Table 8, the number of samples investigated by the VRI for parasites, microbiology, histopathology, CMT, ABST etc. have been remarkably increased annually during the review period. Quality testing of various samples doubled from 2013 to 2017.

Table 8. Examination of specimens, quality testing, and species identifications done during the review period

Specimen Type	No. of Samples				
	2013	2014	2015	2016	2017
Different samples investigated (parasites, microbiology, histopathology, CMT, ABST etc.)	9,768	6,994	28,476	34,141	43,866
Analysis, identification and quality testing of samples (feed, milk & milk products, soil, water, plants and seeds)	2,264	2,124	4,791	6,520	4,641

Table 9. Field and laboratory investigations carried out by the VRI

Investigation Type	No. of investigations				
	2013	2014	2015	2016	2017
Field Disease Investigations	8	7	15	8	11
Postmortems	535	662	683	820	1988
No. of Lab Disease investigations	322	161	6	527	798
Field Investigation into nutritional problems	10	24	33	25	2
Field investigation into milk quality control problem	0	0	0	0	1
Ration formulations	119	77	64	40	70
Confirmation of contagious / Notifiable diseases	7	79	39	16	15

9. STAKEHOLDER SURVEY

A stakeholder survey was carried out using a pretested questioner. Twelve stakeholders including livestock/poultry farmers and feed millers who obtain various services from the VRI were involved in the survey. The result reveal that all the stake holders interviewed obtain services/material from the VRI less than 5 times per year and mostly wanted service (83 %) has been investigation of specimens for disease diagnosis. With regard to type of materials/products available at the VRI, 17% of the stakeholders had asked for diagnostic reagents. However, 83% of the stakeholders have not responded. Great majority (75%) of the stakeholders were satisfied with services provided by the VRI, but 42 % of them find that the VRI takes too long time to provide requested services. All stakeholders are happy with the fees charged by the VRI. According to 66% of the stakeholders, the VRI has satisfactory capacity in testing laboratories but 17 % are not happy with the facilities available. Eighty four percent of the stakeholders were not happy with the information provided by the VRI on their services and products. This indicated that the VRI either do not provide any information along with their services/products to the clients or the information provided were not adequate. The survey also reveals that the VRI in most of the cases do not obtain a feedback from their clients whenever they provide services or materials/products. If a feedback had been obtained, the VRI could have delivered a better service to the stakeholders. In spite of the above deficiencies, 75 % of the stakeholders responded that they will most likely recommend VRI to other persons in the industry. Probably this is because there is no other choice for most of them.

10. ANNUAL BUDGET AND ALLOCATION OF RESOURCES, FINANCIAL MANAGEMENT

The capital and recurrent budget allocated to the VRI for the year 2018 is given in table 10. Financial progress of the VRI during the review period is presented in Table 11.

Table 10: Total Allocation – 2018 – Veterinary Research Institute

CAPITAL		
Se . No.	Description	Amount (Rs.)
1	Repair of buildings and structures	11,000,000.00
2	Furniture and office equipment	200,000.00
3	Plant, machinery and equipment	5,000,000.00
4	Land and land improvement	1,000,000.00
5	Implementation of Livestock Research	35,000,000.00
6	Production of FMD Vaccine	25,000,000.00
7	Establishment of Laboratory (DT) for VRI	5,000,000.00
8	Mastitis control Programme	15,000,000.00
9	Quality assurance for animal origin feed for food safety and export facilities	70,000,000.00
10	Production of Compatible and High Quality Vaccines Locally for Substitution of Vaccines imported	94,000,000.00
Total		261,200,000.00
RECURRENT		
Se . No.	Description	Amount (Rs.)
1	Overtime and days pay	375,000.00
2	Travelling (Local)	600,000.00
3	Supplies : Stationary	300,000.00
4	Fuel	450,000.00
5	Animal feed and Uniform	4,000,000.00
6	Medical Supplies	100,000.00
7	Other	2,250,000.00
8	Maintenance: Vehicles	750,000.00
9	Machinery & Equipment	150,000.00
	Building construction	200,000.00
10	Contractual Services: Electricity and water	5,000,000.00
11	Other	4,500,000.00
	Total	18,675,000.00

Table 11: Financial Progress during the review period.

	2017			2016			2015			2013		
	Allo ¹ (Rs. Mn.)	Exp ² (Rs. Mn.)	Ach ³ %	Allo ¹ (Rs. Mn.)	Exp ² (Rs. Mn.)	Ach ³ %	Allo ¹ (Rs. Mn.)	Exp ² (Rs. Mn.)	Ach ³ %	Allo ¹ (Rs. Mn.)	Exp ² (Rs. Mn.)	Ach ³ %
Recurrent	25.6	32.2	125.9*	21.2	30.9	145.7*	22.3	28.3	126.67*	11	10.9	98.7
Capital	13.7	10.5	76.3	10.5	6.8	65.1	7.3	6.8	92.61	19.3	27.3	141.2*
Special capital projects	96.5	86.9	90.1	89.0	87.9	98.8	91.5	87.5	95.63	92	75.4	81.9

Allo¹ – Allocation, Exp² – Expenditure, Ach³ - Achievement. Date related to 2014 not available. *Certain transfers were done during the year

11. GENERAL COMMENTS & SUGGESTIONS FOR IMPROVEMENT

11.1 Commendations:

- The institute has shown a satisfactory financial progress during the review period. Annual expenditure percentage exceeded 70 %.
- VRI had been able to secure 4 special Projects to upgrade facilities in several divisions.
- In spite of limited number of scientists, adequate number of research projects had been conducted and satisfactory scientific publications has been made.
- There is a significant contribution to national level committees by VRI scientists.
- The mobile test kit to test the adulteration of milk at field level developed by the Dairy Technology Laboratory which was established 3 years ago is commendable. The laboratory has made a remarkable progress since its establishment in 2015.
- The VRI has always achieved targets given by the DAPH in relation to vaccine production.
- The link established by CVIC for Proficiency testing (PT) arrangements with CSIRO (Australia) and ITI (Sri Lanka) is commended. CVIC is also in the process of preparing documents to apply for ISO 17025.
- The research programs conducted by VRI are in par with the National priorities as well as with 2030 Sustainable Development Goals.
- Current research activities have been expanded to include other animal species such as companion animals, wildlife and fish.
- About 95 % of the completed research projects had been completed on time.
- There is an increasing trend in publishing research articles in international peer reviewed journals.

11.2 Constraints/ Limitations:

- Vision, mission statements of VRI do not match with those of DAPH. Though the previous review committee also had commented on this, their recommendations are not implemented yet.
- The Vision and Mission of both DAPH and VRI do not address the statutory authority vested by relevant Acts and Regulations.
- The exact position and the role of ADG/ veterinary research is not clear.
- There are problems and excessive delays in recruitments and promotions of scientific officers.
- Director VRI and most of the Divisional Heads were serving on acting basis for a long period (for years).
- There is no proper human resource development plan.
- There are difficulties encountered by scientists in obtaining leave for overseas training. This happens especially when applications for scholarships were submitted online. At the Ministry level, leave applications are turned down as the applications for scholarships had not been submitted through proper channels which is not relevant for online applications.
- Some of the TOR activities listed for Research management committee are not fulfilled efficiently and effectively. E.g Progress monitoring, liaison with Director (HRD).
- Though there is a formal mechanism to disseminate information, this system is not functioning effectively.
- Lack of motivations for higher level postgraduate training (Ph.D.) of scientists. According to the comments made by scientists, Ph.D. level training is discouraged. This had contributed to leaving of scientists from the VRI.
- There are serious reporting delays in some of the laboratory services.
- There is no emergency service (hotline, 24hour service,) at the VRI. However, the DAPH has an emergency service (Hotline) but relevant messages are not passed to the VRI in time.
- Stakeholders are not well aware about services/materials provided by the VRI.
- There is a serious communication gap between the VRI and the Provincial set up of the DAPH.
- The Central Poultry Research Station at Karandagolla is currently underutilized for research activities.
- There is no effort taken to expand the vaccine production or to improve the facilities available at the vaccine production Laboratory at Polgolla during the review period. However, the laboratory has received a special Project this year to improve its facilities.
- There is no adequate promotion made on the services/materials provided by the VRI to stakeholders.
- Trained scientists in certain major disciplines such as pasture development and animal breeding are not available.

- An action Plan and a Procurement Plan is developed by the DAPH which includes the VRI as well. A separate Action Plan or a Procurement Plan is not available for the VRI.
- Some of the important contributions of VRI are not recorded/reported in annual reports or any other official documents. There are no reports available on national level awards, collaborations with other institutions etc.
- The VRI scientific publication list do not include Radio & TV programs, Newspaper articles etc.
- There is no research impact assessment mechanism.
- There is a general belief that middle level cadre positions currently available are not sufficient enough to deliver a better job.
- A software for statistical analysis of data is not made available to scientists.
- There is no minor Procurement committee for the VRI. All procurements should go through the Procurement committee of the DAPH which causes prolong delays in procurements.

11.3 Recommendations for improvement:

- Take immediate actions to fill cadre vacancies, especially the scientific staff.
- Avoid long term acting arrangements in senior positions like Directorate and Head of Divisions and Units. Acting arrangements caused some delays in decision making.
- Prepare and follow human resource development program to ensure quality of the research and services.
- Avoid long delays and obstacles in obtaining overseas leave for foreign training both long term and short term.
- Strengthen the laboratory facilities to cater expanding demand for statutory, reference purposes.
- Staff should encourage to obtain memberships in professional bodies to broaden their professional recognition. Initiative should come from VRI scientists.
- ISO 9001 certification commenced in 2014 had helped specially to bring some management aspects, documentation in to some order, but this certification did not continue. Recommend to consider commencement of some accreditation system both for management and laboratories involved in statutory work.
- The VRI staff should encourage to apply for patent certification for their innovations.
- A separate Action Plan and a Procurement Plan to VRI should be developed and follow up actions should be taken.
- MIS systems should be introduced to help Research planning, Prioritization, Monitoring, Impact assessment, Information dissemination, workload calculation etc.
- Strengthen the Research-Extension link to disseminate R&D findings, identify research problems and get stakeholder feedback. Activate the formal link with Extension Division (DAPH) and Provincial Departments of DAPH.
- Establishment of a revolving fund for urgent use (purchase/repair) and also to support training needs (Travel grants) of scientists.

- Re-constitute the Research Management Committee (RMC) incorporating outside experts and regularize its mandated activities. Establish a formal monitoring mechanism to ensure proper functioning of RMC.
- Establish a minor Procurement Committee at the VRI to avoid current delays in procurements.
- Make available for scientists an appropriate statistical software package.
- Conduct a cadre review to update needs of cadre.

12: ACKNOWLEDGEMENT

The review team wishes to acknowledge the support extended by the following institutions and persons.

- Sri Lanka Council for Agricultural Research Policy
- Director General and Staff of the Department of Animal Production and Health
- Director and Staff of the Veterinary Research Institute
- Stakeholders of the Veterinary Research Institute who participated in the survey.

13. ANNEXURES

13.1 Annex 1: Terms of Reference (TOR)

External Review of the Research Institution in the National Agricultural Research System (NARS)

Objectives

Objectives of this independent review are;

- To assess the quality, cost effectiveness, relevance and impact of the scientific programmes carried out by the **Institute** to be reviewed in order to ensure that Government funds are being effectively utilized to address the sector needs.
- To look into the appropriateness of the **Institute** research agenda to meet the emerging challenges in the future and in particular in meeting with 2030 sustainable developmental goals and also national targets ensuring food and nutritional security.
- To look into all the aspects of the **Institute** functions directed towards research and development, dissemination of technology through extension and services offered to its stakeholders and its impact and usefulness to address the timely needs.
- To identify any deficiency in the procedures adopted by the **Institute** in recognizing the research needs of the particular sector
- To give advices on effective planning and implementing of future programmes of the **Institute**.

Scope

To achieve the above objectives the Review Panel is expected to pay particular attention to the following aspects:

1. The mission of the **Institute** and its interpretation with respect to;

- Research and development focuses on immediate and long term needs in Sri Lanka
- Transferring technological recommendations/Research outcomes to relevant stakeholders.
- The policies and directive of the SLCARP and the relevant Ministry regarding the appropriateness of **Institution's** Mission in the light of important changes taking place in production and product development in Sri Lanka
- Appropriateness of the roles of relevant partners in the formulation and implementation of the **Institution's** research strategy and priorities
- Conservation of the natural resources, impact of **Institution's** practices on natural environment and long -term environmental sustainability

2. The objectives and relevance of the present programme of work, budget and its forward plans for the next five years in relation to;

- The **Institution's** mandate and its criteria for allocation of resources and planning procedures adopted by the Institution and the mechanisms for their formulation
- The **Institution's** rationale for its presents allocation of resources among research, extension, information exchange and other activities

3. The content and quality and relevance of the scientific work with particular reference to:

- The results of research during the past 5 years and their practical applicability and economic feasibility including the impact on the Relevant Sector
- The current and future research plan and the role of the various scientific disciplines therein
- The degree and extent to which the specific needs of the various stakeholders were studied and analyzed in the formulation of the past and current research plans
- The information exchange and extension programmes and the participation of the research staff therein
- The adequacy of research support and facilities
- The management of the scientific and financial resources of the **Institution** and the coordination of its activities
- Level of national and international recognition of the **Institution** and its scientific staff
- Cooperation/collaboration with universities, regional and international research organizations
- Adequacy of publications of research findings

4. The impact and usefulness of the **Institute** activities in relation to:

- The recorded and potential impact of the **Institution's** research
- Cooperation with other research institutes and with national development programmes, private sector organizations and other stakeholders

5. Examine the extension programme of the **Institution** to determine:

- Its effectiveness in the relevant sector
- The effectiveness of its information exchange programmes and the timelines, quality and relevance of the technologies generated and its publications
- The effectiveness of transferring technological recommendations based on research outputs
- Mechanism adopted to get the feedback of stakeholders on research outputs and then planning future R&D
- The identification of problems and constraints impeding the extension programmes / dissemination of technological recommendations to the stakeholders.

6. The quality and effectiveness of the management of the **Institution** in relation to;

- Constitution of research, advisory or sub-committees of the Board
- Adequacy in coordination to ensure excellence of the research programme and related activities
- Competency and professionalism of the directorate and the senior management of the **Institution** and the definition of roles, organization and quality of the leadership of the **Institution** and rapport with staff
- Nature of the budgetary review and evaluation processes and the involvement of important stakeholders in the above stability of funding and the relationships between budget, institutes policies and plans and the effectiveness of utilization of resources
- Procedure for determining staffing requirement at all levels for selection evaluation and compensation of staff
- Administrative of fiscal, purchasing and supply, personal computers, housing and other facilities including transport and general management services and their effectiveness in supporting the scientific staff

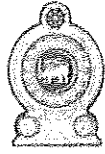
7. Services provided by the **Institution**

- Consultancy and Advisory Services
- Laboratory Services
- Pest Control and Fumigation of warehouses

8. Overall analysis through;

- A SWOT analysis to identify internally controllable and uncontrollable factors

13.2 Annex 2: TOR of the research management committee



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VETERINARY RESEARCH INSTITUTE
 Department of Animal Production and Health

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- ✓ Dr. U.L.P. Mangalika (Chair Person) (Deputy Director/Research)
- Dr. G.A. Gunawardana (Deputy Director/ Veterinary Research)
- Dr. P.S. Fernando (Head/ Bacteriology)
- Dr. H. Kothalawala (Head/ Virology)
- Dr. M.W.C.D. Palliyeguru (Head/ Animal Nutrition)
- Dr. W.M.P.B. Weerasinghe (Head/ Pasture & Fodder)

Research Management Committee – 2018

I am pleased to inform you that you have been appointed to Research Management Committee of Veterinary research Institute. You are expected to do following functions.

1. Evaluating, guiding and technically monitoring research projects at VRI. In preparation of research priorities and guidelines, documents on research priorities of done by CARP, NSF etc. apart from Livestock Sector Development Plan may be used. You can also use the duty lists in aiding the process.
2. Organizing research proposal presentations
3. Organizing half yearly research reviews.
4. Technical Resource Development including human resources to support research programs.
5. Conducting Year End Annual Research Reviews
6. Liaise with D/HRD for dissemination of research finding.

Director VR

Copies:
 Director General/DAPI
 ADG/VR, D/HRD
 DDIR, DD/VR, DD/TS, HOD's (VRI)

ශ්‍රී ලංකා වෛද්‍ය පර්යේෂණායතනය, පලුක නෛත්‍රීය විද්‍යාලය, කොළඹ 05, මධ්‍යම, ශ්‍රී ලංකාව. P.O. Box 28, Colombo 05, Sri Lanka.

Sri Lanka
 පලුක නෛත්‍රීය විද්‍යාලය / Telephone Nos

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විද්‍යාලය / Email: info@vri.lk / vria@vri.lk / වෙබ් / Internet: Web: www.vri.lk

13.3 Annex 3: Research projects completed during the review period

	Research project	Investigator	Collaborators	Duration (Years)	Year Commenced	Year Completed
1	Study on quality and strategies to improve the quality of locally produced maize	Dr. N. Priyankarage	Dr. S. P. Gunarathne, Dr. W. M. P. B. Werasinghe, Dr. M. W. C. D. Palliyaguru, Dr. A. P. D. G. Pathirana, Dr. P. S. Fernando	2	2012	2013
2	Cotton Seed Meal & Full Fat Soya as alternatives for SBM in Poultry; Levels, improvements using enzymes & Iron supplementation	Dr. A.P.D.G. Pathirana	Dr. N. Priyankarage, Dr. S. S. P. Silva	2	2013	2014
3	Effects of different treatments of rice straw on milk yield and quality	Dr. M.W.C.D. Palliyeguru	Dr. N. Priyankarage, Dr. W. M. P. B. Weerasinghe, Dr. A. P. D. G Pathirana, Dr. U. L. P. Mangalika	1	2013	2013
4	Effect of feed grade antibiotics on dietary trypsin inhibitor activities and intestinal health in broiler chickens	Dr. M. W. C. D. Palliyeguru	Dr. N. Priyankarage, Dr. W. M. P. B. Weerasinghe, Dr. U.L.P. Mangalika, Dr. S. S. P. Silva, Dr. A. Thiskumara	3	2012	2014
5	Formulation and production of dense total mixed ration (TMR) blocks for ruminants and its effect on the production performance in dairy cows	Dr. W. M. P. B. Weerasinghe	Mr. G. G. C. Premalal, Mr. R. M. C. Chandrasena, Dr. N. Priyankarage	3	2012	2014

6	The freezing point of Milk: The influence of various factors and their bearing on the detection of added water	Dr. U. L. P. Mangalika	Dr. N. Priyankarage, Dr. M. W. C. D. Palliyeguru	2	2013	2014
7	Detection of mycoplasma syanoviae in commercial broilers in NWP	Dr. M.A.R. Priyantha	Dr. P. S. Fernando, Dr. N. Liyanagunawardana	1	2013	2013
8	Development of udder infusions for lactating and dry cow therapy	Dr. P. S. Fernando	Dr. MAR Priyantha, Dr. N. Liyanagunawardana, Dr. D. L. N. Kumuduni, Dr. T. Manchanayake	3	2012	2014
9	Evaluation of the immunity development & economic impact of the usage of SG 9R live <i>Salmonella</i> vaccine	Dr. N. Liyanagunawardana	Dr. P. S. Fernando, Dr. M.A.R. Priyantha, Dr. H. Kothalawala, Dr. M. Kodithuwakku	2	2013	2014
10	Preparation of Direct vat Set culture for yoghurt	Dr. P. S. Fernando	Dr. M.A.R. Priyantha, Dr. N. Liyanagunawardana	2	2012	2013
11	Economic feasibility of management of solid livestock waste through Vermi-composting with crop residues and earth worms	Mrs. I. K. Leukebandara	Prof. Mrs. S Premarathne	3	2013	2015
12	Socio – Economic Impact of Foot and Mouth Disease in Sri Lanka	Mr. R. M. Chandrasena	Dr. R. M. Ariyadasa	2	2012	2014

13	An Epidemiological Study on Bovine Babesiosis in Selected Provinces in Sri Lanka	Dr. N. D. S. Dissanayake	Dr. M. B. Nawarathne, Dr. S.S. Iddamaldeniya	3	2012	2014
14	An economic analysis of controlling immature paramphistomiasis in cattle at Galnewa VS range	Dr. S. S. Iddamaldeniya	Dr. M. B. Nawarathne, Dr. N. D. S. Dissanayake	2	2013	2014
15	Establishment of a confirmatory diagnosis method for Cerebro Spinal Nematodiasis (CSN) in goats	Dr. S. S. Iddamaldeniya	Dr. M. B. Nawarathne, Dr. N. D. S. Dissanayake	1	2013	2013
16	Evaluation of some multi-cut fodder Sorghum varieties for dairy development in Sri Lanka	Mr. G. G. C. Premalal	Prof. Mrs. S. Premarathne, Dr. W. Jayawardana, Mr. M. Z. Gafoor	2	2013	2015
17	Economic Evaluation of Seed Production for Pasture development in Sri Lanka	Mr. G. G. C. Premalal	Prof. Mrs. S. Premarathne, Dr. W. Jayawardana	2	2012	2013
18	Investigation of Avian Malaria and Leucocytozoon infections in commercial poultry farms in	Dr. S. M. T. S. Manchanayake	Dr. S. S. Iddamaldeniya, Dr. G. I. S. Perera, Dr. H. Kothalawala, Dr. W. M. P. Bandara	2	2013	2014

	Sri Lanka.					
19	Pathological changes of tissues after ingestion of mycotoxins	Dr. G. I. S. Perera	Dr. S. M. T. S. Manchanayake, Dr. P. S. Fernando, Dr. H. Kothalawala, Dr. N. Priyankarage, Dr. P. Jayasooriya	2	2013	2014
20	Microbial load, composition, keeping quality and prevalence of Listeria spp. in Ready to drink pasteurized milk products	Dr. J.K.H. Ubeyratne	Dr. M. D. N. Jayaweera, Dr. U. L. P. Mangalika	2	2012	2013
21	Assessment of potential disease threat posed by backyard poultry in Sri Lanka	Dr. U.K.S.P. Alexander	Dr. M D N Jayaweera, Dr. J.K.H. Ubeyratne, Dr. P D N Bandara	2	2012	2013
22	Foot and mouth disease outbreaks foci of origine and route of spread of the infection.	Dr. S.A.E. Abeyratne	Dr. H. Kothalawala, Dr. S. Puvanendiran, Dr. K. Jayasundara	2	2012	2013
23	A comparative study to establish local production facility for bovine serum suitable for cell cultures & vaccine production.	Dr. S.A.E. Abeyratne	Dr. H. Kothalawala, Dr. S. Puvanendiran, Dr. K. Jayasundara	2	2012	2014
24	Investigation of immune response of locally produced vaccines against Newcastle Disease in commercial	Dr. H. Kothalawala	Dr. S. Puvanendiran, Dr. K. Jayasundara, Dr. S. A. E. Abeyratne	3	2011	2013

	layers					
25	Impact of PPRS and PPV on swine production and develop in house assays for the diagnosis	Dr. S. Puvanendiran	Dr. H. Kothalawala, Dr. S. A. E. Abeyratne, Dr. G. Rajapaksha	2	2013	
26	Determination of genetic composition of a dairy cow in NWP	Dr. W. D. Abayawansa	Dr. K. M. S. G. Weerasooriya, Dr. H.P.V.D.S. Bandara, Dr. A.D.N. Chandrasiri	2	2012	Discontinued
27	Critical analysis of factors affecting conception rate after artificial insemination in cows	Dr. W. D. Abayawansa	Dr. M. B. D. Lakmali, Dr. H.P. V. D. S. Bandara, Dr. A. D. N. Chandrasiri	2	2012	Discontinued
28	Comparison of the production performance between local poultry in CPRS and their crosses with brown shaver and to find out their genetic relationship	Dr. K. M. S. G. Weerasooriya	Dr. W. D. Abayawansa, Dr. G. Gunawardana	2	2013	2014
29	Evaluation of nutritional status of shrimp and quality of available shrimp feeds in Sri Lanka:	Dr. N. Priyankarage	Dr. S.S.P. Silva, Dr. P. S. Fernando, Dr. R. Munasinghe	2	2014	2016
30	Effect of <i>Saccharomyces cerevisiae</i> , NaOH treatment and nutrient supplementation of rice straw as a night feed for dairy cows on	Dr. M.W.C.D. Palliyeguru	Dr. N. Priyankarage, Dr. W. M. P.B. Weerasinghe, Dr. A.P.D.G Pathirana, Dr. U.L.P. Mangalika	1	2014	2014

	milk yield & quality					
31	Isolation and identification of aflatoxin producing fungi and determination of total aflatoxin levels at different growing stages of maize plant and harvest in Anuradhapura district during Yala & Maha	Dr. A. P. D. G. Pathirana	Dr. N. Priyankarage, Dr S. S. P. Silva, Dr. P. S. Fernando. Dr, R. Munasinghe	2	2014	2015/2017
32	Compare the production performances between local poultry in CPRS and their crosses with brown shaver the genetic relationship.	Dr. D. M. W. C. B. Dissanayake	Dr. K. M. S. G. Weerasooriya, Dr. G. Gunawardana	1	2014	2014
33	Prevalence and diversity of <i>Bovine leptospirosis</i> in Kurunegala district	Dr. P. S. Fernando	Dr. M. A. R. Priyantha, Dr. N. Liyanagunawardana Dr. Candika Gamage Dr. C. Karunarathne	2	2014	2016
34	Determination of antimicrobial susceptibility pattern and minimum inhibitory concentration of bacteria causing bovine mastitis in Sri Lanka	Dr. K. M. S. G. Weerasooriya	Dr. P. S. Fernando, Dr. N. Liyanagunawardana	1	2014	2014

35	Study on natural resistance of indigenous village chicken to Salmonella Infection comparing to the commercial strains.	Dr. K. M. S. G. Weerasooriya	Dr. P. S. Fernando, Dr. N. Liyanagunawardana, Dr. S. M. T. S. Manchanayake, Dr. E. Abeyrathne.	2	2014	2015
36	Determination of productivity parameters in medium scale dairying under different farming systems	Mr. R. M. Chandrasena	Dr. S. H. G. Wickramaratne, Dr. A. M. U. W. Adikarinayake	2	2014	2015
37	Determining the possibility of <i>Neospora caninum</i> in causing bovine abortions	Dr. N. D. S. Dissanayake	Dr. M. B. Nawarathne, Dr. S. S. Iddamaldeniya	2	2014	
38	Development of an early diagnosis method for immature paramphistomiasis in cattle	Dr. S. S. Iddamaldeniya	Dr. M. B. Nawarathne, Dr. N. D. S. Dissanayake, Dr. G.A. Gunawardene.	2	2014	2015
39	Investigation of Avian Mycoplasmosis infections in poultry production systems in North Western province	Dr. S.M.T.S. Manchanayake	Dr. N. Liyanagunawardane, Dr. G. I. S. Perera, Dr. P. S. Fernando, VIO Wariyapola.	2	2014	2015/2017
40	Prevalence of different <i>Salmonella</i> spp in poultry wet markets and their public health and	Dr. J. K. H. Ubeyratne	Dr. M. D. N. Jayaweera, Dr. S. Pathirage, Dr. S. Wickramasinghe, Dr. K. H. D. T. Kasagala Dr. L.G.S. Lokugalappatti	2	2014	2016

	epidemiological relationship with <i>Salmonella</i> isolates of human origin					
41	A Preliminary investigation on Current status of Infectious Laryngotracheitis (ILT) in North Western Province & Gampaha District of Sri Lanka	Dr. S.A.E. Abeyratne	Dr. H. Kothalawala, Dr. S. Puvanendiran, Dr. R. Hettiarachchi, Dr. G. Rajapakse, Dr. C. Karunarathne, Dr. S. Chandrasekara.	1(2)	2014	2014
42	Production of local vaccine against Fowl pox for layer chickens	Dr. H. Kothalawala	Dr. S. Puvanendiran, Dr. G. A. Gunawardena, Dr. S. A. E. Abeyratne, Dr. W. M. P. Bandara.	2	2014	2015
43	Formulation of effective organic acid blend to control common enteric disease, salmonellosis in poultry	Dr. S. S. P. Silva	Dr. P. S. Fernando, Dr. N. Priyankarage, Dr. A. P. D. G. Pathirana	3	2014	
44	Genetic characterization analysis of phylogenic relationships, adaptations to grow in cell culture and development of quantitative assays for Foot And Mouth Disease isolates of Sri Lanka	Dr. S. A. E. Abeyrathne/ Dr. S. Puvanendiran	Dr. H. Kothalawala, Dr. S. Puvanendiran, Dr. N. Jayaweera, Dr. S. Sooriyapathirana	1	2015	2015/2016
45	Detection of Salmonella by multiplex polymerase chain	Dr. N Liyanagunawardana	Dr. P. S. Fernando, Dr. K.M S.G. Weerasooriya	2	2015	2016

	reaction					
46	Assessment & improvement of chemical, physical & microbiological quality of raw milk available in milk marketing channel in mid country.	Dr. U. L. P. Mangalika	Dr. P. S. Fernando, Dr. N. Priyankarage, Dr. J K H Uberathne.	1	2015	2015
47	Effects of use of improved fodder varieties as cattle feed	Dr. W. M. P. B. Weerasinghe	Mr.G. G. C Premalal, Dr. N. Priyankarage, Dr. M. W. C. D. Palliyeguru	3	2015	2017
48	Evaluation of the quality of differently processed local fish meal in Sri Lanka and to examine a proper processing technology suitable for the country.	Dr. W. M. D. C. Palliyaguru	Dr. N. Priyankarage, Dr. W. M. P. B. Weerasinghe	2/3	2015	2016/2017
49	Suitability of palm kernel cake as a feed ingredient for poultry feeding	Dr. N. Priyankarage	Dr. M. W. C. D. Palliyeguru, Dr. W. M. P. B. Weerasinghe.	2	2015	2016
50	Comparative evaluation of adverse and anti-nutritional factors in common forage species grown in Sri Lanka	Mr. G. G. C. Premalal	Prof. Mrs. S. Premarathne, Dr. W. M. P. B. Weerasinghe.	2	2015	
51	Detection of <i>M. bovis</i> and <i>M. tuberculosis</i> species in suspected animals by LAMP technique	Dr. P. S. Fernando	Dr. N. Liyanagunawardana, Dr. K. M. S. G. Weerasooriya, Dr. C. Gamage	2	2015	
52	Preliminary study	Dr. D. M. W. C.	Dr. N. Priyankarage	2	2015	

	to compare production performances of village chicken in different management systems	Bandara				
53	Formulating effective methodologies to control protozoan parasites that infect livestock animals in Sri Lanka	Prof. N. Yokohama & Dr. S.S.P. Silva	Dr. H. Kothalawala	4	2015	
54	Effectiveness of electrical conductivity(EC) on the diagnosis of subclinical mastitis in dairy cows and its relation with other mastitis detection methods	Dr. U. L. P. Mangalika	Dr. P. S. Fernando, Dr. M. D. N. Jayaweera	2	2016	2017
55	Potential of Duck Weed and Azolla as low cost feed substitutes for farm animals in small scale farming in Sri Lanka.	Mrs. I. K. Leukebandara	Dr. N. Priyankarage, Mr. G.G.C. Premalal	2	2016	2017
56	Preliminary study to compare production performance of village/indigenous chicken in two different management systems in Sri Lanka	Dr. D. M. W. C. B. Dissanayake	Dr. N. Priyankarage	3	2016	2016

57	Preliminary study to differentiate buffalo and cattle milk using PCR assay and develop a PCR based method to quality assurance of buffalo curd and yoghurt	Dr. D. M.W. C. B. Dissanayake	Dr. U. L. P. Mangalika, Dr. K. H. D. T. Kasagala	2	2016	2017
58	Determining dietary caution anion difference, grass tetany index and NIRS prediction of the composition of major forages in central province, Sri Lanka	Dr. A. P. D. G. Pathirana	Dr. N. Priyankarage, Dr. U. L. P. Mangalika, Mr. G. G. C. Premalal, Dr. S. S. P. Silva	3	2016	2017
59	Genotyping <i>Thielaria orientalis</i> complex found in Southern province, Sri Lanka and devising a control measure.	Dr. S. S. Iddamaldeniya	Dr. N. D. S. Dissanayake, Dr. K. H. D. T. Kasagala	1	2016	2016
60	Determining the prevalence of <i>Neospora Caninum</i> in bovines in Central and Uva province.	Dr. N. D. S. Dissanayake	Dr. S. Iddamaldeniya	1	2016	2017/continued 2018
61	Identification of Mycobacterium species from nasal secretion of PPD positive cattle by LAMP technique.	Dr. P. S. Fernando	Dr. C. Gamage, Dr. K. M. S. G. Weerasooriya, Dr. N. Liyanagunawardhana	1	2016	2016 terminated
62	Introduction of oil adjuvant vaccine against Newcastle	Dr. H. Kothalawala	Dr. S. Puvanendiran, Dr. G. A. Gunawardena, Dr. S. A. E. Abeyratne,	2	2016	Continued 2018

	disease for Layers.		Dr. W. M. P. Bandara			
63	Seroprevalence of Infectious bovine rhinotracheitis and bovine viral diarrhoea in dairy cattle in Sri Lanka.	Dr. S. Puvanendiran	Dr. H. Kothalawala, Dr. S. A. E. Aberathne, G. Rajapakse, C. Karunarathne	2		2016
64	Development of flock screening rapid test for mycoplasma infection in poultry	Dr. K. M. S. G. Weerasooriya	Dr. P. S. Fernando, Dr. N. Liyanagunawardhana	3	2016	2017
65	Efficient utilization of minerals in raw materials used in poultry feed; Calcium & Phosphorus	Dr. N. Priyankarage	Dr. W. M. B. P. Weerasinghe, Dr. A. P. D. G. Pathirana, Dr. M. W. C. D. Palliyeguru	2	2017	
66	Layer performances and Egg Quality characteristics affecting the hatchability, in village chicken at CPRS, Karandagolla	Dr. M. W. C. D. Palliyeguru	Dr. N. Priyankarage	2		2017
67	Examine the efficacy of selected probiotics and Photobiotics to replace antibiotics in poultry feed	Dr. M. W. C. D. Palliyeguru	Dr. N. Priyankarage	2	2017	
68	Evaluation of Level of Antibiotic Residues in Livestock Products and	Dr. P. S. Fernando	Dr. K. M. S. G. Weerasooriya	2		2017

	Antimicrobial Resistant Pattern of Mastitis Organisms					
69	Phenotypic and Molecular characterization of salmonella isolates in the chain of broiler industry in Sri Lanka	Dr. N. Liyanagunawardana	Dr. P. S. Fernando, Dr. Ruwani Kalupahana	3		2017
70	Development of new vaccine seed for Babesia Bovis	Dr. S. S. Iddamaldeniya	Dr. N. D. S. Dissanayake, Dr. N. A. D. E. M. Gunasekara	4		2017
71	Devising a protocol for <i>Theilaria orientalis</i> cell culturing and sequencing <i>T.orientalis</i> type 1 found in Sri Lanka	Dr. S. S. Iddamaldeniya	Dr. N. D. S. Dissanayake, Dr. N. A. D. E. M. Gunasekara, Dr. M. L. W. P. De Silva, Dr. N. K. Jayasekara, Dr. K. H. D. T. Kasagala	1	2017	2017
75	Immuno Histopathological Study on Porcine Reproductive and Respiratory Syndrome (PRRS) and Porcine Parvo Virus (PPV) infection	Dr. T. Manchanayake	Dr. S. Puwanendiran, Dr. G. I. S. Perera, Dr. P. Bandara, Dr. K. G. J. S. Disnaka	3	2017	
76	Study on Use of Histopathological and Immuno Histochemical Techniques for Detection of Bovine Tuberculosis	Dr. G.I.S. Perera	Dr. T. Manchanayake, Dr. P. S. Fernando, Dr. H. R. N. Jinadasa	3	2017	
77	Study on the Prevalence and Economic impact of Contagious Pustular Dermatitis in Goats in Sri	Dr. S. Puwanendiran	Dr. S. Piratheepan, Dr. H. Kothalawala	1	2017	2017

	Lanka and isolation of Contagious Pustular Dermatitis Virus					
78	Identification of reliable method for laboratory diagnosis of tuberculosis using nasopharyngeal swabs and saliva of PPD positive cattle and buffalo	Dr P. S. Fernando	Dr. N. Liyanagunawardena, Dr. K. M. S. G. Weerasooriya Dr. C.D. Gamage	2	2017	