Swine News

NATIONAL RESEARCH CENTRE ON PIG, RANI, GUWAHATI

Vol. 06 | July-December, 2014 | No. 02

Director's Message

Dear Readers,

Pig husbandry is playing a significant role in rural livelihood in north eastern (NE) states where pigs are the major source of income for a sizeable rural population. Significance of piggery in north eastern region can be gauged from the fact that the region holds 38.38 % of the total pig population in the country. NE states are growing and developing at rapid phase. The average GSDP growth of eight NE states during 11th plan stood at 9.95% against 7.9% at the national level. Increase in overall income is expected to create huge demand for processed food products especially processed meat products as consumers of the region are predominantly non vegetarian. Consumers of NE states have special preference for pork and pork products. Several programs have been initiated to promote piggery but it is a matter of great concern that pig population is decreasing year by year. As per the livestock census data of Department of Animal Husbandry, Dairying & Fisheries (DAHDF) ,Govt. of India pig population showed decreasing trend in five out of the eight NE states. Some of the issues concerning piggery sector in NE states are: (a) high price of quality pig feed (b) lack of biosecurity and higher incidence of diseases (c) poor availability of quality germplasm (d) lack of organized slaughter houses and efficient post harvest infrastructure and (e) lack of structured marketing channels etc. There is an urgent need to undertake a coordinated program covering all the states of NE for comprehensive development of piggery sector. The ICAR-NRC on Pig being the premier institute in the country is trying its best to bring in excellence in pig production through innovative research on pig production, health and product processing. It is important to bring the unorganized piggery sector to an organized vibrant sector in a sustainable manner so that this NE region is not only self sufficient in pork but can also export pork and pork products. A few of the research works and other activities of the Institute during the period are highlighted briefly in this news letter.

SECTORAL NEWS

H1N1 Virus infection in India

The influenza which was first named as swine flu and later on declared as a pandemic because of rapid spread in many countries since 2009 is again appearing in India. After the global pandemic the incidences of the disease reduced drastically, but the sudden burst of cases and increasing number of casualties in India is creating a panic situation in some places. Besides its impact on human health, the frequent use of the term "swine flu" for the disease may have a negative impact on pig farming, which is playing an important role in rural livelihood of tribal dominant states particularly the North Eastern states of India.

The novel H1N1 strain of the influenza A virus, which is responsible for the human infection since 2009 was termed as swine flu at the beginning thinking that the causative virus is the same that cause influenza in pigs/ swine. Subsequently it was found that the influenza virus strain causing human infection is a cocktail, having genetic material of swine, bird and human influenza viruses. Based on this, many countries have stopped using the name swine flu and used the name like new flu, novel flu, influenza A (H1 N1) infection and H1N1 virus infection etc. The current influenza A (H1N1) virus is contagious and is spreading from human to human. Spread of the virus is mainly from person to person through coughing or sneezing of people with the virus infection. Infected people may be able to infect others beginning one day before symptoms develop and up to seven or more days after becoming sick. Children, especially younger children, might potentially be contagious for longer periods. Viruses can be spread when a person touches something that is contaminated with the viruses and then touches his or her eyes, nose, or mouth. This H1N1 virus is not spread by food. So far pigs are not playing any role in spread of the disease and one cannot get this influenza from eating pork or pork products. The flu virus is killed by cooking temperatures of 70 degrees Celsius (160 degrees Fahrenheit).

Based on the symptoms it is difficult to confirm the H1N1 virus infection. The real-time reverse transcriptase (rRT)-PCR, is the most sensitive and specific test for the diagnosis of the virus infection.The rRT-PCR Flu Panel diagnostic test can better determine whether an infected person is carrying the new strain of the flu virus or not. The cost of the test as fixed by the Govt.of India is coming around Rs.4500.00

If a person becomes sick with the influenza virus infection, antiviral drugs can make the illness milder and make the patient feel better faster. Treatment may also prevent serious flu complications. For treatment, antiviral drugs work best if started soon after getting sick (within 2 days of symptoms). Beside antivirals, palliative care at home or in the hospitals, focuses on controlling fevers and maintaining fluid balance. The CDC recommends the use of Tamiflu (oseltamivir) or Relenza (zanamivir) for the treatment and/or prevention of infection with the influenza virus, however, the majority of people infected with the virus make a full recovery without requiring medical attention or antiviral drugs.

Research Highlights

Tapioca (*Manihot esculenta*) silage for pig feed

Tapioca roots contain about 30 to 40% dry matter. Starch and sugar are the predominant components of the dry matter. It contains 70 % starch and 10 % sugar on DM basis. Crude protein content of tapioca root is 2 to 4%. The roots contain significant amounts of vitamins, particularly vitamin C, thiamine, riboflavin and niacin. Tapioca root is primarily a source of carbohydrate and can completely replace maize as an energy source in feeds for pigs. Properly dried whole tapioca roots can replace maize in finisher ration if the hydro-cyanic acid does not exceed 100 ppm. Tapioca roots can also be used for preparation of silage for pigs. First peeling of the tubers is required as peels contain toxic level of hydrocyanic acid. Then tuber should be sliced into a size of 2-3 mm in diameter and mixed with 1% molasses or juggery and 0.25 % common salt and then tightly packed in a polythene sheet. The packed materials should be kept for 40 days. Then the material becomes ready for feeding to pigs. The pH of the silage ranges from 3.5 to 4.5. The aroma of the material become very pleasant and it becomes very palatable for pigs. In a feeding trial in grower pigs tapioca root silage was used @ 0, 10 and 15 % by replacing the maize ingredients in T_1, T_2 and T_3 groups. The average daily gain in body weight has improved by 1.21 (253.22±18.71 vs 256.28±10.63) and 16.99 % (253.22±18.71 vs 296.25±11.22) in T_2 and T_3 groups respectively in comparison to T_1 group. The feed conversion ratio was found to be similar across the treatment groups. The cost (Rs/kg gain) of production of pigs per kg live weight reduced significantly ($P<0.05$) by Rs 4.97 and 16.61 in T_2 and T_3 groups.

Potassium permanganate and Skim milk powder can be used in GEPs extender for preservation of boar semen

Potassium permanganate could successfully be used in place of antibiotics in the GEPS semen extender for preservation of boar semen at 15° C up to 48 hours of preservation. Artificial insemination done both at institute and field level resulted in the litter size at birth of 7.56 ± 0.23 (n=9) and 8.7 ± 0.35 (n=10) in gilts and sows respectively. Skim milk powder as added to the GEPS semen extender when inseminated within 120 hours of preservation at 15°C resulted in the higher litter size at birth of 9.17 ± 0.45 as compared to insemination with plain GEPS extender that resulted in 8.83 ± 0.34 litter size at birth.

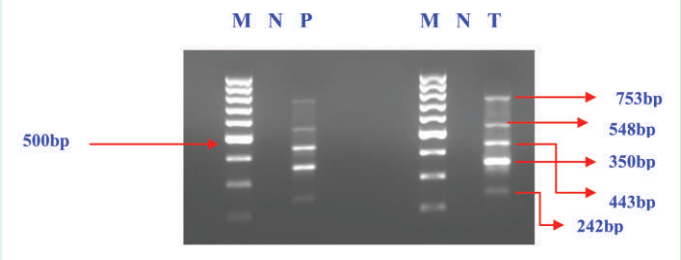
Comminuted pork products could be processed in the absence of refrigeration facilities

Available literature indicate that high comminution temperatures are deleterious to the stability of the meat batter, which would suggest that processed meat products cannot be made in tropical climates without the aid of refrigeration. Thus a study was conducted in pork nuggets to understand the effect of comminution temperature on quality and shelf life and to elucidate the feasibility of processing such products without reliable refrigeration facilities in tropical countries.

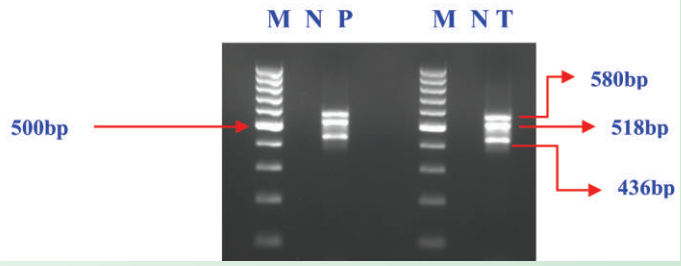
Cooking loss increased with increasing comminution temperature and was higher ($P < 0.05$) for the 26.4°C chopping temperature treatment than 15.1 or 18.2°C treatments, while the 33.6°C treatment displayed highest loss ($P < 0.01$) than all other treatments. Lovibond Tintometer colour analysis revealed that, redness (a values) decreased significantly ($P < 0.05$) with increase of comminution temperatures, however, a significant reduction was absent for 18.2°C treatment compared to 15.1°C. Texture profile analysis results revealed that the pork nuggets prepared from batters with higher temperatures (26.4 and 33.6°C) differed significantly ($P < 0.05$) for most of the parameters compared to those processed from batters with lower temperatures. Even though, a significant ($P < 0.05$) difference was absent among the four treatments for TBARS values during the first week of storage, the 33.6°C temperature treatment had significantly higher ($P < 0.01$) values than all other treatments during the subsequent storage periods. Aerobic mesophilic counts enumerated were significantly ($P < 0.05$) higher for 33.6°C treatment than all other treatments. It is readily apparent that, the pork nuggets processed from batters with different temperature differs quite markedly, as evidenced by their emulsion stability, cooking loss and texture profiles. The differences among the four treatments for TBARS values, sensory attributes and microbiological parameters indicated that the shelf life of pork nuggets is also influenced by the comminution temperature of batter. Objective and subjective assessment revealed that at least up to comminution temperatures of 26.4°C the nuggets were acceptable. Thus, the present findings suggests that, in tropical countries like India, comminuted pork products could be processed, without much affecting the quality and shelf life, even in the absence of refrigeration facilities.

Development of a novel multiplex PCR assay for rapid detection of important virulence associated genes (VAGs) of *P. multocida* from pigs

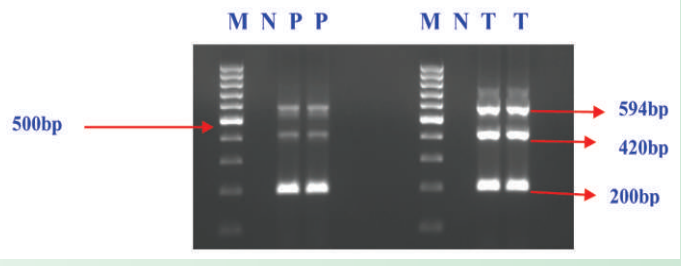
P. multocida infection is common in pigs and the diseases caused by this organism have significant impact on swine production because of the considerable mortality associated with the diseases caused by this organism. It is very much essential to know the virulence factors of the organism which will help us in knowing the pathogenic potential of the organism. As several virulence factors have been found to be associated with the organism which might play a pivotal role in disease causation, it will be very helpful if we can detect the most important virulence factors generally associated with the organism. PCR will



Detection of virulence associated genes [*ompH* (242bp), *ompA* (350bp), *plpB* (443bp), *hgbA* (548bp) and *pfhA* (753bp)] of *P. multocida* from pigs by multiplex PCR (Multiplex 1), M: Molecular marker (100bp DNA ladder), N: Negative control, lane P: Positive control, lane T: Test organism



Detection of virulence associated genes [*oma87* (436bp), *nanB* (580bp) and *nanH* (518bp)] of *P. multocida* from pigs by multiplex PCR (Multiplex 2), M: Molecular marker (100bp DNA ladder), N: Negative control, lane P: Positive control, lane T: Test organism



Detection of virulence associated genes [*toxA* (200bp), *ptfA* (420bp) and *tonB* (594bp)] of *P. multocida* from pigs by multiplex PCR (Multiplex 3), M: Molecular marker (100bp DNA ladder), N: Negative control, lane P: Positive control, lane T: Test organism

help in detection of those virulence associated genes of the organism but we have to perform several simplex PCRs which will be time consuming. If we can develop multiplex PCR for detection of those important VAGs of the organism it will save our time and labour. As there is no much information available on the use of multiplex PCR for detection of VAGs of *P. multocida* from pigs, we developed a novel multiplex PCR sets (3 sets) for the detection of 11 important VAGs of the organism. The multiplex-PCR protocols which we have developed gave the same results as individual protocols. Therefore, the novel multiplex PCR developed will be very helpful in large scale screening of *P. multocida* isolates of porcine origin for their virulence genes profile.

INSTITUTIONAL NEWS

Meeting and Other Activities

Institute Management Committee meeting

11th Institute Management Committee meeting of the Institute was held on 25th July, 2014 under the Chairmanship of the Director, NRC on Pig. The members present in the meeting were Dean, AAU, C.V.Sc., Khanapara, Dr. A. Chakraborty, Director of Research (Vety), C.V.Sc., Khanapara, Director, Vety & Animal Husbandry, Govt. of Assam, Dr. A. K. Pattanayak, Principal Scientist & Head, Division of Plant Breeding, ICAR Res Complex for NEH Region, Umiam, Megahlaya, Dr. G. C. Acharya, Incharge CPCRI, Kahikuchi, Guwahati, Dr. S. Rajkhowa (member secretary), Senior Scientist, NRC on Pig, Dr. N. H. Mohan, Senior Scientist, NRC on Pig, Mr. Parimal Ghosh, Sr. F &AO, ICAR Res Complex for NEH Region, Umiam, Megahlaya and Mr. P. Nayak, AF & AO, 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 the meeting.

11th IMC Meeting

Stakeholders meeting

A stakeholders meeting was organized by NRC on Meat, Hyderabad on 19th August, 2014 at the committee room of NRC on Pig, Guwahati. The meeting was attended by more than 25 stakeholders and a few to list are Dr. Dilip Kumar Sarma, Director, NRC on Pig, Dr. V.V. Kulkarni, Director, NRC on Meat, Dr. N.V. Nagchan, Director, ICAR-RC, Umiam and Dr. C. Rajkhowa, Director, NRC on Mithun.

Institute Research Council meeting

Institute Research Council meeting was held under the Chairmanship of the Director on 20th August, 2014. Scientists of the Institute presented the progress of ongoing and completed research projects and each presentation was followed by deliberation and comments from the Chairman. A few new research proposals were also presented in this meeting.

IRC meeting is in progress

Celebration of Independence Day

68th Independence day was celebrated at the Institute with full enthusiasm where all the staff of the institute participated actively in different events organized for the occasion. The Director of the institute also delivered a speech emphasizing the importance of the day for each citizen of the country and achievements of the country since its independence.

Celebration of Independence Day at the Institute

Hands-on training on Hygienic pig slaughter

A five day's training program on "Hygienic pig slaughter and value addition of pork" was organized successfully from 18th to 22nd August, 2014. Five participants from Khasi Hills, Meghalaya viz. Mr. Shibun Lyngdig, Mr. Heavy Paul Lyngkhoi, Mr. Kynsai John Kharlukhi, Mr. Herman Massar and Mr. Dapbor Khongdup participated in the program. All the trainees were meat handlers and the training has provided exposure to participants on basics of ante & postmortem inspection, hands-on-training on scientific pig slaughter process, preparation, fabrication & packaging of pork, facilities required for hygienic slaughter, common diseases encountered during the slaughter operations and the importance of personnel hygiene.

Interaction of participants with the scientists of the Institute

Research Advisory Committee Meeting

8th Research Advisory Committee meeting of the institute was held on 20th September, 2014 under the Chairmanship of Dr. K.M. Bujarbaruah, Vice-Chancellor, Assam Agricultural University. All the RAC members viz. Dr. A.S. Nanda, Vice-Chancellor, Nana Deshmukh University of Veterinary and Animal Sciences, Jabalpur; Dr. R.S. Gandhi, ADG (AP&B); Dr. V.V. Kulkarni, Director, NRC on Meat, Dr. S.C. Dubey, Former Director, HSADL, Bhopal and Dr. S.K. Singh, Former Dean, BAU attended the meeting. RAC has critically evaluated and commented on each of the research programme/ projects carried out at the institute.

8th RAC meeting is in progress

Model training course on piggery

An eight-day Model Training Course (MTC) on 'Breeding and management strategies for piggery enterprises for increased productivity and profitability' was organized at the institute from 08th to 15th September 2014. The training program was sponsored by the Directorate of Extension, Department of Agriculture & Cooperation, Ministry of Agriculture, Govt. of India. All together twenty four senior veterinary officials from the line departments of ten different states of the country participated in the training programme. During this training, experts from ICAR-NRC on Pig, other ICAR organizations of northeastern states, Assam Agricultural University and banking institution like State Bank of India have been the resource person.

Model Training Course on Piggery

Celebration of Hindi Week

Hindi Week was celebrated from 25th to 30th September, 2014. 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.

Celebration of Hindi Week at the Institute

Celebration of Institute Foundation Day

Institute celebrated its 13th Foundation Day on 4th September, 2014. 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. Dr. H. Kakati, Ex-Director, Veterinary & AH department, Govt. of Assam was Guest of Honour in the event. Chief Guest and the Guest 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 celebration.

Glimpse of Institute Foundation Day

Annual Review Meet of All India Coordinated Research Project on Pig and Mega Seed Project on Pig

To review the progress made in the AICRP on Pig and Mega-seed project on pig centres, the review meeting was held on 10-11th October, 2014 under the Chairmanship of Dr. K.M.L. Pathak, Deputy Director General (Animal Sciences), ICAR, New Delhi in the presence of Dr. R.S. Gandhi, Assistant Director General (AP&B), ICAR; Dr. D.K. Sarma, Director, ICAR-NRC on Pig and Dr. Vineet Bhasin, Principal Scientist, (AG&B), ICAR, New Delhi. The meeting started with the welcome address by Dr. D.K. Sarma, Director, ICAR-NRC on Pig, followed by remarks of Dr. R.S. Gandhi, Assistant Director General (AP&B) and Dr. Vineet Bhasin, Principal Scientist (AGB), ICAR. The Director of the Institute who is also the Project Coordinator presented the project coordinator's report briefing the progress of AICRP on pig centres and Mega Seed Project on Pig. Dr. K.M.L. Pathak, Deputy Director General (Animal Sciences), ICAR reviewed the project coordinator's report and stressed upon the initiation of artificial insemination, uniform feeding and management practice and validation of developed technologies at farmers field.

Annual Review Meet of AICRP and MSP on Pig

Celebration of Vigilance Awareness Week

The Vigilance awareness week was celebrated from 27th October to 1st November, 2014 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.

Celebration of Vigilance awareness week at the Institute

Farmer's training programme on scientific pig husbandry practices

A 5 days farmer's training programme on scientific pig husbandry practices under Indian Army's Operation Sadbhavaana Programme was organized at the Institute from 27th to 31st October, 2014. The programme was sponsored by 9 Punjab 107 Mountain Brigade. Under this programme unemployed rural youths from selected districts of Assam were trained in different batches.

Farmers training programme conducted at the Institute

ICAR sponsored short term training program

ICAR sponsored short term training program on 'Farm to fork approach for quality pork production in the country' was successfully organized from 1st to 10th December 2014 at ICAR-National Research Centre on Pig, Rani, Guwahati for the benefit of scientific, teaching and extension faculties from different Institutions across India. Twenty participants from nine different states viz., Karnataka, Andhra Pradesh, Telangana,Madhya Pradesh,Arunachal Pradesh, Nagaland, Assam, Mizoram and Tripura participated in the program.

ICAR sponsored short term training programme

Organization of National Conference

For the first time in India a National Conference focusing issues on sustainable pig husbandry was organized by the ICAR-National Research Centre on Pig, Rani,Guwahati on 20th and 21st December 2014. The conference critically deliberated the issues of contemporary relevance in sustainable pig production such as feeding systems, climate change, pig breed development, health, zoonosis, pork product development and value chain under different production systems. Besides experts and scientists, representatives from NABARD, SBI, entrepreneurs and progressive farmers participated in the conference. Shri V.K. Pipersenia, IAS, Additional Chief Secretary and Agriculture Production Commissioner to the Govt. of Assam inaugurated the conference and the session was presided by Dr.K.M. Bujarbaruah, Vice-Chancellor, Assam Agricultural University, Jorhat. Dr.M.P.Yadav former Director of Indian Veterinary Research Institute and Secretary, National Academy of Agricultural Sciences and Dr.K.M. Cherian, legendary cardiac surgeon and a Padmashri awardee were the guests of honour. More than 100 delegates including leading researchers from different parts of India participated in the conference. Based on the deliberations over six technical sessions, a road map was prepared to augment sustainable pig production in India to ensure nutritional and livelihood security among farming community.

National Conference organized at the Institute

Organization of training on CeRA

An one day awareness training on Consortium for e-Resources in Agriculture (CeRA) was organized at ICAR-NRC on Pig, Rani, Guwahati on 19th November, 2014. This training was jointly organized by DKMA, ICAR, Krishi Bhawan, New Delhi and Informatics Publishing Ltd., Bangalore and locally coordinated by ICAR-NRC on Pig, Rani, Guwahati. More than 25 participants from different parts of India participated in this training.

Organization of awareness training on CeRA

Institute Animal Ethics Committee (IAEC) Meeting

Meeting of the Institute Animal Ethics Committee (IAEC) and CPCSEA was conducted on 31st December, 2014 to discuss the matters related to ethical principles for conducting scientific experiments which involve use of animals at the Institute. Dr. P. Chakravarthy, In-charge Head, Deptt. of Pharmacology, Silchar Medical College and Dr. K.C. Nath, Professor, Animal Reproduction and Gynecology, CVSc, Khanapara, both nominees of CPCSEA and other members of IAEC were present in the meeting.

IAEC meeting is in progress

Distinguished Visitors

❖ Dr. N. K. Bhattacharjee, Former Director, CIRG visited the institute and interacted with the scientists on 9th June, 2014.

❖ Dr. S. C. Gupta, Senior Consultant, DBT (NER-BPMC) visited and interacted with the scientists on 13th June, 2014.

❖ Dr. K. M. Cherian, legendary cardiac surgeon and Padmashri awardee visited the Institute on 20th December, 2014 on the eve of inauguration of National Conference on Opportunities and Strategies for Sustainable Pig Production during 20-21st December, 2014.

❖ Shri. V.K. Pipersenia, IAS, Additional Chief Secretary and Agriculture Production Commissioner to the Govt. of Assam visited the Institute on the eve of inauguration of National Conference on Opportunities and Strategies for Sustainable Pig Production during 20-21st December, 2014.