

ANNUAL REPORT

(2001-2002 to 2002-2003)



**WEST BENGAL UNIVERSITY OF
ANIMAL AND FISHERY SCIENCES**

**68, KSHUDIRAM BOSE SARANI
KOLKATA - 700 037**

ANNUAL REPORT

(2002-2003 to 2003-2004)

Edited and Published by

Prof. M. K. Bhowmik

Director of Research, Extension and Farms

West Bengal University of Animal and Fishery Sciences

68, K. B. Sarani, Kolkata - 700 037



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WEST BENGAL UNIVERSITY OF
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FOREWORD



I am pleased to place before you the Annual Report for the year 2001-02 & 2002-03 alongwith a profile of three mandatory functions such as education, research and extension apart from the human resource and institutional development.

Livestock and fishery sectors play a pivotal role in sustainable agricultural production system for the small and marginal farmers and landless labourers of the state. The well developed poultry and dairy farming are paving the way for women empowerment for poverty alleviation by rural upliftment. The course-curricula of educational programme alongwith various research programmes of the university have been directed in such a way so that potentiality of the livestock and fishery sectors of the state could be exploited

judiciously for the benefit of the stakeholders. The perspective plan of the University has been prepared with a view to gain in future through diversification of education, research and extension activities in the global scenario.

During the year under report, the WBUAFS made significant studies in the area of preservation of garole sheep, Bengal goat and ghoongroo pig which are native germplasms of the state. The faculty members of the university have also taken keen interest in research activities in the field of processing of pork and broiler, indigenous milk products, threatened status of fishes, integrated management of livestock and fish, weather based animal diseases, blue tongue disease, ITK and technology assessment and refinement etc.

An attempt has been made to establish industry-institute linkage by arranging interface meeting with a view to solve the unemployment problem of neo-vets alongwith adoption and application of new technologies in a large scale.

The Directorate of Research, Extension and Farms of the University has conducted several training programmes in livestock, poultry and fishery sectors for the benefit of the farming community. The university has published various extension literatures for the use of the farmers.

The University with its academic excellence has made significant contribution to human resource development. I am happy to note that a number of students are admitted in advanced courses in reputed institutions of the country and abroad.

I would like to convey my sincere thanks to the Editorial and Publication Board for taking keen interest to publish this Annual Report. I wish that all the efforts taken by this university will definitely help the people of our state and country as a whole.

S. S. Ghosh
VICE-CHANCELLOR

PROLOGUE

The publication of Annual Report of the University is a regular feature. It gives a comprehensive accounts of all activities and achievements of the University during the particular period. The University started its activity from the year 1995 after its bifurcation from the 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, V.C.I. syllabus has been introduced in B.V.Sc. & A.H. course. Similarly, uniform I.C.A.R. syllabus is being followed for Fishery Sciences and Dairy Technology for U.G. courses.

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

The Annual Report is very helpful for the members of University Community, Government Officials and other concerned persons which give a brief account of various aspects of their interest.

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

D. N. JANA

Registrar

PREFACE

Animal Husbandry and fishery are the most important sectors of the Indian economy providing food nutritional and economic security, employment generation and poverty alleviation. These sectors have already acquired a prime seat In context to the present global negotiations on bringing the farming systems into multinational trading system. There is a huge demand of livestock, dairy and fishery products in the national and international markets. A good number of occupations currently exist under the sectors.

India has built up over the decades, a fairly advanced research, education and extension systems in animal husbandry and fishery. The satisfactory growth in these fields after independence is the integrated functioning of these three systems as well as transformation from an age of traditional subsistence farming to modern commercial venture.

The role of WBUAFS has always been on high pedestal in the areas of human resource development, research on basic and applied aspects, extension activities and technological transfer services which are cherished through wide linkage with various agencies and government support.

An attempt has been made to compile and document the significant achievements of the University during last two years in this Annual Report. This publication will help the University to review periodically its academic, research, extension and farm activities to meet the future challenges.

It gives immense contentment to express my sincere thanks to Dr. S.S. Ghosh, Vice-Chancellor, WBUAFS under whose able leadership and constructive supervision in bringing out the Annual Report which will make an important base for formulating appropriate strategies for the development of the State by policy makers, planners, academic, research and extension professionals and the administrators. I am thankful to Dr. A. Goswami, Asstt. Director (Extn.) for his incessant interest and enthusiasm which helped in bringing out the publication. The sincere efforts made by Publication Board are gratefully acknowledged.

M. K. Bhowmik
Editor

ACKNOWLEDGEMENT

I wish to convey my deep sense of gratitude to Dr. S.S. Ghosh, Vice-Chancellor of the University for his valuable advice and constant inspiration for the preparation of this Annual Report.

I gratefully acknowledge the active support and guidance rendered by Editor cum Director of Research, Extension & Farms, Registrar, Finance Officer, Controller of Examinations, Deans of the Faculties, Secretary of Faculty Council and other Faculty members for extending help and co-operation in the preparation of this Annual Report.

Sincere thanks are due to all the Officers and Staff of the Directorate. I am also specially grateful to all the members of the Editorial and Publication Board of this Annual Report for collection and compilation of the matter published.

I hope that this Report will be meaningful which has highlighted the activities of the University in a systematic manner. Comments and suggestions are cordially invited to improve the quality of the Report in future.

A. GOSWAMI

Associate Editor

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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 state and the country as a whole through imparting Education, accomplishing need based research and disseminating proven technology to the people. The highlights of various activities of the university during the period (2001-02 & 2002-03) are given below.

Institutional :

The second convocation was conducted to award degrees to 432 U.G., 132 P.G. and 7 Ph.D. students of the three Faculties (Vety. and Animal Sci., Dairy Technology and Fishery Sci.) The expert team of Veterinary Council of India (VCI) visited university to assess the academic activities of U.G. Course under VCI system adopted recently. The Parliamentary Standing Committee on Agriculture (Study Gr.-II) visited and made interaction with the faculty members with a view to strengthen the financial support from the Govt. of India. University has conducted two National Conferences on Vety. parasitology and Animal Nutrition. The Central Library with Information Network service was established in a new mode during this period.

Academic :

The admission of students for three faculties during the year 2001-02 & 2002-03 was 690. During the period, a total of 514 students comprising of 255 in UG, 220 in PG and 39 in Ph.D. programmes have successfully completed their courses. Best students were awarded with different types 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 :

Thirty two schemes sponsored by various agencies worth Rs.540 Lakh were in progress. In addition, University has submitted another 143 schemes to different funding agencies for their consideration during the period.

Some of the on-going research projects have been mentioned below.

A. Production :

- i. AICRP on goat improvement, Black Bengal (Field Unit).
- ii. AICRP on improvements of feed resources and nutrient utilisation for raising animal production.
- iii. Survey and evaluation of garole sheep in Sundarban areas of West Bengal.
- iv. Processing of pork, broiler and eggs.
- v. Animal genetic resource biodiversity : Characterization and conservation of Bengal goat and garole sheep.

- vi. Processing and upgradation of indigenous milk products for industrial application.
- vii. Determination of threatened status and cytological characterisation of fish species in Nadia & Howrah districts, West Bengal.
- viii. Urban & Peri-urban system of milk production through use of concentrate based feeding system.
- ix. Integrated management through fish, duck and pig culture in rice farming system.

B. Health :

- i. Network project on Blue Tongue Disease
- ii. Weather based animal disease forecast.
- iii. Diagnosis of parasitic diseases of domesticated animals.
- iv. Treatment of FMD in cattle with Harida and Bahada (ITK)
- v. Use of probiotics in fresh water aquaculture.

C. Technology Transfer :

- i. Documentation of ITK under the plan scheme strengthening of Extension Education services.
- ii. Technology Assessment and Refinement (TAR) in coastal Agro-Eco-system of Midnapore through Institution village Linkage Programme (IVLP).
- iii. Validation of ITK on Use of Banana Pseudostem in fishpond.

Technology dissemination :

The University has organised various training programmes, workshops, seminars, kishan mela, consultancy, on-farm trial, front-line demonstrations, field day and other extension activity benefiting 19331 farmers during the period under report. Three documentary video films were produced to disseminate information on latest technologies in livestock and fishery sectors.

During the period 220 research papers were published in different national and international journals. Apart from this, university has also published 42 number of books, monographs, manuals, compendiums and research highlights etc.

A.1. 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, Fisheries Sciences, Dairy Technology and allied sciences.
- B. To conduct basic and applied research in the field of Veterinary and Animal Sciences, Fisheries Sciences and Dairy Technology for advancement of knowledge and enhancement of productivity.
- C. To undertake the development of such sciences 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 authorities 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

A.4. Staff Position

University Officers	8
Faculty Members	116
Ministerial staff	53
Technical Assistants	5
Supporting staff	127

A.5. Officers of the University

Dr. S.S. Ghosh	Vice-Chancellor
Dr. D.N. Jana	Registrar
Dr. M.K. Bhowmik	Director of Research, Extension & Farms (Actg.)
Dr. B.B. Ghosh	Dean, F/O Vety. & Animal Sciences (Actg.)
Dr. A.K. Bandopadhyay	Dean, F/O Dairy Technology (Actg.)
Dr. K.C. Dora	Dean, F/O Fishery Sciences (Actg.)
Dr. C.K. Dasgupta	Controller of Examinations (Actg.)
Sri S. Bhattacharya	Finance Officer

A.6. Different Statutory Bodies

EXECUTIVE COUNCIL

Dr. A.K. Bhattacharya Vice-Chancellor (upto 07-01-03)	Chairman (Ex-Officio)
Dr. S.S. Ghosh Vice-Chancellor	Chairman (Ex-Officio)
Dr. A. Chatterjee Director of Animal Husbandry & Vety. Services, Govt. of West Bengal	Member (Ex-Officio)
Sri Sabyasachi Sengupta Director of Fisheries Govt. of West Bengal	- do -
Sri K. K. Ghosal Milk Commissioner Govt. of West Bengal	- do -

Dr. B. B. Ghosh Dean, Faculty of Vety. & Anim. Sciences (Actg.) WBUAFS	Member (Ex-officio)
Dr. A. K. Bandopadhyay Dean, Faculty of Dairy Technology (Actg.) WBUAFS	- do -
Dr. K. C. Dora Dean, Faculty of Fishery Sciences (Actg.) WBUAFS	- do -
Dr. M.K. Bhowmik Director of Research, Extension & Farms (Actg.) WBUAFS	- do -
Dr. P. Biswas Reader, Deptt. of Animal Nutrition (Teachers' Representative, Faculty of Vety. & Anim. Scs., WBUAFS)	<i>Elected Member</i>
Sri S. Sarkar Reader, Deptt. of Dairy Engineering (Teachers' Representative, Faculty of Dairy Technology, WBUAFS)	- do -
Dr. B. K. Das Sr. Lecturer, Deptt. of Fish Environment (Teacher's Representative, Faculty of Fishery Scs, WBUAFS)	- do -
Sri K.B. Bhattacharjee Record Keeper (Non-Teaching Staff Representative, WBUAFS)	- do -
Sri Pranoy Kr. Das 5th Yr., BVSc. & AH, (Students' Representative, WBUAFS)	- do -
Dr. Asim Bala, (M.L.A Representative, West Bengal Legislative Assembly)	<i>Nominated Member</i>
Dr. S.K. Roy Prof. & Head, Deptt. of Vety. Medicine, Orissa Vety. College, Bhubaneswar (Representative of Vety. Council of India, New Delhi)	<i>Nominated Member</i>

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 or Producers,
nominated by Govt. of West Bengal)

- do -

Dr. A.D. Diwan
Asstt. Director General (Marine Fisheries)
I.C.A.R.
(Representative of I.C.A.R., New Delhi)

- do -

Dr. D. N. Jana
Registrar, WBUAFS

*Ex-officio
Non-Member Secretary*

FACULTY COUNCIL

Vice-Chancellor

Chairman

Registrar

Member

Director of Research, Extension & Farms

- do -

Librarian

- do -

Controller of Examinations

Invitee Member

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. The Vice-Chancellor-Chairman
2. The Director of Research, Extension and Farms- Member Secretary
3. The Director of Veterinary Services and Animal Husbandry, Govt. of West Bengal
4. The Deans of Faculties - Member
5. The 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 by 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. The Vice-Chancellor-Chairman
2. The Director of Research, Extension and Farms - Member
3. The Deans of Faculties - Member
4. The Registrar-Non- Member Secretary - Member
5. The Controller of Examinations - Member
6. The 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 student from the University elected by the regular students in a manner as shall be prescribed - Member
10. Two eminent academicians from the field of Veterinary/ Dairy/ Fishery Sciences nominated by the Vice-Chancellor. - Member

A.7. Dignitaries Visited

1. Sri Viren J. Shah, Hon'ble Governor, West Bengal and Chancellor
2. Shri Buddhadeb Bhattacharya, Hon'ble Chief Minister, Govt. of West Bengal
3. Sri Jyoti Basu, Former Chief Minister, Govt. of West Bengal



*Sri Nirupam Sen, MIC, Industries, Govt. of W B
with Vice-Chancellor.*



*Sri Anisur Rahaman, MIC, A.R.D., Govt. of W.B.
visiting Stall during National Conference
of Animal Nutrition at Belgachia Campus.*



*Dignitaries on the dias during National Congress of
Veterinary Parasitology.*



*Sri Anisur Rahaman, MIC, A.R.D., and Sri Kiranmoy Nanda,
MIC, Fisheries, Govt. of W.B. are coming out from
Poultry Processing Unit.*



Scientist in the field for Ornamental Fish Farming.

4. Dr. Panjab Singh, DG, ICAR, Govt. of India
5. Sri Nirupam Sen, MIC, Dept. of Industries, Planning and 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. Sardar Jagmohan Singh Kang, MIC, Animal Husbandry & Fisheries, Govt. of Punjab
9. Prof. D. Dasgupta, Vice-Chancellor, BCKV
10. Dr. S. Brambhachari, Vice-Chancellor, Uttar Banga Krishi Viswa Vidyalyaya
11. Prof. M. G. Som, Ex-Vice-Chancellor, B.C.K.V.
12. Dr. Subhankar Chakraborty, Former Vice-Chancellor, Rabindra Bharati
13. Sri Master Mathan, MP
14. Sri T.C. Gehlot, MP
15. Sri H.K. Javare Gowda, MP
16. Sri Punaji Sadaji Thakore, MP
17. Sri Samik Lahiri, MP
18. Sri R. Kamraj, MP
19. Mr. Mahaboob Zahedi, M.P
20. Dr. N. Sharma, Director, NDRI
21. Mr. S. L. Mehta, National Director, NATP
22. Dr. J.C. Katyal, DDG (Edn), ICAR
23. Dr. Harpal Singh, Chairman of VCI team
24. Ms. Anita Jain, Under Secretary, Govt. of India

A.8. 2nd Convocation

The highly prestigious and vainglorious 2nd convocation of West Bengal University of Animal and Fishery Sciences was organised at the university campus on 19th December, 2001. Hon'ble Chancellor Viren J. Shah inqugarated the aphroditic convocation and the convocation address was delivered by Dr. Panjab Singh, Director General, ICAR. Among the other dignitaries, Hon'ble minister, ARD, Govt. of West Bengal Mr. Anisur Rahaman and Hon'ble minister of fishery. Mr. Kiranmoy Nanda graced the occasion with their illuminous presence. The degrees were awarded to 132 MVSc students, 240 BVSc & A.H students, 65 B.Sc (DT) students, 65 B.Tech (DT) students, 62 BFSc students and 7 Ph.D students with a bliss to culminate their voyage of education at a cosmic point.

A.9. Financial achievement

During the Financial Year 2001-02 University received Rs.919.79 lakh from ICAR, State Govt. and other funding agency. In the same year University incurred expenditure about 95% of fund.

During the Financial Year 2002-03 University received Rs.932.82 lakh from ICAR, State Govt. and other funding agency. In the same year University incurred expenditure about 90% of fund.

A.10. Important events

A.10.1. Welcome to New Vice Chancellor

Dr. Satya Saran Ghosh has taken over the charge as the new Vice-Chancellor of the West Bengal University of Animal and Fishery Sciences w.e.f. 08.01.2003. Dr. Ghosh, a soft spoken gentleman with uncanny approach derives his strength from his sincere devotion to his duties and would be able to give proper leadership to look upon our university as a roll model. We wish him all success in his endeavours while welcoming him on his new appointment, which he richly deserves.

A.10.2. 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. Harpal Singh, Professor & Head, Deptt. of Surgery & Radiology, College of Veterinary Sciences, Pantnagar, visited the University from 28th November to 29th November, 2001.

The Inspection Team submitted its report expressing its satisfaction about the facilities available in this University for imparting teaching to the U.G. students of B.V. Sc. & A.H. courses alongwith certain deficiencies which are to be fulfilled. The team also mentioned with appreciation in their report that this is the first University in the country, which has adopted academic regulation of Veterinary Council of India. The inspection team was pleased to recommend the recognition of the Veterinary College under this University to the Veterinary Council of India, New Delhi.

A.10.3. Visit of Parliamentary Standing Committee on Agriculture

The Parliamentary Standing Committee on Agriculture (Study Group – II) consisting of five (5) Hon'ble MPs visited the University on 26.05.03 to evaluate its activities since inception in 1995. A Scientific Exhibition was arranged to focus the details of the activities of the University. A theme paper on "Role of West Bengal University of Animal and Fishery Sciences in livestock improvement and development of fisheries" was presented by the Vice-Chancellor, followed by a detailed discussion between the Hon'ble Members of the team and the Officials and Teachers of the University. The Hon'ble Members expressed satisfaction on the arrangement of programmes as well as achievement made so far.

A.10.4. National Congress of Veterinary Parasitology

The thirteenth National Congress of Veterinary Parasitology on 'Current Approaches for Controlling of Animal Parasites' was held at West Bengal University of Animal and Fishery Sciences, Kolkata – 37 from 14-16th December, 2002. A total of 130 delegates from India and abroad attended the said Congress.

A.10.5. Inauguration of Central Library

The University established its Central Library and Information Network Service in its prime location by renovating the old Principal's office of Bengal Veterinary College by utilizing ICAR catch-up grant. This has been reconstructed to suit the requirement of a University level library, keeping the aesthetic view almost at par with the original one. This was inaugurated by Hon'ble Chief Minister of West Bengal, Sri Buddhadeb Bhattacharya in presence of Sri Anisur Rahaman, Hon'ble Minister In Charge, ARD Dept., Govt. of West Bengal and Sri Kiranmay Nanda, Hon'ble Minister In Charge, Dept. of Fisheries, Govt. of West Bengal on 12th August, 2002. Local Network and CD Rom service are established with ICAR fund through NATP project. With the cooperation and active support of students, the lake in front of the building was excavated and reconstructed to create a congenial atmosphere of learning.

A.10.6. Animal Nutrition Association Conference

Department of Animal Nutrition, West Bengal University of Animal & Fishery Sciences, in collaboration with the Animal Resources Development Department, Govt. of West Bengal and Animal Nutrition Association of India, organized the 4th Biennial conference of Animal Nutrition Association, at the university during November 20-22, 2002. The theme of the Conference was "Globalization - Challenges to Animal Nutritionists." This was inaugurated by Sri Anisur Rahaman, Hon'ble Minister In Charge, ARD Dept. Govt. of West Bengal. An exhibition was also organized during the conference to exhibit the modern equipments, feed additives, complete feed related to dairy and poultry industry.

About 250 delegates from different Universities, Research Institutes and Industries participated in the conference and exchanged their views during different technical sessions. An unique session on "Government - Industry - Scientist interaction" was held very successfully in presence of the Chief Guest of the session Sri Nirupam Sen, Hon'ble Minister In Charge, Department of Industries, Planning & Development, Govt. of West Bengal.

B.1. Academic Programmes***Faculty of Veterinary and Animal Sciences :***

- i) B.V. Sc. & A.H. (5 years Bachelors' degree course)
- 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)
- 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)
- ii) M.F. Sc (2 years Masters' degree course)

B.2. Admission & Results

Course	Admission		Results	
	2001-2002	2002-2003	2001-2002	2002-2003
<i>Faculty of VAS :</i>				
BVSc. & AH	103	112	100	77
MVSc.	104	106	73	88
Ph.D.	30	56	23	16
<i>Faculty of DT :</i>				
B.Tech. (DT)	23	22	21	11
M.Tech. / M.Sc.	12	18	13	8
Ph.D.	2	3		-
<i>Faculty of DT :</i>				
B.F. Sc.	25	26	25	21
M. F. Sc.	25	23	20	18

B.3. Awards & Recognition

- Smt. Mira Mallick Gold Medal
(Highest marks in BVSc & AH)
- 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 Surgery & Radiology in B.V.Sc & A.H)
- Dr. P. Bhattacharya Gold Medal
(Highest OGPA in MVSc in Animal Production and Management)
- Dr. D.K. Biswas Gold Medal
(Highest marks in Poultry Science in B.V.Sc & A.H.)

B.4. University Library

The University established Central Library and Information Network Service (CLINS) at its Kolkata Campus alongwith another setup at Mohanpur, the second campus of the University.

A Night Library Service beyond the office hours is in force for a long time.

CLINS provides :

- * Electronic Abstracting Services like CD ROM / Internet Browsing
- * Full Articles Access from INFLIBNET / ICRISAT
- * Bibliographical databases on Books (12600)
- * Bibliographical databases on contents of selective scientific and research periodicals (25000)
- * Bibliographical databases on dissertation / theses (400)
- * LAN facilities within our Kolkata and Mohanpur campus under CLINS
- * On-line data access from J-Gate and ICRISAT
- * Photocopying
- * Book bank
- * Resource sharing
- * 16 foreign journals are procured during the period
- * Computation of books, journals and thesis

C. TECHNOLOGY GENERATION

PROJECTS AT A GLANCE

	No. of projects	Fund involved
1. On-going projects	32	Rs. 540 lakh.
2. Projects submitted:		
a) ICAR and other funding agencies	28	Rs. 812 lakh.
b) DST, Govt. of India	18	Rs. 4887 lakh.
c) Planning Commission	97	Rs. 5555 lakh.
TOTAL	175	Rs. 11794 lakh.

TYPE OF ON-GOING PROJECTS AND FUNDING AGENCIES

Sl. No.	Type of Project	Funding Agency	Number
1.	All India Co-ordinated Research Projects	ICAR	2
2.	Network Project.	ICAR	3
3.	AP Cess Fund. .	ICAR	2
4.	National Agricultural Technology Projects.	NATP	9
5.	Food Processing & Livestock Conservation	GOI	2
6.	Threatened Fish Species	GOWB	1
7.	Adhoc Research Schemes.	ICAR	4
8.	Ecology and Environment (Education for Nature)	WWF, USA	1
9.	Indigenous Technical Knowledge (ITK).	NATP	3
10.	Drug Trials	Industry	5

C.1. Production Allied

P1: ALL INDIA COORDINATED RESEARCH PROJECT ON GOAT IMPROVEMENT, BLACK BENGAL (FIELD UNIT).

Principal Investigator : A.K. Samanta

Achievement:

The project started functioning from December, 2000. During this short span of time till date the center has completed survey of three densely goat populated districts of West

Bengal viz. Midnapore, Nadia and Malda, situated in three different agro-climatic zones. A total of 6000 animals were surveyed. The caste classification of farmers showed that the goat farmers belonging to SC were the highest in Nadia (67.84%) followed by Malda and Midnapore whereas, ST were highest in Malda (56.63%) followed by Midnapore and Nadia. The overall literacy in male and female were 75.81% and 58.43% respectively. The main occupation of goat farmers in 3 districts was agriculture with animal husbandry (57.44%), followed by agriculture (23.08%), animal husbandry (8.31%), business (7.74%) and service (2.68%). The goat flock size varied widely among farmers. Thus a flock size of 1 to 4 was reared by 56% farmers, flock size of 5 to 8 by 33% and flock size above 8 goats by 11% farmers. Body colour pattern of 6 different types viz. solid black (52.9%), white (15.7%), black and white (12.1%), brown (10.3%), black and brown (5.5%) and white and brown (1.9%) were observed in the survey. The prevailing management practices of goats and prevention against diseases were also recorded in the survey.

As per guideline given in the technical programme of the project, a total of 600 does, aged 1-3 years, were registered in the operational area comprising of 3 village-centres and thereafter breeding was continued using 2 categories of bucks: unselected (traditional) and supplied superior bucks and monitored regularly. Under both categories, does kidded with high breeding efficiency wherein overall kidding rate (kids born /100 does kidded) was 178.12%. The types of birth were either single (34.69%), twin (54.06%), triplet (10.0%), quadruplet (0.94%) and pentaplet (0.31%). On the newborn kids body weight and measurements at birth, 3 month, 6 month, 9 month and 12 month were recorded along with weight at service which were subjected to statistical analysis. Seasonal trend was observed in kid birth wherein 52.62% kids were born in winter as against 32.10% in summer and 15.26% in monsoon. The monsoon-born kids weighed higher (1.34, 1.24 kg) than there of summer-born (1.24, 1.15 kg) and winter-born kids (1.26, 1.18 kg). The overall body weight, body length, height and heart girth for males and females were : at birth 1.28, 1.19 kg; 22.88, 21.64 cm; 23.73, 22.83 cm and 25.28, 24.67 cm; at 3 month 5.96, 5.38 kg; 36.17, 34.35 cm; 36.60, 34.71 cm; and 40.46, 38.81 cm; at 6 month 8.86, 7.80 kg; 42.71, 39.90 cm; 41.41, 39.55 cm and 46.95, 44.46 cm; at 9 month 10.33, 9.91 kg; 44.14, 42.57 cm; 43.62, 41.66 cm; and 48.39, 47.60 cm; at 12 month 13.33, 12.48 kg; 47.50, 45.59 cm; 48.54, 45.64 cm; and 53.92, 51.59 cm respectively. Treatment and prophylactic measures were taken up which included deworming, mineral supplementation and vaccination.

Kidding Pattern

The kidding pattern was shown in Table 1. A total of 320 nos. of does kidded during the year. From these does, 570 kids were born of which 278 (48.77%) were male and 292 (51.23%) were female. Type of birth varied from centre to centre and individual to individual from single birth to pentaplet. The twin birth of 173 (54.06%) was the highest, followed by single birth of 111 (34.69%), triplet of 32 nos. (10.00%), quadruplet of 3 nos. (0.94%) and pentaplet of 1 (0.31%). The centre-wise distribution of kidding was presented in Fig.1.

Fig 1. Kidding Pattern (%)

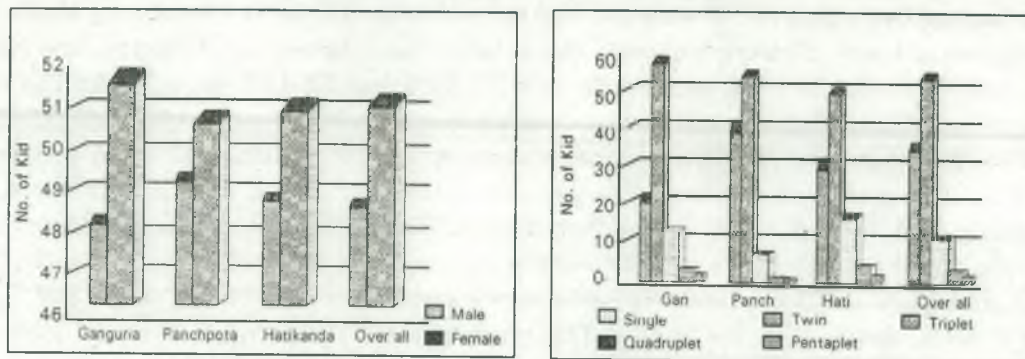


Table 1. Details of kidding pattern in 3 centres during 2002-2003.

Village-Centre	Total Does kidded	Total Kids born (Kidding rate) (%)	No. of males (%)	No. of females (%)	Single birth (%)	Twin birth (%)	Trip-let (%)	Quadr-uplet (%)	Pent-aplet (%)
Ganguria	111	199 (179.28)	86 (48.24)	103 (51.76)	36 (32.43)	63 (56.76)	11 (9.91)	1 (0.9)	-
Panchpota	118	195 (165.25)	96 (49.23)	99 (50.77)	47 (39.83)	65 (55.08)	6 (5.09)	-	-
Hatikanda	91	176 (193.41)	86 (48.86)	90 (51.14)	28 (30.77)	45 (49.45)	15 (16.48)	2 (2.20)	1 (1.10)
Total	320	570 (178.12)	278 (48.77)	292 (51.23)	111 (34.69)	173 (54.06)	32 (10.0)	3 (0.94)	1 (0.31)

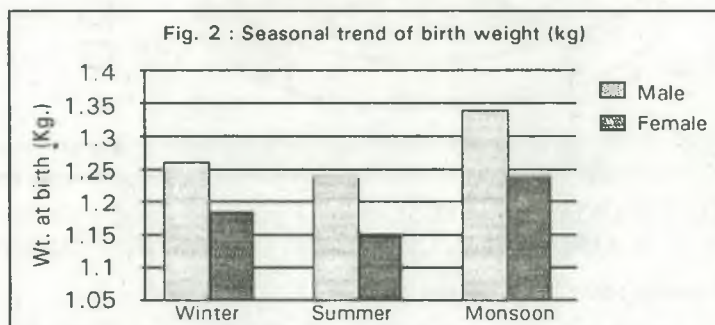
Seasonal Trend of Weight at Birth

Season-wise weight at birth is presented in Table-2 and Fig.2 . The overall mean birth weight of the males and females were 1.28 ± 0.06 kg and 1.19 ± 0.06 kg respectively. The monsoon-born kids weighed higher (male 1.34, female 1.24 kg) than the summer -born (male 1.24, female 1.15 kg) and the winter-born kids (male 1.26, female 1.18 kg). Possibly at the advanced stage of pregnancy the does were fed better in monsoon due to abundance of green grass, bushes and tree leaves than those of summer and winter seasons.

Table 2. Seasonal trend of birth weight during 2002-2003

Season of birth	Mean birth weight \pm Standard error (kg)		
	MALE	FEMALE	POOLED
Winter	1.26 \pm 0.04 (160)	1.18 \pm 0.03 (140)	1.22 \pm 0.02 (300)
Summer	1.24 \pm 0.03 (74)	1.15 \pm 0.02 (109)	1.20 \pm 0.02 (183)
Monsoon	1.34 \pm 0.13 (44)	1.24 \pm 0.11 (43)	1.29 \pm 0.07 (87)
Overall	1.28 \pm 0.06 (278)	1.19 \pm 0.06 (292)	1.23 \pm 0.02 (570)

Figures in parentheses indicate range.



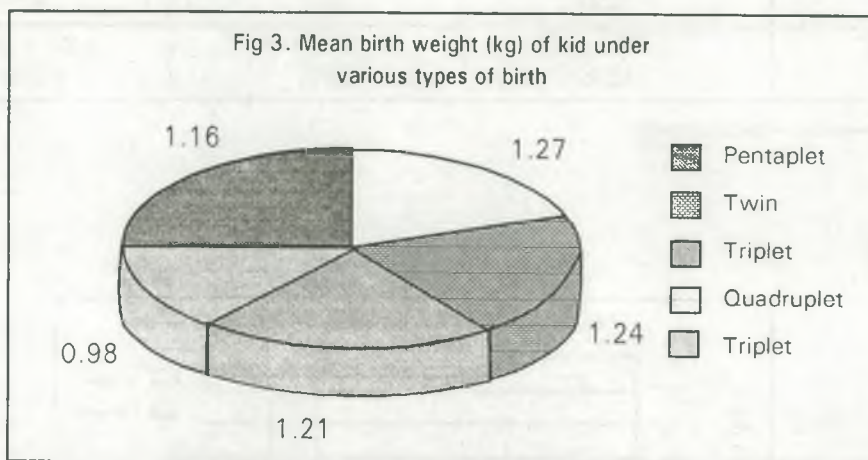
Birth weight under various types of birth

The computation of birth weight on various types of birth has been shown in Table-3 and Fig 3. As expected, the single born kids weighed higher at birth due to higher available nutrition of the single foetus inside uterus than others.

Table 3. Mean birth weight of kids under various types of birth

Types of birth	Mean birth weight	Standard error	No. of observations
Single (111)	1.27 kg	± 0.03	111
Twin (173)	1.24 kg	± 0.26	346
Triplet (32)	1.21 kg	± 0.03	96
Quadruplet (3)	0.98 kg	± 0.06	12
Pentaplet (1)	1.16 kg	± 0.16	5

Figures in parentheses indicate range.



P2: ALL INDIA CO-ORDINATED RESEARCH PROJECT ON IMPROVEMENTS OF FEED RESOURCES AND NUTRIENT UTILIZATION FOR RAISING ANIMAL PRODUCTION.

Principal Investigator : Dr. P. Biswas

Achievements:

1. The survey work conducted in the previous years revealed widespread deficiency of P and also Cu, Mn and Zn in various feed and fodder consumed by the livestock of different agro-climatic zone of West Bengal.
2. Attempts were made to evaluate the effects of specific stress element supplements on the productivity performance of dairy cattle.
3. The selection of the supplemental trace elements, viz., Cu, Zn and Mn was made on the basis of the commonly deficient trace elements of feeds and fodder.
4. Bio-availability trial in poultry was conducted to ascertain the effects of supplemental Zn and Mn on the productive performance of broiler birds.
5. The compositions of trace elements was kept unchanged to safeguard the deficiency of P and the mineral mixture was prepared on DCP base.

6. On-field, digestibility trials were conducted with dairy cattle selected from the medium and large category of farmers to ascertain the pattern of nutrient utilization and the effects of experimental mineral mixture on the digestibility parameter.
7. Approximately 500 farmers in five blocks of Bankura and Hooghly districts of West Bengal (New Alluvial Zone) have been supplied with this mineral mixture free of cost. Those farmers were selected who have reported to the local Veterinary hospitals with any reproductive problem, particularly, anestrus. Supplementation of these experimental mineral mixtures is under process at the present moment.

P3: SURVEY EVALUATION OF GAROLE SHEEP IN SUNDERBANS AREA OF WEST BENGAL.

Principal Investigator : Dr. S. Pan

Achievements:

1. Total area of Garole breeding tract has been estimated as 6210.867 sq. km located in two districts, viz., North and South 24 Parganas. The animals are heterogeneously distributed in the breeding tract being more concentrated in the islands.
2. Climatologically, two seasons, viz., warm humid and warm wet have been identified in the breeding tract.
3. The breed is exclusively used as mutton producer. Though the breed produces good amount of coarse hairy fibre yet, there is no practice of shearing and no marketing channel for the fibre is available.
4. Total population has been estimated as 2,64,997(2001). Fifty six percent of the total animals are managed under small flocks. (upto 4 animals)
5. Majority of the Garole farmers is either landless labourer or marginal farmers. Monthly family income of 85 percent of farmers is less than Rs. 1000.00.
6. Phenotypically Garole sheep is a small sized breed with average body weight of 11 Kg at 12 months of age. The breed possesses both pure and mixed coat colour. Pure colours are white, Grey, black and brown. Grey and white are predominant colours (48 and 28 percent respectively).
7. Incidences of twin, triplet and quadruplet birth in the population are 66.4, 11.5 and 0.2 percent respectively. Average number of lambs per lambing is highest in third lambing (1.94).
8. Average fibre diameter is 53.02 μ , fibre length 4.99 cm with 86.7 % medulated fibre.
9. Garole mutton contains 17% protein 11% ether extract. Water holding capacity is 30 ml per 100 gm. Muscle fibre diameter is 15 μ . Dressing percentage is 52.
10. Semen volume per ejaculate is 0.523 ± 0.025 ml. Average number of spermatozoa (in million) per ml is 3570 ± 146.62 .
11. The breed is fairly tolerant to different diseases particularly foot rot and liver fluke infection.

P1: PROCESSING OF PORK, BROILER AND EGGS.

Principal Investigator : Dr. S. Biswas

Achievements:

Following trials were conducted :

1. 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 has been standardized.
2. Broiler meat marketing situation was studied covering 464 broiler farmers and 580 retailers at coastal belts of West Bengal covering three districts (S-24Pgs, N-24Pgs & Midnapore).
3. Effort has been made towards identifying 'critical control points' for hygienic broiler dressing and comparison with conventional method of dressing practices to improve quality and acceptability by consumers to increase economic returns. This was carried out with the views to implement HACCP.
4. A comparative study of different surface decontaminants on chicken carcass has been performed to evaluate the best decontamination technique, from the points of microbiological quality along with other keeping and eating quality and economic.
5. Some trials have been made for preparing chicken sausage, meat ball and meat patties with non-prime cuts and skin in different percentages and efforts are given to standardize the programme.

Table 4. Results of chicken patties and meatballs (Value-added Poultry products)

	pH		Yield %	Cooking loss%	Moisture %		Fat%	Protein %	Ash %	Total plate count (log / cfu/gm)	Overall acceptability
	Raw	Cooked			Raw	Cooked					
Paties	5.50	5.63	83.14	16.86	60.72	48.88	12.85	18.22	3.93	3.24	8
Meat Ball	6.31	6.25	85.35	14.65	65.97	59.53	9.38	16.12	4.02	3.245	3

Table 5. Results of chicken sausage prepared from 'less valued cut-up parts' (neck, wings and back) of chicken carcass

Physico chemical parameters	pH		2- thio-barbuturic acid value	Total plate count (log cfu/gm)	Emulsion stability %	Moisture %	Crude protein %	Ether extract %
	Raw	Smoked						
	6.22	5.88	0.132	5.61	12.95	50.00	18.50	17.22
Organoleptic parameters	Colour	Flavour	Juiciness	Tenderness	Saltiness	Overall acceptability		
	8	7	6	8	6	7 Assessed by using 9 point hedonic scale.		

Table 6. Results on microbiological study of the conventional and scientific methods of slaughter

Ways of slaughter	Microbial load on scalding water logcfu/ml		Microbial load of carcass after evisceration log cfu/sq.cm.	
	Total plate count	Psychotropic count	Total plate count	Psychotropic count
Scientific	8.66	6.22	3.55	3.09
Conventional	8.07	5.71	5.34	5.19

Table 7. Results on effect of 70°C warm water (the cheapest, safe and eco friendly decontaminant) treatment on poultry carcass at 0 hrs.

	Total plate count (log cfu/sq.cm)	Total coliform count (log cfu/cm)	pH	Extract release volume (ml)	Water holding capacity (Sq.cm.)
Hot water	3.531 ± 0.05	1.302 ± 0.04	6.615 ± 0.02	15.16 ± 0.28	1.778 ± 0.02
Control	4.81 ± 0.07	2.637 ± 0.04	6.428 ± 0.03	17.75 ± 0.33	1.9919 ± 0.04

* Other decontaminants like 2% lactic acid, acidified sodium chlorite solution 1200 ppm, chlorine solution 50 ppm were also tried with varying level of effectiveness.

P5: ANIMAL GENETIC RESOURCE BIODIVERSITY: CHARACTERIZATION AND CONSERVATION OF BENGAL GOAT AND GAROLE SHEEP.

Principal Investigator : Dr. A.K. Sahoo

Achievements:

1. Bengal Goat and Garole Sheep were characterised in the field based on their present population status, phenotypic and genetic parameters, farming systems and their socioeconomic importance.
2. Incidences of singleton, twin, triplet and quadruplet production in Bengal goat were found to be 45.2, 50.4, 3.7 and 0.7 % respectively. Lifetime number of kidding was 10.8 ± 0.02 .
3. Incidences of twin, triplet and quadruplet birth in Garole sheep are 66.4, 11.5 and 0.2 % respectively. Average number of lambs per lambing is maximum in third lambing (1.94).
4. Elite Bengal buck and Garole ram were procured from field identified from computerised database.
5. Cryopreservation of semen from both species are in progress to be kept at the National Gene Bank.
6. Molecular characterisation was established with respect to microsatellite allelic frequencies.
7. Commercially and economically important genes of the breeds are being characterised which may be beneficial/necessary input for the transgenic projects and marker assisted selection projects.
8. The survey work and repeated interaction with farmer are creating more awareness among the farmers about the animals.

P6: PROCESS AND UPGRADATION OF INDIGENOUS MILK PRODUCTS FOR INDUSTRIAL APPLICATION.

Principal Investigator : Prof. S.R. Chakraborty

Achievements:

Regional varieties of chhana based indigenous milk sweet marketed in West Bengal were collected and analysed. The sweet samples were collected from Kolkata, North & South 24-Parganas and Nadia Disdtricts. They were analysed for their chemical composition, microbial quality and texture profile. The results obtained are depicted in tables given below :

Table 8. Chemical composition of Chhana based indigenous milk sweets

Name of the sample	Total solid (%)	Moisture (%)	Protein (%)	Fat (%)	Sugar (%)	Ash (%)	Additives (%)
Hard							
Talsans sandesh (5x5)	78.824	21.176 (20.987-21.868)	7.894 (7.214-8.567)	14.552 (14.176-14.854)	46.842 (46.619-47.012)	1.858 (1.712-2.016)	7.678 (7.414-8.121)
Guava sandesh (5x5)	81.558	18.442 (17.664 - 18.872)	7.214 (6.921 - 7.587)	15.217 (15.014-15.552)	49.012 (48.872-49.211)	1.891 (1.655-2.110)	8.225 (8.114-8.361)
Soft/Semi soft							
Kalakand(10x5)	78.884	20.116 (19.767-20.454)	7.662 (7.217-8.015)	14.886 (14.676-15.012)	48.219 (48.091-48.512)	2.017 (1.981-2.214)	7.100 (6.914-7.321)
Burfi(10x5)	83.086	16.914 (16.557-17.214)	7.879 (7.445-9.101)	13.887 (13.576-14.019)	50.786 (50.432-51.614)	1.872 (1.661-2.015)	8.664 (8.414-8.912)
Chocolate burfi(5x5)	77.743	22.257 (21.871-22.767)	15.511 (14.818-15.901)	8.115 (7.981-8.312)	45.811 (45.114-46.021)	1.414 (1.331-1.671)	6.892 (6.313-7.105)
Juicy (dipped in sugar solution)							
Pantooa(10x5)	61.585	38.415 (38.113-38.872)	6.216 (6.151-6.276)	7.932 (7.661-8.015)	42.117 (41.976-42.414)	0.551 (0.545-0.561)	4.210 (4.197-4.235)
Rasimalai(5x5)	43.512	43.512 (42.878-44.465)	5.109 (4.852-5.393)	8.558 (8.137-8.842)	41.487 (40.954-42.767)	1.129 (1.091-1.201)	0.205 (0.181-0.225)
Kamalabhogh (10x5)	74.337	25.664 (25.212-25.898)	6.117 (6.004-6.314)	14.021 (13.879-14.294)	45.459 (45.197-46.078)	1.944 (1.787-2.024)	6.815 (6.616-7.214)
Rasokadam (5x5)	80.922	19.078 (18.842-19.559)	7.041 (6.945-7.321)	11.882 (11.667-12.101)	53.214 (53.119-53.445)	2.091 (1.994-2.179)	6.694 (6.445-7.018)
Langcha(5x5)	62.01	37.892 (36.454-38.910)	6.135 (5.367-7.103)	7.892 (6.627-9.137)	42.812 (40.156-45.508)	0.657 (0.622-0.712)	4.432 (3.895-4.985)
Chabbar Jelqiri(5x5)	60.446	39.354 (38.176-40.583)	6.412 (6.147-6.667)	10.121 (9.898-10.356)	40.250 (39.169-41.346)	0.985 (0.827-1.143)	3.005 (2.798-3.112)
Danadar(5x5)	75.628	24.372 (22.136-26.588)	7.143 (6.875-7.411)	8.576 (7.625-9.507)	52.117 (51.237-52.997)	1.152 (0.963-1.321)	6.64 (5.87-7.51)

Figures in parentheses indicate range.

Table 9. Microbial quality of chhana based indigenous milk sweets

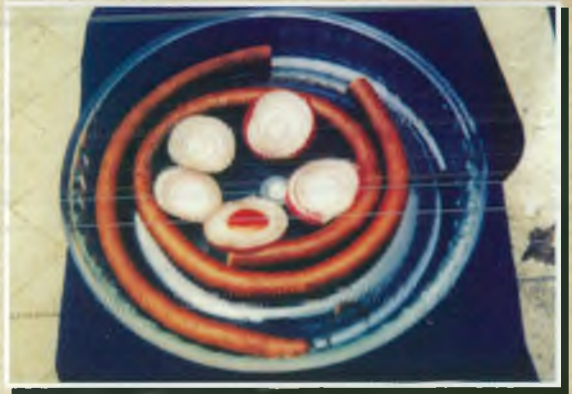
Name of the sample	Standard Plate Count (cfu/g)	Total Coliform Count (cfu/g)	Total Yeast and Mold Count (cfu/g)	Total Staphylococcus Count (cfu/g)
Hard				
Talsans Sandesh (5 x 5)	31.31×10^3 (25.08×10^3 - 37.39×10^3)	86 (78 - 92)	102 (93 - 119)	15.57×10^3 (14.41×10^3 - 16.92×10^3)
Guava sandesh (5 x 5)	18.87×10^4 (16.21×10^4 - 19.37×10^4)	160 (153-171)	186 (171-195)	41.17×10^4 (40.39×10^4 - 42.44×10^4)
Soft / semi soft				
Kalakand (10 x 5)	16.87×10^3 (15.21×10^3 - 18.49×10^3)	109 (97 - 114)	48 (41 - 53)	25.45×10^3 (23.45×10^3 - 29.08×10^3)
Burfi (10 x 5)	22.61×10^4 (18.49×10^4 - 26.97×10^4)	191 (177 - 209)	187 (168 - 202)	21.16×10^3 (19.97×10^3 - 23.41×10^3)
Cholate burfi (5 x 5)	22.81×10^4 (20.55×10^4 - 28.16×10^4)	148 (141 - 156)	216 (209 - 228)	12.21×10^5 (12.01×10^5 - 12.33×10^5)
Juicy (dipped in sugar solution)				
Pantooa (10 x 5)	12.50×10^3 (9.6×10^3 - 14.50×10^3)	125 (118 - 131)	85 (77 - 92)	15.16×10^3 (14.32×10^3 - 15.85×10^3)
Rasomalai (5 x 5)	16.68×10^3 (15.18×10^3 - 17.01×10^3)	127 (115 - 136)	168 (161 - 178)	11.01×10^3 (10.40×10^3 - 11.80×10^3)
Kamalabhogh (10 x 5)	21.41×10^4 (18.32×10^4 - 23.41×10^4)	216 (209 - 225)	189 (172 - 198)	77.62×10^4 (75.01×10^4 - 81.41×10^4)
Rasokadam (5 x 5)	60.70×10^3 (57.92×10^3 - 64×10^3)	126 (117 - 137)	141 (133 - 158)	36.64×10^3 (34.44×10^3 - 38.21×10^3)
Langcha (5 x 5)	20.75×10^3 (16.72×10^3 - 24.2×10^3)	130 (125-140)	92 (86 - 96)	20.25×10^3 (18.92×10^3 - 21.58×10^3)
Channar Jelapi (5 x 5)	22.50×10^3 (20.15×10^3 - 25.40×10^3)	135 (128 - 140)	172 (165 - 178)	15.75×10^3 (13.85×10^3 - 17.72×10^3)
Danadar (5 x 5)	20.35×10^4 (18.95×10^4 - 22.25×10^4)	158 (154 - 162)	184 (175 - 195)	42.28×10^4 (40.29×10^4 - 45.18×10^4)

Figures in parentheses indicate range.

Indigenous milk sweets samples of different varieties (juicy and non-juicy) prepared from channa namely Talsans sandesh, Guava sandesh, Kalakand, Burfi (plain/ordinary), Pantooa, rasomalai, Kamalabhogh, Rasokadam, Channar Jelapi, Langcha and Danadar, prepared from khoa namely Peda, Chandrapuli, Milk cake, Kaju Burfi and Gulabjamun, those prepared from the mixture of channa and khoa namely Kheer Mohan, Sweet Roll and Kheer Kadam and that prepared from fat (Sar) namely Sarbhaja were collected from Calcutta, Howrah, North and South 24 Parganas and Nadia and analysed for their chemical composition, microbial quality and textural characteristics.



Meat Ball - from our own kitchen.



Delicious dish - Chicken Sausage.



Moment of a Training Programme.



Black Bengal Goat - Bengal's pride.



Scientist-Panchayet-Stakeholders.
Ideal combination.

The chemical analysis (Table 8) showed that the samples of Rasomalai contained maximum moisture (43.512%), the samples Peda contained maximum protein (24.557%), fat (21.108%) and ash (3.870%) respectively, the samples of Kheer Kadam contained maximum sugar (59.822%) and the samples of Kheer Mohan contained maximum additives (8.693%).

Table 10. Texture profile of chhana based indigenous milk sweets

Name of the sample	Hardness (g)	Fracturability (g)	Adhesiveness (gs)	Springiness (mm)	Cohesiveness	Gumminess (g)	Chewiness (g mm)	Resilience
Hard								
Talsans sandesh (5x5)	45.812 (21.176-81.419)	48.622 (23.245-86.791)	58.917 (20.209-89.197)	0.319 (0.225-0.378)	0.331 (0.211-0.385)	11.197 (9.901-12.582)	5.017 (4.672-5.871)	0.131 (0.124-0.142)
Guava sandesh (5 x5)	10.115 (7.223 - 18.235)	11.672 (9.414 - 21.625)	-19.215 (-37.672 to -14.151)	0.117 (0.105 - 0.141)	0.127 (0.114 - 0.152)	1.228 (1.116 - 1.302)	0.161 (0.152 - 0.173)	0.041 (0.029 - 0.058)
Soft /semi soft								
Kalakand (10 x5)	3.321 (3.117 - 3.376)	3.872 (3.214 - 4.311)	-189.891 (-221.455 to -166.912)	0.682 (0.633 - 0.721)	0.241 (0.229 - 0.258)	0.821 (0.792 - 0.885)	0.701 (0.665 - 0.751)	0.044 (0.031 - 0.057)
Burfi (10 x 5)	9.905 (8.214 - 10.552)	11.216 (10.662 - 12.015)	-8.821 (-20.205 to -6.118)	0.104 (0.095 - 0.118)	0.107 (0.089 - 0.125)	4.421 (4.216 - 4.664)	5.117 (5.107 - 5.228)	0.038 (0.029 - 0.051)
Chocolate burfi (5 x 5)	9.612 (8.852 - 10.101)	8.585 (7.662 - 10.416)	-269.570 (-326.185 to -241.145)	0.819 (0.662 - 0.981)	0.558 (0.489 - 0.601)	4.474 (4.017 - 4.909)	4.130 (3.914 - 4.266)	0.579 (0.502 - 0.616)
Juicy (dipped in sugar solution)								
Pantooa (10 x 5)	4.376 (3.876-4.717)	4.258 (4.115 - 4.421)	-51.195 (-71.114 to -37.329)	0.466 (0.395 - 0.501)	0.321 (0.289 - 0.372)	1.558 (1.442 - 1.663)	0.905 (0.878 - 0.931)	0.517 (0.507 - 0.529)
Rasomalai (5 x 5)	26.964 (24.178 - 29.559)	18.442 (16.066 - 22.487)	-16.664 (-24.394 to -13.017)	0.589 (0.515 - 0.632)	0.742 (0.712 - 0.778)	23.445 (20.869 - 26.158)	14.109 (11.919 - 17.331)	0.178 (0.158 - 0.191)
Kamalabhog h (10 x 5)	7.178 (6.852 - 7.321)	8.151 (7.676 - 8.351)	3.476 (3.191 - 3.762)	0.892 (0.772 - 0.945)	0.707 (0.612 - 0.725)	4.115 (3.912 - 5.244)	4.872 (4.626 - 5.213)	0.154 (0.142 - 0.161)
Rasokadam (5 x 5)	31.171 (27.276 - 33.169)	42.404 (38.191 - 46.217)	-27.290 (-33.329 to -24.628)	0.604 (0.556 - 0.647)	1.109 (1.089 - 1.216)	21.228 (19.785 - 23.016)	6.844 (6.212 - 7.941)	0.321 (0.271 - 0.36)
Langcha (5 x 5)	7.831 (4.187 - 11.190)	6.834 (2.138 - 11.190)	-91.553 (-146.725 to -16.077)	0.581 (0.450 - 0.684)	0.319 (0.283 - 0.366)	2.486 (1.279 - 3.719)	1.426 (0.591 - 2.404)	0.092 (0.080 - 0.109)
Channar jelapi (5 x 5)	6.581 (2.762 - 8.731)	7.436 (6.611 - 9.871)	-77.778 (-243.201 to -22.549)	0.687 (0.659 - 0.717)	0.405 (0.376 - 0.421)	2.639 (1.163 - 3.282)	1.804 (0.827 - 2.179)	0.104 (0.082 - 0.120)
Danadar (5 x 5)	8.297 (6.290 - 9.568)	6.397 (4.437 - 9.034)	-15.792 (-22.575 to -8.984)	0.799 (0.793 - 0.806)	0.326 (0.323 - 0.329)	2.709 (2.060 - 3.146)	2.164 (1.644 - 2.354)	0.059 (0.052 - 0.067)

Figures in parentheses indicate range.

The microbial count revealed maximum SPC value 32.31×10^4 cfu/g for milk cake samples. Maximum coliform count 216 cfu/g was found for the samples of Kamalabhogh, yeasts and molds count and *Staphylococci* were found to be maximum 220 cfu/g and 12.21×10^5 cfu/g for the samples of Chocolate burfi (Table 9).

The texture profile study revealed maximum hardness, fracturability, gumminess and chewiness of 98.447 g, 106.213 g, 64.467 g and 41.317 g/mm respectively for Kheer Mohan, adhesiveness was found maximum 199.425 g for Kheer Kadam, springness was found maximum 0.892 mm for Kamalabhogh, cohesiveness was found maximum 1.109 for Rasokadam and resilience was found maximum 0.579 for Chocolate burfi (Table 10).

P7: DETERMINATION OF THREATENED STATUS AND CYTOLOGICAL CHARACTERIZATION OF FISH SPECIES IN NADIA AND HOWRAH DISTRICTS, WEST BENGAL.

Principal Investigator : T.S. Nagesh

Achievements:

1. The catches of almost all the species from the rivers came down considerably.
2. The catch Per Unit Effort of the fishermen was declined drastically due to the increase in number of fishermen.
3. The size at first capture was decreased.
4. Commercial catches in the market comprised more of juveniles.
5. Selective seed collection activity using very small sized nets (Chat jal and Phas jal) caused severe destruction of non-targeted species.
6. Some of the identified threatened fishes were as follows:
 - a) **Carps**: i. Raig, ii. Elanga, iii. Koksa/Chaedra, iv. Bola, v. Chela, vi. Bangan, vii. sarana/Swarna pungti etc.
 - b) **Catfishes**: i. Puffta, ii. Pabda/Pava, iii. Pabo, iv. Pangwas/Pungas, v. Bacha/Bhacha/Tunti, vi. Rita/Reta, vii. Kajoli/Kajri etc.
 - c) **Featherbacks**: i. Patola/Phulo, ii. Chitala etc.
 - d) **Clupeids**: i. Khoira, ii. Phasa etc.
 - e) **Eels/Moray eels**: Eel etc.
 - f) **Belonids**: Kankley etc.
 - g) **Perchs/Gobies**: i. Koi, ii. Chanda, iii. Pama, iv. Nadosh/Bheda etc.
 - h) **Snake heads**: i. Gajal, ii. Cheng etc.
 - i) **Spiny eels**: Bam etc.

P8: URBAN AND PERI-URBAN SYSTEM OF MILK PRODUCTION THROUGH USE OF CONCENTRATE BASED FEEDING SYSTEM

Principal Investigator : Dr. Barun Roy

Achievements:

1. Total number of 369 farming households were surveyed and analyzed statistically in and around the urban and peri-urban areas of Kolkata district including the areas of Howrah, Hooghly, Nadia, 24 pgs (N) and 24 pgs (S) which were coming under the zone of milk production system of Kolkata milk supply.
2. Farmers of these areas maintained their animal mostly in stall fed with paddy straw. The concentrate mixture was mainly composed of maize, wheat bran, rice bran, gram chunni, mug chunni, gram husk, mustard oil cake etc, without supplementation of vitamin and mineral regularly.
3. Nutritional parameters of available tree leaves ; straw and concentrate ingredients were assessed. Detail micronutrient status has also been evaluated.
4. The nutritional status revealed that overall cattle of urban and peri-urban areas of Kolkata district were found to be deficit in DM, CP and TDN by 9.83, 1.96 and 0.79 kg respectively whereas nutritional status of buffalo showed deficit of CP and TDN by 4.10 and 1.74 kg respectively but DM was found to be surplus by 5.90 kg on daily intake basis. It was assessed that about 41% manpower came from female laborer. Estimated tannin content of available tree leaves ranged from 0.98-8.56% on DM basis.
5. Economically viable, balanced complete feeds for cattle and buffaloes at different level of milk yield were developed. An attempt has been made for development of easy accessible software for "Least Cost Formulation" of complete feed for cattle (NRC, 1989) and buffaloes (Kearl, 1982) with available resources.
6. The study on *in vitro* and *in sacco* dry matter digestibility of the complete feed developed has been successfully completed and showed satisfactory results for cattle weighing 400 kg yielding 5-10 L/day and cattle weighing 500 kg yielding 10-15 L/day.

P9: INTEGRATED MANAGEMENT THROUGH FISH, DUCK AND PIG CULTURE IN RICE FARMING SYSTEM

Principal Investigator : Dr. T.K. Ghosh

Achievements:

Before starting NATP project, soil sample was collected from each selected farmer's pond and chemical analyses like pH, organic carbon and phosphate were made in both pig-cum-fish and duck-cum-fish farming. After completion of one year experiment the mean value of the same parameters were compared with previous one and each parameter the value increased which indicated better productivity of the pond soil.

Water quality parameters were also analysed before and after implementation of NATP research work and graphical representation of value exhibited improvement of pond water quality which was ultimately reflected by fish production.

C.2. Health Allied

H.1: NETWORK PROJECT ON BLUE TONGUE DISEASE

Principal Investigator : Prof. A. Chakraborty

Achievements:

1. On sero-monitoring of the suspected 97 paired sera samples (goat-60, sheep-28 and cattle-9), 46.67% goat, 18.18% sheep and 25% cattle were found positive, indicating presence of anti-blue tongue antibodies in those sera. A thorough sero-surveillance study is further, needed to explore the possibility of presence of anti-blue tongue antibodies in the animal population in 5 agro-climatic zones of the State of West Bengal and other adjoining states.
2. Total numbers of 156 blood samples (goat-62 and sheep-94) were collected from ailing blue tongue suspected goat and sheep for isolation of virus. No positive case was recorded in chicken Embrigo culture and in primary goat kidney monolayer cell culture.
3. Vector population of *Culicoides* sp. was collected for identification in all the 19 districts of West Bengal and the identified species are – *C. actoni*, *C. oxystoma*, *C. clavipalpis* and *C. imicola*.
4. *C. clavipalpis* and *C. imicola* could be recorded in the states of West Bengal, Orissa and North-Eastern states of India.
5. No disease incidence/outbreak of blue tongue in deer and black buck was recorded in Zoological gardens of West Bengal.

Thirty number of blue tongue awareness camps were organised in different districts of West Bengal, which were attended by more than 3000 farmers along with their animals for study.

H.2: WEATHER BASED ANIMAL DISEASE FORECASTS.

Principal Investigator : Prof. A.K. Pramanik

Achievements:

1. Data on disease outbreak, attack, death and population at risk were collected from all the 19 districts month-wise for the period 1994-95 to 2000-01.
2. Detailed meteorological parameters like Maximum and Minimum (°C), Relative humidity (%), Cloud (Octa), Wind direction, Wind speed (Km. PH.), Soil temperature (5,15,30 cm.), Vapor Pressure (K pa) etc. at 06:36 hrs. & 13:36 hrs. have been collected from 1997 to 2001 for Nadia district.
3. Meteorological data collection from other districts is being carried out in continuation with disease data collection, which would be correlated using statistical database.
4. Feeding of meteorological and disease data together with other epidemiological data into the epidemiological software indiaadmas.Epitrak is under process.

H.3: DIAGNOSIS OF PARASITIC DISEASES OF DOMESTICATED ANIMALS.

Principal Investigator : Prof. C.K. Dasgupta

Achievements:

1. Studies were carried out on the prevalence of Fasciolosis in ruminants based on coprological examination in four agro-climatic zones of West Bengal. Infection was absent in temperate hills and tarai zone.

2. Abattoir survey for Fasciolosis in cattle and buffaloes was undertaken at Large Animal Slaughter House, Tangra, Kolkata.
3. A total of 1,010 *Lymnaea auricularis* snail populations were screened based on random collection and of these only 39(3.86%) were showing the presence of *Fasciola* cercariae.
4. To assess anti-*Fasciola* antibodies, cattle and buffalo sera were collected from a local abattoir of Kolkata. DID (Double Immune Diffusion) and ELISA were performed using crude ES antigens of *F. gigantica*.

DID: A total of 4 (out of 56) buffalo sera samples were showing precipitating bands whereas, no precipitating band was observed in DID of 6 parasites sera samples of cattle. This might be due to low titre of the sera.

ELISA: Indirect ELISA was performed using 56 buffalo sera and 9 cattle sera samples. Variable sero-reactivity was found when assessed using crude ES antigen. Optical Density values ranged from 0.564 to 2.957.

5. Immunological studies were undertaken by (i) raising of hyperimmune sera in 2 adult Newzealand White rabbits against *F. gigantica* ES antigen. The titre of the sera was quite appreciable (1:8), as detected by DID, (ii) fractionation of crude ES antigen by anion exchange chromatography and (iii) characterization of chromatographed fractions through indirect ELISA, SDS-PAGE difference in polypeptide profile of fractionated and crude antigens was observed), counter-current immunoelectrophoresis precipitating bands were observed when crude somatic and ES antigens were used with hyperimmune serum raised against ES antigens).

H.4: TREATMENT OF FMD IN CATTLE WITH HARIDA AND BAHADA (ITK).

Principal Investigator : Prof. N.R. Pradhan

Achievements:

During field visit, it was confirmed that using Harida and Bahada in treatment of FMD in cattle is practised for many years. It was identified that the combined therapy of Harida and Bahada is effective in the treatment of FMD in cattle. The experimental trial is in progress.

H.5: USE OF PROBIOTICS IN FRESH WATER ACQUACULTURE.

Principal Investigator : DR. T.J. Abraham

Achievements:

1. Total plate counts and antagonistic bacterial counts from the samples of fish/ornamental fish and samples of aquarium/aquaculture environment were completed.
2. *In-vitro* antagonistic activity of standard lactic acid bacterial strains against bacterial pathogens: agar overlay technique and bacterial flora screened as test strains were studied.
3. Source and characterisation of antagonistic (producer) bacterial strains (n=60) and *in-vitro* antagonistic activity of producer bacteria agar overlay technique were also studied.
4. Influence of probiotic on the counts of bacterial flora of Sword Tail including growth and survival of Sword Tail were studied. The growth performances of *Carassius auratus* fed with probiotic and antibiotic were also assessed.

C.3. Technology Transfer

TT.1: DOCUMENTATION OF INDIGENOUS TECHNICAL KNOWLEDGE (ITK) UNDER THE PLAN SCHEME STRENGTHENING OF EXTENSION EDUCATION SERVICES.

Principal Investigator : Dr. B. K. Chand

The objective of the project is to identify the available indigenous technology practised by the farmers based on their experience and local conditions and document them agro-climatic zone / district wise and get them validated, and to blend the traditional indigenous practice with that of new technologies to achieve maximum results with neutralizing ill effects of intensive use of high production technology.

The work is in progress and more than 70 ITKs have already been collected. Few of them are as below :

1. Massage of neck and body with heated mustard oil mixed with garlic against non-specific fever in livestock.
2. Use of herbal extracts (1/2 cup date-palm leaf extract + 1/2cup pine apple leaf extract) against endoparasitism in livestock.
3. Rubbing indigenous mixture (25 gm carbon collected from roof top on the fire place + 25 gm common salt + 25 gm Jowan, (*Ptychotia jowan*) on the tongue of the animal twice a day for 3 days to increase appetite.
4. Surrounding the Black Quarter (BQ) affected area in cattle with the line marked by red-hot sickle to arrest the spread of disease to other parts of the body.
5. Application of mixture of Karanja (*Pongamia Olubra*) and neem oil at affected site to cure wound in livestock.
6. Application of burnt engine oil on infected area (for 7-10 days) against skin disease in livestock.
7. Use of neem oil on the wounds of livestock to repel flies.
8. Application of banana pseudostem in fish pond to improve water quality and check fish mortality.
9. Broadcasting of ash (of freshly burnt paddy straw) in fishpond to check disease outbreak in fish.
10. Use of earthworm/ roasted pupa as bait for angling fish.
11. Use of mixture of lime and neem leaf powder (2:1 ratio) to control disease in fish and prawn ponds.
12. Application of mixture of neem oil and turmeric powder on wounds of fish affected by Epizootic Ulcerative Syndrome (EUS).
13. Use of roasted rice husk mixed with cow dung and kerosene as attractant in catching fish and prawn.
14. Sprinkling of fresh cow dung on paddy seed and drying under shade before storage helps in good germination.
15. Mixing of ash and turmeric powder with vegetable seeds before sowing to prevent fungal attack.
16. Use of 'Tadi' (fermented palm juice) against FMD in cattle.
17. Use of chopped pork through oral administration against FMD in cattle.
18. Use of raw camphor mixed with ripe banana to control mastitis in milch cattle.
19. Use of palmkin to subside swelling of mastitis in milch animals.
20. Use of "Jaiphal" with banana to treat anoestrus cow.

21. Application of green chilli, onion, ginger, black salt, garlic, tomato and lemon mixture as appetizer in livestock.
22. Use of neem extract against various diseases of fin-fish and shell fish.
23. Use of garlic against different dermatological affections in livestock.

TT.2: TECHNOLOGY ASSESSMENT AND REFINEMENT (TAR) IN COASTAL AGRO ECOSYSTEM OF MIDNAPORE THROUGH INSTITUTION - VILLAGE LINKAGE PROGRAMME (IVLP).

Principal Investigator : Dr. A. Goswami (upto December 2002) & Dr.B.K.Chand from January 2003

The above project is under NATP and the main objective is to assess and refine the agricultural technologies in a particular agro-ecosystem with multiple options, i.e., stability and sustainability for enhanced productivity of small production systems and to sustain higher productivity and profitability taking environmental issues into consideration in well defined farm production systems. This project offered suitable platform for promoting meaningful linkages between scientific institutions and farmers. The technical interventions are designed to solve the problems faced by the farmers of the area in livestock, fishery and agriculture sector. Through these interventions the technologies are assessed and refined (as required) to suit the particular set of local conditions under the coastal agro-ecosystem. During the period of 2001-2002 and 2002-2003, 20 technical interventions were implemented out of which 8 were livestock based, 6 were fishery based and 6 were agriculture based. The name of the interventions, and number of families covered under each interventions are described below.

S1. No.	Name of the Intervention	No. of families benefited
Livestock based		
1.	Influence of supplementary feeding of mineral vitamin mixtures on reproductive calving interval and age at first calving in cattle.	30
2.	Improvement of poor quality roughages through urea-molasses-mineral mixture treatment for feeding cows.	15
3.	Assessment of efficacy of anthelmintics in control of helminth in cattle.	100
4.	Assessment of efficacy of vaccination against Foot and Mouth Disease in cattle	140
5.	Evaluation of oxytetracycline on the control of Amphotomiasis in goat.	80
6.	Assessment of efficacy of Piperazine adipate in control of Ascariasis in pig	30
7.	Evaluation of vaccination against Ranikhet Disease (RD) of backyard poultry.	200
8.	Evaluation of vaccination against Duck Plague (DP) of backyard duck.	100

Fishery based

9.	Optimisation of stocking density of Indian major carp in composite fish farming system.	10
10.	Integrating duck rearing with fish farming	10
11.	Stocking of 6-12 month old stunted carp seed of 100-150 g size instead of fry of fingerling as practiced in the normal farming system.	10
12.	Supplementary feeding of rice bran and oil cake (1:1) through feeding bags in farming system.	5
13.	Inclusion of high value item freshwater prawn (<i>Macrobrachium rosenbergii</i>) in carp farming system.	5
14.	Collection of miscellaneous fish juveniles from the nearby paddy field during monsoon and culturing them in the seasonal pond for 4-6 months.	10

Agriculture based

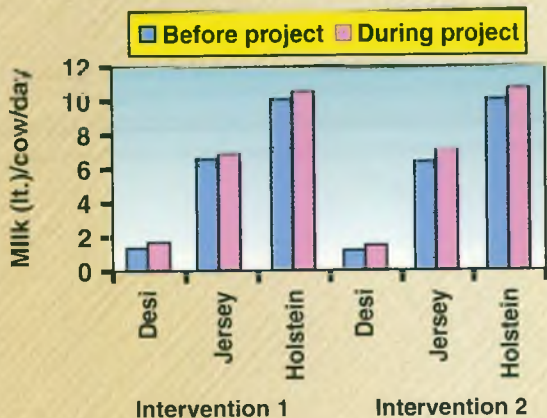
15.	Cultivation of green fodder and supplementation of green fodder to cattle for better milk production.	10
16.	Cultivation of vegetables in kitchen gardens by womenfolk	10
17.	Integrated use of chemical and microbial fertilizers in winter rice.	5
18.	Planting of banana trees on the dyke of the fishpond	10
19.	Papaya production through modern agro technique.	5
20.	Agroforestry for better utilization of land.	5

The project covered 765 families of Barua village in Midnapore district and the beneficiaries for different technical interventions were selected in farmers' perspective with due consideration to their resource. The interventions were implemented either in form of verification trial (VT) or On-Farm Trial (OFT). The project work was constantly monitored through regular farm visits, collecting field data, conducting farmers' meet, and feed back from the farmers. Data obtained from various interventions were analyzed and results were evaluated for their socio-economical impacts. The project has brought remarkable improvement in socio-economic status of the farmers by generating additional income through implementation of improved technologies.

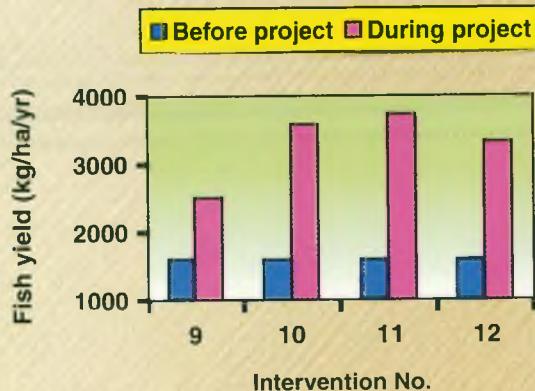
During the period 15 training programmes were conducted to impart knowledge and skill to 450 farmers on various technologies. In last two years 4 health camps were organized where about 1800 animals and birds were vaccinated and treated. An inventory of 30 ITKs (Indigenous Technical Knowledge) prevailing in the region was also prepared. From the project work 10 research papers have been prepared out of which 8 have already been published in scientific journals and 2 have been accepted for publication. Apart from these, for the use of the farmers of the project area, 8 technical booklets have been published (in Bengali language) on various farming aspects such as cattle farming, goat farming, pig farming, poultry farming, duck farming, fish farming, green fodder cultivation and vegetable cultivation.

Fig. 4 Performances under IVLP

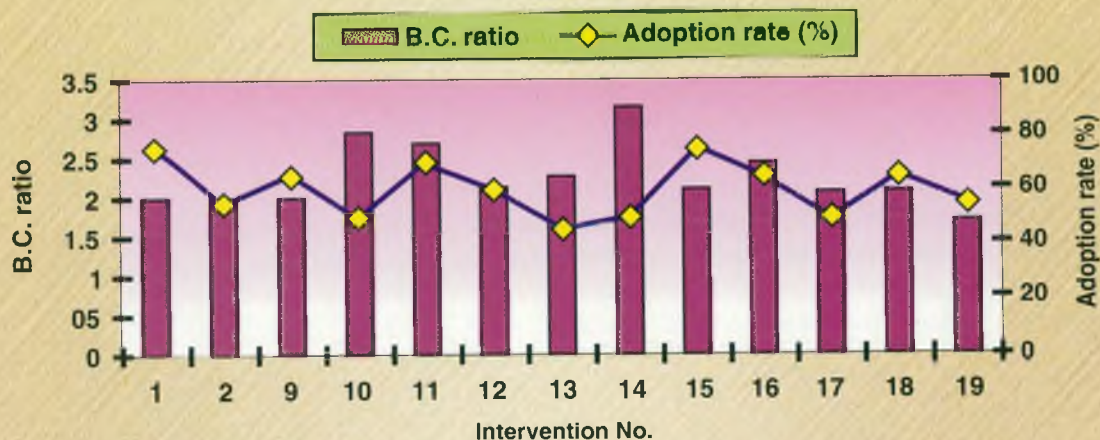
Increase in milk production of cow under IVLP project



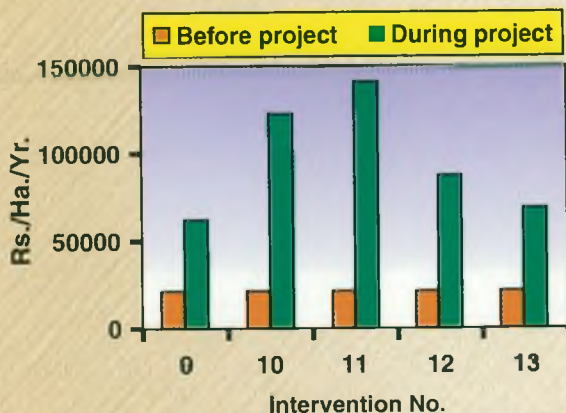
Increase in fish yield under IVLP project



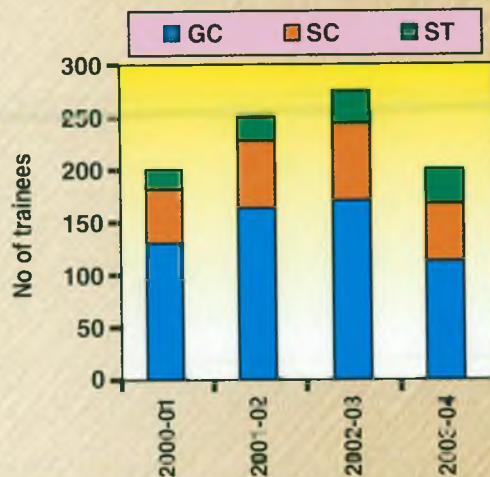
Benefit Cost (B.C.) ratio Vs. Adoption rate achieved in different interventions under IVLP project



Net Profit (Rs./ha./yr.) from fishery based interventions under IVLP project



Profile of the trainees under IVLP



The project has brought remarkable improvement in socio-economic status of the farmers in IVLP village by generating additional income through implementation of improved technologies.

By stocking 6-12 month old stunted carp seed, higher fish production of 3738 kg/ha/yr. was achieved with the mean weight of Catla, Rohu and Mrigal as 1340, 1174 and 791 g respectively in one year.

Supplementary feeding of rice bran and oil cake (1:1) through feeding bags in carp farming had yielded fish production of 3332 kg/ha/yr. With feed Conversion Ratio (FCR) of 2.95.

Inclusion of high value items – Freshwater prawn (*Macrobrachium rosenbergii*) in carp farming system yielded high profit. Under this intervention fish yield of 2184 kg/ha/yr And prawn yield of 122 kg/ha/yr. have been achieved.

Miscellaneous fish juveniles were collected from the nearby paddy field during monsoon and cultured in the seasonal ponds for 4-6 months. It helped in conservation of some endangered fish species. The work is being continued.

TT.3: VALIDATION OF INDIGENOUS TECHNICAL KNOWLEDGE (ITK) ON “USE OF BANANA PSEUDOSTEM IN FISHPOND” UNDER NATIONAL AGRICULTURAL TECHNOLOGY PROJECT

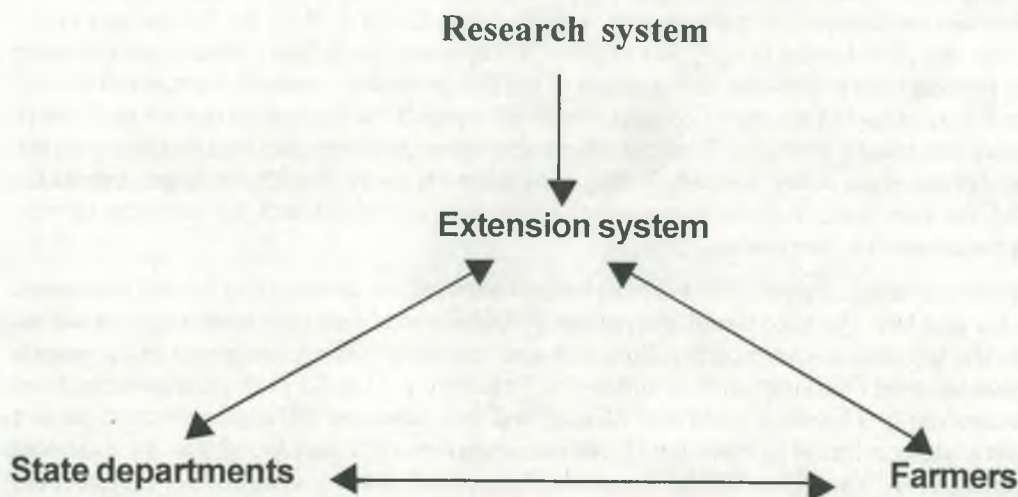
Principal Investigator: Dr. C. Lodh

The location of use of the ITK is Basta block in Balasore district of Orissa. The agro-ecosystem of the area was carried out using the Participatory Rural Appraisal (PRA) technique. “QulK” method was applied for validation of ITK, where matrix ranking was used as a PRA tool. The data were collected through observations, interaction, participation and interview. About 40% of the fish farmers in the locality use banana pseudostem in the pond to check fish mortality from Sept. - May, when the water depth of the fishpond starts reducing and biomass of the fish gradually increases. Hence, during that period there is a shortage of Dissolved Oxygen in the pond water. If the farmers do not use lime, pH of the pond water also reduce gradually. Due to unfavourable water condition, fish start swimming on the upper surface of the pond water, specially during early morning hours. If such conditions prevail for longer period, fish start dying. In order to improve the water quality and to check fish mortality, farmers use banana pseudostem in the ponds.

The chemical analysis of juice extracted from banana pseudostem revealed that it is rich in minerals like Fe, Zn, Cu and Mn. The juice was slightly acidic in nature and is very high in alkalinity as well as hardness. In the laboratory, one month culture trial was conducted taking the spawn of *C. mrigala* species in glass aquaria. Five treatments designated as To (control), T1 to T3 (with juice extracted from banana pseudostem @ 0.5 ml/l, 1.0 ml/l and 1.5 ml/l) and lime treatment (50 mg/l) were tried out and each treatment was conducted in triplicates. From above experiment it was found that the treatment with lime application @ 50mg/l (i.e. 500 kg/ha) yielded best growth of fish followed by T3, the treatment with juice of banana pseudostem @ 1.5 ml/l (i.e. 1.5 ppt Concentration of juice). From the experiment it was clear that treatment with juice of banana pseudostem as well as lime gave significantly better ($P > 0.01$) growth of fish seed than the control (without any treatment).

D. TECHNOLOGY DISSEMINATION

Extension education in animal and fishery sectors 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 feedback to influence the research, education and training systems. Such education also forces the act of transferring innovations 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 education programs in the country, farmer's participation has been given prime emphasis. This system operates as a Farmer's program with the presence of the Scientists and extension educationists, alongwith the support and initiative of the government and non-government organizations. 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 Article

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D.2. Publication of Scientific and Extension Literature

1. Annual Report	1
2. News letter	3
3. Leaflets in Bengali	4
4. Research highlights	2
5. Compendium in training programmes	3
6. University At a Glance	2
7. Books in Bengali on different livestock (cattle, pig, goat, duck, poultry) and fish farming etc.	9
8. Monographs for V.C.I. course	6
9. Laboratory Manuals for V.C.I. course.	12

D.3. Seminar / Workshop organised

Sl. No.	Title	Place	No. of participants
1.	Seminar on "Income generation through animal farming"	South 24-pgs	85
2.	Workshop on "Role of goat farming in rural economy"	Mohanpur, Nadia	55
3.	Seminar on "Current approaches for controlling parasites in livestock" during December 2002	University Head Quarter	40
4.	Seminar on "Popular drug delivery system- a recent view" in August, 2002	Belgachia	40
5.	Seminar on "Animal and Food borne pathogens and their impact on human health" on December, 2002	Kolkata	40
6.	Seminar on "Productive capacity enhancement of milk production system with special reference to West Bengal context", 2003	Kolkata	75
7.	Seminar on "e-learning and management", 2003	Kolkata	40
8.	Workshop on "Canine Leishmaniasis" on February, 2003	Kolkata	40
9.	Seminar on "Improving post-partum fertility in cattle" on March, 2002	Kolkata	50
10.	Seminar on "Human embryonic stem cells- current research and application" on March, 2001	Kolkata	78
Total participation			543

D.4. Training

Sl.	Title	Place	No. of participants
1.	Importance of livestock and fishery sectors in rural economy	Bhurkunda. North 24-pgs	32
2.	Fishery extension and its future prospects	Mohanpur, Nadia	40
3.	Integrated piggery development	Mohanpur, Nadia	35
4.	Poultry and duck farming	Midnapore	120
5.	Goat and Pig farming	Midnapore	80
6.	Quail and rabbit farming	Midnapore	60
7.	Vermicompost at kitchen garden	Midnapore	50
8.	House dairy	Midnapore	200
9.	Integrated duck cum fish farming	Midnapore	50
10.	Banana plantation	Midnapore	30
11.	Composite fish farming	Midnapore	60
12.	Prawn farming	Midnapore	30
13.	Ornamental fish farming	Kolkata	25
Total participation			812

D.5. Mela organised

1. 'Vidyasagar Mela' at Kolkata.
2. 'Bigyan Bhabna Mela' at Tala Park, Kolkata.
3. 'Krishi Mela' at CoochBehar.

D.6. Participation

1. 'Prani Sampad Saptaha' of the Department of Animal Resources Development, Govt. of West Bengal.
2. National Conference on Animal Nutrition.
3. National Conference on Veterinary Parasitology.
4. National scientific symposium during Re-union of erstwhile Bengal Veterinary College.

D.7. Consultancy

The extension wing of the Directorate of Research, Extension and Farms helps in consultancy for the stakeholders in relation to initiation of different livestock farms including fish farming. The wing also provides model schemes alongwith extension literature (leaflets, books etc.) to the beneficiaries free of cost.

D.8. Film Produced

1. Produced documentary video film on "CHARAIBETI" in relation to TAR (IVLP) for 28 minutes.
2. Produced documentary video film for 15 minutes in relation to processing of pork, broiler and eggs.

D.9. Model Village

Adopted village Chandpur under Rajarhat-Gopalpur block of North 24-pgs in collaboration with DumDum Rotary Club.

D.10. Training Centre

Vocational Training Institute at Panskura, Purba Medinipur in collaboration with Vidyasagar Training Institute (NGO) is yet to be started.

D.11. Krishi Vigyan Kendra, Ramshai, Jalpaiguri

Training

Discipline	No. of training courses	No. of participants	Male	Female
i)Agronomy	19	451	451	-
ii)Horticulture	14	249	243	06
iii)Animal Husbandry	48	543	372	171
iv)Fishery Sciences	4	140	140	-
v)Home Sciences	16	522	-	522
Total	101	3277	2206	1071

Extension Activities

Activities	No. of Programmes	No. of participants
i) Farmers' Field day	8	374
ii) Kishan Gosthy	5	865
iii) Kishan Mela	2	6300
iv) Disease diagnosis service	9	255
v) Clinical services	6	685
vi) Mass Animal vaccination	14	4000
vii) Demonstration of balanced ration	6	450
viii) Demonstration of fodder production	6	400
ix) Demonstration of fish harvesting	3	150
Total	59	13479

On-Farm Trial

Activities	No.	Area	No. of beneficiaries
i) Animal Husbandry	3	House Dairy	300
ii) Agronomy	1	Fodder cultivation	200
Total	4		500

Front-Line Demonstration

Activities	No.	Area	No. of beneficiaries
i) Animal Husbandry	4	Goat rearing composite Livestock production, Animal Health & Vaccination	500
ii) Agronomy	2	Nutrient analysis	150
iii) Horticulture	1	Seasonal Flowers	70
Total	7		720

D.12. Participation of teachers and officers in conference, meeting, workshop and symposium.

<i>Title of Seminar, Symposium, Workshop, Training etc.</i>	<i>Venue</i>	<i>Duration</i>	<i>Name of the Faculty Members/ Officers</i>
1. Seminar on Wild Life	Delhi	27-04-2001	Dr. A.K. Bhattacharya Vice-Chancellor
2. 2nd Meeting of ICAR Committee	Delhi	25-11-2001	Dr. A.K. Bhattacharya Vice-Chancellor
3. Workshop on Biotechnology	Lucknow	17-01-2002	Dr. A.K. Bhattacharya Vice-Chancellor
4. Vice-Chancellors' Conference	Hyderabad	18-02-2002	Dr. A.K. Bhattacharya Vice-Chancellor
5. Meeting of the Sub- Committee on Finalisation of University Governance System of SAU	Port Blair	07-03-2002	Dr. A.K. Bhattacharya Vice-Chancellor
6. Meeting of the Sub- Committee on Finalisation of University Governance System of SAU	Port Blair	28-08-2002	Dr. A.K. Bhattacharya Vice-Chancellor
7. Workshop on AHRD Project & CIRG	Delhi & Mathura	15-10-2002	Dr. A.K. Bhattacharya Vice-Chancellor
8. Meeting of IAUA	Hyderabad	07-12-2002	Dr. A.K. Bhattacharya Vice-Chancellor
9. Meeting at ICAR Head Quarters	Delhi	24-02-2003	Dr. S.S. Ghosh Vice-Chancellor
10. Vice-Chancellors' Conference	Delhi	31-03-2003	Dr. S.S. Ghosh Vice-Chancellor
11. Working Committee Meeting of Planning Commission	New Delhi	02-08-2001 & 03-08-2001	Dr. D.N. Jana Registrar
12. Post-based Reservation including of Constitutional 81st to 82nd Amendment of SC/ST/OBC	New Delhi	14-02-2002 to 16-02-2002	Dr. D.N. Jana Registrar

<i>Title of Seminar, Symposium, Workshop, Training etc.</i>	<i>Venue</i>	<i>Duration</i>	<i>Name of the Faculty Members/ Officers</i>
13. Workshop on Basics of Captive & Wild Animal Management	New Delhi,	26-04-2001 to 29.4.2001	Prof.M.K.Bhowmik Director of Research, Extension and Farms (Actg.)
14. Seminar on Present status of goat rearing its problem & prospects	Haldia, W.B.	10-07-2001	Prof.M.K.Bhowmik Director of Research, Extension and Farms (Actg.)
15. Workshop on Institutionalizing Research priority assessment in SAUs & ICAR Institutes in Eastern India	Cuttack	28-9-2001	Prof.M.K.Bhowmik Director of Research, Extension and Farms (Actg.)
16. Core Group Meeting on AICRP on Duck production	Bhubneswar	14-1-2002	Prof.M.K.Bhowmik Director of Research, Extension and Farms (Actg.)
17. Workshop on Strategic Research & Extension Plan	Hyderabad	15-1-2002 to 16-1-2002	Prof.M.K.Bhowmik Director of Research, Extension and Farms (Actg.)
18. 6th Scientists' Meet on AICRP on Goat Improvement	Kolkata	19-1-2002 to 20-1-2002	Prof.M.K.Bhowmik Director of Research, Extension and Farms (Actg.)
19. Planning & Management of Agriculture & Extn. Training	New Delhi	22-1-2002 to 23-1-2002	Prof.M.K.Bhowmik Director of Research, Extension and Farms (Actg.)
20. Zonal Technical Co-Ordination Committee Meeting on Collection, Documentation & Validation of ITK	Kolkata	5-3-2002 to 7-3-2002	Prof.M.K.Bhowmik Director of Research, Extension and Farms (Actg.)
21. Review Workshop on All India Network Programme on Haemorrhagic Septicaemia	Kolkata	9-4-2002 to 10-4-2002	Prof.M.K.Bhowmik Director of Research, Extension and Farms (Actg.)

<i>Title of Seminar, Symposium, Workshop, Training etc.</i>	<i>Venue</i>	<i>Duration</i>	<i>Name of the Faculty Members/ Officers</i>
22. National Symposium on Historical overview on Veterinary Sciences and Animal Husbandry in Ancient India	Izatnagar	16-4-2002 to 17-4-2002	Prof.M.K.Bhowmik Director of Research, Extension and Farms (Actg.)
23. Workshop-cum-Training On Oilseeds and pulses	Deoghar	9-11-2002	Prof.M K.Bhowmik Director of Research, Extension and Farms (Actg.)
24. New IPR Regime : Challenges and opportunities Before Indian Industries.	Kolkata	10.10.01	Dr. S. Biswas, Deptt. of APT & M
25. Seminar on Packaging materials of different foods	Kolkata	10.03.01 to 11.03.01	Dr. S. Biswas, Deptt. of APT & M
26. Globalisation- Challenges to Nutritionists	Kolkata	20.11.02 to 22.11.02	Dr. S. Pan, Deptt. Animal of APM.
27. Scientist Meet on All- India coordinated Research Project On Goat improvement.	Bhuban- eswar	06.01.03 to 07.01.03	Dr. S. Pan, Deptt. of APM.
28. 6th Scientists' Meet on All-India coordinated Research Project On Goat improvement.	Kolkata	19.01.03 to 20.01.03	Dr. S. Pan, Deptt. of APM.
29. Farmers' Training Programme	Mohanpur	08.07.02 to 12.07.02	Dr. S. Pan, Deptt. of APM.
30. Farmers' Training Programme	Mohanpur	23.01.03 to 25.01.03	Dr. S. Pan, Deptt. of APM.
31. National Symposium on Bio-diversity	Andaman & Nicobar Island	23.04.01 24.04.01	Dr. A.K. Sahoo, Deptt. of AGB
32. National Symposium of XXXIII Re-union of B.V. College	Kolkata		Dr. S.K. Ghosh, Deptt. of AGB
33. 9th International Congress on Biotechnology in animal Reproduction.	Chennai		Dr. S.K. Ghosh, Deptt. of AGB
34. 17th Annual Convention of Indian Association of Veterinary Anatomist	Mumbai	14.11.02 to 16.11.02	Dr. R.K. Ghosh, Dr. Partha Das. Deptt. of Anatomy

<i>Title of Seminar, Symposium, Workshop, Training etc.</i>	<i>Venue</i>	<i>Duration</i>	<i>Name of the Faculty Members/ Officers</i>
35. 10th Animal Nutrition Society Conference	Karnal	November, 2002	Prof. T.K. Ghosh Dr. S. Halder. Deptt. of Animal Nutrition.
36. IVth Asian Buffalo Congress Conference	New Delhi	February, 2002	Prof. T.K. Ghosh Dr. S. Halder. Deptt. of Animal Nutrition.
37. IVth Biennial Conference of Animal Nutrition Association	Kolkata	20.11.02 to 22.11.02	Prof. T.K. Ghosh Prof. G. Samanta Dr. B. Roy Deptt. of Animal Nutrition. Dr. S. Chattopadhyay Deptt. of Biochemistry
38. Annual Workshop on NATP Progarmme	Uttaranchal	08.09.03	Dr. B. Roy Deptt. of Animal Nutrition.
39. National Seminar on Recent Advances in Molecular Physiology	Kalyani	04.02.02 to 06.02.02	Dr. S. Batabyal Deptt. of Biochemistry.
40. 13th National Congress of Veterinary Parasitology	Kolkata	14.12.02 to 16.12.02	Dr. S. Batabyal Deptt. of Biochemistry
41. Advanced Immunological Techniques for the diagnosis of parasitic diseases of domestic Animals	Kolkata	16.05.03 to 18.05.03	Dr. S. Batabyal Deptt. of Biochemistry
42. TAR-IVLP Annual Workshop	Barrackpur	24.05.01 to 26.05.01	Dr. B.K. Chand DREF
43. NATP Workshop for Coastal Agro-ecosystem	Bangalore	30.07.02 to 31.07.02	Dr. B.K. Chand DREF
44. National Seminar on HRD in Fisheries and Aqua- culture for Eastern & north eastern India.	Kolkata	14.03.02 to 15.03.02	Dr. B.K. Chand DREF
45. Annual Workshop on TAR-IVLP project on coastal agro-ecosystem	Trivandram	20.06.02 to 22.06.02	Dr. B.K. Chand DREF

<i>Title of Seminar, Symposium, Workshop, Training etc.</i>	<i>Venue</i>	<i>Duration</i>	<i>Name of the Faculty Members/ Officers</i>
46. Refresher course on Coastal Zone Management	Kolkata	26.02.01 to 18.03.01	Dr. (Mrs.) Satabdi Das DREF
47. Training Programme on Fish Nutrition	Bhubneswar	13.12.01 to 22.12.01	Dr. (Mrs.) Satabdi Das DREF
48. Summer School on Methods of Assessment of Aquatic Ecosystem for fish health care	Barrackpore	18.07.02 to 16.08.02	Dr. (Mrs.) Satabdi Das DREF
49. International Conference on Arsenic Contamination in Ground Water and its health effects	Kolkata	14.02.03 to 16.02.03	Dr. (Mrs.) Satabdi Das DREF
50. National Seminar on Fish and its Environment	Kalyani	14.06.03	Dr. (Mrs.) Satabdi Das DREF
51. Training programme on Cyber Extension : Application of Information & Communication Technology in Agricultural Extension	Mohanpur	20.05.02 to 24.05.02	Mrs. A. Biswas DREF
52. National Seminar on Environment: Dimensions & Issues	Kolkata	17.02.01	Dr.S.K.Mukhopadhyay Deptt. of Pathology
53. National Seminar on End of Century & Stepping into an Unknown Millennium	Kolkata	13.03.01	Dr.S.K.Mukhopadhyay Deptt. of Pathology
54. National Seminar on Education for Social Justice	Bhubaneswar	23.02.02 to 24.02.02	Dr.S.K.Mukhopadhyay Deptt. of Pathology
55. Seminar on Academic & of Financial Management of Colleges of West Bengal	Kolkata	17.03.02	Dr.S.K.Mukhopadhyay Deptt. of Pathology
56. International seminar on Sundarban: Dimensions & Strategies	Kolkata	20.04.02	Dr.S.K.Mukhopadhyay Deptt. of Pathology
57. National Symposium on Current Trends & Challenges in the livestock & poultry diseases including wildlife crisis in 21st Century" & XVIII. Annual Conference Of the Indian Association of Vety Pathologists	Gujrat	11.10.01 to 13.10.01	Dr.T.L. Som Deptt. of Pathology

<i>Title of Seminar, Symposium, Workshop, Training etc.</i>	<i>Venue</i>	<i>Duration</i>	<i>Name of the Faculty Members/ Officers</i>
58. Winter School on Molecular Diagnosis & Modern Trends in the control of poultry diseases	Namakkal	19.11.01 to 09.12.01	Dr. C. Guha Deptt. of PVM
59. 4th All Indian Annual Conference of Association of Public Health Veterinarians	Kolkata	23.09.01	Dr. U. Biswas Deptt. of P.V.M.
60. 4th All Indian Annual Conference of Association of Public Health Veterinarians	Tirupati	21.12.02 to 23.12.02	Dr. U. Biswas Deptt. of P.V.M.
61. Workshop of The Zonal Technical Co-ordination Committee of NATP on Collection, Documentation & Validation of Indigenous Technical Knowledge.	Kolkata	05.03.02 to 07.03.02	Dr. C. Guha Deptt. of P.V.M
62. Workshop of Annual Scientists' meet & Review Workshop on All India Network Programme On Haemorrhagic Septicaemia.	Kolkata	09.04.02 to 10.04.02	Dr. C. Guha Deptt. of P.V.M
63. XIII National Congress of Veterinary Parasitology	Kolkata	14.12.02 to 16.12.02	Dr. T.K. Mandal Deptt. of Vety. Pharmacology & Toxicology
64. North East Regional Millennium Conference NERCON-III	Burdwan	2001	Dr. T.K. Mandal Deptt. of Vety. Pharmacology & Toxicology
65. IInd Annual Conference of Indian Society of Veterinary Pharmacology & Toxicology	Palampur	20.12.01 to 22.12.01	Dr. T.K. Mandal Deptt. of Vety. Pharmacology & Toxicology
66. IIIrd Annual Conference of Indian Society of Veterinary Pharmacology & Toxicology	Pantnagar	24.12.02 to 26.12.02	Dr. T.K. Mandal Deptt. of Vety. Pharmacology & Toxicology
67. 35th Annual Conference of Indian Pharmacological Society	Gwalior	26.11.02 to 29.11.02	Dr. T.K. Mandal Deptt. of Vety. Pharmacology & Toxicology

<i>Title of Seminar, Symposium, Workshop, Training etc.</i>	<i>Venue</i>	<i>Duration</i>	<i>Name of the Faculty Members/ Officers</i>
68. 15th Annual Conference of Pharmacology (W.B. Branch)	Burdwan	21.12.02	Dr. T.K. Mandal Deptt. of Vety. Pharmacology & Toxicology
69. ICMR-WHO Workshop on Ethical issues in biomedical Research.	Kolkata	11.03.03 to 13.03.03	Dr. T.K. Mandal Deptt. of Vety. Pharmacology & Toxicology
70. XIV Annual State Conference of Indian Pharmacological Society of W.B. Branch	Kolkata	25.01.02	Dr. T.K. Mandal Deptt. of Vety. Pharmacology & Toxicology
71. Seminar on Ocular drug delivery system – a recent view	Kolkata	01.08.02	Dr. T.K. Mandal Deptt. of Vety. Pharmacology & Toxicology
72. 9-O-acetylated sialic acid, a biomarker for monitoring the status of canine visceral leishmaniasis (leishmaniasis)	Kolkata	25.02.03	Dr. T.K. Mandal Deptt. of Vety. Pharmacology & Toxicology
73. Advanced Training on Trends in small & small animal orthopaedic surgery	Ludhiana	03.10.01 to 23.10.01	Dr. S.K. Nandi Deptt. of Surgery & Radiology.
74. Winter school on “Recent trends on orthopaedic techniques & radiographic imaging in farm and pet animals.	Chennai	12.09.02 to 11.10.02	Dr. S.K. Nandi Deptt. of Surgery & Radiology.
75. Winter school on “Recent trends on orthopaedic techniques & radiographic imaging in farm and pet animals.	Chennai	12.09.02 to 11.10.02	Dr. S. Halder Deptt. of Surgery & Radiology.
76. Advanced training on Osteo-synthesis with special reference to Dynamic Compression Plating in small animals.	Ludhiana	01.02. to 21.02.	Dr. D. Ghosh Deptt. of Surgery & Radiology.
77. Advances in Equine Surgery Deptt. of Surgery	Pantnagar	June, 2001	Dr. (Mrs.) S. Hazra Deptt. of Surgery & Radiology.

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78. Special atechniques in Vety Surgery & Radiology.	Ludhiana	19.02.03 to 11.03.03	Dr. (Mrs.) S. Hazra Deptt. of Surgery & Radiology.
79. Advances in the diagnosis and management of disease of small ruminants & pet animals.	Chennai	December, 2002	Dr. S. Guha Deptt. of Surgery & Radiology.
80. One day international Workshop of World small animal Vety. Association on Trauma Management, orthopaedic disease & external fixation in small animals.	Mumbai	17.10.02 2002	Dr. S. Guha Deptt. of Surgery & Radiology.
81. National symposium on Vety. Public Health in containing Bioterrorism.	Tirupati	21. 12.02 to 23.12.02	Prof. A. Chakraborty Deptt. of VMEJ
82. National symposium and annual convention of the of the Indian Society for Vety. Medicine.	Anand	07.02.03 to 09.02.03	Prof. N.R. Pradhan Deptt. of VMEJ
83. Indian Science Congress on "Bovine Tuberculosis & its zoonotic significance.	New Delhi	2001	Dr. S.Sarkar Deptt. of VMEJ
84. Conference on Emerging animal disease & its impact on socioeconomic & health development.	Kolkata	23.09.01	Dr. C. Lodh Deptt. of VMEJ
85. Workshop on Collection, Documentation & Validation of ITK	Kolkata	05.03.03 to 07.03.03 & 21.05.03 to 22.05.03	Dr. C. Lodh Deptt. of VMEJ
86. Training programme on Advances in the diagnosis & treatment of diseases of ruminants	Madras	18.11.01 to 19.11.01	Dr. C. Lodh Deptt. of VMEJ
87. Refresher Course on Environmental Science	Kalyani	05.11.01 to 26.11.01	Dr.(Mrs.) K. Ray Deptt. of Vety. Gynae. & obstetrics
88. 5th All India conference on VPH on 'Vety. Public Health Containing Bioterrorism'	Tirupati	21. 12.03 to 23.12.03	Prof. A.K. Pramanik Deptt. of VPH

<i>Title of Seminar, Symposium, Workshop, Training etc.</i>	<i>Venue</i>	<i>Duration</i>	<i>Name of the Faculty Members/ Officers</i>
89. National symposium on challenges before the animal Husbandry Sector in the present Economic Scenario.	Kolkata	11.01.02	Prof. A.K. Pramanik Deptt. of VPH
90. National Seminar on Fish Culture for North - Eastern India.	Kolkata	21-01-2003 to 22-01-2003	Dr. S.S. Dana Dr. A.K. Panigrahi Deptt. of Fishery Extn
91. A training on Fish Health Management	Mohanpur	15-02-2003 to 17-02-2003	Dr. S.S. Dana Dr. A. K. Panigrahi Deptt. of Fishery Extn
92. Workshop on Harnessing the Agribusiness potential Eastern Region	Kolkata	27-07-2001	Prof. K.C. Dora Deptt. of Fish Processing Technology
93. National Seminar on Bio-Technology for the development On Nutraceuticals & probiotics; Health Foods in Nutritional Security disease prevention for Nation.	Jadavpur	25-02-2002	Prof. K.C. Dora Deptt. of Fish Processing Technology
94. 15th meeting of the Regional Committee No – II	Barrackpore	15-06-2001 to 16-06-2001	Prof. K.C. Dora Deptt. of Fish Processing Technology
95. Workshop on Quality Assurance & safety of organic foods.	Kolkata	03-02-2003	Prof. K.C. Dora Deptt. of Fish Processing Technology
96. National Seminar on Aquatic Environment problems Related to fisheries & prospects.	Barrackpore	23-02-2003 to 24-02-2003	Prof. K.C. Dora Deptt. of Fish Processing Technology
97. Seminar on Fish and its Environment	Kalyani	14-06-2003	Prof. K.C. Dora Deptt. of Fish Processing Technology
98. National Science on HRD In fisheries and aquaculture For Eastern and North-Eastern India.	Kolkata	14-03-2003 to 15-03-2003	Prof. K.C. Dora Deptt. of Fish Processing Technology

<i>Title of Seminar, Symposium, Workshop, Training etc.</i>	<i>Venue</i>	<i>Duration</i>	<i>Name of the Faculty Members/ Officers</i>
99. National Conference on Conservation and Management Of marine Biodiversity	Kanyakumari	21-03-2003 to 22-03-2003	Dr. S.K. Das Deptt. of Fishery biology & resources Management
100. Cultural-based fisheries for Island fisheries development	Barrackpore	18-07-2001 to 17-08-2001	Dr. S. Behera Deptt. of Fishery biology & resources Management
101. National Seminar on HRD In fisheries & Northern India	Kolkata	14-03-2003 to 15-03-2003	Dr. (Mrs.) S. Jana Deptt. of Fishery Economics & Statistics
102. National Workshop in Bio-Informatics and Statistics In Aquaculture Research	Bhubneswar	16-01-2001 to 18-01-2001	Dr. (Mrs.) S. Jana Deptt. of Fishery Economics & Statistics
103. Winter School on Advances In Harvest Tech. In Aquaculture Research	Cochin	20-11-2002 to 19-12-2002	Mr. E. Kathavarayan Deptt. of Fishery Engineering
104. Summer School on Coastal Zone Management an integrated approach	Mumbai	07-08-2002 to 19-12-2002	Mr. N.A. Talwar Deptt. of Fishery Engineering
105. National Symposium on Genetic & Gene banking Of fish & shell fish.	Mumbai	29-03-2003 to 30-03-2003	Dr. S.K. Rout Deptt. of Fisheries Environment
106. Workshop on Present status Of induced breeding & its Impact on aquaculture.	Mohanpur	05-05-2003	Dr. R.K. Trivedi Deptt. of Fisheries Environment
107. Seminar on Fish and its environment.	Kalyani	14-06-2003	Dr. R.K. Trivedi Deptt. of Fisheries Environment
108. Workshop on Prioritization Of Research & development Needs for dairying in Eastern India.	Kalyani	21-06-2002 to 22-06-2002	Dr. P.K. Ghatak Deptt. of Dairy Chem.
109. Seminar on Preservation & Packaging of indigenous Sweets	Bhubaneswar	10-01-2003	Dr. P K. Ghatak Deptt. of Dairy Chem.

<i>Title of Seminar, Symposium, Workshop, Training etc.</i>	<i>Venue</i>	<i>Duration</i>	<i>Name of the Faculty Members/ Officers</i>
110. National Seminar on Recent Advances in molecular Physiology	Kalyani	04-02-2002 to 06-02-2002	Dr. S.P. Sarkar Depth. of Dairy Micro Biology
111. Total Quality Control Management in Dairy	Karnal	01-03-2003 to 30-03-2003	Dr. T.K. Maity Depth. of Dairy Micro Biology
112. Refresher course on Advances In preservation of dairy	Karnal	13-08-2001 to 12-09-2001	Mr. P.K. Ray Depth. of Dairy Engineering
113. Refresher course on Integrated Bioreactions-Bioseparation processes	Kolkata	10-12-2001 to 01-01-2002	Mr. S.K. Bag Depth of Dairy Engineering
114. Short Course on Evaluation framework for Agricultural Developmental Programmes and Projects.	Coimbatore	24-05-2001 to 02.06.2001	Dr. A. Goswami DREF
115. Summer School on Research methodology in Extension Education	Ludhiana	04-07-2001 to 24.07.2001	Dr. A. Goswami DREF
116. Training on Cyber Extension	Kalyani	20.05.2002 to 24.05.2002	Dr. A. Goswami DREF

- 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 to the door steps of the stakeholders.

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