MITHUN DIGEST

National Research Centre on Mithun, Nagaland - 797 106

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From Director's Desk

Mithun (Bos frontalis) is believed to be originated from wild gaur more than 8000 years ago and is considered to be a semi domesticated bovine species. This species of semi domesticated free-range bovine is distributed mainly in the North-Eastern hill region of India and in parts of Bhutan, Myanmar, China and Bangladesh. Mithun rearing is an important occupation for hilly tribal farmers of Arunachal Pradesh, Manipur, Mizoram and Nagaland, mostly at an elevation range from 300 to 3000 msl. This species is primarily used for beef and its ownership is considered to be the sign of prosperity of individual in society. Its milk production potentiality has also been explored recently. Since the consecration of "National Research Centre on Mithun", the Institute is devoting it's all activities for the preservation, conservation and propagation of this unique bovine species despite of all the hardships prevailing in hilly terrain. According to mandate, at present the Institute is involved actively in basic and applied research on nutrition, physiology, production management and health aspects for augmenting productivity status of this animal. Publication of "Mithun Digest" has been conceptualized recently by the Institute to document and publish the various activities of the Institute at regular interval for information of the scientific communities, as well as developmental agencies engaged in the field of animal husbandry in general and mithun husbandry in particular. I congratulate all the staff members of our Institute for their active cooperation to bring out the first issue of "Mithun Digest" for highlighting different activities of the Institute. I wish all the best for success and improvement of this newsletter in coming days.

(Chandan Rajkhowa)

Arunachal Strain

Nagaland Strain

Mizoram Strain

Manipur Strain

Research Achievements

Valuable local fodders for mithun

A total number of 58 different locally available fodders from two different locations of Nagaland (Porba and Medziphema) have been collected and analysed. Some of these fodders are found to be very promising and are having high nutrient content. However, all these samples are yet to be identified botanically. Availability of different nutrients from these mixed forages also has been estimated. The production (q / ha) of total green, DM, CP, DCP and TDN were found 151.13, 28.98, 3.01, 2.52 and 17.90, respectively during flush season.

Availability of nutrients from mixed jungle forages has been estimated

Nutrient content (% DM) of important locally available fodders

Fodders	OM	CP	CF	TCHO
Tophala	88.78	19.62	26.13	66.22
Kere	89.91	20.65	11.82	65.78
Kuve	91.29	22.40	9.81	64.99
Kosuh	88.60	25.45	10.35	59.71
Tukholumu	85.55	25.38	8.95	58.11
Roza	94.03	20.70	13.53	60.42
Khaboo	88.83	21.74	16.99	63.32
Nusa	92.17	21.68	13.29	61.67
Horu	94.47	20.21	9.98	72.24

High plasma GH concentration in mithun

Growth hormone (GH) concentration in mithun plasma has been found considerably higher than any other reported species. In a six week sampling, the mean basal plasma GH concentration (ng/ ml) has been found to be 29 and 25 in growing and adult mithuns, respectively. Age and body weight (BW) have been found to influence plasma GH and GH per 100 kg BW in mithun,but later has been found to be better indicator of growth.

Mean (± SEM) growth rates, GH concentrations and GH per unit live weight in mithun

Age	Growth rate (kg/ day)	GH (ng/ ml)	GH (ng/ ml) / 100 kg BW
0-6 months	0.66 ± 0.05	86.63 ± 9.69	198.52 ± 15.93
> 6-12 months	0.53 ± 0.04	67.96 ± 8.53	71.00 ± 9.12
> 1-2 years	0.43 ± 0.04	58.42 ± 9.44	45.08 ± 6.13
> 2-2.5 years	0.28 ± 0.05	48.88 ± 6.29	22.96 ± 5.83
> 2.5-3 years	0.25 ± 0.05	40.64 ± 7.93	16.03 ± 2.31
> 3 years	0.02 ± 0.01	33.17 ± 4.97	9.39 ± 1.02

Comparative evaluation of different tuberculin tests in mithun

A total of 57 mithuns (24 male and 32 female) from Institute's farms have been tested by three different tuberculin skin tests, namely single intradermal cervical test (SIDc), single intradermal tail caudal fold test (SIDt) and stormont test (STM) to evaluate the suitability of these tests to detect tuberculosis in mithun. Out of 57 animals, 15.78 % were found to be positive for STM. While the positive cases found in SIDc and SIDt were 10.52 % and 5.26 %, respectively.

Extensive Papillomatosis in mithun

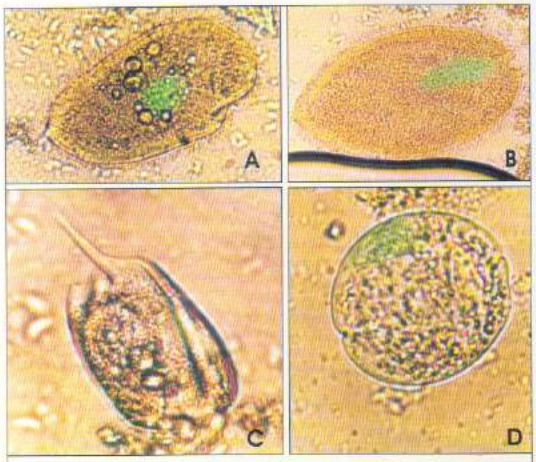
Hydatid cyst on mithun kidney

Evaluation of different diagnostics tests for brucellosis in mithun

Serum samples of 98 mithuns (43 cows, 30 heifers and 25 bulls) have been collected and screened for brucella antibodies by three serological tests viz., Rose-Bengal plate test (RBPT), standard serum agglutination test (SAT) and AB-ELISA. Out of 98 samples, 33.67 % have been found to be positive against brucellosis in AB-ELISA. Whereas, 24.48 % and 7.14 % have been found positive for brucellosis in SAT and RBPT, respectively. The critical features of brucellosis in mithun detected by SAT and RBPT using AB-ELISA as standard was investigated. It has observed that the relative sensitivity and specificity of SAT (70 % and 98 %) is greater than that of RBPT (15 % and 97 %). Similarly the predictive value (positive test result) of SAT has been found to be greater (96 %) than RBPT (71 %). Individually all these tests have showed significant differences in the prevalence of brucellosis among different strains. Highest incidence of brucellosis has been observed in Mizoram strain followed by Nagaland, Manipur and Arunachal strains.

Biochemical Properties and Ciliate Counts in Mithun Rumen Fluid

Profiles of different rumen metabolites and ciliate counts in rumen fluid have been established in mithun. The pH, total N_2 content (mg/ dl), TCA precipitated N_2 content (mg/ dl), total soluble N_2 content (mg/ dl), ammonia N_2 content (mg/ dl) and TVFA (meq/ dl) have been found to be 5.83 ± 0.10, 91.00 ± 14.20, 61.25 ± 7.48, 29.75 ± 7.54, 20.80 ± 3.61 and 8.15 ± 0.05, respectively in mithun rumen fluid. The total ciliate count (10^5 / ml) has been found to be 1.435 ± 0.210. The count (10^5 / ml) of holotrichs and spirotrichs have been found to be 0.029 ± 0.017 and 1.405 ± 0.207, respectively. Different holotrichs identified in mithun rumen fluid were *Isotricha prostoma, Isotricha intestinalis, Dasytricha ruminatum* and *Caronina ventriculi*. Whereas, different spirotrichs identified in mithun rumen fluid were *Entodinium bovis, Entodinium longinucleatum, Entodinium simplex, Entodinium nanellum, Entodinium caudatum, Entodinium ovium, Entodinium parvum, Entodinium rectangulatum, Entodinium minimum and Entodinium ypsilon.*



A. *Isotricha intestinalis* ; B. *Isotricha prostoma* ; C. *Entodinium caudatum* ; D. *Entodinium simplex*

Mithun milk products

Different conventional milk products viz. Paneer, Barfi, Rasgulla and Flavoured Lassi have been prepared successfully from the mithun milk containing 10 to 12 % fat and 4 to 7 % protein. However mithun milk has not been found suitable for making *rasgulla* as crack appears after cooling. It is found to be highly suitable for making dahi.

***Rasgulla* prepared from mithun milk**

Barfi prepared from mithun milk

Flavoured lassi prepared from mithun milk

Farm News

Medziphema Mithun Farm

A total number of 65 mithuns of different strains from different locations of N-E hill region are being maintained in this farm for conservation, preservation, propagation and also for experimental purposes. The total area of the farm is 68.5 acres including 2 acres of land under exclusive fodder cultivation. During November 2004, 11 mithuns from Nagaland and Myanmar border area have been procured for the Medziphema farm. Feed Block machine and Feed Mixtures manufactured by IARI, New Delhi, have been installed recently in the farm under NATP project.

A View of Medziphema mithun farm

Porba Mithun Farm

A total of 60 mithuns of different strains are being maintained here in its natural ecology for preservation, conservation, propagation and also for experimental purposes. The farm is located on steep hilly land at an altitude of 2133 M msl.

A View of Porba mithun farm

Cultivation of maize for fodder at Porba farm

Extension Activities

Activities of KVK

A Krishi Vigyan Kendra (KVK) has been approved for Phek distict of Nagaland. This is the third KVK of Nagaland, which has been allotted to NRC Mithun. Due to non availability of infrastructure and human resources, the KVK is functioning actively from Porba campus of NRC Mithun.

Demonstration to farmers during KVK training is on progress

At present the station in charge of Porba campus is looking after the different activities of KVK including conducting survey and training programmes. The KVK is currently conducting various training programmes in animal sciences, horticulture, fishery sciences, plant protection and home sciences. A total of 24 training programme have been conducted for the local farmers, school dropout and educated unemployed youth during 2003-04, which could generate lots of enthusiasm among rural masses of the district.

Details of KVK training programme conducted during 2003-2004

Sl No	Area	No of training	Number of different Participants			Others	Total number of participants
			Practising Farmers	Rural youth	Extension workers		
1	Animal sciences	8	70	34	48	64	216
2	Horticulture	3	20	32	-	38	90
3	Fishery sciences	4	35	30	88	-	153
4	Home sciences	3	-	64	23	-	87
5	Plant protection	6	91	33	31	24	179

Demonstration of horticulture nursery preparation during KVK training

Visitors at exhibition stall during republic day celebration on January 26, 2004 in Kohima

Other extension activities

- Exhibition cum mithun auction stall in "Agri Fare" during republic day celebration on January 26, 2004 at Kohima ground.
- Exhibition stall on Institute activities during international conference "Organic Food Nature", 14th-17th February, 2004 at ICAR Research Complex for NEH region, Barapani.

Honaurable Chief Minister of Meghalaya Mr. D. D. Lapang during his visit to the exhibition stall at Barapani

News

New office cum residential campus

The Directorate and the laboratories have been started functioning from its new office cum residential campus. The new campus is having a full-fledged office cum laboratory building and staff quarters. The new three-storied office building is consisted of 7 laboratories, library, ARIS cell, Director's cell including director's conference hall, Accounts section, Administrative section, Store, Seminar hall and Museum hall. A total number of 4 type-IV, 6 type-III, 4 type-II and 8 type-I staff quarters are available in the new residential campus.

New Directorate cum laboratory and residential campus of NRCM, Medziphema

NRCM library

Personalia

Dr. Chandan Rajkhowa has joined as the new Director of NRC Mithun. He has resumed the office of Director on 27th Dec., 04.

Honours / Awards

- Dr. Mohan Mondal, Scientist, Animal Physiology has been awarded the prestigious "Jwaharlal Nehru Award" for his doctoral research in Animal Production.
- Dr. Arindam Dhali and Group has been awarded the best poster paper award for their research on mithun rumen protozoa in "V Biennial Conference of Animal Nutrition Association" held in Bangalore.

Distinguished Visitors

The delegates from International Livestock Research Institute (ILRI), Nairobi and International Potato Center (CIP) Peru have visited NRC Mithun.

Dr. W. Thorpe from ILRI during his visit to the Institute mithun farm at Medziphema

MEMBERS OF THE FIRST QRT
TEAM WITH MITHUN FARMERS AT PORBA

VISIT OF THE GOVERNOR OF NAGALAND
HIS EXCELLENCY MR. SHYAMAL DUTTA AT
MITHUN FARM , MEDZIPHEMA

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