

**PROCEEDINGS OF THE INTERACTIVE SRC MEETING ON MITHUN
PRODUCTION AND HEALTH RESEARCH IN NATIONAL RESEARCH
CENTRE ON MITHUN**

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4th April 2003



NATIONAL RESEARCH CENTRE ON MITHUN

JHARNAPANI, MEDZIPHEMA

NAGALAND – 797 106

Proceedings of the interactive SRC meeting on mithun production and health research National Research Centre on mithun, held on 4th April 2003

The interactive SRC meeting of NRC on Mithun was held on 4th April 2003 in the meeting hall of NRC Mithun of Nagaland.

Dr. Chandan Rajkhowa, Acting Director, NRC Mithun, chaired meeting on the day.

The following members from the following ICAR institute, SAUs and State Government Department and all scientists of NRC Mithun were present:

1. Dr. B. S. Prakash
Head, Dairy Cattle Physiology Division
NDRI, Karnal- 132 001.
2. Dr. Babul Sharma
Head, Department of Animal Physiology and Biochemistry
College of Veterinary Sciences, AAU
Khanapara, Guwahati.
3. Dr. D. K. Sharma
FMD coordinator
AAU, Khanapara, Guwahati
4. Dr. V.B. Sharma
Dean, F/o Animal Sciences
Nagaland University, Medziphema
5. Dr. N. Savino
Lecturer, Animal Science
Nagaland University, Medziphema
6. Dr. A. Vidharthy
Reader, Animal Science
Nagaland University, Medziphema
7. Ms. Rashmi
Lecturer, Animal Science
Nagaland University, Medziphema
8. Dr. Hekha Mao
Addl. Director, Veterinary Department Nagaland
9. Dr. S. Rajkhowa
Scientist, NRCM, Jharnapani
10. Dr. A. Dhali
Scientist, NRCM, Jharnapani
11. Dr. M. Mondal
Scientist, NRCM, Jharnapani

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Dr. C. Rajkhowa, Acting Director of NRC on Mithun and Chairman of the SRC delivered the welcome address for the meeting. In his opening remarks, he explained that this meeting would provide a platform for interaction with the personals from other animal science institute of ICAR as well as SAU's, engaged in animal production and health research. This interaction will also facilitate the evaluation of the institute ongoing research projects and will also help to identify the areas for collaborative research programme. This will intern help better utilization of facilities available in different institutes for improving the quality of research of this institute. He stated that this would help to draw long-term strategies for mithun production and health research.

He further mentioned that this institute is yet to be a full flagged research organization with ample scope for developing better research facilities in coming days. Currently it is working for generating basic information on mithun production and health aspects. He emphasized the major objectives as follows.

1. To evaluate the ongoing research projects
2. To foster cost effective collaborative research programme and development of partnerships
3. To identify the priority areas of mithun production and health research.

He also is of opinion that the use of common facilities and human resources available with the other organizations will help this institute to take up some research programme on frontier discipline as the present facilities of the institute may not be sufficient for taking up advanced programme. He also acknowledged that the contribution from the members and their wisdom will help to develop insights among ourselves and inspire the young scientific minds working in this centre to perform

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better. He also extended his sincere thanks to all the members who could make it convenient to attend the meeting at a short notice in spite of their busy schedule.

Chairman mentioned that the institute projects would be presented first and requested to present the proposed research project afterwards.

ANIMAL HEALTH

Ongoing Projects

Programme 1: Screening, evaluation and monitoring of parasitic diseases in mithun

Dr. S. Rajkhowa, the principle investigator gave the brief background of the project. He mentioned that the climate of the north eastern region is very conducive for parasitic growth. Parasitic diseases are more sub-clinical in nature unlike bacterial or viral diseases. The study was undertaken to find out the different parasitic diseases in captive mithun. During the study the seasonal influences, strains differences, effect of age, sex and type of pasture were also investigated. Nineteen different genera of parasites were identified along with eight different species of *Eimeria*. Ivermectin @1ml/ 50 kg body weight, S/C was found to be highly effective against GI nematodiasis. Comparative efficacy of different anthelmintics and coccidiostats were also investigated. A significant variation in the haemato-biochemical parameters of infected animals were observed. Among haemoprotozoan parasites *Trypanosoma theileri* was recorded. The external parasitic infestations were found mostly due to mites (*Psoroptes*) and ticks (*Boophilus*).

Programme 2: Survey of prevailing diseases of mithun in NEH region

Dr. S. Rajkhowa, the principle investigator mentioned that the project would be useful to develop health calendar for mithun. In long run the project will also help to forecast diseases in mithun and to adopt a suitable vaccination programme against recorded endemic diseases. The objectives of the project were to record the different diseases, to collect the meteorological data for correlating the disease pattern in mithun inhabited areas. The survey was conducted in five different mithun rearing

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pockets in Nagaland. Mithuns were found to suffer from FMD, leech infestation, non specific diarrhoea, tick infestations, internal parasitic diseases, corneal opacity and bloat. FMD was identified to be the major disease problem in mithun. In institute farm, among the screened animals 10%, 16.66% and 27.45% mithuns were found to be positive for tuberculosis, johne's disease and brucellosis, respectively.

Dr. D.K. Sharma suggested that the johnin test sometime gives false result. Therefore the animals should be confirmed against the disease through ELISA.

Additional Director, Veterinary Department, Govt. of Nagaland, mentioned that the diseases that have been found in the institute farm, especially brucellosis, are never reported in the farmer's field. So the institute should investigate the epidemiology to confirm the actual cause of infection.

Dr. D.K. Sharma mentioned that the reason might be due to the fact that in field condition animals are never screened for these diseases.

Proposed Projects

programme 1: Studies on FMD in mithuns (*Bos frontalis*)

The project has been proposed to be undertaken as collaborative programme with Dr. D. K. Sharma, FMD coordinator, AAU, Khanapara, Guwahati.

Dr. S. Rajkhowa, PI, stated that, as FMD is the major disease problem in mithun. It needs to be studied intensively to adopt suitable vaccination programme to control the disease. He proposed the project with the following objectives.

1. To study the epidemiology of FMD in mithuns
2. To find out the serotypes responsible for the disease out break
3. To find the immune status of mithun vaccinated with the cattle vaccines

programme 2: Studies on mineral deficiency diseases in mithuns (*Bos frontalis*)

Dr. S. Rajkhowa, PI, gave the brief background of the project proposed the study with the following objectives.

1. To assess the micronutrient status in soil, plant and animals (mithuns)

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2. To find out the incidence of mineral deficiency disease in mithuns
 3. To formulate preventive/ control measures against deficiency disease of mithuns.

ANIMAL PRODUCTION

Ongoing Projects

Programme 1: Studies on biochemical properties of rumen fluid and characterization of rumen ciliates in mithun

Dr. A. Dhali gave the brief background of the project and mentioned the importance of rumen studies for better understanding of the ruminal activities in mithun. Rumen fluid was collected from mithuns and were subjected for the biochemical analysis and screening for rumen ciliates. The values for different biochemical parameters viz., pH, Total N₂, Ammonia N₂, TCA precipitated N₂, Total soluble N₂, TVFA were found similar as in cattle. The total ciliates count and differential counts were also found similar as in cattle. A total of 14 different genera of rumen ciliates have been identified in mithun.

Dr. B.S. Prakash suggested to conduct further intensive studies in more number of animals.

Proposed Projects

programme 1: Developing Macro and Micro element Map of Mithun Grazing Areas in Nagaland

The project has been proposed to be undertaken as collaborative programme with Dr. Babul Sarma, Head, Department of Animal Physiology and Biochemistry, College of Veterinary Sciences, AAU, Khanapara, Guwahati.

Dr. A. Dhali, PI, indicated the importance of macro and micro elements in ruminant nutrition. He stated that, as there is no information available on this aspect the proposed study will help to understand better the macro and micro elements metabolism in mithun. The objectives of the studies are

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1. To conduct survey on important macro elements and microelements content of soil, water and feeds in different Mithun grazing areas of Nagaland
 2. To develop a statistical model to predict the status of elements in Mithun from the data of soil, water and feeds.

Dr. B.S. Prakash enquired about the background of the study. Director mentioned that the study would be helpful to understand the salt hunger behaviour of mithun. He also mentioned that the ICAR Head quarter directed institute to conduct such studies.

Dr. B.S. Prakash suggested to consider the different physiological stages during the experiments.

Dr. B. Sharma suggested that endocrinology and element interaction should also be studied. He also assured the help for utilizing the facilities for Atomic Absorption Spectrophotometer and other facilities available in his department to conduct this study.

Additional Director, Veterinary Department, Govt. of Nagaland requested to disseminate the research result to the other North Eastern States.

Director gave the assurance for the same.

Programme 2. Studies on endocrine status of Mithun (*Bos frontalis*) during different stages of growth, oestrous cycle, peri- oestrous period, pregnancy and lactation.

The project has been proposed to be undertaken as collaborative programme with Dr. B. S. Prakash, Head, Dairy Cattle Physiology Division, NDRI, Karnal-132 001.

Dr. M. Mondal gave a brief account on importance of endocrinology on mithun growth and reproduction. He has also mentioned that though mithuns are used for beef purposes in this north-eastern hill region of the country, these animals may also be exploited for milk as well as draft reasons. He has also stated that to improve growth as well as reproductive performance of mithun on Endocrinological viewpoint, there is a need of elaborative study on mithun endocrinology before

Endocrinological manipulation. The project has been proposed with the following objective:

1. To validate sensitive EIA for GH, LH, FSH, Oxytocin and PGFM in mithun blood plasma.
2. To determine the changes in plasma Progesterone, LH, FSH and GH in mithun during different stages of growth.
3. To establish plasma metabolites and haematological profile during different stages of growth, oestrous cycle, pregnancy, lactation, peri-oestrous and peri-parturient period in mithun.
4. To measure Endocrinological changes during oestrous cycle, peri-oestrous, pregnancy peri-parturient period and lactation in mithun
5. To study on changes in milk composition, certain hormones (GH, T3/T4, Insulin and Prolactin) and somatic cell count throughout lactation in mithun.

Dr. B. S. Prakash suggested that the proposed programme is too long and will be very difficult to complete by only two scientists and it will be wise to take only a part of the proposed project. He also suggested to modify the programme as below:

Project title: *Development and validation of hormone principles by enzyme immunoassay in mithun (Bos frontalis) plasma and its application for growth studies.*

Objectives:

1. To develop and validate sensitive EIA procedures for GH, LH and FSH in mithun blood plasma.
2. To determine the changes in plasma Progesterone, GH, LH and FSH in mithun during different stages of growth.
3. To study the diurnal rhythm in Endocrinological parameters and hormone principles in adult female mithuns.

He suggested to study of diurnal variation of GH and samples should be collected in every hour for 24 hours for the same.

Dr. Babul Sarma enquired whether there is any information available on mithun as a seasonal breeder. Dr. A. Dhali and Dr. M. Mondal replied that the seasonal breeding pattern does not exist in mithuns maintained in the institute farm. However, Dr. B. Sarma suggested that the further scientific study should be conducted in this aspect.

Dr. M. Mondal mentioned that blood samples should be transported in frozen condition to NDRI for analysis. He, therefore, requested to the Director to make the provision for airfare to transport the samples.

Director assured the provision for the same.

Programme 3: Studies on different physiological stages of growth, blood metabolites and minerals and their relationship in mithun (*Bos frontalis*)

Dr. M. Mondal described the importance of study on mithun growth, blood metabolites and minerals. He also stated the significance of these parameters viz. blood metabolites, minerals and growth in mithun. Dr. Mondal highlighted the importance of growth constants and growth curve in mithun physiology for further development of this species. The proposed objectives of the study are:

1. To study on relationship between age and different types of growth rates in growing mithuns.
2. Estimation of growth constants in respect to age and body weight.
3. To study the pattern of changes of blood metabolites and minerals with advancement of age.

SUMMARY

Dr. C. Rajkhowa, Director sum up the presentations made by the scientists. He mentioned that the meeting has been successful and could lead to an informative interactions among the members. He told that the meeting definitely has instilled critical scientific vision in young scientists. He declared that the following proposed projects are approved along with the ongoing projects but should incorporate the necessary modifications if required in consultation with the collaborators in future.

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Animal Health

Programme 1: Studies on FMD in mithuns (*Bos frontalis*)

Principal Investigator : S. Rajkhowa

Co Investigator : C. Rajkhowa, D.K. Sarma

Programme 2: Studies on mineral deficiency diseases in mithuns (*Bos frontalis*)

Principal Investigator : S. Rajkhowa

Co Investigator : C. Rajkhowa, B. Sarma

Animal Production

Programme 1: Developing Macro and Micro element Map of Mithun Grazing Areas in Nagaland

Principal Investigator : A. Dhali

Co Investigator : M. Mondal, B. Sarma and C. Rajkhowa

Programme 2: Studies on endocrine status of Mithun (*Bos frontalis*) during different stages of growth, oestrous cycle, peri-oestrous period, pregnancy and lactation.

Principal Investigator : M. Mondal

Co Investigator : A. Dhali, B.S. Prakash and C. Rajkhowa

Programme 3: Studies on different physiological stages of growth, blood metabolites and minerals and their relationship in mithun (*Bos frontalis*)

Principal Investigator : M. Mondal

Co Investigator : A. Dhali, S. K. Mondal and C. Rajkhowa

A. Dhali
12/5/03