



Mithun Digest

NATIONAL RESEARCH CENTRE ON MITHUN

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July - Dec, 2005

INSTITUTIONAL ACTIVITIES

Institute Management Committee Meeting

The IXth IMC meeting of the Institute was held on 18th November, 2005 under the chairmanship of the Director N.R.C. Mithun. Dr. O. P. Dhanda, ADG (AN & P), ICAR, New Delhi, Dr. D. Das, Ex. Dean, F. V. Sc. Khanapara, AAU, Dr. B. P. S. Yadav, P.S., ICAR-RC-ER and Dr. T. Heli, Vet. & A. H. Dept., Arunachal Pradesh attended the meeting. The committee reviewed the various activities and progress of the Institute and gave valuable suggestions for the future actions to be taken. The committee strongly suggested to take initiative form creation of all the sanctioned post of the ixth and xth plan.



IXth IMC meeting in progress



Visit of Dr. O. P. Dhanda (ADG) to the Animal Health laboratory

Hindi Week Celebration

The Hindi week was celebrated in the Institute during 14th to 21st September, 2005. The events like essay writing, extempore speech, debating, singing and drawing were organized on the occasion. All the staff members participated actively and prizes were distributed to the winners of different events in various categories.

Independence Day Celebration

The Institute had celebrated the 59th Independence Day, where all the staff members participated along with their family members.



RESEARCH ACTIVITIES

Animal Nutrition

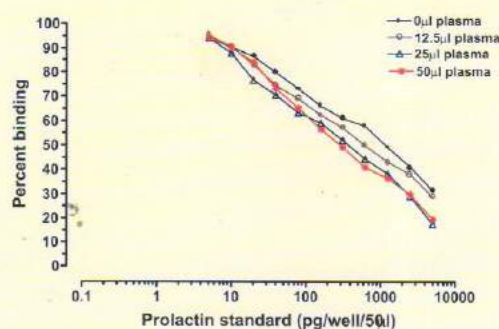
Different locally available tree leaves, herbs and grasses were collected from different mithun inhabited districts of Nagaland and were analyzed for chemical compositions. The crude protein (CP) content of different green foliages ranged from 10.3 to 24.38 %. The in sacco degradability study revealed that the *T. agrostis* (Prie), *E. officinalis* (Khuluhu), *F. hirta* (Temicheadie) and *Jasminum* sp (Tsakhroro) could be a good source of energy as the effective dry matter degradability is found to be higher. However, the *D. indica* (Khupro), *F. infectoria* (Rhijho), and *C. recusvata* (Khabu) could be a moderate source of bypass protein as the rumen degradable CP fraction is lower.



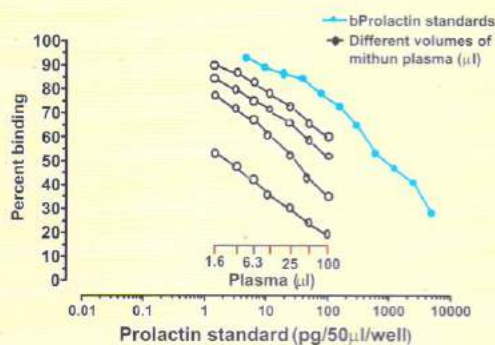
Spondias pinnata(CP: 24%)

Animal Physiology

Keeping in view the importance of prolactin in reproduction through regulating fertility process, lactational events of milk letdown, and its role mainly during lactogenesis and galactopoiesis, a simple, highly sensitive, rapid, cost effective, and eco-friendly enzymeimmunoassay procedure most suited for this region of our country has been developed. The developed assay methodology was also further validated biologically. Further, the efforts were made to apply this assay procedure during milk letdown and cyclicity in mithun cows.



Influence of different plasma volumes viz., 12.5, 25 and 50µl on percent binding in prolactin standard curve; Standards were also prepared in 20µl assay buffer. Optical density was measured at 450nm.



Parallelism for bovine prolactin standards with serially diluted different volumes of 100, 50, 25, 12.5, 6.3, 3.1, and 1.6µl of four mithun plasma samples containing high endogenous prolactin. Standards for bovine prolactin were ranging from 5 to 5000pg/50µl/well.

Livestock Production & Management

The effect of lactation stages on milk yield and milk composition was evaluated in mithun. Milk samples were collected twice a day at weekly intervals from week 2 to the last week of lactation.

Milk yield was recorded and the fresh milk samples were analyzed for different milk components. The average lactation length was found to be approximately 315 days and the period (days) 15 to 105, 106 to 210 and 211 to 315 were defined as early, mid and late lactation, respectively. The average

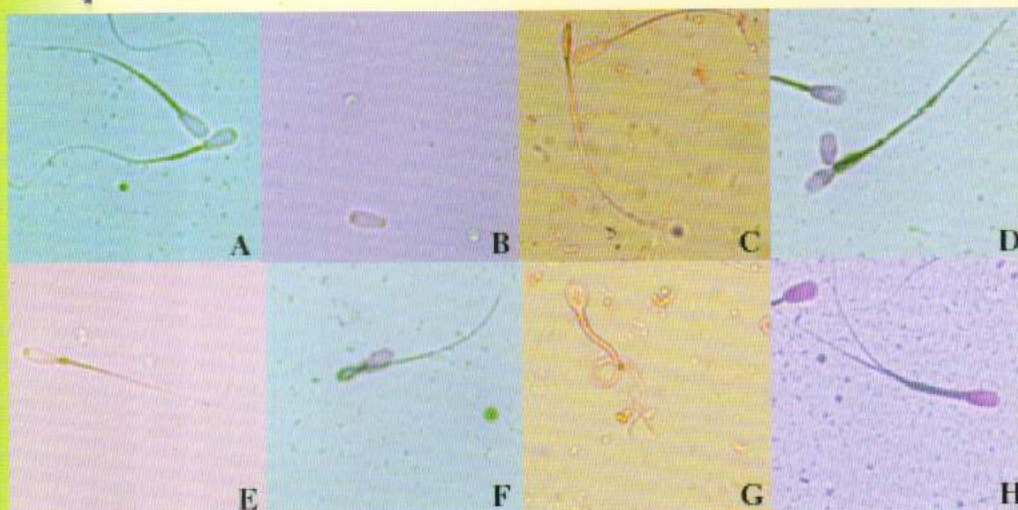
milk yield in Mithun was found significantly higher during early and mid lactation as compared to late lactation. On the contrary the total solid, casein and urea content were significantly higher during late lactation as compared to early and mid lactation. The average fat content was consistent during early lactation and increased significantly during mid and late lactation. The total protein, lactose and solid not fat contents did not follow any definite trend and the variations were 5.73 to 7.16%, 3.45 to 4.79% and 11.81 to 15.99%, respectively.

Variations in milk yield (kg/ day), total solid (%), fat (%), total protein (%), casein (%), SNF (%), lactose (%), urea (mg/ dl) and ash (%) content in mithun milk during early (8-105 days), mid (106-210 days) and late lactation (211-315 days) stages are given below.

Particulars	Early	Mid	Late
Milk yield	0.697 ± 0.02	0.627 ± 0.02	0.487 ± 0.03
Total solid	20.76 ± 0.20	21.47 ± 0.23	22.36 ± 0.42
Fat	7.54 ± 0.15	8.32 ± 0.19	10.05 ± 0.34
Total protein	6.18 ± 0.11	6.50 ± 0.12	6.48 ± 0.24
Casein	4.26 ± 0.06	4.36 ± 0.07	4.71 ± 0.12
SNF	13.16 ± 0.19	13.13 ± 0.25	13.04 ± 0.50
Lactose	4.31 ± 0.08	4.11 ± 0.09	3.84 ± 0.15
Urea	34.77 ± 1.17	35.75 ± 1.06	39.43 ± 1.81
Ash	0.93 ± 0.01	0.90 ± 0.01	0.90 ± 0.01

Mithun semen has been preserved successfully at refrigeration temperature (4°C). Semen was collected from 4 adult mithun bulls (4 to 6 years of age) through rectal massage method and neat semen drops were collected in a graduated test tube with the help of a funnel. The 30 ejaculates of good quality were preserved. The samples were diluted with tris-egg yolk extender (Tris-hydroxymethyl aminomethane 3.028% w/v, Sodium citrate 1.655% w/v, Fructose 1.250% w/v, Egg yolk 20% v/v; one lac IU Penicillin G sodium salt and 100 mg

Dihydrostreptomycin were added in 100 ml of extender) and stored at 4°C for 72 h. It was observed that the progressive motility and live sperm count were reduced significantly after 36h of storage. The morphologically abnormal sperm count was increased significantly over the time of storage and the highest value was recorded at 72h. The study indicates that the mithun semen can be preserved with tris-egg yolk extender effectively for a period of 36h at refrigeration temperature and may be used for insemination.

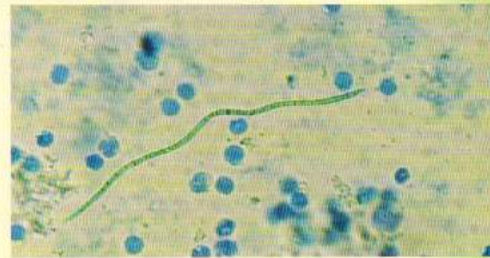


Light micrograph (400×) of mithun spermatozoa stained with eosine-nigrosin stain. A: Live morphologically normal; B: Loose head; C: Abnormal shaped head; D: Degenerated midpiece; E: Cytoplasmic droplet in midpiece; F: Bent midpiece; G: Coiled tail; H: Double tail

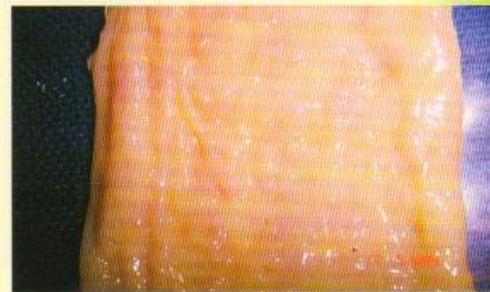
Animal Health

All available mithuns from Porba and Medziphema farms of the Institute as well as mithuns from natural habitat were screened against Rotavirus, Coronavirus and Cryptosporidium parvum (the proven causes of calf mortality in bovine) by using ELISA technique. The overall prevalence of Rotavirus, Coronavirus and Cryptosporidium parvum infection in mithuns were found to be 75, 80 and 47% respectively. The role of various factors (risk factors) such as age groups, sex and management (semi-intensive versus free-range) in the epidemiology of these infections were also analyzed. Mithuns of all age groups are found to be susceptible though it was found to be higher in adults in case of Rotavirus and Coronavirus infection.

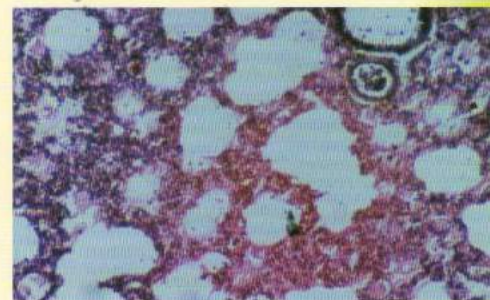
Mithuns (n=102) that found in their natural habitat were vaccinated with polyvalent FMD vaccine containing serotypes O, A and Asia-1. The blood and faecal samples from these animals were also collected for screening against various important diseases. The prevalence of *Toxoplasma gondii* antibodies in mithuns that managed under semi-intensive system as well as in free-grazing mithuns was also assessed.



Microfilaria detected by Knot technique



Pimply gut condition caused by *Oesophagostomum sp* infection



Disruption of alveolar septa due to massive bacterial infection

EXTENSION ACTIVITIES

Mass FMD vaccination programme in free-range mithuns was organized at Chozuba village in Phek district.

The Director along with Mr. Nyeiwang Konyak, Parliamentary secretary, Govt. of Nagaland visited Mon district for close interaction with farmers.

The Institute KVK in Phek district has imparted training to the local people including women and unemployed educated youth in various fields viz. fruit processing, scientific cultivation of horticultural crops, plant protection and use of biofertilizer



KVK training on fruit processing



Mass FMD vaccination programme at Thuvopisumi village



KVK training on biofertilizer



Interaction with farmers in Mon District



Farmer with a promising locally available fodder

DISTINGUISHED VISITORS

Mr. K. Hollohon, Parliamentary Secretary, Govt. of Nagaland and Mr. Imchalemba, Ex. MP, Nagaland visited the Institute to discuss about community mithun farming on 4th Jul, 05.

Dr. M Ahmed, Deputy Commissioner (A.H), Govt. Of India, New Delhi visited the Institute on 2nd Sept, 05.

Mr. K. N. Hazarika, Chairman & MD (NEDFI), Guwahati visited the Institute to explore the possibility of having common programme in the farmers' field on 8th Nov, 05.

Dr. D. Das, Ex. Dean, F. V. Sc., A.A.U., Guwahati, Dr. B. P. S. Yadav, PS, ICAR-RC-Eastern Region, Patna visited various laboratories to have in depth discussion on various research activities on 18th Nov, 05.

Dr. O. B. Dhanda, A.D.G (AN&P), I.C.A.R., New Delhi visited various laboratories to review the ongoing research programme of the Institute on 18th Nov, 05.

Mr. Tim Harris SDA, Director, British Livestock Genetics Ltd., UK and Mr. Robert M. Marshall, Livestock Product processing expert, Scotland, UK visited the Institute on 26th Nov, 05.

PERSONALIA

Dr. S. Rajkhowa and Dr. C. Rajkhowa attended FMD workshop held on 12 and 13th Sept, 05 at AAU, Khanapara.

Director, Dr. C. Rajkhowa has participated in the Executive Development Programme at NAARM, Hyderabad from 15th to 20th Dec '2005.

Dr. D. K. Sharma, PS (Dairy Technology) has joined the institute on 15th Dec, 05.



Visit of Mr. Imchalemba, Ex. MP, Nagaland



Visit of Mr. Tim Harris and Mr. Robert M Marshall



Visit of Dr. M Ahmed to the Mithun farm

From The Director's Desk



Livestock meet variety of human need. Mithun being one of the important components of hilly livestock production system, has got the potential to meet many needs of human population. Presently it is being used as a source of nutritional protein in the form of meat. But this animal has a bright prospect to be used as a source of milk and its processed product. Mithun hides have also been found to be excellent source for finished leather. Considering these prospects, we need to improve and propagate this animal in different mithun rearing areas of north eastern hill region. However, to achieve this, the prevailing production system needs to be improved through scientific feeding, breeding, management and health care measures.


For improving the productivity of livestock, feeds and fodders play an important role. Mithun consumes various tree leaves, herbs and grasses from the jungles. The initiative taken by this institute in the field of identification and nutritive evaluation of these is an important step for selection of the promising ones for future propagation and to enhance the nutritive quality of biomass that is available in mithun rearing areas.

To have a successful breeding programme through artificial insemination, standardization of collection and preservation methods of semen is a very important step. Efforts taken by the scientists in this line is really commendable.

Calf rearing is one of the important factors for livestock production system. The efforts to find out the etiological causes of calf mortality will definitely help us to strengthen the managerial strategy for healthy calf rearing.

FMD is one of the important diseases in Mithun. Mass vaccination programme carried out in the adopted villages will definitely help to bring awareness among farmers to save their mithuns from this menacing disease.

I must congratulate the scientists and other staff members for their untiring efforts to publish this document which will definitely help the people engaged in the field of Animal Husbandry in general and Mithun rearer in particular.


(C. Rajkhowa)

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