

**Proceedings of the IRC Meeting of ICAR-NRC on Mithun, Medziphema, Nagaland held  
on 7<sup>th</sup> and 9<sup>th</sup> August 2020**

IRC Meeting of ICAR-NRC on Mithun was held on 7<sup>th</sup> and 9<sup>th</sup> August 2020 through Video conferencing. The meeting started at 10 AM in the chairmanship of Dr. Abhijit Mitra, Director, ICAR-NRC on Mithun. Dr. Vineet Bhasin, Principal Scientist (AG&B), ICAR Hqrs-New Delhi participated in the meeting. The following Officers were present in the meeting:

1. Dr. Abhijit Mitra, Director, ICAR-NRC on Mithun and Chairman, IRC
2. Dr. Vineet Bhasin, Principal Scientist (AG&B), ICAR Hqrs, New Delhi
3. Dr. Nazrul Haque, Principal Scientist (Animal Nutrition)
4. Dr. (Mrs) Saroj Toppo, Principal Scientist (Animal Nutrition)
5. Dr. Meraj Haider Khan, Principal Scientist (AR) and Member Secretary, IRC
6. Dr. Jayanta Kumar Chamuah, Scientist(Animal Health)
7. Dr. S. S. Hanah, Scientist, Livestock Production & Management
8. Dr. L. Sunitibala Devi, Scientist(Livestock Production & Management)
9. Dr. H. Lalzampaia Scientist(Animal Health)
10. Dr. Vivek Joshi, Scientist(Animal Health)
11. Dr. Vikram R., Scientist(Animal Reproduction)
12. Mr. Kamni P. Biam, Scientist(Ag. Extension)
13. Dr. K. Vupru, Chief Technical Officer

At the outset, Dr. M. H. Khan, Member Secretary, IRC & Incharge PME Cell welcomed the participants and briefed about the number of completed and ongoing projects during 2019-20 and the number of new proposals to be discussed during the meeting.

Dr. Abhijit Mitra, Director, ICAR-NRC-Mithun in his initial remarks emphasized the need for good research publications in the peer-reviewed journals and for developing standard operating practices - and preparation of technical bulletin.

Dr. Bhasin in his opening remarks urged that all the PIs - to stick to the timeline and complete the projects in time.

There were some general recommendations of IRC which are as follows:

1. Due to COVID19 lockdown since March-2020 onwards, the supply of chemicals, kits, and outsourcing services got delayed which resulted in delays in many projects. Though the concerns are well taken, however, the extension of the project has been considered on case to case basis.
2. All the PIs need to stick to the timeline and complete the projects in time. While submitting the RPP of the newly approved projects, an activity table e must be given showing the work to be undertaken by PI and each co-PI with the timeline for each milestone.
3. Each scientist may not be associated with more than three projects at a time (in one project as PI and two as Co-PIs). Contribution less than 20% in any project may not be counted as a significant contribution.

  
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(M. H. Khan)

4. Bull exerciser to be shifted behind the new bull shed. Dr. Kezha Vupru to co-ordinate with CPWD.
5. Dr. Haque to submit a feeding schedule for each category of mithun including the transition mithun cows within a month for immediate implementation. While developing the feeding schedule, the results of the different projects particularly those of the LPM section and Animal Health Section may also be consulted. With the aim to target. reducing AFC and service period and better growth, reproduction and in particular to provide required nutrition during the transition and lactation period.
6. Animals under breeding projects will not be allotted for other experiments until the required recording of parameters is completed as per project requirement.
7. On 5<sup>th</sup> day of every month, every PI will have to submit the montly progress of research work to PME Cell.

Section-wise research achievements of the completed and ongoing projects as well as the new projects were presented by the individual PI. Project wise recommendations of IRC are as follows.

### Completed / Ongoing Projects

#### ANIMAL NUTRITION SECTION

##### Project # 1: Profiling gut microbiome of Mithun

|                    |   |                                           |
|--------------------|---|-------------------------------------------|
| PI                 | : | Dr. Saroj Toppo                           |
| Co-PIs             | : | Dr. N Haque                               |
|                    | : | Dr. Abhijit Mitra                         |
|                    | : | Dr. S Mukherjee                           |
|                    | : | Dr. Sudipto Saha, Bose Institute, Kolkata |
| Date of Start      | : | May 2017                                  |
| Date of completion | : | December 2019                             |

#### Recommendations:

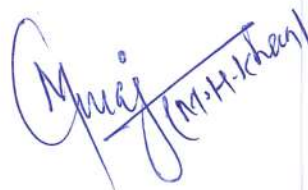
1. Data generated needs to be categorized and analyzed in consultation with Dr. Sudipto Saha and submit the revised manuscript in the journal within 15 days.
2. Further, to compare mithun with local cattle reared under similar conditions a new project may be taken up.
3. RPP-II and III may be submitted.

#### LIVESTOCK PRODUCTION & MANAGEMENT

##### Project # 1: Genetic improvement of growth performance of mithun

|        |   |                   |
|--------|---|-------------------|
| PI     | : | Dr. S. S. Hanah   |
| Co-PIs | : | Dr. K Vupru       |
|        | : | Dr. N Haque       |
|        | : | Dr. M H Khan      |
|        | : | Dr. J K Chamuah   |
|        | : | Dr. Lalchamliani  |
|        | : | Dr. Abhijit Mitra |

  
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Date of Start : May 2017  
Date of Completion : April 2020

**Recommendations:**

1. Due to lack of sufficient sire family data, the genetic parameters could not be recorded. Further, the results of the present study highlighted the need for nutritional intervention in calves between the age of 18 to 30 months.
2. Data recording will continue as a service project along with the intervention of feeding, breeding and management. The recording of the traits of economic importance like body weight at birth and weaning, growth rate, milk production, AFC, and other reproduction and health parameters should be continued.
3. All male calves to be maintained till weaning and then select 50% of the calves to be used for replacement based on the growth performance and the remaining calves to be either discarded or castrated.
4. A manuscript and a booklet on growth and reproductive parameters of mithun to be written and submitted within one month along with RPP-II and III.

**Project # 2: Developing weaning strategies in mithun (*Bos frontalis*)**

PI : Dr. L. Sunitibala Devi  
Co-Pis : N Haque  
: S S Hanah  
: Dr. Vikram R  
Start Date : June 2019  
Date of completion : May 2020

**Recommendations:**

1. The progress of the project is good, however, more number (up to 10 no) of calves under each group to be included to draw a meaningful conclusion. Further, while analyzing the data, the body weights of the calves up to 12 months of age to be included.
2. The project is extended till March 2021

**ANIMAL PHYSIOLOGY AND REPRODUCTION**

**Project # 1: Characterization of physico-chemical properties of cervical mucus with reference to estrus behaviour and endocrine profile in mithun**

PI : Dr. M. H. Khan  
Co-PIs : Dr. Vikram R  
: Dr. S S. Hanah  
: Dr. Kobu Khate

Date of Start : April 2018  
Date of completion : December 2020

**Recommendations:**

1. The project has generated useful information on estrous behavior in mithun and other relevant parameters.

  
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2. Draft manuscripts to be submitted within 15 days and the same to be communicated to the journal at the earliest.

**Project # 2: Ovarian follicular dynamics and hormonal profile in pre-pubertal and pubertal mithun**

|                    |   |               |
|--------------------|---|---------------|
| PI                 | : | Dr. Vikram R  |
| Co-PIs             | : | Dr. M H Khan  |
|                    | : | Dr. S S Hanah |
| Date of start      | : | June 2019     |
| Date of completion | : | May 2020      |

**Recommendations:**

1. Basic information generated on the follicular dynamics in mithun will be helpful in the understanding of female reproduction in general and in determining the time of AI in mithun.
2. Considering the challenge in carrying out transvaginal ultrasonography in pre-pubertal animal and non-availability of animals, IRC approved the extension of the project till December 2020.
3. Draft manuscripts to be submitted within a month.

**ANIMAL HEALTH**

**Project # 1: Phyto-formulation for effective control against Leech infestation in Mithun (*Bos frontalis*)**


|                    |   |                   |
|--------------------|---|-------------------|
| PI                 | : | Dr. J. K. Chamuah |
| Co-PIs             | : | Dr. K Vupro       |
|                    | : | Dr. Vivek Joshi   |
| Date of Start      | : | June 2017         |
| Date of completion | : | December 2019     |

**Recommendations:**

1. The efforts made for identifying the bioactive principle of the effective phyto-formulation, as per the recommendations of the last IRC (2019) are neither appropriate nor sufficient. It is recommended to make written communications to CSIR-CDRI, Lucknow, CSIR-CIMAP, Lucknow and other such organizations. Further, the possibility of outsourcing may also be explored.
2. IRC also recommended ascertaining the effective doses of the phyto-formulation for aquatic leech as it is done for land leech only.

**Project # 2: Clinico-epidemiological study of major subclinical metabolic diseases of transition mithun cows**

|        |   |                  |
|--------|---|------------------|
| PI     | : | Dr. Vivek Joshi  |
| Co-PIs | : | Dr. J K Chamuah  |
|        | : | Dr. K Vupru      |
|        | : | Dr. H Lalzampaia |
|        | : | Dr. Vikram R     |

  
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Dr. M.H. Khan

Date of Start : June 2019  
Date of completion : May 2020

**Recommendations:**

1. The data generated in the project are of immense value in determining the package of practices including nutrition for the transition mithun cows. Nutritional intervention and strategies for the efficient management of mithun cows during the transition period to be developed in consultation with Dr. Haque and the same to be submitted within a month
2. The delay in receiving kits/ chemicals due to COVID19 lockdown is taken into consideration and PI is allowed to submit the RPF III in January 2021 after completing the remaining laboratory work and analysis. However, the project will be considered completed by 31st August 2020.

**Project # 3: Immune response profile of FMD vaccinated farm mithun**

PI : **Dr. H. Lalzampaia**  
Co-PIs : Dr. J K Chamuah  
: Dr. Vivek Joshi  
Date of Start : June 2019  
Date of completion : May 2020

**Recommendations:**

1. Extension of the project is granted for one more year i.e. May 2021. However, considering the animal to animal variations, the sample size seems to be too low and it is recommended to take at least 10 animals per treatment group for serological assay in consultation with a statistician.
2. The recommendation made during the last IRC also needs to be completed.
3. The schedule of vaccination should be as recommended by the GoI and sampling to be done accordingly.
4. The procurement of vaccines, its storage and transportation to be monitored properly to avoid any untoward effect on the results.

**VETERINARY EXTENSION**

**Project # 1: Socio-economic evaluation of mithun rearing**

PI : **Kamni P. Biam**  
Co-PIs : Dr. D. Bardhan (IVRI)  
: Dr. Abhijit Mitra  
: Dr. L. Sunitibala Devi  
: Dr. Kobu Khate  
Date of Start : June 2019  
Date of completion : May 2020

  
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(Kamni P. Biam)

**Recommendations:**

1. Progress of the research work is satisfactory.
2. Due to lockdown, data collection from Arunachal Pradesh could not be initiated. It is recommended to revise the technical program and take 3 districts and three villages per district instead of four districts and four villages per district as approved earlier.

**New Proposed Project****ANIMAL NUTRITION****Project # 1: Determination of energy and protein requirement in mithun**

|            |   |                         |
|------------|---|-------------------------|
| PI         | : | <b>Dr. S. S. Hanah</b>  |
| Co-PIs     | : | Dr. Nazrul Haque        |
|            | : | Dr. Debojyoti Borkotoky |
|            | : | Dr. Kobu Khate          |
| Start Date | : | September 2020          |
| Duration   | : | 02 years                |

**Recommendations:**


1. The project is approved in principle with a recommendation to complete the project within 2 years.
2. The proposed project requires a large number of calves of similar age groups (approximately 6 months of age). Therefore, IRC recommends for the procurement of calves from the field since the institute Mithun farm has a small number of breedable females (32-36 numbers), hence the number of calves produced each year is less (18 -20 numbers). Mithun farmers generally do not sell the small calves alone, therefore buying of the calf with mother may also be considered with the idea that the dam will be used as breeding stock in the farm..
3. Fund approved for the purchase of animals under the last year SFC may be utilized for the procurement of mithun calves.

**Project # 2: Seasonal variation in carrying capacity of forest for rearing mithun in Nagaland**

|               |   |                         |
|---------------|---|-------------------------|
| PI            | : | <b>Dr. Nazrul Haque</b> |
| Co-PIs        | : | DR. S. S.Hanah          |
|               | : | Dr. K. Vupru            |
| Date of Start | : | Sept. 2020              |
| Duration      | : | 02 Years                |

**Recommendations:**

1. Take - two sites (Medziphema and Porba) initially to-, assess the carrying capacity at institutes' mithun farms first and come out with recommendations. Later, the same may be validated under field conditions.
2. IRC also recommended handing over this project to Dr. Stephen S Hanah as Dr. Nazrul Haque is already PI of an important nutrition project.

  
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(Dr. Nazrul Haque)

3. The project has been approved.

## LIVESTOCK PRODUCTION & MANAGEMENT

### Project # 1: Assessment and documentation of the existing mithun rearing practices under free-range system on North-Eastern India

|               |   |                        |
|---------------|---|------------------------|
| PI            | : | <b>Dr. S. S. Hanah</b> |
| CO-PIs        | : | Mr. Kamni Paia Biam    |
|               | : | Dr. M.H. Khan          |
|               | : | Dr. H. Lalzampaia      |
|               | : | Dr. L.Sunitibala Devi  |
|               | : | Dr. Kobu Khate         |
| Date of start | : | January 2021           |
| Duration      | : | 02 Years               |

#### Recommendations:

1. The project is approved and to be completed within two years.
2. IRC recommended keeping this project in abeyance till January 2021 and Mr. Kamni P. Biam (Scientist- Ag. Extension) to act as a PI

### Project # 2: Assessment of draughtability of mithun

|                |   |                               |
|----------------|---|-------------------------------|
| PI             | : | <b>Dr. L. Sunitibala Devi</b> |
| Co-PIs         | : | Dr.K.Vupru                    |
|                | : | Dr S. S. Hanah                |
|                | : | Dr. Nazrul Haque              |
|                | : | Dr. Kobu Khate                |
| Date of start: | : | Jan. 2021                     |
| Duration       | : | 02 Years                      |

#### Recommendations:

1. The project is approved in principle. But as per the understanding given, trainers for bulls/ bullocks will be available after the harvesting of paddy i.e., after November 2020. In the meantime, castration of male calves and other necessary preparations may be initiated. Dr. Kezha, however, will explore the availability of trainers at an early date and till that time the project may be kept in abeyance.
2. Instead of ALT, AST and SDH, free T4, bicarbonate, blood pH, oxygen saturation level, oxidative stress parameters like ROS, RNS, LPO, SOD and ECG to be recorded.
3. Load carrying capacity and area of ploughing may also be included.
4. The tread-mill procured earlier may also be used to study the work-physiology parameters.

  
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## ANIMAL PHYSIOLOGY AND REPRODUCTION

### Project # 1: Vitrification of semen and sperm ultra-structural changes in Mithun

|               |   |                   |
|---------------|---|-------------------|
| PI            | : | Dr. M. H. Khan    |
| Co-PIs        | : | Dr. Vikram R      |
|               | : | Dr. H. Lalzampaia |
|               | : | Dr. S. S. Hanah   |
|               | : | Dr. Abhijit Mitra |
| Date of Start | : | Sept. 2020        |
| Duration      | : | 02 Years          |

#### Recommendations:

1. Project is approved and the title of the project to be modified as "Development of vitrification protocol of Mithun semen"
2. Microbiological quality of fresh, frozen as well as vitrified semen to be evaluated as per the minimum standard recommended for cattle/ buffalo by DAHD. Till the vitrification protocol is standardized, microbiological evaluation of fresh and frozen semen to be undertaken.
3. Ultra-structure changes using electron microscopy of spermatozoa of fresh, and conventional frozen samples to be initiated.

### Project # 2: Testing and validation of pregnancy diagnosis kit, PregD in Mithun (Inter-Institutional project with ICAR-CIRB)

From, ICAR-NRC on Mithun

|        |   |                   |
|--------|---|-------------------|
| PI     | : | Dr. Vikram R      |
| Co-PIs | : | Dr. M. H. Khan    |
|        | : | Dr. Abhijit Mitra |


From, ICAR-CIRB

|               |   |                   |
|---------------|---|-------------------|
| PI            | : | Dr. Ashok Balhara |
| Co-PIs        | : | Dr. S. K. Phulia  |
|               | : | Dr. R. K. Sharma  |
| Date of Start | : | Sept. 2020        |
| Duration      | : | 01 Year           |

#### Recommendations:

1. The Project is approved
2. The availability and regular supply of the kit to be ascertained for the smooth function of the project. A joint meeting of PIs and co-investigator of both the Institute along with the respective Directors may be conducted at the earliest.
3. Further, the effect of estrous synchronization on the efficiency and sensitivity of the kit also needs to be looked into.

  
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## ANIMAL HEALTH

### Project # 1: Molecular screening of tick vector and host mithun (*Bos frontalis*) for haemoparasites in the states of Nagaland and Arunachal Pradesh

|               |   |                          |
|---------------|---|--------------------------|
| PI            | : | <b>Dr. J. K. Chamuah</b> |
| Co-PIs        | : | Dr. H. Lalzampaia        |
|               | : | Dr. Vivek Joshi          |
|               | : | Dr. Kobu Khate           |
|               | : | Dr. D. Borkotoky         |
|               | : | Dr. K. Vupru             |
| Date of start | : | Sept. 2020               |
| Duration      | : | 02 Years                 |

#### Recommendations:

1. The technical programme should mention the number of districts, the number of villages and the number of samples per village. A proper sampling strategy to be devised. Select the districts based on the prevalence of the haemo-parasitic infection. PI to consult Dr. Bardhan from IVRI and Dr. Pinaki Sengupta, Pr. Sci. (Parasitology), NIVEDI for devising the sampling strategy and appropriate technical programme.
2. Resubmit RPPI with the revised technical programme.

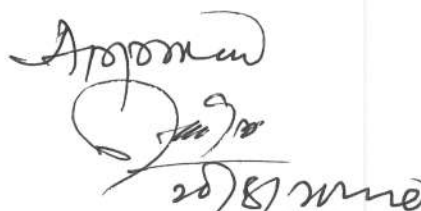
### Project # 2: Development of novel mithun body condition scoring system (MBCSS) and its validation by ultrasonography

|               |   |                        |
|---------------|---|------------------------|
| PI            | : | <b>Dr. Vivek Joshi</b> |
| Co-PIs        | : | Dr. Vikram R           |
|               | : | Dr. Kobu Khate         |
|               | : | Dr. J. K. Chamuah      |
|               | : | Dr. H. Lalzampaia      |
|               | : | Dr. M. H. Khan         |
| Date of start | : | September 2020         |
| Duration      | : | 01 Year                |

#### Recommendations:

1. The project is approved.
2. Since Mithun is a unique animal, PI is requested to consult NDRI and develop a new body condition scoring system for mithun.
3. Validate the body condition score developed from mithun farmers and State Veterinary Officers.

  
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