



# Swine News



**NATIONAL RESEARCH CENTRE ON PIG, RANI, GUWAHATI**

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## Director's Message

Dear Readers,

Pig husbandry has been playing a pivotal role in the socio-economic development of large population in India in general and North-Eastern states in particular. There is a growing demand for pork due to increasing per capita income, urbanization and changes in lifestyle and food habits. Considering the demand of tribal masses who are closely associated with pig farming for their livelihood generation, the institute has developed a pig variety (Crossbred Variety II) which can easily be propagated to farmers' field and its salient features are reflected in this document. Studies conducted to minimize expenditure on swine feeding showed that water hyacinth (*Eichhornia crassipes*) foliage could replace 5 % maize in ration of crossbred grower pigs without any adverse effect on nutrient utilization. While evaluating different additives for boar semen preservation it was noted that butylated hydroxitolune (BTH) exhibited positive effect with Modena extender for boar semen preservation irrespective of temperature of preservation. Studies on hormonal profile of indigenous pigs (Niang Megha and Ghungroo) revealed that the levels of T3, T4, cortisol and testosterone in the blood varied significantly. As atrophic rhinitis (AR) is one of the most important bacterial diseases of pigs and has tremendous economic impact on pig husbandry particularly in tropical countries like India, the institute has developed a novel monoplex PCR for the rapid detection of toxigenic strains of *Pasteurella multocida*, the etiological agent of progressive atrophic rhinitis (PAR) in pigs. The PCR assay developed for the differentiation of toxigenic *P. multocida* strains from non-toxigenic strains can be used for the routine screening of pig herd for toxigenic *P. multocida*, the etiologic agent of PAR. This institute has conducted Institute Management Committee meeting, Research Advisory Committee meeting, Institute Research Council meeting, celebrated Independence Day, Institute Foundation Day, Vigilance Awareness Week and organized Farm Innovation Day, Agricultural Education Day, Workshop on 'Technology Transfer and Training on Artificial Insemination during the reported period which are also reflected in this issue of the News letter. In addition, several distinguished dignitaries also visited the institute during the reported period.



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# SECTORAL NEWS

## MRSA strain jumped over from animals

A strain of methicillin-resistant *Staphylococcus aureus* has jumped from food animals to humans, according to a new study led by the Translational Genomics Research Institute (TGen), Phoenix, AZ. The study published in the online journal

*mBio* focuses on MRSA CC398. The study suggests that MRSA CC398 probably started as a non-resistant (antibiotic-susceptible) strain in humans before it spread to food animals where it became

resistant to several antibiotics. Using whole genome sequencing, researchers at 20 institutes joined forces to study 89 genomes from humans and animals spanning 19 countries and four continents.

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## Research Highlights

### Development of crossbred pig

The salient features of Crossbred Variety II ( $H_{50}M_{50}$ ) developed in the institute are: The average litter size of birth and weaning for this crossbred variety was  $6.94 \pm 0.61$  and  $6.63 \pm 0.61$ , respectively. The corresponding litter weight and individual weight at birth and weaning was  $5.89 \pm 0.61$  and  $0.84 \pm 0.06$  kg and  $38.68 \pm 4.03$

and  $5.97 \pm 0.35$  kg, respectively. Age at first heat and age at first service was found to be  $270.52 \pm 6.85$  and  $311.51 \pm 7.96$  days, respectively. Pre and post weaning growth rate was  $122.45 \pm 6.31$  and  $240.87 \pm 20.35$  g/day. Slaughter weight at 8 months age was  $57.488 \pm 1.624$  kg. Pre and post weaning mortality

was found to be 2.63% and 2.22%, respectively. Among the carcass traits; hot carcass weight, dressing percentage, carcass length, loin eye area and back fat thickness at 10<sup>th</sup> rib was observed as  $54.24 \pm 3.26$  kg,  $75.70 \pm 0.60\%$ ,  $87.00 \pm 6.54$  cm,  $3.20 \pm 0.25$  sq. inch and  $2.92 \pm 0.37$  cm, respectively.



Crossbred Variety II male pig



Crossbred Variety II female pig



Crossbred Variety II Piglets

## Water hyacinth (*Eichhornia crassipes*) foliage can replace 5% maize in the ration of grower pig

Eighteen crossbred (Hampshire X Ghungroo) grower male pigs were divided into three groups of six each in a randomized block design. The pigs were fed as per BIS (1986) feeding standard on three different types of grower rations supplemented with three different levels of water hyacinth foliage (*Eichhornia crassipes*) @ 0, 5 and 10 % by replacing (DM basis) the maize namely T<sub>1</sub> (maize- 60.0, wheat bran- 10.5, soyabean meal- 14.0, groundnut- 13.0, water hyacinth foliage 0.0, mineral mixture- 2.0, common salt-0.50); T<sub>2</sub> (maize- 55.0, wheat bran-10.5, soyabean meal- 14.0, groundnut-

13.0, water hyacinth foliage 5.0; mineral mixture-2.0, common salt-0.50) and T<sub>3</sub> (maize- 50.0, wheat bran-10.5, soyabean meal- 14.0, groundnut- 13.0, water hyacinth foliage 10.0, mineral mixture 2, common salt-0.5). Additionally, 40g phytase enzyme, 0.04% lysine and 0.01% methionine was added to all diets. Water hyacinth (*Eichhornia crassipes*) foliage was supplemented on fresh basis. The digestibility coefficient of dry matter, organic matter, crude protein, ether extract and nitrogen free extract was similar in T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> groups while digestibility coefficient of crude fiber reduced

significantly (P<0.01) in T<sub>3</sub> group.

Average feed intake (kg/d) ranged from 1.13±0.03, 1.11±0.03 and 1.14±0.03 in T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> groups respectively and found similar across all treatment groups. Average growth rate (g/day) ranged from 260.6 ±48.2 to 365.9 ±85.6 in T<sub>3</sub> and T<sub>2</sub> group respectively and the value for other group is within this range of variation. From this study, it is concluded that water hyacinth (*Eichhornia crassipes*) foliage could replace 5 % maize in ration of crossbred grower pigs without any adverse effect on nutrient utilization.

## Trial on additives for boar semen preservation

Popular semen extenders, GEPS and Modena were compared for preservation of boar semen at 15°C and 5°C up to 96 hours of preservation in presence of additives viz. KMnO<sub>4</sub>, Vitamin E, Butylated hydroxitolune (BTH) and Trehalose after dilution of boar semen @ 1:3 ratio. Live intact acrosome (LIA) percentage was recorded as 42.06 ± 3.33, 39.33 ± 3.23, 39.67 ± 3.47 and 33.45 ± 3.10 in GEPS extender with

KMnO<sub>4</sub>, Vitamin E, BTH and Trehalose respectively at 15°C temperature of preservation. The relative values at 5°C temperature of preservation were recorded as 39.29 ± 3.97, 36.42 ± 3.15, 36.83 ± 3.23 and 32.75 ± 3.15 in GEPS extender. Alternatively, LIA percentage was recorded as 45.67 ± 4.74, 43.25 ± 4.14, 52.46 ± 3.95 and 38.58 ± 4.21 in Modena extender with KMnO<sub>4</sub>, Vitamin E,

BTH and Trehalose respectively at 15°C temperature of preservation. The relative values at 5°C temperature of preservation were recorded as 43.17 ± 3.29, 42.89 ± 3.10, 49.58 ± 4.24 and 37.83 ± 3.94 in Modena extender. BTH exhibited positive effect with Modena extender for boar semen preservation irrespective of temperature of preservation.

## Hormonal profile of indigenous pigs

Studies on hormonal profile of indigenous pigs (Niang Megha and Ghungroo) revealed that the levels of T<sub>3</sub>, T<sub>4</sub>, cortisol and testosterone in the blood varied significantly in different age groups. There was an increasing trend of triiodothyronin levels as the age advances in both

the sexes and breeds of pigs, however, no significant difference was observed between the breeds, sex and age. It was also observed that level of thyroxin increased with age in both the sexes and breeds of pigs. However, no significant difference was

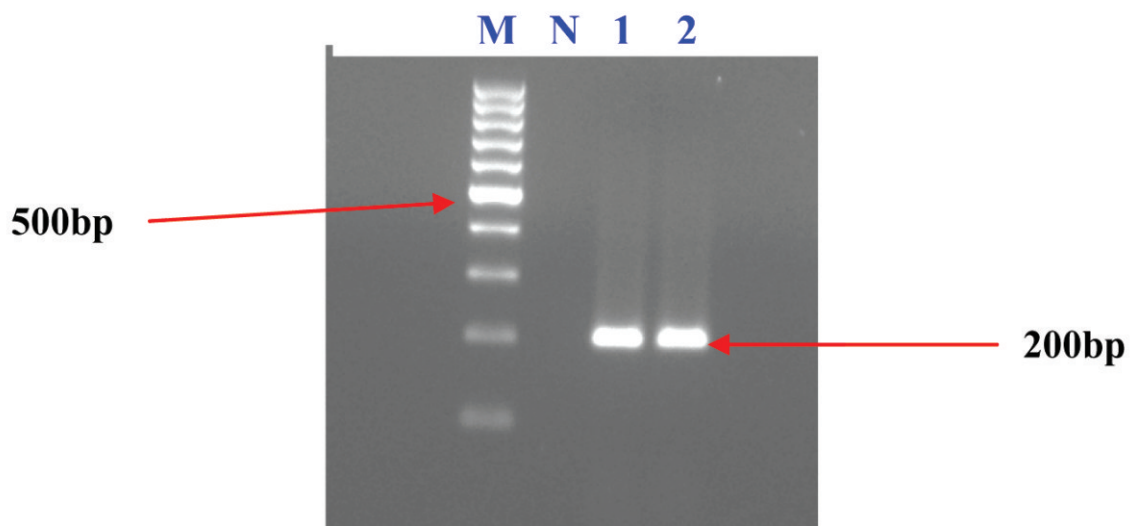
observed between the breeds and sexes. Similarly an increasing trend of testosterone levels was observed with increase in age in both the sexes and breeds of pigs. However, no significant difference was observed between the breeds and sexes.

## Development of a novel simplex PCR for rapid detection of toxigenic strains of *Pasteurella multocida* from pigs

Atrophic rhinitis (AR) is a serious, highly contagious disease of swine characterized by conchal atrophy, facial distortion, sneezing, nasal hemorrhage and impaired growth. The progressive form (PAR) of the disease is caused by toxigenic *P. multocida* alone or in combination with *B. bronchiseptica*. A definite diagnosis of PAR cannot be based solely on clinical and pathomorphologic observations, but requires detection of toxigenic *P. multocida* from nasal and/or tonsillar swabs. Nontoxigenic *P. multocida* can also concurrently infect the nasal cavities and tonsillar surfaces of

pigs. The etiologic importance of the toxin necessitates classification of the isolates as toxigenic or nontoxigenic for the diagnosis of PAR. As the disease (PAR) has tremendous impact on swine production we have developed a novel PCR for rapid detection of toxigenic strains of *P. multocida* from pigs. In order to develop the PCR assay for detection gene (*toxA*) encoding dermonecrotic toxin of *P. multocida*, the primers were designed (by primer designing software) by using gene sequences available in GenBank. The sequences of the newly designed primers for

detection of *toxA* gene of *P. multocida* were GGTAAGAGTTTGCCGTGGA (forward) and CGAGGCTTTGTGAAAAGAGG (reverse) and the amplification condition was initial denaturation at 95°C for 5 min followed by 30 cycles of denaturation at 95°C for 30 s; annealing at 56°C for 45 s, extension at 72°C for 45 s, and a final extension of 72°C for 5 min. The PCR assay developed for the differentiation of toxigenic *P. multocida* strains from nontoxigenic strains can be used for the routine screening of pig herd for toxigenic *P. multocida*, the etiologic agent of PAR.



Detection of *toxA* gene of *P. multocida* from pig by PCR, M: Molecular marker (100bp DNA ladder), N; Negative control, Lane 1: Positive control, Lane 2: Positive sample

# INSTITUTIONAL NEWS

## Meeting and Other Activities

### Institute Management Committee meeting

10<sup>th</sup> Institute Management Committee meeting of the Institute was held on 20<sup>th</sup> July, 2013 under the Chairmanship of the Director, NRC on pig. Various agenda items were discussed in detail and the suggestions put forward by the committee members were incorporated in the proceedings of meeting.



10<sup>th</sup> IMC meeting of the Institute

### Research Advisory Committee meeting

7<sup>th</sup> Research Advisory Committee meeting of the Institute was held on 21<sup>st</sup> August, 2013 under the chairmanship of Dr. K.M. Bujarbaruah, Hon'ble Vice-Chancellor, Assam Agricultural University. Other RAC members, Dr. S.C. Dubey, Ex-Joint Director, HSADL, Bhopal, Dr. S.K. Singh, Ex-Dean, College of Veterinary Sciences and Animal Husbandry, Ranchi and Dr. V.V. Kulkarni, Director, NRC Meat, Hyderabad and scientists of the Institute also attended the meeting. The briefing by the Director was followed

by the presentations of research projects, carried out under different approved research programmes, by the Scientists of NRC on Pig. Each research project presentation was followed by comments from the Chairman and members of the RAC.



7<sup>th</sup> RAC meeting is in progress

### Institute Research Council meeting

Institute IRC meeting was held under the Chairmanship of the Director during 24-25<sup>th</sup> September, 2013. Scientists of the Institute presented the progress of ongoing and completed research projects and each presentation was followed by deliberation and comments from the experts and the Chairman.

### Celebration of Independence Day

The Institute has celebrated the 67<sup>th</sup> Independence Day on 15<sup>th</sup> August, 2013 where all the staff members of the Institute actively participated.



Celebration of Independence Day at the Institute

Farm Innovation Day celebrated on 19<sup>th</sup> August, 2013

### **Farm Innovation Day**

Institute celebrated 'Farm Innovation Day' in collaboration with Zonal Project Directorate, Zone III, Barapani at KVK Goalpara on 19<sup>th</sup> August, 2013. The meeting was chaired by Dr. D.K. Sarma, Director, NRC on Pig. Dr. A.K. Gogoi, Zonal Project Director, Zone III gave a special address on the role of KVK in transforming the agricultural scenario of the state. An exhibition was organized with display of different adoptable technologies for the benefit of farmers. Farmer-scientists interaction meeting was also organized in which more than 100 progressive farmers and farm innovators attended.

### **Agricultural Education Day**

'Agriculture Education Day' was celebrated on 3<sup>rd</sup> September, 2013. Prof. B. K. Konwar, Vice-Chancellor, Nagaland University was the Chief Guest on the occasion.



Agriculture Education Day celebrated on 3<sup>rd</sup> September, 2013

### Celebration of Institute Foundation Day

Institute celebrated its 12<sup>th</sup> Foundation Day on 4<sup>th</sup> September, 2013. Dr. Anubrata Das, former Director

of the Institute was the Chief Guest on the occasion. Sri. I. Lokendra Singh, Commandant, 175 Bn CRPF, Rani also graced the occasion besides other dignitaries. Dr. Raju, Director, Family Welfare Centre, Manipur and Sri. L.M. Dey, SOS Village, Guwahati were the other Guests of Honour in the event. Chief Guest and the Guests of Honour also delivered speeches on the occasion followed by interaction of progressive farmers with Scientists and subject matter specialists of KVK on various aspects of livestock and agricultural issues. About 200 farmers including farm women, scientists and subject matter specialists participated in the interactive session. Various sporting events were also conducted in conjunction with the foundation day celebrations.



Glimpse of Institute Foundation Day Celebrations

## Celebration of Hindi Week

Hindi Week was celebrated from 23<sup>rd</sup> to 28<sup>th</sup> September, 2013. All the staff members of the Institute actively participated in various competitive events like typing, essay writing, debate, drawing, singing etc. and the winners of the events were awarded with cash prizes. Similarly Hindi divas was celebrated in the KVK located at Dudhnoi, Goalpara and all the staff of the KVK and 3 local leaders and 20 students from farm families participated in the programme.

## Celebration of Vigilance Awareness Week

The Vigilance awareness week was celebrated from 27<sup>th</sup> October to 2<sup>nd</sup> November, 2013 with a pledge taking ceremony by all the staffs in presence of the Director and Vigilance officer. During the week, casual counseling had been carried out about the good points of the vigilance which needs to be maintained with honesty and dignity.

## Workshop on 'Technology Transfer

Workshop on 'Technology Transfer Programmes in NEH States' organized by CIFT, Cochin was held in the Institute on 10<sup>th</sup> July, 2013. Dr. S.V. Ngachan, Director, ICAR-RC for NEH region, was the Chief Guest of the occasion.

## Training on Artificial Insemination

- ❖ A training on 'Piggery Development with special emphasis to Artificial Insemination' was organized during 1-8<sup>th</sup> July, 2013. The training was sponsored by Punjab Veterinary Council, Chandigarh for ten selected Veterinary officers from the state.



Training on AI for the Veterinary officers of the state of Punjab

- ❖ Two more training programmes on 'Artificial Insemination in pig' sponsored by Punjab Veterinary Council, Chandigarh was organized during 3-10<sup>th</sup> August and during 21<sup>st</sup> to 28<sup>th</sup> October, 2013 for batches of 10 selected Veterinary officers in each. During the last training programme, one associate Professor from CAU, Imphal had also undergone training.



## Distinguished Visitors

- ❖ Mr. Adriaan Vernooij, Research, training and education, Policy development, Wageningen University and Research Center, Livestock Research, Netherlands and Mr. Anand Krishanan, Deputy Counsellor for Agriculture, Nature and Food quality, India and Sri Lanka visited the Institute on 18<sup>th</sup> September, 2013.



- ❖ Dr. S. K. Bandyopadhyay, Hon'ble Member, ASRB visited the Institute on 2<sup>nd</sup> October, 2013.