

# **ANNUAL REPORT**

## **2016-2017**



**VETERINARY RESEARCH INSTITUTE**  
**ZARAR SHAHEED ROAD**  
**LAHORE CANTT.**  
**(PH: NO. 042-99220140)**



**FOOT AND MOUTH DISEASE RESEARCH**  
**CENTRE, ZARAR SHAHEED ROAD, LAHORE**  
**CANTT.**  
**(PH: NO. 042-37167007)**

**DIRECTORATE OF VETERINARY RESEARCH INSTITUTE,  
LIVESTOCK & DAIRY DEVELOPMENT  
ZARAR SHAHEED ROAD, LAHORE, CANTT.  
(PH: NO. 042-99220140 FAX: 99220142)**

Veterinary Research Institute, Lahore is the premier research organization in the country administratively controlled by Government of the Punjab. The institute was established in 1963 and is located on Zarar Shaheed Road, Lahore Cantt with a complex of hi-tech laboratories and animal houses extended over a vast area.

The nature of the work in Veterinary Research Institute, Lahore is basically a combination of biologics production and applied research. The institute has contributed significantly towards prevention and control of prevailing, newly emerging and reemerging diseases of livestock & poultry. Thus it has created conditions conducive for the expansion of poultry and livestock industries in the country. The activities during the year 2016-17 also remained significant in every aspect of function and development.

**MOTTO**

“Prevention is better than cure”

**OBJECTIVES**

- a. Large scale production of quality biologics for control of infectious diseases of livestock and poultry.
- b. Research studies in the related disciplines of animal health and biologics being produced in VRI.
- c. Development of modern techniques for production of new biologics and to improve the quality and quantity of vaccines being produced at VRI.
- d. Training of field in-service veterinarians, post-graduate students, graduate internees from Veterinary / other universities of all over the Punjab.

### **Achievements for 2016-17**

- Quality Control Laboratory is ISO 9001: 2008 certified and is ISO 17025: 2005 accredited.
- It is made mandatory to test each batch of vaccine, antigen and hyperimmune serum being produced in VRI from Quality Control Laboratory before their issuance to supply section.
- To control Hemorrhagic Septicemia a fetal disease of bovid VRI started production of HSOB montanide ISA 50 vaccine. The vaccine gives immunity for one year thus prevents the repeated use of vaccine to get protection against fatal disease. Hemorrhagic Septicemia vaccine (HSOB ISA 50) production is enhanced to give 100% coverage against Hemorrhagic Septicemia in mass vaccination campaign of L&DD Department 2016-17.
- Production of Newcastle Disease vaccine LaSota (oral vaccine) on completion of its safety and efficacy trials is initiated and 64748600 doses of NDV LaSota vaccine are produced and supplied to mass vaccination campaign of L&DD Department.
- To enhance the production of lyophilized vaccines ( Mycoplasma, Sheep Pox, Goat Pox, PPR and ND vaccines) the lyophilization facilities are upgraded and two new lyophilizers are installed and all lyophilizers are made operational.
- In field freeze dried vaccines fail to provide required immunity due to their reconstitution with improper diluents. To overcome this problem production of diluent started and 15,134,100 ml volumes of diluent are produced.
- To enhance the production of BQ, ETV, and HS vaccines. In Media Section gas, electric and water supplies are upgraded. Quality of different vaccines BQ, ETV, and HS are improved and volume per dose of these vaccines is reduced which is value addition to minimize the reaction at the site of injection.
- Production of vaccine against Pest des Petits Ruminants (PPR) a fatal disease of Sheep and Goat is 3 times increased as compare to previous years.
- Molecular Characterization is the latest approach to identity the field isolates at the strain and sub strain level and confirmation of the seeds of different

vaccines for effective control of infectious diseases. Molecular Lab made fully operational which characterized almost all seeds being used for production of different vaccine in VRI. It has optimized molecular techniques/ tests for rapid diagnosis and confirmation of Rabies, Hemorrhagic Septicemia, Orf, Sheep Pox Virus, Goat Pox Virus, Anthrax, Glanders, Pest des Petits Ruminants virus, Newcastle Disease virus, CCPP and Mycoplasma infections, Foot and Mouth Disease Virus serotypes.

- Bio-fermenter and other latest machineries and equipments are procured, installed and made operational to upgrade the production and filling of HS vaccines.
- Filling and labeling of HS, ETV and BQ vaccines are upgraded and transformed from manual to automation.
- A day care centre to facilitate the female employees of the institute to keep their children during working hours is developed.
- Buildings of vaccine production laboratories are under up-gradation.

**STAFF**

Sr. No.	Designation	BPS	Nos.
<b>a. NON-DEVELOPMENT STAFF</b>			
1.	Director General (Research)	20	1
2.	Principal Veterinary Officer (Director)	20	1
3.	Additional Principal Veterinary Officer (SRO/RO)	19	06
4.	Senior Veterinary Officer	18	27
5.	Veterinary Officer (O/I Stores / curator )	17	33
6.	Bio-Chemist	18	1
7.	Ministerial Staff	1-16	24
8.	Para-technical staff	1-16	283
<b>b. SNE STAFF</b>			
1	Administrative Officer	17	1
2.	Budget and Account Officer	17	1
3.	Estate Officer	15	1
4.	Second Class Boiler Engineer	14	1
5.	Computer Operator	11	1
6.	Sweeper	01	1

**STAFF STRENGTH**

Sr. No.	BS	Nos.
1.	17 to above	69
2.	01 to 16	307

**RECRUITMENT MADE DURING THE PERIOD  
FROM 01.07.2016 TO 30.06.2017**

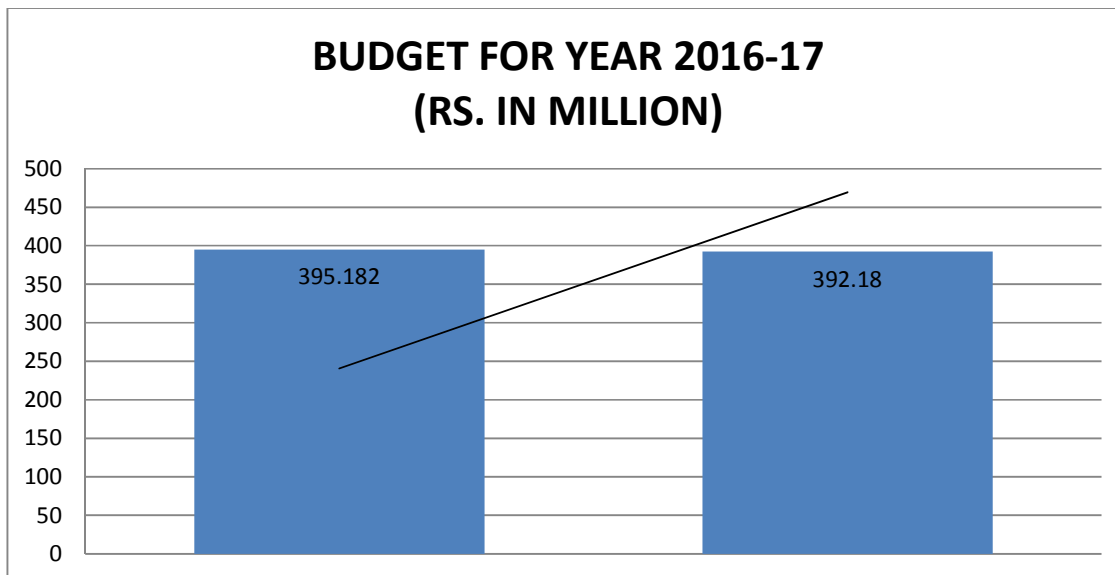
Sr. No.	BS	No. of Recruitment
1.	01 to 04	06
2.	05 to 16	4
3.	17 to Above	18

**OFFICERS/OFFICIAL RETIRED  
FROM 01.07.2016 TO 30.06.2017**

Sr. No.	BS	No. of Retirement
1.	01 to 04	03
2.	05 to 16	--
3.	17 to Above	03

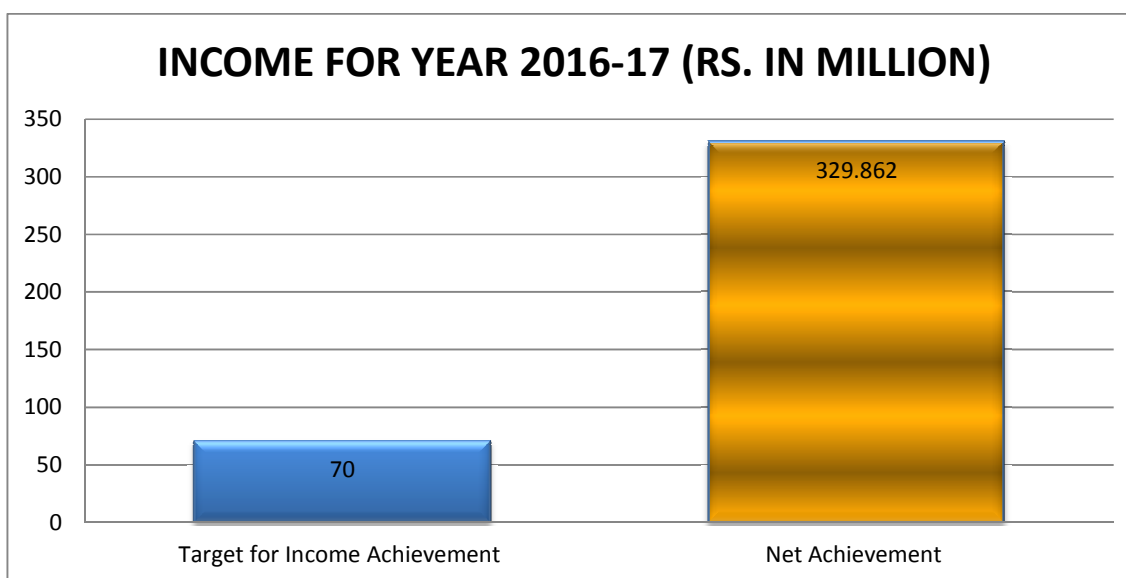
## ALLOCATION AND EXPENDITURE FOR UNDER NON-DEVELOPMENT SIDE

Year	Allocation (in Million)	Expenditures (in Million)	Percentage
2016-2017	395.182	392.180	99%



## TARGET AND RECEIPT

Year	Target income fixed by Government (in Million)	Target achieved (in Million)	Percentage
2016-2017	70.000	329.862	471%



# PROJECTS

## Ongoing

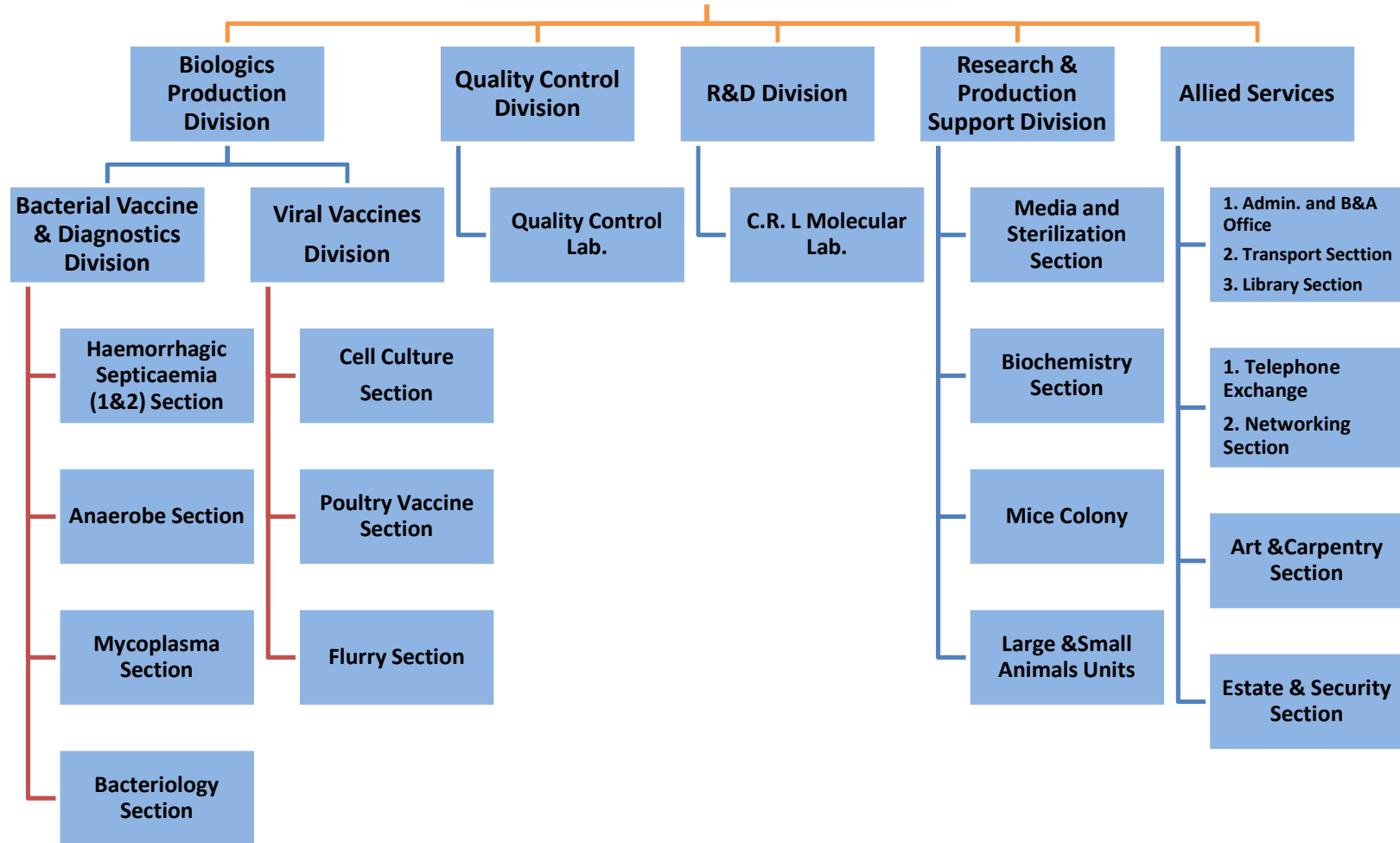
<b>Name of Project</b>	<b>Missing Facilities At Veterinary Research Institute (VRI) And Foot And Mouth Disease Research Centre (FMDRC)Lahore</b>	
Gestation Period	36 Months(2014-15 to 2016-17)	
<b>Year</b>	<b>Allocation (in Million)</b>	<b>Expenditure (in Million)</b>
2016-17	189.320	165.828

<b>Name of Project</b>	<b>Up-Gradation of Facilities for Augmentation and Production of Biologics at Veterinary Research Institute Zarar Shaheed Road Lahore Cantt</b>		
Gestation Period	24 months (2016-17 to 2017-18)		
<b>Year</b>	<b>Allocation (in Million)</b>	<b>Expenditures (in Million)</b>	<b>Percentage</b>
2016-2017	251.609	192.068	76.33%

## NEW PROJECTS FOR 2017-2019

Title of the Proposed Project	<b>Establishment of state of the art labs at Veterinary Research Institute and Foot &amp; Mouth Disease Research Center to meet the International Standards of Biologics production and Research &amp; Development</b>
Gestation Period	24 months (2017-18 to 2018-19)
Total cost of the Project	330 million

# DIRECTORATE OF VRI





## **Biologics Production Division**

Biological production division is a complex of 13 sections, poultry unit and mice colony producing 20 vaccines and 07 diagnostics for livestock & poultry.

### **Functions**

- Production of biologics.
- Maintenance and characterization of seeds for production of biologics.
- Preparation and sterilization of different types of media and solutions for production of biologics, propagation & characterization of seeds and quality testing of biologics.
- Maintenance and propagation of cell lines (For cell culture vaccines).
- To maintain poultry flocks to supply embryonated eggs for production of NDV & influenza vaccines.
- In- house quality control testing of each and every batch of biologics
- Training of undergraduate internees on microbiological techniques and production of biologics.
- To provide assistances.
- Assist in diagnosis of diseases like pox, rabies, mycoplasmosis, PPR, brucellosis, clostridial diseases.
- Provision of assistance and supervision to post graduate students in their research
- Dissemination of knowledge on prevention and control of infectious diseases of livestock and poultry through radio talks and print media
- Allied Research

### **Activities of Biologics Production Division**

1	Media, Reagents & solutions produced	130000 liters
2.	Diluent Produced	15134100 ml
3	No. of lab animals maintained & produced	1385
4	No. of poultry birds maintained	800
5	No. of Vaccine Doses Lyophilized	182922600
6	No. of Seed Vials Lyophilized	1855
7	Biologics produced*	279319965 doses

### Types of Biologics Produced\* for Livestock & Poultry

Types of Biologics	Livestock	Poultry	Total
Bacterial Vaccines	6	--	6
Viral Vaccines	3	11	14
Diagnostic Agents	7	--	7
<b>Total</b>	<b>16</b>	<b>11</b>	<b>27</b>

#### Quality Control Section

##### Functions

- To test the biologics (Vaccine/sera/antigen) being produced in VRI.
- To check nutritive value of feed and level of aflatoxin in them.
- To implement the standard of ISO-9001-2008 and ISO-17025 in lab management system and lab testing.

##### Services provided by the section

- Quality control section is testing biologics (Vaccines, diagnostic antigens and anti sera) prepared at VRI.
- Feed testing for nutritional value as well as toxins level.
- To conduct training of students and in service personals.

##### Activities of Quality Control Lab

##### Biologics, Diluent and NDV Anti-bodies Titer Tested for Quality Control

Sr. No.	Vaccine	Test performed
1	H.S Vaccine	Sterility test, safety test
2	B.Q.V	Sterility test, safety test
3	E.T.V	Sterility test, safety test
4	Anthrax Vaccine	Spore count, Sterility test, safety test
5	C.C.P.P Vaccine	Sterility test, safety test
6	Sheep pox	Sterility test, safety test
7	Goat pox	Sterility test, safety test
8	P.P.R Vaccine	Sterility test, safety test
9	Avian Influenza+ND	Sterility test, safety test
10	N.D.V	Sterility test, safety test, EID <sub>50</sub> /ELD <sub>50</sub>
11	FMD Serum	Sterility test, safety test
12	Mallien	Sterility test, safety test
13	Tuberculin	Sterility test, safety test
14	Brucella Antigens	Spot Test
15	Diluent	Sterility test
16	NDV Antibodies titer	HIT
<b>Total No of Batches Tested</b>		<b>615</b>

## Activities of Molecular Lab

- Molecular characterization of seed of VRI Vaccines.
- Molecular identification / confirmation of causative organisms of field outbreaks.

### Total Number of Field / Vaccine Samples Tested Through PCR

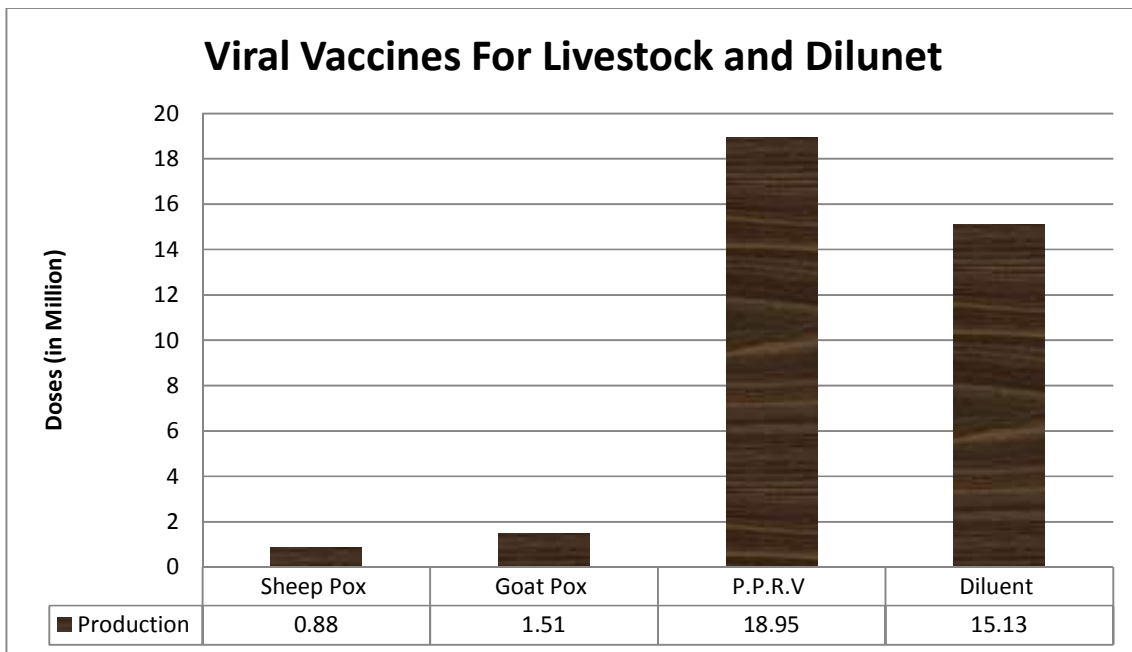
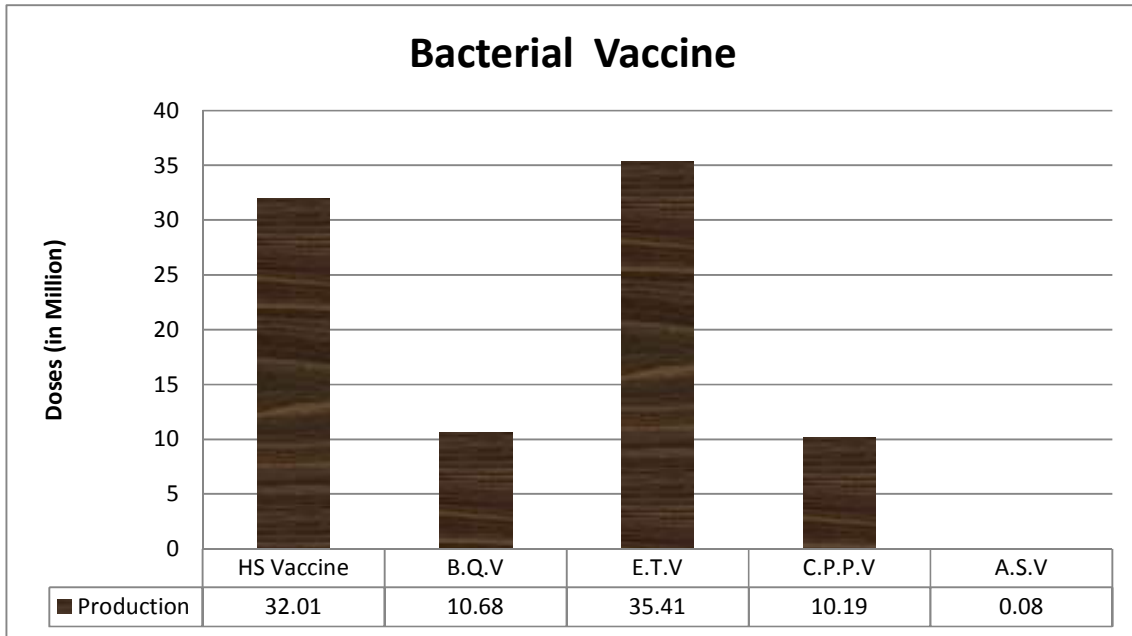
<b>Sr. No</b>	<b>Samples suspected for</b>	<b>No of Samples Tested</b>
1	FMD	80
2	Mycoplasmosis	22
3	Pox (vaccines +Hides)	24
4	Rabbies	04
5	ND Vaccine	02
6	ORF	10
7	HS	12
8	BQ Vaccine	09
9	PPR	03
10	Anthrax	02
11	Glanders	02
<b>Total</b>		<b>170</b>

## BIOLOGICS PRODUCTION REPORT FOR THE YEAR 2016-17

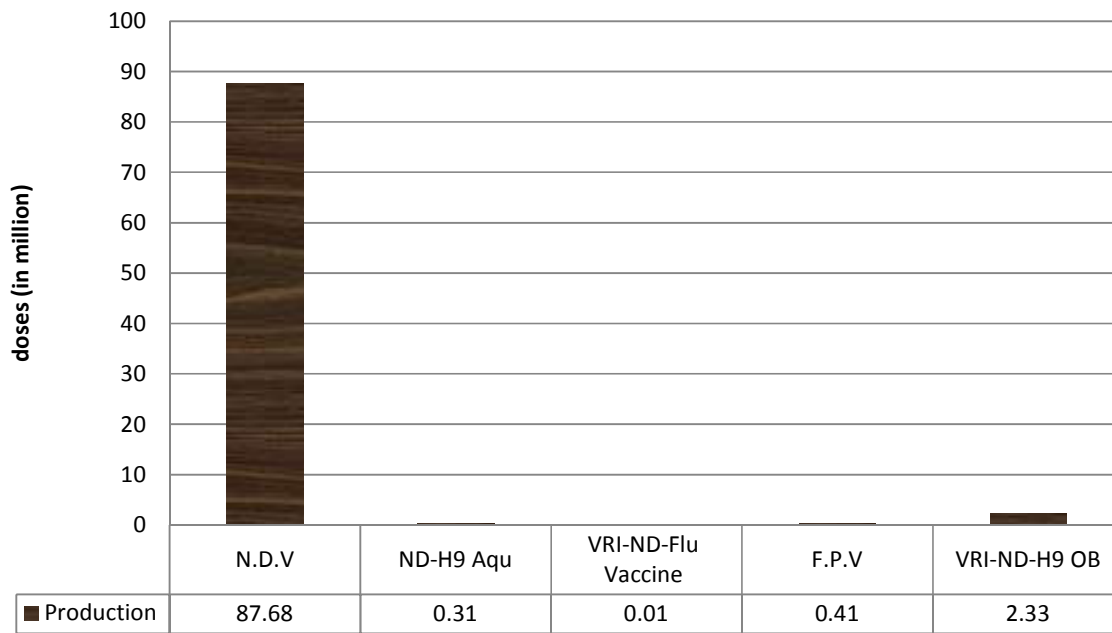
Sr. No	Name of Vaccines	Doses (in Million)
<b>A</b>	<b>Bacterial Vaccines</b>	
	<b>For Livestock</b>	
	HaemorrhagicSepticaemia Vaccine (Alum Precipitated) (HS APV)	4.91
	HaemorrhagicSepticaemiaVaccine(Oil Adjuvant) (HS OBV)	27.10
	<b>Total Haemorrhagic Septicaemia Vaccine</b>	<b>32.01</b>
	Black Quarter Vaccine(BQV)	10.68
	Enterotoxaemia Vaccine (ETV)	35.41
	Caprine Pleuropneumonia Vaccine (CPPV)	10.19
	Anthrax Spore Vaccine (ASV)	0.08
<b>B</b>	<b>Viral Vaccines</b>	
	<b>For Poultry</b>	
	New Castle Disease Vaccine	87.68
	VRI-ND-Flu Vaccine (Aqueous) (ND-H9 Aqu)	0.31
	VRI-ND-Flu Vaccine	0.01
	Fowl Pox Vaccine (FPV)	0.41
	VRI-ND-Flu Vaccine (Oil Based) (ND-H9 OB)	2.33
	<b>For Livestock</b>	
	Sheep Pox Vaccine (SPV)	0.88
	Goat Pox Vaccine (GPV)	1.51
	Peste Des Petits Ruminants Vaccine(PPRV)	18.95
	Diluent	15.13

### Diagnostic Antigen

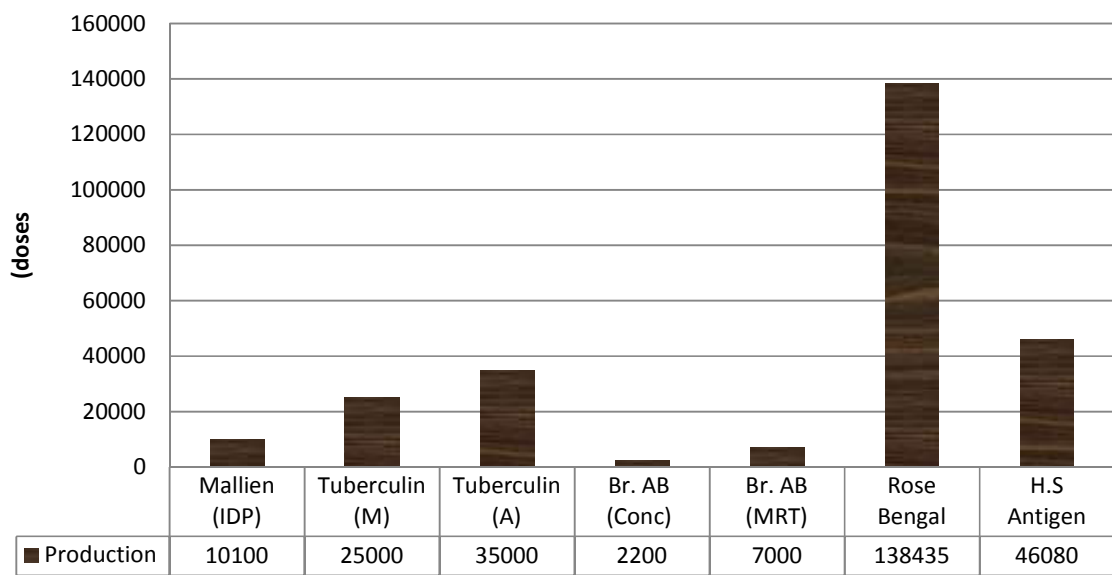
Sr.	Name of Diagnostic Antigen	Doses
1.	Mallien	10100
2.	Tuberculin PPD (Mammalian) for Tuberculosis	25000
3.	Tuberculin PPD (Avian) for Tuberculosis	35000
4.	Brucellaabortus agglutination antigen	2200
5.	Milk Ring Test (MRT) Antigen	7000
6.	Rose Bengal Plate Test Antigen (RBPT)	138435
7.	Haemorrhagic Septicaemia Antigen	46080



### Viral Vaccines For Poultry



### Diagnostics



## TRAINING

Capacity building of internee / House Job doctors of different universities / veterinary colleges from Punjab

Sr. No.	University / Institute	Prog.	No. trainees	Date	
				To	From
1.	Islamia University Bahawalpur	DVM	06	11.01.2017	10.09.2016
2.	Gomal University	DVM	02	17.07.2016	17.08.2016
3.	Gomal University	DVM	02	17.08.2016	15.09.2016
4.	Islamia University Bahawalpur	DVM	06	19.09.2016	16.12.2016
5.	University of Agriculture Faisalabad	DVM	06	13.01.2017	28.02.2017
6.	Bahaudin Zikria University	DVM	10	30.01.2017	20.05.2017
7.	Lahore Garrison University	MSc. Zoology	13	03.03.2017	30.05.2017
8.	UVAS	BS. Hons (Micro bioogy)	01	11.04.2017	05.05.2017
9.	UAF	DVM	05	18.04.2017	13.05.2017
10	UVAS	DVM	01	28.04.2017	25.05.2017

### RESEARCH PUBLICATIONS 2016-17

SR. NO.	REFERENCE
1.	<b>A.Rasool</b> Preparation of Mycoplasma Synoviae Antigens and Evaluation by Rapid Slide Agglutination and Enzyme Linked Immunosorbent Assay, The Journal of Animal & Plant Science, 27(3):2017 (Accepted)
2.	<b>A. Rasool</b> Physicochemical factors affecting persistence of Francisella Tularensis in soil, The Journal of Animal & Plant Science, 27 (3):2017 (Accepted)
3.	<b>A. Rasool</b> Molecular Characterization and phylogenetic analysis of Mycoplasma Synoviae isolated from chicken 27(5) 2017 (Accepted)
4.	<b>Khan, A. R., Tahir, M. S., Naz, S., Chughtai, S. A., Khan, M. N., and Raana, W.</b> (2016). <i>Genetic characterization and phylogenetic analysis of bacillus anthracis Sterne strain by 16S rRNA gene sequencing.</i> Pakistan Journal of Science, 68(1).
5.	Umar, S., <b>Sarfraz, S.</b> , Mushtaq, A., and Attique, M. (2016). <i>Emerging threat of H9N2 viruses in poultry of Pakistan and vaccination strategy.</i> World's Poultry Science Journal, 72(02), 343-352.
6.	<b>Mahboob, K., Rafique, R., Farooq, T., Huma, I., Parveen, S., and Khan, M. N.</b> (2016). <i>Raising of hyper-immune serum against FMD virus type "O" prevailing in Punjab, Pakistan.</i> International Archives of Bio Medical and Clinical Research. 2(3):104-106.
7.	<b>Afroz, H., Sattar, S., Rasool, A., Zamir, B., Haq, I. U., and Rafique, R.</b> (2016). <i>Comparison of immunogenic effect of three oil adjuvant vaccines against haemorrhagic septicaemia in cattle and buffalo.</i> International Archives of Bio Medical and Clinical Research. 2(2): 43-48.
8.	<b>Shahzad, W.,</b> Yaqoob, T., Mukhtar, N., Munir, R., <b>Ahmad, R.,</b> Khan, M. S., and Hussain, A. (2016). <i>Sero-prevalence of mycoplasma capricolum subsp. capripneumoniae in goats through cELISA in different districts of Punjab, Pakistan.</i> The Journal of Animal and Plant Sciences. 26(4), 931-937.
9.	<b>Ullah, R.W.,</b> Bin Zahur, A., Latif, A., Iqbal Dasti, J., Irshad, H., Afzal, M., and <b>Qureshi, Z. U. A.</b> (2016). <i>Detection of peste des petits ruminants viral RNA in fecal samples of goats after an outbreak in Punjab province of Pakistan: a longitudinal study.</i> BioMed Research International, 2016. Article ID. 1486824, 5.
10.	Zahur A. B., Ullah, A., <b>Afzal, M.,</b> Irshad, H., Latif, A., <b>Mahboob, K.,</b> Rasheed, T., <b>Ullah, R. W.,</b> (2016). <i>Timeline for the development of comparative clinical disease following experimental infection with lineage-IV Peste des petits ruminants virus in goats.</i> Journal of Zoology. 2016



11.	Umar, S., Younus, M., Shahzad, M., <b>Aqil, K., Qayyum, R., Mushtaq, A.</b> , Abdullah Shah, M. A., and Munir, M. T. (2016). <i>Role of wheat based diet on the pathology of necrotic enteritis in Turkeys</i> . Scientifica, 2016.
12.	<b>Abidin, Z. U.</b> , Khan, M. Z., Khatoon, A., Saleemi, M. K., and Khan, A. (2016). <i>Protective effects of l-carnitine upon toxicopathological alterations induced by ochratoxin a in white Leghorn cockerels</i> . Toxin Reviews. 35(3-4):157-164.
13.	Saleemi, M. K., Khan, M. Z., Khan, A., Hameed, M. R., Khatoon, A., <b>Abadin, Z. U.</b> , and Hassan, Z. U. (2016). <i>Study of fungi and their toxigenic potential isolated from wheat and wheat bran</i> . Toxin Reviews. 1-9.
14.	F.Akhthar, M. Rabbani, K. Muhammad, Y. Younus, A. Ghafoor, A. A. Shaikh, A. Ahmad, J. Muhammad, <b>A. Rasool</b> and A. Y. Shaheen (2016). Comparative antibiotic resistance profile of the multidrug resistant e.coli isolated from commercial and backyard poultry, The Journal of Animal & Plant Sciences, 26(6):2016 1628-1632.

# **ANNUAL REPORT 2016 – 2017**



**FOOT AND MOUTH DISEASE RESEARCH CENTRE,**  
**ZARAR SHAHEED ROAD, LAHORE CANTT.**

**Ph: No. 042-3716700**

**FOOT AND MOUTH DISEASE RESEARCH CENTRE,  
LIVESTOCK & DAIRY DEVELOPMENT  
ZARAR SHAHEED ROAD, LAHORE, CANTT.  
Ph: No. 042-3716700**

Foot and Mouth disease Research Centre was established in 1964 as a section of Veterinary Research Institute, Lahore and was declared as independent centre financially and administratively in July, 2001.

**Aims & Objectives**

- Production of oil based Cell Culture Foot and Mouth Disease Vaccine.
- Diagnosis of Foot & Mouth Disease Out breaks & Typing of virus isolates.
- Research & Development.
- Production of Hyper immune serum.
- In service training / Internship of DVM students and para veterinary staff.

**DIVISION/SECTION**

Name of Section	Function
Production –I	Production of FMD Virus, Serotype “O”
Production-II	Production of FMD Virus, Serotype “A”
Production-III	Production of FMD Virus, Serotype “Asia -I” .
Vaccine Formulation, Filling & Bottling Section	Formulation of Oil adjuvant FMD Vaccine and preparation of finished product.
R&D / Quality Control Section	In house quality of vaccine and allied research activities including ELISA, Adaptation of field isolates of FMD virus on LFBK cell line for further incorporation into routinely prepared vaccine.
Serum production Section	Production of FMD Hyper immune serum
Miscellaneous Sections	To take care of estate, building, carpentry, electricity and transport etc.

## STAFF

S. No.	Name of Post	BPS	Sanctioned Strength
1.	Additional Director	19	1
2.	Additional Principal Veterinary Officer/RO	19	2
3.	Senior Veterinary Officer /ARO	18	5
4.	Veterinary Officer	17	6
5.	Stenographer	14	1
6.	Assistant	14	2
7.	Electrician-cum-Mechanic Supervisor	11	1
8.	Laboratory Technician	11	4
9.	Senior Clerk	9	2
10.	Laboratory Assistant	9	4
11.	Junior Clerk	7	2
12.	Electrician	5	1
13.	Carpenter	5	1
14.	Driver	4	2
15.	Laboratory Attendant	1	6
16.	Naib Qasid	1	4
17.	Mali	1	2
18.	Chowkidar	1	2
19.	Cattle Attendant	1	25
20.	Sweeper	1	2
	<b>Total:-</b>		<b>75</b>

## **BUDGET 2016 -17**

<b>Regular Budget (Million Rs.)</b>		<b>ADP Budget (Million Rs.)</b>	
<b>Allocation</b>	<b>Expenditure</b>	<b>Allocation</b>	<b>Expenditure</b>
<b>66.798</b>	<b>66.60</b>	<b>60.828</b>	<b>60.827</b>

### **Ongoing Project**

<b>Name of Project</b>	<b>Missing Facilities At Veterinary Research Institute (VRI) And Foot And Mouth Disease Research Centre (FMDRC)Lahore</b>	
<b>Gestation Period</b>	36 Months(2014-15 to 2016-17)	
<b>Year</b>	<b>Allocation (in Million)</b>	<b>Expenditure (in Million)</b>
2016-17	60.828	60.827

### **NEW PROJECTS FOR 2017**

<b>Title of the Proposed Project</b>	<b>Establishment of Suspension Culture Plant at Foot and Mouth Disease Research Center Lahore</b>
<b>Gestation Period</b>	36 months
<b>Total cost of the Project</b>	3000 million

## Work performed 2017

<b>Name of Biologic</b>	<b>Target</b>	<b>Achievements</b>
FMD Trivalent Vaccine	06 Million Doses	7.8 Million Doses
FMD Serum	On Demand	16020

## FMD SAMPLES TESTED.

<b>Total Samples</b>	<b>O</b>	<b>A</b>	<b>Asia-1</b>	<b>Mixed</b>	<b>NVD*</b>
58	19	01	07	06	25

\* No Virus Detected

## ACHIEVEMENTS

### Restructuring of F&MDRC:-

Restructuring of F&MDRC was being made in September, 2016 to improve the quality of vaccine. Sectional duties were readjusted. In the past five sections were preparing the FMD vaccine individually by propagation of BHK-21 cell line and harvesting of virus (O, A, Asia-I). In restructuring sections (Production-I, Production-II, Production-III) are harvesting the virus individually and vaccine formulation and bottling section is responsible for the final and finished product after receiving virus from these three sections.

### Establishment of R&D Section:-

A newly established section R&D / QC is responsible for maintaining in house quality of vaccine as well as wet material received from the production sections.

### **Maintenance of seed bank and virus bank :-**

R&D / QC is maintaining a seed bank of BHK-21, LFBK & virus (O, A, Asia-I). R&D is also typing field isolates and vaccinal strains by ELISA, adopting field isolates on LFBK and BHK-21 to improve the quality of vaccine.

### **Standardization of SOPs of F&MDRC:-**

- R&D Section designed and standardized SOPs of F&MDRC, Lab activities.
- Designed different performa to standardized the quality result of vaccine and for wet material to be sent by different production sections.

### **Inactivation of Virus through BEI + FA combination:-**

- F&MDRC has now shifted to BEI + FA for inactivation of virus instead of only formalin inactivation. It is a big land mark in in-activation process of virus for vaccine production.

### **Preparation of Experimental trivalent vaccine of FMD:-**

- A new vaccine including new sub strains (PAN Asia-I, Sindh-08, Tur-06) is under experimental trials and will be introduced shortly in the field to improve the quality of vaccine and control of disease in the field.

## **RESEARCH ACTIVITIES**

1. Different projects are under process in different sections.
  - Production Section- I :-  
Comparative study of the effect of different preservatives to maintain the quality of FMD vaccine.
  - Production Section- II :-  
Inactivation kinetics for inactivation of “Asia-I” virus.
  - Production Section- III :-  
Inactivation kinetics for inactivation of “A” virus.
  - QC / R&D Section :-  
Comparative study of experimentally prepared Foot and Mouth Disease vaccine in cow calves and guinea pigs with correlation of their immune response by ELISA and VNT.

### **Vaccine Filling & Bottling:-**

- Vaccine filling & bottling is now mechanical instead of manual filling to improve the quality of vaccine.

### **Serum Production:-**

- No. of raising of serum producing animals has increased from 11 animals to 40 animals along with shifting from green fodder to silage with cooperation of Estate Section.
- A water pond has constructed for animals in F&MDRC, Lahore.

### **MAJOR TASKS**

- Doubled the FMD vaccine production through ADP Scheme entitled “Missing facilities at F&MDRC and VRI, Lahore” which had been Major Achieved successfully.
- Prepared Trivalent oil based FMD Vaccine.

### **ADP SCHEME (PROVISION OF MISSING FACILITIES AT VRI & F&MDRC, LAHORE)**

- ADP scheme is running successfully in the Centre. New building as per international standard is now under construction for cell culture and vaccine production and will be handed over to 30 June 2017 by Building Department.

### **FAO Project (Progressive Control of Foot & Mouth Disease in Pakistan):-**

- ELISA facility established in 2012 under FAO project contributing a lot in testing field samples for FMD virus serotyping.

### **CONSTRAINTS**

- Very old infrastructure.
- Production of vaccine on Monoculture/Stationary culture system.
- Foreign Trainings required in the field of Production & Typing (R & D).
- Lack of cold store.



## **FUTURE STRATEGY**

- Shifting of the Vaccine Production in the new vaccine block i.e. 2017 – 2018.
- Quantity of FMD vaccine will be enhanced and quality will be improved..
- Strengthening of R & D in quality control set up being the core area.