WEST BENGAL UNIVERSITY OF ANIMAL AND FISHERY SCIENCES

ANNUAL REPORT

(2003-04 to 2006-07)

37 & 68, Kshudiram Bose Sarani
Kolkata – 700 037
West Bengal

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Edited and Published by :
Prof. M. K. Bhowmik
Director of Research, Extension and Farms
West Bengal University of Animal and Fishery Sciences
68, Kshudiram Bose Sarani, Kolkata, West Bengal
India, Pin Code – 700 037
Phone No. : 033 2556-3396
Mobile : 9830826747

Report page planned and designed by :
Dr. Sourav Chandra
Assistant Director (Extension)
Directorate of Research, Extension and Farms
West Bengal University of Animal and Fishery Sciences
68, Kshudiram Bose Sarani, Kolkata, West Bengal
India, Pin Code – 700 037
Mobile : 9433330888

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FOREWORD

It gives me immense pleasure to present the Annual Report of the West Bengal University of Animal & Fishery Sciences which highlights the important activities of the varsity and salient achievements made during the period from 2003-04 to 2006-07.

It is now crystal clear that the livestock and fishery sectors play a pivotal role in sustainable agricultural production system for the small and marginal farmers and landless labourers of the country. The well developed poultry and dairy farming are paving the way for women empowerment, poverty alleviation and rural upliftment. The West Bengal University of Animal & Fishery Sciences is recognized as one of the leading institutions in the eastern region of the country, shouldering the responsibilities of education, research and extension activities in veterinary, dairy and fishery sciences. The University has made significant studies in the area of preservation of Garole sheep, Black Bengal goat and Ghoongroo pig, whcih are native germplasms of the State. The faculty members of the University have also taken keen interest in research activities related to processing of pork and broiler, production of indigenous milk products, conservation of threatened fishes, integrated management of livestock and fish, weather based animal diseases, blue tongue disease, technology assessment and refinement etc.

The process of dissemination of knowledge and techniques have been significantly undertaken by the three Krishi Vigyan Kendras under the aegis of the University. The Directorate of Research, Extension & Farms has conducted various training programmes on livestock, poultry and fishery aspects for the State Govt. officials and also for the farmers.

Quality teaching and resarch activities have received paramount importance during these years and I am happy to know that the University has achieved academic excellence and made valued contribution to human resource development.

Our University could never attain the success it has achived without the active support and patronage of the Government of West Bengal, I. C.A. R. and other agencies.

I appreciate the efforts made by the editorial and publication board in bringing out the Annual Report in precise and attractive form. I would like to thank all my colleagues in West Bengal University of Animal & Fishery Sciences for their incredible work and cooperation, I shall look forward for any suggestion and comments on the information contained in this publication, which would prove to be very much valuable for future activities.

Chakrabarti.

(Prof. C. S. Chakrabarti)
Vice Chancellor

PROLOGUE

Comprehensive accounts of all activities and achievements of the University during the year 2003-04 to 2006-07 are being reflected in the Annual report of the University in a regular basis. The University started its activities from the year 1995 after its bifurcation from Bidhan Chandra Krishi Viswavidyalaya. The University is marching ahead in spite of certain initial hurdles. Within the short span of time, the University has taken up a number of Research projects in the field of Veterinary and Animal Sciences, Dairy Technology and Fishery Sciences with the financial assistances from Indian Council of Agricultural Research, Department of Science and Technology of Govt. of West Bengal and other funding agencies. In academic fields, VCI syllabus has been introduced in BVSc & AH course. Similarly, uniform icar syllabus is being followed for Fishery sciences and Dairy Technology of UG courses. It has developed the Central Library to its desired level and in a position to provide modern facilities to the users.

In the meantime, a good number of construction works have been undertaken to provide working space to various Departments and Sections of the University as well as to create congenial atmosphere for Education, Research and Extension.

Various programmes on field extension activities have been taken-up successfully by the Directorate of Research, Extension & Farms to transfer technologies to enhance productivity of livestock and fishery sectors in the State.

Since this report contains a brief account of various aspects of their interest, it is very much expected that the Annual Report would be useful to the members of University Community, Government Officials and other concerned persons.

The publication of this Annual report has been made possible by untiring efforts of various officers, who deserve appreciation.

R. Ghosh

(Prof. Ranjit Ghosh)
Registrar

EDITOR'S COLUMN

India has experienced the worst-ever-effects of Avian Influenza (AI) so-called Bird flu scare, even not being affected, on the poultry industry, and obviously being drastically cut down the livelihood security of millions of our farm population. Since its first emergence in Maharashtra and Gujrat in February, 2006, followed by 13 districts of West Bengal from January 2008 onwards, this transboundry disease (TD) continues devastating losses both in domestic as well as international markets. The virulent virus is notably undaunted to go on rampage in absence of any vaccines and we are to choose either Devil or Deep Sea, whatsoever. Fortunately prompt detection, mass culling and biosecurity measurers with banning all movements of poultry and related materials from the affected areas had controlled rapid spread of the disease. In 1981, the term Fowl plague was abandoned and given "highly pathogenic avian influenza". And now the influenza virus has plagued poultry producers world -wide for atleast a century. This continually mutating virus is a continual challenge in all its different forms, and has even developed ability to cross species.

It is, after all, a great relief that the cherished bird flue vaccine has been developed in the country's premier Veterinary Research organization namely High Security Animal Disease Laboratory (hsadl) at Bhopal. This killed vaccine prepared indigenously can be used during a H5 N1 outbreak and the protection offered by it, has been found to be above 90% lasting upto six months. The vaccine has been now tested for safety, dosage, adjuvant and the routes of inoculation. The cost and the licensing of the technology for commercial production are yet to be finalised. However, with the advent of the vaccine benefiting from the biotechnology revolution, the future of AI vaccines seems bright as new and exciting types are explored.

All the more the widespread use of AI vaccines only can not be the surest methods of combating the disease, they can provide an effective economic 'safety net' should other measurers fail in preventing or moderating the losses due to both mortality and morbidity. Biosecurity is equally important to the control of AI despite through vaccination in times of any challenge.

(Prof. M. K. Bhowmik)
Director of Research, Extension & Farms
&
Editor

ACKNOWLEDGEMENT

I convey my deepest sense of gratitude to Prof. C. S. Chakraborty, Honourable Vice Chancellor of the University for his valuable advice and constant inspiration for the publication of this Annual Report.

I gratefully acknowledge the active support and untiring guidance rendered by Prof. M. K. Bhowmik, Director of Research, Extension and Farms and Editor for preparation of the Annual Report.

Sincere thanks also to acknowledge in favour of Prof. R. K. Ghosh, Registrar, Sri Debabrata Kundu, Finance Officer, Prof. N. R. Pradhan, Controller of Examinations, Prof. D. De, Dean of Veterinary and Animal Sciences Faculty, Prof. A. K. Mishra, Dean of Dairy Technology Faculty, Prof. K. C. Dora, Dean of Fishery Sciences Faculty, Sri Anuj Chakraborty, Secretary Faculty Council and other Faculty members for their cooperation in preparing this Annual Report.

The help and cooperation received from all the Officers and staff of Directorate of Research, Extension and Farms is certainly to record with glad.

I am also especially grateful to all the members of the Editorial and Publication Board of this Annual Report for allout support rendered by them.

I hope this Report will be meaningful, which has highlightened the activities of the University in a fascinating manner. Comments and suggestions are cordially invited to improve the quality of report publication in future.

(SOURAV CHANDRA)
Assistant Director (Extension)
&
Associate Editor

CONTENTS

EXECUTIVE SUMMARY

West Bengal University of Animal and Fishery Sciences, the second Veterinary University of the country started its journey during January 1995 with an objective to serve the Sate as well as the nation as a whole through imparting quality **Education**, accomplishing basic and need based **Research** and disseminating proven technologies to the farming community through **Extension** wing. The highlights of various activities of the University during the period 2003-04 to 2006-07 are depicted below :

Institutional :

The 3rd convocation was organized to confer degrees to 631 Under-graduate, 541 Post-graduate and 46 Ph.D. students under the three Faculties of the University. The expert team of Veterinary Council of India (VCI) visited University to assess the academic activities of Under-graduate course through VCI system adopted in the University. The Director General (DG) of Indian Council of Agricultural Research (ICAR) visited the University and made interaction with the Faculty members with a view to strengthen the education and research and financial support from ICAR. University has conducted 6 National Conferences. The Central Library with Information Network services is in action towards fulfilling the objectives of the University.

Academic :

The admission of students for three faculties during 2003-04 to 2005-06 was 832. During the period, a total of 724 students comprising 371 in Under-graduate, 311 in Post-graduate and 42 in Ph.D. programmes have successfully completed their courses. Best students were awarded with different kinds of medal namely, Mira Mallick Gold Medal, Dr. S.N. Roy Gold medal, Prof. D.B. Mukherjee Gold medal, Dr. P. Bhattacharya Gold medal and Dr. D.K. Biswas Gold medal.

Research :

Since inception the University has completed 49 research projects with fund allocation of Rs. 584.019 lakhs, received from various funding agencies. The University has already evolved 35 technologies, which inturn, would help to enhance the income and livelihood security of the farming community. Currently there exists 33 numbers of on-going research projects with fund allocation of Rs. 1016.476 lakhs. In addition, there exists – Collaborative research projects with other Institutions. Further, this University has been selected as the Supporting Institute to undertake 2 (two) National Agricultural Innovative Projects (NAIP) under component 3 relating to livelihood security in collaboration with Bidhan Chandra Krishi Viswavidyalaya (BCKV), ICAR Research complex for NEH Region (Tripura) and IVRI (UP).

Extension :

One of the prime features of the University is the acceptance of the philosophy of service to farmers and rural community. The University has organized various training programmes, workshops, seminars, kishan mela, consultancy and advisory services, on-farm trail, frontline demonstrations, field days and other extension activities benefiting 30335 farmers during the period under report. The University also offers training for State level Extension Officers and also periodically organize National level training programmes for Extension Officers of different States. Five documentary films were produced to disseminate knowledge on latest technologies in livestock and fishery sectors.

During the period, nearly 600 research papers were published in different national and international journals. Apart from this, University has also published 42 numbers of books, monographs, manuals, compendiums and activity highlights.

Krishi Vigyan Kendras :

The University has 3(three) Krishi Vigyan Kendras (KVKs) in Jalpaiguri, North 24 Parganas and Murshidabad disticts. All the KVKs have been functioning based on the mandates formulated by Indian Council of Agricultural Research (ICAR). Three centrally sponsored research projects have been implemented at Jalpaiguri KVK. In addition, 6 (six) projects sponsored by Planning Commision, Govt. of India have been implemented at the Jalpaiguri KVK.

A. ADMINISTRATION

A.I. MANDATE

The mandate of West Bengal University of Animal and Fishery Sciences is as follows :

A. To impart education in the branches of Veterinary and Animal Sciences, Fishery Sciences, Dairy Technology and allied sciences.

B. To conduct basic and applied research in the field of Veterinary and Animal Sciences, Fishery Sciences, Dairy Technology for advancement of knowledge and enhancement of productivity.

C. To undertake the development of such siences and the extension thereof to the rural people in co-operation with the concerned Departments of Government of West Bengal.

A.2. ORGANISATIONAL SET-UP

The University operates through following autorities, which are responsible for policy matters and decision making in the field of Academic, Research, Extension, Farm activities and Administration :

- Executive Council
- Academic Council
- Research and Extension Education Council
- Board of Examinations
- Finance Committee
- Faculty Council
- Board of Studies

A.3. ORGANISATIONAL STRUCTURE

Chancellor

↓

Vice-Chancellor

- **Registrar**
  - a. Establishment
  - b. Security
  - c. General Administration
- **Dir. Res. Extn. & Farms**
  - a. Research
  - b. Extension
  - c. Farms
- **Finance Officer**
  - a. Accounts
  - b. Audits
- **Controller of Examinations**
  - A. Admission
  - b. Examination
- **Deans of the Faculties**

Dean, F/o Vety. & Animal. Sci.

Departments :

1. Vety, Anatomy,Histology & Embryology
2. Vety. Pathology
3. Vety. Bio-chemistry
4. Animal Nutrition
5. Vety. Pharmacology &Toxicology
6. Vety. Physiology
7. Vety. Microbiology
8. Vety. Parasitology
9. Animal Genetics & Breeding
10. Clinical Vety. Medicine, Ethics and Jurisprudence
11. Vety. Epidemiology & Preventive Medicine
12. Vety. Public Health.
13. ~~Animal~~ Livestock Production Management
14. ~~Animal~~ Livestock ProductsTechnology ~~& Marketing~~ Livestock
15. Vety.Gynaecology & Obstetrics
16. Vety. Surgery & Radiology
17. Vety. & Animal Husbandry Extension Education.

~~18. Vety. Clinics.~~

Dean, F/o Dairy Technology

Departments :

1. Diary Microbiology
2. Dairy Technology
3. Dairy Engineering
4. Dairy Chemistry

Dean, F/o Fishery Sci.

Departments :

1. Fish Biology & Resources Management
2. Aquaculture
3. Fisheries Environment
4. Fishery Pathology & Microbilogy
5. Fish Procesing Technology
6. Fish Engineering
7. Fishery Economics, Statistics & Marketing
8. Fishery Extension

A.4. STAFF POSITION

University Officers	8
Directorate of Research, Extension & Farms	
Deputy Director (Research)	1
Assistant Director (Research)	1
Assistant Director (Extension)	1
Assistant Director (Farms)	1
Scientist	2
Computer Programmer	1
Finance and Accounts Section	
Assistant Finance Officer	2
Establishment Section	
Security cum Estate Officer	1
Central Library	
Assistant Librarian	1
Teaching staff	
Faculty of Veterinary and Animal Sciences	56
Faculty of Dairy Technology	13
Faculty of Fishery Sciences	19
Non-teaching staff	
Group C	
Senior Superintendent	4
Junior Superintendent	2
Senior Assistant	20
Junior Assistant	5
Technical Superintendent	3
Technical Assistant	2
Field Assistant	2
Junior Journalist	1
Junior Assistant Librarian	1
Personal Assistant	1
Senior Compounder	2

Group D

Record Keeper	8
Record Supplier	15
Office Attendant	19
Laboratory Attendant	28
Senior Farash	1
Mali	1
Vistiman	1
Driver	2
Cyclostyle Operator	1
Gymnasium Attendant	1
Darwan	2
Sahis	3
Animal Keeper	8
Sweeper	18

A. 5. NAME OF OFFICERS IN THE UNIVERSITY

Prof. C. S.Chakrabarti	Vice-Chancellor
Prof. R. K. Ghosh	Registrar
Prof. M. K. Bhowmik	Director of Research, Extension & Farms
Prof. D. K. De	Dean, F/O Vety. & Animal Sciences
Prof. A. K. Mishra	Dean, F/O Dairy Technology
Prof. K. C. Dora	Dean, F/O Fishery Sciences
Prof. N. R. Pradhan	Controller of Examinations
Sri D. Kundu	Finance Officer

A. 6. DIFFERENT STATUTORY BODIES

EXECUTIVE COUNCIL

Prof. C. S. Chakrabarti Vice-Chancellor	*Chairman*
Dr. Dilip Kr. Das Director of Animal Husbandry & Vety. Services, Govt. of West Bengal	*Member*
Sri S. K. Bhattacharya Director of Fisheries Govt. of West Bengal	-do-

Sri S. Mazumder Milk Commissioer Govt. of West Bengal	-do-
Prof. D. K. De Dean, Faculty of Vety. & Anim. Sciences WBUAFS	Member
Prof. A. K. Mishra Dean, Faculty of Dairy Technology WBUAFS	-do-
Prof. K. C. Dora Dean, Faculty ofFishery Sciences WBUAFS	-do-
Prof. M. K. Bhowmik Director of Research, Extension & Farms WBUAFS	-do-
Prof. P. Biswas Professor, Deptt. of Animal Nutrition (Teachers' Representative, Faculty of Vety. & Anim. Sci., WBUAFS)	*Elected Member*
Prof. S. K. Gangopadhyay Professor, Deptt. of Dairy Technology (Teachers' Representative, Faculty of Dairy Technology, WBUAFS)	-do-
Prof. N. R. Chattopadhyay Professor Deptt. of Aquaculture (Teacher's Representative, Faculty of Fishery Sci, WBUAFS)	-do-
Sri K. K. Roy Senior Superintendent (Non-Teaching Staff Representative, WBUAFS)	-do-
Sri Debasish Mohanta 5th Yr., BVSc. & AH, (Students' Representative, WBUAFS)	-do-
Sri Biplab Mazumder (M.L.A. Representative, nominated by West Bengal Legislative Assembly)	*Nominated Member*

Prof. A. P. Singh Professor, Deptt. of Vety. Surgery College of Vety. Science & Animal Husbandry Jawharlal Neheru Krishi Viswavidyalaya (Representative of Vety. Council of India, New Delhi)	*Nominated Member*
Sri Shibadas Bhattacharjee (Representative from Farmers or Producers, nominated by Govt. of West Bengal)	-do-
Sri Pitabasan Das (Representative from Farmers or Producers, nominated by Govt. of West Bengal)	-do-
Sri Anil Patra (Representative from Farmers of Producers, nominated by Govt. of West Bengal)	-do-
Dr. K. K. Vass Director, Central Inland Fisheries Research Institute I.C.A.R. (Representative of I.C.A.R., New Delhi)	-do-
Prof. R. K. Ghosh Registrar, WBUAFS	*Non-Member Secretary*

FACULTY COUNCIL

Vice-Chancellor	*Chairman*
Registrar	*Member*
Director of Research, Extension & Farms	-do-
Librarian	-do-
Controller of Examinations	*Invitee menber*
Dean of the respective Faculty	*Member*
All Heads of the Deptt. of respective Faculty	-do-
Professor from respective Faculty	*Elected Member*
Reader from respective Faculty	-do-
Lecturer from respective Faculty	-do-
U. G. student from respective Faculty	-do
P.G. student from respective Faculty	-do-
Secretary, Faculty Council	*Ex-officio Secretary of three Faculties*

RESEARCH AND EXTENSION EDUCATION COUNCIL

1. Vice-Chancellor-Chairman
2. Director of Research, Extension and Farms-Member Secretary
3. Director of Veterinary Services and Animal Husbandry, Govt. of West Bengal
4. Deans of Faculties - Member
5. Director of Fisheries, Govt. of West Bengal - Member
6. Head of all Research Stations and Project Co-ordinators of State/ICAR/other agencies, research schemes - Member
7. Three Scientists of eminence to be nominated byt the Vice-Chancellor for their specialized knowledge, one for each faculty for a period of two years - Member
8. Three progressive farmers associated with Veterinary, Animal Husbandry/Fisheries/Dairy Technology practices to be nominated by the Vice-Chancellor. - Member

ACADEMIC COUNCIL

1. Vice-Chancellor-Chairman
2. Director of Research, Extension and Farms - Member
3. Deans of Faculties - Member
4. Registrar-Non-Member Secretary - Member
5. Controller of Examinations - Member
6. Librarian - Member
7. All Heads of the Departments of all the Faculties - Member
8. One Lecturer, one Reader and one Professor from each Faculty - Member
9. One undergraduate student from each Faculty and one Post-graduate studet from the University elected by the regular students in a manner as shall be prescribed - Member
10. Tow eminent academicians from the field of Veterinary/Dairy/Fishery Sciences nominated by the Vice-Chancellor. - Member

A. 7. DIGNITORIES VISITED

1. Sri Gopal Krishna Gandhi, Hon'ble Governor, West Bengal and Chancellor
2. Shri Buddhadeb Bhattacharya, Hon'ble Chief Minister, Govt. of West Bengal
3. Dr. Mangla Rai, Secretary (DARE) & DG, ICAR, Govt. of India
4. Sri Nirupam Sen, MIC, Dept. of Industries, Planning and Development, Govt. of West Bengal
5. Dr. Surya Kanta Mishra, MIC, Dept. of Health & Family Welfare and Panchayat & Rural Development, Govt. of West Bengal.
6. Sri Anisur Rahaman, MIC, ARD,Govt.of West Bengal
7. Sri Kiranmoy Nanda, MIC, Fisheries, Govt. of West Bengal

8. Dr. R. Samanta, Vice-Chancellor, BCKV
9. Prof. M. G. Som, Ex-Vice-Chancellor, B.C.K.V.
10. Dr. N. Sharma, Director, NDRI
11. Mr. S. L. Mehta, National Director, NATP
12. Dr. J. C. Katyal, DDG (Edn), ICAR
13. Dr. R.B. Sing, Ex-Director, Central Avian Research Institute
14. Ms. Anita Jain, Under Secretary, Govt. of India
15. Prof. Ganaprakashan, Ex-Vice Chancellor, Tamilnadu University of Veterinary & Animal Sciences.
16. Sri Biman Bose, President, Nodal Research Centre, Govt. of West Bengal.
17. Dr. A. Bandyopadhyay, National Coordinator, NATP
18. Prof. A. R. Thakur, Vice Chancellor, West Bengal University of Technology.
19. Prof. S. Banerjee, Vice Chancellor, Netaji Open University.

A.8. 3RD CONVOCATION

The highly prestigious and vainglorious Third Convocation of West Bengal University of Animal and Fishery Sciences was organized at the University campus on 10th April, 2007. Hon'ble Chancellor His Excellency, Sri Gopal Krishna Gandhi inaugurated the aphrodisiac convocation and the convocation address was delivered by Dr. Magla Rai, Secretary to the Department of Agricultural Research and Education (DARE) and Director General, Indian Council of Agricultural Research (ICAR). Sri Buddhadeb Bhattacharya, Hon'ble Chief Minister, Govt. of West Bengal was present as Chief Guest in the auspicious function. Amongst the other dignitaries, Sri Anisur Rahaman, Hon'ble Minister, Animal Resource Development Department, Govt. of India and Sri Kiranmoy Nanda, Hon'ble Minister of Fisheries Department, Govt. of West Bengal graced the occasion with their luminous presence. Faculty wise following degrees were awarded to the students –

Degree in the Faculties	*No. of students*
Faculty of VAS	
B.V.Sc. & A.H.	**432**
M.V.Sc.	**371**
Ph.D.	**43**
Faculty of DT	
B.Tech. (DT)	**89**
M.Sc. (Dairying)	**40**
M. Tech. (DT)	**17**
Ph.D.	**3**
Faculty of Fishery	
B.F.Sc.	**110**
M.F.Sc.	**113**

Besides, **32** students were awarded with Gold Medals for their success in different branches of studies under the University.

A. 9. IMPORTANT EVENTS

A.9.1. WELCOME TO NEW VICE CHANCELLOR

Prof. C. S. Chakrabarti has taken over the charge as the new Vice-Chancellor of the West Bengal University of Animal and Fishery Sciences w.e.f. 7.08.06. Prof. Chakrabarti, a soft spoken gentleman with uncanny approach derives his strength from his sincere devotion to his duties and responsibilities. He would be able to give proper leadership to look upon our University as a roll model. We wish him all sucess in his endeavours while welcoming him on his new appointment, which he rightly deserves.

A.9.2. VISIT OF VETERINARY COUNCIL OF INDIA (V.C.I.) INSPECTION TEAM

The Inspection Team of the Veterinary Council of India (V.C.I.), New Delhi under the Chairmanship of Dr. R.B. Sing, Ex-Director, Central Avian Research Institute, Port Blair, Andaman & Nicobar Islands visited the University from 4th October to 6th October 2007. The report of visiting team in favour of our University is highly appreciated in the Faculty Council of Veterinary & Animal Sciences.

A. 9.3. NATIONAL CONFERENCE / SYMPOSIUM CONDUCTED

1. Twenty first Annual Conference of Indian Association of Veterinary Pathologists (IAVP) was held in the Department of Vety. Pathology from November 23-25, 2004. The topic of the conference was 'Advances in pathological techniques in diagnosis of animal, birds and fish disease.
2. Organised the 6th All India Conference of Association of Public Health Veterinarians and National Symposium on "Sustainable production of safe food of animal and fish origin : Public awareness and People's participation" from 26-28 Novermber, 2004 at Krishi Vigyan Kendra, Sri Ramkrishna Ashram, Nimpith, South 24 Parganas.
3. Nineteenth Annual Convention and Symposium of Indian Association of Veterinary Anatomist was held in the Department of Veterinary Anatomy from 16 - 19 November, 2004. The theme of the National Symposium was "Interdisciplinary approach in Veterinary Anatomy for livestock production".
4. Thirty seventh National Conference of Indian Pharmacological Society, held at Science City, Kolkata organizd by Department of Veterinary Pharmacology during 14-16 January, 2005.
5. National level Seminer on 'Nutritional Vista - Imagine 2010' organised by Department of Animal Nutrition with animal nutritionist, feed industries, students and prograssive farmers.
6. Seventh Indian Veterinery Congress and XV Animal Conference of Indian Association of Advancement in Veterinary Research on 'Public, Private-Partnership (PPP) in Vetininary Research and Education sector' organised by Faculty of Veterinary & Animal Scieces during 22-24 February 2008.

B. ACADEMIC

B.1. ACADEMIC PROGRAMMES

Faculty of Veterinary and Animal Sciences :.

i) B. V. Sc. & A.H. — 5 years Bachelors' degree course (60 capacity)

ii) M.V. Sc — 2 years Masters' degree course

iii) Ph. D. — 3 years Doctoral degree course

Faculty of Dairy Technology :

i) B. Tech. (DT) — 4 years Bachelors' degree course (30 capacity)

ii) M. Tech./M.Sc. — 2 years Masters' degree course

iii) Ph. D. — 3 years Doctoral degree course

Faculty of Fishery Sciences :

i) B.F. Sc. — 4 years Bachelors' degree course (30 capacity)

ii) M. F. Sc. — 2 years Masters' degree course

B.2. ADMISSION AND PASSED-OUT

Course	Admission			Passed-out		
	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06
Faculty of VAS						
B.V.Sc. & A.H.	93	70	72	77	80	91
M.V.Sc.	80	76	80	78	84	63
Ph.D.	46	39	17	7	15	17
Faculty of DT						
B.Tech. (DT)	26	23	29	12	19	23
M. Tech. (DT)	6	12	23	8	12	11
Ph.D.	-	-	-	1	1	1
Faculty of Fishery						
B.F.Sc.	24	26	25	20	29	20
M.F.Sc.	14	30	31	20	22	13
Total	289	276	277	223	262	239

B.3. AWARDS (GOLD MEDALS/SCHOLARSHIPS)

Follwing recognitions are being awarded as Gold Medals by the University:

- Smt. Mira Mallik Gold Medal
  [Highest marks in B.V.Sc.&A.H.]
- Dr. S. N. Roy Gold Medal
  [Highest marks in Livestock Farm Management in B.V.Sc.&A.H.]
- Prof. D. B. Mukherjee Gold Medal
  [Highest marks in Veterinary Surgery and Radiology in B.V.Sc.&A.H.]
- First Bathch (1953) B.V.Sc.&A.H. Students' Gold Medal
  [Highest marks in 5th & 6th semester in B.V.Sc.&A.H.]
- Dr. P. Bhattacharya Gold Medal
  [Highest OGPA in Animal Production and Management in M.V.Sc.]
- Prof. Sukumar De Gold Medal
  [Highest marks in B.Tech. (Dairy Technology)]
- Smt. Tirthamayee Ganguli Gold Medal
  [First position in M.Tech. (Dairy Technology)]
- Prof. G. Ganguly Scholarship
  [Highest marks in B. Tech. (Dairy Technology), 3rd Year]
- Mrs. P. Ganguly Scholarship
  [Highest marks in B. Tech. (Dairy Technology) 3rd Year]

B.4. CENTRAL LIBRARY OF THE UNIVERSITY

The University has full-fledged Central Library and Information Network Service (CLINS) at its Belgachia, Kolkata Campus alongwith another two Units at Chakgaria, Kolkata campus and Mohanpur, Nadia campus.

The workings hours at Belgachia campus is 10AM to 7:00PM and at Chakgaria and Mohanpur Campus is 10AM to 5·30PM.

The no. of Books at CLINS is 22000. The number of Journals/periodicals – International 25 and national 44.

The other services extended through CLINS :

- Internet browsing
- Electronic abstracting services like CD-ROM
- Online abstracting
- CAS
- Photocopying
- Information services files
- Resource sharing
- Service to career guidance tools
- Bibliographical database on books, journals, these and dissertations
- Book bank
- Electronic circulation
- LAN facilities in the campus

C. TECHNOLOGY GENERATION

PROJECTS AT A GLANCE

		No. of Projects	*Fund received*
1.	Completed projects	49	Rs. 584.0198 lakhs
2.	On-going projects	29	Rs. 956.837 lakhs
3.	Submitted projects	10	Rs. 484.8305 lakhs

TYPE OF ON-GOING PROJECTS AND FUNDING AGENCIES

SlNo.	Type of project/scheme	Funding agency	Number
1.	All India Coordinated Research Projects (AICRP)	ICAR	3
2.	Network Project	ICAR	3
3.	Adhoc Research Schemes	ICAR	12
4.	National Agricultural Innovation Project	ICAR	2
5.	Ministry of Agriculture, Govt. of India	GOI	2
6.	Ministry of Environment & Forests, Govt. of India	GOI	1
7.	Deptt. of Science & Technology, Govt. of India	GOI	2
8.	Private Industry sponsored	Industry	3
9.	UGC	UGC	1

LIST OF ON-GOING PROJECTS IN THE UNIVERSITY

Faculty of Veterinary & Animal Sciences

Sl. No	Title of the Project Agency	Funding	PI & Dept. Sanctioned	Fund
1.	AICRP on 'Improvement of feed resources and nutrient utilization in raising animal production' (AICRP)	ICAR	Dr. P.Biswas, AN	1,41,62,000.00
2.	Gastro-intestinal parasitism (All India Network Project)	ICAR	Dr. J.D. Ghosh, Parasitology	44,43,000.00
3.	All India Co-ordinated Research Project on Black Bengal goat improvement	ICAR	Dr. A. K. Samanta, APM	1,29,63,500.00
4.	Blue Tongue Disease (Network - AINP)	ICAR	Dr. S.N.Joardar, Dept. of Vety. Micro.	36,46,846.00
5.	Technological investigation into development of meat product from duck.	ICAR	Dr. S. Biswas, APTM	8,62,968.00
6.	Sustainable duck production in natural foraging system (Adhoc AP Cess Fund)	ICAR	Dr. G. Samanta, AN	1322360.00
7.	Conservation of Threatened Breed (Ghoongroo Pig) under Xth Plan by Ministry of Agril., Govt. of India	Ministry of Agril., Govt. of India	Dr. S.Pan, APM	5350000.00
8.	Bovine Lameness with special reference to Pathogenesis and pain perception	ICAR	Dr. Samit Kr. Nandi, Vet. Surg. & Radiology	651220.00
9.	Application of Acrylic External Skeletal Fixator for Fracture Repair in Small Domestic and Wild Ruminants. (Adhoc)	ICAR	Dr. S.Halder, Vet. Surg. & Radiology	2000000.00
10.	Studies on safety of foods of animal origin (Adhoc)	ICAR	Dr. T.K.Mandal, Pharma. & Toxico.	2000000.00
11.	Conservation of Bonpala Sheep in Teesta Valley	Ministry of Agril., Govt. of India	Dr. S.Pan, APM	6315000.00
12.	Study on Immuno-histochemical status of mammary gland of different breeds of cows (Adhoc)	ICAR	Prof. R.K. Ghosh, Anatomy & Histology.	2000000.00
13.	Toxicological Study on Livosin (liquid, Capsule) and Arnika Plus TRIOFER	Industry	Dr. T. K. Mondal, Pharmacology & Toxicology	75000.00

14. Impact assessment of environmental hazards caused by slaughterhouse wastes and control of pollution by recycling the wastes as animal feed	Ministry of Environment & Forests, GOI	Prof. T. K. Ghosh, AN	1553420.00
15. Development of Ceramic-based Implantable Delivery System For Sustained Released of the Drugs for the Treatment of Osteomyelitis in the Patients	DST, New Delhi	Dr. S.K. Nandi, Vety. Surg & Radiology. Collborative Institutes : i) Central Glass & Ceramic Research Institute,Kolkata ii) R.G. Kar Medical College, Kolkata	15,02,980.00
16. Endocrine Profiles and characterization of Candidate Genes Influencing Prolificacy in Black Bengal Goat	NAIP, ICAR	Dr. S.Pan, APM Collaboration between : ICAR Research Complex for NEH Region, Tripura, IVRI, Izatnagar,BCKV, Mohanpur & WBUAFS, Belgachia, Kolkata	708400.00
17. Arsenic in food chain: cause, effect & mitigation	NAIP, ICAR	Dr. S.Sarkar Dr. T.K.Mandal Dept. Phar. & Toxicology Lead Institute; BCKV	53 lakh
18 Studies on clinical efficacy and adverse drug reaction of Isometamidium hydrochloride against Trypanosoma evansi infection in animals	Industry	Dr. T.K.Mandal, Dept. of Vety. Pharmacology & Toxicology.	1.72 lakh
19 Acute & Sub-acute toxicity studies of oral insulin formulation in Wister rats.	Industry	Dr. T.K.Mandal, Dept. of Vety. Pharmacology & Toxicology	1.32 lakh
20 Study on Consumers' Awareness in relation to meat and meat products consumption in West Bengal	UGC	PI: Prof. S. Biswas, APTM as Dr. A Goswami, VAHEE on lien.	65,000.00
21 Characterization of Immune-effector cells and cytokines of Indian major and minor carps	DBT, MST, New Delhi.	Dr. S.N.Joardar, Lecturer, Dept. of Vety. Microbiology	15,15,000.00

FACULTY OF DAIRY TECHNOLOGY

Sl. No.	Title of the Project	Funding Agency	PI & Dept.	Fund Sanctioned
1.	R and D support for process upgradation of Products for Industrial Application (Network)	ICAR	Prof. M.K. Sanyal. Dairy Technology	14350000.00
2.	Collection, characterization and preservation of lactic starter culture for the manufacture of misti dahi.	ICAR	Dr. S.P. Sarkar, Dairy Microbiology	1500000.00

FACULTY OF FISHERY SCIENCES

Sl. No.	Title of the Project	Funding Agency	PI & Dept.	Fund Sanctioned
1.	Breeding & Larval rearing of a threatened Fish Anabas testudiuens.	ICAR	Dr. S. Behera, FBRM	928500.00
2.	Design and development of responsible Trawl for Pomfret fishery of northeast coast of India.	ICAR	Dr. T.J. Abraham, Fish Pathology & Microbiology	1567000.00
3.	Analysis and Impact Assessment of Credit Structure at the Micro- And Macro level for the Development of Fisheries Sector in India	ICAR	Dr. (Ms) S. Jana, Fish Eco. & Stat.	553500.00
4.	AICRP on Establishment of Post-Harvest Technology in Fisheries	ICAR	Sri Sreekanta Sarkar, FPT	13600000.00
5	Seed Production in Agricultural Crops and Fisheries	ICAR	Dr. T.K. Ghosh, Aquaculture.	2300000.00

DIRECTORATE OF RESEARCH, EXTENSION & FARMS

Sl. No.	Title of the Project	Funding Agency	PI & Dept.	Fund Sanctioned
1.	NISAGENET	ICAR	Dr. (Mrs) S. Das Scientist. DREF	108000

SALIENT ACHIEVEMENTS THROUGH RESEARCH PROJECTS/SCHEMES

1. All India Coordinated Research Project (AICRP) on Goat Improvement (Black Bengal Field Unit), Kolkata

1. The total goat populations in during 2001-2002 the registered farmers had 779 which gradually increased with a population growth of 40-45 %.
2. The average flock strength in three adopted village units was also increased consistently.
3. The twin % and the triplet % were enhanced substantially replacing the single %.
4. The growth of kids born as twin was found to be higher or similar to the kids born as single and both groups of kids were significantly higher than in triplets.
5. Out of total kids born 99% are pure black and rests were black with small patches of brown or white and or both.
6. The body weight at 9 months of age had increased 4.56%.
7. The growth performance of the selective group was better than in random mating group.
8. The survey analysis showed that income from only goat faming was higher for farmers of lower caste, with higher land holding, having A.H. knowledge and higher number of family members. Result indicated that the income from the goat farming did not relate with educational status of farmers.
9. Incidences of disease were decreased and mortality in various age groups also checked (6%).
10. The model goat house had been provided in each of the three villages (those who had more than 15 goats) to educate the other farmers about scientific housing and management.

SUCCESS STORY OF THREE WOMEN GOAT FARMERS COVERED UNDER THE AICRP

Ms. Jhunu Bibi, Sukurjan Bibi and Akila Bibi are three well-known goat farmers under AICRP on goat improvement. In the year 2000-2001, they started goat rearing with only 2 or 3 goats. During the time period they sold many of the goats and utilized the amount for matrimonial purpose of their daughter's, rebuilt their house, purchased land and van rickshaw and one of them running LIC policy too. This suggest that the livelihood of rural under-previlaged families may be enthanced with goat rearing. Now they had total goat strength between 20 to 30.

2. All India Coordinated Research Project (AICRP) on Improvement of Feed Resources and Nutrient Utilization in Raising Animal Production

Detailed report under each activity:

a) Collection of primary data at farm gate level on the on-going feeding systems:

- Feeding systems under costal saline zone were studied, covering two districts- Purba Medinipur (Two blocks viz. Ramnagar-I & Nandigram) and South 24 Parganas (Two blocks Gosaba & Mathurapur-II). Two villages from each block and ten or more farmers from each village of different land holding were selected for collection of feed, fodder, soil and biological material for estimating micro nutrient profile.
- Locally available feed resources which were being used as animal feed were collected for evaluation for both major (Energy, Protein) and micro (Ca, P, Cu, Zn, Fe & Mn) nutrients.
- A detailed survey work was conducted covering the different types of cattle (on the basis of history & per rectal exam) i.e. lactating, heifer, anoestrous & dry cows with regards to their feeding, production etc. Subsequently, blood samples were collected for estimating their mineral profile.
- Dietary deficiency of major and micro nutrients had been evaluated.

b) Prioritization of limiting nutrients based on primary data:

Nutrient deficiency was evaluated on the basis of information collected from the farmers. Most of the livestock in the rural area were either indigenous or crossbreed and weighing between 150 to 300 kg. A computer programme has been developed with average requirement of DCP & TDN per kg metabolic body weight ($W^{0.75}$) considering the recommendation of Ranjhan (1991). Intake of DCP and TDN was calculated on the basis of book value against each ingredient and accordingly percentage of deficiency of DCP and TDN was evaluated. From the analysis of primary data obtained during survey in the coastal zone of West Bengal under two distracts, it was observed that, livestock suffered from 19.9 ± 5.21 to 72.76 ± 7.49 percent dietary deficiencies in DCP and 1.26 ± 0.00 to 42.25 ± 5.28 percent dietary deficiencies in TDN. Calcium deficiency was observed mainly in lactating animals, whereas phosphorous deficiency was observed in all categories of animals. Dietary Cu and Zn deficiency was also observed in almost all the animals.

c) Feed resource augmentation under different production systems (species specific):

To meet up the macronutrients deficiencies, that are very much essential for increasing the productive and reproductive efficiency of the livestock, oil cakes and cereal grains/ by

products are to be supplemented regularly. Maize, broken rice, Mustard oil cake, Til oil cake are to be fed in required quantity regularly to the livestock. Urea treatment of paddy straw also would help in meeting the protein requirement of the cattle. Enrichment of paddy straw with urea is to be popularized among the farmers. Micronutrient deficiency could easily overcome through supplemental feeding of Dicalcium phosphate based mineral mixture containing Manganese sulfate, Copper sulfate, Zinc sulfate alongwith Cobalt chloride and Potassium iodide.

d) Scio-economic evaluation:

West Bengal is one of the most densely populated States of the country. Agricultural land holding per farmer's family is very less, as a result marginal, submarginal and landless farmers depend mostly of the livestock rearing for their livelihood alongwith earning from labour wages. Due to poor economic condition of the farmers as well as non-remunerative price of the milk in the rural areas, rearing of high yielding/ cross-bred cows has not been much popularized. Most of the farmers rear indigenous breed of cows maintained on grazing and feeding of paddy straw and rice husk/ bran. Although some farmers rear cross-bred / high yielding cows, but most of this stock suffer from anoestrus/ infertility due to poor feeding regime. It may be mentioned that most of the feed ingredients other than rice by products are very costly as these are imported from other States.

It has been observed that the supplementation of area specific mineral supplement developed on the basis of survey result has economically improved the total milk yield, fat and SNF content of the milk along with improved health status and reproductive performance of the cows significantly. It has also been observed that due to establishment of Co-operative Societies under various Milk Unions in the different districts of the State, farmers have started rearing high yielding / cross-bred cows. But the main constraint in the development of livestock rearing in rural areas is **infertility** due to improper feeding practices. A package of feeding schedule for livestock with the available feed ingredients based on the requirement of different categories of livestock is to be developed and distributed among the farmers for nutritional management of their livestock.

e) Documentation of the existing feeding practices based on production systems:

Farmers keep very small number of cattle and feeding practice based upon the traditional system in which animals are reared on grazing and feeding of paddy straw and rice husk/bran and occasional supplementation of concentrate mixture/oil cake (Mustard), particularly during lactation. Some farmers used to feed tree leaves when available.

f) Field testing the area specific mineral mixture in villages for productive (milk & egg) and reproductive efficiency:

Field trial was conducted in the coastal saline zone of West Bengal. Two districts, namely East Midnapore and South 24 parganas fall under the Coastal saline zone. Two blocks under each district and two villages under each block were selected for such trial. Minimum 30 animals, covering **anoestrous heifer**, **postpartum anoestrous lactating** and **postpartum anoestrous dry** cows were supplemented with area specific mineral mixture for consecutive 3 months. It was observed that 82.5% heifer, 90% dry and 85.42% lactating cows manifested symptoms of estrous after supplementation of area specific mineral mixture.

After insemination, pregnancy diagnosis through per rectal examination revealed 68.75%, 72.5% and 63.42% positive result in heifer, dry cow and lactating cows respectively under the two districts.

g) Supplementation of inorganic and organic sources of micronutrients on tissue level utilization:

1) Studies on the effect of dietary oil and sources of copper at various levels on the growth performances of black Bengal (*capra hircus)* kids.
2) Studies on the effect of dietary oil and sources of copper at various levels on the growth performances of broiler chicken.
3) Comparative bioavailability of organic and inorganic forms of zinc and manganese in the laying performance of chicken

h) Economics of supplementation:

During the field trial under the two districts of coastal saline zone of West Bengal it was observed that on supplementation of area specific mineral mixture, overall 11.86% in milk production was increased. 11.04% increase in milk production was observed in indigenous cows and 12.68% milk production was increased in cross-breed cows. From these data, it was revealed that a overall of Rs. 2.20 was gained per animal per day considering the cost of mineral mixture @ Rs.52.00/Kg and Rs.10.00/lit of milk for indigenous / crossbreed animal. It was observed that profit was found higher in cross breed cows where milk production much higher in comparison to indigenous cattle. Rs. 3.75/- per animal per day was gained as profit with a dose rate of 25g supplementation per animal per day whereas, only Rs.0.64 was gained per animal per day in indigenous cows with a dose rate of 20g mineral mixture per animal per day.

Moreover, the plane of nutrition was very much poor in terms of DCP and TDN intake/animal/ day in both cross breed and indigenous cattle. Profit would have been more it the dietary nutrient was optimum in those animals.

Salient findings:

1. From the analysis of primary data obtained during survey in the coastal zone of West Bengal under two distract, it was observed that, livestock suffer from 19.9 ± 5.21 to 72.76 ± 7.49 percent dietary deficiencies in DCP and 1.26 ± 0.00 to 42.25 ± 5.28 percent dietary deficiencies in TDN.
2. Calcium deficiency was observed mainly in lactating animals whereas phosphorous deficiency was observed in all categories of animals. Dietary Cu and Zn deficiency was also observed in almost all the animals.
3. It was observed that 82.5% heifer, 90% dry and 85.42% lactating cows showed symptoms of estrous after supplementation of area specific mineral mixture.
4. After insemination, pregnancy diagnosis through per rectal examination revealed 68.75%, 72.5% and 63.42% positive result respectively in heifer, dry cow and lactating cows suffering from anoestrous under the two districts of coastal saline zone.
5. On supplementation of area specific mineral mixture, overall 11.86% increase in milk production was observed. 11.04% and 12.68% increase in milk production was observed respectively in indigenous and cross-breed cows.
6. Profit of Rs. 2.20 was made per animal per day considering the increased milk production in both indigenous and cross breed cows. Rs. 3.75/- per animal per day was gained as profit with a dose rate of 25g supplementation per animal per day in cross breed cows whereas only Rs.0.64 was gained per animal per day in indigenous cows with a dose rate of 20g mineral mixture per animal per day.
7. Supplementation of Cu salt from different sources can alter lipid metabolism as low as 20 mg kg^{-1} diet in Black Bengal kid.
8. Supplementation of SBO in the diet increases plasma cholesterol, HDL-C, LDL-C and phospholopid but reduces triglyceride. Whereas Cu decreases plasma cholesterol, HDL-C, LDL-C and phospholipids in Black Bengal kid.
9. Supplementation of Cu salt increases plasma Cu and decreases plasma Zn concentration in Black Bengal kid.
10. Supplemental Cu couldn't disturb the major mineral balance but increase N_2, Cu retention and reduces Zn retention in Black Bengal kid.

11. Supplementation of copper proteinate at 400 ppm improves the performance of broiler chicken as it increases LW and FCR than $CuSO_4$ in starter phase.

12. Supplementation of copper proteinate at 400 ppm with 4% soyabean oil could increase LW, LWG and FCR but reduce CFI

1. Supplementation of copper proteinate at 400 ppm more efficiently could reduce serum cholesterol, LDL-C, phospholipid, TG and blood reduced GSH than $CuSO_4$ at the same dose level but increases HDL-C, HDL-C% and do not affect total lipid content in broiler chicken.

2. Supplementation of copper proteinate at 400 ppm with 4% soyabean oil, has a better response in respect to reduction of cholesterol, LDL-C, LDL% and phospholipid, blood reduced GSH than $CuSO_4$ but increases HDL-C%.

3. Supplementation of 4% soyabean oil at finisher stage increases plasma Mn concentration without changing other trace minerals.

4. Supplementation of copper proteinate at starter stage increases plasma Cu level than $CuSO_4$ but do not change plasma Zn, Mn and Fe concentration.

5. Copper proteinate supplementation with 4% soybean oil increases DM, crude fat metabolizability but has no effect on CF metabolizability.

6. Copper proteinate supplementation irrespective of dose increases DM, NFE and OM metabolizability than $CuSO_4$

7. Copper proteinate salt irrespective of dose improves better bioavailability of Cu, Mn and Fe but decreases Zn bioavailability in comparison to $CuSO_4$

8. Supplementation of copper proteinate with oil also improves the bioavailability of Cu but decreases Mn, Zn and Fe bioavailability.

9. Copper proteinate supplementation at 400 ppm with 4% soyabean oil tends to produce a good quality meat than $CuSO_4$ as it increases carcass weight, reduces abdominal fat but do not increase the proportion of breast and thigh meat which consumer prefers most.

10. Supplementation in different level of Organic Zn and Mn instead of Inorganic Zn and Mn improved the feed efficiency as well as significantly improved DM Metabolizability, Nutrient Metabolizability, Ca, Zn, Mn & Cu retention in layer.

11. The concentration of Zn, Mn & Cu in liver as well as Ca, Zn, Mn & Cu in bone of treatment groups showed significantly higher value than inorganic control.

12. The supplementation of trace minerals in the organic and inorganic forms had significant effects on egg production and egg quality measures with few consistent responses.

13. Organic form of Zn & Mn at different levels of supplementation improves overall performances of BV 300 Layer.

Results which could be exploited at field level / academic purpose with specific recommendations :

1) Studies on the effect of dietary oil and sources of copper at various levels on the growth performances of Black Bengal (*Capra hircus)* kids.

2) Studies on the effect of dietary oil and sources of copper at various levels on the growth performances of broiler chicken.

Comparative bioavailability of organic and inorganic forms of zinc and manganese in the laying performance of chicken

3. Centrally sponsored project on Conservation of Threatened Breed (Ghoongroo Pig)

Two units of elite Ghoongroo pig farms were established at Jalpaiguri KVK and Mohanpur Farm. Selective breeding is in progress for genetic improvement of the herd. Regular training programmes for pig farmers were being conducted. Piglets were being sold to the progressive farmers for propagation of the breed. Ancillary studies were conducted for standardization of Ghoongroo pig production management practices. Different extension activities were undertaken for generating awareness among the farmers.

4. Centrally sponsored project on Conservation of Threatened Breed (Bonpala sheep)

An elite Bonpala sheep farm was established at Jalpaiguri KVK to accommodate 500 females and 20 males. Selective breeding is in progress for genetic improvement of the flock. Regular training programmes for sheep farmers are being conducted. Ancillary studies have been conducted for standardization of Bonpala sheep production management practices. Different extension activities have been undertaken for generating awareness among the farmers.

5. NATP on Processing of Pork, Broiler and Eggs.

To serve poultry meat in a more wholesome and hygienic way, a small scale hygienic poultry dressing unit with a compact, sophisticated, semi-automatized poultry dressing line with

the capacity to dress 6-8 birds at a time were standardized. Results of survey covering 464 broiler farmers and 580 retailers at coastal belts of West Bengal covering three districts (28, 321 km^2 having 29 blocks) revealed that maximum retailers (62.58%) were continuing their business for a period of 5 to 10 years with the selling capacity upto 30 Kg per day, keeping the average profit range of Rs. 2-3/- per kg. About 57.11% farmers followed all-in all out system of rearing. 300-500 birds per lot was the capacity of production of 39.2 % farmers and 54.53 % farmers sold the birds mainly through agents at 45 days of age at a minimum margin of profit. Effort has been made towards identifying critical control points with the views to implement HACCP, that could be helpful to organize modern poultry processing unit with the due provision of food safety in future in the state. In the present study, the observation for *E. coli* contamination was noted to a percentage of 59.56% in conventional method of slaughtering of poultry birds in comparison to 18% in case of scientific slaughtering and such observation was confirmed by cultural and biochemical characters, serotyped by National Salmonella and Escherichia Centre, Kasauli and common findings were 025, 0165 and 0123 serotypes. A comparative study of different surface decontaminants on chicken meat quality has been performed to evaluate the best decontamination technique, from the points of microbiological quality along with other keeping and eating quality and economics. The less preferred parts of broiler carcass (neck, wings and back), whole skin and edible viscera (gizzard, Heart) could be used even at a 70 % level for preparation of chicken sausage with natural and artificial casings. Physico- chemical parameters, sensory evaluation and microbiological assessment were conducted to judge and compare the quality of such sausages with shelf-life study revealed that such sausages could be kept for a period of 30 days in freezing temperature (-10 ^{0}C ± 0) without much adverse change on quality. Some preliminary attempted has been made towards the study on egg preservation at ambient temperature by oil coating, thermo-stabilization and their combinations. The observations revealed that upto seven days the protein profile of egg white had been remained the same at the agro-climatic zone of West Bengal both in oil-treated and non-oil treated table eggs as identified by SDS-PAGE.

6. All India Network Programme on Bluetongue Disease.

Sero- monitoring of suspected samples (2911 in number) revealed 23.53 % positivity indicating presence of anti-bluetongue antibodies in the sera. Bluetongue virus isolated from two grazing sheep of Kolkata Maidan pasture was subsequently confirmed by conventional and molecular biological techniques. Samples were also confirmed positive by IVRI and Hissar centre. One of the isolates was found to be **serotype -15**. Following midges viz. *Culicoides oxystoma, C. clavipalpis, C. imicola, C. anophelis, C. palpifer* were found by thorough investigation in different agro-climatic zones of West Bengal. Thirty eight numbers of Bluetongue awareness camps were conducted in different districts of West Bengal, Jharkhand, Tripura, Manipur and Assam, attended by more than 4050 farmers alongwith their animals. A folder in local language (Bengali) on

Bluetongue was published to cater general information and basic knowledge to the farmers and field Veterinarians.

7. NATP on Diagnosis of parasitic diseases of domestic animals

Based on coprological examination, the prevalence of fasciolosis in the four ruminant livestock species in West Bengal and other eastern and north-eastern states was studied. Fasciolosis was recorded in all the four livestock species with different rate of prevalence in West Bengal, Bihar, Assam, Orissa, Tripura and Manipur. In Bihar the infection was not recorded in sheep. *Fasciola* infection was not detected in Meghalaya and Mizoram. Slaughter house study revealed 25.42% prevalence of fasciolosis in buffaloes in West Bengal. *Lymnaea auricularia* snails, the intermediate host of *Fasciola,* were found to harbour the cercaria (1.59%- 5.14%) in all the states except Meghalaya and Mizoram, where this snail was not found. The somatic and excretory-secretary antigens of *Fasciola* were purified by gel filtration /ion-exchange chromatography and the purified antigens were employed for early detection of fasciolosis. The immunodetection based on ELISA gave promising results.

8. ICAR Adhoc project on Studies on safety of food of Animal origin with reference to antibiotic and pesticide residue

Most of the collected samples of meat, milk, egg was devoid of any residue of antibiotics and pesticides.

9. ICAR adhoc AP-cass project on Sustainable Duck Production in Natural Foraging System

Selected blocks of various districts (viz., Howrah, Nadia and Hoogly) of West Bengal were surveyed. It was found that cultivation was the main occupation followed by labourer among the farmers. The ducks were mostly fed home made feed with foraging facilities. Most of the farmers reared their ducks in forging system with some supplementation by rice bran, broken rice, broken wheat, boiled rice, paddy, crushed snails, rice paste and kitchen refusals etc. Very few farmers reared ducks under intensive system with total supplement. In the surveyed area, it was found that the annual average egg production per duck was only about 90 numbers and the duck owners earned a good amount of subsidiary income by selling eggs and spent ducks. The duck owners mostly belonged to small or marginal income groups and also belonged to backward classes. Most of the duck farmers were illiterate or having their educational qualification up to Middle school. Ducks were mainly reared by female members of the family. Growth performances on Khaki Campbell ducks at field level were conducted under intensive and foraging system. The results

indicated that the ducks reared under forging system by 50 % supplement of standard diet showed better body weight than those ducks which were reared with 25 % supplementation. It was also observed that 50 % supplementation under natural foraging system better growth performance than that of ducks reared under intensive system

10. DST, Govt. of West Bengal, R&D project on Development of user-friendly diagnostic kit for motile *Aeromonas septicemia* (MAS) in fish

Sera from Indian major carps (viz. rohu, catla, mrigal) were collected and immunoglobulins were isolated. Hyperimmunization was carried out in healthy rabbits with these immunoglobulins. After separating rabbit immunoglobulins from hyperimmune sera conjugation was done with the enzyme horse radish peroxidase by per-iodate and glutaraldehyde methods. Assessment of anti-fish immunoconjugates was done using sera of experimentally inoculated *Aeromonas hydrophila* sensitized catla, rohu and mrigal. Using this anti-fish immunoconjugate one user-friendly dip-stick ELISA kit was prepared to detect anti-aeromonas antibody in suspected fish. Encouraging results were obtained in experimental and naturally infected fish using this diagnostic kit showing potentiality in detecting sub-clinical and clinical forms of MAS (motile aeromonas septicemia) having ulceration and/or hyperemia on the skin of infected fish.

11. Ad-hoc project on Bovine lameness with special reference to pathogenesis and pain perception

Lameness in dairy cattle and its impact on producton and animal welfare has been well recognized. Economically, it causes reduction of milk production, lower fertility and involuntry culling of lactating dairy cattle.

The selected organized farms of agroclimatic zones (Hilly, Terai, Read laterite and New Alluvial) of West Bengal revealed tht the age group of animlas between 3-10 years weighing body weight of 200-380 kg was more susceptible for lameness. Prolong lying condition of animals, concrete based pacca housing having abrasive surface, feeding of only green fodder might trigger lameness. Claw trimming, hoof examination, feeding before calving, regular stockmanship and foot bath during rainy and winter season might reduce the prevalence of lameness in dairy animals resulting to increased milk production. Comparison of pain score amongst the regions revealed that except activity at rest, all other quantitative values had no significant difference. Biomechanical study explored that stride of sound cows were faster, longer and of shorter duration that in lame animals.

12. Ad-hoc project on Use of probiotics in freshwater aquariculture

Incorporation of probiotic strain, *Lactobacillus* sp P21 isolated from fish gut at 10^7 cells / g feed or about above 10^6 / ml rearing water improved the weight increment, length increment,

wet weight gain, mean survival, food conversion ratio (FCR) and specific growth rate, and resistant to diseases compared to control group. The survival of the probiotic bacteria in feed and water was observed to be up to 4 weeks and =14 days, respectively. The adherence capability (biofilm formation) of probiotic strain on different substrates such as glass, plastic and stainless steel was studied *in-vitro* using half strength MRS broth containing 0.2% dextrose (pH 7.0) for about 10 days. Biofilm formation was prominent in stainless steel (log 2.90/ cm^2) followed by plastic (log 2.22/ cm^2) and was least in glass (log 0.38/ cm^2). The average number of fry / female released by probiotic fed, positive control and negative control groups were 53.15±21.78, 40.88±21.05 and 41.06±19.88, respectively.

13. NATP on Shrimp and fish health managment

Twenty-three diseased and/or abnormal conditions (5 infectious diseases and 18 non-infectious diseases) have been observed in the cultured shrimp of West Bengal. In grow-out ponds, the luminous bacterial counts were higher (log 2.91±0.57/ml) between DOC 30 and 60. Luminous bacteria *Vibrio harveyi* induced septicemic hepatopancreatitis was noticed in semi-intensive grown *Penaeus monodon*. Histopathological observations on diseased shrimp revealed multiple diseased conditions with the predominance of WSSV infection and vibriosis. It also revealed the HPV infection in few infected shrimp.

Bacteria involved in nitrogen cycle were present in all the culture systems and there existed significant differences in their counts among the systems. The TAN removal efficacy of commercial products was less when compared to indigenous microbial flora. The *Nitrosomonos-Bacillus* mixture immobilized in sand-clay particles and the commercial bioremediators failed to reduce TAN levels in simulated pond condition, with a stocking density of 100 shrimp /m^3. Marine bacteria such as *Alteromonas* sp, *Bacillus* sp and *V. harveyi* exhibited vibriostatic activity. *Bacillus* sp exhibited maximum vibriostatic activity followed by *Alteromonas* sp.

14. Ad-hoc project on Elucidation of food safety issues related to fish–borne parasites with zoonotic potential in aquaculture produce

Several groups of helminth parasites viz; Monogeneans, Digeneans, Cestodes, ematodes, Trematodes and Acanthocephalans were observed during the study period. Among these, monogeneans and nematodes showed highest prevalence in IMC. Smaller size groups (10-15 cm) have showed more susceptibility compared to the larger ones. The overall digenean infections were rare among the IMC. Nematodes were most abundant in rainy season. *Catla catla* was found to be most susceptible to nematodes infection, followed by *Labeo rohita* and the least prevalence was observed in *Cirrhinus mrigala.* Several cercarial and metacercarial stages of helminth parasites were observed in snails (*Pila globosa*), which are the intermediate hosts for these parasites.

Three zoonotic strains, viz., *Clonorchis sp, Capillaria sp* and *Heterophyes heterophyes* were identified and isolated from *Catla catla* and *Cirrhinus mrigala*. The availability of these zoonotic strains was quite low as compared to other helminth species. *Catla catla* was found to be more susceptible than the other carps.

15. ICAR project on Effect of chromium supplementation on improvement of carcass quality in goats with special emphasis on immune modulation

i. Supplementation of 0.5 mg Cr as $CrCl_3$ in diets of goats may efficiently improve live weight gain even in absence of any stressor stimulus.

ii. The lower clearance rate of glucose from blood during the IVGTT indicated subtle effect of supplemental $CrCl_3$ on insulin sensitivity. This would suggest that the major effects of Cr in ruminants may not be mediated through glucose tolerance.

iii. The serum hormonal assay and the primary Ab response indicated that growth stimulatory effects of supplemental Cr may be mediated through a shift in metabolic balance more towards anabolism and a consequent enhancement in immune responses.

iv. The study revealed further that Cr as $CrCl_3$, besides effectively augmenting the growth performance of non-stressed goats, may improve the Ab response against PPR and help conferring immunity to the disease.

16. ICAR Project on Technological investigation into development of meat products from duck

Procedure for preparation of duck meat products like patties, sausage, meatball, cured duck hams, duck rolls, duck meat pickle and duck Tandoori was standardized. The microbial and physiochemical profile and organoleptic acceptability of different products were evaluated and the economic feasibility of such products in comparison to other products available in the market was assessed. Duck meat patties were found to be more economical in comparison to chicken patties. Thus, net income will be more in case of duck patties as the retail price is to keep same for market sustainability. Moreover, physicochemical, nutritional and organoleptic characters of both the product being the same, duck patties will be more acceptable to the consumers. Similar observation was made in case of sausage, meat ball, duck ham, duck meat roll, duck meat pickle and duck Tandoori.

17. All India Network Programme on Gastrointestinal Parasitism

Epizootiological studies on gastrointestinal parasitism in livestock (cattle, buffalo, sheep &

goat) were conducted in the three-agro climatic zones (New Alluvial, Coastal & Red laterite) of West Bengal during the period of 2003 to 2006. Gastrointestinal parasites were of common occurrence in all the four livestock species surveyed during the period under report. Prevalence was much higher in small ruminants than in the large ruminants. In sheep and goat the prevalence of g.i. parasites ranged from 71.26% - 74.31% and 69.96% - 73.95%, respectively, whereas in cattle and buffalo it ranged from 39.16% - 44.79% and 46.13% - 49.88%, respectively. The highest prevalence was in monsoon (sheep- 83.79%, goat- 85.49%, cattle- 55.61% & buffalo- 56.51%) and lowest in summer (sheep- 57.82%, goat- 61.0%, cattle- 32.89% & buffalo- 39.89%). The overall prevalence of g.i. parasites in sheep and buffalo were higher (sheep- 77.55%, buffalo- 52.43%) in the red laterite zone whereas, in cattle and goat it was higher in coastal (61.85%) and new alluvial (72.31%) zones, respectively. *Haemonchus* was the predominant nematode species in all the animal species surveyed during the study period. In small ruminants the mean worm load was maximum in rainy season (sheep- 83.25 & goat- 147) and minimum during winter season (sheep- 16.5 & goat- 37.25).

Commonly used anthelmintics e.g. albendazole, fenbendazole, levamisole, closantel, ivermectin and doramectin continue to yield the desired efficacy in the treatment of G.I. nematodosis without emergence of resistance in small ruminants. Gastrointestinal nematodosis was found to cause significant economic loss in goat due to reduced/ loss in body weight. This loss in terms of net meat production was Rs. 189.99/- per goat of 3-6months age and it was Rs.202.10/- per goat of ≥ 6-12months age group as was estimated during a period of 11months. Similarly, a loss of Rs.195.33 per sheep was attributed to gastrointestinal nematodosis. An anthelmintic treatment schedule as a tool for increasing the profitability of goat rearing was devised.

The crude sonicated antigen of *Oesophagostomum* sp. was characterized and an ELISA based diagnostic technique using the antigen was standardized for detection of gastrointestinal nematode infections under field conditions.

18. ICAR Project on Design and development of responsible trawl for pomfret fishery of north east coast of India

Two types of trawl nets - shrimp trawl and finfish trawl - are currently used In the Northeast coast. The trawlers engaged in the fishing of demersal and pelagic fishes were 65 % and 35%, respectively. The total number of trawlers engaged for finfish trawling was 3,055, with an average pomfret catch of 9.4 kg / haul. Maximum catch was contributed by 50 - 100 cm length group (24.8%), followed by 100 - 150 cm (15.93%) and below 50 cm length groups (13.58%).

Twenty-four models of different designs were tested in Circulatory Water Channel. The model net - 3 was chosen as the best model, as it showed highest fishing height (0.48 m) and fishing spread (1.2 m) at 0.65 m/s velocity. This gave 0.9 m^2 of mouth area at 0.65m/s and, therefore, was selected as a prototype for the development of full scale net for field level testing. This was designed as six-seam semi-pelagic trawl net with a head-rope length of 30.3 m. The

Design - 3 was the best among the nets as it caught pomfrets selectively to the tune of about 37 - 45% ($P<0.01$) due to its six-seam high opening and semi pelagic.

19. Ministry of Environment & Forests, Govt. of India sponsored project on Impact assessment of environmental hazards caused by slaughter house wastes and control of pollution by recycling the wastes as animal feed

1. The data of study revealed that a substantial quantity of nutrients in terms of DM, OM and CP go wasted as the undigested feed materials remaining in the fore stomach of ruminants slaughtered in the municipal abattoirs which might be recycled as animal feed.

2. The chemical composition of sun dried and stacked buffalo and goat rumen contents were analyzed thoroughly. Data revealed that the nutrient composition of the sun dried rumen contents may be comparable with many conventional and unconventional feed ingredients.

3. *In vitro* evaluation of digestibility coefficients revealed that the sun dried rumen cntents may prtially relace wheat bran in a concentrate mixture of Black Bengal goats without significant effect on DM, OM and CP digestibility.

4. The present investigation showed that the sun dried bovine rumen contents collected from the slaughtered animals may serve as a potential source of nutrients for livestock.

5. The dry matter, organic matter and crude protein concentrations of the sun dried bovine rumen contents are comparable to the conventional feed ingredients which are moderately rich in energy and protein.

6. The digestibility coefficient determined *in-vitro,* indicated that the sun dried bovine rumen content may supply moderate quantity of digestible protein when fed to the ruminants and the findings were corroborate through animal experiments using Black Bengal goats as the model animal.

7. Work on further improvement inthe quality of the dry rumen contents as animal feed by converting the contents into silage and complete feed block is undergoing.

8. Human health aspect of the dumped rumen contents had been checked under the supervision of a medical doctor through more detail study in this aspect is implicated.

9. However, detail work on bacteriological study for assessing the impact of the dumped rumen contents on environment and human health involving a medical doctor had been undertaken and the work is going on.

20. Strategies to withstand the intrinsic threat of rivers by solid wastes contamination through sporadic idol immersion

The project was undertaken with mass campaign and ended with the main outcomes as—

- The local people feel on the adverse of sporadic idol immersion in the large water bodies,
- The puja authorities and local administrators opined that the idols would be immersed only in the pre-selected water bodies after celebration,
- The water body would be cleaned immediately after immersion.

21. ICAR Project on National Information System in Agricultural Education Network (India).

- Introduced a network system in Agricultural Education in India,
- Inclusion of various data regarding WBUAFS in the given software,
- Updation of data already sent through internet to the main server at IASRI, New Delhi,
- Data is available in the internet network in all 42 centres through out India.

22. Network project on R & D Support for Process Upgradation of Indigenous Milk Products for Industrial Application

A. Survey of Rasogolla, Sandesh and other Indigenous Milk Products

Rasogolla (ordinary and sponge variety) and Sandesh (narampak and karapak variety) samples were collected from different places in the district of Jalpaiguri, Coochbihar, Malda, Murshidabad, Bardhhaman, Nadia, North 24-Parganas, South 24-Parganas and Kolkata in West Bengal ; Barauni, Darbhanga, JhaJha and Muzaffarpur in Bihar; Dhanbad, Bokaro and Ranchi in Jharkhand; and Puri, Bhubaneswar and Cuttack in Orissa, in rigid ice-containers, transported to the laboratory at Mohanpur, Nadia, West Bengal. Similarly, Indigenous milk sweets such as Talsans sandesh, Guava sandesh, Pantooa, Rasmalai, Kamalabhog and Rasokadam prepared from chhana; Peda, Chandrapuli, Milk cake, Gulabjamun, Kalakand, Sarbhaja and Burfi prepared from Khoa; Kheermohan, Sweet roll and Kheerkadam prepared by using both khoa and chhana were collected from the different places in Kolkata. Howrah, North 24-Parganas, South 24-Parganas and Nadia districts. All the samples of rasogolla, sandesh and other indigenous milk products were analyzed for chemical, microbiololgical, rheological and sensory attributes and reported to ICAR through the Project Coordinator, NDRI, Karnal.

B. i) Standardization of manufacturing technique for the preparation of rasogolla from buffalo milk.

A good quality rasogolla was prepared from standardized buffalo milk after addition of carrageenan to the milk before coagulation at 70°C using 1% solution of citric acid followed by cooking of chhana balls in 60% sugar syrup solution and soaking overnight in 40% sugar syrup solution. Use of sodium chloride along with carrageenan improved marginally but nonsignificantly the quality of buffalo milk rasogolla when compared with the use of carrageenan alone. A good quality rasogolla was also prepared from a blend of cow and buffalo milk containing 75% or less of buffalo milk and standardized to fixed fat and SNF ratio.

ii) Determination of the keeping quality of market samples of rasogolla right from the stage of manufacture till spoilage

The keeping quality of market samples of rasogolla was observed to be 2 days at 30± 2°C and 9 days at 8± 2°C.

C. i) Standardization of manufacturing technique for the preparation of sandesh from buffalo milk

Procedure for the preparation of a good quality sandesh from buffalo milk was standardized. The process essentially consists of standardizing the buffalo milk to a SNF:Fat ratio of 1.4, coagulating the milk at 70°C using citric acid solution (strength 1%) after addition of carrageenan to milk, cooking of chhana with addition of wheat flour and ground cane sugar. Addition of carrageenan proved more beneficial than sodium alginate or carboxy methyl cellulose, for obtaining desirable body and texture in sandesh.

ii) Market survey for assessing the keeping quality of sandesh right from the stage of manufacture till spoilage

The keeping quality of market samples of sandesh was found to be 3 days at 30± 2°C and 9 days at 8± 2°C.

TRANSFERABLE TECHNOLOGIES

Through research programmes the University has evolved certain technologies, which inturn, would help to enhance the income and livelihood of farmers of the State. The technologies developed through research are as follows :

1. In view of importance of parasitic diseases affecting the productivity of livestock, technologies have been generated for spot and immediate diagnosis of the diseases causing both morbidity and mortality loses.

2. Sandwich ELISA- a new sero-diagnostic tool has been first evolved for pre-panent, low level of infection and clinical Fascioliosis, a highly economically important parasitic disease of cattle and buffaloes of the State. The evolved test might contribute to the lanning and assessment to the *Fascioliosis* control programme in the Country.

3. Technology has been generated to optimise micronutrient nutrition of livestock and area specific mineral supplement has been developed by AICRP on improvement of feed resources and nutrient utilization in raising Animal Production. Feeding of this supplement to the livestock at field level has revealed excellent result in improving the productive and reproductive performance of livestock of the state as well as initiated action to minimize the production of methane, a green house gas responsible for **global worming**.

4. The technology of developing value added products from ducks has been evolved. The products included the duck sausage, meat balls, duck hams, duck prickles and duck tandoori, which were compared with the similar types of products from chicken meat and found the same in terms of physiochemical and sensory parameters. This could be transferred to the small scale processing units for production of such products having market values and would provide better prices for the ducks and the consumers can also get a taste of duck products which are unique in character.

5. While studying the autecology's of hog deer (*Axis percinus*), an action plan to conserve this **threatened wild life** in the protected areas of West Bengal has been formulated and submitted to the State Government for implementation.

6. Calcium chloride has been established as a new chemosterilizing agent for the mass sterilization programme of street dogs to control rabies, a zoonotic disease of human and animals.

7. A technology based on tactical use of anthelmintic has been devised for enhanching the profitability of goat rearing. A method based on ELISA has been developed for the diagnosis and /or differentiation of naturally occurring gastro intestinal nematode infection in goats has been developed.

8. Technology has been generated for formulation of economically viable balanced complete feed for cattle and buffaloes at different level of milk yield. Attempt has been made for development of easily accessible software for "least cost complete formulation" with available resources.

9. Production of low fat health meat from goat and broiler chicken by supplementation of a mineral mixture enriched with chromium.

10. Technology for conversion of undigested rumen contents dumped at the slaughter house into valuable livestock feed are evolved.

11. Garole sheep, a highly prolific breed of Sundarban delta has been recognized as the prolific most breed of the world. The genetic material has been utilized to develop many prolific sheep breed of the world, including famous Booroola Merino of Australia. This University has characterized the breed and has been actively engaged in conservation of this valuable genetic material.

12. Bonpala sheep is a threatened breed of sheep to the Duar's valley of North Bengal and Southern Sikkim. The breed is also prolific producing twins in 40% lambing. This University has been constantly engaged in characterization of this breed and also conservation through propagation among farmers.

13. Bengal goat, a prolific breed was characterized in details. It is also prolific breed producing chevon having low cholesterol and good quality of leather.

14. Ghoongroo pig is the most outstanding amongst the recognized indigenous pig breed of the country. It is highly prolific producing litter size at birth 12, occasionally 18 litters at birth has been noticed. The breed can attain a body weight of 70 kg. at puberty at 7 months of age. This University was first identified the breed on its characteristic. As a threatened breed, this University has also engaged in conservation of the breed through its propagation. Though the breeding tract is Duar's valley of West Bengal but it is doing fine in South Bengal too.

15. Since khaki Campbell ducks depend heavily on supplementary feed, farmers found rearing of khaki Campbell ducks very expensive. Up gradation of local breed of duck by crossing deshi females with khaki Campbell male was found to give best result. Recommended number of ducks per ha. water spread area is 200-400. However, during the course of study, the duck density of 250 nos. per ha. water spread area is found to be most suitable.

16. Recommended stock density for Indian Major Carp seed is 5000-10000/ha. However, stocking density of 8000/ha. was found to give best production.

17. Recently developed herbicides (Isoproturon, Napropamide, Bifenox, Chlorprofam, phenpyroximate, ACTP ester) on animal experimentation reveal that these molecules are almost non toxic to anomals.

Polyherbal drugs like Livina® and Livsee® are hepatoprotective in animals.

Polyherbal drugs Fibrosin® facilitates the absorption of antibiotics in mammary gland of cow with mastitis.

Aspirin® is highly effective analgesic and antipyretic in ruminant with least side effect.

Livosin®, a Polyherbal drug is non toxic to rats at the dose of 10mg/kg body weight.

18. Use of some low cost ecofriendly herbal drugs to enhance milk production and immunity has been evaluated.

19. Green fodder production technology in rainfed disadvantageous districts is available.

20. Adequate livestock & poultry health care support system to prevent both morbidity and mortality losses.

21. Fodder development through integration of food, horticulture and fodder crops.

22. The utilization of Sal seed & Mahua meal seed in livestock feed, which are available in plenty in the district of Purulia and Bankura for economic milk production.

23. Model for development & regeneration of common property resources for use by the poor livestock farmers.

24. The merits and demerits of the use of probiotics in fresh water aquaculture have been derived.

25. Computer based programme to determine the nutritional status of livestock has been evolved.

26. Stocking of 6-12 month old stunted Carp (100-150 g size) instead of fry or fingerling in the pond for higher fish production. Average fish yield was 3560 kg/ ha/year. Income: Expenses ratio was 2.68 with net-profit of 1,10,595 ha/ year. *Masobrachim rosenbergi.*

27. Inclusion of high value species freshwater prawn in carp fishery farming. Average fish yield of fish and prawn were 2184 kg and 122 kg respectively per ha. Carp of 9 month. Income: Expenses ratio was 2.16 with net-profit of Rs. 68,400/- per ha per crop.

28. Integration of duck rearing with fish farming has been found more profit through integrated farming system.

29. Collection of miscellaneous fish juveniles from paddy fields during monsoon & culturing them in seasonal ponds for 4-6 months. Income: Expenses ratio was 3.14 with net profit of Rs. 26,000/- per ha per crop.

30. Livelihood improvement of fishermen through culture of fish in village canal. After 6 months of culture period, the average production of fish was 520 gm. Income: Expenses ratio was 3.1.

31. Endangered and threatened fish varities of the State have been identified.

32. Technologies for proper utilization of low cost unutilized marine fishes by value addition have been established.

33. Low cost technology on value addition to dairy and meat products.

34. Technologies for hygienic preparation of certain milk products like rasogolla, sandesh etc. have been formulated.

35. Trypanosomiasis, an economically important disease of cattle and buffaloes was found highly prevalent in hot and highly humid months of the year in the State of West Bengal. Isometamidium chloride / hydrochloride at the dose level of 0.5 mg/kg I.M. at 1% solution in distilled water was established highly effective to control the disease within 24 hours.

Determination of angulation in feet by Goniometer under project on Bovine Lameness with special reference to pathogenesis & pain perception

Clinical treatment in the Dog Ward

Surgical operation for small animal

Physiological tests in horse

Animal Room at Mohanpur Campus in the Department of Pharmacology & Toxicology under collaborative research project

Student's Dairy

Twin-Screw Extruder modelled under AICRP on Post-harvest Technology

Farmers' meet under AICRP on Goat Improvement (Black Bengal Field Unit)

Training of KVK Scientists sponsored by ICAR, Zone-II

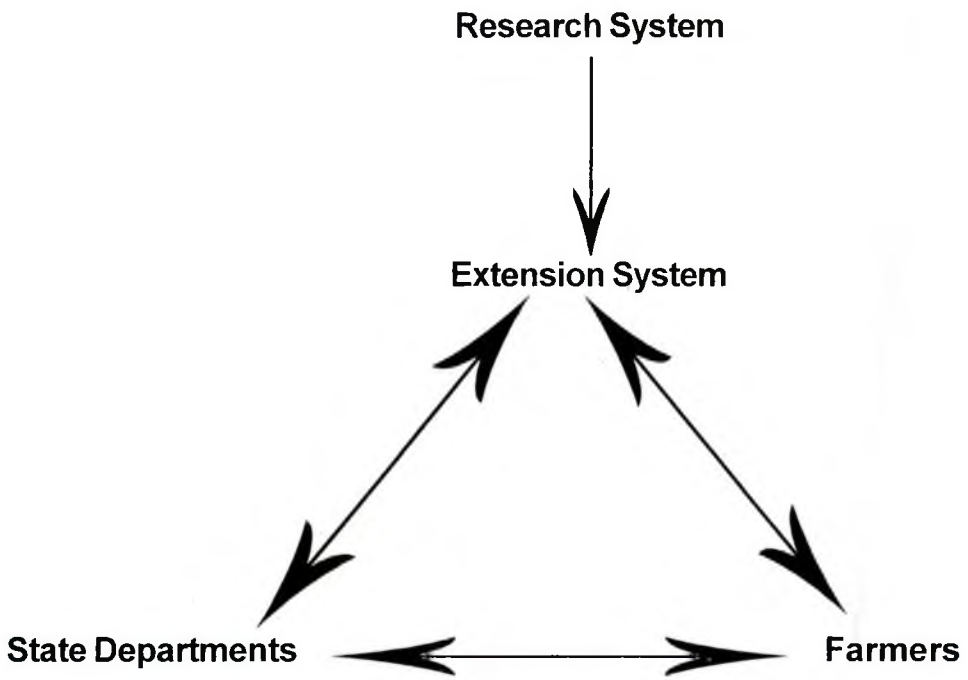
Training programme inauguration by MIC, ARD Department, Govt. of W.B.

Animal Nutrition Research Farm Complex

Processing of meat under NATP on Pork, Broiler and Eggs

D. TRANSFER OF TECHNOLOGY

Extension system in animal and fishery sector is concerned with the successful transfer of technologies to the farming community to increase productivity, employment and income generation. On the other side, it provides need-based feed back to influence the research, education and training module set up. Such education also forces the act of transferring innovation through proper education of the concerned personnel so that they are properly trained and the skills are acquired for conviction, action and adoption. Since the inception of organized extension programmes in the country, farmers' participation has been given prime emphasis. This system operates as a farmers' programme with the presence of scientists and extension educationists, alongwith the support and initiative of the Government and non-government oragnisations. The system has to deal with socio-economically weak farming community, which is large in size, with either small or no landholdings and thus, massive in demand.



D.1. PUBLICATION OF RESEARCH FINDINGS

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a. gi|55139410|gb|AY785758.1|[55139410]

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D.2. PUBLICATION OF SCIENTIFIC AND EXTENSION LITERATURE

1.	News letter	2
2.	Leaflets in Bengali	3
3.	Compendium of training programmes	8
4.	University at a glance	5
5.	Books in Bengali	6
6.	Monograph of VCI Course	2
7.	Laboratory manuals	12
8.	A decade Research at WBVAFS	1

Awareness camp on bovine infertility at KVK, Murshidabad

Visit of Sri Mangla Rai, Secretary (DARE) & DG (ICAR) at University main campus

Bonpala sheep with triplet lambs rearing under conservation project on Threatened Breed

On-farm trial on onion cultivation under KVK, North 24 Parganas

Krishi-O-Mahila Samridhhi Mela at KVK, Jalpaiguri

Health Camp under AICRP on Improvement of feed resources & nutrient utilization in raising animal production

D.3. TRAINING PROGRAMMES ORGANISED

S. No.	Title	Duration	Venue	Number of participants
1	Training on house dairy for higher milk production	5 days	Barua	25
2	Training on poultry and duck rearing	5 days	Barua	25
3	Training on sheep and goat farming	5 days	Barua	25
4	Training on pig farming	5 days	Barua	25
5	Training on integrated fish farming	5 days	Barua	25
6	Training on composite fish cultivation	5 days	Barua	15
7	Training on cultivation of green fodder	5 days	Barua	15
8	Training on cultivation of vegetables in kitchen garden	5 days	Barua	20
9	Training on banana plantation and management	5 days	Barua	10
10	Training on papaya cultivation	5 days	Barua	15
11	Training on dairy cattle and goat farming	3 days	Barua	50
12	Training on composite fish cultivation & integrated fish farming	3 days	Barua	40
13	Training on fodder, banana & papaya cultivation	3 days	Barua	35
14	Training on house dairy for higher milk production	3 days	Narandia	25
15	Training on poultry & duck rearing	3 days	Narandia	25
16	Training on sheep & goat farming	3 days	Narandia	25
17	Training on pig farming	3 days	Narandia	25
18	Training on integrated fish farming	3 days	Narandia	15
19	Training on composite carp cultivation	3 days	Narandia	25
20	Training on shrimp health management	3 days	Narandia	15
21	Training on fish drying using solar drier and production of pickle from low value prawn	3 days	Narandia	20
22	Training on green fodder cultivation	3 days	Narandia	10
23	Training on mushroom cultivation	3 days	Narandia	15
24	Summer training course on 'Immunobiochemical techniques for diagnosis of diseases'	15 days	Kolkata, Haldia, Durgapore, Allahabad, Bangalore.	59

25	State level training for WBCADC village organizers on 'Livestock farming'	15 days	Mohanpur	50
26	Refresher training for KVK SMS(Animal Sci.) on 'Sustainable livestock farming thru KVKs'	5 days	Mohanpur	30
27	Fish and prawn seed production and their culture	10 days	Canning II Sundarban	30
28	Shrimp seed bank, crab fattening, ornamental fisheries and farming system	10 days	Jharkhali Basanti Sundarban	30
29	Low cost hygienic fish drying, post harvest processing, value added fishery products and ornamental fisheries	12 days	RRS, BCKV, Kakdwip	30
30	Post harvest fish processing, low cost fish drying and value added fishery products	10 days	Mohanpur	30
31	Seed production of carps and prawn and their culture	10 days	Nezat, Sundarban	30
32	Trainers' Training Programme on Sustainable fishing and post -harvest handling	5 days	Panchasayar Kolkata	30

D.4. PARTICIPATION IN MELA (FAIR) / EXHIBITION

1. State Fruit, Fish and Animal Resource Festival – 2005 at Amritlal College, Baruipur, South 24 Parganas, West Bengal.

2. Regional Agricultural Fair – 2006, Bidhan Chandra Krishi Viswavidyalaya, Nadia.

3. Exhibition Stall at 3rd Grundtvig International Conference, 2007 held at Indian Museum , Kolkata, West Bengal.

4. State Vegetable – Fish and Animal Resource Festival – 2007 at Amritlal College, Baruipur, South 24 Parganas, West Bengal.

5 Agriculture – Industry – Tourism and Science Festival – 2007 at Baruipur Science Fair Campus, Patashpur – I, Purba Medinipur, West Bengal.

6. Krishi Samriddhimela, Paikpara, 2003, 2004, 2005

7. Krishi Mela, Teleniapara, N. 24 Parganas, 2007

D. 5. CONSULTANCY

The Extension wing of the Directorate of Research, Extension and Farms helps in Consultancy services to stakeholders in relation to livestock farming, including fish farming. The wing also provides consultacy on animal husbandry, dairy technology and fishery related laboratory and field services. In addition, need based training and distribution of extension literature to the beneficiaries are being regulary made undertaken.

D. 6. DOCUMENTARY FILM PRODUCED

Five Documentary Video films have been produced and being sold, namely-

i. Gabadi (in Bengali on Cattle husbandry)
ii. Garoler golpo (in Bengali on Garole sheep husbandry)
iii. Chhagoler golpo (in Bengali on Bengal goat husbandry)
iv. Hansomin (in Bengali on Integrated farming of duck cum fishery)
v. Choroibeti (in Bengali on Institution Village Linkage programme)

D. 7. ACTIVITY OF KRISHI VIGYAN KENDRAS

D.7.1. JALPAIGURI KRISHI VIGYAN KENDRA

1. Abstract of different training programmes conducted

Year	No. of training courses		No. of Participants												
			SC			ST			OTHERS			TOTAL			TOTAL
	On Campus	Off Campus	M	W	T	M	W	T	M	W	T	M	W	T	
PRACTICING FARMERS :															
2003-2004	16	55	519	658	1177	26	24	50	382	157	539	924	839	766	1766
2004-2005	18	48	649	332	981	85	34	159	284	104	388	1018	465	1483	1483
2005-2006	30	46	649	554	1203	55	21	76	219	217	436	923	792	1715	1715
2006-2007	24	69	606	1598	2204	48	147	195	130	465	595	784	2210	2994	2994
TOTAL	**88**	**218**	**2423**	**3142**	**5565**	**214**	**226**	**480**	**1015**	**943**	**1958**	**3649**	**4306**	**7958**	**7958**

RURAL YOURTH

2003-2004	6	10	156	147	303	7	6	13	76	30	106	239	183	422	422
2004-2005	6	13	205	89	294	26	21	47	60	7	67	291	117	408	408
2005-2006	8	16	338	138	476	107	62	169	76	37	113	521	237	758	758
2006-2007	4	2	62	51	113	5	26	31	37	11	48	104	88	192	192
TOTAL	**24**	**41**	**761**	**425**	**1186**	**145**	**115**	**260**	**249**	**85**	**334**	**1155**	**625**	**1780**	**1780**

EXTENSION FUNCTIONERIES

2003-2004	2	-	25	3	28	-	-	-	23	1	24	41	11	52	52
2004-2005	-	1	2	-	2				7	-	7	9	-	9	9
2005-2006	1	2	02	15	17	-	-	-	25	-	25	27	15	42	42
2006-2007	1		-	15	15	-	-	-	-	-	-		15	15	15
TOTAL	**4**	**3**	**29**	**33**	**62**	**-**	**-**	**-**	**55**	**1**	**56**	**77**	**41**	**118**	**118**

2. Abstract of FLD Programmes undertaken

Year	Discipline	No. of FLDs	Area (ha.)/No	No. of beneficiaries												TOTAL
				SC			ST			OTHERS			TOTAL			
				M	W	T	M	W	T	M	W	T	M	W	T	
2003-2004	Agronomy	5	34	130	-	130	-	-	-	-	-	-	130	-	130	130
	Horticulture	1	30	3	-	3	-	-	-	-	-	-	3	-	3	3
	Animal Husbandry & Health	2	34 Animals	2	2	4	5	5	6	6	-	6	8	5	15	15
2004-2005	Agronomy	3	18.9	59	-	59	8	-	8	7	-	7	74	-	74	74
	Horticulture	3	28.85	689	-	689	-	-	-	-	-	-	689	-	689	689
2005-2006	Agronomy	4	25	95	-	95	-	-	-	-	-	-	95	-	95	95
	Horticulture	7	80	1720	-	1720	-	-	-	-	-	-	1720	-	1720	1720
	Animal Husbandry & Health	3	48 Animals	3	11	14	-	-	-	-	-	-	3	11	14	14

2006-2007	Agronomy	3	16	60	-	60	8	-	8	28	-	28	95	-	95	95
	Horticulture	5	376	340	-	340	30	-	30	120	-	120	490	-	490	490
	Animal Husbandry	2	186 Animals	45	-	45	14	-	14	31	-	31	90	-	90	90

3. Abstract of OFT/OST programmes undertaken

		No. of	Area	No. of beneficiaries												TOTAL
Year	Discipline	OFT/	(ha.)/	SC			ST			OTHERS			TOTAL			
		OST	No.	M	W	T	M	W	T	M	W	T	M	W	T	
2003-2004	Agronomy	1	50	5	-	5	-	-	-	-	-	-	5	-	5	5
	Animal Husbandry & Helath	1	30 Animals	7	1	8	3	4	7	4	1	5	14	6	20	20
2004-2005	Agronomy	1	50	5	-	5	-	-	-	-	-	-	5	-	5	5
	Horticulture	1	30	4	-	4	-	-	-	-	-	-	4	-	4	4
	Animal Husbandry & Health	1	48 Animals	13	2	15	4	2	6	2	1	3	19	5	24	24
2005-2006	Agronomy	1	50	8	-	8	-	-	-	-	-	-	8	-	8	8
	Horticulture	1	30	4	-	4	-	-	-	-	-	-	4	-	4	4
	Animal Husbandry & Health	2	140 Animals													
2006-2007	Agronomy	2	1ha	14	-	14	-	-	-	2	-	2	16	-	16	16
	Horticulture	1	40	5	-	5	-	-	-	-	-	-	5	-	5	5
	Animal Husbandry	1	40 Animals	2	-	2	10	8	18	-	-	-	12	8	20	20
	Home Science	1	1ha	-	16	16	-	-	-	-	4	4	-	20	20	20

D.7.2. MURSHIDABAD KRISHI VIGYAN KENDRA

The Murshidabad KVK started its activities with limited infrastructural facilities and manpower existing there. The Murshidabad KVK has carried out 15 number of Vocational training courses benefiting 678 farmers, which involved 386 OBC (360 men and 26 women), 273 SC (246 men and 27 women) and 19 ST (men) participants. The KVK has already undertaken 3 On-farm trails and 4 Frontline demonstrations in the field on Animal Sciences, Soil Scieces and Horticulture.

D.7.3. NORTH 24 PARGANAS KRISHI VIGYAN KENDRA

Being very new, the KVK North 24 Parganas has just started its activities in the mandated areas, which could be summarized as below :

Till date a total of 12 training programmes on various topics of crop, animal sciences and home sciences were conducted. A total of 684 farmers were being benefited during these training programmes.

To equip the farmers with improved and scientific farm activities, 4 no. of Frontline Demonstrations were being conducted at nearby vilages involving a total of 42 farmers. The demonstrations were on black gram, mustard, gram and onion.

One On-farm trail on onion has already been started; the other on Boro rice had also been undertaken.

D.8. PARTICIPATION OF TEACHERS AND OFFICERS IN CONFERENCE, MEETING, WORKSHOP, SEMINAR, SYMPOSIUM ETC.

FACULTY OF VETERINARY AND ANIMAL SCIENCES

Veterinary Pathology

Name of the Participant	Name of Seminar/Conference	Place	Date
Dr. S. K. Mukhopadhayay	Advances in pathological techniques in diagnosis of Animal, Birds and fish diseases.	IAVP, Kolkata	November 23-25, 2004
	National Symposium on challenges to education in the presence scenario	WBCUTA, Howrah	09.10.2004
	National Seminar on Knowledge based system, theory, applications and tools	B.K.C.C. Kolkata	01.12.2004 to 02.12.2004
	Seminar on Sunder Ban-Nature and environment	M.K.C.	02.04.2004
	IAVA National symposium on recent advancement in Veterinary Anatomy and their inter disciplinary approach in livestock production		16.11.04 to 18.11.2004
	Seminar on the search of truth-Sciences	M.M.C.C. Kolkata	03.01.2005

	Seminar on Globalization and Liberalization of the Indian economy	M.M.C.C.	12.11.2005
	Seminar of Sciences	M.K.C.	15.03.2005
	XXXVII-th annual conference of Indian pharmacologicl society	Kolkata	14.01.05 to 16.01.05
Dr. Nimai Chand Patra	CAS training coure on Techniques in murine monoelonal antibody production at CCS HAU		12 Jan.-12 Feb 2008

Veterinary Bio-Chemistry

Name of the Participant	Name of Seminar/Conference	Place	Date
Dr. S. Batabyal	UGC sponsored Refester course on 'Biophysics'	Kalyani	14 Feb - 6 March, 2003
Dr. S. Chattopadhyay Dr. S. Batabyal	XIX Annual convention of I.A.V.A. and National Symposium on 'Recent Advances in Veterinary anatomy and their interdisciplinary approach in livestock production'	Kolkata	16-18th November 2004
	XXI Annual conference of Indian Association of Veterinary Pathologist and National Symposium of 'Advances in pathological techniques in diagnosis of animal, brd and fish diseases'	Kolkata	23-25th November, 2004

Animal Nutrition

Name of the Participant	Name of Seminar/Conference	Place	Date
Prof. T. K. Ghosh Dr. S. Halder	Fourth Asian Buffalo Congress	New Delhi	25-28 Feb, 2003
Prof G. Samanta	XI Animal Nutrition Society Conference	JNKVV, Jabalpur	5-7 Jan, 2004
Prof. T. K. Ghosh Prof. G. Samanta Prof. P. Biswas	XXXVII Annual Conference of Indian Pharmacological Society	Science City Kolkata	14-16 Jan, 2005
Dr. B. Roy	Alltech 21st International Feed Industry Symposium	USA	22-25 May, 2005
Prof. G.Samanta	3rd World Waterfall Conference	Guangzhon, China	3-6Nov, 2005

Prof. P. Biswas	Workshop on Animal Feed Science & Technology in Indian Perspective	Jhansi, India	11-12 Feb, 2005
Prof. T.K. Ghosh	International Conference on Bio-technological approaches for malnutrition & human health	UAS, Bangalore	9-11 Jan, 2006
Prof. T. K. Ghosh Prof. G. Samanta Prof. P Biswas Dr. B. Roy	20th Asia-Pacific lecture tour-2006	Kolkata	14, Nov, 2006
Prof. T. K. Ghosh	IPSACON-2007	Ludhiana	25-27April 2007
Prof. T. K. Ghosh Prof. P. Biswas Dr. S.Halder	TROPNUTRICON	NDRI, Karnal	4-7 Oct. 2007

Veterinary Pharmacology & Toxicology

Name of the Participant	Name of Seminar/Conference	Place	Date
Dr. T. K. Mondal	36th Annual Conference of Indian Pharmacological Society	Delhi University	3 days
	38th National Conference of Indian Pharmacological Society	Madras Medical College	
	5th Annual Conference of India Society of Veterinary Pharmacology & Toxicology	TANUVAS	3 days
	26th Annual Conference of Indian Association of Biomedical Scientists	CU, Kolkata	3 days
	6th Annual Conferences of Indian Society of Veterinary Pharmacology & Taxicology	Patna	3 days
	39th Annual Conference of Indian Society of Veterinary Pharmacology & Toxicology	Jaipur, Rajasthan	3 days
	State Indian Pharmalogical Society Conference	Kolkata Medical College	1 day

Veterinary Physiology

Name of the Participant	Name of Seminar/Conference	Place	Date
Dr. S. Sanyal Dr. P. K. Das Dr. P. R. Ghosh	International Conference on 'Recent Advance in Biomedical & Therapeutic Sciences'	Bundelkhand University, Jhansi	13-15 January 2004
Dr. S. Sanyal Dr. P. K. Das Dr. P. R. Ghosh	XIX Annual Convension of ISSAR & National Symposium on 'Current Reproductive Technologies for Improvement of Livestock Production in India	Kolkata	22-24 August 2003
Dr. S.Sanyal Dr. P. K. Das Dr. P. R. Ghosh	XIX Annual Conversion of IAVA & National Symposium of 'Recent Advancement in Veterinary Anatomy,	Kolkata	16-18 Novermber 2004
Dr. S.Sanyal Dr. P. K. Das Dr. P. R. Ghosh	National Symposium & XXI Annual Conference of IAVP	Kolkata	23-25 November 2004
Dr. S. Sanyal Dr. P. K. Das Dr. P. R. Ghosh	UGC sponsored State Level Seminar on 'Impact of Civilization Environment'	Jhargram WB	27-28 November 2004
Dr. S. Sanyal Dr. P. K. Das Dr. P. R. Ghosh	National Symposium on 'Recent Advance in Cryopreservation of Livestock Germplasm' and XIV Annual Conference of SAPI	Durg	28-29 January 2005

Veterinary Parasitology

Name of the Participant	Name of Seminar/Conference	Place	Date
Prof. J. D. Ghosh	XIV National Congress of Veterinary Parasitology	Nagpur	15-17 Oct, 2003
	XV National Congress of Veterinary Parasitology	Pantnagar Uttaranchal	25-27 Oct, 2004
Prof. J. D. Ghosh Prof. N. K. Sasmal	XXI Annual Conference of Indian Association of Veterinary Pathologists	Kolkata	23-25 Nov, 2004
Prof. J. D. Ghosh	Fifth All India People's Technology Conference	Science City, Kolkata	Dec. 2004
	XVI National Congress of Veterinary Parasitology	Durg, Chhatisgarh	6-8 Dec, 2005

	National Symposium on 'Advancement in livestock & poultry sectors and the challenges ahead with special embhasis on bird flu	WBUAFS Kolkata	10 Jan, 2006
	XVII National Congress of Veterinary Parasitology	Pandichery	15-17 Nov. 2006
	XVIII National Congress of Veterinary Parasitology	SKUAFS & T, Jammu	7-9 Sept 2007

Clinical Veterinary Medicine, Ethics and Jurisprudence

Name of the Participant	Name of Seminar/Conference	Place	Date
Prof. N. R. Pradhan	21st Annual Convention of Indian Society for Veterinary Medicine & National Symposium	Anand Vety. College, Gujrat	7-9 Feb. 2003
	22nd Annual Convention of ISVM & National symposium	Izatnagar, UP	11-13 Feb 2004
	6th all India Conference of Association of Public Health Veterinarians and National Symposium on Sustainable production of safe food of animal and fish origin : Public awareness and People's participation	Sri Ramkrishna Ashrm Nimpith, South 24 Parganas, West Bengal.	26-28 November 2004
	XXXVII annual Conference of Pharmacological Society	Science City Anditorium, Kolkata	14-16 January, 2005
	XXIII Annual Convention of the Indian Society for Veterinary Medicine & National Symposium	Anjora, Durg	2-4 February 2005
	2nd Annual Convention of Indian Society for Advancement of Canine Practice	Hotel Hyatt Regency New Delhi	9-11 February 2005
	Golden Jubilee celebration of National Dairy Research Institute, ERS, Kalyani	NDRI, Eastern regional station, Kalyani	25-26 February 2005

	3rd Annual Convention of Advancement of Canine Practice	Bhubaneswar Orissa	10-12 Feb 2006
	24th Annual Convention of ISVM & National Symposium	Bangalore Vety. College, Bangalore	23-24 Feb, 2006
Dr. Chandan Lodh	National symposium on recent advances in canine practice conducted by ISACP	Locknow	8-9 April 2004
	National symposium latest approaches and biotechnological tools for health management of farm and companion animals conducted by ISVM	IVRI, UP	11-13 Feb, 2004
	National symposium on scientific advancement for improving animal health and production conducted by ISVM		204th Feb., 2005
	International congress on emerging challenges in canine practice conducted by ISACP	New Delhi	911th Feb, 2005
	National symposium on advances in pathological technique in diagnosis of animal birds and fish diseases organized by IAVP		23-25th Nov, 2004
	National Symposium on Sustainable Production ofsafe food of animals and fish origin : public awareness and people's participation	Krishi Vigyan Kendra, Nimpith	26-28th Nov, 2004
Prof. S. Sarkar	Symposium on Faunal diversity and its impact on human health as Guest speaker	Ballygunj Science College Kolkata	1st March 2008
	Short-term training on Organic farming for sustainble Agriculture as Guest speaker	Dept of Agril. & Food Engineering, IIT, Kharagpur	21st March 2008

Veterinary Epidemiology and Preventive Medicine

Name of the Participant	Name of Seminar/Conference	Place	Date
Prof. C.Guha & Dr. U. Biswas	Veterinary Public Helath on 21st century	Association of Public Health Veterinarians	21st-22nd Oct, 2000

Prof. C.Guha & Dr. U. Biswas	Emerging Animal Discases-Impact on Socio-economic and Health development	Association of Public Health Veterinarians	23rd Sept 2001
Dr. U. Biswas	National Symposium of Veterinary Public Health in continuing bioterrorism	Association of Public Health Veterianrians	21st-23rd Dec., 2002
Prof. C. Guha & Dr. U Biswas	Bovine Mastitis...regarding	West Bengal Veterinary Alumni Association	20th April 2003
Prof. C. Guha & Dr. U. Biswas	Status of Foot and Mouth Disease in India and future strategies of control	West Bengal Veterinary Alumni Association	27th-28th Dec., 2003
Prof. C. Guha & Dr. U. Biswas	Current Reproductive Technologies for Improvement of Livestock Production in India	Indian Society for Study of Animal Reproducton	22nd-24th Aug 2003
DProf. C. Guha	Latest Aproaches and Biotechnological Tools for Health Management of Farm and Companion Animals	Indian Society for Veterinary Medicine	11th-13th Feb., 2004
Dr. U. Biswas	Sustainable production of safe food of animal and fish origin	Association of Public Health Veterinarians	26th-28th Nov., 2004
Dr. U. Biswas	Advances in pathological techniqes in diagnosis ofanimal, ird and fish diseases	Indian Society of Veterinary Pathologists	23rd-25th Nov., 204
Dr. U. Biswas	Scientific advancement for improving animal health and production	Indian Society for Veterinary Medicine	2nd-4th Feb., 2005

Veterinary Public Health

Name of the Participant	Name of Seminar/Conference	Place	Date
	6th All India Conference of Association of Public Health Veterinarians and National Symposium,	Krish Vigyan Kendra, South 24-Parganas	26-28 November 2004

Animal Production and Management

Name of the Participant	Name of Seminar/Conference	Place	Date
Dr. A. K. Samanta	Seminar on Goat Genome, CIRG, Makhdoom		April 5-6 2004
	XIX Annual Convention of Indian Association of Veterinary Anatomists & National Symposium		16-18 November 2004
	National Symposium ad XXI Annual Conference of Indian Association of Veterinary Pathologists		23-25 November 2004
	6th All Indian Annual Conference of Association of Public Health Veterinarians.		26-28 November 2004

Animal Products Technology & Marketing

Name of the Participant	Name of Seminar/Conference	Place	Date
Dr. S.Biswas	National seminar on Leather Technology	Salt-lake	Nov, 2004
	Vth All India Peoples' Technology Congress		Jan, 2004
	National seminar of Public Health Veterinarians	Nimpith	2004
	National symposium on Dairy development in Eastern India		NDRI Kalyani 2005
	National symposium of Veterinary pathologists	Salt-lake	2004

Veterinary Gynaceology & Obstetrics

Name of the Participant	Name of Seminar/Conference	Place	Date
Dr. P. R. Nandi	UGC sponsored national seminar seminar on "Challenges to Education in the present senario"	Sarat Sadan, Howrah	09.10.2004

Dr. S. Basu Dr. P. R. Nandi Dr. U. Datta Dr. (Mrs.) K. Ray	National symposium on "Recent advancement in Veterinary anatomy and their inter-disciplinary approach in Livestock production"	W.B.U.A.F.S.	16.11.04 to 18.11.04
Dr. S. Basu Dr. P. R. Nandi Dr. U. Datta Dr. (Mrs.) K. Ray	National symposium on "Advances in pathological techniques in diagnosis of Animal, ird and Fish diseases"	Kolkata	23.11.04 to 24.11.04
Dr. U. Dattta	National symposium on "Trends in molecular and applied approaches to production"	Kolkata	4.2.05 to 5.2.05
Dr. S. Basu	5th All India People's Technology Congress	Science City Kolkata	19.2.05 to 20.2.05
Dr. P. R. Nandi	Seminar on "Environment Science"	Maharani Kasiswari College	15.3.05

Veterinary Surgery & Radiology

Name of the Participant	Name of Seminar/Conference	Place	Date
Dr. D. Ghosh, Dr. S. K. Nandi, Dr. S. Hazra	XIX Annual Convention of ISSAR and National Symposium on "Current Reproductive Technologies for improvement of Livestock Production in India"	Kolkata	22.8.2003 to 24.8.2003
Dr. D. Ghosh, Dr. S. K. Nandi, Dr. S. Hazra	XIX Annual Convention of IAVA and National Symposium on "Recent and their inter-disciplinary approach in livestock production"	W.B.U.A.F.S.	16.11.04. to 18.11.04
Dr. S. K. Nandi.	Worshop on "Farm journalism in Dissemination of Animal Husbandry Technology",	WBUAFS	24.03.04 to 25.3.04
Prof. D. K. De. Dr. D. Ghosh, Dr. S.Hazra and	XXIX Annual Congress of Indian Society for Veterinary Surgery & National Symposium on Alternative	I.V.R.I., Izatnagar (U.P.)	9th-11th November 2005
Dr. S.K. Nandi	Teaching and Research Methods on Animal Experimentation in Veterinary Surgery		
Prof. D. K. De.	XXVII Annual Congress & National Symposium of Indian Society for Vetrinary Surgery	Jabalpur, M.P.	

Veterinary & Animal Husbandry Extension Education

Name of the Participant	Name of Seminar/Conference	Place	Date
Dr. A.Goswami	5th people Technology Congress, FOSET	Kolkata	19.2.05 to 20.2.05

FACULTY OF DAIRY TECHNOLOGY

Name of participant	Name of Seminar/ Conference	Place	Date
Prof. A.K. Bandyopadhyay Prof. P.K. Ghatak	National seminar on preservation and packaging of indigenous sweets	Bhubaneswar	10 Jan., 2003
Prof. A.K.Bandyopadhyay	4th Asian Buffalo Congress on buffalo for food security	New Delhi	25-28 Feb, 2003
Prof. P. K. Ghatak	Workshop on constrains of Dairying and solution	Saltlake City, Kolkata	19-20 March, 2003
Prof. A.K. Mishra Dr. S.P. Sarkar Dr. T.K. Maity	International Conference on antioxidants in food & beverage for better maintenance of health & youth:export potential of patented Ayurvedic formulations	Deptt. of Food Technology & Biochemical Engineering, Jadavpur University and AFST (I)	15-16 July, 2003
Dr. S.P. Sarkar	Workshop on Create awareness about strength of the organized Dairy sector	SaltLake City, Kolkata	19-20 March, 2004
Prof. A.K. Mishra Dr. S.P. Sarkar Dr. T.K. Maity	Workshop on Farm Journalism in dissemination of Animal Husbandry Technology	WBUAFS, Kolkata	24-25 March, 2004
Prof. A.K. Mishra Dr. S.P. Sarkar Dr. T.K. Maity	Interactive session on Food technology and food safety entrepreneurs	Deptt. of Food Sci & Tech., Jadavpur University	29-31 March, 2004
Prof.A.K. Bandyopadhyay	National symposium on sustainable	Krishi Vignan	26-28

Dr.P.K.Ghatak Mr. P.R. Ray	production of safe food of Animal and Fish origin:Public awareness and Peoples Participation	Kendra, Sri Ramkrishna Ashram Nimpith.	November 2004
Prof.A.K. Bandyopadhyay	XXXIII Dairy Industry Conference	New Delhi	12-14 Feb., 2004
Prof. A.K. Mishra Prof. P.K. Ghatak Dr. S.P. Sarkar Mr. P.R. Ray	Vth All India Peoples' Technology Congress, FOSET	ScienceCity, Kolkata	19-20 Feb., 2005
Prof. A.K. Mishra Prof.P.K.Ghatak Dr. S.P. Sarkar Sri P.R.Ray	Workshop on Technology Transfer in Dairying	NDRI(ERS), Kalyani	25-26 Feb., 2005
Dr. S.P. Sarkar	Prof. A.N. Bose Memorial lecture on Protein as versatile molecule	Central Food Laby., Kolkata	11 March, 2005
Prof.A.K. Bandyopadhyaya Prof. A. K. Mishra Prof. P.K.Ghatak Dr. S.P. Roy Dr. T. Maity Mr. P.R. Ray	Seminar on Emerging trends in Dairy processing and marketing	Inst. of Engineers Auditorium, Kolkata	9-10 Sept., 2005
Dr. S.P. Roy	Workshop on Value addition of foods: Tea	Hotel Taj Bengal, Kolkata	Nov. 5, 2005
Dr. P.K.Ghatak Sri P.R.Ray	National seminar on value added dairy products	NDRI, Karnal, Haryana	21-22 December 2005
Mr. P.R.Ray	Retraining programme on Research Funding and project proposal	Jadavpur University Kolkata	17-18 February 2006
Prof. P.K. Ghatak	Environmental impact on food safety	Jadavpur University	10 March, 2006
Prof. A.K. Mishra Dr. S.P. Sarkar Dr. T.K. Maity	Seminar on Principles of thermal processing of foods, methods of process evaluation and recent advances in sterilization systems	Indian Inst. of Chemical Engineers, Jadavpur University	23 March, 2006
Prof.A.K. Bandyopadhyay Prof. A.K. Mishar	XXXV Dairy Industry Conference	Kolkata	23-25 Nov.,2006

Prof. P.K. Ghatak Dr. S.P. Sarkar			
Prof. P.K. Ghatak Dr. T.K. Maity Mr. P.R. Ray	National seminar on prospects and challenges of manufacturing organic indigenous milk products for export market	NDRI, Kalyani	26-27 Nov., 2006
Dr. S.P. Sarkar Dr. T.K. Maity	National conference on Quality improvement in food processing: role of science and technology	Kolkata	18-20 January, 2007
Prof. P.K. Ghatak Dr. S.P. Sarkar Dr. T.K. Maity	VIth All India Peoples' Technology Congress	Science City, Kolkata	10-11 Feb., 2007

FACULTY OF FISHERY SCIENCES

Name of participant	Name of Seminar/Conference	Place	Date
Dr. S. K. Das Dr. R. K. Trivedi Dr. S. K. Rout	Seminar on "*Fish and its Environment*"	Dept. of Zoology, University of Kalyani	14 June, 2003
Prof. N. R. Chattopadhyay	Workshop on "*Sustainable Aquaculture Development*"	Dept. of Zoology, University of Kalyani	20 Sept., 2003
Prof. N. R. Chattopadhyay Dr. Sudhir Kr Das Dr. S. Behera Dr. S. K. Rout Dr. B. K. Das	Workshop on "*Present Status of Induced Breeding and its Impact on Aquaculture*"	Faculty of Fishery Sciences, WBUAFS, Mohanpur	5 May, 2003
Prof. N. R. Chattopadhyay Dr. S. K. Das	International Conference on "*Environment and Development*"	Science city, Kolkata	4-8 Feb., 2004
Prof. N. R. Chattopadhyay Dr. T. K. Ghosh Dr. S. K. Das	National Seminar on "*Green Technology and Biodiversity conservation*"	Science city, Kolkata	28 March, 2003
Dr. T.J. Abraham	National Seminar on "*Prospects of*	CIFE, Salt Lake,	16-17 Feb,

Dr. S. K. Das Dr. A.K. Panigrahi	*Ornamental Fish Breeding and Culture in Eastern and North-Eastern India*"	Kolkata	2004
Prof. N. R. Chattopadhyay	Indo-Singapore Joint Workshop on "*Development of Collaborative Projects*"	Cochin Univ. of Science and Technology	22-23 April, 2004
Prof. N. R. Chattopadhyay	Brain storming session on "*Water and Waste Water Management in Aquaculture and Marketing of Value Added Aquatic Products from Small Scale Cottage Industries*"	CIFE, Mumbai	8-9 May, 2004
Prof. N. R. Chattopadhyay	"*Third Fisheries Congress*"	Fisheries Congress Association, New Delhi	4-6 Nov, 2004
Dr. S. K. Das	International Conference on "*Coastal Hazards*"	SASTRA Deemed University & Indian Geological Congress,	9-11 Feb, 2005
Prof. N. R. Chattopadhyay	Seminar on "*Intelligence Property Rights*"	Thanjavour, T. N.	9 April, 2005
Dr. S. K. Das	"*Conservation of Endangered Fish*"	IIT, Kharagpur	9 Feb, 2005
Prof. N. R. Chattopadhyay	Seminar on "*Interface on Aquaculture*"	Peoples' Technology Congress, Science City, Kolkata	27-28 Sept., 2004
Dr. S. K. Das	Seminar on "*BIO-Thurst - The Gateway to a Safer World*"	CIFA, Bhubaneswar	10 Sept., 2006
Dr. S. K. Das	National Symposium on "*Developmental Dynamics*"	The Park, Kolkata	23-25 Nov, 2005
Prof. N. R. Chattopadhyay	Seminar on "*Popularization of Organic Farming Approach in Fisheries for Sustainable Development*"	Department of Zoology, University of Kalyani, Kalyani	12 Dec, 2006
Prof. N. R. Chattopadhyay	Workshop-cum-Training Programme on "*Economic Empowerment of Homestead Ponds*"	CIFRI, Barrackpore	21-22 Dec, 2006
Dr. Sudhir Kr. Das	National Seminar on "*Conservation and*	Kanyakumari,	21-22

	Management of Marine Biodiversity"	Tamilnadu	March, 2003
Dr. T. S. Nagesh	Winter School on *"Recent Advances in Mariculture Genetics and Biotechnology"*	CMFRI (ICAR), Kochi, Kerala	4-24 Nov., 2004
Dr. Sudhir Kr. Das Dr. G. Dash	National Seminar on *"Responsible Fisheries and Aquaculture"*	Berhampur, Orissa	12-13 Feb, 2004
Dr. T.S. Nagesh	Workshop on *"Fisheries Stock Assessment – Capacity Building"*	Dept. of Fisheries, Govt. of West Bengal, Great Eastern Hotel, Kolkata.	8-12 Aug 2005
Dr. Sudhir Kr. Das	Workshop on *"Impact, Adaptation & Vulnerability of Fisheries/Livestock to Climate Change".*	CIFRI, Barrackpore	4 March, 2006
Dr. T.J. Abraham	"*Bioinformatics in Genomics and Proteomics*'	Department of Biotechnology, Indian Institute of Technology, Kharagpur	24-25 Sept. 2004
Dr. T.J. Abraham Dr. S.N. Joardar Dr. A.K. Panigrahi	*"Computer Application"*	WBUAFS and WEBEL, Kolkata and Mohanpur	July and August 2004
Dr. S.N. Joardar	31st of Annual conference of IIS, Org. by Anna University	Chennai	15-18 Dec, 2004
Dr. T.J. Abraham Dr. R. K. Trivedi Dr. A.K. Panigrahi	All India Seminar on "Sustainable Aquaculture for Augmentation of Export with Special Reference to Environment, Engineering *and Value Addition*"	Agricultural Engineering Division, The Institution of Engineers (India) West Bengal State Centre, Kolkata	3-4 Sept, 2004
Dr. S.N. Joardar Dr. A.K. Panigrahi	"5th People's Technology Congress"	FOSET, Kolkata	19-20 Feb, 2005
Dr. S. K. Rout	"*Genetics and Gene Banking of Fish and Shellfish*"	CIFE, Mumbai	29-30 March

			2003
Dr. R. K. Trivedi	"*Jaliya Paryavaran Evam Matsyaki – Samasyaen va Samadhan*"	CIFRI, Barrackpore.	23-24Feb, 2003
Dr. B. K. Das	"*Marine Bio-diversity in South, South Asia: Utilization and Conservation*"	Society of Indian Ocean Studies, Kolkata	7-8 March, 2003
Dr. B. K. Das	"*Third Indian Fisheries Science Congress*"	IARI, Pusa, New Delhi	4-6 Nov, 2004
Dr. R. K. Trivedi	"*Disaster and its Management: Perspective and Future Approaches*"	Krishnanagar Government College, W. B.	15-17 April, 2004
Dr. R. K. Trivedi	"*Management Challenges in Fisheries of Rivers and Associated Ecosystems: Issues and Strategies*"	CICFRI, Barrackpore	16-17 April, 2005
Dr. B. K. Das	"*Remote Sensing and Geographical Information System*"	Jadavpur University, Kolkata	2-3 Feb, 2006
Dr. S. K. Rout	National Seminar on "*Marine and Estuarine Biodiversity*"	Central Calcutta Science & Culture, Kolkata	26 Feb, 2006
Dr. S. K. Rout	"*Inland Fisheries Management using GIS Tools*"	CIFRI, Barrackpore	14 Nov, 4Dec, 2006
Dr. A.K. Panigrahi	National symposium on "*Recent Trends in Fisheries Education and Research*"	Fisheries College and Research Institute, Thoothukudi	4 Dec, 2004
Dr. A.K. Panigrahi	Training Programme on "*Engendering Agricultural Research and Extension*"	National Research Centre for women in Agriculture Bhubaneswar.	3-9 March, 2005
Dr. A.K. Panigrahi	National Seminar and Workshop on "*Ornamental Fish and Ornamental Fish Fair*"	Central Calcutta Science and cultural Organization for Youth, Kolkata	17-18 March, 2006

DIRECTORATE OF RESEARCH, EXTENSION AND FARMS

Name of participant	Name of Seminar/Conference	Place	Date
Dr. B.K. Chand	National Seminar on Sustainable production of safe food of animal and fish origin: Public Awareness & Peoples' Participation	KVK, Sri Ramkrishna Ashram, Nimpith, West Bengal	26-28 November, 2004
	All India Seminar on Sustainable Aquaculture for augmentation of export with special reference to environment, engineering and value addition.	Institute of Engineers (India), W. B. State Center, Kolkata	03-04 September, 2004
	National Symposium cum Exhibition on "Enhancing productivity and sustainability in coastal agro-ecosystem"	Central Tuber Crops Research Institute, Thiruvanthapuram	09-11 June, 2004
	National Seminar on Recent Advances & Rebuilding of Fish and Fisheries in North East India	St. Anthony's College, Shillong	22-23 August, 2007
	National Workshop on Sustainability of Indian Aquaculture Industry	Indian Institute of Technology, Kharagpur	28-29 September, 2007
	National Workshop on Higher Education Governance	University of Calcutta, Kolkata	08-09 December, 2007
Dr. P. K. Biswas	Winter School on "Significance of Micronutrients in Livestock Health Production	IVRI, Izatnagar, UP	24 Nov, 14 Dec, 2005
	Training Course on "Computer certificate course on PC application	WBUAFS, Kolkata	1-30 Sept, 2005
	International seminar on Higher Education Administration in Developing Countries	Ballygunge Science College, Calcutta University	4-6 Feb., 2006

	National Seminar on "Higher education scenario in West Bengal: New ideas and role of academic administrators"	Calcutta University Rowing Club, Kolkata	20 Aug, 2006.
	Workshop on "Academic Administration / Administrative Practices"	Jadavpur University	12-13 January, 2006
	Conference cum National Symposium of Indian Poultry Science Association (IPSACON 2005) on "Indian Poultry Production in changed Global Scenario: Challenges and opportunities"	University Auditorium, ANGRAU, Rajendranagar	2-4 Feb., 2005
Dr. (Mrs.) S. Das	Certificate course in PC Application	WBUAFS, Kolkata	September, 2004
	Introduction on LAN/WAN Technologies	Barrackpore	6-11 September, 2004
	Conference on Arsenic Contamination in Ground Water And Its Health Effects	Indian Inst. of Chemical Biology, Kolkata	14-16 February, 2003
	Seminar on Fish and its Environment	University of Kalyani	14 June, 2003
	National Seminar on Evolutionary Biology and biotechnology	Zoological Society, Department of Zoology, University of Calcutta	26 Feb., 2005
	National Seminar on Contemporary Zoology: Ex-classroom Highway To Industry".	Bangabasi College, Kolkata	23-24 April, 2005
	International Seminar on Higher Education dministration in Developing Countries	Calcutta University	4-6 Feb., 2006
	National Seminar on Biodiversity and Conservation	Scottish Church College, Kolkata	29 March, 2006
	National Seminar and Workshop on Ornamental Fish	Kolkata	17-18 March, 2006

	Workshop on History of Science in 20th Century and Contribution of the Indian Scientists	The Asiatic Society, Kolkata	21-28 November, 2006
	Participated in Grundtvig International Conference	Asutosh Centenary Hall at Calcutta Museum	8-11 January, 2007
Dr. K. Dhara	XIX Annual Convention of ISSAR and National Symposium on Current reproductive technologies for improvement of livestock production in India	Salt Lake City, Kolkata	22-24 August, 2003
	XIX Annual Convention of ISSAR and National Symposium on Current reproductive technologies for improvement of livestock production in India	Salt Lake City, Kolkata	22-24 August, 2003
	National Symposium on Prospective role of Veterinary Public Health in integrated rural development and 7th All India Conference of the Association of Public Health Veterinarians	OUAT, Bhubaneswar	7-8 Dec, 2006
	Seminar on Planning for livestock production with special emphasis on indigenous Animal Genetic Resources	Conference Hall, WBVC, Kolkata on	27 Dec, 2006
	Workshop on Farm Journalism in Dissemination of animal Husbandry Technology	WBUAFS, Kolkata	24-25 March 2004
	Workshop on Quantitative techniques for research workers	Deptt. of Statistics, the University of Burdwan.	24-26 August, 2006
	Orientation course by the Compound Livestock feed Manufacturers Association of India	WBUAFS, Kolkata	18 Nov., 2000
	Interactive Meet on Present Status and Future Prospective of sheep, Goat and Rabbit production in Eastern Region	OUAT, Bhubaneswar	28th June 2006

E. OUR MISSION

- To produce better quality of Veterinary doctors, dairy technologists and fishery specialists in the State.
- To create self-employment through livestock, dairy and fish farming.
- To develop women empowerment.
- To conduct need-based research on livestock, dairy and fishery sectors.
- To disseminate improved livestock, dairy and fishery practices at the door steps of the stakeholders.

F. OUR CONTACT

Vice-Chancellor	033-2557 1986 (Fax) 033-25563450 (O) 9433136014 (M)
Registrar	033-25563123 (O)
Director of Research, Extension & Farms	033-25563396 (O) 9830826747 (M) 033-25563396 (Tele Fax)
Dean, Faculty of Vety. & Anim. Sciences	033-25569234 (O) 9331026628 (M)
Dean, Faculty of Dairy Technology	033-25876307 (O) 9331025256 (M)
Dean, Faculty of Fishery Sciences	9433333004 (M)
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