

WEST BENGAL UNIVERSITY OF ANIMAL AND FISHERY SCIENCES

ANNUAL REPORT **(2007–2008)**



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Kolkata – 700 037
West Bengal**

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Printed by :

Gouri Printing Works

P.O. Khardah, Biswas Para

Dist. : North 24 Parganas

Kolkata, Pin Code - 700 117

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FOREWORD



I am extremely delighted in presenting the Annual Report of the West Bengal University of Animal & Fishery Sciences, which highlights the principal activities of the varsity and important achievement made during the period for 2007-2008.

Importance of Animal and Fishery Science University like us is now well recognized. These Universities have been serving the country by providing education, research and extension services to the farming community. One third of the Agricultural GDP is coming from the

Animal husbandry and Fishery sectors. More than 70% of rural people are directly or indirectly associated with livestock and fish farming either as organized or un-organized form. A big number of small and marginal farmers as well as landless labourer are engaged in backyard poultry keeping, goat, sheep and pig rearing. Besides these they also maintain cattle and buffaloes in their houses. Mostly the women folk are involved in these activities. Our rural economy greatly depends upon these activities. West Bengal is famous for its Black Bengal goat, Garole sheep and also for our indigenous fowl and duck population. Scientists of our university have established the importance of Bonapala sheep and ghongroo pigs. West Bengal possess many kinds of big and small water bodies. A total farming system integrating crop cultivation with horticulture, livestock and fish farming can transform the economic scenario of the State. Motto of our University is to create knowledgeable man power in the field of Animal sciences, Dairy technology and Fishery sciences through proper education and research. University is regularly imparting trainings in the relevant areas for upgradation of knowledge of the farming communities.

Since there is a heavy demand for the animal proteins either in the form of meat, egg or milk so there is a scope of expansion of these fields. These will help in the process of self employment and livelihood development.

The teachers and the scientists of the University are engaged in research work for the conservation of germ plasm of vulnerable livestock varieties of West Bengal.

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 and endangered fishes, integrated management of livestock and fish, wecther based animal diseases, blue tongue disease, ITK and technology assessment and refinement and many other research activities.

It is now crystal clear that the livestock and fishery sectors play the pivotal role in sustainable agricultural production system for the small and marginal farmers and landless labourers of the country. The well-developed poultry and dairy farming are paving the way for women empowerment for poverty alleviation by economic upliftment. The West Bengal University of Animal & Fisheries Sciences is recognized as one of the leading institutions in the eastern region of the country, shouldering the responsibilities of education, research and extension activities in veterinary, dairy and fishery sciences. The University made significant studies in the area of preservation of Garole sheep, Bengal goat and Ghoomgroo pig, which are native germplasm of the State.

The university runs three Krishi Vigyan Kendras one each in Bamshai, Dist - Jalpaiguri, Digha, Dist - Murshidabad and Aihole, Dist - North 24 Parganas.

The process of dissemination of knowledge and techniques have been significantly undertaken by three Krishi Vigyan Kendras. The Directorate of Research, Extension & Farms has conducted various training programmes in livestock, poultry and fishery sectors for the State Govt. Officials and also for the farmers and farm-women.

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

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

I appreciate the efforts made by the editorial and publication board in bringing out the annual report in precise and attractive form. I would like to thank all my colleagues in WBVAFS for their incredible work and cooperation. I shall look forward to any suggestion and comment on the information contained in this publication which would prove to be very much valuable for future activities.

Belgahia,
Kolkata

Chambers

(Prof. C. S. Chakrabarti)
Vice Chancellor

PROLOGUE



The annual report is the documentation of various activities and achievements of the University throughout the year. Other than scheduled academic programmes of Under graduate, Post-graduate and Doctoral degree in the field of Veterinary science, Dairy technology and Fishery Sciences, this University is involved in research and extension activities through various projects financed by Central and State Governments. Indian council of

Agricultural Research has always been generous by Providing financial assistance to maintain and develop the teaching and Research programmes on regular basis. VCI being the regulatory body of veterinary education always guides for the development of education in the concerned field. D.T and Fishery faculties follow the AICTE and ICAR norms respectively for their U.G. curriculum. Various programmes on field extension activities have been taken-up successfully by the Directorate of Research, Extension & Farms to transfer technologies for the purpose of enhancing productivity of livestock and fishery sectors in the State through AICRP, NAIP, PHT etc.

This annual report must be useful to the students, researchers and concerned officers of the Government and to all those who are involved in the development of livelihood through Animal husbandry, Dairy and Fishery sciences.

*Belgachia,
Kolkata*


(Prof. Ranajit Kumar Ghosh)
Registrar

PREFACE



Annual report serves as a mirror that reflects the image of the University by focusing its overall activities performed and achievements gained. Since the inception of the University, in the year 1995, it has devoted in imparting education, conducting both basic and applied research, and organizing extension

activities in the field of Veterinary and Animal Sciences, Dairy Technology and Fishery Sciences to enhance animal productivity and fish production in the state. Though, all achievements are documented in the annual report of the University, a need has been felt to bring together all relevant technologies and achievements in one place. In this publication, an effort has been made to present all the achievements in a lucid and comprehensive manner.

The University has three Faculties viz. Veterinary and Animal Sciences, Dairy Technology and Fishery Sciences, and one Directorate of Research, Extension and Farms alongwith other supporting units/sections. Three Krishi Vigyan Kendras under the Directorate has been satisfactorily functioning at Jalpaiguri, North 24 Parganas and Murshidabad Districts.

This annual report provides an over-view of our activities conducted during the period 2007-2008. I sincerely hope that this report will be useful to Faculty Members, Researchers, Students, Staff, Administrators, Farmers and Policy makers of the concerned or related fields. This publication will also help the University to review periodically its human resource development, research, extension and farm activities to meet the future challenges.

*(Prof A. K. Misra)
Director of Research,
Extension and Farms*

*Belgachia,
Kolkata*

ACKNOWLEDGEMENT

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

I gratefully acknowledge the active support rendered by Prof. A. K. Misra, Director of Research, Extension and Farms and Editor for preparation of the Annual Report.

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

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

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

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



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

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EXECUTIVE SUMMARY

West Bengal University of Animal and Fishery Sciences, the second Veterinary University of the country started its journey on 2nd January 1995 with an objective to serve the State as well as the nation as a whole through imparting quality **Education**, accomplishing basic and need based **Research** and disseminating proven technologies to the farming community through **Extension** wing. The highlights of various activities of the University during the period 2007-2008 are depicted below :

Institutional :

The 4th convocation was organized to confer degrees to 114 Under-graduate, 84 Post-graduate and 14 Ph.D. students under the three Faculties of the University. The expert team of Veterinary Council of India (VCI) visited University to assess the academic activities of Under-graduate course through VCI system adopted in the University. University has conducted 5 National Conferences during the span. The Central Library with Information Network services is in full action towards fulfilling the objectives of the University.

Academic :

The admission of students for three faculties during 2007-2008 was 252. During the period, a total of 216 students comprising 108 in Under-graduate, 97 in Post-graduate and 11 in Ph.D. programmes have successfully completed their courses. Best students were awarded with different kinds of medal namely, Mira Mallick Gold Medal, Dr. S.N. Roy Gold medal, Prof. D.B. Mukherjee Gold medal, Dr. P. Bhattacharya Gold medal and Dr. D.K. Biswas Gold medal.

Research :

Since inception the University has completed 49 research projects with fund allocation of Rs. 584.019 lakhs, received from various funding agencies. The University has already evolved 47 technologies, which inturn, would help to enhance the income and livelihood security of the farming community. Currently there exists 29 numbers of on-going research projects with fund allocation of Rs. 1016.476 lakhs. In addition, there exists – Collaborative research projects with other Institutions. Further, this University has been selected as the Supporting Institute to undertake 2 (two) National Agricultural Innovative Projects (NAIP) under component 3 relating to livelihood security in collaboration with Bidhan Chandra Krishi Viswavidyalaya (BCKV), ICAR Research complex for NEH Region (Tripura) and IVRI (UP).

Extension :

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

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

Krishi Vigyan Kendras :

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

A. ADMINISTRATION

A.1. MANDATE

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

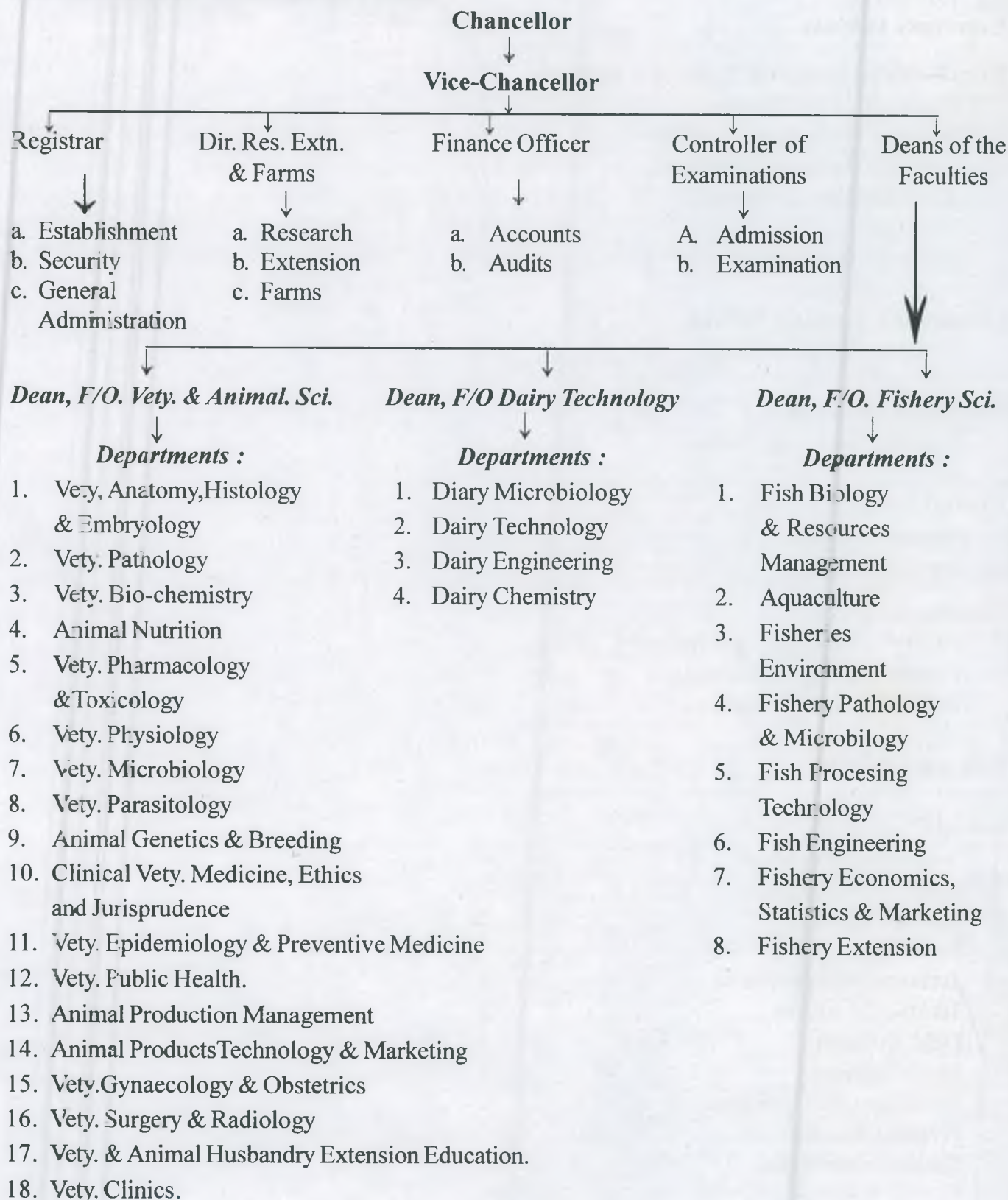
- A. To impart education in the branches of Veterinary and Animal Sciences, Fishery Sciences, Dairy Technology and allied sciences.
- B. To conduct basic and applied research in the field of Veterinary and Animal Sciences, Fishery Sciences, Dairy Technology for advancement of knowledge and enhancement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

Directorate of Research, Extension & Farms

Deputy Director (Research) 1

Assistant Director (Research) 1

Assistant Director (Extension) 1

Assistant Director (Farms) 1

Scientist 2

Computer Programmer 1

Finance and Accounts Section

Assistant Finance Officer 2

Establishment Section

Security cum Estate Officer 1

Central Library

Assistant Librarian 1

Deputy Librarian 1

Teaching staff

Faculty of Veterinary and Animal Sciences 56

Faculty of Dairy Technology 13

Faculty of Fishery Sciences 19

Non-teaching staff

Group C

Senior Superintendent 4

Junior Superintendent 2

Senior Assistant 20

Junior Assistant 5

Technical Superintendent 3

Technical Assistant 2

Field Assistant 2

Junior Journalist 1

Junior Assistant Librarian 1

Personal Assistant 1

Senior Compounder 2

Group D

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

A. 5. NAME OF OFFICERS IN THE UNIVERSITY

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

A. 6. DIFFERENT STATUTORY BODIES

EXECUTIVE COUNCIL

Prof. C. S. Chakrabarti Vice-Chancellor	<i>Chairman</i>
Dr. K. K. Saha Director of Animal Husbandry & Vety Services, Govt. of West Bengal	<i>Member</i>
Sri S. K. Bhattacharya Director of Fisheries Govt. of West Bengal	-do-

Sri B. Roy Milk Commissioner Govt. of West Bengal	-do-
Prof. D. K. De Dean, Faculty of Vety. & Anim. Sciences WBUAFS	Member
Prof. A. K. Mishra Dean, Faculty of Dairy Technology & Director of Research, Ext. of Forams WBUAFS	-do-
Prof. K. C. Dora Dean, Faculty of Fishery Sciences WBUAFS	-do-
Prof. P. Biswas Professor, Deptt. of Animal Nutrition (Teachers' Representative, Faculty of Vety. & Anim. Sci., WBUAFS)	<i>Elected Member</i>
Prof. S. K. Gangopadhyay Professor, Deptt. of Dairy Technology (Teachers' Representative, Faculty of Dairy Technology, WBUAFS)	-do-
Prof. N. R. Chattopadhyay Professor Deptt. of Aquaculture (Teacher's Representative, Faculty of Fishery Sci, WBUAFS)	-do-
Sri M. Ahmed Junior Superintendent (Non-Teaching Staff Representative, WBUAFS)	-do-
Vacant (Students' Representative, WBUAFS)	-do-
Sri Biplab Mazumder (M.L.A. Representative, nominated by West Bengal Legislative Assembly)	<i>Nominated Member</i>

Dr. (Mrs.) K. G. Suma Additional Director, Animal Husbandry Directorate of Animal Husbandary, Govt. of Kerala (Representative from VCI)	<i>Nominated Member</i>
Sri Sanjoy Putatundu (Representative from Farmers or Producers, nominated by Govt. of West Bengal)	-do-
Sri Lakshmi Kanta Roy (Representative from Farmers or Producers, nominated by Govt. of West Bengal)	-do-
Sri Anil Patra (Representative from Farmers of Producers, nominated by Govt. of West Bengal)	-do-
Dr. K. K. Vass Director, Central Inland Fisheries Research Institute I.C.A.R. (Representative of I.C.A.R., New Delhi)	-do-
Prof. R. K. Ghosh Registrar, WBUAFS	<i>Non-Member Secretary</i>

FACULTY COUNCIL

Vice-Chancellor	<i>Chairman</i>
Registrar	<i>Member</i>
Director of Research, Extension & Farms	-do-
Librarian	-do-
Controller of Examinations	<i>Invitee member</i>
Dean of the respective Faculty	<i>Member</i>
All Heads of the Deptt. of respective Faculty	-do-
Professor from respective Faculty	<i>Elected Member</i>
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	<i>Ex-officio Secretary of three Faculties</i>

RESEARCH AND EXTENSION EDUCATION COUNCIL

1. Vice-Chancellor-*Chairman*
2. Director of Research, Extension and Farms-*Member Secretary*
3. Director of Veterinary Services and Animal Husbandry, Govt. of West Bengal-*Member*
4. Deans of Faculties - *Member*
5. Director of Fisheries, Govt. of West Bengal - *Member*
6. Head of all Research Stations and Project Co-ordinators of State/ICAR/other agencies, research schemes - *Member*
7. Three Scientists of eminence to be nominated 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. Vice-Chancellor-*Chairman*
2. Director of Research, Extension and Farms - *Member*
3. Deans of Faculties - *Member*
4. Registrar-Non-Member Secretary - *Member*
5. Controller of Examinations - *Member*
6. Librarian - *Member*
7. All Heads of the Departments of all the Faculties - *Member*
8. One Lecturer, one Reader and one Professor from each Faculty - *Member*
9. One undergraduate student from each Faculty and one Post-graduate 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 Gopal Krishna Gandhi, Hon'ble Governor, West Bengal and Chancellor
2. Dr. Surya Kanta Mishra, MIC, Dept. of Health & Family Welfare and Panchayat & Rural Development, Govt. of West Bengal.
3. Sri Anisur Rahaman, MIC, ARD, Govt. of West Bengal
4. Sri Kiranmoy Nanda, MIC, Fisheries, Govt. of West Bengal
5. Dr. R. Samanta, Vice-Chancellor, BCKV
6. Dr. N. Sharma, Director, NDRI
7. Sri Bankim Ghosh, Minister of State, Panchayet & Rural Development, Govt. of West Bengal

8. Dr. R.B. Sing, Ex-Director, Central Avian Research Institute
9. Ms. Anita Jain, Under Secretary, Govt. of India
10. Prof. Ganaprakashan, Ex-Vice Chancellor, Tamilnadu University of Veterinary & Animal Sciences.
11. Dr. Ramlinga Raju, Vice-President, Veterinary Council of India
12. Dr. A. Bandyopadhyay, National Coordinator, NATP
13. Prof. A. R. Thakur, Vice Chancellor, West Bengal University of Technology.
14. Prof. S. Banerjee, Vice Chancellor, Netaji Open University.
15. Minister-in-charge, Deptt. of Animal Husbandy, Govt. of Tripura.

A.8. FOURTH CONVOCATION

The highly prestigious and vainglorious Fourth Convocation of West Bengal University of Animal and Fishery Sciences was organized at the Mahajati Sadan Hall, Kolkata on 17th April, 2008. Hon'ble Chancellor His Excellency, Sri Gopal Krishna Gandhi inaugurated the aphrodisiac convocation and presided over the ceremony. He exhorted the degree recipients to contribute immensely towards realizing the dreams of shining India and prosperous West Bengal. The convocation address was delivered by Prof. Rathindra Narayan Basu, Chairman of the West Bengal State Agriculture Commission and former Vice Chancellor, University of Calcutta and remain present as Chief Guest on the occasion. Prof. C.S. Chakrabarti, Vice Chancellor of University served oath to the recipients of degree and awards. Amongst the other dignitaries, Sri Anisur Rahaman, Hon'ble Minister, Animal Resource Development Department, Govt. of India graced the occasion with his luminous presence. Faculty wise following degrees were awarded to the students –

<i>Degree in the Faculties</i>	<i>No. of students</i>
Faculty of VAS	
B.V.Sc. & A.H.	77
M.V.Sc.	59
Ph.D.	14
Faculty of DT	
B.Tech. (DT)	18
M.Sc. (Dairying)	7
M. Tech. (DT)	2
Faculty of Fishery	
B.F.Sc.	19
M.F.Sc.	16

Besides, 6 students were awarded with 11 Gold Medals for their success in different branches of studies under the University.

A.9. IMPORTANT EVENTS

A.9.1. ESTABLISHMENT OF DISTANCE EDUCATION STUDY CENTRE

The first of its nature in India, a Programme Study Centre of Indira Gandhi National Open University is established during November, 2008 under the Department of Animal Products Technology and Marketing, Faculty of Veterinary & Animal Sciences at Mohanpur campus, Nadia. This Study Centre will cater studies on '**Diploma in Meat Technology**'. This is a one year diploma course under Distance mode of education. Ten (10) number of students have been enrolled themselves for this course during the academic session 2009-2010.

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

The Inspection Team of the Veterinary Council of India (V.C.I.), New Delhi under the Chairmanship of Dr. Ramlinga Raju, Vice President of VCI visited the University from 18th February to 19th February 2009. The report of visiting team in favour of our University is highly appreciated in the Faculty Council of Veterinary & Animal Sciences.

A. 9.3. NATIONAL CONFERENCE / SYMPOSIUM CONDUCTED

1. Seventh Indian Veterinary Congress and XV Animal Conference of Indian Association of Advancement in Veterinary Research on 'Public, Private-Partnership (PPP) in Veterinary Research and Education sector' organised by Faculty of Veterinary & Animal Sciences during 22-24 February 2008.
2. National Workshop on 'Advanced PCR Based DNA finger printing sponsored by Dept. of Biotechnology, Govt. of India during 2008.
3. Indian Veterinary Congress in 2008.
4. Sixth Annual Convntion of Indian Society for Advancement of Canine Practice organised by Faculty of Veterinary & Animal Sciences. The National Convention was held at Hotel Hindustan International, Kolkata during 6-8 February, 2007.
5. International Symposium on 'Organic livestock farming : global issues, trends and challenges' organised by Indian Society for Animal Production and Management and WBUAFS in the Deptt. of Animal Production & Management during 26-28 Feurary, 2009.
6. National Symposium on 'Sustainable livestock production through self-help group and livelihood security in the perspective of bird flu outbreak organised by XXXIX Re-union committee of Veterinary Students', ARD Deptt. Govt. of West Bengal and WBUAFS during 10-11 January, 2009.

B. ACADEMIC

B.1. ACADEMIC PROGRAMMES***Faculty of Veterinary and Animal Sciences :***

- i) B. V. Sc. & A.H. 5 years Bachelors' degree course (60 capacity)
- ii) M.V. Sc 2 years Masters' degree course
- iii) Ph. D. 3 years Doctoral degree course

Faculty of Dairy Technology :

- i) B. Tech. (DT) 4 years Bachelors' degree course (30 capacity)
- ii) M. Tech./M.Sc. 2 years Masters' degree course
- iii) Ph. D. 3 years Doctoral degree course

Faculty of Fishery Sciences :

- i) B.F. Sc. 4 years Bachelors' degree course (30 capacity)
- ii) M. F. Sc. 2 years Masters' degree course

B.2. ADMISSION AND PASSED-OUT

Course	Admission	Passed-out
Faculty of VAS		
B.V.Sc. & A.H.	60	75
M.V.Sc.	82	70
Ph.D.	18	9
Faculty of DT		
B.Tech. (DT)	27	17
M. Tech. (DT)	9	4
Ph.D.	-	2
Faculty of Fishery		
B.F.Sc.	30	16
M.F.Sc.	26	3
Total	252	216

B.3. AWARDS (GOLD MEDALS/SCHOLARSHIPS)

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

- ☆ Smt. Mira Mallick Gold Medal
[Highest marks in B.V.Sc.&A.H.]
- ☆ Dr. S. N. Roy Gold Medal
[Highest marks in Livestock Farm Management (APM) in B.V.Sc.&A.H.]
- ☆ Prof. D. B. Mukherjee Gold Medal
[Highest marks in Veterinary Surgery and Radiology in B.V.Sc.&A.H.]
- ☆ First Batch (1953) B.V.Sc.Students' Gold Medal
[Highest marks in 5th & 6th semester in B.V.Sc.&A.H.]
- ☆ Dr. P. Bhattacharya Gold Medal
[Highest OGPA in Animal Production and Management in M.V.Sc.]
- ☆ Prof. Sukumar De Gold Medal
[Highest marks in B.Tech. (Dairy Technology)]
- ☆ Smt. Tirthamayee Ganguli Gold Medal
[First position in M.Tech. (Dairy Technology)]
- ☆ Prof. G. Ganguly Scholarship
[Highest marks in B. Tech. (Dairy Technology), 3rd Year]
- ☆ Mrs. P. Ganguly Scholarship
[Highest marks in B. Tech. (Dairy Technology) 3rd Year]
- ☆ Dr. B. N. Dey Memorial Endowment Gold Medal
[Highest Marks in Veterinary Gynaecology & Obstetrics in BVS & AM.]
- ☆ Dr. Subir Kr. Sinha Memorial Gold Medal
[Highest Marks in Veterinary Medicine, Ethics & Jurisprudence in B.V.Sc. & A.H.]
- ☆ Dr. D. K. Biswas Gold Medal
[Highest marks in Poultry production & Management in B.V.Sc. & A.H.]

- ☆ Dr. G. L. Sharma Endowment Gold Medal
[Highest marks in Veterinary Public Health in B.V.Sc. & A.H.]

B.4. CENTRAL LIBRARY OF THE UNIVERSITY

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

The workings hours at Belgachia campus is 10:00 A.M. to 7:00 P.M. and at Chakgaria and Mohanpur Campus is 10:00 A.M. to 5:30 P.M.

- | | | |
|--|---|---|
| 1. Working hour of the Library (in general) | : | 10 A.M. to 7 P.M. |
| 2. Working hour of the Network Services | : | 24 hours X 7 days |
| 3. No. of staff working in the Libraries | : | Permanent Staff : 6; Contractual/Agency : 7 |
| 4. Amount of grant received from various agencies | : | ICAR and State funding agencies |
| 5. No of books available for lending in the library | : | 9000 (nine thousand) |
| 6. No. of books available in the book store | : | 18000 (eighteen thousand) |
| 7. No of Indian Journal and periodicals available | : | 50 (fifty) |
| 8. No. of International Journals and Periodicals available | : | 26 (twenty six) |
| 9. General Services provided by the Library | : | Electronic Circulation
Reference Service
Book Bank
Xerox services from Private agency |
| 10. Special services provided by the Library | : | a) Internet Browsing privileges to the users
Extended to Post Graduate and Research
Level Users.
b) On line Abstracting Service
c) CD ROM
d) CAS |

- c) Information Service File
- f) Resource Sharing
- g) Access to INFLIBNET
- h) Consortium for e-Resource in Agriculture (CERA)

11. List of foreign Journals available

<u>Sl No.</u>	<u>Item</u>
1.	Journal of Dairy Research
2.	Anatomia, Histologia, Embryologia
3.	Veterinary Record
4.	Animal
5	Animal Genetics
6.	Veterinary Clinics: Small Animal Practice
7.	Journal of Fish Diseases
8.	Journal of Veterinary Pharmacology and Therapeutics
09	The Israeli Journal of Aquaculture-Bamidgeh
10.	Food Technology
11.	Meat Science
12.	Journal of Aquatic Food Product Technology
13.	ASHRAE
14.	Journal of Animal Science
15.	Fertility and Sterility
16.	Veterinary Pathology
17.	Poultry Science

18. Journal of American Veterinary Medical Association
19. Veterinary Surgery
20. Journal of Parasitology
21. Journal of Food Protection
22. Annals of Clinical Biochem
23. Veterinary Medicine
24. Cell, Tissues, Organs
25. Veterinary Clinics: Equine Practice
26. Journal of International Agriculture & Extension

C. TECHNOLOGY GENERATION

PROJECTS AT A GLANCE

	<i>No. of Projects</i>	<i>Fund received</i>
1. Completed projects	49	Rs. 584.0198 lakhs
2. On-going projects	29	Rs. 956.836 lakhs
3. Submitted projects	10	Rs. 484.8305 lakhs

TYPE OF ON-GOING PROJECTS AND FUNDING AGENCIES

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

Faculty of Veterinary & Animal Sciences

Sl. No.	Title of the Project	Funding Agency	PI & Dept.	Fund Sanctioned
1	AICRP on Improvement of feed resources and nutrient utilization in	ICAR	Prof. P. Biswas. Animal Nutrition	1,41,62,000/-
2	Gastro-intestinal parasitism (All India Network Project)	ICAR	Dr.J. D. Ghosh, Vety. Parasitology	44,43,000/-
3	All India Co-ordinated Research Project on Black Bengal goat improvement	ICAR	Dr. A. K. Samanta. APM	1,29,63,500/-
4	Blue Tongue Disease (Network-ANP)	ICAR	Dr. S. N. Joardar, Dept. of Vety. Micro	36,46,846/-
5	Conservation of Threatened Breed (Chongroo Pig) under Xth Plan by Ministry of Agril., Govt. of India	Ministry of Agril., Govt. of India	Dr. S. Pan, APM	53,50,000/-
6	Application of Acrylic External Skeletal Fixator for Fracture Repair in Small Domestic and Wild Ruminants (Adhoc)	ICAR	Dr. S. Halder. Vet. Surg. & Radiology	20,00,000/-
7	Conservation of Bonpala Sheep in Teesta Vally	Ministry of Agril., Govt. of India	Dr. S. Pan, APM	63,15,000/-
8	Study on Immuno-histochemical status of mammary gland of different breeds of cows (Adhoc)	ICAR	Prof. (Dr.) R. K. Ghosh Anatomy & Histology.	20,00,000/-
9	Impact assessment of environmental hazards caused by slaughterhouse wastes and control of pollution by recycling the wastes as animal feed	Ministry of Environment & Forest. GOI	Prof. T. K. Ghosh Animal Nutrition	15,53,420/-
10	Development of Ceramic-based Implantable Delivery System for Sustained Released of the Drugs for the Treatment of Osteomyelitis in the Patients	DST, New Delhi	Dr. S. K. Nandi, Vety. Surg & Radiology.	15,02,980/-

PROJECTS AT A GLANCE

	<i>No. of Projects</i>	<i>Fund received</i>
1. Completed projects	49	Rs. 584.0198 lakhs
2. On-going projects	29	Rs. 956.836 lakhs
3. Submitted projects	10	Rs. 484.8305 lakhs

TYPE OF ON-GOING PROJECTS AND FUNDING AGENCIES

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

11	Endocrine Profiles and characterization of Candidate Genes Influencing Prolificacy in Black Bengal Goat	NAIP, ICAR	Dr. S. Pan. APM	7,08,400/-
12	Arsenic in food chain : cause, effect & mitigation	NAIP, ICAR	Dr. S. Sarkar	53.00,000/-
13	Characterization of Immune-effector cells and cytokines of Indian major and minor carps	DBT, MST, New Delhi	Dr. S.N. Joardar, Lecturer, Dept. of Vety. Microbiology	15,15,000/-
14	Bioavailability and efficacy of Ceftizoxime in Induced Mastitic animal (goat/cow)	Industry (Alembic Ltd., Mumbai)	Dr. T.K. Mandal, Dept. of Vety. Pharmacology & Toxicology	1,99,000/-
15	Surgical & Pharmacological prevention of posterior Capsular Opacification following cataract surgery	CSIR, New Delhi	Dr. (Mrs.), Sarbani Hazra, Dept. of Vet. Surgery & Radiology	9,02,000/-
16	Exploring effects of liquid lysine and methionine hydroxyl analogues on performance of broiler chickens fed lysine and methionine dense diets	Industry CJ Asia New Delhi	Prof. T.K. Ghosh, Dept. of Animal Nutrition	1,86,00/-
17	Sustainable farming system to enhance and ensure livelihood security of poor in Purulia, Bankura and West Midnapur District. (5 years)	NAIP, Component-III, ICAR	Prof. P. Biswas, Dept. of Animal Nutrition	83,71,000/-
18	Acute & Sub-acute toxicity studies of oral insulin formulation in Wister rats.	Industry (Natreon Inc. Salt lake)	Dr. T. K. Mandal, Dept. of Vety. Pharmacology & Toxicology	1,32,000/-
19	Conservation & improvement of local white Ducks to support Shuttle Cock Feather Industry	DBT, New Delhi	Prof. G. Samanta, Ani. Nutrition	19,99,400/-
20	Development of a model for sustainable poultry farming system in West Bengal (for 4 years)	RKVY, NADP, Ministry of Agriculture	Dr. Pradip Kumar Das, Lecturer, Dept of Vety. Physiology	7.7 crore (1st yr. sanctioned 3.6 crore)
21	Poultry seed project	Project Directorate on poultry	Dr. S. Pan, APM	168.75 lakhs

Faculty of Dairy Technology

Sl. No.	Title of the Project	Funding Agency	PI & Dept.	Fund Sanctioned
1	R and D support for process upgradation of products for Industrial Application (Network)	ICAR	Prof. M. K. Sanyal, Dairy, Technology	1,43,50,000/-
2	Collection, Popularization and preservation of lactic starter culture for the manufacture of misti dahi.	ICAR	Dr. S.P. Sarkar, Dairy Microbiology	15,00,000/-

Faculty of Fishery Sciences

Sl. No.	Title of the Project	Funding Agency	PI & Dept.	Fund Sanctioned
1	Bræding & Larval rearing of a threatened Fish <i>Anabas testudineus</i> .	ICAR	Dr. S. Behera. FBRM	9,28,500/-
2	AICRP on Establishment of Post-Harvest Technology in Fisheries	ICAR	Sri Sreekanta Sarkar FPT	1,36,00,000/-
3.	Seed Production in Agricultural Crops and Fisheries	ICAR	Dr. T. K. Ghosh, Aquaculture	23,00,000/-
4.	Survey & Inventorisation of the by-catch loss in selected coastal zones of West Bengal and its impact on biodiversity."	Ministry of Environment & Forests, GOI	Prof. N. R. Chattapadhyay	15.73 lakhs
5	Technology Transfer cum Demonstration Farm on Integrated Duck cum Fish farming for imparting training and farm Advisory services to Scheduled Caste, Scheduled Tribe and Weaker Section of West Bengal	DST, Govt. of WB., Kolkata	Dr. S.S. Dana, Reader Dept. of Fishery Extension	2,92,800/-

Directorate of Research, Extension & Farms

Sl. No.	Title of the Project	Funding Agency	PI & Dept.	Fund Sanctioned
1	National Information System on Agriculture Education network in India (NISAGENET)	ICAR	Dr. (Mrs.) S. Das, Scientist, DREF	1,08,000/-

SALIENT ACHIEVEMENTS THROUGH RESEARCH PROJECTS/SCHEMES

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

- The project is running in Four growth Centers (viz. Hatikanda-Doluipur; Ganguria; Ayeshpur-Panchpota of Nadia district and one new centre at Jatirampur-Gosaba of South 24 Parganas district) involving 326 no. of household with 737 numbers of registered Black Bengal Does & their offspring.
- Elite Male kids were procured from these centers and distributed in the villages at the breedable age after assessing their reproductive potentialities.
- Information on registered does pertaining to kidding, growth, milk production and reproductive efficiency have been recorded at regular intervals to analyses their performances.
- Socio-economic status and net gain of owners of registered goats were evaluated.

ACHIVEMENT:

- ☐ Average annual population growth of Black Bengal goats in the Field unit was over 50%.
- ☐ Flock size increased from 2.67 to 4.90.
- ☐ Percentage of sell of animals was 30 per annum.
- ☐ Black color is increased from 78% to 99% in the population.
- ☐ Percentage of triplets & quadruplets are increased to its highest ever value (19.83 and 2.52 respectively).
- ☐ Recommended animal health coverage reduced the over all annual mortality from about initial 30% to 8.45%.
- ☐ Net income from Goat husbandry is 14.76% of total annual income, which was double to the agricultural income of 7.28% from average of below 1 acres of land, having single crops per year.

DETAILS OF ACHIEVEMENT:

1. Performances on body conformation, milk yield, and reproductive performances are recorded as per standard pro-forma and analyzed.

BODY CONFORMATION:

<u>Factors</u>	<u>Body Weight at Birth</u>	<u>3 month</u>	<u>6 month</u>	<u>9 month</u>
Overall mean	1.154±0.018 (4522)	4.953±0.112(3135)	7.791±0.207(1870)	10.437±0.224(1046)
<i>Litter size</i>				
Single	1.323 ^b ±0.013(833)	5.650 ^a ±0.085(617)	8.393 ^a ±0.144(371)	10.897 ^a ±0.230(214)
Twin	1.203 ^c ±0.011(2849)	5.314 ^b ±0.072(1996)	8.052 ^c ±0.118(1195)	10.644 ^{ab} ±0.196(655)
Triplet	1.154 ^a ±0.012(764)	4.873 ^c ±0.084(482)	7.654 ^b ±0.146(283)	10.463 ^b ±0.240(147)
Quadruplet	1.110 ^a ±0.029(66)	4.881 ^c ±0.220(32)	6.929 ^b ±0.400(17)	9.744 ^{ab} ±0.600(10)
Quintuplet	0.980 ^a ±0.072(10)	4.046 ^c ±0.408(9)	7.928 ^{abc} ±0.81(4)	—
<i>Sex</i>				
Male	1.200±0.018(2231)	5.150±0.113(1504)	8.073±0.210(862)	10.737±0.233(361)
Female	1.108±0.018(2291)	4.756±0.114(1632)	7.510±0.211(1008)	10.136±0.231(685)
<i>Season</i>				
Summer	1.153 ^a ±0.019(1107)	4.969 ^a ±0.115(915)	7.769±0.206(721)	10.608 ^a ±0.223(411)
Monsoon	1.140 ^a ±0.019(1527)	4.850 ^a ±0.116(1219)	7.908±0.217(528)	10.525 ^a ±0.250(290)
Winter	1.169 ^b ±0.018(1888)	5.039 ^b ±0.116(1004)	7.696±0.221(621)	10.177 ^b ±0.250(345)

TOTAL AVERAGE LITTER WEIGHT OF GOATS AT BIRTH:

	Body Weight (Kg)
Singles:	1.323± 0.013
Twins:	2.39±0.011
Triplets:	3.51±0.012
Quadruplets:	4.42±0.029
Quintuplets:	5.18±0.072

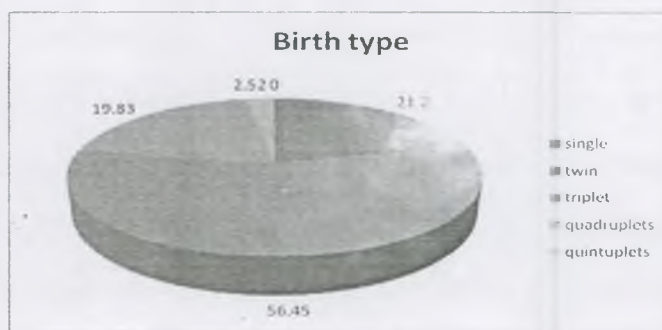
MILK YIELD OF GOATS

- Lactation length in Black Bengal doe is 58 days.
- Milk production of first 2-weeks (1.31 and 1.58 Kg) was higher than the remaining weeks.
- Average daily yield and peak yield are 130 gm & 328 gm respectively.
- The average daily and peak yield are directly proportionate to the number of kids born in a litter.
- The total yield is 7.291 ± 0.0286 kg

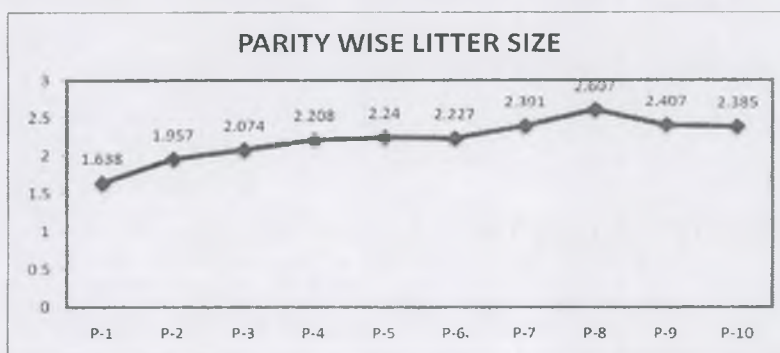
LITTER PROFILE:

Birth type:

Single Birth	21.20%
Twin Birth	56.45%
Triplet Birth	19.83%
Quadruplet Birth	2.52%
Quintuplet Birth	—



Litter size in Black Bengal Goat increases significantly with the advancement of Parity.



SELECTION OF ANIMAL

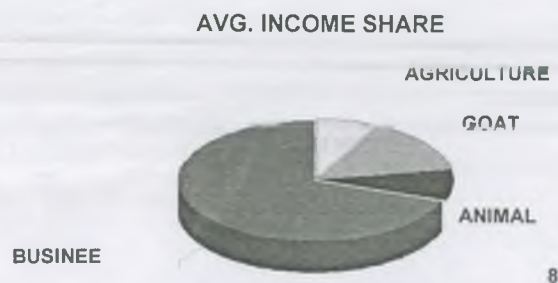
The correlation matrix of body weight at different ages is worked out, which exhibit highest value for the 6 month weight with others. Therefore selection is done based on six month body weight.

Sires are evaluated on the basis of litter size. A total of 16 sires have been used out of which ten sires have been selected.

2. THE SOCIO-ECONOMIC STUDY:

The income of the farmers was analyzed in respect of different sources (viz. from agriculture, goat rearing, animal husbandry except goat and others).

The analysis revealed that goat husbandry alone generated around 14.76% of total annual income (Rs.2296.00 out of Rs.15552.50) and was approximately double to the agriculture income share (7.28% of overall annual income).



3. SUPPLEMENTATION:

Bucks are supplemented daily with average 150 gm of concentrate feed during off breeding period (9 months) and 200 gm during breeding season (3 months).

Breedable Does are supplemented with 100 gm of concentrate daily during critical period and 200 gm daily for 3 months (2 month of late pregnancy and 1 month of lactation).

4. HEALTH CARE:

Health care in the form of prophylactic and curative measures was provided to the goats in the adopted villages regularly.

SUCCESS STORY OF THREE WOMEN GOAT FARMERS COVERED UNDER THE AIC ON GOAT IMPROVEMENT

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

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

1. FIELD TESTING OF AREA SPECIFIC MINERAL MIXTURE (UAFSMIN-P) IN VILLAGES FOR PRODUCTIVE (MILK) AND REPRODUCTIVE EFFICIENCY:

Field trial was conducted in Sundarban delta where different villages from different blocks were selected for studying the existing feeding practices and plasma mineral status of different categories of cattle, covering anoestrous heifer, postpartum anoestrous lactating and postpartum anoestrous dry cows which were supplemented with area specific mineral mixture for consecutive 3 months. It was observed that 82.5% heifer, 90% dry and 85.42% lactating cows showed symptoms of estrous after supplementation of area specific mineral mixture.

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

2. ON FARM EXPERIMENT:

Studies on Supplementation of Live Yeast (*Saccharomyces cerevisiae*) from DDGS on the Performance and Nutrient Utilization in Black Bengal (*Capra hircus*) Kids.

- Supplementation of live yeast (*Saccharomyces cerevisiae*) improved performance (growth as well as feed intake) in Black Bengal kids and the effect was linear with doses.
- No effect of supplemental trace minerals was found on performance (growth as well as feed intake).
- Nutrient digestibility particularly the fibre fraction was increased with live yeast (*Saccharomyces cerevisiae*) supplementation.
- Serum Glucose, Total Protein, Cholesterol and Triglyceride levels remained unchanged with supplementation of live yeast (*Saccharomyces cerevisiae*) and trace minerals.
- No supplemental effect was found with live yeast (*Saccharomyces cerevisiae*) on serum trace mineral balance and mineral utilization, but the effect of trace minerals supplementation was present.
- Improved nitrogen digestibility and retention percentage were revealed due to different doses of live yeast (*Saccharomyces cerevisiae*) supplementation, but the significant effect on digestibility and retention percentage was absent with trace mineral supplementation.

3. SURVEY ON THE STATUS OF SOME MAJOR AND TRACE ELEMENTS IN FEED, FODDER, SOIL AND CATTLE IN FOUR DISTRICTS OF TRIPURA

Mineral status of cattle including feed and fodders were studied in four districts in Tripura as part of the technical programme assigned to this center. Different samples like feed and fodder,

soil and blood of animals were collected from the animals under different physiological categories (viz. calf, anoestrous heifer, post-partum anoestrous, repeat breeder, lactating and pregnant).

1. Mineral concentration in different soil of all districts was found much higher, particularly iron concentration was found too higher than the critical level.
2. Stall feeding was generally practiced by providing paddy straw, different types of cultivated fodders (i.e. hybrid napier, para grass and signal) and locally available grass, supplemented with commercially available compound feed or home made concentrate mixture. Most of the animals are allowed for grazing also.
3. Calcium deficiency was found in most of the fodders in Red Earth, Red Loamy, Laterite and old alluvial soil. Cu deficiency in fodder was found in younger soil.
4. Feeds and fodders of different districts are mainly deficient with Ca, Cu and Zn
5. Most of the animals under study particularly the anoestrous heifer and post partum anoestrous cows were found deficient in Ca, P, Cu and Mn mainly.
6. On the basis of the result a mineral deficiency map for livestock of Tripura has been prepared.

4. SURVEY ON THE STATUS OF SOME MAJOR AND TRACE ELEMENTS IN FEED AND FODDER, SOIL AND CATTLE IN FOUR DISTRICTS OF SIKKIM

Mineral status of cattle including feed and fodders were studied in four districts in Sikkim as a part of the technical programme assigned to this center. Different samples like feed and fodder, soil and blood of animals were collected from the animals under different physiological categories (viz. calf, anoestrous heifer, post-partum anoestrous, repeat breeder, lactating and pregnant).

Analysis in East district is completed. In general trace mineral deficiency was found in cattle as well as in different fodder particularly P, Cu, Mn and Zn. Feeding practice was generally based on feeding of tree fodder. Analysis of other three districts is going on.

3. All India Coordinated Research Project (AICRP) on Post Harvest Technology

Investigation : 1

Storage study of various ready-to-cook & ready-to-eat fishery products prepared from low value fish.

Effect of cryoprotectants, processing methods on the quality and shelf life on Mud Crab (*Scylla serrata*) meat during Refrigerated and Frozen storage.

A brief summary of the present investigation is given below :

- The mud crab (*Scylla serrata*), used as the raw material is considered as highly valued for

their size, high meat yield and the delicate flavour of their flesh and has much demand in the domestic market and fetches a good price, compared to other species of crab.

- Crabs used in the study were in the average length and width of carapace, and weight of 8.28 cm and 225 respectively.
- The yield percentage of raw, cooked and steam cooked crab were 26%, 22% and 21% respectively.
- The proximate composition, physico-chemical, microbiological and sensory characteristics of raw, cooked, steam cooked crab were analyzed and results indicate that the crab used for study was of good quality.
- The percentage of moisture, protein, fat and ash present in the raw material were 80.74%, 16.8%, 1.2% and 2.1% (on W/W basis) respectively.
- Crabmeat, (raw, coked, steam cooked) with and without cryoprotectant treated were stored at two different temperature, one part kept in keep freeze ($-20\pm 2^{\circ}\text{C}$) for 180 days and otehr in refrigereted condition ($4\pm 20^{\circ}\text{C}$) for 14 days, respectively, after packaging in LDPE bag individually.
- The Physico-chemical, microbiological (TPC) and sensory characteristics were analyed for the evaluation of keeping quality of frozen crab samples at an interval of 15 days up to six months and in case of refrigerated storage condition it is done on 1,3,5,7,10,12,14 days respectively.
- Physico-Chemical parameters like SSN, TVB-N, TMA, FFA, TBA and pH were estimated to evaluate the freshness of the crab sample during the frozen and refrigerated storage condition. Analysis of variance (ANOVA) of data indicated, there was significant difference in the chemical parameters between storage days and treatment Physico-chemical parameters were significantly correlated with each other.
- The correlation co-efficient indicates a positive correlation co-efficient between FFA and TBA, TVB-N and TMA, FFA and TVB-N, TVB-N and TBA in case of frozen storage there was a negative correlation co-efficient between SSN and TVB-N, SSN and TMA, SSN and TBA, SSN and FFA, TPC and TVB-N, TPC and FFA, TPC and TBA.
- Investigation was carried out to evaluate the cryoprotectant effect on raw cooked, steam cooked crab meat. In the present study cryoprotectant treated raw meat was in acceptable condition up to 10 days in refrigerated storage, the raw meat can be kept up to 8 days and cooked and steamed crab meat were in good condition up to 12 days. Whereas the cryoportectant treated sample in both cooked and steam cooked meat were in acceptable condition up to 14 days in refrigerated storage condition. In forzen condition the raw crab meat can be kept up to 120 days whereas raw with cryoprotectant treated meat can be

good till 135 days. Cooked and steamed crab meat were in moderately good condition 165 days whereas the cryoprotectant treated cooked and steamed meat were in good condition up to 180 days.

- Sensory analysis of the samples revealed that scores for overall acceptability gradually decrease during frozen and refrigerated storage condition, but scores for treated ones were always higher than control ones.
- From the present investigation it can be concluded that cryoprotectant used during storage has cryoprotective properties in cooked and steamed crab meat. The shelf life of all treated samples increased significantly as compared to the all control samples during entire frozen and refrigerated storage.
- The critical control points for crab meat preparation are quality of raw material, handling, washing, and addition of cryoprotectant, temperature of frozen and refrigerated storage.

Investigation : 2

Effect of soy protein concentrate and unmodified potato starch on restructured fish products from silver carp (*Hypophthalmichthys Modifits, Valenciens, 1844 surimi*)

A brief summary of the present study is given below :

1. SPC in dried powder form increased hardness and chewiness significantly ($p < 0.05$) of restructured fish products from silver carp surimi upto 4% level of addition. Other textural properties like cohesiveness and springiness did not increase significantly ($p < 0.05$). Hence, SPC in dried powder form cannot be used as gel forming additives.
2. SPC in emulsion curd form also increased hardness and chewiness significantly ($p < 0.05$) upto 4% level of addition but did not increase springiness and cohesiveness of the product. SPC in this form yielded higher cohesiveness than SPC dried powder added product but it was not significant from that of control product.
3. In both type of application mode, the least expressible water was obtained at 6% level of addition.
4. Unmodified potato starch increased all textural parameters upto 4% level of addition and decreased expressible water upto 10% level of addition. So, unmodified potato starch can be used as functional binder in gel type product made from silver carp surimi.
5. During addition of starch and SPC (both in dried powder form and emulsion curd form) combinedly, no level of addition yielded better textural properties than control product. Hence, there is no synergistic effect between unmodified potato starch and SPC.
6. The sensory analysis of 4% SPC dried powder and 4% SPC emulsion curd treated products

suggest that SPC emulsion curd improves colour and appearance, texture and overall acceptability than SPC dried powder added products. But both of them did not increase sensory characteristics significantly ($p < 0.05$) from control.

7. Emulsion curd application of SPC found to be beneficial over dried powder application because it improves sensory acceptability than SPC dried powder added product.
8. The results of present study suggest that SPC in emulsion curd form also cannot be used as functional binder like SPC in dried powder form because they affect the textural properties in a similar pattern regardless of their application mode. But, SPC in emulsion curd form yielded slightly better cohesiveness of the product though it is insignificant from that of control.
9. The protein percentage of the product was 18.03%, whereas the protein content of the control product was 15.45%. Hence, SPC can be used to develop the protein fortified fish product.

Instigation 3. Shrimp waste & its utilization.

A brief summary of the present investigation is given below.

Raw shrimp waste (shrimp head, exoskeleton, residual meat etc.) used for flavour extraction were analyzed for organoleptic characteristics and certain biochemical parameters.

Comparative studies were carried out between raw shrimp waste and fresh shrimp meat where a remarkable amount of protein (13.5%) was found compared to fresh shrimp meat (20.0%) which generally goes into waste. Its judicious utilization for flavour extraction can minimize this huge nutrient loss as well as maximize the profit margin of the processor.

An attempt was made to find out the storage life of shrimp head and fresh shrimp meat at different storage temperatures of 4°C, 0°C, 4°C and 18°C during the storage period of 10 days. Both the organoleptic and chemical studies showed that spoilage of shrimp head was faster than fresh shrimp meat. It was also concluded that shrimp head and meat have a shelf life of around 8-10 days when stored at 0°C. Whereas the shelf-life was reduced to around 4-5 days at 4°C storage temperature. At lower storage temperatures of 4°C and -18°C, they were found within the acceptable limit after 10 days storage. For recommending storage life at 4°C and -18°C further studies are required.

In order to standardize the flavour extraction procedure from the shrimp waste, the methods followed were namely sarcoplasmic protein extraction (4.2gm/100gm), myofibrillar protein extraction (5.3 gm/100 gm), through enzymatic hydrolysis (1.5gm/100gm), extraction by 3% salt (9.3gm/100gm), extraction by 3% salt and 3% starch with 0.5% MSG (21.2g/100g) and through fat extraction (1.9gm/100gm). Among above methods, the method of extraction of the shrimp flavour by boiling with 3% starch and 3% salt with 0.5% MSG was selected for further study due to

- (e) To study the polymorphism and differential expression of the candidate genes and their association with variation in prolificacy in Black Bengal Goat.

7. NATP on Processing of Pork, Broiler and Eggs

To serve poultry meat in a more wholesome and hygienic way, a small scale hygienic poultry dressing unit with a compact, sophisticated, semi-automatized poultry dressing line with the capacity to dress 6-8 birds at a time were standardized. Results of survey covering 464 broiler farmers and 580 retailers at coastal belts of West Bengal covering three districts (28,321 km² having 29 blocks) revealed that maximum retailers (62.58%) were continuing their business for a period of 5 to 10 years with the selling capacity upto 30 Kg per day, keeping the average profit range of Rs. 2-3/- per kg. About 57.11% farmers followed all-in all out system of rearing. 300-500 birds per lot was the capacity of production of 39.2 % farmers and 54.53 % farmers sold the birds mainly through agents at 45 days of age at a minimum margin of profit. Effort has been made towards identifying critical control points with the views to implement HACCP, that could be helpful to organize modern poultry processing unit with the due provision of food safety in future in the state. In the present study, the observation for *E. coli* contamination was noted to a percentage of 59.56% in conventional method of slaughtering of poultry birds in comparison to 18% in case of scientific slaughtering and such observation was confirmed by cultural and biochemical characters, serotyped by National Salmonella and Escherichia Centre, Kasauli and common findings were 025, 0165 and 0123 serotypes. A comparative study of different surface decontaminants on chicken meat quality has been performed to evaluate the best decontamination technique, from the points of microbiological quality along with other keeping and eating quality and economics. The less preferred parts of broiler carcass (neck, wings and back), whole skin and edible viscera (gizzard, Heart) could be used even at a 70 % level for preparation of chicken sausage with natural and artificial casings. Physico-chemical parameters, sensory evaluation and microbiological assessment were conducted to judge and compare the quality of such sausages with shelf-life study revealed that such sausages could be kept for a period of 30 days in freezing temperature (-10 °C ± 0) without much adverse change on quality. Some preliminary attempt has been made towards the study on egg preservation at ambient temperature by oil coating, thermo-stabilization and their combinations. The observations revealed that upto seven days the protein profile of egg white had been remained the same at the agro-climatic zone of West Bengal both in oil-treated and non-oil treated table eggs as identified by SDS-PAGE.

8. All India Network Programme on Bluetongue Disease

Sero-monitoring of the suspected serum samples (by cELISA) revealed 43.73% positivity including sheep (49.78%), goats (37.75%) and cattle (24.63%) indicating presence of anti-bluetongue antibodies in those sera. Bluetongue virus (BTV) isolated from grazing sheep of Kolkata Maidan pasture was subsequently confirmed by molecular biological techniques. The isolate (Kol-1) was characterised as Serotype -21. As vector of BTV, the midges were identified as *Culicoides*

alatus. Nineteen (19) camps were organised in West Bengal and Assam for awareness of bluetongue disease amongst farmers and veterinarians. Meteorological data (average rainfall, maximum & minimum temperature and relative humidity) of last five years (2003-2007) of different agro-climatic zones of WB have been collected from Regional Meteorological Centre, Alipore, Kolkata. It has been observed that the climatic condition of different agro-climatic zones of WB is quite conducive for propagation and breeding of *Culicoides* spp. Isolation of virus from blood samples as well as *Culicoides* midges was attempted. One user-friendly diagnostic kit based on dipstick ELISA was developed to detect anti-bluetongue antibodies in sheep. Validation of the kit with field sera is under process.

9. All India Network Programme on Gastrointestinal Parasitism

- a. Prevalence and intensity of gastrointestinal parasitism in the four ruminant livestock species of two out of the six agro-climatic zones have been studied, which are depicted in fig 1, 2 & 3.

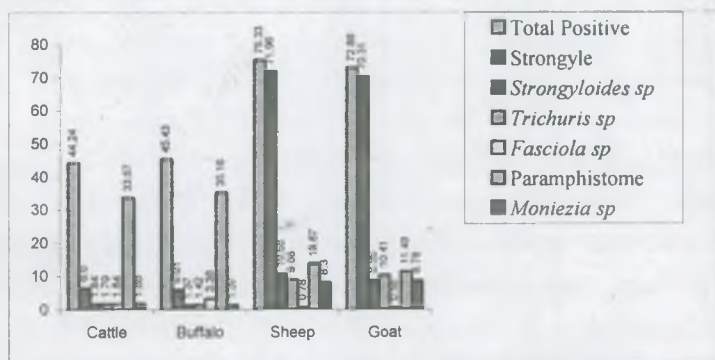


Fig.1. Overall Prevalence of G.I. Parasitic infections in different livestock species of West Bengal

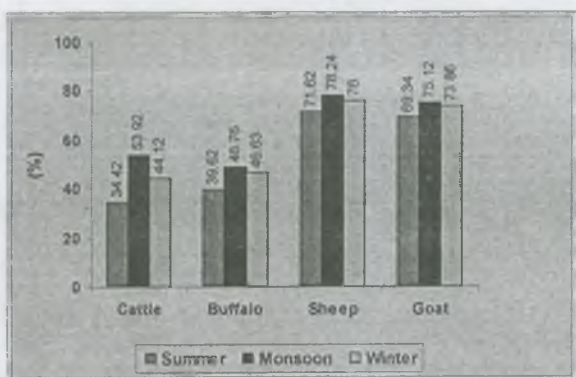


Fig. 3. Overall seasonal prevalence of G.I. Parasitic infections in different livestock species of West Bengal

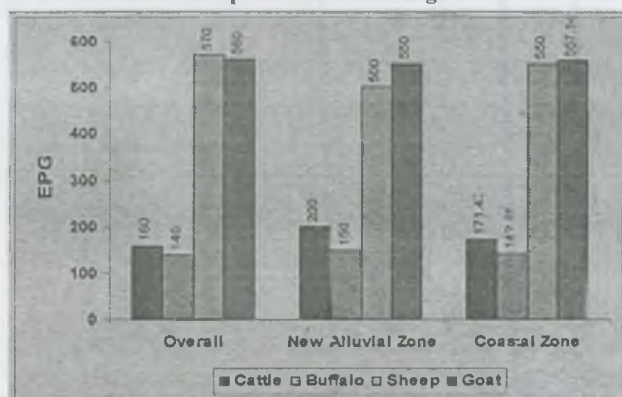


Fig. 2. Overall Intensity of G.I. nematode infections in different livestock species in different agro climatic zones of West Bengal

- b. Enhancing economic return through parasite management in sheep:

Management of gastrointestinal nematode infection by tactical deworming of two breeds of sheep yielded greater economic return which in terms of meat production only, amounted (excluding the cost of anthelmintic) Rs. 115.70/- in Garole sheep (during 7 months) and Rs. 205.69/- in Sahabadi sheep (during 12 months).

higher yield and better flavour retention. Standardization of drying method to obtain the powder form of shrimp flavour extract were also made. Spray-drying at 175°C was found suitable, where flavour retention was excellent compared to hot air oven drying and vacuum drying. However, the powder became lumpy as soon as come in contact with atmosphere.

In the present study, fish cutlet and fish soup were prepared using minced silver carp meat. Shrimp flavoured powder was incorporated in them at different levels (5%, 10%, 15%, 20% and 25%) for standardization of the level of application. Similar study was also carried out on the vegetable soup available in market. Organoleptic result showed that incorporation at 15% was suitable for both fish soup and vegetable soup while higher application rate of 20% was found suitable for fish cutlet.

Two washing cycles of two minutes duration and subsequent cooking of silver carp minced meat was found to be sufficient to develop a pleasant shrimp flavour in the product by suppressing the old fishy odour.

One month storage study was carried out for shrimp flavoured powder. Organoleptic analysis did not find any notable change during this one month storage, whereas moisture percentage and TBA value increased very little well within acceptable limit.

The critical control points for the preparation of shrimp flavour extract, its drying and incorporation are quality of the raw material, handling, washing and dressing, shrimp paste preparation, drying, packing, incorporation and storage condition, which need to be given due consideration for future studies.

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

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

- | | |
|---|---|
| ☛ Recommendation for farmers: | Ghoongroo pig production is a strong source of livelihood security. |
| ☛ Technology generation: | Ghoongroo pig production practices. |
| ☛ Recommendation for scientific community | Ghoongroo pig is a versatile indigenous animal genetic resource. |

Commercialization of technology developed by the project	Commercial Khoongroo pig farming.
Brand/ product developed	Established Khoongroo as a breed of pig.
Infrastructure developed	Established Khoongroo Pig farm at Mohanpur campus and Ramsai KVK, Jalpaiguri district.

5. Centrally sponsored project on Conservation of Threatened Breed (Bonpala Sheep)

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

Recommendation for farmers:	Bonpala sheep production is a sustainable source of additional livelihood security.
Technology generation:	Bonpala sheep production practices.
Recommendation for scientific community	Bonpala sheep is a versatile indigenous animal genetic resource, which needs conservation.
Commercialization of technology developed by the project	Commercial Bonpala sheep farming.
Brand/ product developed	Conserved Bonpala sheep in the breeding tract.
Infrastructure developed	Established Bonpala sheep farm at Ramsai KVK, Jalpaiguri district.

5. ICAR funded Basic and Strategic Research project on Endocrine Profiles and Characterization of Candidate Genes influencing Prolificacy in Black Bengal Goat

Following objectives are nearly to achieve

- To characterize phenotypically for variation in kidding size in Black Bengal Goat.
- To investigate the ovulation rate with observed variation in kidding size.
- To elucidate the endocrine profiles for variation in kidding size.
- To clone and characterize the candidate genes (viz., BPMs and BMPRs) that are known to influence the fecundity.

c. Anthelmintic evaluation:

Anthelmintics, e.g. Albendazole, Fenbendazole and ivermectin gave the desired efficacy without any indication of anthelmintic resistance and they can be used for round worm control in sheep.

d. Early diagnosis:

Antibody and coproantigen (cAg) detection ELISA were standardized for early detection of Oesophagostomosis in goat. CAg-ELISA was superior to Ab-ELISA. The test needs refinement in view of antigenic cross-reactivity among the common nematode species.

e. Parasite Resistance in Garole sheep:

Garole sheep as a whole were not resistant to g.i. nematodes, however 11.18 per cent of them were partially resistant and all of them showed resilience against the pathogenic effect of the infection.

10. ICAR AP-cess project on Sustainable Duck Production in Natural Foraging System

Selected areas of various districts (Bankura, Burdwan, Purba Medinipur, North 24 Parganas and South 24 Parganas) were surveyed and it was found that the ducks were mostly reared with foraging facilities. and the farmers provide supplementary feeding to their ducks in the form of rice bran, broken rice, broken wheat, boiled rice, paddy, crushed snails, rice paste and kitchen refusals etc. In the surveyed area, about 81.04% women out of the total duck farmers involved in duck rearing whereas only 18.96% male members were involved in duck farming. The majority of flocks comprised of 6-10 ducks and when breed is concerned, Khaki Campbell and cross breed ducks were scanty in comparison to Deshi breed. In South Bengal, it was revealed that the ducks were deficient in crude protein in their diet during laying period. Calcium and Phosphorus content in laying ducks were found to be deficient. Snail, rice bran and water weeds were the most common items found in the crop and gizzard of the ducks.

The growth performance of Khaki Campbell ducks at farmers' field under foraging and intensive system of rearing was compared. The ducks were maintained in the farmers house with 50% supplementation of balanced diet and in natural foraging attains better growth and egg production than the ducks reared in intensive system under full feed condition.

The fertility, hatchability and day old hatched duckling weight were also better in 50% supplementation than other groups. It was observed that carcass characteristics of ducks in 50% supplementation under natural foraging were superior to other groups.

The value added duck meat products like duck sausage, duck meat ball and duck meat patties were prepared. The sensory evaluation of different products showed that in terms of appearance, flavor, tenderness and overall acceptability were very good and economically viable.

11. DBT, Govt. of India project on Conservation and Improvement of Local White Ducks to Support Shuttle Cock Feather Industry System

The project has been implemented very recently and preparatory stage is in progress.

1. A duck farm comprising of local white ducks has been established.
2. Second generation of duckling has been established through hatching of eggs for farmers' distribution.
3. 1st training programme on duck rearing for women farmers were conducted at Banban Panchayet, Howrah district.

12. ICAR, Adhoc project on Bovine Lameness with Special reference to Pathogenesis and pain perception

The importance of lameness in dairy cattle has been interestingly recognized in the last two decades and is now considered one of the most urgent health and serious welfare problem of dairy cattle as well as one of the most significant economic losses for the dairy industry. After three years of study the project outcomes recommended some key features on farming practices which are as follows -

- Advised to take special attention during the age for developing lameness in the corresponding agro-climatic zones to reduce the lameness.
- Advised to change the floor type from abrasive rough surface to minimize the occurrence of lameness.
- Advised to provide feeding before calving during rainy and winter season to decrease the lameness and hence milk yield reduction.
- Foot bath is specially advised in rainy and winter seasons to decrease the lameness and hence milk yield reduction
- Different managerial practices like locomotion scoring, hoof trimming methods, control of infectious diseases through health recording is beneficial and recommended as better husbandry practice.
- Advised to provide balanced nutrition.

13. DST, New Delhi project on Development of Ceramic-based Implantable Delivery System for Sustained Release of the Drugs for the Treatment of Osteomyelitis in Human Patients

- Synthesis of hydroxyapatite by two different methods viz., solution coprecipitation and aqueous solution combustion method.
- Pure as well as a bi-phasic composition consisting of HAp and β -TCP were synthesized successfully.

- Two methods were employed for the purpose viz. solution coprecipitation and aqueous solution combustion method.
- Above powders were thoroughly characterized for its phase, composition, purity, particle size etc. by different characterization tools including XRD, FTIR, chemical analysis, BET surface area, particle size distribution by laser diffraction studies, etc.
- A special bioactive glass composition was also prepared by usual glass melting procedure which was subsequently characterized thoroughly.
- Porous scaffolds were successfully fabricated using the above powders along with naphthalene as the pore former. Other fabrication techniques are in the process for trial.
- Fabricated blocks were also thoroughly characterized for its porosity, pore size distribution etc. using different characterization methods.
- Drug ceftriaxone and sulbactam was successfully impregnated into the porous scaffolds composed of HAp, β -TCP and bioactive glass by a vacuum infiltration technique.
- Initial studies were carried out for in vitro drug release profile in PBS buffer (at 37° C) for only 21 days.

14. CSIR project on Surgical and pharmacological prevention of posterior capsular opacification following cataract surgery

It is a collaborative project with Department of Ophthalmology, R.G. Kar Medical College Kolkata. Standardization of technique for creating model of cataract in rabbit has been successfully done. Procedure for cataract removal by phacoemulsification followed by placement of intraocular lens has been established. Model of posterior capsular opacification is in progress.

15. Department of Biotechnology, Govt. of India project on Characterization of Immune-effector and Cytokines of Indian Major and Minor Carps

To assess in vitro non-specific immune-effector activities of Indian major [catla, (*Catla Catla*) and rohu (*Labeo rohita*)] and minor [bata (*Labeo bata*)] carps, in vitro proliferation, oxidative radical production, nitrite production and phagocytic activity of leucocytes were determined. Specific immune responses were studied separately in *Aeromonas hydrophila* immunized (I/P) laboratory maintained rohu. After 15 days, the immunized (n=30) along with the control fish (n=10) were challenged with virulent field isolate of *A. hydrophila* to assess cellular effector mechanism for protection. A total of three samplings were done, one at 10th day post immunization and subsequently on 5th and 15th day post challenge periods. Observed significant higher values ($p < 0.05$) of in vitro macrophage and lymphocyte functional assays were corroborated with less mortality and overall protection. It is concluded that non-specific along with specific immune-effector cells are quite active at least for 3 weeks post sensitization that may be exploited during immunomodulation and immunoprophylactic strategies.

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

- i. Supplementation of 0.5 mg Cr as CrCl_3 in diets of goats may efficiently improve live weight gain even in absence of any stressor stimulus.
- ii. The lower clearance rate of glucose from blood during the IVGTT indicated subtle effect of supplemental CrCl_3 on insulin sensitivity. This would suggest that the major effects of Cr in ruminants may not be mediated through glucose tolerance.
- iii. The serum hormonal assay and the primary Ab response indicated that growth stimulatory effects of supplemental Cr may be mediated through a shift in metabolic balance more towards anabolism and a consequent enhancement in immune responses.
- iv. The study revealed further that Cr as CrCl_3 , besides effectively augmenting the growth performance of non-stressed goats, may improve the Ab response against PPR and help conferring immunity to the disease.

7. ICAR project on Technological Investigation into Development of Meat Products from Duck

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

8. ICAR, National Agricultural Innovation Project (NAIP) on Arsenic in Food-chain : Cause, Effect and Mitigation

Survey work was conducted on two villages (Mitrapur and Dakshin panchpota) of Chakadha block under Nadia district was conducted and 30 samples of each straw, drinking water, urine, faeces, milk and hair of cattle and egg of poultry from the villages were collected for analysis of arsenic. Arsenic content in straw samples range from 1.107 to 6.315 ppm and 0.675 to 3.56 ppm at Mitrapur and Dakshin panchpota. Arsenic content in milk samples range from 0.03 to 0.08 ppm at Mitrapur, and 0.27 to 0.11 ppm at Dakshin panchpota. On the other hand Arsenic content in hair samples range from 0.78 to 10.948 and 0.588 to 6.42 ppm at Mitrapur and Dakshin panchpota. Arsenic level was above permissible limit at the above substrates.

19. Private Industry funded project on Studies of Clinical Efficacy and Adverse Drug Reactions to Isometamidium, Hydrochloride Against *Trypanosoma evansi* Infection in animals

A study on clinical efficacy, dosage regimen, adverse drug reactions and field trial on isometamidium chloride/hydrochloride against trypanosomiasis was carried out in animals. Trypanosomiasis in calves and rats was induced by subcutaneous or intraperitoneal administration of blood collected from infected mice. Isometamidium chloride/hydrochloride was administered at a single intramuscular dose levels of 0.25, 0.5 and 1.0 mg/kg in calves and 1.0, 1.5, 2.0 mg/kg in rats as 1% solution in distilled water. Parasitaemia was disappeared at 0.5 mg/kg and above in calves, and 1.5 mg/kg and above in rats. The dose of isometamidium chloride/hydrochloride has been determined as 0.5 mg/kg i.m. at 1% solution in distilled water in calves. Physiological and haematobiochemical parameters study in calves after single dose intramuscular administration of isometamidium chloride/hydrochloride suggest that the drug has no adverse reaction in calves. Field trial of isometamidium chloride on infected cattle shows that the drug is highly effective at the dose of 0.5 mg/kg as 1% solution in distilled water intramuscularly. Treatment with diminazemine aceturate, isometamidium chloride/hydrochloride and quinapyramine in induced trypanosomiasis in pups show that isometamidium chloride/hydrochloride has better efficacy compared to other two drugs.

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20. Private Industry funded project on Bioavailability and Efficacy of Ceftizoxime in Induced Mastitis (Goat)

- Minimum inhibitory concentration of ceftizoxime are 1.1, 1.0 and 1.3 $\mu\text{g/ml}$ for *E. coli*, *Staphylococcus sp* and *Streptococcus sp*.
- To treat mastitis intravenous route of ceftizoxime is preferred in cows while intramuscular route is recommended in goat.
- Recommended dose of ceftizoxime to treat mastitis in cows is 5 mg/kg b.wt after single intravenous route which will maintain a maximum concentration of 21.29 $\mu\text{g/ml}$ and a minimum of 0.44 $\mu\text{g/ml}$ of milk till 96 hr.
- Physiological, biochemical and haematological parameters reveal that ceftizoxime has no adverse effect on goat. The drug neither cause hepatic damage nor kidney damage after single administration.

1. ICAR project on Studies of Safety of Food of Animal Origin with Reference to Antibiotic and Pesticide Residue

It is observed from the study that ALT activity was increased while AST activity was decreased by amoxicillin treatment. Cypermethrin also increased and decreased significantly ALT and AST activity. Acetamiprid decreased AST and ALT activity in liver. The hormone levels both male and females were altered by most of xenobiotics. Most of the organs contained significant amount of xenobiotics on 60 day but after withdrawal period of 21 days, they could not be detected in tissues.

On the other hand, physical and chemical treatment on edible tissue fortified with 10 ppm of xenobiotics reveal that physical and chemical treatment like sunlight exposure, boiling, vinegar and sodium bicarbonate treatment reduced the residue present in tissues under study.

On histopathology study amoxicillin, oxytetracycline, ceftriaxone, cypermethrin, acetamiprid and endosulfan caused changes in some vital organs but others like sulphadimidine and BHC did not alter any remarkable changes in vital organs.

Therefore, it may be concluded that the xenobiotics under study were not present after recovery period following prolonged exposure in goats or reduced in concentration after physical and chemical treatment. Most of the liver enzymes particularly reduced glutathione, lipid peroxidation, superoxide dismutase and catalase activity were not affected, but some xenobiotics altered reproductive hormone levels.

2. Private Industry funded project on Acute and Sub-chronic Studies of Oral Insulin Formulation (Natsom Insulin Clathrate) in Wistar Rats

The LD₅₀ value of 'Natsom Insulin Clathrate' is above 3 gm/kg b.wt. and is non-toxic following sub-chronic oral toxicity study.

3. ICAR project on National Information System in Agricultural Education Network (India)

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

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

The manufacturing procedure for a good quality rasogolla from buffalo milk has been standardized which essentially consists of standardizing the milk to a SNF:Fat ratio of 1.5, heating of milk added with carrageenan to boiling temperature, cooling to 70°C, coagulation of milk by adding citric acid solution, holding the coagulated mass in whey, removal of whey through filtration,

addition of wheat flour to chhana, preparation of chhana balls, cooking of balls in 70% cane sugar solution followed by soaking of cooked balls in 30% cane sugar solution.

The shelf life of laboratory made rasogolla prepared from buffalo milk added with 750 ppm of mixed preservatives of sodium benzoate and potassium sorbate (1:1) and packaged in low density polyethylene pouches was 5 and 50 days at $30 \pm 2^\circ\text{C}$ and $8 \pm 2^\circ\text{C}$ respectively, and in polyethylene laminated pouches was 8 and 90 days at $30 \pm 2^\circ\text{C}$ and $8 \pm 2^\circ\text{C}$ respectively.

Concentrations of arsenic, copper, zinc, manganese and cadmium in cow and buffalo milk samples collected from seven districts of West Bengal viz. North 24-Parganas, South 24-Parganas, Hooghly, Nadia, East Medinipur, West Medinipur and Bankura, estimated using Atomic Absorption Spectrophotometer, were within the limits specified in PFA Rules. The average values for arsenic ($\mu\text{g/l}$), copper ($\mu\text{g/ml}$), zinc ($\mu\text{g/ml}$), manganese ($\mu\text{g/ml}$) and cadmium ($\mu\text{g/ml}$) in cow milk varied from 5.918 to 15.749, 0.033 to 0.088, 2.224 to 3.315, 0.067 to 0.155 and 0.021 to 0.033 respectively and in buffalo milk ranged from 7.423 to 21.341, 0.047 to 0.121, 2.318 to 3.241, 0.062 to 0.157 and 0.028 to 0.039 respectively. The Maximum Residue Limit prescribed by PFRA for arsenic, cadmium, copper and zinc in milk are 100 $\mu\text{g/l}$, 1.5 $\mu\text{g/ml}$, 30 $\mu\text{g/ml}$ and 50 $\mu\text{g/ml}$ respectively.

Works are being carried out to standardize the manufacturing technique of paneer from buffalo milk, ascertain the shelf life of paneer collected from the markets in Kolkata and its surrounding urban areas and, estimate the concentrations of heavy metal contaminants in milk products available in West Bengal.

25. ICAR, Adhoc project on Design and Development of Responsible Trawl for Pomfret Fishery of North East Coast of India

In the Northeast coast two types of trawl nets are currently used and they are shrimp trawl and finfish trawl. The trawlers engaged in the fishing of demersal and pelagic fishes were 65 % and 35%, respectively. The total number of trawlers engaged for finfish trawling was 3,055 with an average pomfret catch of 9.4 kg / haul. The annual total pomfret catch from 3,055 trawlers of Orissa and West Bengal was estimated as 21, 537 tonnes, respectively. Maximum catch was contributed by 50 - 100 cm length group (24.8%), followed by 100 - 150 cm (15.93%) and below 50 cm length groups (13.58%).

Twenty-four models of different designs were tested in Circulatory Water Channel. The model net no 3 was chosen as the best model, as it showed highest fishing height (0.48 m) and fishing spread (1.2 m) at 0.65 m/s velocity. This gave 0.9 m^2 of mouth area at 0.65m/s. Therefore, the model net no 3 was selected as a prototype for the development of full scale net for field level testing. This was designed as six-seam semi-pelagic trawl net with a head-rope length of 30.3 m.

Eight numbers of semi-pelagic pomfret trawls were designed and fabricated with 30 m head-rope length to match with 106 hp engine fitted trawlers and tested in sea with different variants. The Catch Per Unit Effort (CPUE) in kg/haul of eight experimental pomfret trawl nets from

Shankarpur based trawler was 64.95, 74.20, 93.25, 80.40, 62.90, 65.20, 64.00, and 59.25, respectively, and for control net it was 68.13 kg/haul. Similarly, the CPUE (kg/haul) for 8 Designs from Paradeep based trawler was 63.75, 84.55, 92.25, 80.60, 72.35, 71.55, 72.05 and 81.35, respectively and for control net it was 73.1 kg/haul. Among all designs, the Design - 3 recorded higher CPUE in both the fishing grounds.

The percentage of pomfret catch with respect to the Designs 1 – 8 from Shankarpur based trawlers was 24.70, 26.32, 36.79, 24.34, 22.91, 19.78, 25.12 and 16.47, respectively; where as for control net it was 13.35. Likewise, the percentage of pomfret catch with respect to the Designs 1 – 8 for Paradeep based trawlers was 29.95, 31.47, 44.97, 31.44, 29.32, 29.32, 23.03 and 22.43, respectively and for control net it was 14.15. The pomfret catch efficiency of all the experimental nets was higher than the control net. The Design - 3 was the best among the nets as it caught pomfrets selectively to the tune of about 37 - 45% ($P < 0.01$) due to its six-seam high opening and semi pelagic.

The specific technology generated through this project is A six-seam semi-pelagic trawl net with a head-rope length of 30.3 m designed for pomfret.

26. ICAR, AP-cess project on Analysis and Impact Assessment of Credit Structure at the Micro- and Macro level for the Development of Fisheries Sector in India

In India there is a lack of sufficient credit flow from institutional sources to the fisheries sector in comparison to credit supplied from non institutional sources. The objective of this study is to examine the role of institutional loan in fisheries sector in India.

Banks are supporting the fisheries sector providing long term, medium term and short term loan. The credit flow in fisheries sector in India is of the order of 1% of the total GLC in agriculture which was Rs.820, 730 million as on 2003-04. Though there has been massive expansion of banking net work in rural areas, yet the commercial banks which have a significant role credit supply are suffering from weaknesses in performance of rural lending where as the cooperative credit institutions are performing a better role.

Field work has been carried out in this study in some blocks of three districts of West Bengal, Nadia, North 24 Paraganas and South 24 Paraganas to examine the credit structure and its impact. More than two hundred farmers have been interrogated to analyze credit grant, credit utilization pattern, credit requirement, and its impact assessment, rate of loan recovery and the study has also taken consideration of farmers' views and suggestion about credit policies

MAJOR FINDINGS :

1. There has been increasing trend in the flow of institutional credit in West Bengal though not remarkably as the scheme of short term credit grant was introduced since 2003-04 but the amount of sanctioned loan was much lower as 40% to 50% than the sponsored amount by

Poultry Farmer. Monitoring schedule, meaningful Logo, badge. Head Cap. Sticker, Hoarding Mass awareness publications was already developed. Surveyors, Key Communicator were provided project kit which includes Identity card, Cap. working manual and schedule of work etc. Flex, sticker and leaflet for proper awareness about the project was already circulated within the project area. Awareness programme and other essential activities for the project work are in progress.

Total 2548 householders are to be considered for experimental work in backyard poultry farming unit.

About 6, 42, 982 Man-days are to be created each year by this project.

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

- The undigested rumen contents from cattle and goats are collected from different municipal slaughter houses of Kolkata.
- The fresh samples and the sun-dried samples of indigested rumen contents are being analyzed for their nutrient contents and it has been observed that the sun-dried rumen contents have nutrient composition comparable to de-oiled rice bran and may be incorporated in livestock diet.
- Nutrient analyses reveal that the dried rumen contents contain 20-30% dry matter, 75-85% organic matter, 10-12% crude protein, 60-70% fiber, 0.13-0.15 % calcium, 60-160 ppm copper and 11-20 ppm lead.
- Therefore, the dried rumen contents may be used as a bulk feed having nutrient composition better than rice straw.
- Salient achievements in general: The preliminary work conducted so far under this project indicated that the undigested rumen contents, which otherwise caused environmental pollution, may be successfully recycled as an ingredient of animal feed. The samples are now being analyzed for their microbiological load and are being processed further so that the materials become acceptable to animals. The future course of the project will involve feeding goats (as ruminant proto type) with diets containing the undigested rumen contents in graded quantities and the acceptability of these diets along with the performance of the animals will be ascertained.
- Technology generation: Successful execution of the project is likely to indicate a way for reutilizing an environmental pollutant as a livestock feed ingredient.
- Recommendations for farmers: Final recommendations will be made after successful completion of the project

- Recommendations for scientific community: The goats maintained under the AICRP on Goat and the large ruminants under the AICRP on Nutrient Utilization have already used the diets (silage and complete feed blocks) containing rumen contents. Further research is warranted in this regard to establish the rumen contents as an animal feed ingredient.
- Transfer of technology: Will be done after successful completion of the project
- Commercialization of technology developed by the project: Will be done after successful completion of the project

29. Private Company sponsored project on A Study on Exploring Liquid Lysine and Methionine Hydroxyl Analogue on Performance of Broiler Chickens Fed Lysine and Methionine Dense Diets

- a. Liquid lysine is an effective and superior alternative to lysine.HCl as the source of supplemental lysine in broiler chickens.
 - b. Supplementation of liquid lysine significantly improved the rate of live weight gain, feed conversion efficiency and the slaughter weight of broilers relative to lysine.HCl.
 - c. Increasing the concentration of both lysine and methionine in diet together did not have any added benefit.
 - d. It was, therefore, concluded that supplementing broiler diet with liquid lysine and MHA as sources of lysine and methionine respectively may bring about substantial improvement in broiler performance.
 - e. Increasing the level of lysine and methionine in diet by 20% may not be beneficial and may lead to a diminishing return.
-
- Technology generation: Liquid lysine has been proved to be an effective form of supplemental lysine
 - Recommendations for farmers: Poultry producers may opt for liquid lysine instead of conventional lysine HCl. Liquid lysine is easy to handle, ensures accuracy of the amount added and can be stored with much ease.
 - Recommendations for scientific community: Liquid lysine seems to be more bio-available and further study is warranted to assess its bioavailability values. Effects of elevated levels of lysine and methionine (as MHA) on broiler meat production may be explored further.

39. ICAR project on Effect of Chromium Supplementation on Improvement of Carcass Quality in Goats with Special Emphasis on Immune Modulation

Phase I: Survey work

The project started with a survey work to assess the distribution of chromium in soil, common dietary ingredients and tissue samples of goats. The observed values were compared with the published standards (World Health Organization, 1988 and Puls R., 1994: Mineral levels in Animal Health, 2nd edition, Sherpa International, Clear brook, British Columbia). The findings indicated adequate concentration of chromium in the analyzed samples of feed ingredients and tissue samples of goats.

Phase II: Performance study

Experiment I: The experiment was a preliminary one conducted with the objective of ascertaining the effects of supplemental chromium on various aspects of growth, nutrient digestibility and glucose utilization. Black Bengal goats were supplemented with 0.2 mg chromium as chromic chloride hexahydrate.

It was concluded from the first of this series of the experiments that 0.2 mg Cr as chromic chloride hexahydrate may augment nutrient utilization and body weight gain in black Bengal goats. However, in absence of any stress specific factor Cr supplementation above the dose level of 0.2 mg/day may not yield much beneficial effect in terms of growth performance and nutrient utilization.

Experiment II: In this experiment chromium was supplemented in graded dose levels viz., 0, 0.5, 1.0, 1.5 and 2.0 mg per day to growing goats. Growth performance, nutrient metabolism, glucose utilization and circulatory hormone profiles in the goats were studied. Supplementation lasted 150 days and the findings are summarized below:

- Supplementation of chromium may augment growth performance in growing black Bengal goats.
- Augmentation of the activity of thyroid hormones and that of insulin may be possible by chromium supplementation.
- A dose level of 0.5 mg was found to be the optimum in augmenting the growth performance and glucose clearance. It was at this dose level which reduced the circulatory cortisol level and increased the tissue responsiveness to insulin.

Experiment III: In this experiment an attempt was made to compare the efficacy of chromic chloride hexahydrate, the inorganic reference salt used in this study, with chromium yeast which is an organically complexed form of chromium. The objective of the study was to ascertain the difference in the response criteria due to supplementation of inorganic and organic chromium compounds. The dose level of chromium employed in this experiment was 0.5 mg per day per goat which was based on the findings of the earlier sets of investigation described above. The summary of the findings of the said experiment are listed below:

- Notwithstanding inconsistent effects on body weight and growth performance some notable changes in selected blood metabolites and hormone measurements was possible when Cr was added as a dietary supplement in the diet of the goats.
- It appeared that contrary to the generally accepted hypothesis supplemental Cr may maneuver the metabolism of animals even in a non stressed management regime.
- However, the comparison between Cr chloride and Cr yeast as the source of supplemental Cr remained inconclusive from the present investigation.
- Nevertheless, the lowering of cortisol and circulating cholesterol with an improved glucose tolerance in the goats receiving added dietary Cr suggested that maneuvering the metabolic criteria of non-stressed adult ruminants by added dietary Cr is possible which ought to have a far reaching implication in the management regime of food animals.

Phase III: Study on carcass quality of goats

The objective of this study was to ascertain the stress alleviating effects of chromium in goats as well as to judge the effects of dietary chromium supplementation on different carcass traits and meat quality of black Bengal goats. The dose level of chromium employed in this study has been established through a series of experiments conducted in the project (the results of these studies are depicted earlier). Hence, a dose level of 0.5 mg was selected and the goats were supplemented with this dose level of chromium for 150 days. The sources of chromium were chromium chloride and chromium yeast.

The study revealed that :

- Supplementation of as little as 0.5 mg Cr per day to goats either as Cr chloride or Cr yeast complex may improve body weight and average daily gain in body weight
- Supplemental Cr feeding may effectively reduce the loss in body weight in goats due to shrinkage that occurs during antemortem transportation.
- Supplemental Cr feeding may reduce circulatory cortisol and increase blood insulin level to shift the metabolic pattern of the goats more towards anabolism.
- The consequence was an increased meat protein content in the goats receiving dietary Cr
- The most important aspect of the finding was the reduction in meat fat content and the study revealed that supplementation of 0.5 mg Cr may pave a new way of feeding regime for meat producing ruminants and supplemental Cr may thus be used as a tool for production of low fat meat or the health meat.

Phase IV: Study on immune modulation

According to the mandate of the project the immune modulatory effects of supplemental

chromium was to be determined. Adult black Bengal goats were used as the animal model. The dose level of Cr employed in this study has been established through a series of experiments conducted in the project earlier and accordingly the goats were fed with a concentrate diet supplemented with 0.5 mg Cr/kg. The source of supplemental Cr was $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$ and the method of preparation of the Cr supplemented diet has been described in the earlier sections. The supplementation lasted for 60 days.

Summary of Achievements:

The objective of the study was to ascertain the primary antibody response due to vaccination against pest de petits ruminants and the findings are summarized below:

- Supplementation of 0.5 mg chromium as chromic chloride in diets of goats may efficiently improve live weight gain even in absence of any stressor stimulus.
- The lower clearance rate of glucose from blood during the glucose tolerance test indicated subtle effect of supplemental chromium on insulin sensitivity. This would suggest that the major effects of Cr in ruminants may not be mediated through glucose tolerance.
- The serum hormonal assay and the primary antibody response indicated that growth stimulatory effects of supplemental chromium may be mediated through a shift in metabolic balance more towards anabolism and a consequent enhancement in immune responses.
- The study revealed further that chromium as chromic chloride besides effectively augmenting the growth performance of non-stressed goats, may improve the antibody response against PPR and help conferring immunity to the disease.
- The present investigation revealed that supplemental Cr from $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$ may augment growth performance and feed efficiency in growing black Bengal goats but the effect in the adult goats may not be significant.
- The present study revealed that supplementation of as little as 0.5 mg Cr to the goats may be sufficient to maneuver the metabolism and performance traits of the goats.
- Nutrient digestibility and nitrogen retention coefficient may not be affected by Cr supplementation in goats.
- However, retention coefficient and net balance of some of the essential trace elements (copper, iron, manganese and zinc) may be improved by Cr supplementation.
- A significant reduction in circulatory cholesterol is possible by supplementation of Cr in the diets of goats and the effect is consistent for young and mature goats alike. This ought to help in developing innovative feeding strategies for the farm animals for production of low fat goat meat.

- Clearance rate and serum half life of glucose and insulin may be improved by Cr supplementation suggesting an enhanced utilization of glucose.
 - Cr may improve the clearance rate and reduce the serum half life of insulin also suggesting an enhancement in tissue responsiveness or tissue sensitivity to insulin is possible under the influence of Cr.
 - Dietary supplementation of Cr may bring about a significant increase in serum T3 level, especially in less mature goats, and may cause a decline in circulatory cortisol concentration. These two effects, coupled together may alleviate the stresses which are inevitable even under the normal farm management condition.
 - Supplementation of chromium has been found to be a promising tool for production of low fat meat.
 - Chromium supplementation at the dose rate of 0.5 mg may provide an augmentation effect of primary antibody response in goats vaccinated against peste de petits ruminants.
-
- Technology generation: A chromium enriched mineral supplement has been formulated which will be helpful in production of low-fat healthy meat for human consumption.
 - Recommendations for farmers: Farmers are advised to use the above mentioned chromium rich mineral supplement which will augment productivity of their livestock, stimulate immunity and confer fertility to their stock – hence ensuring a better economic return.
 - Recommendations for scientific community: The unique features of chromium supplementation has been brought into fore by this project. The scientific community may explore the findings further for more accurate determination of the exact mechanism of action of action of this ultra trace element for making more precise recommendations to the farming community.
 - Transfer of technology: The findings have been transmitted to the ICAR for transfer of technology.



Dignitaries on the dias in the inaugural ceremony of RKVV on Development of a model for sustainable backyard poultry farming in West Bengal



Phaco-surgery for cataract operation is going on the Dept. of Veterinary Surgery & Radiology



Dean, F/VAS receiving Fellowship during convention of Indian Canine Congress



High power committee on Bird flu constituted with University personnel, by Govt. of West Bengal visiting at Murshidabad district



Faculty teacher Dr. S. K. Nandi being awarded by the Union Minister of Agriculture, Govt. of India



Dairy processing plant under Faculty of Dairy Technology



Dignitaries on the dais in the 4th convocation of the University



Meat processing plant at Dept. of APTM



PI, AICRP on Improvement of feed resources...animal production in the animal health camp



Faculty teacher investigating horse health at Calcutta Police Department



Teaching Veterinary Clinical Complex building at Belgachia campus



Hon'ble Vice Chancellor, Director of Res., Extn. & Farms and PI, AICRP (Goat) visiting project activities at Nadia district

TRANSFERABLE TECHNOLOGIES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

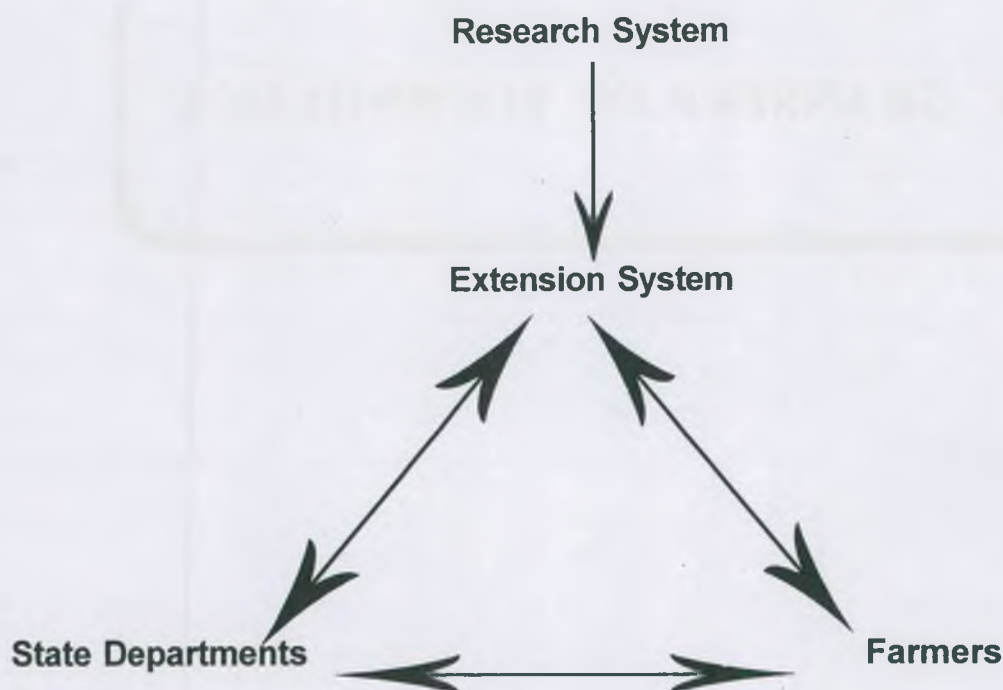
19. Green fodder production technology in rainfed disadvantageous districts is available.

20. Adequate livestock & poultry health care support system to prevent both morbidity and mortality losses.
21. Fodder development through integration of food, horticulture and fodder crops.
22. The utilization of Sal seed & Mahua meal seed in livestock feed, which are available in plenty in the district of Purulia and Bankura for economic milk production.
23. Model for development & regeneration of common property resources for use by the poor livestock farmers.
24. The merits and demerits of the use of probiotics in fresh water aquaculture have been derived.
25. Computer based programme to determine the nutritional status of livestock has been evolved.
26. Stocking of 6-12 month old stunted Carp (100-150 g size) instead of fry or fingerling in the pond for higher fish production. Average fish yield was 3560 kg/ ha/year. Income: Expenses ratio was 2.68 with net-profit of 1,10,595 ha/ year. *Masobranchim rosenbergi*.
27. Inclusion of high value species freshwater prawn in carp fishery farming. Average fish yield of fish and prawn were 2184 kg and 122 kg respectively per ha. Carp of 9 month. Income: Expenses ratio was 2.16 with net-profit of Rs. 68,400/- per ha per crop.
28. Integration of duck rearing with fish farming has been found more profit through integrated farming system.
29. Collection of miscellaneous fish juveniles from paddy fields during monsoon & culturing them in seasonal ponds for 4-6 months. Income: Expenses ratio was 3.14 with net profit of Rs. 26,000/- per ha per crop.
30. Livelihood improvement of fishermen through culture of fish in village canal. After 6 months of culture period, the average production of fish was 520 gm. Income: Expenses ratio was 3.1.
31. Endangered and threatened fish varieties of the State have been identified.
32. Technologies for proper utilization of low cost unutilized marine fishes by value addition have been established.
33. Low cost technology on value addition to dairy and meat products.
34. Technologies for hygienic preparation of certain milk products like rasogolla, sandesh etc. have been formulated.
35. Trypanosomiasis, an economically important disease of cattle and buffaloes was found highly prevalent in hot and highly humid months of the year in the State of West Bengal. Isometamidium chloride / hydrochloride at the dose level of 0.5 mg/kg I.M. at 1% solution in distilled water was established highly effective to control the disease within 24 hours.

36. Standardization of immunobiochemical techniques was done for isolation purification and immunobiochemical characterization of parasitic and bacterial antigens.
37. Modified DNA isolation and Polymerase Chain Reaction (PCR) technology.
38. HPLC determination of residual antibiotics and pesticides from meat, milk and foods was made.
39. Water Bacteriology techniques were determined to study on water borne pathogens.
40. Standardization of Microscopical Agglutination Test (MAT) was made for Serodiagnosis of Leptospirosis, both in man and animals.
41. Established and standardized Ultrasonography studies on canine for different urogenital and hepatic disorder.
42. Surgical procedure has been standardized for cataract surgery in dogs by highly sophisticated phacoemulsification technique.
43. Standardization made on anaesthetic regimen for anaesthetization of ruminants by subarachnoid anaesthesia.
44. Developed the technique of operation for Urolithiasis of dog in field condition.
45. Use of ceramic bone grafts and bioceramic based drug delivery system has been established for treatment of osteomyelitis in animal.
46. A six-seam semi-pelagic trawl net with a head-rope length of 30.3 m was designed for boomfret fishery.
47. Developed a new Economic Growth Model for the sustainable upliftment of the socio-economic condition of the fisher folk at Purba Medinipur district of West Bengal.

D. TRANSFER OF TECHNOLOGY

Extension system in animal and fishery sector is concerned with the successful transfer of technologies to the farming community to increase productivity, employment and income generation. On the other side, it provides need-based feed back to influence the research, education and training module set up. Such education also forces the act of transferring innovation through proper education of the concerned personnel so that they are properly trained and the skills are acquired for conviction, action and adoption. Since the inception of organized extension programmes in the country, farmers' participation has been given prime emphasis. This system operates as a farmers' programme with the presence of scientists and extension educationists, alongwith the support and initiative of the Government and non-government organisations. 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.



TRANSFER OF TECHNOLOGY

D.1. PUBLICATION OF RESEARCH FINDINGS

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DIRECTORATE OF RESEARCH, EXTENSION AND FARMS

D.2. PUBLICATION OF SCIENTIFIC AND EXTENSION LITERATURE

1.	News letter	2
2.	Annual Report	2
3.	Faculty at a glance	5
4.	Leaflets in Bengali	5
5.	Compendium of training programmes	10
6.	University at a glance	5
7.	Status of KVKs under WBUAFS	1
8.	Epidemiological Investigation Report on Bird flu outbreak in West Bengal	1
9.	Books in Bengali	10
10.	Monograph of VCI Course	2
11.	Laboratory manuals	16
12.	Technology Manuals	5
13.	Package of practices	5

D.3. TRAINING PROGRAMMES ORGANISED

Sl. No.	Title	Duration (days)	Gen	SC	ST	OBC	Male	Female	Total no. of trainees
1	Skill upgradation training of fisher-folk involved in fish handling & processing	5	23	6	3	0	32	0	32
2	Skill development training on composite fish farming	5	3	24	0	1	19	8	28
3	Skill development training on poultry & duck rearing	5	9	27	0	0	1	35	36
4	Skill development training on nursery rearing of fish	5	4	10	13	0	0	27	27
5	Skill development training on poultry & duck rearing	5	23	7	0	0	5	25	30
6	Skill development training on clean milk production & production of indigenous dairy products	5	21	13	0	4	0	38	38
7	Skill development training on nursery rearing of fish	5	2	27	0	0	24	5	29
8	Skill development training on composite fish farming	5	11	20	0	1	14	18	32
9	Skill development training on poultry & duck rearing	5	24	7	2	4	6	31	37
10	Skill development training on pig rearing	5	4	25	9	0	10	28	38
11	Skill development training on poultry & duck rearing	5	28	5	0	0	10	23	33
12	Refresher course on goat, poultry & pig farming	9	14	5	0	1	20	0	20
13	Skill development training on goat farming	5	6	17	3	0	12	14	26
14	Model Training Course on value added products of feed from animal origin – its processing & marketing	8	7	3	0	2	2	10	12
15	Refresher course on animal husbandry	10	16	3	0	1	20	0	20
16	Skill development training on poultry & duck farming	5	8	16	2	4	0	30	30

Sl. No.	Title	Duration (days)	Gen	SC	ST	OBC	Male	Female	Total no. of trainees
17	Skill development training on composite fish farming	5	27	18	4	8	8	49	57
18	Skill development training on poultry & duck rearing	5	17	9	0	1	0	27	27
19	Refresher training course under continuing veterinary education on frozen semen technology	6	-	-	-	-	-	-	40
20	Summer training course on immunobiochemical techniques for diagnosis of diseases	30	-	-	-	-	-	-	60

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

1. State Fruit, Fish and Animal Resource Festival – 2008 at Amritlal College, Baruipur, South 24 Parganas, West Bengal.
2. Krishi Samridhimela, Paikpara, 2007
3. Krishi Mela, Teleniapara, N. 24 Parganas, 2007
4. Agricultural Exhibition at Uluberia, Howrah, 2008
5. Educational Exhibition, Kolkata, 2008

D.5. CONSULTANCY

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

D.6. DOCUMENTARY FILM PRODUCED

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

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

D.7. ACTIVITY OF KRISHI VIGYAN KENDRAS**D.7.1. JALPAIGURI KRISHI VIGYAN KENDRA****1. Abstract of different training programmes conducted**

Discipline	No. of training courses		No. of Participants											
			SC			ST			OTHERS			TOTAL		
	On Campus	Off Campus	M	W	T	M	W	T	M	W	T	M	W	T

PRACTICING FARMERS :

Agronomy	11	28	204	882	1086	61	59	120	28	110	138	293	1051	1344
Horticulture	11	44	283	1103	1386	17	30	47	69	378	447	370	1510	1880
Animal Science	5	8	102	78	180	15	128	143	31	32	63	232	238	470
Home Science	3	9	-	171	171	-	5	5	-	36	36	-	212	212
Total	30	89	589	2234	2823	93	222	315	128	556	684	895	3011	3906

RURAL YOUTH

Agronomy	1	-	11	-	11	-	-	-	4	-	4	15	-	15
Horticulture	1	-	10	-	10	1	-	1	4	-	4	15	-	15
Animal Science	3	2	70	27	97	4	26	30	33	11	44	107	94	201
Total	5	2	91	27	118	5	26	31	41	11	52	137	94	231

EXTENSION FUNCTIONERIES

Agronomy	2	-	8	-	8	-	-	-	10	2	12	18	2	20
Horticulture	2	-	15	-	15	-	-	-	15	-	15	30	-	30
Total	4	-	23	-	23	-	-	-	25	2	27	48	2	50

2. Abstract of Frontline demonstrations (FLD):

Discipline	No. of FLDs		No. of beneficiaries											
	Initiated (No./ ha)	Completed (No./ha.)	SC			ST			OTHERS			TOTAL		
			M	W	T	M	W	T	M	W	T	M	W	T
Agronomy	114	30	50	26	76	8	-	8	22	8	30	80	34	114
Horticulture	2545	360	1200	620	1820	215	45	260	260	205	465	1675	870	2545
Animal Science	10	200	2	1	3	3	-	3	1	-	1	9	1	10
Total	2669	590	1252	647	1899	226	45	271	283	213	496	1764	905	2659

3. Abstract of On-farm trial/On-station testing (OFT/OSTs) :

Discipline	No. of OFT/OSTs		No. of beneficiaries												TOTAL
	Initiated (No. /ha.)	Completed (No /ha.)	SC			ST			OTHERS			TOTAL			
			M	W	T	M	W	T	M	W	T	M	W	T	
Agronomy	1	1	8	-	8	-	-	-	-	-	-	8	-	8	8
Horticulture	2	2	16	-	16	-	-	-	-	-	-	16	-	16	16
Animal Science	1	1	-	-	-	4	-	4	-	-	-	4	-	4	4
Home Science	1	1	-	6	6	-	-	-	-	2	2	-	8	8	8
Total	5	5	24	6	30	4	-	4	-	2	2	28	8	36	36

Salient achievements through OFT/OSTs:**Horticulture Section:**

Low yield of chilli & brinjal due to pest infestation is a major problem in terai region. Using bleaching powder @ 30 kg. per ha. And lime @ 750 kg per ha. 15 – 20 days before planting shows good result. Along with this spraying of Monocrotophos and Carbendizim as and when required gives a very good result to get a good yield

. Abstract of other extension activities:

Nature of	No. of activities	Farmers			Extension Officials			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Field Day	12	340	-	340	2	-	2	342	-	342
Kisan Mela	1	13000	16000	29000	53	21	74	13053	16021	29074
Kisan Goshthi / Mahila Goshthi	20	200	200	400	5	3	8	205	203	408
Exhibition	2	23000	26000	49000	103	101	204	23103	26101	49204
Film Show	5	575	300	875	25	5	30	600	305	905
Method										
Demonstrations	18	222	138	360	4	1	5	226	139	365
Farmers Seminar	4	450	350	800	10	3	13	460	353	813
Workshop										
Group meetings	25	400	100	500	4	2	6	404	102	506
Lectures delivered by resource persons	120	2500	1100	3600	4	2	6	2504	1102	3606
Newspaper coverage	11	-	-	-	-	-	-	-	-	-
Radio talks	3	-	-	-	-	-	-	-	-	-
TV talks	5	-	-	-	-	-	-	-	-	-
Popular articles	5	-	-	-	-	-	-	-	-	-
Extension Literature	5	-	-	-	-	-	-	-	-	-
Advisory Services	109	-	-	-	-	-	-	-	-	-
Scientific visit to farmers field	109	75	200	275	5	2	6	80	202	282
Farmers visit to KVK	1265	437	828	-	-				828	1265
Diagnostic visits	12	450	35	485	2	1	3	452	36	499
Exposure visits	10	83	79	162	-	-	-	-	-	-
Ex-trainees Sammelan	-	-	-	-	-	-	-	-	-	-
Conveners meet	12	107	-	107	-	-	-	-	-	
Conveners meetings	10	-	200	200	-	-	-	-	-	

Conveners meetings	32	-	1280	1280	-	-	-	-	-	
Independence Day	1	158	76	234	10	2	12	168	78	246
Total	1,796	41,947	46,886	88,883	227	143	370	42,224	47,029	89,253

5. Linkages established with other organizations / line departments / institutes.

Sl. No.	Name of the organization / line department / institutes etc.	Area (activity) of linkage
1	District Rural Development Cell	Training
2	Uttar Banga Krishi Viswavidyalaya	Technical support
3	Jalpaiguri Zilla Parishad	Infrastructure
4	National horticulture Mission, Jalpaiguri.	Area expansion under Horticultural Crops
5	ATMA, Jalpaiguri	Training and On Farm Trial
6	Backward Classes Devp. Dept., govt. of W.Bengal	Training for SHG group leaders & Co-leaders

6. Major achievement / Success story :

A. POPULARIZATION OF GHOONGROO PIG PRODUCTION

Based on this thrust area Ramshai KVK organizes long term vocational training programmes on "Ghoongroo pig production as a profitable enterprise for un-employed rural youth. The farmers of this area who have participated in the piggery training programme already started their own piggery farm. They took the challenge to earn more what they learnt from Ramshai KVK by seeing is believing and doing by learning. The Subject Matter Specialist from Ramshai KVK also visited their farm in a regular interval to boost up their spirit and to provide necessary advice. During the last 5 (five) years the main achievements obtained through the vocational training programmes on Ghoongroo Pig productions are as follows :

Key points of the success story gained through training programmes :

- Total Nos. of Training Programmes conducted (during the last 5 yrs.) : 14
- Total Nos. of Beneficiaries participated (during the last 5 yrs.) : 452
- Total Cost of Training Programmes : Rs.1,20,000/-
- Adoption (%) of Ghoongroo Pig Production : 60 %
- Income / Family / Month with a unit of 5 breeding stock : Rs.3000/-
- Mandays generated / Unit / Year : 188

- Total Nos. of Self-Employments : 180
- The Cost - Income Ratio in Pig Farming : 1 : 1.8

B. POPULARIZATION OF CULTIVATION OF ELEPHANT FOOT YAM (OL)

Jalpaiguri district with its conducive agro-climatic condition offers a vast potential for development of horticultural crops, specially, Elephant Foot Yam. Based on the thrust area analyzed through PRA conducted in the village level, Ramshai KVK organizes long term vocational training programme on “ Skill development training on agro techniques for producing different horticultural crops ”. This crops favours light sandy soil with high organic matter content. Elephant Foot Yam helps farmers to earn more income per unit area, enhance productivity per unit area, generate more employment opportunity. Elephant Foot Yam is not a perishable product, so, market glut or influence of market intermediates can be avoided to get perfect price. It improves nutritional & health standard of livelihood.

These skill development vocational training programme is formulated with following objectives:

- Enhanced productivity per unit area.
- Helped the farmers and farm women to earn more income per unit.
- To exploit available natural resources.
- To generate employment opportunity for women & weaker section of the farming community.
- To uplift economic condition & social recognition.
- To exploit agro-climatic advantage.

For successful implementation of the training programme organized by Krishi Vigyan Kendra, special venture has been taken to implement the scheme at the potential pocket of the district, 6 blocks viz. Maynaguri, Dhupguri, Jalpaiguri Sadar, Malbazar, Matiali and Rajganj are selected for implementation of the scheme according to the suitability of the crop production. Beneficiaries for the scheme are selected by the KVK personnel keeping close contact with the rural leaders, belonging to below poverty line (BPL), mostly under backward classes. Individual beneficiaries having experience in cultivation practices are given preference. Potential villages having suitable land situation and textual classes of soil are considered. Firstly KVK personnel demonstrated the Elephant Foot Yam (OL) cultivation in the instructional farm profitably where similar soil condition and land situation and weaker condition prevails. So, this scheme was formulated and implemented in their fields. Under this scheme seed material, fertilizer and plant protection chemicals required

for $\frac{1}{2}$ bigha land was provided to each farmers. They were motivated to cultivate the Elephant Foot Yam, through the training programme organized at the Krishi Vigyan Kendra by following the learning by doing method. At the end of the scheme farmers produced. In an average 60 qntl. Per bigha Elephant Foot Yam was produced by individual farmer, which costs Rs. 48,000=00 (@ 800=00 per quintal). The farmers are interested to continue Elephant Foot Yam cultivation for coming year. During the last 5 years the main achievement obtained through the vocational training programme and demonstration programme are as follows.

Key points of the success story gained through Popularisation of Elephant Foot Yam (OLEF)

✓ Total no. of training programme conducted	:	56
✓ Total no.of beneficiary participated	:	2352
✓ Area under cultivation	:	70.4 ha.
✓ Total cost for demonstration scheme (Sponsored by RSVY scheme of Planning Commission, Govt. of India)	:	60.18 lakhs
✓ Total cost of training programme (Sponsored by RSVY scheme of Planning Commission, Govt. of India)	:	5.20 Lakhs
✓ Cost benefit ratio	:	1 : 2 . 2
✓ No. of mandays generated (34 mandays per bigha) (land preparation, pit making, sowing, intercultural & harvesting)	:	17952

D.7.2. MURSHIDABAD KRISHI VIGYAN KENDRA**1. Abstract of different Training programmes:**

Discipline	No. of training		No. of Participants												
	courses		SC			ST			OTHERS			TOTAL			TOTAL
	On Campus	Off Campus	M	W	T	M	W	T	M	W	T	M	W	T	
PRACTICING FARMERS :															
Animal Science	5	4	148	81	229	2	0	2	204	201	405	354	282	636	636
Soil Science	7	2	208	4	212	6	0	6	412	38	450	626	42	668	668
Horticulture	7	3	154	8	162	7	0	7	333	35	368	494	43	537	537
Total	19	9	510	93	603	15	0	15	949	274	1223	1474	367	1841	1841

RURAL YOUTH

Animal Science	1 (one Phase)	0	3	7	10	0	0	0	14	6	20	17	13	30	30
Horticulture	2 (two Phase)	0	10	0	10	2	0	2	18	0	18	30	0	30	30
Soil Science	2 (two Phase)	0	9	0	9	0	0	0	25	2	27	34	2	36	36
Total		0	22	7	29	2	0	2	57	8	65	81	15	96	96

2. Abstract of Frontline demonstrations (FLD):

Discipline	No. of FLDs		No. of Participants												
	On Campus	Off Campus	SC			ST			OTHERS			TOTAL			TOTAL
			M	W	T	M	W	T	M	W	T	M	W	T	
Animal Science			6	0	6	0	0	0	24	0	24	30	0	30	30
Horticulture		1 (1 ha)- Cabbage	3	0	3	0	0	0	4	0	4	7	0	7	7
	1 (0.5ha)- Broccoli		2	0	2	0	0	0	6	0	6	8	0	8	8
Soil Science	1/1 ha		3	0	3	1	0	1	4	0	4	8	0	8	
(Mustard)	1/5 ha-														
Black gram)		18	0	18	0	0	0	23	0	23	41	0	41		
Total			32	0	32	1	0	1	61	0	61	94	0	94	

Salient achievements through FLDs:**Horticulture section:**

1. Cabbage: From the FLD “Introduction of high yielding cabbage variety- Rare Ball” the yield from unit area is increased by 19.04% in comparison to the Farmers’ Variety.

2. **Spouting Broccoli:** It is a newly introduce crop in this area. The crop is in standing condition in the farmer’s field. Harvesting of 1-2 head/curd of broccoli has been started. According to the recent information from the farmers they fetch a very good price for their new crop in the market as compare to the other traditional crops from their field. The target is to introduce the new crop and increase their income.

Animal Science section: 1. 80% coming in estrous

2. 8-10% increased in milk production

Soil Science section: 1. Introduction of biofertilizer as inoculating material for cultivation of Black Gram Sarada(WBU-108) variety.

2. Introduction of NC-1 variety for cultivation of Mustard.

3. Abstract of On-farm trail (OFT):

Discipline	No. of OFT/OSTs		No. of beneficiaries												TOTAL
	Initiated (No. /ha.)	Completed (No ./ha.)	SC			ST			OTHERS			TOTAL			
			M	W	T	M	W	T	M	W	T	M	W	T	
Animal science			0	0	0	0	0	0	8	0	8	8	0	8	8
Horticulture		1 (1 ha)- Pea	3	0	3	2	0	2	3	0	3	8	0	8	8
		1 (0.48ha)- Okra	1	0	1	1	0	1	5	0	5	7	0	7	7
Soil Science	1(1ha) Mustard 1(1ha) Wheat		1	0	1	0	0	0	6	0	6	7	0	7	7
Total			5	0	5	3	0	3	22	0	22	30	0	30	30

Salient achievements through OFTs:

Horticulture section:

1. **Pea:** From the trial "Evaluation of high yielding varieties of green pea" the Benefit Cost ratio of farmer was increased from 1.27 (traditional local variety) to 2.13 incase of variety Azad P-1 and 2.63 incase of variety PSM-3.

2. **Okra:** The main objective was to make the farmer to aware about tolerate variety of okra to reduce the percentage of infestation of Yellow Vein Mosaic Virus. The results of trial showed that the infestation of YVMV was very less and net return increased remarkably.

Soil Science section:

1. **Mustard:** Assessment the performance of sulphur application on mustard under irrigated medium land of Murshidabad – standing crop

2. **Wheat:** Assessment of yield performance of wheat against balanced nutrition under irrigated medium land of Murshidabad district.- standing crop

4. Abstract of other Extension activities during the period.

Sl No.	Activity	No. of Activities organized	Durati on	No. of beneficiaries												TOTAL
				SC			ST			OTHERS			TOTAL			
				M	W	T	M	W	T	M	W	T	M	W	T	
1	Sponsored Training programme	1	1 Day	14	0	14	2	0	2	18	0	18	34	0	34	34
Total		1	1	14	0	14	2	0	2	18	0	18	34	0	34	34
2	Field Day on Mustard	1	1 day	5	0	5	0	0	0	29	6	35	34	6	40	40
	Field Day on Black gram	1	1 day	12	0	12	13	0	13	6	0	6	31	0	31	31
Total		2		17	0	17	13	0	13	35	6	41	65	6	71	71
3	Scientist visit to farmers field	1		74	4	78	6	0	6	139	16	155	219	20	239	239
Total		1		74	4	78	6	0	6	139	16	155	219	20	239	239
4	Farmers visit to KVK			64	4	68	2	14	16	243	50	293	309	68	377	377
Total		1		64	4	68	2	14	16	243	50	293	309	68	377	377

5	Awareness camp			86	7	93	26	0	26	126	55	181	238	62	300	300
Total				86	7	93	26	0	26	126	55	181	238	62	300	300
6	Participation at Mela			31	13	44	1	0	1	207	68	275	239	81	320	320
Total				31	13	44	1	0	1	207	68	275	239	81	320	320
7	Soil sample collection for testing			9	0	9	0	0	0	0	33	0	33	42	0	42
Total				9	0	9	0	0	0	0	33	0	33	42	0	42

5. Linkages established with other organizations/line departments/ institutes.

Sl.No.	Name of the organization/ line department/ institutes etc	Area (activity) of linkage
1.	PAO, Murshidabad	Formulation of action plan, RKVY,
2.	NABARD	Formulation of action plan.
3.	ARD	Formulation of action plan.
4.	District Horticulture Department (National Horticulture Mission)	Formulation of action plan, Participation in meeting and funding for rejuvenation of mango trees and establishment of vermicompost unit
5.	Pulse & Oil Seed Research station, Berhampore	Testing of soil sample and supply of Bio-fertilizer

6. Details of outside fund received for the sponsored projects/training/seminar etc.

Name of the Activity (project/ training/seminar/ camp etc. with Duration (Dates))	Name of the sponsoring organization/ line department/ institutes etc.	Total fund received or sanctioned for the purpose
a) Rejuvenation of old fruit plant	National Horticulture Mission	a) 8,000.00
b) Vermicomposting Unit		b) 60,000.00
Sponsored training programme	Karnataka Agro Chemicals	1800.00

Major achievement / Success story:

A. Horticulture: i) Demonstration plots of Broccoli, red cabbage, Chinese cabbage, Gladiolus, mango seedling raising for grafting the next year.

B. Soil Science: i) Seed production at farmer's field on mustard and lentil.
 ii) Black gram seed production at KVK campus.
 iii) Biofertilizer (Azolla) unit at KVK campus.
 iv) Demonstration plots of Wheat and Mustard at KVK campus.

Other achievements:**Publication of Extension literature in Bengali**

1. Sarser chas sambandhe prayojaniya tathya	Abhishake Naskar, SMS in Soil Science
2. Mati parikhar janya namuna sangraher padhati	Abhishake Naskar, SMS in Soil Science
3. Pat chas	Abhishake Naskar, SMS in Soil Science
4. Dhnyras chas	Soma Giri, SMS in Horticulture
5. Aam chas	Soma Giri, SMS in Horticulture
6. Lichu chas	Soma Giri, SMS in Horticulture
7. Kala chas	Soma Giri, SMS in Horticulture
8. Sabjir sustha sabal chara gachh tari karun	Soma Giri, SMS in Horticulture
9. "Bird flu" atanka nay satarka han	Dr. C. C. Samanta, SMS in Animal Science

9.7.3. NORTH 24 PARGANAS KRISHI VIGYAN KENDRA**Abstract of different Training programmes:**

Discipline	No. of training		No. of Participants											
	courses		SC			ST			OTHERS			TOTAL		
	On Campus	Off Campus	M	W	T	M	W	T	M	W	T	M	W	T

PRACTICING FARMERS :

Agronomy	-	10	90	02	92	10	-	10	370	03	373	473	05	478	478
Horticulture	06	-	12	-	12	10	-	10	100	-	100	132	-	132	132
Fishery	-	04	15	07	22	-	-	-	60	40	100	75	47	122	122

Animal Science	02	05	112	19	131	08	10	18	216	10	346	336	159	495	495
Animal Health	-	05	40	09	49	02	03	05	100	140	240	142	152	294	294
Home Science	-	01	10	10	20	-	-	-	15	25	40	25	35	60	60
Total	08	25	279	47	326	30	13	43	861	338	1199	1183	398	1581	1581

2. Abstract of Frontline demonstrations (FLD):

Discipline	No. of FLDs		No. of beneficiaries												
	Initiated (No. /ha.)	Completed (No. /ha.)	SC			ST			OTHERS			TOTAL			TOTAL
			M	W	T	M	W	T	M	W	T	M	W	T	
Agronomy	-	05	20	-	20	-	-	-	77	-	77	97	-	97	97
Horticulture	-	02	-	-	-	-	-	-	11	-	11	11	-	11	11
Fishery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Animal Science		01	16	10	26	09	-	09	150	31	181	175	41	216	216
Animal Health	01	01	15	05	20	07	-	07	75	20	95	97	25	122	122
Total	01	09	51	15	66	16	-	16	313	51	364	380	66	446	446

3. Abstract of On-farm trial/On-station testing (OFT/OSTs) :

Discipline	No. of OFT/OSTs		No. of beneficiaries												
	Initiated (No. /ha.)	Completed (No. /ha.)	SC			ST			OTHERS			TOTAL			TOTAL
			M	W	T	M	W	T	M	W	T	M	W	T	
Agronomy		01	03	-	03	-	-	-	08	-	08	11	-	11	11
Horticulture	02	01	06	-	06	-	-	-	24	-	24	30	-	30	30
Fishery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Animal Science	01	-	05	03	08	-	-	-	15	05	20	20	08	28	28
Animal Health	01	-	3	-	03	-	-	-	04	-	04	07	-	07	07
Total	04	02	17	03	20	-	-	-	51	05	56	68	08	76	76

4. Abstract of other Extension activities :

Sl No.	Activity	No. of Activities organized	Durati on	No. of beneficiaries												TOTAL
				SC			ST			OTHERS			TOTAL			
				M	W	T	M	W	T	M	W	T	M	W	T	
1	Field Day	10	1 Day	50	04	54	36	-	36	100	10	110	186	14	217	217
2.	Kisan Mela	1	8 days	100	20	120	22	-	22	280	33	313	402	53	455	455
3.	Method Demon.	06	1 day	37	10	47	02	-	60	11	71	99	21	120	120	
4.	Advisory Service	52	1 day	15	10	25	05	-	05	80	12	92	100	22	122	122
5.	Newspaper coverage	05														
6.	Estension literature	15														
Total		89	-	202	44	246	65	-	65	520	66	586	787	110	914	914

Action Photos



Dignitaries on the dias in the inaugural ceremony of Krish-o-Mahila Samridhhi Mela at Jalpaiguri KVK



Hon'ble Vice Chancellor, former Director of Res, Extn. & Farms & PI, Centrally sponsored project on threatened breed (Boipale sheep) visiting sheep farm at Jalpaiguri KVK



Animal Health camp being organized by North 24 Parganas KVK



Hon'ble Vice Chancellor visiting the FLD plots under North 24 parganas KVK



Members of Executive Council visiting Murshidabad KVK



Animal Health camp being organized by Murshidabad KVK



Hon'ble Vice Chancellor in the DRDC, North 24 Parganas district assisted skill development training programme for SHG women



Participants with University officers in the refresher training course for rural youth



Progressive farmer and PI under AICRP on Goat Improvement



Field visit of participants under the skill development training programme on composite fish farming



AICRP on Improvement of feed resources... animal production at Assam



Hon'ble Vice Chancellor addressing the trainees of skill development training programme of SHGs

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

FACULTY OF VETERINARY AND ANIMAL SCIENCES

Department of Veterinary Biochemistry

Title of Seminar, symposium, workshop, training etc.	Venue	Duration	Name of faculty members participating
Participated in the 8 th Indian Veterinary Congress and XV th annual conference of IAAVR and National Symposium on "Public-Private-Partnership in Veterinary Research and Education Sector"	WBUAFS	22-24 th February, 2008	Subhasis Batabyal Saibal Chattopadhyay
Participated in the XXXV th Annual National Conference of Clinical Biochemists of India.	Vedic Village Kolkata.	19-20 December, 2008	Subhasis Batabyal

Department of Veterinary Gynaecology & Obstetrics

Title of Seminar, symposium, workshop, training etc.	Venue	Duration	Name of faculty members participating
Challenges in improving reproductive efficiency of farm and pet animals	OUAT, Bhubaneswar, Orissa	7 th -9 th Dec' 2007 (3 days)	Prof. Siddhartha Basu
Twenty third Annual Convention of ISSAR and National Symposium on "Challenges in improving reproductive efficiency of farm and pet animals"	Department of Gynaecology, Orissa Vet. College, Bhubaneswar-751003	7 th to 9 th Dec' 2007 (3 days)	Dr. Syamal Kumar R
23 rd Annual convention of ISSAR and National Symposium on "Challenges in Improving Reproductive Efficiency of Farm and Pet animals".	Department of Gynaecology, Orissa Veterinary College, Bhubaneswar- 751003	7 th to 9 th Dec'2007 (3 days)	Dr. Pramode Ranjan N

National seminar on “Public-private-partnership (PPP) in Veterinary Research and Education Sector” organized by Indian Association for Advancement of Veterinary Research	F/O-VAS, WBUAFS, Kolkata-37	22 nd to 24 th Feb’2008	Dr. Pramode Ranjan Nandi
Recent perspective of Nanoscience and Technology	Jadavpur University, Kolkata-700032	4 th to 26 th Dec’2008	Dr. Uttam Datta
Public-private-partnership (PPP) in Veterinary Research and Education Sector	F/O-VAS, WBUAFS, Kolkata-37 and IAAVR	22 nd to 24 th Feb’2008	Dr. (Mrs.) Kalyani Ray

Department of Veterinary Public Health

Title of Seminar, symposium, workshop, training etc.	Venue	Duration	Name of faculty members participated
Participated in “APRICON-2004, 6 th Annual Conference on Rabies organized by the Association for Prevention and Control of Rabies in India”	ITC Sonar Bangla Sheraton Hotel and Tower at Kolkata.	July 9 to 11, 2004	Dr. C. Debnath
6 th All India Conference and National symposium on” Sustainable production of safe food of animal & fish origin Public Awareness and peoples’ Participation.	Krishi Vigyan Kendra, Ramkrishna Ashram, Nimpith, 24-Parganas (s)	18-20 th December, 2004	Dr. C. Debnath Dr.A.K.Pramanik Dr. Utpal Das
7 th All India Conference of APHV & National Symposium on « Prospective Role of Vety.	Orissa Univ. of Agricultural Technology	7 th to 8 th December 2006	Dr.A .K.Pramanik

Public Health in Integrated rural development.	Auditorium Bhubaneswar		
Attended Winter School on "Pesticides and veterinary drug residues in foods of animal origin"	Department of Veterinary Public Health, C.V.A.Sc., GBPUA&T, Pantnagar, Uttarakhand.	Feb. 24 to Mar. 15, 2008	Dr. C. Debnath
Global meet on Veterinary Public Health and Symposium on "New Horizons in Food Security with Special Reference to Veterinary Public Health & Hygiene-Evolving Strategies with Global Perspective" of APHV.	Hotel Taj Residency, Lucknow, UP, India.	November 19 th to 21 st , 2008	Dr. C. Debnath Dr.A.K.Pramanik
Participated in the "52 nd Conference of the Indian Public Health Association, West Bengal State Branch"	Rabindra Bhawan, Barasat, West Bengal.	26 th Oct, 2008	Dr. C. Debnath Dr.A.K.Pramanik

Department of Veterinary Surgery & Radiology

Title of Seminar, symposium, workshop, training etc.	Venue	Duration	Name of faculty members participated
8 th Indian Veterinary Congress and XV Annual Conference of IAAVR and National Symposium on Public-private partnership (PPP) in Veterinary research and education sector	Kolkata	22-24 February, 2008	Prof. (DR). D.K. De, Dr. Samar Halder, Dr. S. K. Nandi

National Conference of Indian Society for Veterinary Surgery	Namakkal, Tamilnadu	7 to 8 Oct., 2008	Prof. (DR). D.K. De Dr D. Ghosh, Dr Asit Maji
Global meet on Veterinary Public Health	Lucknow	19-21 st Nov., 2008	Prof. (DR). D.K. De Dr Asit Maji
VCI Seminar in Hyderabad	Hyderabad	13-14 Dec., 2008	Prof. (DR). D.K. De
All VC and Deans meeting organized by VCI	New Delhi	November, 2008	Prof. (DR). D.K. De
SAARC canine congress	Chennai	February, 2007	Prof. (DR). D.K. De
15th Symposium and the 7th Conference on "Lameness in Ruminants"	Kuopio, Finland	9 – 13 June, 2009	Dr. S. K. Nandi
The 15th Congress of the Federation of Asian Veterinary Association and OIE Symposium	Bangkok, Thailand	27-30 Oct., 2009	Dr. S. K. Nandi
Advanced Refresher Training course on "Imaging techniques for veterinary patients with special reference to ultrasonography"	GADVASU, Ludhiana	1-21 February, 2008	Dr. S. K. Nandi Dr D. Ghosh
UGC sponsored refresher course on "Recent perspective of Nanoscience and Technology"	UGC-Academic staff college, Jadavpur University	4 – 26 Dec., 2009	Dr. S. K. Nandi
Refresher Training course on Nutrition in wild animals	IVRI, Bareilly	28 Nov. to 18 Dec., 2008	Dr D. Ghosh
Short term training on "Electro physiology of vision" at L.V. Prasad Eye Institute	Hyderabad	1-30 April 2008	Dr (Mrs) S. Hazra

Short term training on "Phacoemulsification" from R.P.Center for ophthalmic sciences	All India Institute of Medical Sciences, New Delhi.	1- 30 Dec. 2008	Dr (Mrs) S. Hazra
XLV ISCEV Symposium	Hyderabad, India	25-29 Aug., 2007	Dr (Mrs) S. Hazra
World ophthalmology Congress	Hong Kong	28 June-2 July 2008	Dr (Mrs) S. Hazra
Winter school on USG and other techniques in disease diagnosis and reproduction in farm and pet animals	Madras Veterinary College, TANUVAS	3 -23 Dec., 2007	Dr Asit Maji

Department of Animal Products Technology & Marketing

Title of Seminar, symposium, workshop, training etc.	Venue	Duration	Name of faculty members participated
National Seminar on Prospective of Meat Industry in India organized by Indian Meat Scientists Association	Bangalore Veterinary College	6-8 July, 2008	Prof. S. Biswas, Dr. B. Bhattacharyya
OIE Conference on Food Safety and Standardization organized by Federation of Asian Veterinary Association	Bangkok, Thailand	27 - 30 Oct., 2009	Prof. S. Biswas
Workshop on A Social Entrepreneurship Approach to Graduate & Undergraduate Training in Policy Analysis for Global, National and Local Food System organized by Food & Nutrition & Public Policy Department, Cornell University, USA	Bangladesh Rural Agricultural Centre, Dhaka, Bangladesh	8 – 12 February, 2009	Prof. S. Biswas

Department of Veterinary & Animal Husbandry Extension Education

Title of Seminar, symposium, workshop, training etc.	Venue	Duration	Name of faculty members participated
8 th Indian Veterinary Congress and 15 th Annual Conference of IAAVR and National Symposium on Public Private Partnership in Veterinary Research and Education sector	Faculty of Veterinary and Animal Sciences, WBUAFS, Kolkata	22-24 February, 2008	Dr. Debasis Ganguli
National Symposium on 'Sustainable Livestock Production through self-help group and Livelihood Security in the perspective of Bird flu outbreak'	Faculty of Veterinary and Animal Sciences, WBUAFS, Kolkata	10-11 January, 2009	Dr. Debasis Ganguli

Department of Veterinary Epidemiology & Preventive Medicine

Title of Seminar, symposium, workshop, training etc.	Venue	Duration	Name of faculty members participated
Organized training programme on 'Handling the Bird Flu Operation'	VCI Seminar Hall, Belgachia, Kolkata	31 January, 2007	Prof. Chanchal Guha Ujjwal Biswas
Animal welfare and sustainable health through recent therapeutic and disease management strategies	Panthnagar, Uttarakhand	26-28 February, 2007	Prof. Chanchal Guha Dr. Ujjwal Biswas

Department of Animal Nutrition

Title of Seminar, symposium, workshop, training etc.	Venue	Duration	Name of faculty members participated
8 th Indian Veterinary Congress	WBUAFS, Kolkata	22-24 February, 2008	Prof. T.K. Ghosh Prof. G. Samanta Prof. P. Biswas Prof. B. Ray

			Dr S. Halder Dr A. Patra Dr G.P. Mondal
9 th International Conference on Goats	Queretaro, Mexico	31 August-5 September, 2008	Dr A. Patra
International Livestock and Dairy Expo	New Delhi	26-28 August, 2008	Prof. T.K. Ghosh Prof. B. Ray
Sustainable and Integrated Dairy Development in Eastern and North-Eastern Region – status and strategies	NDRI (ERS), Kalyani	11-12 December, 2008	Prof. T.K. Ghosh Dr S. Halder Dr G.P. Mondal

Department of Veterinary Pathology

Title of Seminar, symposium, workshop, training etc.	Venue	Duration	Name of faculty members participated
Department of Zoology, university of Calcutta and The Zoological Society.	Kolkata	23-25 March, 2007	Dr. S. K. Mukhopadhyay
XVth West Bengal State Science and Technology congress.	BESU, Howrah	28-29 Feb. 2007	Dr. S. K. Mukhopadhyay
Agribiotechnology : opportunities and challenges organized by Assochem	Kolkata	3 Aug. 2007	Dr. S. K. Mukhopadhyay
Linking farmers to markets the food processing way. By Assochem Ministry of food processing industries Govt. of W. B.	Kolkata	23 March, 2007	Dr. S. K. Mukhopadhyay
XXIV Annual conference of Indian	Tirupathi	29-31 Oct,	Dr. S. K. Mukhopadhyay