DEPERTMENT OF VETERINARY MICROBIOLOGY

COLLEGE OF VETERINARY SCIENMCE AND ANIMAL HUSBANDRY

NARENDRA DEVA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

KUMARGANJ, FAIZABAD (Uttar Pradesh)

With establishment of College of Veterinary Science and Animal Husbandry under N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) in year 1999 and subsequently, admission of the first batch of B.V.Sc& A.H. students in year 2000, Department of Veterinary Microbiology came into existence in year 2000. Since then, department is offering B.V.Sc. & A.H. courses as per the Indian Veterinary Council Act – 1984, regulation entitled *"The Veterinary council of India (Minimum standards of veterinary education) – degree course (B.V.Sc. and A.H.) Regulation – 1993"*. The post Graduate programme leading to award of M.V.Sc. degree

in Veterinary Microbiology and Ph. D. degree in Veterinary Immunology was started in year 2004 and 2010 respectively.

1. **Faculty member:-**

A. Teaching staff:-

S. No.	Name	Designation	Mobile No.	Address
1.	Dr. R.K.Joshi	Professor and Head	9451663077	A-31,NDUAT,Kumarganj
2.	Dr.VibhaYadav	Assistant Professor	9450423644	B-12,NDUAT,Kumarganj
3.	Dr.R.P.Diwakar	Assistant Professor	9452488447	B-62,NDUAT,Kumarganj

B. Non Teaching staff:

S. No.	Name	Designation	Mobile No.	Address
1.	Mr. Vijay Kumar	Accounts Clerk	9450354011	PaliyaPratapShah,Faizabad
2.	Mr. A.P.Tiwari	Lab Assistant		Shivpurum colony FZD Road Nawabganj-Gonda
3.	Mr. RamTirath	Sweeper	8052299287	Swarav,Sultanpur

2. **Courses Offered:-**

A. Under Graduate (B.V.Sc. & A.H.) courses:

As per VCI regulation 2008			
Course No.	Title	Credits	Offered in
VMC-211	General Veterinary Microbiology	1+1=2	III Semester
VMC-221	Veterinary Immunology and Serology	1+1=2	IV Semester
VMC-311	Systemic Veterinary Bacteriology and Mycology	2+1=3	V Semester
VMC-321	Systemic Veterinary Virology	2+1=3	VI Semester
	Total	6+4=10	

B. Post Graduate (M.V.Sc.) courses:

Course No.	Title of the Course	Credit hr.
A. Core Courses		
VMC-611	General Bacteriology and Mycology	2+1=3
VMC-612	Microbial Techniques	0+2=2
VMC-621	General Virology	2+1=3
VMC-622	Principles of Immunology	2+1=3
VMC-691	Seminar	0+2=2
B. Optional Courses		
VMC-613	Systemic Bacteriology	2+1=3
VMC-614	Concepts in Virology	2+0=2
VMC-615	Molecular Immunology	2+0=2
VMC-616	Avian Diseases	2+1=3
VMC-617	Veterinary Biologicals	2+1=3
VMC-623	Systemic Virology	2+1=3
VMC-624	Virological Techniques	0+2=2
VMC-625	Immunological Techniques	0+2=2
VMC-626	Microbial Toxins	2+1=3
VMC-627	Microbial Genetics	2+0=2
VMC-690	Special Problem	0+2=2
C. Thesis Research		
VMC-700	Thesis Research	12+3=15

Undergraduate students in practical class




Post graduate students in practical class




3. **Facilities:**-

- Bacteriology and Mycology Lab. - Well equipped Bacteriology laboratory with facilities of isolation and characterization of bacteria.
- Virology Lab (with tissue culture lab, Egg inoculation booth)- Well equipped with cell culture facilities.
- Veterinary Immunology Lab. - Well equipped Immunology laboratory with diagnostic facilities.
- Well equipped molecular biology Laboratory with facilities of PCR and genomic characterization.
- Sterilisation room
- Cleaning and washing room
- Media and preparation room
- Well equipped Clinical diagnosis laboratory to provide help in laboratory diagnosis of animal infectious diseases.

Syllabus (UGCourses):

Course No. VMC- 211
Course Title: General Veterinary Microbiology

Topic
Development and history of Vet.–cum Med Microbiology, Microscopy, Microbiology of unicellular micro. and their classification
General characteristics of microorganisms.
Morphology and structure of bacteria
Shape, size, arrangements and morphological variation
Bacterial stains and staining principles
Gram's, acid- fast, endospore, flagella, capsular staining
Cultivation of bacteria
Nutritive requirements of bacteria

Culture media
Reproduction and growth rate
Measurement of growth
Isolation of bacteria in pure culture
Culture characteristics
Aerobic and anaerobic cultivation
Identification of bacteria
Distribution of bacteria and other microbes, sources of infection and methods of transmission
Sterilization and disinfection
Evaluation of disinfectants and antiseptics
Break in asepsis and break in sterilization
Aseptic handling of sterilized material
Disinfect ion of animal and life of sterile status
Antibiotics and their mode of action
Bacterial metabolism
Energy relationship, source of energy and metabolism of carbohydrates, proteins and fats
Classification and nomenclature of bacteria
Bacterial genetics- mutation and variation
Transformation, transduction and conjugation
Plasmids and drug resistance
Introduction and Classification of fungi
Morphology and growth of fungi
Nutrition, physiology and reproduction of fungi
Gen. properties of viruses, morpho.,EM and size of viruses and Purification of viruses.
Viral proteins, nucleic acids and lipids
Cultivation and replication of viruses
Viral genetics and interactions, Viral haemagglutination, interferons and inclusion bodies

Course No. VMC- 211
Course Title: General Veterinary Microbiology

Topic
Safety instructions and Microscopy
Measurement of size of bacteria
Simple and Gram's Staining
Acid- fast staining
Special staining
Demonstration of Fungi
Preparation of media and reagents, Aseptic Transfer of Bact.
Morphology and Cultural Characteristics of Bacteria
Anaerobic Cultivation of Bacteria
Biochemical Activities of Microorganisms
Antimicrobial Susceptibility Test
Determination of Inhibition Coefficient of Antiseptic
Determination of Phenol Coefficient of an Antiseptic
To study the motility of bacteria

Course No. VMC- 221
Course Title: Veterinary Immunology and Serology

Topic
Concept in Veterinary and Medical Immunology.
Immune systems:Organs ,tissues and cells.
Types of Immunity
Development of humoral and cellular immune responses
Antigens:Definitionspecificity,types and factors affecting immunogenicity,blood group antigens
Antibodies:Stracture properties and function of different classes of immunoglobulines
Site Mechanism and theories of antibody production
Monoclonal antibodies
Major Histocompatability complex
Complement system
Cytokines: Major types and fuction
Serological reactions:Agglutination,precipitation,haemagglutination
Phagocytosis,opsonicindex,cytolysis
Complement fixation,neutralization,toxin and antitoxin reaction
Immunofluorescence
Hypersensitivity classification and mechanism of induction
Autoimmunity and immunotolerance
Immunization of animals
Biologicals:Role of conventional and modern vaccines in immmunoprophylaxis
Adjuvants Quality control of biological.

Course No. VMC- 221
Course Title: Veterinary Immunology and Serology

Topic
Preparation of antigen
Raising of antisera
Concentration of immunoglobulins
Agglutination (plate ,tube)
Precipitation (Agar gel precipitation test)
Crossed immunoelectrophoresis (CIE)
Rocket Immunoelectrophoresis (RIE).
Indirect agglutination (Latex co-agglutination, Passive haemagglutination(PHA),ReversedPassive haemagglutination(RPHA))
Haemagglutination
Complement fixation test
Immunoperoxidase test(IPT)
Fluorescent antibody technique (FAT)
Enzyme linked immunosorbent assay(ELISA)
Cell mediated immune (CMI) response
Veterinary biological(visits and appraisal)

Course No. VMC- 311
Course Title: Veterinary Bacteriology and Mycology

Topic	*Escherichia coli*
General introduction of the subject	*Salmomella*
Streptococcus	*Proteus, Shigella*
Staphylococcus	*Yersinia and other enterobacteria*
Bacillus	*Campylobacter*
Clostridium	*Brucella*
Pseudomonas and Burkholderia	*Nocardia, Dermatophilus, Bordetella and Morexella*
Actinobacillus	*Rickettsia*
Actinomyces	*Chlamydia*
Erysipelothrix	*Spirochaetes*
Listeria	*Mycoplasma, Ureaplasma and Acholeplasma*
Mycobacterium	*Aeromonas*
Corynebacterium	*Superficial Mycoses*
Vibrio and Heamophillus	*Rhinosporidium, sporotricum*
Candida, Mycetomal fungi	*Zygomycetes and other fungi*
Histoplasma, cryptococcus	*Fungi causing mastitis and abortion*
Aspergillus	*Mycotoxins*

Course No. VMC- 311

Course Title: Veterinary Bacteriology and Mycology

Topic	
Preparation of media for identification of bacteria	Proteus
Streptococcus	Klebsiella
Staphylococcus	Mycobacterium
Bacillus	Pseudomonas
Escherichia coli	Mastitis
Salmonella	Examination of skin scrapings
Identification of fungus	Aspergillus

Course No. VMC- 321

Course Title: Systemic Veterinary Virology

Topic
Brief history, Classification and Characteristic of various families of DNA and RNA Viruses causing diseases in livestock and poultry
Laboratory diagnostic tech.,Immunity to viral infections
DNA Viruses: Poxviridae: Pox viruses of cow, Sheep,goat and fowl
Asfarviridae: African swine fever
Herpesviridae: Aujeszky's disease, Malignant catarrhal fever, Infectious bovine rhinotracheitis, Herpesviridae:Infectious bovine rhinotracheitis, Equine abortion, Marek's disease, ILT.
Adenoviridae: ICH,EDS, : IBH-HPS
Papillomaviridae:Papillomatosis,Parvoviridae:Canine parvovirus
Circoviridae: Chicken infectious anaemia.
RNA Virus: Orthomyxoviridae: Swine,equine and Avian influenza. Avian influenza.
Paramyxoviridae: RP,PPR, CD and Ranikhet disease.
Flaviviridae: Classical swine fever, Bovine viral diarrhea
Picornaviridae: FMD, Duck viral hepatitis

Rhabdoviridae:Rabies, Vesicular stomatitis ephemeral fever
Cornaviridae: Avian infectious bronchitis Transmissible gastroenteritis
Togaviridae: Equine encephelitis
Arteriviridae: Equine viral arteritis
Calciviridae; Vesicular exanthema
Retroviridae: Avian leucosis group
Lentiviruses: Equine infectious anemia virus
Sheep pulmonary adenomatosis, Maedi/visna
Reoviridae: African horse sickness and Blue tongue Calf Rotavirus
Birnaviridae: IBD
Prions: Exotic and emerging animal and poultry viruses.

Course No. VMC- 321
Course Title: Systemic Veterinary Virology

Topic
Glassware and media preparation
Demonstration of cell culture
Virus propagation by egg inoculation, cell culture
Study of cytopathogenesis viral inclusions
Diagnostic procedures
Serological tech.
Preservation and transportation of clinical samples for virological investigations.
Diagnostic procedures for PPR,RD,IBD and orther viral agent

4. **Salient Achievements**:-

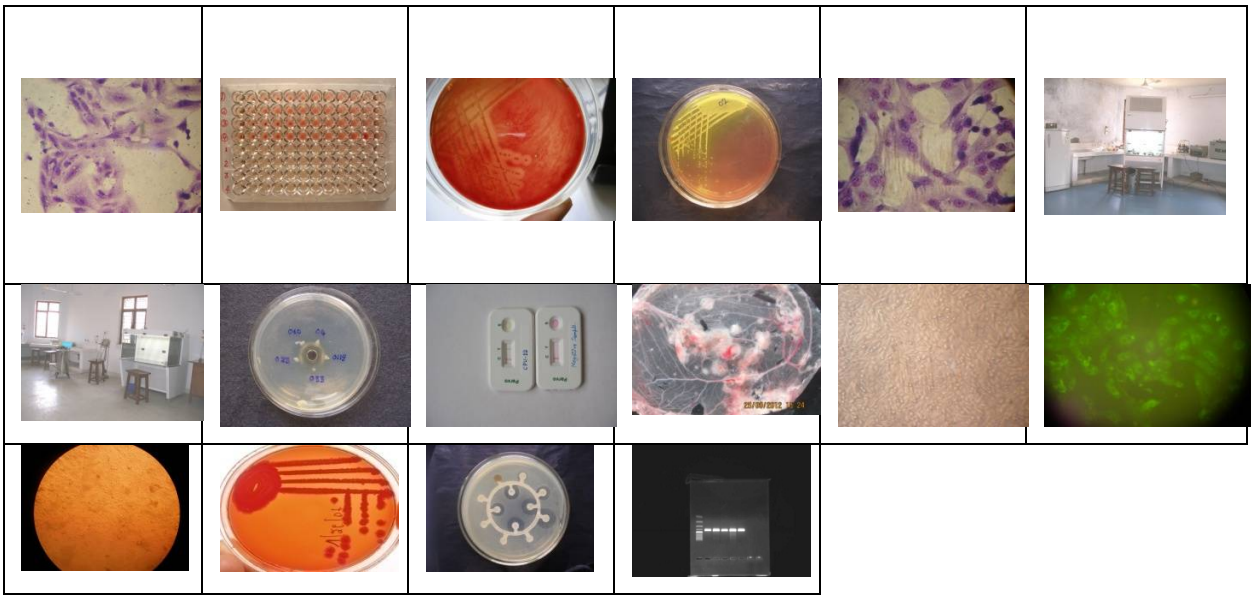
Teaching:-

- The department has developed practical manuals for undergraduate and Post graduate courses for giving first hand information to the students.
- Teaching materials in the form of Power point projections are developed for providing better reading materials to the students.

Research:-

- At least 200 *E.coli* serotypes are isolated and characterized from cases of calf diarrhea, poultry faces and meat and are maintained in the department.

- Infectious bursal disease virus was isolated and characterized from poultry farms in the region.
- Fowl pox virus was isolated and characterized from poultry farms in the region.
- New castle disease virus of poultry was characterized.
- Canine Parvo Virus was isolated and characterized from dogs in the region.
- Presently working on isolation and characterization of Staphylococcus aureus from cases of Bovine Mastitis.



Extension:-

- Department is actively engaged in the extension activities in coordination with Department of Veterinary Extension and Directorate of Extension of the University.

7. Teaching Manuals Prepared:-

1. Practical Manual of course General Veterinary Microbiology (VMC-211).
2. Practical Manual of course Immunology and Serology (VMC-221).
3. Practical Manual of course General and Systemic Veterinary Virology (VMC-321).
4. Practical Manual of course General Veterinary Microbiology (VMC-211) Revised as per VCI curriculum.
5. Practical Manual of course Immunology and Serology (VMC-221) - Revised as per VCI curriculum.

6. Systemic Veterinary Bacteriology and Mycology (VMC-311) – Prepared as per VCI curriculum.
7. Practical Manual of course Systemic Veterinary Virology (VMC-321) - Revised as per VCI curriculum.

8. Seminar Conference attended:

- Dr. R.K.Joshi attended XIth Annual Conference of IAVPHS on "One Health: Harnessing biotechnology for addressing veterinary and biomedical concerns on food safety, zoonoses and environmental sustainability" held at Assam Agricultural University, Khanapara, Guwahati during 3-4th Feb, 2014.
- Dr. R.P.Diwakar/R.K.Joshi/Vibha Yadavattendedl*"Nutritional Challenges and Strategies for Sustainable Animal Production and Health in Eastern Plain Zone"* Workshop- cum-Symposium. Animal Nutrition Association &N.D.U.A&T., Kumarganj, Faizabad (U.P)
- Dr. R.P.Diwakar/R.K.Joshi/Vibha Yadav attended *"Role of Veterinarian in Safe, Sufficient and Sustainable Animal Health and Production"* Organized by Department of Veterinary Medicine, C.V.Sc&A.H., N.D.U.A&T., Kumarganj, Faizabad (U.P)

9. Publications from the Department:-

a) Research Papers:

- Tyagi, S.P., **Joshi, R.K**. and Joshi, N. (2013) Detection and characterization of *Staphylococcus aureus* from the cases of Sub clinical bovine mastitis.*Journal of Animal Health and Production*. **1 (2)**: 20–23

- R.P.Diwakar, NamitaJoshi,R.K.Joshi and Vibha Yadav (**2014**). Isolation and antibiogram of enterobacteria associated with bovine calf diarrhea. ***Advances in Animal and Veterinary Science*** 2 (2S):43-45
- Vibha Yadav, R.K.Joshi, Namita Joshi and R.P.Diwakar (**2014**).Congo red binding and Plasmid Profile of *E.coli* isolates of poultry origin. ***Journal of Animal Health and Production*** 2(3):31-32.
- Dutta A, Joshi N, Joshi PK and Kamal A (2014). Molecular characterization of *e. coli* isolated from raw vegetable**.***Advances in Animal and Veterinary Sciences*. 2(1): 42 – 45

- Verma, R.K., Joshi R.K., Joshi, N. and Niyogi, D. (2014) Studies on cultivation of a field isolate of Fowl Pox Virus and its detection in infected tissue samples by PCR. *Advances in Animal and Veterinary Sciences*(Under Review).

- Verma, R.K., Joshi, R.K., Joshi, N. and Niyogi, D. (2013) Propagation of a field isolate of avian pox virus on chorioallantoic membrane of developing chicken embryo and in BGM-70 cell line. ***Indian Veterinary Journal*** (Submitted)

a) Abstracts published in compendium:

- D.Niyogi, Mukesh Kumar, K.K. Tripathi, R.P.Diwakar and G.K.Singh (2016). Histopathological observation ofhyperkeratosis in Buffalo due to vitamin-A deficiency. *"Nutritional Challenges and Strategies for Sustainable Animal Production and Health in Eastern Plain Zone"* **ANW64:P88.**

PreritKumar,MukeshKumar,VibhaYadav, R.P.Diwakar and N.K.Singh (2015).Biometrical study of the testes of Jamunapari goats in the eastern region of Utter Pradesh.XXXAnual Convention of Indian associtation of Veterinary Anatomists".

- R.K.Diwakar, Namita Joshi, R.P.Diwakar and R.K.Joshi (**2013**). Identification and molecular characterization of *E.coli* isolated from meat. OMICS Group "2nd*International Conference on Clinical Microbial Genomics" (Clinical Microbiology - 2013),Septembere 16 – 18, 2013 at* ***Las Vegas, USA*** *(Acceptance).*

- R.K.Diwakar,V.Yadav,R.P.Diwakar,R.K.Joshi,M.Kumar,Krishnanand,N.Joshi,Ruma (**2014**). Cow urine: As antiseptic *"8th convention of Uttar Pradesh Chapter of Indian Society for Veterinary"*, College of Veterinary Science and A.H., N.D.U. A. & T., Kumarganj, **Faizabad** (U.P.), pp 45.

R.K.Joshi,VibhaYadav, R.P.Diwakar**,** Prerit Kumar and ShivendraPratap Singh(2016).Antibiotic Resistance:Implication For A Post-Antimicrobial Era.*"Role of Veterinarian in Safe, Sufficient and Sustainable Animal Health and Production"* Lead Paper **p.70-77**.

- R.P.Diwakar, R.K.Joshi, R.K.Diwakar, Namita Joshi and Vibha Yadav (**2013**).Complication inHuman Health By Environmental Pollution.*International Conference on Environmental Science and Technology.****Venice,Italy****,Nov.14-15,20213*

- R.P.Diwakar, R.K.Joshi, R.K.Diwakar,VibhaYadav and Mohit Verma (**2013**). Effect of vaccine in Infectious diseases. *OMICS Group "2nd International Conference on Clinical Microbial Genomics" (Clinical Microbiology - 2013),Septembere 16 – 18, 2013 at* ***Las Vegas, USA*** (Acceptance).

- R.P.Diwakar, R.K.Joshi, Vibha Yadav and R.K.Diwakar (**2013**). Human health implications of Avian Influenza viruses and Paramyxoviruses.Page 49-50, XX Annual convention of IAAVR and International Conference on " *THRUST AREAS IN VETERINARY RESEARCH, EDUCATION,REGULATORY REFORMS AND GOVERNANCE FOR QUALITY SERVICES TO FORMERS*" 16-17 April 2013 **Bangalore**, India.

- R.P.Diwakar, R.K.Joshi, Vibha Yadav, R.K.Diwakar and Rajesh Kumar (2013). Impact of livestock on climate change. Page 70, *Abstracts and Souvenier, Alumni Meet and National Seminor on ''Frontier Agriculture – 2013" April 20 – 21, 20132 at N.D.U.A&T. Kumarganj Faizabad 224229.*
- R.P.Diwakar, R.K.Joshi, Vibha Yadav, R.K.Diwakar and Rishi Kant (**2013**).Effect of air pollution on human and animals. Page 93-95*, Abstracts and Souvenier, National symposium on ''Emerging pollutants and pathogens due to climatic change: Challenges and Risk redction.'' March 08-09, 2013 at N.D.U.A. &T. Kumarganj* ***Faizabad*** *224229.*
- R.P.Diwakar,R.K.Joshi,VibhaYadav, R.K.Diwakar and Rajesh Kumar (**2013**). Impact of livestock on climate change. Page 70, *Abstracts and Souvenier,Alumni Meet and National Seminor on ''Frontier Agriculture – 2013" April 20 – 21, 20132 at N.D.U.A&T. Kumarganj* ***Faizabad*** *224229.*

- Rajesh Kumar Joshi and Namita Joshi (2014)Co Agglutination test: A rapid tool for detection of Viral antigensPaper presented in XIth Annual Conference of IAVPHS on "One Health: Harnessing biotechnology for addressing veterinary and biomedical concerns on food safety, zoonoses and environmental sustainability" held at Assam Agricultural University, Khanapara, Guwahati during 3-4th Feb, 2014.
- Ruma devi, S.S. Sengar, K.D.Kashyap, K.D.Singh, V.Yadav, Krishnanand. M.Kumar and R.P. Diwakar, (**2014**). Role of nutrition in wound healing of animals. *"8th convention of Uttar Pradesh Chapter of Indian Society for Veterinary"*, College of Veterinary Science and A.H., N.D.U. A. & T., Kumarganj, Faizabad (U.P.), pp 52
- V.Yadav, D.K.Yadav, R.P.Diwakar and A.K.Singh (**2014**). Management of benign mammary tumors in female dogs. *"8th convention of Uttar Pradesh Chapter of Indian Society for Veterinary"*, College of Veterinary Science and A.H., N.D.U. A. & T., Kumarganj, Faizabad (U.P.), pp 49.
- V.Yadav, N.S.Jadon, D.K.Yadav, R.P.Diwakar and S. Kumar (**2014**). Treatment of Perineal Hernia in a Dog using canine small intestinal submucosa allograft.*"8th convention of Uttar Pradesh Chapter of Indian Society for Veterinary"*, College of Veterinary Science and A.H., N.D.U. A. & T., Kumarganj, Faizabad (U.P.), pp 46.
- V.Yadav, R.K.JoshI, R.P. Diwakar, Krishnanand and Ruma (**2014**). Approaches to wound management in special reference to wound microbiology.*"8th convention of Uttar Pradesh Chapter of Indian Society for Veterinary"*, College of Veterinary Science and A.H., N.D.U. A. & T., Kumarganj, Faizabad (U.P.), pp 51.
- V.Yadav, R.P. Diwakar, Mukesh and Ravindra Verma (**2014**). Tramsmissible venereal tumor in dogs. *"8th convention of Uttar Pradesh Chapter of*

Indian Society for Veterinary", College of Veterinary Science and A.H., N.D.U. A. & T., Kumarganj, Faizabad (U.P.), pp 46.

- Verma, M, **Joshi, N** and Joshi, R.K. (2014) Conventional and molecular approaches for detection of zoonotic *Arcobacter* from poultry. Paper presented in XIIth Annual Conference of IAVPHS on "One Health: Harnessing biotechnology for addressing veterinary and biomedical concerns on food safety, zoonoses and environmental sustainability" held at Assam Agricultural University, Khanapara, Guwahati, during 3-4th Feb, 2014. Also acted as **Co-chairman** in young scientist award session.
- Vibha Yadav, R.P.Diwakar and Rajesh kumar Verma(2016). Gastrointestinal Microorganisms in Animal Nutrition and Health. *"Nutritional Challenges and Strategies for Sustainable Animal Production and Health in Eastern Plain Zone"* **ANW71:P93.**
- Vibha Yadav**,***R.K. Joshi,and R.P. Diwaker***(2013).***Biodiversity and its Conservation.page 39,Abstracts,UP Agricultural Science Congress2013"Emerging Challenges and Resource Management for Food Security"August 17-19,2013 at N.D.U.A.&TKumarganj,Faizabad 224229*
- Vibha Yadav**,***R.K. Joshi,and R.P. Diwaker*(**2013**).*Biosafety Measures .page 60,Abstracts,UP Agricultural Science Congress 2013"Emerging Challenges and Resource Management for Food Security"August 17-19,2013 at N.D.U.A.&TKumarganj,Faizabad 224229*
- Vibha Yadav**,***R.K. Joshi,and R.P. Diwaker(**2013**). "Livestock and its Role in Women Empowerment" .page 60,Abstracts,UP Agricultural Science Congress 2013"Emerging Challenges and Resource Management for Food Security"August 17-19,2013 at N.D.U.A.&TKumarganj,Faizabad 224229*
- Vibha Yadav**,***R.K. Joshi,and R.P. Diwaker(2013).Virulence Characteristics &Plasmid Profiles of E. coli isolates from poultry"(Clinical Microbiology-2013) Septembere 16 – 18, 2013 at **Las Vegas, USA***(Acceptance).