ANNUAL REPORT

AICRP ON PIG

&

MEGA-SEED PROJECT ON PIG

2015-16

भा.कृ.अनु.प.- राष्ट्रीय शूकर अनुसंधान केन्द्र

ICAR-NATIONAL RESEARCH CENTRE ON PIG

Indian Council of Agricultural Research

Rani, Guwahati, Assam, Pin -781131

Annual Report (2015-2016)
AICRP on Pig
&
Mega Seed Project on Pig

ICAR-National Research Centre on Pig
Rani, Guwahati, Assam- 781 131

Annual Report (2015-2016)
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ICAR-National Research Centre on Pig, Rani, Guwahati, Assam

Annual Report (2015-2016)
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CONTENTS

Mega-Seed Project on Pig

कार्यकारी सारांश

सूकर पर अखिल भारतीय समन्वित अनुसंधान परियोजना

अखिल भारतीय समन्वित अनुसंधान परियोजना का सूत्रपात पांचवीं पंचवर्षीय योजना (1970-1971) के दौरान हुआ था जिसका मुख्य उद्देश्य मौजूदा प्रबंधन शर्तों के तहत सूकरों की शुद्ध नस्लों के प्रदर्शन का अध्ययन करना था ।

चौथी और पांचवीं पंचवर्षीय योजना के दौरान निम्नलिखित उद्देश्यों के साथ सूकरों की विदेशी नस्लों पर (तिरुपति और जबलपुर में बड़े सफेद यार्कशायर पर, खानापाड़ा और इज्जतनगर में Landrace पर) अनुसंधान कार्य संपादित किए गए :

- चयन सूचकांक और आनुवंशिक उन्नयन की दृष्टि से भारत में उपलब्ध सूकरों की विदेशी नस्लों की उपयोगिता हेतु आर्थिक रूप से महत्वपूर्ण विदेशी नस्लों के विभिन्न आनुवांशिकी मानकों का आकलन करना ।
- सूकर उत्पादन पर प्रोटीन ऊर्जा अनुपात के प्रभाव की जांच करना और विभिन्न स्थानों पर सूकरों के लिए कम लागत पर समुचित और किफायती चारे का पता लगाने हेतु पोषण संबंधी प्रयोग करना ।
- सूकर रोगों का अध्ययन करना और उनकी रोक-थाम के लिए उपयुक्त नियंत्रण उपायों की खोज करना ।

पांचवीं पंचवर्षीय योजना के अंत तक इनकी बहुल संख्या और ग्रामीण जनता के लिए इसके उच्च आर्थिक महत्व को ध्यान में रखते हुए देशज सूकरों में सुधार करने की जरूरत महसूस की गई । यह भी महसूस किया गया है कि ग्रामीण स्थिति के साथ-साथ फार्म में भोजन रूपांतरण की अधिकतम क्षमता वाले अनुकूल किस्म के सूकर विकसित करने के लिए प्रजनन तकनीक को विकसित करना आवश्यक है । अतः सूकर उत्पादनों के बहुआयामी पहुंच के लिए छठी पंचवर्षीय योजना की शुरुआत में सर्वप्रथम देशज सूकर पर, तत्पश्चात वर्तमान लक्ष्य के साथ देशज मादा से उचित विदेशी नस्ल के साथ परस्पर प्रजनन पर शोध कार्य हेतु राष्ट्रीय सूकर अनुसंधान केंद्र (एनआरसी) द्वारा सूकर के तकनीकी कार्यक्रम को संपूर्णतः दुबारा तैयार किया गया । इसके बाद बारहवीं योजना अवधि के दौरान एआईसीआरपी केन्द्रों की संख्या बढ़कर 15 हो गयी । 31.3.2016 तक एआईसीआरपी के निम्नलिखित केंद्र कार्य कर रहें हैं-

- असम कृषि विश्वविद्यालय, खानापाड़ा, गुवाहाटी।
- बिरसा कृषि विश्वविद्यालय, कांके, रांची
- केरल पशु चिकित्सा एवं पशु विज्ञान विश्वविद्यालय, मन्नुति।
- तमिलनाडु पशु चिकित्सा पशु विज्ञान विश्वविद्यालय, कट्टुपक्कम ।
- श्री वेंकटेश्वर पशु चिकित्सा विश्वविद्यालय, तिरुपति
- आईवीआरआई, इज्जतनगर।
- गोवा, ओल्ड गोवा के लिए आईसीएआर अनुसंधान परिसर।
- केन्द्रीय कृषि विश्वविद्यालय, आइजोल, मिजोरम
- नागालैंड विश्वविद्यालय, मेड़्ज़ीफेमा
- कृषि विज्ञान केंद्र, दुधनोई, गोलपाड़ा, असम

- केंद्रीय कृषि अनुसंधान संस्थान, पोर्ट ब्लेयर, अंडमान और निकोबार द्वीप
- केन्द्रीय कृषि विश्वविद्यालय, इम्फाल, मणिपुर
- भारतीय पशु चिकित्सा अनुसंधान संस्थान, पूर्वी क्षेत्रीय केन्द्र, कोलकाता, पश्चिम बंगाल
- NEH क्षेत्र, त्रिपुरा केंद्र, अगरतला, त्रिपुरा के लिए आईसीएआर अनुसंधान परिसर
- NEH क्षेत्र, बारापानी, शिलांग, मेघालय के लिए आईसीएआर अनुसंधान परिसर

ऊपर्युक्त केन्द्रों को वित्तीय समर्थन प्रदान करने के अलावा, राष्ट्रीय सूकर अनुसंधान केंद्र (एनआरसी) वार्षिक समीक्षा बैठकों के दौरान केन्द्रों की कार्य योजना तय करता है और प्रत्येक केन्द्र की प्रगति पर लगातार निगरानी रखता है ।

सूकर पर मेगा सीड प्रोजेक्ट

वर्तमान परियोजना एक नाभिक जर्मप्लाज्म उत्पादन केंद्र की अवधारणा के साथ क्रियान्वित की गयी है जिसे लक्षित गांव के अंदर और बाहर विशिष्ट सूकरों के क्षैतिज प्रसार सुनिश्चित करने के लिए ग्रामीण स्तर पर इसे उपग्रह केंद्रों से जोड़ा गया है ।

उद्देश्य:

- प्रतिवर्ष 300 सूकर पालक परिवारों को वितरित करने हेतु प्रत्येक केंद्र द्वारा 900 सूकर के बच्चों का उत्पादन करना ।
- उत्तम दर्जे के बहु संख्यक सूकर के बच्चों के उत्पादन के लिए संस्थानों की क्षमता का निर्माण करना ।
- उन्नत सूकर पालन के माध्यम से लिंग सम्मत अस्थायी गरीबों के विकास की शुरुआत करना ।

लक्ष्य:

- प्रौद्योगिकी नेतृत्व विकास के माध्यम से उत्तम दर्जे के उन्नत किस्म के सूकर के बच्चों का उत्पादन और फार्म की आय में बढ़ोतरी करना ।

वर्तमान में इस परियोजना के तहत आठ केंद्र हैं, जैसे-

- बिरसा कृषि विश्वविद्यालय, रांची
- असम कृषि विश्वविद्यालय, खानापाड़ा
- आईसीएआर आर सी **NEHR**, नागालैंड केंद्र, मेड्ज़िफेमा
- राज्य पशु चिकित्सा विभाग, मिजोरम, आइजोल, मिजोरम सरकार।
- केरल पशु चिकित्सा एवं पशु विज्ञान विश्वविद्यालय, मन्नुथि।
- पशु चिकित्सा और पशु पालन विभाग, अरुणाचल प्रदेश सरकार ।
- पशु संसाधन विकास विभाग, त्रिपुरा सरकार
- छत्तीसगढ़ कामधेनु विश्वविद्यालय, रायपुर, छत्तीसगढ़।

पिछले कुछ वर्षों के दौरान सुअर पर मेगा सीड प्रोजेक्ट के प्रभाव किसानों को सूकर के बच्चों के विकसित किस्म की आपूर्ति के संदर्भ में महत्वपूर्ण हो पाया था । विभिन्न मेगा सीड केन्द्रों द्वारा बेरोजगार ग्रामीण युवाओं की क्षमता निर्माण के बीच में उन्हें आजीविका के एक तरीके के रूप में सुअर पालन को लेने के लिए मदद की है।

Executive Summary

AICRP on Pig

All India coordinated research project was initiated during IVth five year plan (1970-1971) with the main objective of studying the performance of pure breed pigs under existing managemental conditions During IVth and Vth five year plan, the research work was conducted with the exotic breeds of pig (Large white Yorkshire at Tirupati and Jabalpur, landrace at Khanapara and Izatnagar) with the following objectives:

- To assess various genetics parameters of economically important exotic breeds of pig genetics available in India with a view to utilize the same in selection index and for making genetic advancement.
- To investigate the effect of protein energy ratio on production of pig and to conduct nutritional experiment to find out low cost and reasonably economic pig feed for different locations.
- To study the occurrence of pig diseases and to find suitable control measures against the same.

By the end of Vth five year plan, it was realized the need for improvement of indigenous pig in view of their large number and high economic importance to the rural population. It was also realized that breeding technologies need to be developed to evolve a suitable type of pig having optimum efficiency of feed conversion in farm as well as rural condition. Therefore, to give a multidisciplinary approach in pig production, the technical programme of AICRP on pig was completely remodeled in the beginning of VIth five year plan to undertake research work first on indigenous pig and then subsequently on the crossbreeding by crossing indigenous female with appropriate exotic breed with the present objectives. Subsequently during XII plan period, the AICRP centres were increased to 15 numbers. As on 31.3.16 the following AICRP centers were in position.

- Assam Agricultural University, Khanapara, Guwahati.
- Birsa Agricultural University, Kanke, Ranchi
- Kerala Veterinary and Animal Sciences University, Mannuthy.
- Tamilnadu Veterinary Animal Science University, Kattupakkam.
- Sri Venkateswara Veterinary University, Tirupati
- IVRI, Izatnagar.
- ICAR Research Complex for Goa, Old Goa.
- Central Agricultural University, Aizawl, Mizoram
- Nagaland University, Medziphema
- Krishi Vigyan Kendra, Dudhnoi, Goalpara, Assam
- Central Agricultural Research Institute, Port Blair, Andaman and Nicobar Island
- Central Agricultural University, Imphal, Manipur

- Indian Veterinary Research Institute, Eastern Regional Station, Kolkata, West Bengal
- ICAR Research Complex for NEH Region, Tripura Centre, Agartala, Tripura
- ICAR Research Complex for NEH Region, Barapani, Shillong, Meghalaya

Besides providing the budgetary support to the above centers, the NRC on pig is deciding the work plan of the centres during the annual review meeting and continuously monitoring the progress of each of the centres

Mega seed project on pig

The present project is implemented with a concept of one nucleus germplasm production centre linking it with satellite centres at village level to ensure a horizontal spread of quality pigs within and outside the targeted village.

Objectives:

- Production of 900 piglets by each centre for distribution to 300 farm families per annum.
- Capacity building in institutes to produce above number of quality piglets
- Initiating gender friendly pro-poor growth through improved pig husbandry

Target:

- Production of upgraded variety of quality piglets and increased farm income through technology lead growth

Currently there are eight centers under this project viz.

- Birsa Agricultural University, Ranchi
- Assam Agricultural University, Khanapara
- ICAR RC NEHR, Nagaland Centre, Medziphema
- State Veterinary Department, Government of Mizoram, Aizawl, Mizoram.
- Kerala Veterinary and Animal Sciences University, Mannuthy.
- Department of Veterinary and AH, Govt. of Arunachal Pradesh
- Animal resources development department, Government of Tripura
- Chattisgarh Kamdhenu Vishwavishyalaya, Raipur, Chattisgarh.

The impact of Mega Seed Project on Pig during last few years was found to be significant in terms of supply of developed variety of piglets to the farmers. Capacity building of the unemployed rural youth by different Mega Seed centers has helped to take up piggery as a way of livelihood among them.

AICRP on Pig

NAME OF THE CENTRE AND INCHARGE

	AICRP Project on Pig	Name of Incharge
1	College of Veterinary Science, Assam Agricultural University Khanapara, Guwahati, Assam-781022	Dr. D. Kalita
2	College of Veterinary & Animal Science Kerala Veterinary and Animal Science University, Mannuthy, Kerala-680651	Dr. A.P. Usha
3	College of Veterinary Science, Birsa Agricultural University, Kanke, Ranchi, Jharkand -834006	Dr. L.B. Singh
4	College of Veterinary Science, Sri Venkateshwara Vety. University, Tirupati- 517 502, Andhra Pradesh	Dr. D. Suresh Babu
5	ICAR-Central Coastal Agricultural Research Institute, Ela, Old Goa-403402, Goa	Dr. E.B. Chakurkar
6	Indian Veterinary Research Institute, Izatnagar, U.P. -243122	Dr. G.K. Gaur
7	Post Graduate Research Institute in Animal Sciences, Tamil Nadu Veterinary and Animal Sciences University, Kattupakkam, Tamilnadu-603203	Dr. D. Balasubramanyam
8	College of Veterinary Science & AH, CAU, Selesih, Aizawl, Mizoram-796007	Dr. S. Singh
9	School of Agricultural Science and Rural Development, Nagaland University, Medziphema, Nagaland-797 106	Dr. M. Catherine Rutsa
10.	ICAR-Central Island Agricultural Research Institute, Port Blair, A&N Island-744105	Dr. M.S. Kundu
11.	Central Agricultural University, Imphal, Manipur-795004	Dr. Th. R. Singh
12.	Indian Veterinary Research Institute, Eastern Regional Station, Kolkata, West Bengal-700037	Dr. S. Naskar
13.	ICAR Research Complex for NEH Region, Tripura Centre, Agartala, Tripura- 799210	Dr. A. Haldar
14.	ICAR Research Complex for NEH Region, Barapani, Shillong, Meghalaya-793 103	Dr. A. Sen
15.	Krishi Vigyan Kendra, NRC on Pig, Dudhnoi, Goalpara, Assam- 781131	Dr. S. Banik

ACTIVITY ASSIGNED AND TARGET FIXED

General:

1. Most significant achievements made since inception by individual centers need to be compiled and sent to the project coordinating unit by 31st October, 2015.
2. Monthly report of piglet production and sold should be sent to the Project Coordinator office by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.
3. Each of the centres needs to submit AUC before July month of preceding financial year and UC quarterly, positively.
4. The unspent amount as on 31st of March must be refunded by 30th April of next financial year positively.
5. Final annual report should be submitted as per format to ICAR-NRC on Pig by April of the preceding financial year.
6. The 75 percent of revenue receipt from sale proceed should be retained in the SAU/institute and 25 percent should be sent to the Project coordinating unit. 50% of the 75% retained with the institute can be utilized by the concerned project centre.
7. No additional budget will be provided in "salary component" for promotion of scientists to higher position other than sanctioned post. Increase of emolument for JRF/SRF or other contractual persons involved in the project should be borne from contingency fund. No additional fund will be provided for this purpose. The funds under salary head of AICRP should be used for payment of salary of regular staff only.
8. Changing of PI/In-charges of the centre should be done in consultation with Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, as the major mandate of each centres is on breeding aspect, however scientists from other disciplines may be associated with the project as Co-PIs.
9. The AICRP on pig and Mega Seed Project on pig incharges shall make a programme to visit other centres.

Animal Breeding:

Each of the old AICRP on pig centers should follow the following breeding plan:

1. Breed registration and conservation: All the AICRP on Pig centres shall take necessary steps for breed registration of indigenous germplasm in collaboration with ICAR-NRC on Pig and ICAR-NBAGR, Karnal. Centres may take initiatives at their respective states.
2. Crossbred animals of 75% exotic inheritance should be maintained.
3. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres.
4. Selection of male animals should be based on weaning weight (best 25%) and 8 month body weight (best 5%), based on two stage sequential selection. Selection of female animals should

be based on dam's litter size at birth (>7) and weaning weight (best 25%) and number of functional teats (at least 6 pairs of functional teats).

5. The males should be selected based on cyto-genetics screening.
6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. The overall genetic gain due to selection, selection differential and heritability need to be calculated and reported. Data should be presented for last three generation in the report.
7. Three number of farrowings per sow need to be recorded. Three farrowings par sow should be completed in 2 years. Following lifetime production traits should be reported:
    - Live weight produced per sow at birth
    - Live weight produced per sow at weaning
    - Live weight produced per sow at 8 months
    - Live weight produced per sow at the time of slaughter.
8. Artificial Insemination should be strictly implemented at all centers by 31.03.2016. Required training for AI may be obtained from ICAR-NRC on pig or other AICRP on pig centres.
9. All the new AICRP on Pig centres should initiate the programme for genetic improvement to achieve the technical recommendation for respective old centres with the following breeds:
    - Krishi Vigyan Kendra, ICAR-NRC on Pig, Dudhnoi, Goalpara, Assam - Doom Pig
    - Central Agricultural Research Institute, Port Blair, Andaman and Nicobar Island- Andaman local pig. The centre should also take efforts for registration of Andaman local and Nicobari pigs.
    - Central Agricultural University, Imphal, Manipur - 50% crossbred of Hampshire X Ghungroo crossbred
    - Indian Veterinary Research Institute, Eastern Regional Station, Kolkata, West Bengal- Ghungroo
    - ICAR Research Complex for NEH Region, Tripura Centre, Agartala, Tripura - Mali
    - ICAR Research Complex for NEH Region, Barapani, Shillong, Meghalaya -50% crossbred of Hampshire X Niang Megha.

Nutrition, physiology and management:

1. Final recommendation based on validation of existing feeding packages developed by AICRP on pig units need to be documented.
2. Each of the AICRP on Pig centres should explore the possibility of adopting villages for technology validation and transfer.
3. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.

4. The centers should develop technologies, including shelter management to reduce thermal stress on animals.
5. Success stories in this regard may be sent to ICAR-NRC on Pig.

Health Management:

1. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.
2. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5 months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2%; respectively.
3. Steps need to be taken to strengthen the bio-security measures at the farm to reduce pre and post weaning mortality.

Centre wise recommendation:

Assam Agricultural University, Khanapara:

1. The performance of the animals came to selection plateau. Hence, necessary steps may be taken to replace the boar to increase the variability among the population.
2. All other recommendations as mentioned should be strictly followed.

Kerala Veterinary and Animal Science University, Mannuthy:

1. Data should be presented generation wise for last three generations. Selection differential and genetic gain should be assessed.
2. All other recommendations as mentioned should be strictly followed.

Birsa Agricultural University, Ranchi:

1. Critical evaluation of genetic gain in selection experiment needs to be assessed.
2. To develop 75% exotic inheritance existing T&D crosses need to be back crossed with Tamworth. The performance of developed 75% crosses should be compare with existing T&D cross.
3. All other recommendations as mentioned should be strictly followed.

ICAR-IVRI, Bareilly:

1. Probiotic developed by the centre should be given to other centres for evaluation.
2. All other recommendations as mentioned should be strictly followed.

Sri Venkateswara Veterinary University, Tirupati

1. The data need to be properly analysed as the house observed disparity among different parameters. Further, specific attention need to be taken care while recording, analysis and interpretation of data.
2. All other recommendations as mentioned should be strictly followed.

ICAR Research centre for Goa, Goa:

1. The centre should present generation wise data for last three generation to compare the genetic gain.

2. All other recommendations as mentioned should be strictly followed.

Tamil Nadu Veterinary and Animal Sciences University, Kattupakkam:

1. Data should be presented generation wise for last three generations. Selection differential and genetic gain should be checked.
2. Experiment should be undertaken to reduce the heat stress.
3. All other recommendations as mentioned should be strictly followed.

CVSC, Central Agricultural University, Aizawl:

1. The centre should improve their performance as per technical programme assigned to them.
2. All other recommendations as mentioned should be strictly followed.

SASARD, Nagaland University, Nagaland:

1. Breeding programme need to be followed properly as the selection and crossbreeding experiments did not show the desired outcome.
2. All other recommendations as mentioned should be strictly followed.

INTRODUCTION

1. Brief history:

AICRP on pig was launched during IVth five year plan (1970-1971) with the main objective of studying the performance of purebred exotic pigs under existing managemental conditions at the following research centers:

I. ANGRAU, Tirupati, Andhra Pradesh
II. AAU, Guwahati, Assam
III. JNKVV, Jabalpur, Madhya Pradesh
IV. IVRI, Izatnagar, Uttar Pradesh

In 1992-93, two more centres at Kattupakam (Tamilnadu) and Mannuthy (Kerala) was added in the AICRP network. During the year 2000-2001, two more centres at ICAR Research Complex, Goa and BAU, Ranchi were started to study the performance of indigenous pig for two generations followed by their crossbreeding with Large White Yorkshire boars.

During the XI plan two more centres of AICRP were approved, namely College of Veterinary Science (CAU) at Aizawl, Mizoram and Nagaland University, Medziphema. JNKVV, Jabalpur, Madhya Pradesh center was discontinued from AICRP programme since April, 2013.

Most recently, during the XII plan five more new centers were approved and started functioning in 2014-15.

All existing AICRP centres on pig as listed below are coordinated by NRC on Pig.

- Assam Agricultural University, Khanapara, Guwahati
- Birsa Agricultural University, Kanke, Ranchi
- Kerala Veterinary and Animal Science University, Mannuthy
- Sri Venkateswara Veterinary University, Tirupati
- Tamilnadu Veterinary and Animal Science University, Kattupakkam
- Indian Veterinary Research Institute, Izatnagar
- ICAR-Central Coastal Agricultural Research Institute, Old Goa.
- Central Agricultural University, Aizawl, Mizoram
- SASARD, Nagaland University, Medziphema.
- Krishi Vigyan Kendra, NRC on Pig, Dudhnoi, Goalpara, Assam
- Central Agricultural University, Imphal, Manipur
- Indian Veterinary Research Institute, Eastern Regional Station, Kolkata, West Bengal
- ICAR Research Complex for NEH Region, Tripura Centre, Agartala, Tripura
- ICAR Research Complex for NEH Region, Barapani, Shillong, Meghalaya
- ICAR-Central Island Agricultural Research Institute, Port Blair, Andaman and Nicobar Island

NRC on Pig is engaged in coordinating the research and development of the AICRP centers both in terms of technical and financial aspect in consultation with Council.

2. Original objectives and modification thereof:

During IVth and Vth five year plan, the research work was carried out with the exotic breeds of pig (*viz.* Large White Yorkshire at Tirupati and Jabalpur, Landrace at Khanapara and Izatnagar) with the following objectives:

- To assess various genetic parameters of economically important traits of existing exotic breeds (Landrace and Large White Yorkshire) of pigs in India with respect to production, reproduction and efficiency of feed utilization.
- To investigate the effect of protein energy ratio on production of pigs and to evolve a low cost and reasonably economic pig feed for different region.
- To study the occurrence of pig diseases with a view to derive suitable control measure against the same.

By the end of Vth five year plans, urgent need for improvement of indigenous pig was realized in view of their large number and high economic importance to the rural population. Simultaneously breeding needed to be put in place to evolve a suitable type of pig having optimum efficiency of feed conversion in farm as well as rural condition. Therefore, to give a multidisciplinary approach in pig production, the technical programme of AICRP on pig was completely remodeled in the beginning of VIth five year plan to undertake research first on indigenous pig and then subsequently on the crossbreeding between indigenous female with appropriate exotic breed with the following objectives:

- To study the performance of indigenous pigs under optimal managemental conditions
- To produce crossbred by crossing indigenous gilts with exotic boars and to assess their performance in respect of their efficiency of feed conversion, production and reproduction
- To evolve economic pig ration with locally available feed ingredients, conventional and unconventional
- To select animals from within half breeds with faster growth on economic ration(s) to produce superior strain of improved pigs.
- To study the incidences of various diseases in pigs, so as to suggest areas for undertaking research to provide optimum health care.

The above technical programme was followed till Xth plan.

3. Revision of Technical Programme in XIth Plan:

The technical programme was further refined in view of the objective of the programme at AICRP meet at College of Veterinary and Animal Science, Manuthy in June, 2007 as follows:

1. *Inter-se*-mating in small population is not appropriate. Replacement of males must be practiced to avoid inbreeding.

2. Early weaning as early as 4 weeks of age should be practiced providing all nutritive feed supplements in creep ration
3. Region based shelter management should be adopted and for that extra fund may be provided
4. Integrated farming system may be adopted in order to economize production and transfer to field unit. Stocking density per hector area of land for pig *cum* fish may be calculated
5. Efforts need to be adopted to reduce overall mortality below 10% level. Meteorological data need to be recorded in order to forecast the disease outbreaks so that appropriate prevention measures can be adopted.
6. Region based suitable developed economic feed formula(e) is(are) yet to come up for adoption as package of practice. Search should continue, but it should not be a component of replacement in feeding formula for pigs under AICRP research units.

To further streamline and maintain uniformity among different centers, and finalization of work plan of new centers, lastly, details technical programme against the objective was recommended at AICRP Scientists' meet at NASC Complex, Pusa, New Delhi on September, 2015.

4. Action point discussed in Review Meet of 'All India Coordinated Research Project on Pig' and "Mega Seed Project on Pig" held at NASC Complex, Pusa, New Delhi on 17-18th September, 2015

AAU, Khanapara

Recommendation	Action Taken
General	
1. The most significant achievements made since inception by individual centers need to be compiled and sent to the project coordinating unit by 31st October, 2015.	1. Yet to be done
2. The monthly report of piglet production and sold are to be sent to the Project Coordinator office by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.	2. Regularly being sent
3. The centres need to submit AUC before July month of preceding financial year and UC quarterly, positively.	3. Yet to be done
4. The unspent amount as on 31st of March must be refunded by 30th April of next financial year positively.	4. Yet to be done
5. Final annual report should be submitted as per format to ICAR-NRC on Pig by April of the preceding financial year.	5. Done
6. The 75 percent of revenue receipt from sale proceed should be retained in the SAU/institute and 25 percent should be sent to the Project coordinating unit. 50% of the 75% retained with the institute can be utilized by the concerned project centre.	6. Noted
7. No additional budget will be provided in "salary component" for promotion of scientists to higher position other than sanctioned post. Increase of emolument for JRF/SRF or other contractual persons involved in the project should be borne from contingency fund. No additional fund will be provided for this purpose. The funds under salary head of AICRP should be used for payment of salary of regular staff only.	7. Noted
8. Changing of PI/In-charges of the centre should be done in consultation with Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, as the major mandate of each centres is on breeding aspect, however scientists from other disciplines may be associated with the project as Co-PIs.	8. Noted
9. The AICRP on pig and Mega Seed Project on pig in-charges shall make a programme to visit other centres.	9. Noted

Animal Breeding	
1. Breed registration and conservation: All the AICRP on Pig centres shall take necessary steps for breed registration of indigenous germplasm in collaboration with ICAR-NRC on Pig and ICAR-NBAGR, Karnal. Centres may take initiatives at their respective states.	1. AAU have already applied for registration of Doom Pig
2. Crossbred animals of 75% exotic inheritance should be maintained.	2. Carried out
3. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres.	3. Maintaining
4. Selection of male animals should be based on weaning weight (best 25%) and 8 month body weight (best 5%), based on two stage sequential selection. Selection of female animals should be based on dam's litter size at birth (>7) and weaning weight (best 25%) and number of functional teats (at least 6 pairs of functional teats).	4. Being maintained
5. The males should be selected based on cyto-genetics screening.	5. Practicing
6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. The overall genetic gain due to selection, selection differential and heritability need to be calculated and reported. Data should be presented for last three generation in the report.	6. Practicing
7. Three number of farrowings per sow need to be recorded. Three farrowings par sow should be completed in 2 years. Lifetime production traits should be reported:	7. Recorded
8. Artificial Insemination should be strictly implemented at all centers by 31.03.2016. Required training for AI may be obtained from ICAR-NRC on pig or other AICRP on pig centres.	8. Initiated
Nutrition, Physiology and Management	
1. Final recommendation based on validation of existing feeding packages developed by AICRP on pig units need to be documented.	1. Done
2. Each of the AICRP on Pig centres should explore the possibility of adopting villages for technology validation and transfer.	2. Initiated in Boko village
3. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	3. Being recorded
4. The centers should develop technologies, including shelter management to reduce thermal stress on animals.	4. Initiated
5. Success stories in this regard may be sent to ICAR-NRC on Pig.	5. Noted
Health Management	
1. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	1. Being done
2. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5 months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2%; respectively.	2. Carried out
3. Steps need to be taken to strengthen the bio-security measures at the farm to reduce pre and post weaning mortality.	3. Done
Centre wise recommendation	
1. The performance of the animals came to selection plateau. Hence, necessary steps may be taken to replace the boar to increase the variability among the population.	1. Initiated replacement of boar

BAU, Ranchi

Recommendation	Action Taken
General	
1. The most significant achievements made since inception by individual centers need to be compiled and sent to the project coordinating unit by 31st October, 2015.	1. Yet to be done
2. The monthly report of piglet production and sold are to be sent to the Project Coordinator office by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.	2. Regularly being sent
3. The centres need to submit AUC before July month of preceding financial year and UC quarterly, positively.	3. Yet to be done
4. The unspent amount as on 31st of March must be refunded by 30th April of next financial year positively.	4. Yet to be done
5. Final annual report should be submitted as per format to ICAR-NRC on Pig by	5. Done

April of the preceding financial year.	
6. The 75 percent of revenue receipt from sale proceed should be retained in the SAU/institute and 25 percent should be sent to the Project coordinating unit. 50% of the 75% retained with the institute can be utilized by the concerned project centre.	6. Informed to competent authority
7. No additional budget will be provided in "salary component" for promotion of scientists to higher position other than sanctioned post. Increase of emolument for JRF/SRF or other contractual persons involved in the project should be borne from contingency fund. No additional fund will be provided for this purpose. The funds under salary head of AICRP should be used for payment of salary of regular staff only.	7. Informed to CA
8. Changing of PI/In-charges of the centre should be done in consultation with Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, as the major mandate of each centres is on breeding aspect, however scientists from other disciplines may be associated with the project as Co-PIs.	8. Informed to CA
9. The AICRP on pig and Mega Seed Project on pig in-charges shall make a programme to visit other centres.	9. Noted
Animal Breeding	
1. Breed registration and conservation: All the AICRP on Pig centres shall take necessary steps for breed registration of indigenous germplasm in collaboration with ICAR-NRC on Pig and ICAR-NBAGR, Karnal. Centres may take initiatives at their respective states.	1. Initiated
2. Crossbred animals of 75% exotic inheritance should be maintained.	2. Carried out
3. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres.	3. Maintaining
4. Selection of male animals should be based on weaning weight (best 25%) and 8 month body weight (best 5%), based on two stage sequential selection. Selection of female animals should be based on dam's litter size at birth (>7) and weaning weight (best 25%) and number of functional teats (at least 6 pairs of functional teats).	4. Being maintained
5. The males should be selected based on cyto-genetics screening.	5. Practicing
6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. The overall genetic gain due to selection, selection differential and heritability need to be calculated and reported. Data should be presented for last three generation in the report.	6. Practicing
7. Three number of farrowings per sow need to be recorded. Three farrowings par sow should be completed in 2 years. Lifetime production traits should be reported:	7. Recorded
8. Artificial Insemination should be strictly implemented at all centers by 31.03.2016. Required training for AI may be obtained from ICAR-NRC on pig or other AICRP on pig centres.	8. Not done due to lack of manpower
Nutrition, Physiology and Management	
1. Final recommendation based on validation of existing feeding packages developed by AICRP on pig units need to be documented.	1. Information being collected.
2. Each of the AICRP on Pig centres should explore the possibility of adopting villages for technology validation and transfer.	2. Not done due to lack of fund
3. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	3. Being recorded
4. The centers should develop technologies, including shelter management to reduce thermal stress on animals.	4. Not done
5. Success stories in this regard may be sent to ICAR-NRC on Pig.	5. Not done.
Health Management	
1. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	1. Being done
2. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5 months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2%; respectively.	2. Carried out
3. Steps need to be taken to strengthen the bio-security measures at the farm to reduce pre and post weaning mortality.	3. Done

Centre wise recommendation	
1. Critical evaluation of genetic gain in selection experiment needs to be assessed.	1. Being done
2. To develop 75% exotic inheritance existing T&D crosses need to be back crossed with Tamworth. The performance of developed 75% crosses should be compare with existing T&D cross.	2. Three Tamworth male and 15 female are allotted

KVASU, Mannuthy, Kerala

Recommendation	Action Taken
General	
1. The most significant achievements made since inception by individual centers need to be compiled and sent to the project coordinating unit by 31st October, 2015.	1. Yet to be done
2. The monthly report of piglet production and sold are to be sent to the Project Coordinator office by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.	2. Regularly being sent
3. The centres need to submit AUC before July month of preceding financial year and UC quarterly, positively.	3. AUC sent
4. The unspent amount as on 31st of March must be refunded by 30th April of next financial year positively.	4. Yet to be done
5. Final annual report should be submitted as per format to ICAR-NRC on Pig by April of the preceding financial year.	5. Done
6. The 75 percent of revenue receipt from sale proceed should be retained in the SAU/institute and 25 percent should be sent to the Project coordinating unit. 50% of the 75% retained with the institute can be utilized by the concerned project centre.	6. Being followed
7. No additional budget will be provided in "salary component" for promotion of scientists to higher position other than sanctioned post. Increase of emolument for JRF/SRF or other contractual persons involved in the project should be borne from contingency fund. No additional fund will be provided for this purpose. The funds under salary head of AICRP should be used for payment of salary of regular staff only.	7. Noted
8. Changing of PI/In-charges of the centre should be done in consultation with Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, as the major mandate of each centres is on breeding aspect, however scientists from other disciplines may be associated with the project as Co-PIs.	8. Noted
9. The AICRP on pig and Mega Seed Project on pig in-charges shall make a programme to visit other centres.	9. Noted
Animal Breeding	
1. Breed registration and conservation: All the AICRP on Pig centres shall take necessary steps for breed registration of indigenous germplasm in collaboration with ICAR-NRC on Pig and ICAR-NBAGR, Karnal. Centres may take initiatives at their respective states.	1. Initiated
2. Crossbred animals of 75% exotic inheritance should be maintained.	2. Carried out
3. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres.	3. Being done
4. Selection of male animals should be based on weaning weight (best 25%) and 8 month body weight (best 5%), based on two stage sequential selection. Selection of female animals should be based on dam's litter size at birth (>7) and weaning weight (best 25%) and number of functional teats (at least 6 pairs of functional teats).	4. Being maintained
5. The males should be selected based on cyto-genetics screening.	5. To be done
6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. The overall genetic gain due to selection, selection differential and heritability need to be calculated and reported. Data should be presented for last three generation in the report.	6. Carried out
7. Three number of farrowings per sow need to be recorded. Three farrowings par sow should be completed in 2 years. Lifetime production traits should be reported:	7. Followed
8. Artificial Insemination should be strictly implemented at all centers by 31.03.2016. Required training for AI may be obtained from ICAR-NRC on pig or other AICRP on pig centres.	8. Following

Nutrition, Physiology and Management	
1. Final recommendation based on validation of existing feeding packages developed by AICRP on pig units need to be documented.	1. Carried out
2. Each of the AICRP on Pig centres should explore the possibility of adopting villages for technology validation and transfer.	2. Yet to be done
3. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	3. Done
4. The centers should develop technologies, including shelter management to reduce thermal stress on animals.	4. Carried out
5. Success stories in this regard may be sent to ICAR-NRC on Pig.	5. Not done.
Health Management	
1. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	1. Being done
2. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5 months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2%; respectively.	2. Being practiced
3. Steps need to be taken to strengthen the bio-security measures at the farm to reduce pre and post weaning mortality.	3. Done
Centre wise recommendation	
1. Data should be presented generation wise for last three generations. Selection differential and genetic gain should be assessed.	1. Reported

SVVU, Tirupati

Recommendation	Action Taken
General	
1. The most significant achievements made since inception by individual centers need to be compiled and sent to the project coordinating unit by 31st October, 2015.	1. Yet to be done
2. The monthly report of piglet production and sold are to be sent to the Project Coordinator office by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.	2. Regularly being sent
3. The centres need to submit AUC before July month of preceding financial year and UC quarterly, positively.	3. AUC sent
4. The unspent amount as on 31st of March must be refunded by 30th April of next financial year positively.	4. Yet to be done
5. Final annual report should be submitted as per format to ICAR-NRC on Pig by April of the preceding financial year.	5. Done
6. The 75 percent of revenue receipt from sale proceed should be retained in the SAU/institute and 25 percent should be sent to the Project coordinating unit. 50% of the 75% retained with the institute can be utilized by the concerned project centre.	6. Noted
7. No additional budget will be provided in "salary component" for promotion of scientists to higher position other than sanctioned post. Increase of emolument for JRF/SRF or other contractual persons involved in the project should be borne from contingency fund. No additional fund will be provided for this purpose. The funds under salary head of AICRP should be used for payment of salary of regular staff only.	7. Noted
8. Changing of PI/In-charges of the centre should be done in consultation with Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, as the major mandate of each centres is on breeding aspect, however scientists from other disciplines may be associated with the project as Co-PIs.	8. Noted
9. The AICRP on pig and Mega Seed Project on pig in-charges shall make a programme to visit other centres.	9. Noted
Animal Breeding	
1. Breed registration and conservation: All the AICRP on Pig centres shall take necessary steps for breed registration of indigenous germplasm in collaboration with ICAR-NRC on Pig and ICAR-NBAGR, Karnal. Centres may take initiatives at their respective states.	1. No specific breed is available
2. Crossbred animals of 75% exotic inheritance should be maintained.	2. Carried out

3. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres.	3. Maintaining
4. Selection of male animals should be based on weaning weight (best 25%) and 8 month body weight (best 5%), based on two stage sequential selection. Selection of female animals should be based on dam's litter size at birth (>7) and weaning weight (best 25%) and number of functional teats (at least 6 pairs of functional teats).	4. Being done as per two stage sequential selection
5. The males should be selected based on cyto-genetics screening.	5. Taken up
6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. The overall genetic gain due to selection, selection differential and heritability need to be calculated and reported. Data should be presented for last three generation in the report.	6. Done
7. Three number of farrowings per sow need to be recorded. Three farrowings par sow should be completed in 2 years. Lifetime production traits should be reported:	7. Reported
8. Artificial Insemination should be strictly implemented at all centers by 31.03.2016. Required training for AI may be obtained from ICAR-NRC on pig or other AICRP on pig centres.	8. Being practised
Nutrition, Physiology and Management	
1. Final recommendation based on validation of existing feeding packages developed by AICRP on pig units need to be documented.	1. Carried out
2. Each of the AICRP on Pig centres should explore the possibility of adopting villages for technology validation and transfer.	2. Yet to be done
3. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	3. Done
4. The centers should develop technologies, including shelter management to reduce thermal stress on animals.	4. Carried out
5. Success stories in this regard may be sent to ICAR-NRC on Pig.	5. Yet to be done
Health Management	
1. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	1. Being done
2. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5 months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2%; respectively.	2. Being practiced
3. Steps need to be taken to strengthen the bio-security measures at the farm to reduce pre and post weaning mortality.	3. Done
Centre wise recommendation	
1. The data need to be properly analysed as the house observed disparity among different parameters. Further, specific attention need to be taken care while recording, analysis and interpretation of data.	1. Done and reported in Annual report 15-16.

TANUVAS, Kattupakkam

Recommendation	Action Taken
General	
1. The most significant achievements made since inception by individual centers need to be compiled and sent to the project coordinating unit by 31st October, 2015.	1. Yet to be done
2. The monthly report of piglet production and sold are to be sent to the Project Coordinator office by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.	2. Regularly being sent
3. The centres need to submit AUC before July month of preceding financial year and UC quarterly, positively.	3. AUC sent
4. The unspent amount as on 31st of March must be refunded by 30th April of next financial year positively.	4. Yet to be done
5. Final annual report should be submitted as per format to ICAR-NRC on Pig by April of the preceding financial year.	5. Done
6. The 75 percent of revenue receipt from sale proceed should be retained in the SAU/institute and 25 percent should be sent to the Project coordinating unit. 50% of the 75% retained with the institute can be utilized by the concerned project	6. Informed to competent authority

centre.	
7. No additional budget will be provided in "salary component" for promotion of scientists to higher position other than sanctioned post. Increase of emolument for JRF/SRF or other contractual persons involved in the project should be borne from contingency fund. No additional fund will be provided for this purpose. The funds under salary head of AICRP should be used for payment of salary of regular staff only.	7. Noted
8. Changing of PI/In-charges of the centre should be done in consultation with Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, as the major mandate of each centres is on breeding aspect, however scientists from other disciplines may be associated with the project as Co-PIs.	8. Noted
9. The AICRP on pig and Mega Seed Project on pig in-charges shall make a programme to visit other centres.	9. Noted
Animal Breeding	
1. Breed registration and conservation: All the AICRP on Pig centres shall take necessary steps for breed registration of indigenous germplasm in collaboration with ICAR-NRC on Pig and ICAR-NBAGR, Karnal. Centres may take initiatives at their respective states.	1. Initiated characterization work
2. Crossbred animals of 75% exotic inheritance should be maintained.	2. Maintained
3. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres.	3. Maintaining
4. Selection of male animals should be based on weaning weight (best 25%) and 8 month body weight (best 5%), based on two stage sequential selection. Selection of female animals should be based on dam's litter size at birth (>7) and weaning weight (best 25%) and number of functional teats (at least 6 pairs of functional teats).	4. Being maintained
5. The males should be selected based on cyto-genetics screening.	5. Practicing
6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. The overall genetic gain due to selection, selection differential and heritability need to be calculated and reported. Data should be presented for last three generation in the report.	6. Practicing
7. Three number of farrowings per sow need to be recorded. Three farrowings par sow should be completed in 2 years. Lifetime production traits should be reported:	7. Recorded
8. Artificial Insemination should be strictly implemented at all centers by 31.03.2016. Required training for AI may be obtained from ICAR-NRC on pig or other AICRP on pig centres.	8. Initiated
Nutrition, Physiology and Management	
1. Final recommendation based on validation of existing feeding packages developed by AICRP on pig units need to be documented.	1. In progress
2. Each of the AICRP on Pig centres should explore the possibility of adopting villages for technology validation and transfer.	2. Carried out
3. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	3. Being recorded
4. The centers should develop technologies, including shelter management to reduce thermal stress on animals.	4. Carried out
5. Success stories in this regard may be sent to ICAR-NRC on Pig.	5. Documented
Health Management	
1. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	1. Being done
2. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5 months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2%; respectively.	2. Carried out
3. Steps need to be taken to strengthen the bio-security measures at the farm to reduce pre and post weaning mortality.	3. Done
Centre wise recommendation	
1. Data should be presented generation wise for last three generations. Selection differential and genetic gain should be checked.	1. Presented
2. Experiment should be undertaken to reduce the heat stress.	2. Initiated by installation of fogger

ICAR-IVRI, Bareilly

Recommendation	Action Taken
General	
1. The most significant achievements made since inception by individual centers need to be compiled and sent to the project coordinating unit by 31st October, 2015.	1. Done
2. The monthly report of piglet production and sold are to be sent to the Project Coordinator office by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.	2. Regularly being sent
3. The centres need to submit AUC before July month of preceding financial year and UC quarterly, positively.	3. AUC sent
4. The unspent amount as on 31st of March must be refunded by 30th April of next financial year positively.	4. Yet to be done
5. Final annual report should be submitted as per format to ICAR-NRC on Pig by April of the preceding financial year.	5. Done
6. The 75 percent of revenue receipt from sale proceed should be retained in the SAU/institute and 25 percent should be sent to the Project coordinating unit. 50% of the 75% retained with the institute can be utilized by the concerned project centre.	6. Informed to CFO-IVRI
7. No additional budget will be provided in "salary component" for promotion of scientists to higher position other than sanctioned post. Increase of emolument for JRF/SRF or other contractual persons involved in the project should be borne from contingency fund. No additional fund will be provided for this purpose. The funds under salary head of AICRP should be used for payment of salary of regular staff only.	7. NA
8. Changing of PI/In-charges of the centre should be done in consultation with Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, as the major mandate of each centres is on breeding aspect, however scientists from other disciplines may be associated with the project as Co-PIs.	8. Noted
9. The AICRP on pig and Mega Seed Project on pig in-charges shall make a programme to visit other centres.	9. Noted
Animal Breeding	
1. Breed registration and conservation: All the AICRP on Pig centres shall take necessary steps for breed registration of indigenous germplasm in collaboration with ICAR-NRC on Pig and ICAR-NBAGR, Karnal. Centres may take initiatives at their respective states.	1. Characterization completed, breed registration initiated
2. Crossbred animals of 75% exotic inheritance should be maintained.	2. Action taken
3. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres.	3. Maintaining
4. Selection of male animals should be based on weaning weight (best 25%) and 8 month body weight (best 5%), based on two stage sequential selection. Selection of female animals should be based on dam's litter size at birth (>7) and weaning weight (best 25%) and number of functional teats (at least 6 pairs of functional teats).	4. Being done
5. The males should be selected based on cyto-genetics screening.	5. Taken up
6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. The overall genetic gain due to selection, selection differential and heritability need to be calculated and reported. Data should be presented for last three generation in the report.	6. Done
7. Three number of farrowings per sow need to be recorded. Three farrowings par sow should be completed in 2 years. Lifetime production traits should be reported:	7. Reported
8. Artificial Insemination should be strictly implemented at all centers by 31.03.2016. Required training for AI may be obtained from ICAR-NRC on pig or other AICRP on pig centres.	8. Initiated
Nutrition, Physiology and Management	
1. Final recommendation based on validation of existing feeding packages developed by AICRP on pig units need to be documented.	1. Carried out
2. Each of the AICRP on Pig centres should explore the possibility of adopting villages for technology validation and transfer.	2. Action taken
3. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation	3. Done

of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	
4. The centers should develop technologies, including shelter management to reduce thermal stress on animals.	4. Carried out
5. Success stories in this regard may be sent to ICAR-NRC on Pig.	5. In process
Health Management	
1. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	1. Being done
2. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5 months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2%; respectively.	2. Being practiced
3. Steps need to be taken to strengthen the bio-security measures at the farm to reduce pre and post weaning mortality.	3. Done
Centre wise recommendation	
1. Probiotic used by the centre may be shared with other centres.	1. Noted

ICAR-CCARI, Goa

Recommendation	Action Taken
General	
1. The most significant achievements made since inception by individual centers need to be compiled and sent to the project coordinating unit by 31st October, 2015.	1. Done
2. The monthly report of piglet production and sold are to be sent to the Project Coordinator office by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.	2. Regularly being sent
3. The centres need to submit AUC before July month of preceding financial year and UC quarterly, positively.	3. AUC sent
4. The unspent amount as on 31st of March must be refunded by 30th April of next financial year positively.	4. Sent UC and asked for carry forward
5. Final annual report should be submitted as per format to ICAR-NRC on Pig by April of the preceding financial year.	5. Done
6. The 75 percent of revenue receipt from sale proceed should be retained in the SAU/institute and 25 percent should be sent to the Project coordinating unit. 50% of the 75% retained with the institute can be utilized by the concerned project centre.	6. Noted
7. No additional budget will be provided in "salary component" for promotion of scientists to higher position other than sanctioned post. Increase of emolument for JRF/SRF or other contractual persons involved in the project should be borne from contingency fund. No additional fund will be provided for this purpose. The funds under salary head of AICRP should be used for payment of salary of regular staff only.	7. NA
8. Changing of PI/In-charges of the centre should be done in consultation with Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, as the major mandate of each centres is on breeding aspect, however scientists from other disciplines may be associated with the project as Co-PIs.	8. Noted
9. The AICRP on pig and Mega Seed Project on pig in-charges shall make a programme to visit other centres.	9. Noted
Animal Breeding	
1. Breed registration and conservation: All the AICRP on Pig centres shall take necessary steps for breed registration of indigenous germplasm in collaboration with ICAR-NRC on Pig and ICAR-NBAGR, Karnal. Centres may take initiatives at their respective states.	1. Completed registration of Agonda Goan
2. Crossbred animals of 75% exotic inheritance should be maintained.	2. Action taken
3. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres.	3. Maintaining
4. Selection of male animals should be based on weaning weight (best 25%) and 8 month body weight (best 5%), based on two stage sequential selection. Selection of female animals should be based on dam's litter size at birth (>7) and weaning weight (best 25%) and number of functional teats (at least 6 pairs of functional	4. Being done

teats).	
5. The males should be selected based on cyto-genetics screening.	5. Taken up
6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. The overall genetic gain due to selection, selection differential and heritability need to be calculated and reported. Data should be presented for last three generation in the report.	6. Done
7. Three number of farrowings per sow need to be recorded. Three farrowings par sow should be completed in 2 years. Lifetime production traits should be reported:	7. Reported
8. Artificial Insemination should be strictly implemented at all centers by 31.03.2016. Required training for AI may be obtained from ICAR-NRC on pig or other AICRP on pig centres.	8. Followed regularly
Nutrition, Physiology and Management	
1. Final recommendation based on validation of existing feeding packages developed by AICRP on pig units need to be documented.	1. Carried out
2. Each of the AICRP on Pig centres should explore the possibility of adopting villages for technology validation and transfer.	2. Action taken
3. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	3. Done
4. The centers should develop technologies, including shelter management to reduce thermal stress on animals.	4. Carried out
5. Success stories in this regard may be sent to ICAR-NRC on Pig.	5. In process
Health Management	
1. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	1. Being done
2. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5 months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2%; respectively.	2. Being practiced
3. Steps need to be taken to strengthen the bio-security measures at the farm to reduce pre and post weaning mortality.	3. Done
Centre wise recommendation	
1. The centre should present generation wise data for last three generation to compare the genetic gain.	1. Noted

CVSc & AH, CAU, Aizawl

Recommendation	Action Taken
General	
1. The most significant achievements made since inception by individual centers need to be compiled and sent to the project coordinating unit by 31st October, 2015.	1. Yet to be done
2. The monthly report of piglet production and sold are to be sent to the Project Coordinator office by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.	2. Regularly being sent
3. The centres need to submit AUC before July month of preceding financial year and UC quarterly, positively.	3. AUC sent
4. The unspent amount as on 31st of March must be refunded by 30th April of next financial year positively.	4. Yet to be done
5. Final annual report should be submitted as per format to ICAR-NRC on Pig by April of the preceding financial year.	5. Done
6. The 75 percent of revenue receipt from sale proceed should be retained in the SAU/institute and 25 percent should be sent to the Project coordinating unit. 50% of the 75% retained with the institute can be utilized by the concerned project centre.	6. Noted
7. No additional budget will be provided in "salary component" for promotion of scientists to higher position other than sanctioned post. Increase of emolument for JRF/SRF or other contractual persons involved in the project should be borne from contingency fund. No additional fund will be provided for this purpose. The funds under salary head of AICRP should be used for payment of salary of regular staff only.	7. Noted
8. Changing of PI/In-charges of the centre should be done in consultation with Project	8. Noted

Coordinator. In-charges should have specialization in Animal Genetics and Breeding, as the major mandate of each centres is on breeding aspect, however scientists from other disciplines may be associated with the project as Co-PIs.	
9. The AICRP on pig and Mega Seed Project on pig in-charges shall make a programme to visit other centres.	9. Noted
Animal Breeding	
1. Breed registration and conservation: All the AICRP on Pig centres shall take necessary steps for breed registration of indigenous germplasm in collaboration with ICAR-NRC on Pig and ICAR-NBAGR, Karnal. Centres may take initiatives at their respective states.	1. Yet to be done
2. Crossbred animals of 75% exotic inheritance should be maintained.	2. Maintained
3. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres.	3. Maintaining
4. Selection of male animals should be based on weaning weight (best 25%) and 8 month body weight (best 5%), based on two stage sequential selection. Selection of female animals should be based on dam's litter size at birth (>7) and weaning weight (best 25%) and number of functional teats (at least 6 pairs of functional teats).	4. Being maintained
5. The males should be selected based on cyto-genetics screening.	5. Yet to be done
6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. The overall genetic gain due to selection, selection differential and heritability need to be calculated and reported. Data should be presented for last three generation in the report.	6. NA, due to new cross of 75% being evolved
7. Three number of farrowings per sow need to be recorded. Three farrowings par sow should be completed in 2 years. Lifetime production traits should be reported:	7. Being done
8. Artificial Insemination should be strictly implemented at all centers by 31.03.2016. Required training for AI may be obtained from ICAR-NRC on pig or other AICRP on pig centres.	8. Being followed
Nutrition, Physiology and Management	
1. Final recommendation based on validation of existing feeding packages developed by AICRP on pig units need to be documented.	1. In progress
2. Each of the AICRP on Pig centres should explore the possibility of adopting villages for technology validation and transfer.	2. Yet to be done
3. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	3. Noted
4. The centers should develop technologies, including shelter management to reduce thermal stress on animals.	4. Yet to be done
5. Success stories in this regard may be sent to ICAR-NRC on Pig.	5. Yet to be done
Health Management	
1. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	1. Being done
2. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5 months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2%; respectively.	2. Carried out
3. Steps need to be taken to strengthen the bio-security measures at the farm to reduce pre and post weaning mortality.	3. Done
Centre wise recommendation	
1. The centre should improve as per technical programme assigned to them.	1. Noted

SASARD, Nagaland

Recommendation	Action Taken
General	
1. The most significant achievements made since inception by individual centers need to be compiled and sent to the project coordinating unit by 31st October, 2015.	1. Yet to be done
2. The monthly report of piglet production and sold are to be sent to the Project Coordinator office by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.	2. Regularly being sent

3. The centres need to submit AUC before July month of preceding financial year and UC quarterly, positively.	3. AUC sent
4. The unspent amount as on 31st of March must be refunded by 30th April of next financial year positively.	4. Yet to be done
5. Final annual report should be submitted as per format to ICAR-NRC on Pig by April of the preceding financial year.	5. Done
6. The 75 percent of revenue receipt from sale proceed should be retained in the SAU/institute and 25 percent should be sent to the Project coordinating unit. 50% of the 75% retained with the institute can be utilized by the concerned project centre.	6. Noted and informed to CA
7. No additional budget will be provided in "salary component" for promotion of scientists to higher position other than sanctioned post. Increase of emolument for JRF/SRF or other contractual persons involved in the project should be borne from contingency fund. No additional fund will be provided for this purpose. The funds under salary head of AICRP should be used for payment of salary of regular staff only.	7. NA
8. Changing of PI/In-charges of the centre should be done in consultation with Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, as the major mandate of each centres is on breeding aspect, however scientists from other disciplines may be associated with the project as Co-PIs.	8. Noted
9. The AICRP on pig and Mega Seed Project on pig in-charges shall make a programme to visit other centres.	9. Noted
Animal Breeding	
1. Breed registration and conservation: All the AICRP on Pig centres shall take necessary steps for breed registration of indigenous germplasm in collaboration with ICAR-NRC on Pig and ICAR-NBAGR, Karnal. Centres may take initiatives at their respective states.	1. Already applied for registration of Tenyi Vo
2. Crossbred animals of 75% exotic inheritance should be maintained.	2. Maintaining
3. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres.	3. Maintaining
4. Selection of male animals should be based on weaning weight (best 25%) and 8 month body weight (best 5%), based on two stage sequential selection. Selection of female animals should be based on dam's litter size at birth (>7) and weaning weight (best 25%) and number of functional teats (at least 6 pairs of functional teats).	4. Being done
5. The males should be selected based on cyto-genetics screening.	5. Followed
6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. The overall genetic gain due to selection, selection differential and heritability need to be calculated and reported. Data should be presented for last three generation in the report.	6. NA, due to new cross of 75% being evolved
7. Three number of farrowings per sow need to be recorded. Three farrowings par sow should be completed in 2 years. Lifetime production traits should be reported:	7. Achieved
8. Artificial Insemination should be strictly implemented at all centers by 31.03.2016. Required training for AI may be obtained from ICAR-NRC on pig or other AICRP on pig centres.	8. Done
Nutrition, Physiology and Management	
1. Final recommendation based on validation of existing feeding packages developed by AICRP on pig units need to be documented.	1. In process
2. Each of the AICRP on Pig centres should explore the possibility of adopting villages for technology validation and transfer.	2. In process
3. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	3. Yet to be done
4. The centers should develop technologies, including shelter management to reduce thermal stress on animals.	4. Carried out
5. Success stories in this regard may be sent to ICAR-NRC on Pig.	5. In process
Health Management	
1. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	1. Being done

2. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5 months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2%; respectively. 3. Steps need to be taken to strengthen the bio-security measures at the farm to reduce pre and post weaning mortality.	2. Being practiced 3. Done
Centre wise recommendation	
1. Breeding programme need to be followed properly as the selection and crossbreeding experiments did not show the desired outcome.	1. Noted

New Centers:

Targets	ICAR-CIARI, Port Blair	CAU, Imphal	IVRI-ERS, Kolkata	ICAR-RC Tripura, Agartala	ICAR-RC, Barapani	KVK, ICAR-NRCP, Dudhnoi
Submission of AUC	Yes	No	Yes	Yes	No	Yes
Final Report submission	Yes	Yes	Yes	Yes	Yes	Yes
Breed maintained	Andaman local and Nicobari pigs	Hampshire X Ghungroo pig	Ghungroo pig	Mali pig	Hampshire X Niang Megha	Doom Pig
Construction work		Initiated	Initiated			Initiated

5. Salient Achievements of the AICRP on Pig till Date

Significant achievements have been made in respect of pig breeding, nutrition, reproduction including endocrinology, production, health management practices, extension education and technology dissemination. Necessary details about the same areas under:

A. Animal Breeding & Production:

- Breeding programmes were developed to generate the following genotypes/genetic groups:
  - Conservation of indigenous germplasm
  - Improved indigenous pigs
  - Crossbreds having 50:50 inheritance from Landrace and indigenous pigs
  - Large White Yorkshire crossbreds having 50% indigenous inheritance
  - Crossbreds having 75% Large White and 25% indigenous inheritance
  - Landrace crossbreds having 25% indigenous inheritance
  - Hampshire crossbreds carrying 25% and 50% indigenous inheritance
  - Landrace X indigenous half-breds from reciprocal crosses
- Exotic pig *viz.* Landrace, Large White Yorkshire and Hampshire could be successfully raised and multiplied under organized farm conditions.
- Genetic improvement of indigenous pig through pure breed selection programme was conducted in all eight centres of AICRP under different agro- climatic conditions.
- Litter size at birth and weaning showed continuous improvement over the years. Similarly, the growth rate and body weight at 32 weeks was also increased significantly.
- However, the genetic improvement of indigenous breed through pure breed selection programme has been slow.

- All groups of crossbred had higher litter size and weight, growth rate and better feed conversion efficiency than indigenous pig.
- Large White Yorkshire crossbred (75%) and Hampshire crossbred (75%) had higher value of litter traits than their respective 50% crossbred.
- Pig can be utilized effectively as a component in integrated farming system which shall act as an insurance cover. Significant improvement on economic gain could be observed under integrated farming system.
- The crossbreds had lower back fat thickness and higher lean cuts in their carcasses than the indigenous pigs.

B. Pig Husbandry and Management:

- Collection of boar semen and artificial insemination: Technology was developed for collection of boar semen using a dummy. Artificial insemination technology by using liquid semen has been standardized and widely been used in different centres.
- Artificial milk feeder: To feed orphan piglets when suitable foster dams are not available, artificial milk feeder was developed which can be recommended to breeder farmer.
- Sprinkler system: This was designed and installed in the open pig styes for alleviating summer stress in pigs. This can be recommended to commercial farmers rearing more than 250 pigs in tropical areas where there are chances of heat stress. Wallowing can be avoided in this system, thereby saving water and labour.
- Pressure cleaning system: The system helps considerable savings in labour and time in cleaning of sheds and ensures effective cleaning of pens. In this system cleaning of a pen can be done in 4-5 minutes against 10-15 minutes in traditional system. This can be recommended for larger commercial breeding farms rearing more than 200 numbers of breeding stocks. Labour can be saved up to 1/3rd of the normal requirement in commercial farms.
- Automatic waterers: It ensures continuous drinking water availability to pigs. It can be fitted at varying heights from the floor for various categories of pigs (25 cm for weaners, 65 cm for growers and 85-90 cm for sows and boars).

C. Animal Nutrition:

- Energy protein ratio for optimum production:
  - 18.2 to 18.5 kcal energy per g CP for Landrace and Large White grower pigs.
  - 20.4 to 21.3 kcal energy per g CP for finishing exotic pigs.
  - A diet with 15.44% CP and 3.0 MCal DE per kg feed for indigenous grower pigs.
  - For crossbred pigs, ratio of 16% C.P. and 3000 kcal digestible energy per kg of feed was found to be optimal.

- Locally available feed resources like root crop (tapioca, sweet potato etc.), brewery waste, used tea leaves and other vegetable wastes like cabbage, collocassia etc. could be used for developing economic ration for pig.
- Various alternate sources of energy and protein were identified
    - Energy sources: rice polish, molasses, tamarind seed, wheat bran, tea waste, pine apple waste, jackfruit waste and cashew apple.
    - Protein sources: silk worm pupae, sunflower cake
- Economic ration was developed by partial or complete replacement of costly ingredient of the standard ration with the alternate feed sources.
    - Replacement of maize with 20% tamarind seed and 5% molasses or 30% tamarind seed and 10% molasses increased average daily gain and lowered cost/kg body weight gain.
    - Cabbage is an important vegetable crop of North East India. Generally 50 to 70% of the biological yield cabbages are used as human consumption and remaining portion is discarded as waste which is primarily the green leaves. This waste can be fed to grower and finisher pig replacing 10% of the concentrate mixer in the daily feed allowances.
    - Graded replacements of maize with 40, 30 and 12 parts of rice polish/supplemented with zinc sulphate) were found to be superior in terms of ADG, feed per kg gain and cost of ration per kg gain for Large White grower pigs.
    - Replacing maize partly or completely with 20% tamarind seed and 5% molasses or 30% tamarind seed and 10% molasses was found to give higher ADG (423 g) and lower cost/kg gain as compared to ADG 401 g under the standard ration.
    - In pregnant and lactating gilts, maize (36% in standard ration) could be replaced with 30% rice polish or tamarind seed along with 20% molasses without affecting the performance characteristics.
    - An economic ration was developed by graded replacement of maize with wheat bran.
    - In indigenous grower pigs, 20 parts of maize can be replaced with bagasse and molasses mixture without any adverse effect on FCR.
    - In crossbred finisher pigs, tamarind seed waste replaced up to 75% of maize without any detrimental effect on performance, carcass-characteristics and nutrient utilization.
    - No significant reduction in ADG (420 Vs 408 g) and FCR (4.13 Vs 4.26) when GN cake in the standard ration was replaced with sunflower cake in crossbred growers.
    - Replacement of wheat bran up to 50% level with de-caffeinated tea waste lowered the cost of production in crossbred pigs.
- Supplementation of yeast culture product containing useful enzyme improved average daily gain and feed conversion efficiency by 5 and 8%, respectively.

- Chelated mineral could be supplemented at a dose of 0.05% along with Dicalcium Phosphate in diet for better growth and feed conversion efficiency in pig.
- Fish meal can be replaced with dried cuttla fish waste silage without causing any deleterious effect on growth, feed conversion efficiency or carcass quality.
- Dried *Cuttla* fish bone meal could be used as calcium supplement in the ration for growing pigs replacing calcium carbonate.

D. Pig Reproduction and Endocrinology

- Indigenous pigs compared unfavourably with exotic pigs in respect of litter size and weight at birth, weaning, growth rate, efficiency of feed utilization and lean meat production.
- All groups of crossbreds had higher litter productivity, growth rates and efficiency of feed utilization than the indigenous pigs.
- Large White and Hampshire crossbreds carrying 75% exotic inheritance had higher values of litter traits than those respective half-bred.

E. Health Management

- Health calendar was maintained by all the AICRP centers
- Reduced disease outbreak, pre and post weaning mortality could be achieved in most of the AICRP centers for better health care and management.

ASSAM AGRICULTURAL UNIVERSITY, KHANAPARA, GUWAHATI

Assam possesses 1.63 million (15.89%) pigs of the total population of India (10.92 millions). Assam is having highest pig population amongst NE Region, yet it has to import about one lakh number of pig per year from the other parts of the country to meet the requirement. Due to some biological advantages like high prolificacy, faster growth, good converter of feed to meat, short generation interval, high dressing percentage etc. the pig plays an important role for increasing meat production in this region Hampshire, Large black and crosses are more popular among the farmers in Assam. Pig production in the state is invariably a small-scale backyard enterprise and majority of the farmer reared piglets only up to the slaughter age. The tribal people and other weaker sections of the society have been traditionally involved in rearing of pigs as they consider it as subsidiary income source on low managemental cost. The weaker sections maintain their pigs with least housing. They confine their pigs during night and left in morning for scavenging. In the evening some rice bran is provided to them as feed. Generally those pigs are reared on kitchen waste. Sometimes banana, papaya orum, Juguli (local beverage residue) etc. are cooked and provided with rice bran.

For profitable pig production, efficient use of cheaper balanced rations based on locally available materials and agricultural by products is very essential. Due to low availability of balanced feed along with higher cost handicapped the development of organized pig farm in this part of country. But a sizeable numbers of unemployed educated youth have taken up this venture as means of their livelihood and also as subsidiary income generation.

The ICAR-AICRP/MSP on pig, AAU, Khanapara has played an important role since its inception for development of pig production in the state and neighboring states through various ways like attending training, awareness program, exhibition, demonstration, distribution of leaflet /booklet. The ICAR- AICRP/ MSP on Pig, AAU, Khanapara has played a significant role in developing piggery sector by selling of quality piglets, elite gilts / sows and boars at nominal price to the interested farmers of the state.

Herd dynamics:

Herd Strength I: 01.04.2015 - 31.03.2016

Age in months	Opening balance as on 01. 04. 2015 of the financial year under report		Total	Closing balance as on 31.03.2016 of the financial year under report		Total
	Male	Female		Male	Female	
	75% H	75% H		75% H	75% H	
0 - 6 week	-	-	-	-	-	-
6wk – 2 m	-	-	-	-	-	-
2 – 6 m	-	-	-	50	57	107
6 – 8 m	-	-	-	-	-	-
Over 8 m	13	43	56	13	51	64
Total	13	43	**56**	63	108	**171**

Stock Continuity Details II:

Sex	Stock as on 01.04.2015	Addition (1st & 2nd Crop)	Purchase	Total	Grand total
	1	2	3	4	5
Male	13	68 + 156 = 224	-	237	237
Female	43	59 + 136 = 195	-	238	238
Total	56	127 + 292 = 419	-	475	475

DELETION

Sex	Sale	Slaughter	Destroyed	Died	Total	Stock as on 31.03.2016	Grand total
	6	7	8	9	10	11 (4-10)	
Male	133	15	-	26	174	63	63
Female	106	1	-	23	130	108	108
Total	239	16	-	49	304	171	**171**

Breeding strategy of the farm as approved:

- The Exotic breed, Landrace was maintained since inception (1971) of the project and studied their performances and genetic parameters under agro-climatic condition of Assam.
- A number of selected indigenous gilts were maintained since 1981. A group of indigenous gilt was bred (1987) with pure Hampshire boars to get 50% Hampshire inheritance from 24 normal farrowings. Another group of indigenous gilts were maintained for indigenous line.
- The progenies of 50%H50%I were again grouped to produce 50%H50%I (*Inter se mating*) and 75%H25%I by crossing with pure Hampshire Boar.
- The cross breeding program *ie inter se* mating was adopted initially to maintain 50%H50%I and 75%H25%I genetic groups since 1987.
- The Annual Scientist Meet'2007 (Manuthy) recommended for the production of 87.50%H12.50%I genetic group in addition to 75%H25%I genetic group for the AAU Khanapara Centre.
- Pure Hampshire boar or AI with Pure Hampshire boars were utilized for production of 87.50%H genetic group.
- Annual Scientist Meet (Jabbalpur 21st Nov.'2011) recommended maintaining sufficient number of 75%Hampshire genetic group only for the AAU, Khanapara Centre.
- The 75%H25%I breeding males are selected on the basis of Selection Index including birth weight(X_1), weaning weight (X_2) and 8 month body weight (X_3). The Index in selection of pigs is $(-0.483X_1+1.139\ X_2 - 0.472\ X_3)$
- The breeding females are selected on the basis of litter traits and functional teat size (12 nos,). Age at sexual maturity and Body weight are also considered in selection of breeding female.
- Selection of male animals should be based on weaning weight (25%) and 8 month body weight (best 5%) ,based on two stage sequential selection. Selection of female animals should be based on dam's litter size at birth (7) and weaning weight (best 25%) and number of

functional teats (at least 6 pairs of functional teats) .NASC Complex, Pusa New Delhi 17-18 Sept'2015)

- The body weights are recorded at monthly interval up to 8 months of age.
- Boars are selected on Intra-Sire basis.
- The parent stocks are maintained up to 3rd farrowing and weaning of piglets at 42 days of age.

Performance of animals

Sl. No	Traits/ Characters		Mean ± SE (No. of observation) 75% H Genetic group		
		Crop no.	M	F	T
1	Av. Litter size at birth (no.)	1st Crop (20) 2nd Crop (35)	3.40 ± 0.30 4.46 ± 0.22	2.95 ± 0.31 3.89 ± 0.26	6.35 ± 0.44 8.34 ± 0.15
2	Av. Litter weight at birth (kg)	1st Crop (20) 2nd Crop (35)	3.47 ± 0.29 4.43±021	3.07 ± 0.90 3.83±0.26	6.38 ± 0.21 8.26±0.18
3	Av. Litter size at weaning (no.)	1st Crop (18) 2nd Crop (35)	2.55 ± 0.42 4.31±0.22	2.40 ± 0.38 3.64±0.26	4.95 ± 0.69 8.00±0.19
4	Av. Litter weight at weaning (kg)	1st Crop (18) 2nd Crop (35)	28.08 ± 3.95 43.93±2.25	26.09 ± 3.65 37.28±2.60	54.17 ± 2.66 81.22±1.87
5	Av. individual wt at birth (kg)	1st Crop 2nd Crop	1.02 ± 0.01 (68) 0.99 ±0.01 (156)	0.99 ± 0.01 (59) 0.99 ± 0.01 (136)	1.01 ±0.01 (127) 0.99 ± 0.01 (292)
6	Av. individual wt at weaning (kg) (6 weeks)	1st Crop 2nd Crop	9.91 ± 0.09 (51) 10.14 ± 0.02(151)	9.79 ± 0.12 (48) 10.11 ± 0.02(129)	8.39 ± 0.07 (99) 10.13 ± 0.01 (280)
7	Number of days for weaning	1st Crop 2nd Crop	42 days		
8	Pre weaning mortality rate (%)	1st Crop 2nd Crop overall	25.00 3.21 9.82	18.64 5.15 9.23	22.05 4.11 9.55
9	Pre weaning growth rate (g /day) (0 to 6 wks)	1st Crop 2nd Crop	211.43 ± 1.99 217.86 ± 0.46	209.25 ± 2.79 217.37 ± 0.49	210.37 ± 1.69 217.63 ± 0.33
10	Post weaning mortality rate (%) (Weaning to 5m)	1st Crop 2nd Crop	1.93 NA	2.20 NA	2.06 NA
11	Adult mortality rate (%) (above 5 month)	1st Crop 2nd Crop	- NA	0.45 NA	0.23 NA
12	Post weaning growth rate (6 wks to 8th months) (g/d)	1st Crop 2nd Crop	334.08 ± 3.82 NA	296.72 ± 1.08 NA	317.20 ± 4.00 NA
13	Overall growth rate 0 to 8th months of age) (g/day)	1st Crop 2nd Crop	313.91 ± 3.16 NA	283.07 ± 1.15 NA	299.99 ± 3.32 NA
14	Body weight (kg) at 1 month	1st Crop 2nd Crop	6.80± 0.12(55) 7.27 ± 0.02 (152)	6.53± 0.16(49) 7.21 ± 0.02 (131)	6.66 ± 0.09(104) 7.27 ± 0.02 (283)
	2 month	1st Crop 2nd Crop	12.47 ± 0.11 (44) 12.27± 0.03(150)	12.21 ± 0.13 (42) 12.25 ± 0.09(128)	12.34 ± 0.09 (86) 12.31± 0.04(278)
	3 month	1st Crop	17.23 ± 0.19 (41)	17.03 ± 0.15 (31)	17.14 ± 0.12 (72)
	4 month	1st Crop	24.41 ± 0.23 (17)	25.23 ± 0.28 (14)	25.35 ± 0.17 (31)
	5 month	1st Crop	34.88 ± 0.29 (17)	33.74 ± 0.28 (14)	34.37 ± 0.22 (31)
	6 month	1st Crop	46.94 ± 0.36 (17)	44.81 ± 0.28 (14)	45.98 ± 0.30 (31)
	7 month	1st Crop	59.94 ± 0.46 (17)	55.48 ± 0.29 (14)	57.93 ± 0.49 (31)
	8 month	1st Crop	76.30 ± 0.76 (17)	68.93 ± 0.29 (14)	72.97 ± 0.79 (13)
15	Age at slaughter (days)		255 days (12 Nos.)		
16	Weight at slaughter (kg)		75.00 ± 1.89		
17	Dressing percentage (%)		68.95 ± 1.31		
18	Carcass Length (cm)		69.06 ± 0.73		
19	Back Fat Thickness (mm)		25.80± 0.67		
20	Feed conversion efficiency (:)		1:4.2		

Life time production traits: Considering 1st and 2nd crop: 2015-16

- Average litter size at birth per sow : 7.62
- Average litter weight at birth per sow : 7.52 kg

- Average litter size at weaning per sow : 7.15
- Average litter weight at weaning per sow: 72.03 kg
- Average litter weight at slaughter per sow: Not Calculated

Specific managemental practice:

Identification: Distinguishing body characteristics of individual animal at birth along with animal number are recorded. The identification number of respective animal is recorded in clip board of individual pens. However, the animal number is given on left thigh of the body by clipping of hair.

Castration: Castrations of male piglets are routinely done before weaning by open method.

ii) **Causes of mortality**

Sl No	Causes of mortality	75 %H		
		M	F	T
1	Anemia	1	-	1
2	Enteritis	7	12	19
3	Pneumonia	5	1	6
4	Traumatic Injury	1	-	1
5	Pneumoenterities	-	1	1
6	Swine Fever	6	-	6
7	Gastric Ulcer	2	-	2
8	Septicemia	3	6	9
9	Putrefied	-	2	2
10	Fibrinous Pneumonia	-	1	1
11	Navel ill	1	-	1
Total		**26**	**23**	**49**

Mortality Parameter:

Mortality rate in 75%H genetic group of pigs during the period 1.4.2015 to 31.03.2016

Pre-weaning mortality:

Animal	Crop No	0 - 14 days			15 - 28 days			29 - 42 days			Overall (Pre-weaning)		
		M	F	T	M	F	T	M	F	T	M	F	T
animals at risk	1st	68	59	127	66	58	124	55	51	106	68	59	127
	2nd	156	136	292	155	133	288	152	131	283	156	136	292
animals died	1st	2	1	3	11	7	18	4	3	7	17	11	28
	2nd	1	3	4	3	2	5	1	2	3	5	7	12
Mortality %	1st	2.94	1.70	2.36	16.67	12.07	14.52	7.27	5.88	6.60	25.00	18.64	22.05
	2nd	0.64	2.21	1.37	1.94	1.50	1.74	0.66	1.53	1.06	3.21	5.15	4.11
Overall %		**1.34**	**3.05**	**1.67**	**6.34**	**4.71**	**5.58**	**2.42**	**2.75**	**2.57**	**9.82**	**9.23**	**9.55**

Post weaning and adult mortality:

Animal		Post weaning (43 days to 5 months)			Adult (over 5 months)			Overall at Farm		
		M	F	T	M	F	T	M	F	T
animals at risk	Parent	-	-	-	13	43	56	13	43	56
	1st Crop	55	51	106	54	49	103	68	59	127
	2nd Crop	152	131	283	149	129	278	156	136	292
animals died	Parent	-	-	-	-	1	1	-	1	1
	1st Crop	1	2	3	-	-	-	18	13	31
	2nd Crop	3	2	5	-	-	-	8	9	17
Mortality %	Parent	-	-	-	-	2.33	1.79	-	2.33	1.79
	1st Crop	1.82	3.92	2.83	-	-	-	26.47	22.03	24.41
	2nd Crop	1.97	1.53	1.77	-	-	-	5.13	6.62	5.82
Overall %		**1.93**	**2.20**	**2.06**	**-**	**0.45**	**0.23**	**10.97**	**9.66**	**10.32**

Measures taken to minimize mortality:

Managemental measures:

- **General management and disease control**: Regular cleaning and washing of pig sheds with Potassium Permanganate /caustic soda/ bleaching powder and proper disposal of sewage were practiced routinely. The floor, corners and crevices inside the pig sheds were burned at fortnight interval. A solution of 3% Formaldehyde spray is also routinely practiced.
- **Action taken to minimize mortality:** Comfortable beddings were provided to all the pregnant sows. Special care and attention were given round the clock during farrowing. Newborn piglets were kept under observation to avoid injury from mother and debilitated piglets were nourished specially to regain their health. Pre starter (7^{th} - 20^{th} day) and Starter (22^{nd} day – weaning) rations were provided to the piglets. Sometime Buffalo milk, Glucose etc. Crealac/ Lactogen are also provided to debilitated piglets. Iron therapy in the form of intra muscular injection "Feritas" were given to all piglets at 4^{th} and 14^{th} day after birth to combat the occurrence of piglet anemia.
- **Diarrhoea:** Many piglets were suffered from diarrhoea during the pre-weaning period and treated with Zinconia, Furoxon /Tetracycline / C-flox TZ Gentamycine/, Enrofloxacine were used.
- **Lameness:** A total of 35 piglets were suffered from lameness during the year under report. The animals were treated with Neuroxine and Vetalgin with antibiotics. Three Pregnant Sows were suffered from lameness due to broken floor.

Prophylactic measures:

- **Vaccination:** The FD Swine Fever Vaccine (Deptt. A.H & Vety, Govt. Assam) was giv regularly to the piglets and adult pigs as per schedule. Blood samples were collected after vaccination of Swine Fever for routine screening. The samples were sent to the ICAR-NRC on Pig, Rani and the Deptt. Veterinary Microbiology, C.V.Sc, Khanapara.
- A total of 24 Pre weaned piglets (1^{st} Crop) showed different symptoms like loss of appetite, loss of body weight / enteritis / lameness / pneumonia during the month of June - July 2015. The ICAR-NRC on Pig, Rani screened the samples/sera and reported positive antibody titer of PCV vides dtd.07.07.2015. However, Dept. of Veterinary Pathology, CVSc, Khanapara reported that the mortality of some piglets might be due to Septicemia/Pneumonia/Enteritis/Swine fever. The Health Advisory Committee ICAR-AICRP on Pig, AAU suggested to purchase Swine Fever vaccine from the Institute of Animal Health & Veterinary Biological (R&T), West Bengal, Kolkata. The Pre-weaned piglets died or affected and showed symptoms like Septicemia /Pneumonia/ Enteritis etc. The Committee also opined lack of maternal immunity of Swine Fever in the Pre-weaned piglets. The committee recommended to vaccinate the piglets at 25-30 days of age as initial dose, booster dose after one month and then repeated every 6 months interval. The FD Swine Fever Vaccine was purchased from the Institute of Animal Health & Veterinary Biological, Kolkata.
- The FMD and HS vaccine are given annually as per schedule.

- **Deworming:** Deworming is done to all the piglets after weaning and repeated after one month. The breeding animals were also dewormed before breeding. Routine fecal examinations were done.

Disposal of diseased carcass: The carcass after conducting PM was disposed to well available in the premises of AICRP on Pig by mixing common salt/Urea. The commercial urea (2 kg) poured at weekly interval on deep well or as per situation.

Nutritional experimentation

Effect of dietary Oligosaccharides on productive performance of cross bred pigs

An investigation was conducted to study the effect of dietary herbal oligosaccharides on the growth performance, nutrient utilization, blood biochemical parameters, carcass characteristic, faecal microbial load and intestinal morphology of crossbred pigs.

The overall mean values of various carcass characteristics viz carcass length, back fat thickness, loin eye area and dressing percentage of meat did not revealed much difference ($P>0.05$). The weight of wholesale cuts viz. ham, loin, boston butt, bacon, picnic and jowl as percentage of carcass weight were almost similar among the groups. The total weight of edible and inedible offals as percentage of carcass weight was also not influenced by dietary treatments among the treatment groups. There was no significant difference ($P>0.05$) among the experimental groups in respect of shear force values, proximate composition of meat and different sensory traits viz colour, flavor, texture, juiciness and overall acceptability of meat. The villous height in the duodenum were significantly ($P<0.01$) increased by the supplementation of oligosaccharides. The cost per kg gain in live weight was found to be lower in group with 0.2% supplement than other groups.

The present study revealed that the supplementation of 0.2% oligosaccharide in swine diet is beneficial in terms of growth, nutrient utilization, feed efficiency, balances of N, Ca and P, intestinal microbial balance, morphology of duodenal villous and economics of feeding.

Package of ration

Sl.No	Ingredients	Parts (%)				
		Pre starter	Starter- I	Starter-II	Grower-I	Lactating Sow
1.	Skim milk powder	30.00	10.00	00.00	00.00	00.00
2.	Maize	17.80	26.00	45.00	54.00	52.50
3.	Fish meal	8.00	6.00	3.00	3.00	3.00
4.	Ground Nut Cake	10.00	15.00	15.50	11.00	15.00
5.	Soy bean meal	15.00	20.00	20.00	15.00	11.00
6.	Wheat Bran	4.75	10.00	9.00	10.40	13.00
7.	Soy bean oil	4.50	4.55	4.10	3.20	2.00
8.	Molasses	2.50	1.00	1.00	1.00	1.00
9.	Sugar	5.00	5.00	00.00	00.00	0.00
10.	DL_methionine	0.15	0.15	0.15	0.15	0.10
11.	Lysine	0.30	0.30	0.25	0.25	0.15
12.	Di cal. phosphate	0.25	0.25	0.25	0.25	0.50
13.	Salt	0.25	0.25	0.25	0.25	0.25
14.	Mineral Mixture	1.15	1.15	1.15	1.15	1.50
15.	Additives	0.35	0.35	0.35	0.35	0.00
	Total	100	100	100	100	100

Adoption of integrated farming systems

Talks on Integrated farming system were rendered at different extension programme.

Mrs. Rumi Saikia Kalita, farmer of Titabar, Jorhat has adopted integrated farming system (Pig cum Fishery) comprising three ponds and 12 pigs as on 15th April'2015. Horticultural crops- banana and lemon are also planted. Earlier, she had a pig farm, started during 2004 with a five fattener. Subsequently, herd size decreases and produced piglets and were sold to the farmers of Tea gardens and Nagaland. At Present, She is maintaining Hampshire Cross.

Sri Lakhyadhar Sarma, unemployed Youth, Haripur, Soneshar (Kamalpur) has maintaining Hampshire cross and Hampshire x Ghungroo since last nine years. He is maintaining 37 pigs, out of which 16 fatteners at different ages, 2 breeding males and 6 females and 13 piglets. The price of piglets is Rs.2500/ piglet at weaning. He is earning about Rs.5.00 lakhs annually. Rice polish, boiled Colocasia and broilar's waste are utilized as feed. He is spending Rs.5000/ pm on Feed and Medicine. He is also maintaining 4 nos. of Betel goats and selling Rs.4500/-Rs.5000/ kid.

Survey on market of pork production

A survey on pork market was carried out in Greater Guwahati and salient points are as follows:

Qualification of Pork Seller:	Mostly under-metric or uneducated
Residence:	Mostly rented
Occupation:	Pork business
Cast:	50% Tribal and 50% others
No. of Retail Shop:	85
No. of Wholesaler:	6
Type of Sale Booth:	90% open
Information about the pig:	
1. Sources of Pig:	Nalbari, Bonda, Boko, Changsari, Chaigaon, Baksha, Mangaldoi, Sonapur , Panikhaiti, Chandrapur and Peripherial areas of Guwahati.
2. Breed:	Mostly Hampshire Cross, Hampshire x Ghunngroo, Local and Ghungroo
3. Age:	6 months- 2 ½ Years
4. Type:	Male- 20%, Female - 40% Castrated - 40%
5. Weight:	50 - 180 kg
6. Method of Slaughter:	Direct Stabbing in most cases, occasionally hammering
7. Price of Pig	Rs.100/kg- Rs.120/kg live wt. basis or Rs.150/ to Rs.160/ kg pork basis considering D.P. 75%.
8. Basis of Price:	Either live wt. or total pork basis.
9. No of Pig Slaughtered Per day:	40-50 numbers.
10. Daily Sale:	40- 45 qt.
11. Period of Highest Sale:	November and February
12. Period of Lowest Sale:	June - September of the year
13. Price per kg of Pork: Retailer	Rs. 240/ - 260/kg,
14. Whether Diseased Pig are Slaughtered or not:	Sometime disease pigs are also slaughtered.

Disposal pattern of farm waste, pig excreta etc/ Establishment of biogas plant: The sewage materials of AICRP on Pig were disposed at the low lying area in the premises of the project.

Production economics: (Considering Feed & Medicine Cost)

A. Farm Condition:

Cost of production / pig upto slaughter / Market age: (12 castrated male)

i) Concentrate feed up to 8 month of age (15-240 days) = 340 kg,
Considering @ Rs.22.00/kg feed Rs. 7480/-

ii) Cost of Medicine & Vaccines Rs. 800/- animal

iii) Total (i+ii) Cost Rs.8280/ animal at 77 kg live weight/animal

Cost of production / kg live wt.: Rs 108/ kg live wt.

Cost of production/kg pork: Rs.159/ kg pork (considering 68% Dressing Percentage)

b. Field Condition: (Apurba Barman, Chamta Nalbari)

Cost of production / pig upto Market age: (10 Castrated male)

i) Cost of piglet (3-4 month of age) and carrying charge = Rs.2700/- (Rs. 2500+Rs. 200/)

ii) Cost of feeding - hotel waste, Vegetable and other available sources of feed
@ Rs.20/day/animal from 3-8 month of age (Rs.3000/)

iii) Cost of Medicine & Vaccines Rs.800/ animal

iv) Total (i+ii+iii) = Rs.6500/ animal upto 8 month, considering live wt 85 kg/animal

Cost of production /kg live wt.: Rs. 76/ kg live wt.

Cost of production /kg pork: Rs. 112/ kg pork (considering 68% Dressing Percentage)

Extension programme with success story:

i) At the institute: The Extension activities organized by the Director of Research (Vety.), AAU, Khanapara, Associate Director of Extension Education (ADEE), AAU, Khanapara, Chief Scientist, Goat Research Station, Burnihat and NIRD-NERC Guwahati involved the Scientist of the project as Resource Persons in their different programs. The trainees were given lessons on theory as well as practical demonstration in various aspects of pig production.

Talks/ Demonstration: 18nos.

- Visits (2) to University Pig farm to learn the managemental practices under the training Prog. on Skill development training on Pig Farming was Organized by ADEE, AAU, Khanapara on 6.04.2015 and 13.07.15
- Talks (2) on "Different breeds of Pig and their selection suiting to adoption in local condition of Assam" under the training Prog. on Skill development training on Pig Farming was Organized by ADEE, AAU, Khanapara on 7.04.15 and 14.07.15
- Talk on "Breeds of Pig, Selection and breeding stock & Pig breeding" under the vocational training Prog. on Commercial Pig Farming, KVK, Kahikushi 08.04.15
- Talks (3) on "Selection of Breeds of Pig and their Characteristics. Pig farm management and breeding System" under Basin Development livelihood prog. Organized by Institute of Rural Development & Panchayati Raj (NIRD), Khanapara on 20.04.2015, 01.06.15 and 4.01.16

- Talks (2) on "Different breeds of Pig and their selection for improved production" under the training Prog. on "Skill development training on Livestock and Poultry Production" Organized by ADEE, AAU, Khanapara on 8.06.2015 and 10.08.15
- Talk on Management of Piggery Farm under the **"**Training of Farm Managers of the State Cattle, Pig and Poultry Breeding Farms, Semen collection Centers and AI officers." Organized by Ministry of Agriculture, Govt of India on 23.09.15 at Aizawal.
- Talk on Scientific Rearing of Pig under the Exposure Visit Prog to AICRP on Pig .Organized by Chief Scientist, Goat Research Station Burnihat on 08.01.16
- Talks (2) on "Scientific Rearing of Pig and contribution to Society" under the Exposure Visit Prog to AAU Pig farm. Organized by Deptt. of Extension Education, West Bengal Veterinary College and Deptt. of Zoology, Kanoi College Dibrugarh on 2.5.15 and 19.3.16 respectively

At Field:

- Participation in the Interactive Session of "Farmers Meet" at Singra , Boko under TSP Programme on 31.03.16
- Participation in the interactive session in the Agricultural Crop Seminar titled Amar Pathar-Amar Katha organized by Prasar Bharati, Doordarshan Kendra, Guawahati at Livestock Research Station, AAU, Mandira on 12.03.16 at 3.00 pm
- Talks (2) on "Scientific Rearing of Pig and Rural Employment" organized By Prasar Bharati, Doordarshan Kendra, Guwahati under the Programme KRISHIDARSHAN Live Telecast on 27.02.16 and 03.03.16

Success story:

- Biju Kalita, Balitera, district Nalbari, an unemployed youth, age 40 years maintaining 8 Sows and 3 breeding males. He is selling 3 fatteners in every 2 month and raising from his farm. He is earning Rs. 4, 00 lakh annually by spending only Rs. 12,000/ month on hotel waste and broiler waste. He is having two ponds of fishery and broiler unit.
- Kamal Talukdar, Chandkushi, district Nalbari, age 45 year maintaining two herds of pig (70+80). He is spending Rs. 500/day for carrying Hotel/Kitchen waste/left out from Nalbari and Rs. 3000/ pm for two labourours. He is earning Rs. 10.00 lakh annually from piggery by regular selling of 10-12 fatteners/pm. and piglets.
- Debojyoti Nath, Gokhaihat Mirza is an unemployed Engineer, age 45 years maintaining 17 Sows, 4 breeding males since 2014. He has now 60 piglets and 12 piglets were died during pre-weaning. He sales piglets to the local farmers. He has a plan to develop fatteners in every month in cyclic manner. Madhurya Sarma, age 40 years, Amguri Sivasagar maintaining a herd of pig (40). He has started a pig farm during 2013 with the piglets of AICRP on Pig. Mr. Sarma earned Rs. 7.00 lakh by selling fatteners monthly and breeding piglets @ Rs.3000/.

Distribution of booklet: *Gahori Palon* a book published by KVK, AAU, Jorhat, are distributed to the farmers in different training programmes. A leaflet on Scientific Rearing of Pigs' was also published by the AICRP on Pig and distributed. Booklet on *'Scientific rearing of pigs*' in local language and published by the Assam Science Society, Guwahati, are distributed free of cost to the farmers in the trainings and the farmers who has purchased the pigs from the project. A book on *Byaboshik Padhyatit Gahori Palon* in local language and published by the KVK, AAU, Jorhat, are distributed to the farmers.

Salient achievement during the report period (2015- 16)

- The genetic group *i.e*. 75%H is developed at the AICRP on Pig, AAU, Khanapara during 1988 and attained 16th generation.
- Two crops (127+292 = 419 piglets) were obtained during 2015-16 and bred for the production of 3rd crop. The average litter size at birth, litter weight at birth, litter size at weaning and litter weight at weaning in 1st Crop were found to be 6.35 ± 0.44, 6.38 ± 0.21 kg, 4.95 ± 0.69 and 58.17 ± 2.66 kg respectively. The average body weight at birth, at 6th week (weaning), at 5 month and at 8 month of age were found to be 1.01 ± 0.01 kg , 9.85 ± 0.08 kg, 34.37 ± 0.22 kg and 72.97 ± 0.79 kg respectively. A total of 292 (156+136) piglets were also obtained in 2nd crop from 35 Sows during December'2015- January'2016. The average litter size at birth, litter weight at birth, litter size at weaning and litter weight at weaning in 2nd Crop were found to be 8.34 ± 0.15, 8.26 ± 0.18 kg, 8.00 ± 0.19 and 81.22 ± 1.87 kg respectively, The average body weight at birth and at 6th week (weaning) of age were found to be 0.99 ± 0.01 kg and 10.13 ± 0.01 kg respectively.
- The pre-, post-weaning and adult mortality percentages during the year under report were recorded as 22.05 and 2.83 and Nil respectively in 1st and 4.11, 1.77 and Nil respectively in 2nd crop.
- A total of 239 **(**133+106**)** pigs of different categories were sold to the farmers during the year under report.
- F. D. Swine Fever Vaccine is rescheduled as - initial dose at 25-30 day of age, booster after 1 month and repeated every 6 months interval.
- Facilities are provided to the M.V.Sc. and Ph. D. students for conducting research in the disciplines of Animal Genetics & Breeding, Animal Physiology, Livestock Production and Management, Animal Nutrition, Veterinary Epidemiology & Preventive Medicine.
- Farmers of different parts of the state particularly Sonitpur, Sivsagar, Baksa, Kamrup, Nalbari, Karbi Anglong, Nagaon and Morigaon districts witnessed the management of pig farm and different genetic groups of pigs maintained under the ICAR-AICRP/MSP on Pig during their training programme.
- Students from West Bengal Veterinary College, Kanoi College Dibrugarh and from leading Schools of Guwahati made a Exposure Visit.

- High level of Expert Teams of Govt. of Nepal and Officials of Govt. of Haryana visited the Project for developing entrepreneurship in their respective Places.
- Implementation of ICAR -MSP on Pig and achieved the target of piglet production since 2011-12 and benefited the farmers/SHG of NE Region and Research Institute/Agencies /NGOs.
- Publication of 4 Research papers and one book chapter.
- Inclusion as Expert Member for formulation of State Pig Breeding Policy, -Nagaland and Assam
- Three Ph. D. students (Animal Nutrition, Animal Physiology, Vety. Epidemiology and Preventive Medicine) and one M.V.Sc student (Animal Genetics & Breeding) completed their degree programme.
- The Artificial insemination programme in Pig is practiced in collaboration with the Department of ARGO, C.V.Sc., Khanapara. The Semen collection and insemination is practiced under the project entitled "*Capacity building and awareness generation for enhanced productivity of pig through assisted reproductive biotechnology and conservation of biodiversity in North Eastern Region through community participation"*

Scientific publications:

- Minakshi Mili, Anubha Baruah, Arundhati Bora, Dipak Bhuyan, Satya Sarma, B.C.Sarmah, B.C.Sarmah, Jitendra Goswami Dhireswar Kalita, Jakir Hussain and Ilakshi Deka (2015). Role of Zinc and Copper Ratio on Growth in Piglets. *Indian J. Anim. Prod. Mgmt*., 31(1-2): 8-10
- Illakshy Deka, B. C. Sarmah, J. Goswami, D. J. Dutta, D. N. Sarma and D. Kalita (2015) Effect of Dietary Supplemental Zinc on Serum Zinc, cAMP, Testosterone Concentration and Histological Architecture of Testis in Male Weanling Pig. *Indian Journal of Applied Research*. 5(7): 379-381
- Nipu Deka, K.Ahmed, D. Kalita and Mrinal Nath (2015). Characteristic and freezability of Hampshire cross bred boar semen. *International J. for Research in Emerging Science and Technology*. 2(5): 173-176
- Mrinal Kr. Nath, D. K. Sarma, B. C. Das, P. Deka, D. Kalita, J. B. Dutta, G. Mahato, S. Sarma and P. Roychoudhury (2016). Evaluation of specific humoral immune response in pigs vaccinated with cell culture adapted classical swine fever vaccine. *Veterinary World*, 9(3): 308-312

Project work of students (M.V.Sc/ Ph.D):

M.V.Sc Research Completed:

Genetic Variation in Reproductive Performance of Crossbred Pigs

The study was carried out on a total of 541 crossbred out of which 308 were half-bred *inter se* (½ Hampshire × ½ Local) and 233 were graded *inter se* (¾ Hampshire × ¼ Local) maintained at ICAR - Mega Seed Project (MSP) and All India Coordinated Research Project (AICRP) on pigs, Assam Agricultural University, Khanapara. Data from 2002 to 2013 were studied to assess the genetic and non-genetic parameters of reproductive traits.

The least squares means (LSM) of reproductive traits *viz*. age at sexual maturity, age at first conception, age at first farrowing and gestation length of half-bred *inter se* were 233.532±5.114, 269.911±5.122, 381.768±5.092 and 113.033±0.838 days respectively. Litter size at birth and at weaning were 7.906±0.157 and 7.068±0.196 respectively. The litter weight (kg) at birth and at weaning was 6.947±0.097 and 58.232±0.829 respectively.

The corresponding LSM values in regards to age at sexual maturity, age at first conception, age at first farrowing and gestation length were 230.426±5.594, 267.039±5.603, 379.326±5.570, 113.032±0.901 days in graded *inter se*. Litter size at birth and at weaning were 7.839±0.169 and 6.634±0.208 respectively. The litter weight at birth and at weaning was 7.292±0.104 and 59.757±0.894 respectively. The two genetic groups had no significant effect in age at sexual maturity, age at first conception, age at first farrowing, gestation length, and litter size at birth and litter weight at weaning. However, the litter weight at birth and litter size at weaning exhibited significantly higher in graded *inter se* and half bred genetic groups respectively. The 2^{nd} and 3^{rd} parity animals showed significantly better litter traits than 1^{st} parity animals. The analysis revealed significantly better results in period 3 (2010-2013) in respect to traits viz. age at sexual maturity, age at first conception, age at first farrowing and all litter traits. Observations of the traits during 4 seasons viz. pre monsoon, monsoon, post monsoon and winter were done. Winter season exhibited better performance in most of the reproductive traits. The heritability estimates of all the reproductive traits apart from litter size at weaning and litter weight at birth were found higher in graded *inter se* pigs than the half bred *inter se* pigs. The phenotypic and genotypic correlation coefficients in both the genetic group were found to be positive for all the reproductive traits.

Ph.D. Research Completed:

Effect of dietary Oligosaccharides on productive performance of cross bred pigs

An investigation was conducted to study the effect of dietary herbal oligosaccharides on the growth performance, nutrient utilization, blood biochemical parameters, carcass characteristic, faecal microbial load and intestinal morphology of crossbred pigs. Twenty-four crossbred (Hampshire x Assam local) piglets of average body weight 12±0.81 kg and about 2 months of age were divided into four groups viz C, T_1, T_2 and T_3 of six each and allotted at random to four nutritional treatments. The basal diet was prepared for grower and finisher pigs separately by using conventional feed ingredients viz maize, wheat bran, groundnut cake and soya bean meal as per BIS (2001) specification of nutrient composition. Four experimental rations for four groups (C, T_1, T_2 and T_3) were prepared by supplementing basal diet with oligosaccharide at 0, 0.1, 0.2, and 0.3 percent level, respectively. Completely randomized design was followed for the experiment. The feeding trial was performed for a period of 182 days. The feed offered and residue left were weighed daily while the weight of pig recorded fortnightly. Fresh drinking water was made available at all the time. At the end of the feeding trial, a metabolism trial was conducted on three animals of each group for a period of 5 days. Blood was collected from three animals of each group at '0' day (initial), 91 days (middle) and at the

end of the experiment to estimate total serum protein and blood haemoglobin. Faecal samples were collected from three animals of each group at the end of the feeding trial to study the faecal microbial load. At the end of the entire experiment, three animals from each group were slaughtered to study the carcass characteristics and meat quality traits. Intestinal tissues were collected from three animals per treatment during slaughter for histological study.

Epidemiology and Antimicrobial Resistance pattern (s) of Streptococcus suis and other Streptococci of Porcine origin

A study on epidemiology and antimicrobial resistance pattern(s) of *Streptococcus suis* and other streptococci of porcine origin was undertaken during the period from October 2012 to April 2014 in and around Guwahati. Samples (n=497) were collected from both apparently healthy (n=267) and diseased (n=230) pigs of both sexes managed under organized (n=230) and unorganized (n=267) systems. On bacteriological examination, 35 (7.04%) isolates comprising eight *Streptococcus* species were obtained. Among these, *S. equi subsp. zooepidemicus* (n=12) was the predominant isolate (34.29%) followed by *S. suis* (n=7; 20.00%), *S. bovis* and *S. porcinus* (n=5 each; 14. 29%), *S. agalactiae* and *S. uberis* (n=2 each; 5.71%) and *S. pyogenes* and *Enterococcus faecalis* (n=1 each; 2.86%). The *S. suis* isolates were subjected to polymerase chain reaction for *gdh* and tested for presence of four virulence-associated genes namely, *sly, epf, mrp* and *arcA* by multiplex-PCR. None of the virulence genes could be demonstrated in the present study. Age-wise, the highest prevalence of *S. suis* was recorded in the age group of 8–24 weeks and lowest in the age group of >24 weeks. Conversely, the prevalence of other streptococci was highest in the age group >24 weeks and lowest in the age group of 8–24 weeks. Sex-wise, the prevalence of *S. suis* and other streptococci was higher in female than male pigs and higher in clinically healthy pigs than diseased pigs. Comparing the herds under different system of management, prevalence of *S. suis* was higher in the organized herds than in unorganized herds. Conversely, the prevalence of other streptococci was significantly higher in the unorganized herds. Testing the isolates to nine antimicrobial groups comprising 17 agents by disc-diffusion method revealed that all the isolates were sensitive to gentamicin, followed by amikacin, erythromycin and enrofloxacin. Most of the isolates were resistant to cefalexin, ofloxacin, kanamycin and tetracycline. The streptococcal isolates showed different antimicrobial resistance pattern(s). Study of antimicrobial resistance patterns showed that were by *S. suis* isolates exhibited five patterns, *S. equi subsp. zooepidemicus* exhibited nine patterns and *S. bovis* and *S. porcinus* exhibited five resistance patterns each.

Bimolecular expression on melatonin and vitamin E supplementation during summer and winter

The experiment was conducted to study the changes of various physiological, haematological and hormonal parameters including expression of HSP70 gene in the crossbred pigs (Hampshire × Local) under the agroclimatic condition of Assam. The experiment included a total of 36 numbers of crossbred weaned female pigs. Eighteen (18) animals were subjected to treatment separately during summer and winter. The selected animals were divided into three groups with six pigs in each group

consisting of the control group (Treatment 1), one group was fed melatonin @3 mg/animal (Treatment 2) and the other group was fed Vitamin E @100 mg (Treatment 3) for both the seasons. The animals were maintained at AICRP on Pig unit.

Ongoing M.V.Sc. Research:

Prevalence and control of Porcine ascariasis (Dept.Veterinary Epidemiology & Preventive Medicine)

Ongoing Ph.D. Research:

Genetics Studies on Growth Performance and Polymorphism of *IGF- II* and *POU1F1* Genes in Crossbred Pigs.

Growth performance of pigs in response to Seasonal stress under varying dietary energy levels.

Distinguish Visitors:

- Dr. R.S. Gandhi, Asstt. Director General (AP&B), ICAR, Govt. of India New Delhi and Director ICAR-NRC on Pig visited the project unit on 10.04.2015.
- Adviser to the CM, Govt. of Haryana, other officials of Haryana State Govt. along with the Ex-Director, IVRI Dr. P. K. Uppal and officials of A.H. & Veterinary Department, Govt. of Assam visited the project unit on 19.06.2015.
- Bhuminand Devkota, DVM, Ph. D., Director, Center for Biotechnology, Head, Dept. of Theriogenology, Dr. I. P. Dhakal, Ph. D., Dean, Faculty of Animal Science, Veterinary Science & Fisheries and Dr. Shyam Kishor Sah, Ph. D., Prof., Theriogenology, Director, Veterinary Teaching Hospital, Rampur, Chitwan, Nepal visited the project unit on 13th August' 2015.
- Professor Micheal Friend, Director, Graham Centre for Agricultural Innovation, Wagga Wagga NSW, Australia visited the project on 22nd January, 2016
- Dr. A. S. Ninawe, Adviser DBT, Govt. of India, New Delhi visited the project on 22nd March'2016 for implementation of project under the Dept. of ARGO, CVSc., AAU, Khanapara, Guwahati-22

Month-wise relative Temperature and Humidity- 2015-16

Month	Minimum Temp. (°C)	Maximum Temp. (°C)	Average Temperature (°C)	Relative Humidity (%)	THI
April	20.51±0.28	33.21±0.44	27.54±0.33	65.07±3.29	76.17±0.52
May	22.63±0.27	33.76±0.12	28.29±0.35	74.23±1.13	79.31±0.44
June	24.80±0.27	33.83±0.47	28.39±0.23	80.13±1.18	81.35±0.26
July	26.74±0.11	34.52±0.30	29.68±0.16	81.77±0.63	83.06±0.43
August	26.25±0.12	34.67±0.55	28.36±0.16	84.00±0.56	81.88±0.21
September	25.67±0.10	33.53±0.36	28.51±0.21	80.43±0.76	80.64±0.26
October	22.11±0.47	32.27±0.35	27.39±0.23	74.65±0.98	78.18±0.40
November	17.07±0.42	29.33±0.48	23.21±0.44	73.27±0.64	71.54±0.64
December	13.02±0.42	27.03±0.29	19.52±0.28	72.71±0.94	65.83±0.45
January	11.31±0.21	25.45±0.29	18.11±0.18	63.43±0.78	63.58±0.24
February	12.98±0.47	27.61±0.74	19.74±0.58	64.64±2.44	65.45±0.69
March	17.67±0.37	33.39±0.29	25.36±0.22	64.80±1.25	72.21±0.44

Climatic data for the year 2015-16 are recorded. The average lowest and highest temperature (°C) was recorded during the month of January (18.11±0.18) and July (29.68±0.16) whereas; the

average lowest and highest humidity (%) was recorded during the month of January (63.43±0.78) and August (84.08±0.43) respectively. The THI level was calculated from the daily records of minimum and maximum ambient temperature and relative humidity and the lowest and highest THI was recorded during the month of January (63.58±0.24) and July (83.06±0.13) respectively.

75% Hampshire pregnant sow

75% Hampshire sow (15th generation) with piglets

Visit of Hon'ble ADG (AP&B) ICAR and the Director, ICAR-NRC on Pig

Semen collection at ICAR-AICRP on Pig

Interactive session with farmers under TSP at Boko, Kamrup

Private farm of Sri A. Mudoi, Sonapur, Kamrup

BIRSA AGRICULTURAL UNIVERSITY, RANCHI, JHARKHAND

Pig production is considered as one of the important activities of A.H. programme specially for the improvement of economic status of tribes and some weaker section of society of Jharkhand. There is tremendous scope for employment and earning with subsidiary occupation in livestock production, pig being one of the important among them. The climatic condition with 1300 to 1600 mm annual rain fall, average 20% humidity and 6 to 40^{oc} environmental temperature is conducive for such activities. Jharkhand state has potential to grow paddy and maize in several pockets besides abundantly available vegetable wastes, jungle roots, tapioca and other soft trees and leaves that provide natural source of feeds for pigs and other livestock. Efforts to improve the productivity of native pig remained more or less negligible. A sizeable section (about 40%) of Jharkhand population is living below the poverty line. A very large section of this group have special liking for pig farming. On the basis of above ground, Pig Breeding Farm at Ranchi Veterinary College of Birsa Agricultural University (BAU) was primarily started as a U.G. and P.G. teaching besides farmers training in the year 1973-74. Initially four exotic breeds viz., Landrace, Tamworth, Large White Yorkshire and Russian Charmukha were maintained. The infrastructure of the farm has been strengthened with financial assistance from the ICAR, New Delhi and the World Bank through Bihar Plateau Development Project and NATP Mission Mode besides the state government. The major population of pig in country including Jharkhand is of native type. Their production performance of which is very poor as compared to other exotics and crossbreds. Their efficiency of feed utilization is also low. Insufficient availability of quality stock is great hindrance in boosting pig production. BAU, Ranchi which is primarily dedicated to socio-economic upliftment of farmers through transfer of improved technologies shares great responsibility than others in respect of piggery development work. Therefore, in order to improve the socio-economic status of pig breeder, the University felt necessity of evolving appropriate pig breeding and management technologies. On the guide lines of National Commission on Agriculture (1976), a series of breeding experiments on pig involving LWY, Landrace, Tamworth, Hampshire and *desi* were conducted over a decade by the scientists of Ranchi Veterinary College and finally a new breed of black pig named "T & D" was developed besides many other improved technologies in respect of its breeding, feeding, management, disease control etc. which is fully adopted by the farmers at the state and National levels. The impact of piggery development programmes was observed to be very high among tribal and backward community engaged in pig production programme. Pig rearing are gaining ground, may gain industry status in Jharkhand. The farmers are eager to make it regular enterprise due to higher economic returns, employment generation and low input-high output ratio. It is clearly seen from the livestock census in which 64.15% increase in pig population was noticed.

Herd dynamics (T&D):

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1.	Piglet (up to 42 d)	37	327		27		258	48
2.	Grower (42d-5 m)	24			4			15
3.	Finisher (5m- 8 m)	9						22
	Adult							7
4.	Breeding Female	39			3			44
5.	Boar	12					5	15
	Total	**121**	**327**		**34**		**263**	**151**

Herd dynamics (75% H):

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1.	Piglet (upto 42 days)	74	261		33		235	56
2.	Grower (42days-5 m)	57			8			22
3.	Finisher (5m- 8 months)	9						15
	Adult	2						15
4.	Breeding Female	33			4		3	35
5.	Boar	11			1		1	19
	Total	**186**	**261**		**46**		**239**	**162**

Breeding strategy of the farm as approved:

i. To study the performance of "T&D" and 75% Hampshire pigs under optimum management conditions.

ii. To select the animals within each genetic group for faster growth rate with better reproductive performances.

Performance of animals: T&D

Sl. No.	Traits/Characters	Mean ± SE (no. of observation)		
1	Litter size at birth	6.37±0.3(38)		
2	Litter weight at birth(kg)	7.33±0.35(38)		
3	Litter size at weaning(no.)	5.95±0.34(38)		
4	Litter weight at weaning (kg)	57.31±2.96(38)		
		Male	**Female**	**Overall**
5.	Avg. weight at birth(kg)	1.19±0.01 (165)	1.15±.01(159)	1.17±0.01(323)
6	Avg. weight at weaning (kg)	7.30±0.15(145)	7.04±0.15(144)	7.17±0.11 (288)
7	Number of days for weaning(d)	42 days	42 days	42 days
8	Pre weaning mortality rate (%)	6.06	8.81	7.43
9	Pre weaning growth rate (gm/d) (6 w)	173.81	167.62	170.71
10	Post weaning mortality rate (%)	2.06	0.69	1.39
11	Post weaning growth rate, up to 8 month (gm/d)	271.21	299.14	289.09
12	Overall growth rate (up to 9 m) (gm/d)	291.96	299.67	296.96
13	Body weight (kg)			
	1 Month	5.08±.11(153)	5.01±.1(151)	5.05±0.8(303)
	2 Month	10.03±.21(142)	9.65±.21(157)	9.85±.15(278)
	3 Month	14.93±.59(16)	13.95±.49(21)	14.38±.38(37)
	4 Month	19.93±.99(8)	19.52±.74(18)	19.64±.58(27)
	5 Month	30.45±2.11(8)	30.24±1.1 (20)	30.30±.95(29)
	6 Month	42.25±3.21(8)	41.79±1.61(18)	41.93±1.42(27)
	7 Month	47.2±5.61(5)	51.40±2.19(10)	50.±2.31(15)
	8 Month	61.0±5.49(6)	66.27±2.98(11)	64.41± 2.7(17)
	9 Month	78.83±4.76(6)	80.91±3.49(11)	10.18±2.74(17)

	10 Month	91.80±8.51(5)	87.88±3.65(8)	89.38±3.79(13)
14	Age at slaughter(d)			
15	Weight at slaughter(Kg)			
16	Dressing percentage (%)			
17	Carcass Length(cm)			
18	Back Fat Thickness(mm)			
19	Meat Bone ratio			
20	Amount of pork produced per sow(Kg)			
21	Feed conversion efficiency (:)			
22	Any other information relevant to this table (Add separate row, if required)			

Performance of animals: 75% Hampshire

Sl. No.	**Traits**	**Mean ± SE**		
1	Litter size at birth(no.)	5.73±0.35 (45)		
2	Litter weight at birth(Kg)	7.70±0.47(45)		
3	Litter size at weaning (no.)	5.62±0.35(45)		
4	Litter weight at weaning (Kg)	55.23±3.12(45)		
		Male	**Female**	**Overall**
5	Avg. weight at birth(kg)	1.34±0.02(152)	1.34±0.02 (145)	1.34±0.01(297)
6	Avg. weight at weaning (kg)	7.16±0.17(125)	7.25±0.14 (136)	7.21±0.11(261)
7	Number of days for weaning(d)	42 days		
8	Pre weaning mortality rate (%)	5.26	4.14	4.71
9	Pre weaning growth rate(gm/d)	170.48	172.62	171.67
10	Post weaning mortality rate (%)	11.20	10.29	10.73
11	Post weaning growth rate(gm/d) up to 8 m	241.62	222.63	229.04
12	Overall growth rate (up to 9 m) (gm/d)	244.44	208.63	222.96
13	Body weight (Kg)			
	1 Month	5.04±0.12(143)	5.25±.11(142)	5.14±.08(285)
	2 Month	9.87±0.23(125)	9.90±.20(134)	9.88±.15(259)
	3 Month	14.18±0.92(8)	14.20±0.7(7)	14.19±.57(15)
	4 Month	18.04±1.42(8)	17.62±.88(6)	17.86±.87(14)
	5 Month	24.88±1.63 (8)	27.33±1.67 (6)	25.93±1.18(14)
	6 Month	31.88±3.17(8)	31.40±3.17(5)	31.69±2.21(13)
	7 Month	40.57±1.99(7)	38.17±3.48(6)	39.46±1.87(13)
	8 Month	55.00±2.89(3)	51.33±4.148(6)	52.56± 2.86(9)
	9 Month	66.00±6.00(2)	56.33±4.49(3)	60.20± 3.9(5)
	10 Month	79.0±5.13(3)	83.20±6.4(5)	81.63±4.25(8)

Lifetime production traits

Reproductive traits	**AICRP (T&D)**	**AICRP (75%)**
Litter size at birth	7.05±0.24(58)	6.90±0.22 (61)
Litter size at weaning	8.31±0.33 (58)	9.46±0.32 (60)
Litter weight at birth (Kg)	6.73±0.26 (57)	6.53±0.25(59)
Litter weight at weaning (Kg)	65.67±2.31(57)	62.74±2.29 (58)

Specific Managerial Practices

Different groups of animals kept in separate pens under uniform housing and managerial conditions. The newly born piglets were provided with paddy straw during winter season as a bedding material to protect the piglets against extreme cold effects.

Care during pregnancy: Farrowing pens were thoroughly cleaned and flushed with water and disinfect by Phenyl. The farrowing pens were provided with creep box for feeding creep ration to suckling piglets, which was provided from 3rd week i.e. 15 days. A few days before farrowing the

pregnant sows were separated from the herd and transferred to farrowing pens. She was then confined to farrowing pen till the weaning of their piglets.

Care during the time of farrowing: Mostly sows did not need any help at the time of farrowing. Therefore, disturbances to the sow were avoided as far as possible while farrowing was in process. Just after birth each piglet was cleaned with clean cloth and the mucous was removed from its mouth and nostrils. The needle teeth of piglets were nipped and were given identification mark through ear notching. The piglets were assisted to suckle their dam and allowed to remain with her till weaning at the age of 8 weeks. The placenta after farrowing removed immediately and the sow was not allowed to eat it.

Pre-weaning care: As a preventive measure against anaemia, one ml. of an iron dextran injection (Imferon) was given intramuscularly to each piglet on 3rd and 14th day of age. We are using ear notching for identification of piglets after farrowing. We are castrating the surplus male piglets at the age of 3-4 weeks by open surgical method.

Post-weaning care: The piglets were vaccinated against swine fever and Foot and Mouth disease. Deworming was also carried out soon after weaning and repeated, if needed. The dams were removed from the farrowing pens and the piglets were allowed to remain in the same pens for at least one week. Proper aid whenever necessary was also provided to the animal.

Mortality parameter:

Genetic group wise and sex wise mortality rate (Pre and post weaning):

	AICRP (T&D)			**AICRP 75% H**		
	Male	Female	Total	Male	Female	Total
Pre weaning	10	14	24	08	06	14
Post weaning	03	01	04	14	14	28
Total	**13**	**15**	**28**	**22**	**20**	**42**

Causes of mortality (Specific cause):

T&D

Sl. No	**Disease**	**Total no.**
	Pre-weaning	
1.	Gastritis	05
2.	Piglet anemia	01
3.	Pneumonia	10
4.	Trampling	04
5.	Premature/ putrified/predator attack etc	04
	Total	**24**
	Post-weaning	
1.	Pneumonia	02
2.	Gastritis	02
	Total	**04**

75% Hampshire

Sl. no	**Disease**	**Total no.**
	Pre-weaning	
1.	Pneumonia	05
2.	Gastritis	03
3.	Trempling	02
4.	Piglet anaemia	02

5.	Predator attack	02
	Total	**14**
Post-weaning		
1.	Pneumonia/pneumoenteritis	19
2.	Enteritis/Gastritis	02
3.	Piglet anemia	01
4.	putrified	02
5.	Necrotic liver	02
6.	Predator attack	02
	Total	**28**

Measures to taken minimize mortality:

Management measures: Provision of bedding specially during winter season,

Prophylactic measures: Following drugs as a prophylactic measures are given to prevent the mortality of piglets

i) All the pigs were vaccinated against the Swine Fever and FMD vaccine.

ii) The imferon were injected to all the piglets at 3rd and 14th days of age.

iii) The piggery shed was cleaned daily and the manure removed completely from the floor and walls through manual scraping.

iv) Providing plenty of sheds around the piggery shed by planting trees.

v) The pigs were dewormed regularly to control parasitic infestation.

Disposal of diseased carcass: Carcass of pigs disposed of by burial method.

Experimentation:

Performance of different genetic groups of pigs maintained under aicrp on pig

Pre-weaning Body weight (kg) of piglets of different genetic groups at various ages

Age	T&D	75% Hampshire	Significance
0 day	1.17±0.01(323)	1.34±0.01(296)	**
2 week	3.23±0.05(310)	3.36±0.05(289)	**
4 weeks	5.05±0.08(303)	5.14±0.08(285)	NS
6 weeks	7.17±0.11(288)	7.21±0.11(261)	NS
8 week	9.85±0.15(278)	9.88±0.15(259)	NS

NS= Non-significant. Figure in parenthesis indicate no. of observations.

Post-weaning Body weight (kg) of different genetic groups of pigs at various ages

Age	T&D	75% Hampshire	Significance
3 months	14.38 ± 0.38 (37)	14.19±.57(15)	NS
4 months	19.64±0.58(27)	17.86±.87(14)	NS
5 months	30.30±0.95(29)	25.93±1.18(14)	**
6 months	41.93±1.42 (27)	31.69±2.21(13)	* *
7 months	50.00±2.31(15)	39.46±1.87(13)	**
8 months	64.41± 2.7(17)	52.56± 2.86(9)	**
9 months	80.18±2.74(17)	60.20± 3.9(5)	**
10 months	89.38±3.79(13)	81.63±4.25(8)	NS

NS= Non-significant. Figure in parenthesis indicate no. of observations.

Reproductive performance of different genetic groups of pigs.

Reproductive traits	T&D	75% Hampshire	Significance
Litter size at birth	6.37 ± 0.30 (38)	5.73 ± 0.35 (45)	NS

Litter size at weaning	5.95 ± 0.34 (38)	5.62 ± 0.35 (45)	NS
Litter weight at birth (Kg)	7.33 ± 0.35 (38)	7.70 ± 0.47 (45)	NS
Litter weight at weaning (Kg)	57.31 ± 2.96 (38)	55.23 ± 3.12 (45)	NS

NS= Non-significant. Figure in parenthesis indicate no. of observations.

Average sow performance of different genetic groups of pigs.

Reproductive traits	AICRP (T&D)	AICRP (75%)	Significance
Litter size at birth	7.05±0.24(58)	6.90±0.22 (61)	NS
Litter size at weaning	8.31±0.33 (58)	9.46±0.32 (60)	**NS**
Litter weight at birth (Kg)	6.73±0.26 (57)	6.53±0.25 (59)	NS
Litter weight at weaning (Kg)	65.67±2.31(57)	62.74±2.29 (58)	NS

NS= Non-significant. Figure in parenthesis indicate no. of observations.

Salient findings:

i. Comparative growth performance of "T&D" and 75% Hampshire pigs were studied. Average body weight at birth, 6th and 8th week of age was observed to be higher in 75% Hampshire (1.34±0.01, 7.21±0.11 and 9.88±0.15 Kg) pigs in comparison to "T&D" (1.17±0.01, 7.17±0.11 and 9.85±0.15 Kg) respectively. However, body weight at 32nd and 40th weeks of age was observed to be higher in T&D than 75% H. Body weights at 32nd and 36th weeks of age were recorded in "T&D" (64.41±2.70 and 89.38±3.79 Kg) and 75% Hampshire (52.56±2.86 and 81.63±4.25 Kg), respectively.

ii.Comparative reproductive performance of "T&D" and 75% Hampshire pigs were studied. No significant differences were observed between these two groups. However, slightly better reproductive performances (LSB, LSW and LWW) were noticed in "T&D" pigs than 75% Hampshire. Litter size at birth, Litter size at weaning and Litter weight at birth and Litter weight at weaning for T&D and 75%H were observed to be 6.37±0.30, 5.95±0.34, 7.33±0.35 Kg, 57.31±2.96 Kg and 5.73±0.35, 5.62±0.35, 7.70±0.47 Kg, 55.23±3.12 Kg, respectively.

Selection differential (Male) of different genetic groups

Selection differential (values in kg) T&D

	2011-12			2012-13			2013-14			2014-15			2015-16		
Traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Birth	0.020	0.010	0.015	0.140	0.130	0.135	0.080	0.040	0.060	0.090	0.070	0.100	0.130	0.070	0.100
6 Wk	0.370	0.020	0.190	0.340	0.130	0.235	0.440	0.130	0.285	0.310	0.190	0.255	0.510	0.190	0.355
8 m	1.500	3.580	3.500	5.600	1.050	3.325	3.600	0.050	1.825	5.000	1.000	5.750	4.000	1.500	5.500

Genetic gain per generation (values in kg) T&D

	2011-12			2012-13			2013-14			2014-15			2015-16		
traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Birth	0.002	0.001	0.001	0.013	0.012	0.012	0.007	0.004	0.005	0.008	0.006	0.007	0.012	0.006	0.009
6 wk	0.041	0.002	0.021	0.037	0.014	0.026	0.048	0.014	0.031	0.034	0.021	0.028	0.056	0.021	0.039
8 m	0.375	0.895	0.635	1.400	0.263	0.831	0.900	0.013	0.456	1.250	0.250	0.750	1.000	0.375	0.688

Genetic gain per year (values in kg) T&D

	2011-12			2012-13			2013-14			2014-15			2015-16		
traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Birth	0.001	0.001	0.001	0.006	0.008	0.007	0.004	0.002	0.003	0.004	0.004	0.004	0.006	0.004	0.005
6 wk	0.020	0.001	0.011	0.019	0.010	0.014	0.024	0.010	0.017	0.017	0.014	0.015	0.028	0.014	0.021
8 m	0.188	0.597	0.392	0.700	0.175	0.438	0.450	0.008	0.229	0.625	0.167	0.396	0.500	0.250	0.375

Genetic gain per generation (values in kg) T&D

	parent			F1			F2			F3			F4		
traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Birth	0.002	0.001	0.001	0.013	0.012	0.012	0.007	0.004	0.005	0.008	0.006	0.007	0.012	0.006	0.009
6 wk	0.041	0.002	0.021	0.037	0.014	0.026	0.048	0.014	0.031	0.034	0.021	0.028	0.056	0.021	0.039
8 m	0.375	0.895	0.635	1.400	0.263	0.831	0.900	0.013	0.456	1.250	0.250	0.750	1.000	0.375	0.688

Selection differential (values in kg) T&D

	2011-12			2012-13			2013-14			2014-15			2015-16		
traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
LSB	0.50	0.20	0.70	0.10	0.10	0.20	0.20	0.20	0.40	0.20	0.10	0.30	0.80	1.23	2.03
LWB	0.30	0.02	0.32	0.10	0.10	0.10	0.20	0.20	0.40	0.10	0.10	0.20	0.57	0.90	1.87
LSWE	0.50	0.56	1.05	0.40	0.50	0.90	0.30	0.40	0.70	0.20	0.30	1.00	0.84	0.81	1.65
LWWE	0.97	1.73	2.69	0.18	0.85	1.03	0.38	1.30	1.68	0.50	1.40	1.41	7.64	2.05	9.69
AvgWt B	0.19	0.13	0.16	0.15	0.08	0.12	0.15	0.08	0.12	0.15	0.07	0.10	0.09	0.12	0.10
AvgWt WE	2.27	1.12	1.69	2.44	1.55	2.00	2.35	1.49	1.92	1.30	0.74	1.02	0.50	0.66	0.58

Genetic gain per generation (values in kg)
T&D

	parent			F1			F2			F3			F4		
traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
LSB	0.11	0.04	0.08	0.02	0.02	0.02	0.04	0.04	0.04	0.04	0.02	0.03	0.18	0.27	0.22
LWB	0.08	0.01	0.04	0.03	0.03	0.03	0.06	0.06	0.06	0.03	0.03	0.03	0.16	0.25	0.21
LSWE	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.03	0.03	0.03
LWWE	0.25	0.45	0.35	0.05	0.22	0.13	0.10	0.34	0.22	0.13	0.36	0.25	1.99	0.53	1.26
AvgWt B	0.07	0.05	0.06	0.05	0.03	0.04	0.05	0.03	0.04	0.05	0.02	0.04	0.03	0.04	0.04
AvgWt WE	0.77	0.38	0.58	0.83	0.53	0.68	0.80	0.51	0.65	0.44	0.25	0.35	0.17	0.22	0.20

Genetic gain per year (values in kg) T&D

	2011-12			2012-13			2013-14			2014-15			2015-16		
traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
LSB	0.06	0.03	0.04	0.01	0.01	0.01	0.02	0.03	0.03	0.02	0.01	0.02	0.09	0.18	0.13
LWB	0.04	0.00	0.02	0.01	0.02	0.02	0.03	0.04	0.03	0.01	0.02	0.02	0.08	0.13	0.10
LSWE	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.02	0.02	0.02
LWWE	0.13	0.30	0.21	0.02	0.15	0.09	0.05	0.23	0.14	0.07	0.24	0.15	0.99	0.27	0.63
AvgWt B	0.03	0.03	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02
AvgWt WE	0.39	0.25	0.32	0.41	0.35	0.38	0.40	0.34	0.37	0.22	0.17	0.19	0.09	0.11	0.10

Selection differential (values in kg) Hampshire 75%

	2011-12			2012-13			2013-14			2014-15			2015-16		
Traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Birth	0.06	0.04	0.05	0.01	0.01	0.01	0.01	0.06	0.06	0.07	0.02	0.04	0.07	0.02	0.04
6 Wk	0.09	0.05	0.22	0.2	0.18	0.2	0.46	0.21	0.35	0.42	0.14	0.28	0.3	0.05	0.17
8 m	2.14	1.2	1.6	7.4	2.95	5.1	4.36	2.4	4.88	0.23	2.35	2.79	3.2	2.07	3.24

Genetic gain per generation (values in kg) Hampshire 75%

	2011-12			2012-13			2013-14			2014-15			2015-16		
traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Birth	0.006	0.004	0.005	0.001	0.001	0.001	0.001	0.006	0.0035	0.007	0.002	0.0045	0.007	0.002	0.0045
6 wk	0.0108	0.006	0.084	0.024	0.0216	0.0228	0.0552	0.0252	0.0402	0.0504	0.0168	0.0336	0.036	0.006	0.021
8 m	0.5564	0.312	0.4342	1.924	0.767	1.3455	1.1336	0.624	0.8788	0.0598	0.611	0.3354	0.832	0.5382	0.6851

Genetic gain per year (values in kg) Hampshire 75%

	2011-12			2012-13			2013-14			2014-15			2015-16		
traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Birth	0.00303	0.002667	0.002833	0.000667	0.000583	0.000667	0.0005	0.004	0.00225	0.0035	0.001333	0.002417	0.0035	0.001333	0.002417
6 wk	0.0054	0.004	0.0047	0.0144	0.0132	0.0144	0.0276	0.0168	0.0222	0.0252	0.0112	0.0182	0.018	0.004	0.011
8 m	0.2782	0.208	0.2431	0.511333	0.736667	0.511333	0.5668	0.416	0.4914	0.0299	0.407333	0.218617	0.416	0.3588	0.3874

Genetic gain per generation (values in kg) Hampshire 75%

	parent			F1			F2			F3			F4		
traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Birth	0.006	0.004	0.005	0.001	0.001	0.001	0.001	0.006	0.0035	0.007	0.002	0.0045	0.007	0.002	0.0045

6 wk	0.01 08	0.0 06	0.008 4	0.02 4	0.021 6	0.022 8	0.055 2	0.025 2	0.040 2	0.050 4	0.016 8	0.033 6	0.03 6	0.006	0.021
8 mon	0.55 64	0.3 12	0.434 2	1.92 4	0.767	1.345 5	1.133 6	0.624	0.878 8	0.059 8	0.611	0.335 4	0.83 2	0.538 2	0.685 1

Selection differential (values in kg) Hampshire 75%

	2011-12			2012-13			2013-14			2014-15			2015-16		
traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
LSB	0.35	0.11	0.66	0.16	0.04	0.2	0.22	0.1	0.32	0.05	0.12	0.17	0.15	0.1	0.25
LWB	0.15	0.1	0.49	0.09	0.14	0.23	0.08	0.27	0.35	0.12	0.08	0.2	0.09	0.11	0.2
LSWE	0.1	0.09	0.4	0.12	0.06	0.18	0.19	0.17	0.36	0.12	0.09	0.21	0.13	0.1	0.23
LWWE	2.28	0.1	4.3	3.01	4.2	7.81	2.5	2.1	4.6	0.25	2.43	2.68	0.61	2.25	2.77
Avg Wt B	0.06	0.04	0.05	0.02	0.01	0.04	0.01	0.01	0.02	0.04	0.03	0.02	0.03	0.02	0.02
Avg Wt WE	0.92	0.05	0.56	0.13	0.1	0.225	0.53	0.05	0.29	0.35	0.21	0.28	0.54	0.05	0.29

Genetic gain per generation (values in kg) Hampshire 75%

	2011-12/p			2012-13/F1			2013-14/F2			2014-15/F3			2015-16/F4S		
traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
LSB	0.077	0.02 42	0.05 06	0.03 52	0.00 88	0.022	0.06 16	0.02 8	0.04 48	0.01 1	0.02 64	0.018 7	0.03 3	0.02 2	0.027 5
LWB	0.04 2	0.02 8	0.03 5	0.02 52	0.03 92	0.032 2	0.00 32	0.01 08	0.00 7	0.03 36	0.02 24	0.028	0.02 52	0.03 08	0.028
LSWE	0.00 4	0.00 36	0.00 38	0.00 48	0.00 24	0.003 6	0.04 94	0.04 42	0.04 68	0.00 48	0.00 36	0.004 2	0.00 52	0.00 4	0.004 6
LWWE	0.59 28	0.02 6	0.30 94	0.78 26	1.09 2	0.937 3	0.87 5	0.73 5	0.80 5	0.06 5	0.63 18	0.348 4	0.15 86	0.58 5	0.371 8
Avg Wt B	0.02 1	0.01 4	0.01 75	0.00 7	0.00 35	0.005 25	0.00 34	0.00 34	0.00 34	0.01 4	0.01 05	0.012 25	0.01 05	0.00 7	0.008 75
Avg Wt WE	0.31 28	0.01 7	0.16 49	0.04 42	0.03 4	0.039 1	0.18 55	0.01 75	0.10 15	0.11 9	0.07 14	0.095 2	0.18 36	0.01 7	0.100 3

Genetic gain per year (values in kg) Hampshire 75%

	2011-12			2012-13			2013-14			2014-15			2015-16		
traits	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
LSB	0.03 85	0.016 133	0.05 06	0.01 76	0.005 867	0.022	0.030 8	0.018 667	0.04 48	0.00 55	0.017 6	0.018 7	0.016 5	0.014 667	0.027 5
LWB	0.02 1	0.018 667	0.03 5	0.01 26	0.026 133	0.032 2	0.001 6	0.007 2	0.00 7	0.01 68	0.014 933	0.028	0.012 6	0.020 533	0.028
LSWE	0.00 2	0.002 4	0.00 38	0.00 24	0.001 6	0.003 6	0.024 7	0.029 467	0.04 68	0.00 24	0.002 4	0.004 2	0.002 6	0.002 667	0.004 6
LWWE	0.29 64	0.017 333	0.30 94	0.39 13	0.728	0.937 3	0.437 5	0.49	0.80 5	0.03 25	0.421 2	0.348 4	0.079 3	0.39	0.371 8
Avg Wt B	0.01 05	0.009 333	0.01 75	0.00 35	0.002 333	0.005 25	0.001 7	0.002 267	0.00 34	0.00 7	0.007	0.012 25	0.005 25	0.004 667	0.008 75
Avg Wt WE	0.15 64	0.011 333	0.16 49	0.02 21	0.022 667	0.039 1	0.092 75	0.011 667	0.10 15	0.05 95	0.047 6	0.095 2	0.091 8	0.011 333	0.100 3

Adoption of integrated farming systems: One farmer, Sri Vishal Day, Getalshut, Angarha, Jharkhand has adopted integrated farming system with piggery as a major component. His IFS components include Piggery- Fishery-Duckery-Horticulture. Total area of the farm is approx 12 acre. He is utilizing waste of piggery for fish pond and manure for horticulture and by-product of horticulture field is ulilized for piggery.

Survey on market of pork production: The price of pork increasing day by day due to the increase in demand of pork in local market. The price of pork increased three times in last five years. Presently price of pork is Rs. 160-200 per kg.

Disposal pattern of waste, pig excreta etc/ Establishment of biogas plant: We have established one bio gas plant of 30 m^3 capacities for better utilization of pig excreta. Bio gas is being used as illuminating the farm and for cooking purpose.

Production economics:

i) Cost of production/pig up to slaughter age: Rs. 5000 to Rs. 11000 depending on feed and marketing

ii) Cost of production/Kg pork: Rs. 60.00 per kg body weight gain on 100% concentrate ration

Extension programme with success story:

At the institute: Training to farmers on Pig breeding & Management at Pig Breeding Farm

A. 10 days duration: 120 no of beneficiary

B. 1 day duration 801 no of beneficiary

Organised one day exposure-cum-training programme on improved pig Management for farmers under *Jai Kishan, Jai Vigyan* programme. Twenty eight farmers from different villages have participated the programme.

At the farmers' field:

i) Livestock (Pig) show during *Kisan Mela* at different KVKs of University.

iii) Kisan gosti at different places of state during Livestock Show.

iv) T.V. Telecast (Doordarsan Ranchi) – 11

v) Radio - 1

Salient achievement during the report period:

i. Comparative growth performance of "T&D" and 75% Hampshire pigs were studied. Average body weight at birth, 6^{th} and 8^{th} week of age was observed to be higher in 75% Hampshire (1.34±0.01, 7.21±0.11 and 9.88±0.15 Kg) pigs in comparison to "T&D" (1.17±0.01, 7.17±0.11 and 9.85±0.15 Kg) respectively. However, body weight at 32^{nd} and 40^{th} weeks of age was observed to be higher in T&D than 75% H. Body weights at 32^{nd} and 36^{th} weeks of age were recorded in "T&D" (64.41±2.70 and 89.38±3.79 Kg) and 75% Hampshire (52.56±2.86 and 81.63±4.25 Kg), respectively.

ii. Comparative reproductive performance of "T&D" and 75% Hampshire pigs were studied. No significant differences were observed between these two groups. However, slightly better reproductive performances (LSB, LSW and LWW) were noticed in "T&D" pigs than 75% Hampshire. Litter size at birth, Litter size at weaning and Litter weight at birth and Litter weight at weaning for T&D and 75%H were observed to be 6.37±0.30, 5.95±0.34, 7.33±0.35 Kg, 57.31±2.96 Kg and 5.73±0.35, 5.62±0.35, 7.70±0.47 Kg, 55.23±3.12 Kg, respectively.

iii. Effect of inclusion of different source of protein in different proportion on the performance of grower piglets was studied. No significant difference in body weight change was observed among groups till fifth fortnight. However feed consumption was observed to be more in case T_2 (100 % FM) followed by T4 (70%GNC+30% FM), T3 (50%GNC+50% FM), T1 (100% GNC) and T5 (control).

Scientific publication:

Effect of genetic and non-genetic factors on litter size at birth and weaning in Pigs. Progressive Research 10 (3): 264-266.

Livestock Based Integrated Farming Systems for Resource Conservation and Sustainability: A Review" *National Conference On Global Research Initiatives For Sustainable Agriculture & Allied Sciences (GRISAAS-2015)* held on December 12–13, 2015 at RVSKVV, Gwalior (M.P.)

Success story:

Success story of Mr and Mrs Dhuma Tudu, Deoghara, Jamshedpur, East Singhbhum: Dhuma Tudu, a decent Santhal youth of village Deoghara, in East Singhbhum was in need of a viable income source through livestock farming as he had a small piece of land in his backyards. He attended a workshop cum training programme organised by Krishi Vigyan Kendra at one of the successful farms of pig in East Singhbhum. The event was a turning point for Mr Tudu as the very day he set up his mind to establish a Pig unit for his livelihood. His wife Mrs Kavita too encouraged in boosting his dreams. So the couple decided to purchase a pair of T&D female and a male piglet as start up. Due to the productive traits of T&D breed he could get the desired result of first farrowing after about 10 months of their hard work in the venture. In the mean time he undergone a training programme at KVK of the district for technical knowhow on pig farming. He kept the pigs in well maintained clean shed. He arranged low cost balanced feed from hostel canteen wastes and feed his pigs. He always maintains 15 to 16 sows and a proven boar of T&D and regularly receive good weaned piglets for sale. On an average he earns a net income of Rs 180,000-2,00,000 by the selling weaned piglets @ Rs 2,000/ per piglet and fattening pigs. He also targets to rear castrated male for pork production depending upon the availability of surplus feed.Now his wife Kavita looks after the stock and he arranges the feed. For additional income he has set up a small tea/snacks shop. The eattable wastes are used in as feed for pigs. Mr and Mrs Tudu has a 5 years old son studing in St Josheph School, Bhilai Pahari, Jamshedpur in UKG. They are leading a happy and satisfied life.

Visit to Farmers' field

Animals at farmers' field

	
Farmers Training	Visit at farmer's door

KERALA VETERINARY AND ANIMAL SCIENCE UNIVERSITY, MANNUTHY CENTRE, KERALA

This farm was started on 12-05-1965 as a small pig breeding unit along with an auxiliary pork production scheme under the Department of Animal Husbandry. It was taken up by Kerala Agricultural University in 1972 and renamed as University Pig Breeding Farm. The All India Coordinated Research Project was started in 1993 with the objective of studying the performance of indigenous pigs and to produce a crossbred between indigenous and exotic pigs. The Massive Livestock Development Programme (MLDP) was started in 1993 in collaboration with Department of Animal Husbandry, Kerala with the objective of distributing 2000 piglets to the farmers in Kerala both as breeding and fattener units. The Farm was upgraded to Centre for Pig production and Research in 1995. The Centre has been identified as the lead institution for the World Bank funded National Agricultural Technology Project on "Strategies for enhancing the productivity of pigs for the farming community" with four co-operative institutions at Kattupakkam, Bangalore, Port Blair and Goa. This center is maintaining about 1600 pigs belonging to Large White Yorkshire, Land race, Duroc, local Desi breed and varieties of crossbred animals. The major activities of this centre are to conduct research on various aspects of pig production, operate as an instructional farm to students, production and distribution of good quality piglets to farmers and to function as a demonstration unit to farmers. Under the AICRP on Pig, two breed (Desi x LWY) and three breed ((Desi x LWY) x Duroc) crosses are produced and supplied to farmers for fattening. So far the Centre has completed various projects including Master's, Doctoral projects. Academic activities include conducting internship training for under graduate students, providing facilities and technical advice for conduct of research of post graduate and doctorate students. The extension activities of the Centre include provision of technical advice to progressive pig farmers, issue of project reports and establishment of field units.

Herd dynamics:

Details	Desi			Crossbred 50 %			Crossbred 75 %		
	M	F	Total	M	F	Total	M	F	Total
Opening balance as on 01/04/2015	25	23	48	0	34	34	54	69	123
Birth 01/04/14 to 31/3/2015	63	54	117	24	72	96	213	197	410
Purchase of animals	0	0	0	0	0	0	5	0	5
Total	88	77	165	24	106	130	272	266	538
Mortality	3	2	5	1	4	5	19	17	36
Sold / Field unit / slaughter	70	63	133	20	75	95	180	188	368
Total	73	65	138	21	79	100	199	205	404
Closing balance as on 31/3/2016	15	12	27	3	27	30	73	61	134

Breeding strategy of the farm as approved: 75% crossbreds are maintained by inter-se mating

Performance of animals:

Sl.No	Traits/Characters	**Total 2013-14**	**Total 2014-15**	Mean ± SE (2015-16)		
				M	F	**Total**
1.	Litter Size at birth (no)	10.64	10.62±0.11	5.81±0.13	4.84±0.10	10.65±0.12
2.	Litter weight at birth (kg)	10.74	10.30±0.13	6.80±0.12	5.58±0.12	12.38±0.12
3.	Litter Size at weaning (no)	9.7	9.92±0.11	5.40±0.13	4.55±0.12	9.95±0.12
4.	Litter weight at weaning (Kg)	82.67	85.80±0.16	47.98±0.20	39.85±0.19	87.83±0.20
5.	Avg. Individual weight at birth (kg)	1.03	1.17±0.06	1.18±0.06	1.14±0.06	1.16±0.06
6.	Avg. Individual weight at weaning (kg)	8.52	8.63±0.22	8.92±0.22	8.37±0.20	8.65±0.21
7.	Number of days for weaning (d)	42	42	42	42	42
8.	Pre weaning mortality rate (%)	8.83	6.56	7.49	6.23	6.86
9.	Pre weaning growth rate(gm/d)	195	177.62	184.64	172.84	178.74
10.	Post weaning mortality rate (%)	0.5	0.67	1.10	1.13	1.12
11.	Post weaning growth rate (gm/d)	357	371.5	382	367	374.5
12.	Overall growth rate (up to 9 m) (gm/d)	315	315	328	325	326.5
13	Body weight at different ages (kg) (n=8)					
	at 1st month	5.92±0.20	5.92±0.20			5.98±0.30
	2nd month	10.20±0.30	10.30±0.30			10.35±0.28
	3rd month	17.10±0.40	17.11±0.40			17.52±0.35
	4th month	27.02±0.40	27.90±0.40			28.10±0.39
	5th month	35.68±0.50	37.60±0.50			38.54±0.50
	6th month	47.87±0.55	48.80±0.55			49.10±0.55
	7th month	59.63±0.60	61.60±0.60			62.65±0.65
	8th month	73.80±0.70	75.70±0.70			76.90±0.75
	9th month	81.70±0.75	86.50±0.75			87.20±0.80
	10th month	91.02±0.80	93.50±0.80			94.25±0.85
14.	Age at slaughter (d)	300	300			300
15.	Weight at slaughter(Kg)	91.02 ±0.80	93.50 ±0.80			94.15 ±0.85
16.	Dressing Percentage (%)	68.81±0.70	66.0±0.70			66.25±0.75
17.	Carcass Length (cm)	77.50±0.65	78.10±0.65			78.25±0.70
18.	Back Fat Thickness (mm)	22.40±0.45	21.11±0.45			21.15±0.50
19.	Meat Bone ratio (:)	4.15± 0.10	4.20± 0.10			4.30± 0.10
20.	Amount of pork produced per sow (kg/year)	1152.36	1855.04			1860.10
21.	Feed Conversion efficiency (:)	4.20	4.01			4.01
22	Live weight produced /sow/litter at birth (kg)	10.74	10.30			12.48
23	Live weight weaned /sow (kg)	82.67	85.80			85.83
24	Live weight produced at slaughter age/sow/litter (kg)	1674.70	927.52			928.12

Lifetime production traits

Sl No	Traits	Mean
1	Live weight produced /sow/litter at birth (kg)	12.38±0.12
2	Live weight weaned /sow (kg)	87.83±0.20
3	Live weight produced at slaughter age/sow/litter (kg)	928.12

Specific managemental practice: Identification using microchips

Mortality parameter: ***Desi -Pre-weaning***

Parameter	Age											
	0-14 days			15-28 days			29-45 d			Over all		
	M	F	T	M	F	T	M	F	T	M	F	T
Number of animals at risk	-	-	-	-	-	-	-	-	-	-	-	-
Number died	1	1	2	1	1	2	-	-		2	2	4
Mortality %	4.35	5.27	4.81	2.50	2.85	2.67				3.43	4.06	3.74

Desi - Post- weaning

Parameter	45 days - 1 year			Adult			Over all		
	M	F	T	M	F	T	M	F	T
Number of animals at risk									
Number died	1						1		1
Mortality %	1.14						1.14		0.61

Cross bred 50% -Pre-weaning

Parameter	Age											
	0-14 days			15-28 days			29-45 d			Over all		
	M	F	T	M	F	T	M	F	T	M	F	T
Number of animals at risk	-	-	-	-	-	-	-	-	-	-	-	-
Number died	1	3	4		1					1	4	5
Mortality %	4.16	5.76	4.96		3.54					3.54	4.65	4.10

Cross bred 50% -Post- weaning: Nil

Cross bred 75 % -Pre weaning

Parameter	Age											
	0-14 days			15-28 days			29-42 days			Over all		
	M	F	T	M	F	T	M	F	T	M	F	T
Number died	5	7	12	6	5	11	5	2	7	16	14	30
Mortality %	8.34	7.51	7.93	7.30	6.41	6.86	6.08	5.22	5.65	7.24	6.38	6.81

Cross bred 75 % -Post- weaning

Parameter	45days-1year			Adult			Over all		
	M	F	T	M	F	T	M	F	T
Number of animals at risk	-	-	-				-	-	-
Number died	3	3	6				3	3	6
Mortality %	1.10	1.13	1.12				1.10	1.13	1.12

Causes of mortality (specific cause):

Pre weaning

Causes	Number died								
	Desi			Crossbred 50%			Crossbred 75%		
	M	F	T	M	F	T	M	F	T
Gastro enteritis	1	1	2		2	2	9	6	15
Hepatosis	-	1	1		-	-	2	4	6
Pulmonary congestion and edema	1	-	1	1	2	3	5	4	9
Total	2	2	4	1	4	5	16	14	30

Post weaning

Causes	Number died								
	Desi			Crossbred 50%			Crossbred 75%		
	M	F	T	M	F	T	M	F	T
Gastro enteritis	1	-	1	-	-	-	-	1	1
Hepatosis	-	-	-	-	-	-	1	1	2
Pulmonary congestion and edema	-	-	-	-	-	-	2	1	3
Total	1	-	1	-	-	-	3	3	6

Measures to taken minimize mortality:

(i) Management measures:

1. Pigs were dewormed periodically and regular spraying against ecto- parasites was carried out.
2. Early treatment to control piglet diarrhea and anemia were undertaken

3. Farrowing crates to minimize the incidence of crushing of piglets
4. Artificial light provided at farrowing pen to prevent piglet mortality due to cold shock
5. Gunny bags were laid over roof and periodically wetted to control the thermal stress
6. Soft bedding with hay was provided to minimize the incidence of crushing of piglets
7. Early detection and treatment of MMA syndrome
8. Disinfectant dip was constructed at the entrance of the centre to control infection from outside.
9. Practice of one time feeding in the early morning of the day was introduced along with provision of shade to minimize the heat stress
10. Efforts are taken to minimize the pre-weaning mortality with suitable interventions.

Prophylactic measures:

1. All the animals were vaccinated twice annually for swine fever disease (CSF) and FMD
2. Weaned piglets were vaccinated against the CSF three days after weaning and FMD after 21 days
3. The wallowing tanks in the pens are routinely cleaned using disinfectants and maintained hygienically.
4. The sows were dewormed and thoroughly scrubbed and cleaned prior to shifting them into the farrowing pens.
5. Pregnant sows were transferred to farrowing pen 2-3 weeks in advance to provide individual care and management.
6. Routine inspection and maintenance of hygienic practices of farrowing pens for preventing MMA

Disposal of diseased carcass: Carcasses are disposed into the carcass pit located in the campus.

Nutritional experimentation:

The feed with following composition is used in the centre.

Sl. No.	Feed Ingredients	16% CP	18%CP	20% CP
1	Maize	45	38	40
2	Soya	15	20	23
3	Rice Polish	19.5	20	10
4	Wheat Bran	14	10	15
5	Dried Fish	5	10	10
6	Mineral Mixture	1	1.5	1.5
7	Salt	0.5	0.5	0.5
8	Vitamins	0.02	0.02	0.02
9	Lysine	0.02	0.02	0.02
10	Methionine	0.02	0.02	0.02
11	Zinc oxide	0.02	0.02	0.02
	Total	100.08	100.08	100.08

Disposal pattern of farm waste, pig excreta *etc*/Establishment of biogas plant:

Solid waste / excreta is collected in the manure pit and sold @ Rs.750/tonn to farmers and government agricultural farms. Liquid waste is collected in the slurry pit and pumped to the grass lands along with water.

Production economics:

i) Cost of production/pig up to slaughter age:
ii) Cost of production/kg pork
Market prices of pork
Pork : Rs. 260 kg from University meat plant
Lean pork : Rs. 320 /kg from University meat plant
Private outlets : Rs. 240/kg.
Live weight : Rs.100/ kg depends upon the season
The production economics is calculated on the basis of feed cost, the existing price of pork is Rs.240/kg and Rs.100/kg live weight.
Cost of production/pig up to slaughter age: Rs. 9860/-
Cost production /kg pork: Rs. 125/-

Extension programme with success story:

(i) At the institute: The Centre imparted scientific knowledge to the progressive pig farmers in establishing the piggery units with respect to health care, feeding and breeding management, waste disposal and other problems faced on a day to day basis through telephone and by direct personal contact. The Centre could establish 210 piggery units throughout the State of which sizable number of farmers took up this as a full time engagement and this unit is proud to report that it could provide a sustainable income for the farmers and many of them now totally depend on their pig farm as their regular income. Training programmes on "Profitable Rearing of Pigs "were held at Centre for Pig Production & Research, Mannuthy in three batches, during May 19-23, 2015, October 12-16, 2015 and March 15-19, 2016. Thirty three farmers attended the programme. The prospects and problems of pig rearing in Kerala were discussed during these training programmes and many of the pig farmers expressed their success stories.

(ii) At the farmer's field: Centre had supplied 368 fattening piglets to 85 farmers. Ten new units have been established during this period.

Salient achievements during the report period:

The centre has successfully fulfilled the demand of the farmers by supplying 368 fattening piglets (crossbreds) and also generated receipt of Rs.11.91 lakhs during the year 2015-16. Crossbred pigs (75%) were produced and their production, reproduction and carcass traits were studied. The breeding stock number was increased; health status of farm stock is improved with utmost care and management. A comprehensive breeding schedule has been introduced for prompt selection / culling of the stock.

An experiment was carried out using twenty five weaned LWY piglets of two months of age to study the effect of dietary supplementation of lecithin and carnitine on growth in piglets fed on high fat diet. The piglets were divided into five groups with five replicates for each group. The animal in five groups were randomly allotted to five dietary treatments, T_1 (control ration as per NRC, 1998), T2 (control ration supplemented with five per cent fat), T3 (T2 plus 0.5 per cent lecithin), T4 (T2 plus 150 mg carnitine per kg diet), T5 (T2 plus 0.5 per cent lecithin and 150 mg carnitine per kg diet). The result of the study indicates that diet supplemented with fat along with lecithin and carnitine has better

body weight, weight gain and average daily gain compared to those fed control diet. The cumulative feed conversion efficiency of the lecithin supplemented group (T_3) was higher throughout the experimental period. Increased apparent digestibility of nutrients such as protein, fat and improved plasma lipid profile (total cholesterol, triglyceride, HDL cholesterol) was also observed in the lecithin supplemented group. From the overall result, it can be concluded that lecithin supplementation at 0.5 per cent (T_3) shows better improvement in growth, apparent digestibility of nutrients and blood parameters compared to other groups.

Publications

Jisha G. S., Shyama K., Dipu M. T. and Tirupathy Venkatachalapathy R. (2015). Effect of zinc at different levels on growth and feed conversion efficiency of cross bred pigs. J. Vet. Anim. Sci. (46): 55-59.

Raghavendra V. B., Venkatachalapathy R. T. and Usha A. P. (2015). Analysis of litter traits in three genetic groups of pigs. Indian Res. J Genet & Biotech 7(3): 347-349.

Pruthviraj R., Usha A. P. and Venkatachalapathy R. T. (2016). Identification of a novel single nucleotide polymorphism in porcine beta defensin-1 gene. Asian Australas. J. Anim. Sci. 29 (3): 315-320.

Project work of students (M.V.Sc./Ph.D.)

An experiment was carried out for a period of 99 days in twenty five weaned female LWY piglets (two months old, with an average body weight of 21.7 kg) to study the effect of dietary supplementation of lecithin and carnitine on growth in piglets fed on high fat diet. The piglets were divided into five groups with five replicates for each group. The animal in five groups were randomly allotted to five dietary treatments, T_1 (control ration as per NRC, 1998), T2 (control ration supplemented with five per cent fat), T3 (T2 plus 0.5 per cent lecithin), T4 (T2 plus 150 mg carnitine per kg diet), T5 (T2 plus 0.5 per cent lecithin and 150 mg carnitine per kg diet) using completely randomized design. Data on daily feed intake, left over feed, fortnightly body weight, body weight gain, feed conversion efficiency, digestibility of nutrients, gross energy of feed and faeces, blood parameters (total protein, total cholesterol, HDL and LDL cholesterol, Ca, P and Mg) were used for evaluation of work. The result of the study indicates that diet supplemented with fat along with lecithin and carnitine has better body weight, weight gain and average daily gain compared to those fed control diet. The cumulative feed conversion efficiency of the lecithin supplemented group (T_3) was higher throughout the experimental period. Increased apparent digestibility of nutrients such as protein, fat and improved plasma lipid profile (total cholesterol, triglyceride, HDL cholesterol) was also observed in the lecithin supplemented group. From the overall result, it can be concluded that lecithin supplementation at 0.5 per cent (T_3) shows better improvement in growth, apparent digestibility of nutrients and blood parameters compared to other groups.

Distinguish visitors

Sl. No.	Name and address of the visitor	Date of visit	Place of visit	Purpose of the visit
1	Dr. M. P. Yadav, Chairman VCI team	05-1-2016	CPPR, Mannuthy	VCI Inspection

Success story:

The centre provides technical knowledge to pig farmers in various aspects of pig farming such as housing, health care, management and other problems. This unit is proud to report that it could provide a sustainable income for the farmers and many farmers have come forwarded to start pig farms with the technical support from this centre. The success story of two farmers is presented here.

Breeding Unit: Name: Mr. Flebin Thomas, Kannamkulam House,Thodupuzha, Idukki 673528, Kerala, (ph-09995052178), a young entrepreneur started pig rearing from 2015 after attending training on scientific pig rearing at AICRP Mannuthy on May 2015. Mr. Flebin Thomas started a breeding pig rearing unit on the advice of AICRP on pig with 30 pigs. Now, he owns 78 breeding pigs and earns a good income by sale of quality piglets and manure.

Fattening Unit: Name of Livestock Keeper: Mr. Jo Mathew, Marottikkathadathil House, S G Press P O, PIN 679122, Shornur, Kerala (ph- 09947631654)

Mr. Jo Mathew expanded his existing piggery unit from 2015 after attending training at AICRP Mannuthy on October 2015. Now, he owns 150 pigs and earns a good income of about Rs.13,500/month through the sale of finisher pigs.

Macroclimatic Data

Sl. No	Month & Year	Mean Temperature (^{0}C)	Relative Humidity (%)	THI
1.	April, 2015	26.3	63.5	75.0
2.	May, 2015	26.3	75.9	76.5
3.	June, 2015	26.5	80.1	77.2
4.	July,2015	25.8	83.1	75.6
5.	August,2015	25.1	86.3	75.7
6.	September,2015	25.0	83.4	75.2
7.	October,2015	25.4	81.3	75.6
8.	November,2015	25.7	82.3	76.2
9.	December, 2015	26.0	76.8	76.0
10.	January, 2016	27.9	68.7	77.4
11.	February,2016	28.6	70.2	78.9
12.	March,2016	33.2	70.5	86.2

Semen collection in pigs

AI crate in pigs

Farmer training

Aerobic compost units

Pigs at farmers' field

SRI VENKATESHWARA VETERINARY UNIVERSITY, TIRUPATI

The All India Coordinated Research Project on Pigs, (APAU/ANGRAU/SVVU Centre) at College of Veterinary Science, Tirupati was sanctioned on 1.10.1970, started functioning from 20.3.1971, with the main objective of studying the performance of Large White Yorkshire pigs under optimum managemental conditions. During the VI Five Year Plan, research work was conducted to study the performance of indigenous pigs under improved managemental conditions and genetic improvement through selection. During the VII Five Year Plan, research work was initiated on crossbreeding of indigenous pigs with boars of Large White Yorkshire to decide about the optimum level of exotic inheritance best suited to local conditions and is in progress. Since 1985-86 the performance of crossbreds of 50% & 75% LWY produced by interse mating was studied. Presently performance of only 75% LWY crossbreds by interse mating is being studied.

Herd dynamics:

Sl. No	Categories	Opening balance as on 1.4.2015	Additions		Disposals			Closing balance as on 31.3.2016
			Birth	Transfers/ Purchased	Death	Transfers/ Slaughter	Sold	
1	Piglet (upto 42 d)	44	247	-	10	-	-	-
2	Grower (42 d-5m)	86	-	-	13	-	106	-
3	Finisher (5 – 8 m)	-	-	5	3	5	115	123
4	Breeding female	34	-	8	-	8	27	13
5	Boar	12	-	1	-	-	11	3
Grand Total		**176**	**247**	**14**	**26**	**13**	**259**	**139**

Breeding strategy of the farm as approved

- Started during IV Five year plan in the year 1970-71 to study performance of LWY pigs and was continued upto the end of V Five year plan.
- During VI Five year plan the performance of indigenous breeds was studied under best managemental conditions.
- Research work on breeding of indigenous gilts with boars of LWY was carried out during VII Five year plan.
- Studies on indigenous pigs was discontinued from 1985-86 and the performance of crossbreds (50% & 75% LWY) by interse mating was studied
- Presently performance of only 75% LWY crossbreds by interse mating are being studied.

Performance of animals: (21st generation III crop)

Sl. No	Traits/ Characters	Mean ± SE (no. of observation)		
		M	F	Total
1	Litter size at birth (no.)	4.34±0.32 (29)	4.00±0.28 (29)	8.34±0.23 (29)
2	Litter weight at birth (kg)	5.75±0.40 (29)	5.30±0.38 (29)	11.05±0.29 (29)
3	Litter size at weaning (no.)	4.21±0.30 (29)	3.86±0.30 (29)	8.07±0.26 (29)
4	Litter weight at weaning (kg)	33.62±2.34 (29)	29.86±2.52 (29)	63.48±1.90 (29)

5	Avg. individual weight at birth (kg)	1.32±0.02 (126)	1.33±0.01 (116)	1.32±0.01 (242)
6	Avg. individual weight at weaning (kg)	7.99±0.08 (122)	7.80±0.07 (111)	7.90±0.06 (233)
7	Number of days for weaning (d)	42 days	42 days	42 days
8	Pre weaning mortality rate (%)	3.17 (126)	4.31 (116)	3.71 (242)
9	Pre weaning growth rate (gm/d)	158.59±1.95 (122)	153.96±1.80 (111)	156.38±1.34 (233)
10	Post weaning mortality rate (%)	5.73 (122)	1.79 (111)	3.86 (233)
11	Post weaning growth rate (gm/d) (up to 9 months)	316.28±1.73 (17)	312.60±1.72 (37)	313.76±1.31 (54)
12	Overall growth rate (*upto 4 m*) (gm/d)	260.93±1.43 (17)	257.89±1.42 (37)	258.85±1.08 (54)
13	1 month	6.28±0.07 (122)	6.26±0.07 (112)	6.27±0.05 (234)
	2 months	9.78±0.11 (122)	9.86±0.11 (111)	9.82±0.08 (233)
	3 months	14.76±0.10 (108)	15.10±0.11 (102)	14.92±0.07 (210)
	4 months	25.27±0.13 (98)	25.13±0.20 (101)	25.20±0.12 (199)
	5 months	36.22±0.15 (72)	36.36±0.21 (93)	36.30±0.13 (165)
	6 months	47.33±0.42 (38)	44.96±0.21 (80)	45.72±0.22 (118)
	7 months	60.60±0.40 (29)	59.68±0.20 (75)	59.93±0.19 (104)
	8 months	70.95±0.36 (17)	69.64±0.30 (37)	70.05±0.24 (54)
	9 months	77.40±0.20 (2)	76.80±0.00 (1)	77.20±0.23 (3)

(21st generation II crop)

14	Age at slaughter (d)	256.40	256.00	256.18
15	Weight at slaughter (kg)	76.20	67.00	71.18
16	Dressing Percentage (%)	59.49	60.71	60.10
17	Carcass Length (cm)	73.62	70.56	71.95
18	Back Fat Thickness (mm)	2.45	2.09	2.25
19	Meat Bone ratio (:)	2:1	2:1	2:1
20	Amount of pork produced per sow (kg)	45.33	47.27	46.31
21	Feed conversion efficiency (:)	3.01	3.12	3.07

Selection differential values of selected parents for 22nd generation

Sl. No	Trait	Males	Females
1	Birth weight	0.17	0.04
2	1 month	0.43	0.01
3	At weaning(42 days)	0.32	0.03
4	2 month	1.01	0.10
5	3 month	1.17	0.19
6	4 month	0.74	0.06
7	5 month	0.17	0.11
8	6 month	0.56	0.12

Observed Genetic gain in 21st generation		
Trait	**M**	**F**
Litter size at birth (no.)	0.24	0.07
Litter weight at birth (kg)	0.58	0.55

Litter size at weaning (no.)	0.31	0.06
Litter weight at weaning (kg)	4.37	1.25
8 month body weight	5.14	3.02

- The selected breeding males are subjected for cytogenetic screening. One PG student was undertaking research on cytogenetic screening in the department of Genetics and Animal breeding of the college.
- The artificial insemination technique was being practiced at this centre.

Selection differential values for production and reproduction traits of selected parents of 21st generation:

Trait	Males	Females
Litter size at birth (No.)	0.01	0.01
Litter weight at birth	0.01	0.20
Liter size at weaning	0.04	0.05
Litter weight at weaning	2.23	1.22
Body weights (kg) at		
Birth weight	0.09	0.04
1 month	0.15	0.02
At weaning (42 days)	0.14	0.05
2 month	0.17	0.08
3 month	0.22	0.07
4 month	0.21	0.07
5 month	0.19	0.14
6 month	0.30	0.16
7 month	0.20	0.12
8 month	0.14	0.11

Observed Genetic gain in 20th generation:

Trait	Male	Female
Litter size at birth (no.)	0.20	0.18
Litter weight at birth (kg)	0.36	0.36
Litter size at weaning (no.)	0.09	0.11
Litter weight at weaning (kg) *	-	-
8 months body weight (kg)	6.10	6.39

* The observed genetic gain for Litter weight at weaning could not be calculated since the data was recorded for weaning weights of 19th generation at 56 days and 20th generation at 42 days.

Lifetime production traits: (For 1st, 2nd & 3rd crop together)

- Average litter size at birth per sow : 7.77
- Average litter weight at birth per sow : 9.57
- Average litter size at weaning per sow : 7.53
- Average litter weight at weaning per sow : 57.80
- Average litter weight at slaughter per sow : 71.79

Specific managemental practice:

- Identification is done by ear notching, employing ear notching pliers on fourth day.
- Castration is not followed in the farm.
- Removal of needle teeth is carried out on fourth day.
- To combat piglet anemia, iron dextran injection will be given on 4th day and repeated on 14th day.

- To reduce the heat stress of the animals in hot summer farmers were advised to reduce the stocking density in sheds and to go for inclusion of high density diets like animal fats in the ration.
- As a measure of shelter management farmers are advised to hang gunny curtains to sides of sheds and sprinkle water in morning and evening time to reduce heat stress.

Mortality parameter:

i) Genetic group-wise and sex-wise mortality rate (*Pre and post weaning*):

	Male			Female			Total		
	Stock available	No. of deaths	% of mortality	Stock available	No. of deaths	% of mortality	Stock available	No. of deaths	% of mortality
Pre-weaning (Birth to 42d)	148	4	2.70	143	6	4.19	291	10	3.43
Post weaning (42 d to 5 m)	198	11	5.55	169	2	1.18	367	13	3.54
Adult(> 5 m)	149	3	2.01	180	0	0	329	3	0.91

Causes of mortality (*Specific cause*):

Pre-Weaning			
	Male	Female	Total
PM changes	1	2	3
E.coli	1		1
E.coli		1	1
Pasteurellosis		1	1
Pulmonary edema and Pneumonia		1	1
Traumatic shock	1		1
Lymphosarcoma	1	1	2
Total	**4**	**6**	**10**
Post-Weaning			
PNEUMONIA	2	1	3
PM Changes	2		2
Lymphosarcoma	2	1	3
Parasitic enteritis	3		3
Pasteurellosis	2		2
Total	**11**	**2**	**13**
Adult			
E.coli	1		1
Pasteurellosis	1		1
Pneumonia	1		1
Total	**3**	**0**	**3**
Grand Total	**18**	**8**	**26**

Measures taken to minimize mortality:

Managemental measures:

All possible bio-security measures were adopted including regular sanitation, screening of animals for parasitic diseases, regular deworming, identification of sick animals in time, proper treatment for the sick animals, regular visits of health committee constituted for the purpose comprising of specialists from Departments of Medicine, Surgery, Gynaecology, Parasitology, Pathology, Microbiology and Epidemiology.

All measures to prevent the access of causative factors by way of feed and water are regularly checked. The parasitic load of the stock be regularly assessed and the animals are properly dewormed. Similarly efforts for controlling ecto-parasitic infection like mange may also be done periodically.

Prophylactic measures: Vaccination schedule for diseases of HS, FMD, Swine fever *etc.* are rigidly followed. In case of outbreaks the segregation and hygienic measures be put into immediate effect.

Disposal of diseased carcass: The dead animals after conducting the post-mortem will be buried properly as per standard practices.

Nutrition experiment

Utilization of shrimp shell meal containing chitosan as an alternative to antibiotic feed additives in crossbred finisher pigs Modern pig production practices that are associated with regular use of antibiotics as growth promoters or to control diseases which contribute to the spread of drug-resistant pathogens in both livestock and humans, posing a significant public health threat. Moreover with the ban of antibiotic growth promoters by several countries, extensive research work has become a continuous process leading to the identification of many potential alternative growth promoters such as acidifiers, probiotics, prebiotics *etc.* to reduce or eliminate the use of antibiotics in animal feeds. Chitosan, obtained from chito-oligosacharides is widely distributed in exoskeleton of shrimp and crab is nontoxic, biodegradable carbohydrate polymer, with antimicrobial activity. Recent research with dietary inclusion of chito-oligosaccharides (COS) in pig rations suggests that COS provide a potential alternative to antibiotic feed additives.

Validation of existing feeding packages

The existing feeding package developed at AICRP on Pigs, Tirupati on **"Effect of replacement of Soybean meal at 5% with shrimp shell waste to study the performance of crossbred pigs during growing periods"** was also conducted at field level through incorporation of Shrimp shell waste in ration to reduce the feeding cost. As per the feeding packages developed at this centre the following rations were formulated and fed to animals with five numbers of farmers in surrounding villages of Tirupati.

Survey on market of pork production:

The surplus animals, culled animals which are unfit for further breeding and also experimental animals where nutritional and carcass characteristics need to be studied are slaughtered and the pork is sold at the rate of 170/- per kg.

A directory of pork eaters comprising about 2000 names along with mobile numbers of Tirupati town is being maintained by the station. Whenever there is a slaughter these customers are alerted through internet SMS to encourage pork consumption.

Disposal pattern of farm waste, pig excreta *etc*/Establishment of biogas plant: The farm waste or pig excreta are used periodically for the plants as manure in the research station premises. The remaining manure being supplied to LPM department in college for growing green fodder. During the

year 2013-14 a biogas unit was established in the project. Pig manure was stored in a separate manure pit and used for production of biogas.

Production economics:

i) Cost of production/pig up to slaughter age: The slaughter age is usually about 10 months or if as the animals reach 75 to 80 kg body weight. The average cost of production per pig upto slaughter age ranges from Rs.6,200/- to 6,500/- and it depends on the cost the ingredients which fluctuate periodically.

ii) Cost of production/ kg pork Rs. 130/- to Rs. 140/-.

Extension programme with success story:

At the institute: Regularly farmers are visiting the farm and are being given technical advises about scientific pig rearing and feeding, vaccination *etc.* Importance of sanitization and hygiene and summer managemental practices to combat heat stress are also explained to the beneficiaries. Problems/constraints faced by the farmers in the field are addressed during the time of their visit to this farm and also through telephone.

Training programmes conducted: One training programme namely **"Scientific rearing of pigs"** was conducted on 21.1.2016 to 30 number of pig beneficiaries of different regions of Andhra Pradesh on various aspects of pig rearing like housing, sanitation, management, feeding, Breeding *etc*. for getting more profits through pig farming.

A total of 259 numbers of pigs were supplied to pig beneficiaries of different regions of Andhra Pradesh and feed back information as impact study was collected from the field in the form of success stories.

ii) At the farmers' field: The staff of the centre periodically visiting the surrounding villages to collect the feedback and advising the farmers about the managemental practices of pig rearing. The following are the success stories collected while taking feed back information from pig farmers.

Success stories:

1. Sri. C. Kanaka Reddy, Chaithanyapuram (Vill.), Renigunta (M), Chittoor District, Andhra Pradesh. This farmer is supplied with 13 number of weaners during the year 2015-16. He has been maintaining pig farm since 2010. He is feeding pigs with leftovers from fruit factories and markets and also providing concentrated feed for breeding and young animals. He is procuring garbage from local hostels and hotels. He has employed one labour family for maintenance of pigs. He told that he is getting a profit of Rs. 4,00,000/- per annum through pig farming.
2. Sri. A. Reddeppa Reddy, Chowdaganapalli, Chowdepalli Mandal, Chittoor District. He is a new pig farmer started pig farm with 50 number of weaners purchased from this centre. Presently they have grown to finisher stage with body weight ranging from 50-60kg. He is feeding the animals with rice bran, and a variety of aloe vera roots as feed. They are costing Rs.5/- per kg. about 2kg per animal per day. He has got market for his animals at Bangalore.

3. Sri. V. Uday Kumar, Dhaminedu, Tiruchanoor, Tirupati Rural. This farmer is maintaining 100 pigs pig unit since 2010 in the outskirts of tirupati. He is maintaining breeding stock also. He has employed one labour family for maintenance of the farm. He is feeding the animals along with garbage procuring from hotels and hostels some concentrate feed particularly for breeding animals. He is spending approximately Rs.6,00,000/- per annum for maintenance of the farm and getting about Rs.12,00,000/- as income having a profit of around Rs.6,00,000/- per annum. He is also slaughter the animals and sell the pork. Feedback information is given by the farmer is encouraging.

Salient achievement during the report period:

During the year 2015-16, 21st generation II crop animals performance was recorded upto 7 months of age and the performance of IIIrd crop animals was recorded. Selection for the parents of 22nd generation was taken up from the 3rd crop animals.

21st generation III Crop: A total of 29 farrowings are recorded during the reporting period.A total of 242 piglets (126 Males + 116 Females) were born. 90 females and 30 males were initially selected for production of 22nd generation. 37 females and 17 males have completed 8 months of age during the reporting period and data were recorded on production and reproduction traits upto 8 months of age for the completed animals. Final selection based on 8 months body weight will be completed as soon as the remaining animals also reach 8 months of age. The litter size and weight at birth and weaning were found to be 8.34 nos, 11.05 kg and 8.07nos, 63.48 kg. The average individual body weight at birth and weaning were1.32 and 7.90 kg, respectively. The post weaning growth rate was 313.76 gms./d and the overall growth rate was 258.85gms./d. The overall average body weights (kg) at 1, 2, 3, 4, 5, 6, 7, 8 and 9 months of age were recorded as 6.27, 9.82, 14.92, 25.20, 36.30, 45.72, 59.93, 70.05 & 77.20 at respective age.

The observed genetic gain in 21st generation for the traits such as litter size at birth and weaning in males were 0.24 no. and 0.31 no., where as in females it was 0.07 no. and 0.06 no. The litter weight at birth and weaning, 8months body weight in males were 0.58kg and 4.37 kg and 5.14 kg in respectively. In females the litter weight at birth and weaning and 8months body weight values were 0.55kg and 1.25kg and 3.02kg, respectively.

The selection differential values of selected female parents for 22nd generation for the traits such as birth weight,1 month, at weaning (42days), 2, 3, 4, 5 and 6 months were 0.04, 0.01, 0.03, 0.1, 0.19, 0.06, 0.11and 0.12, respectively. While for the males these values were 0.17, 0.43, 0.32, 1.01, 1.17, 0.74, 0.17 and 0.56 respectively for the birth weight, 1 month weight, weaning weight, 2, 3, 4, 5 and 6 months body weights.

The parent stock of 21st generation consisting of 27 sows and 11boars were disposed by sales. 2 Sows were slaughtered and 7 (2 Boars + 5 Sows) were retained as per the instructions of the Director and Coordinator during his visit on 8th February, 2016 in order to increase the herd strength. About 8 sows of RKVY project were added to the ICAR stock besides one breeding bore two grower males and

three grower females were purchased from ICAR-AICRP on Pigs, Kattupakkam centre at a cost of Rs.66,000/- for breeding purpose.

The life time production traits for the 21st generation with respect to litter size at birth and weaning (nos) were 7.77 and 7.53. The litter weight (kg) at birth and weaning were 9.57 and 57.80. The average litter weight at slaughter was 71.79kg.

Cytogenetic screening of boars was taken up in the Department of Animal Genetics and Breeding of the College. One PG student is doing research in this aspect. Selection of 10 males for breeding will be made as soon as all the initially selected males have completed 8 months of age which will be in the month of may.2016.

Distinguish visitors

1. Opening of Artificial Insemination lab by Dr. Manmohan Singh, IAS, Hon'ble Vice-Chancellor on 12.06.2015.
2. Dr. D.K. Sarma, Director, NRC on Pig, Guwahati visited the centre on 08.02.2016.

Success story:

Sri V. Uday Kumar, Dhaminedu, Tiruchanoor, Tirupati Rural: This farmer is maintaining 100 pigs pig unit since 2010 in the outskirts of tirupati.He is maintaining breeding stock also. He has employed one labour family for maintenance of the farm. He is feeding the animals along with garbage procuring from hotels and hostels some concentrate feed particularly for breeding animals. He is spending approximately Rs.6,00,000/- per annum for maintenance of the farm and getting about Rs.12,00,000/- as income having a profit of around Rs.6,00,000/- per annum. He is also slaughter the animals and sell the pork. Feedback information is given by the farmer is encouraging.

Month	Temperature (ºC)		Humidity	THI
	Minimum	Maximum		
April, 2015	28.9	**41.5**	66.4	80.0
May	29.4	39.1	61.3	93.0
June	29.1	36.2	65.0	77.0
July,	30.1	37.6	56.4	90.0
August	29.2	36.7	58.1	89.0
September	27.4	36.5	61.4	90.0
October	27.3	35.2	71.7	89.0
November	24.3	32.6	79.8	88.0
December	18.4	27.6	64.4	78.0
January, 2016	20.4	28.5	62.3	79.0
February	26.5	32.4	59.5	83.0
March	18.9	40.2	75.4	98.0

Breeding stock at farmers' field

Animals at field

Supply of qulity germplasm to farmers

TAMILNADU VETERINARY AND ANIMAL SCIENCE UNIVERSITY, KATTUPAKKAM

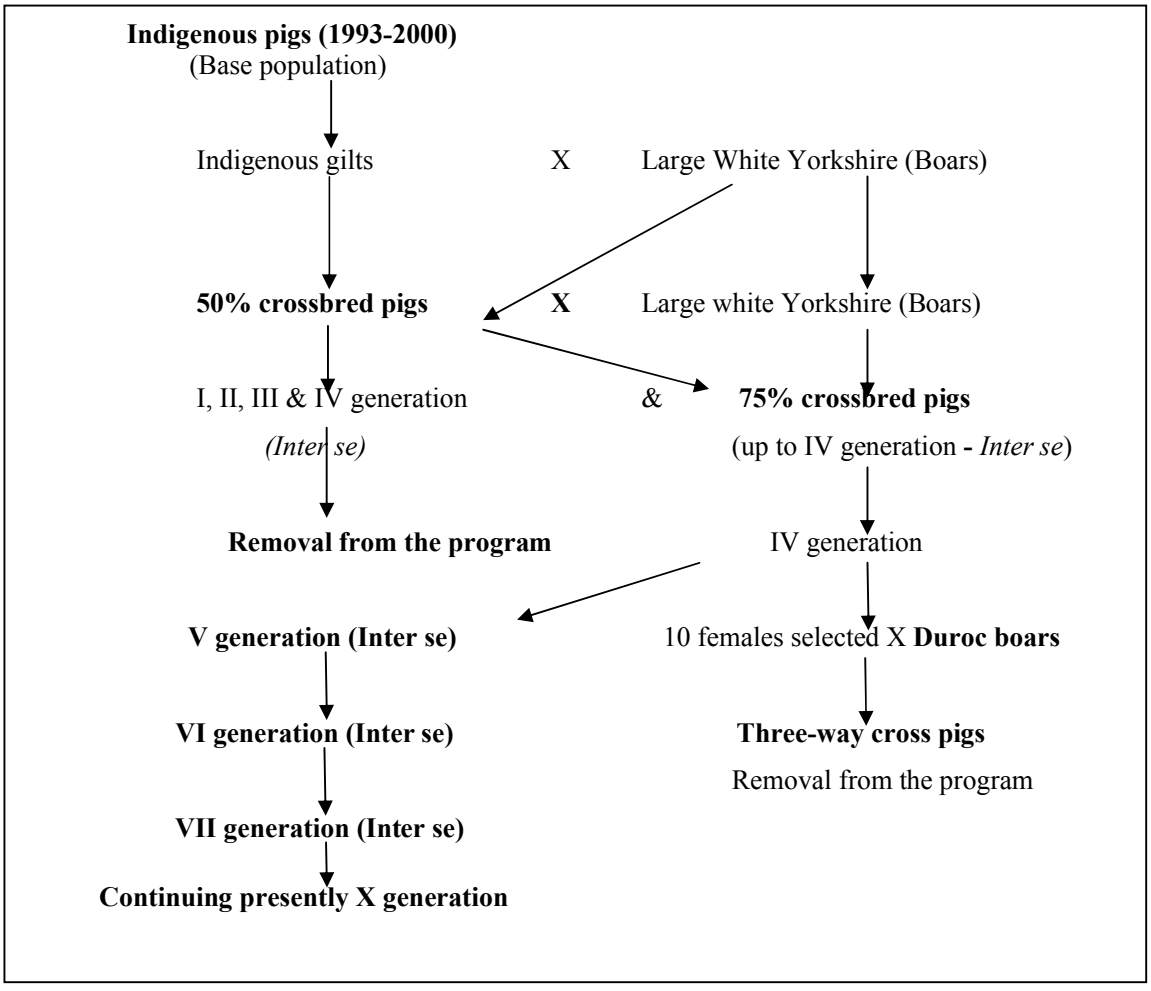
The scheme on "AICRP on Pigs" is functioning at Livestock Research Station, Kattupakkam since 1993-1994. During the period under report, thirty sows of VIII and IX generation parents were inter se mated to produce IX generation progenies and X generation progenies.

Herd dynamics

Particulars	Adult		Grower		Suckling		Total
	M	F	M	F	M	F	
Opening Balance	**11**	**28**	**60**	**77**	**0**	**0**	**176**
Additions							
Birth	-	-	-	-	211	197	408
Internal transfer	22	41	194	182	-	-	439
Purchase	-	-	-	-	-	-	-
Total Additions	22	41	194	182	211	197	847
O.B + T.A	33	69	254	259	211	197	1023
Deletions							
Death	-	-	5	10	16	10	41
Sold for breeding	6	22	128	105	-	-	257
Sold for slaughter	19	21	50	28	-	-	118
Internal transfer	-	-	22	41	194	182	439
Total Deletions	25	43	205	184	210	192	855
Closing Balance	**8**	**26**	**49**	**75**	**1**	**5**	**164**

1) Breeding strategy of the farm as approved

FLOW CHART OF BREEDING STRATEGY



Breeding strategy followed: The unit has *inter se* population of 75% crossbred pigs.

(i) Sex ratio : 1: 3

(ii) No. of breedable pigs

75% crossbred : 10: 30

(iii) Selection procedure : Sequential selection

(iv) Traits considered :
1. Litter size at birth
2. Litter size at weaning
3. Litter weight at birth
4. Litter weight at weaning
5. Birth weight
6. Weaning weight
7. Fifth month weight
8. Eighth month weight.

Performance:

IX th generation II crop

Sl.	Traits / Character	**Mean ± SE (no. of observation)**		
		Male	female	total
1	Litter size at birth(no.)	3.43 ± 0.30 (23)	3.66 ± 0.32 (23)	7.17 ± 0.38(23)
2	Litter weight at birth (kg)	5.35 ± 0.61 (23)	5.17 ± 0.45 (23)	10.56 ±0.72 (23)
3	Litter size at weaning(no.)	3.17 ± 0.33 (23)	3.72 ± 0.35 (23)	6.69 ± 0.38 (23)
4	Litter weight at weaning(kg)	26.51± 2.79(23)	29.94 ±2.60 (23)	54.36± 3.08 (23)
5	Avg. Individual weight at birth (kg)	1.57 ± 0.08 (82)	1.33 ± 0.02 (85)	1.41 ± 0.02(167)
6	Avg. Individual weight at weaning (kg)	8.22 ± 0.19(73)	8.02 ± 0.16 (81)	8.17 ± 0.11(154)
7	Number of days for weaning(d)	42nd DAY		
8	Pre weaning mortality rate (%)	10.97	4.70	7.78
9	Pre weaning growth rate(gm/d)	160	158.8	160.6
10	Post weaning mortality rate(%)	1.36	6.17	3.89
11	Post weaning growth rate (gm/d)	271	276	273
12	Overall growth rate (uto 9 m)(gm/d)	260	263	261
13	Body weight (Kg)			
	1 month	6.14 ± 0.03 (78)	6.02 ± 0.02 (82)	6.07 ± 0.03 (160)
	2 month	11.8 ± 0.04 (30)	11.6 ± 0.03 (42)	11.68 ± 0.01 (72)
	3 month	16.07 ± 0.23(30)	16.52 ±0.01(42)	16.33 ± 0.36(72)
	4 month	22.85 ± 0.52 (28)	23.75 ±0.08(42)	23.40 ± 0.54 (70)
	5 month	33.10 ± 0.23(28)	33.28 ±0.02(42)	33.18 ± 0.52 (70)
	6 month	45.56 ± 0.08(26)	46.01± 0.04(42)	45.85 ± 0.32 (68)
	7 month	56.25 ± 0.28 (20)	57.80 ±0.12(40)	57.25 ± 0.25 (60)
	8 month	68.96 ± 0.02(16)	71.50 ±0.23(40)	70.25 ± 0.38 (60)
	9 month	75.50 ± 0.65 (12)	79.35 ±0.96(35)	78.01 ± 0.46 (47)
14	Age at slaughter (d)	261	325	286
15	Weight at slaughter (kg)	93.34	94.30	93.32
16	Dressing percentage (%)	69.53	68.92	69.22
17	Carcass length (cm)	34.5	33.98	34.25
18	Back Fat Thickness (mm)	4.12	4.32	4.23
19	Meat bone ratio (:)	2.6 : 1	3.13 : 1	2.8 : 1
20	Amount of pork produced per sow (kg)	352	265	309
21	Feed Conversion Ratio (:)	3.49 : 1	3.82 : 1	3.69 : 1

Life time production traits

Traits	**Mean ± SE (no. of observation)**
Average litter size at birth per sow	23 ± 1.78 (10)
Average litter weight at birth per sow	28.60 ± 2.81 (10)
Average litter size at weaning per sow	21.6 ± 1.96 (10)
Average litter weight at weaning per sow	170.26 ± 16.07 (10)
Average litter weight at slaughter per sow	396 ± 28.67 (10)

Specific managemental practice

(a) Identification

- The newborn piglets are identified by temporary ear notching procedure on left ear
- The permanent ear tagging would be done at the time of weaning (42 day) by polyurathane ear tag

(b) Castration : In swine farming, castration is useful for fattener production. Only a few selected male piglets were left intact as potential sires (boars) for future breeding and remaining males were castrated and put for fattener pig production. Castration was performed by open method prior to weaning or at the time of weaning.

Mortality Parameter

Genetic group-wise mortality rate - 75 % crossbred,

(Pre- weaning and post weaning)

	Pre-weaning (1 days to 42 days)			Post-weaning (42 days to 1 year)		
	M	F	T	M	F	T
Animals at risk	211	197	408	254	259	513
Animals died	16	10	26	5	10	15
Mortality (%)	7.50	5.0	6.37	1.90	3.86	2.90

Causes of mortality

Sl. No.	Causes	75% crossbred *(inter se)* and Desi					
		Pre-weaning		Post-weaning		Adult	
		M	F	M	F	M	F
1	Crushing	10	4	-	-	-	-
2	Enteritis	1	2	2	4	-	-
3	Hepatitis	-	-	-	-	-	-
4	Debility	1	1	1	3	-	-
5	Weak piglets	4	3	1	2	-	-
6	Toxaemia	-	-	-	1	-	-
7	Others	-	-	1	-	-	-
	Total	16	10	5	10	-	-

Measures to taken minimize mortality: Health problems such as anorexia, lameness, maggot wound, metritis, mastitis, enteritis, etc. were treated with appropriate medicines and efforts were taken to minimize mortality through prophylactic measures. All the pigs were dewormed periodically using Albendazole and Ivermectin suspension @ 1ml per 3 kg body weight and Ivermectin 0.08% suspension @ 2.5ml per 10 kg body weight to prevent the reinfection because of intensive rearing. Routine health cover measures *viz.,* iron, vitamin and oral calcium supplementation, disinfecting the pig sties and premises, *etc*. were also carried out. Strict supervision and summer managemental practices like sprinkling of water and allowing the pigs for wallowing were followed. Growth promoters like mixtures of yeast extract, nicotinic acid, cyanocobalamin and amino acids or combination of calcium, phosphorus and vitamin D_3 and vitamin B_{12} were given to the weak or runt piglets, pregnant pigs and lactating sows to boost up their growth and health.

Managemental Measure

Particulars	01-04-2015 to 31-03-2015
No. of pigs treated	230
No. of pigs dewormed	615
No. of growers castrated	85

No. of pigs sold for breeding	257
No. of new field units established	5
No. of pigs sold for slaughter	118
Revenue generated (Rs. in lakhs)	19.31
Farm advisory services	310 farmers

Prophylactic measures:

- The piggery premises were disinfected with sodium carbonate (10%) solution
- Animal sheds were disinfected with potassium permanganate solution/kohrsolin.
- Water sanitizer viz sokrena was used routinely for water purification.
- Technical staff, attendants and internees working in pig breeding unit followed the self precautionary measures
- Field units were advised appropriately
- No. of animals vaccinated against Swine Fever: 615
- No. of animals vaccinated against Foot and Mouth Disease: 615
- Vaccinated against Circo virus : 160 animals

Disposal of diseased carcass: The carcasses of dead pigs were buried in the disposal pit dug 4 to 5' feet depth after conducting post-mortem and collecting relevant samples for haematological and histopathological examinations

Nutrition Trails Conducted

- Tree leaf meal included swine ration to minimize cost of production
- Chocolate waste included swine ration to assess the performance of grower pigs
- Isolation and identification of species specific probiotic in swine and its impact on growth performance in piglets
- Dietary betaine to mitigate summer stress in pregnant and lactating sows

Disposal pattern of farm waste, pig excreta *etc*/establishment of biogas plant:

Pig manure was collected from pig sty and stored in a separate manure pit. The stored pig manure was used by the agricultural section as fertilizer for fodder production. Pig urine and cleaned water were drained into manually made drainage channel, located at the rear side of each shed. All the sheds are connected with the channel and the waste is drained into storage tank at the rear end of Pig Breeding Unit. Efforts are taken to create a centralized concrete drainage facility at pig breeding unit and establishment of biogas unit. Open drainage channels constructed at the cost of rupees six lakhs to cover two hundred meters length to avoid the pollution in farm premises.

Production economics:

1	Total variable cost	:	Rs. 22.20 lakhs
2	Total receipts (sale of pigs)	:	Rs 19.31 lakhs
3	Cost of production / kg of live body weight (Total variable cost / total body weight produced during the year)	:	Rs. 152.40
4	Net farm income per adult unit	:	Rs. 49,800.00 /-
5	Cost of production of a piglet at Weaning	:	Rs .2325.98
6	Cost of production/pig up to slaughter age	:	Rs. 5237.03
7	Cost of production/ kg pork	:	Rs. 100.71

Extension programme with success story:

At the institute:

I) Training Conducted

Training	Date	Place
Livestock Farm Manager	3.02.2015 to 12.05.2015	URF, MMC, Chennai

II) Participated in Science City: Exhibited live specimens of Large White Yorkshire, Duroc and 75% Large White Yorkshire pigs and explained to school students and visitors about importance of pig rearing in Science City Festival at Science City, Chennai held between 26.02.2016 – 29.02.2016.

Title	Subject Matter specialist	Date and Place
Presented Project Proposal on "Piggery waste water recycling through integrated farming system" at on 18.11.2015.	Dr.D.Balasubramanyam (AGB), Professor	18.11.2015 ICAR Head Quarters , New Delhi

12 Batches of Progressive Farmers, SHGs, NADP Trainees Including Field Veterinarians

(i) At the farmers field: Three field units were visited during the year 2015-16

Salient Achievement during the Report Period:

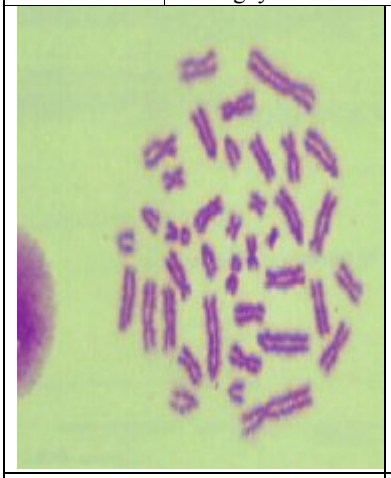
a. VIII, IX generation parents of 75 % crossbred pigs were pen mated to produce IX and X generation progenies, and desi pigs were hand matted and produced progenies.

b. Breeding sale of 257 piglets to needy farmers, there by five new field units were established.

c. Field visits were often made and success stories were collected.

Distinguished visitors:

Date	Name of Visitor	Affiliation
08.04.2015	Dr. Winthrop Harewood	School of Veterinary Medicine , Faculty of Medical Sciences, The University of The West Indies, Triniad, West Indies
23.07.2015	Dr.Elankumaran Subiah	Associate Professor of Virology, Virginia Maryland College of Veterinary Medicine
19.08.2015	Dr. Nasu R. Devikota Dr. S.K.Sha Dr. Bhunianand Devkota	Agriculture and Forestry University , Nepal
31.08.2015	Prof. William David Prof. Ram	Wahington State University, Wahington
30.09.2015	Dr. K.M.L. Pathak	DDG (AS), ICAR, New Delhi
22.03.2015	Dr. V.P. Chahal	ADG, ICAR
12.02.2015	U. Sagayam .IAS	Science City, Chennai



Cyto-genetic screening

Pig farm at Farmers' field

INDIAN VETERINARY RESEARCH INSTITUTE, IZATNAGAR, BARIELLY

All India Coordinated Research Project (AICRP) on Pig was initiated at Indian Veterinary Research Institute (IVRI), Izatnagar in 1971 with Coordinating Unit at IVRI, Izatnagar and 4 research centres at Khanapara, Izatnagar, Jabalpur and Tirupati. After establishment of National Research Centre on Pig, (ICAR), Rani, Guwahati, Assam in September 2002, IVRI remained as an unit. The mandate of this unit was to evaluate the production performance of crossbred animals (75% Landrace) in terms of growth, feed conversion efficiency, reproduction, litter and carcass traits as well as incidence of different diseases and to improve the stock with *inter-se* mating and selection.

Herd dynamics

Herd strength of 50% Crossbred Pigs

Sl. No	Age (months)	Opening Balance	Additions	Disposals				Closing balance
			Births	Deaths	Transfers	Sold	Slaughter	
1	Piglet (up to 42 days)	-	-	-	-	-	-	-
2	Grower (42 d-5m)	-	-	-	-	-	-	-
3	Finisher (5 m-8 m)	-	-	-	-	-	-	-
4	Breeding female	3	-	-	-	3	-	-
5	Boar	4	-	-	-	4	-	-
	Total	**7**	**-**	**-**	**-**	**7**	**-**	**NIL**

Herd strength of 75% Crossbred Pigs

Sl. No	Age (months)	Opening Balance	Additions	Disposals				Closing balance
			Births/ Transfer	Deaths	Transfers	Sold	Slaughter	
1	Piglet (upto 42 days)	109	352	40	-	2	-	33
2	Grower (42 d-5m)	-	-	11	27	192	-	9
3	Finisher (5 m-8 m)	6	-	-	-	41	1	42
4	Breeding female	45	1		-	34	-	44
5	Boar	13	1		-	26	3	22
	Total	**173**	**354**	**51**	**27**	**295**	**4**	**150**

Herd strength of Landrace Pigs

Sl. No	Age (months)	Opening Balance	Additions	Disposals				Closing balance
			Births	Deaths	Transfers	Sold	Slaughter	
1	Piglet (up to 42 days)	-	-	-	-	-	-	-
2	Grower (42 d-5m)	-	-	-	-	-	-	-
3	Finisher (5 m-8 m)	-	-	-	-	-	-	-
4	Breeding female	10	-	-	-	10	-	-
5	Boar	3	-	-	-	3	-	-
	Total	**13**	**-**	**-**	**-**	**13**	**-**	**NIL**

Herd strength of Desi Pigs

Sl. No	Age (months)	Opening Balance	Additions	Disposals				Closing balance
			Births/ Transfer	Deaths	Transfers	Sold	Slaughter	
1	Piglet (up to 42 days)	-	-	-	-	-	-	-
2	Grower (42 d-5m)		4	-	-	-	-	-
3	Finisher (5 m-8 m)	2	-	-	-	-	2	4

4	Breeding female	-	-	-	-	-	-	-
5	Boar	-	-	-	-	-	-	-
	Total	**2**	**4**	**-**	**-**	**-**	**2**	**4**

Breeding strategy of the farm as approved

In order to maintain 75% exotic blood line by inter-se- mating, minimum 30 breedable sows unit are maintained with a sex ratio of 1:3 with 10 sires (2 sires from each 5 unrelated lines). During this year, a total of 352 CB (75%) animals were born. Selection of male animals was done based on weaning weight and 8 month body weight, based on two stage sequential selection. The selection of breeding animals was done considering cyto-genetic screening of population. Selection of female animals should be based on dam's litter size at birth and weaning weight and number of functional teats. Three numbers of farrowings per sow completed in 2 years were recorded.

Performance of animals

Mean ± SE of various production parameters in 75% Crossbreds Pigs

Sl.	Traits/characters	CB75%		
		M	F	Total
1.	Litter size at birth (no.)	4.47±0.29 (44)	3.78±0.28 (44)	7.68±0.34 (44)
2.	Litter weight at birth (kg)	4.27±0.30 (44)	3.51±0.26 (44)	7.26± 0.35 (44)
3.	Litter size at weaning (no.)	3.97±0.30 (41)	3.50±0.24 (41)	6.87±0.37 (41)
4.	Litter weight at weaning (kg)	34.22±2.64 (41)	31.18±2.60 (41)	61.14±3.54 (41)
5.	Avg. individual weight at birth (kg)	0.97±0.01 (189)	0.92±0.01 (163)	0.94±0.01 (352)
6.	Avg. individual weight at weaning (kg)	8.99±0.17 (144)	8.913±0.19 (137)	8.96±0.13 (281)
7.	Number of days for weaning (d)	42	42	42
8.	Pre weaning mortality rate (%)	24/553=4.35%	16/553=2.90%	40/553=7.25%
9.	Pre weaning growth rate (gm/d)	192.75±0.00 (193)	193.24±0.00 (192)	192.99±0.00 (385)
10.	Post weaning mortality rate (%)	8/553=1.44%	3/553=0.54%	11/553=1.98%
11.	Post weaning growth rate (gm/d) (upto 24 weeks)	519.37±0.01 (74)	552.50±0.01 (40)	531.90±0.00 (114)
12.	Overall growth rate (*upto 8 m*) (gm/d)	432.72±0.00	428.91±0.00	431.08±0.00
13.	Body weight (kg) 1 Month	6.36±0.10 (199)	6.32±0.12 (196)	6.34±0.08 (395)
	2 Month	12.19±0.18 (182)	12.13±0.19 (182)	12.16±0.13 (364)
	3 Month	22.21±0.38 (165)	22.72±0.38 (154)	22.45±0.27 (319)
	4 Month	35.04±0.57 (134)	36.03±0.68 (92)	35.44±0.44 (226)
	5 Month	49.92±0.80 (110)	50.44±1.02 (67)	50.12±0.63 (177)
	6 Month	62.81±1.22 (74)	66.80±1.34 (40)	64.22±0.93 (114)
	7 Month	80.07±2.43 (37)	82.67±2.08 (27)	81.16±1.65 (64)
	8 Month	97.97±1.75 (33)	97.15±2.06 (25)	97.62±1.32 (58)
14.	Age at slaughter (d)	280	NA	280

15.	Weight at slaughter (kg)	114.72±3.14	NA	114.72±3.14
16.	Dressing percentage (%)	74.63±1.04	NA	74.63±1.04
17.	Carcass length (cm)	82.44±1.33	NA	82.44±1.33
18.	Back fat thickness (cm)	3.23±0.10	NA	
19.	Meat bone ratio	NA	NA	NA
20.	10th rib fat thickness (cm)	2.97±0.18	NA	2.97±0.18
21.	Feed Conversion Efficiency :	NA	NA	NA
22	Amount of pork produced per sow (kg)	NA	NA	NA
23	Loin eye area (sq cm)	39.80±2.93	NA	39.80±2.93

Lifetime production traits

	75%CB									
Sl. No	**Sow no.**	**Total Furrow -wing**	**Total Litter size at Birth**	**Average Litter size at Birth**	**Total Litter Weight at Birth**	**Average Litter Weight at Birth**	**Total Litter size at Weaning**	**Average Litter size at Weaning**	**Total Litter Weight at Weaning**	**Average Litter Weight at Weaning**
1	7	3	18	6.00	13.40	4.46	6	2.00	43.50	14.50
2	15	3	24	8.00	28.50	9.50	21	7.00	180.30	60.10
3	16	2	16	8.00	19.40	9.70	12	6.00	73.40	36.70
4	20	4	35	8.75	29.20	7.30	29	7.25	256.20	64.05
5	24	1	8	8.00	7.00	7.00	8	8.00	77.10	77.10
6	27	2	20	10.00	21.00	10.50	16	8.00	120.90	60.45
7	28	2	11	5.50	11.90	5.95	10	5.00	94.30	47.15
8	31	2	13	6.50	10.90	5.45	12	6.00	102.30	51.15
9	32	2	13	6.50	11.70	5.85	6	3.00	50.50	25.25
10	34	1	11	11.00	10.60	10.60	10	10.00	88.40	88.40
11	38	3	26	8.66	25.20	8.40	14	4.66	93.10	31.03
12	54	3	28	9.33	26.20	8.73	9	8.66	186.20	62.06
13	57	3	17	5.66	18.80	6.26	9	3.00	70.60	23.53
14	58	3	26	8.66	24.00	8.00	15	5.00	129.30	43.10
15	62	2	15	7.50	12.40	6.20	11	5.50	96.60	48.30
16	64	3	11	3.66	11.30	3.76	1	0.33	12.60	4.20
17	74	1	9	9.00	8.70	8.70	9	9.00	63.10	63.10
18	107	1	8	8.00	8.10	8.10	7	7.00	58.80	58.80
19	116	2	15	7.50	16.10	8.05	15	7.50	154.60	77.30
20	170	2	13	6.50	12.30	6.15	N.A	N.A	N.A	N.A
21	193	1	4	4.00	4.70	4.70	4	4.00	38.80	38.80
22	196	1	10	10.00	9.40	9.40	N.A	N.A	N.A	N.A
23	197	2	9	4.50	9.50	4.75	9	4.50	86.20	43.10
24	198	1	11	11.00	11.60	11.60	10	10.00	88.80	88.80
25	202	2	13	6.50	15.70	7.85	12	6.00	100.80	50.40
26	217	1	6	6.00	6.90	6.90	6	6.00	56.30	56.30
27	218	3	28	9.33	29.00	9.66	17	5.66	141.90	47.30
28	235	1	7	7.00	7.50	7.50	6	6.00	59.30	59.30
29	247	1	9	9.00	8.40	8.40	9	9.00	74.50	74.50
30	250	2	18	9.00	18.40	9.20	13	6.50	142.40	71.05
31	256	2	16	8.00	15.10	7.55	15	7.50	145.10	72.55
32	260	2	15	7.5	14.30	7.15	14	7.00	107.60	53.80
33	350	1	9	9.00	9.10	9.10	N.A	N.A	N.A	N.A
	Mean ±SE		**14.90±1.27**	**7.68±0.32**	**14.73±1.22**	**7.64±0.33**	**10.15±1.11**	**5.60±0.51**	**90.71±10.33**	**48.24±4.54**

Data- 1.4.14 to 31.3.15

NA: Not Applicable due to not weaning

Specific managemental practices:

i) **Identification method:** Four percent silver nitrate solution is used for marking the body in white pigs. The black piglets as well as adult pigs are identified by plastic/brass tags. Presently, plastic tags are also being used for the new stock.

ii) **Age:** Age in pigs is determined by recording the date of birth and duration of their stay at farm.

iii) **Castration:** The piglets are usually not castrated on farm, however, in feed efficiency trial, the castrated barrows are used. In that case, the castration is done by open method at the age below 60 days.

Mortality parameter

i) Genetic group wise and sex wise mortality rate (pre and post weaning)

Already mentioned in the table 4a, 4b and 4c

ii) Causes of mortality:

Causes of mortality in pigs during 2015-16

Sl. No.	Causes of mortality	CB 75%
1	Autolysis/NSD	4
2	Weakling	2
3	Pneumonia	9
4	Enteritis	5
5	Pneumo- enteritis	5
6	Gastro- enteritis	1
7	Trauma	1
8	Nephritis	2
9	Septicemia	3
10	Diaphragmatic Hernia	1
11	Umbilical hernia	1
12	Fibrinous Pericarditis	3
13	Fibrinous pleuritis and peritonis	1
14	Hepatitis	5
15	Putrefied	2
16	Naval-ill	1
17	Necrotic colitis	1
18	Hepatic hemorrhage with pericadito	1
19	Shock associated liver repture	1
	Report not received	2
	Total	51

Measures taken to minimize mortality

a) Managemental measures: Round the clock supervision to minimize piglet mortality.

b) Prophylactic measures: The iron and Vitamin B-Complex injections were given regularly at 4th and 14th as well as at 5th and 15th day of age, respectively, in all piglets. Besides, the vaccination of FMD and Swine Fever is regularly done in all the stock. During the year, 350 animals were vaccinated against FMD and 390 animals were vaccinated against Swine Fever. The deworming of 495 animals and disinfection were also accomplished. Treatment of ailing cases is also being done regularly.

Health care management of practices at SPF during 2015-2016

Sl. No.	Symptoms/ Ailments	Number of cases
1.	Wound/Injury	567
2.	Lameness	60

3.	Digestive problem/ Diarrhea	68
4.	Skin lesions/ Dermatitis/ Pox like lesions	57
5.	Fever	9
6.	Weakness/ Dullness	107
7.	Hernia	12
8.	Abscess	25
9.	Orchitis	2
10	Anorexia	2
11	MMA syndrome	5
	Total:	914

Disposal of diseased carcass: Dead animals are sent to PM Section where incineration is done after the PM examination.

Experimentations:

Defecation pattern in crossbred pigs and development of auto-flush system

An attempt was made to develop auto-flush system for cleaning of floor of elimination area in weaner pigs. The system comprised of over head tank of 50 liter capacity with auto-flush mechanism. The device was installed on the roof of the shed. The outlet of the device was fixed at about 4-5 inch above the elimination area (3×6 ft). The adjustment was made in such a way that water evacuated after every 20 minutes. The designed outlet pipe spread water with at least 8-10 inch coverage area to flush the dung and urine. In order to flush the dung, water velocity (v=8.34 m/sec), vol/sec. (flow rate=0.0042 m3/sec), and pressure= 0.348 bar was used. To see the efficacy of the system, 12 animals were divided in to two groups i.e. G_1 with auto-flush system in the elimination area and G_2 having no flushing system. The defecation pattern and cleanliness of floor was recorded after everyone hour consecutively for five day. It was observed that in G_1 minor quantity of dung was present in the corner of the elimination area due to intermittent flushing, thereby, cleanliness of the elimination area was maintained. Furthermore, due to wetness of elimination area, piglets felt encouraged to defecate in the same area again and again. However, in G_2 uneven spread of dung in the open area was observed. It was concluded that developed auto-flush system was more efficient for cleaning of elimination area of weaner pen in pigs.

Characterization and documentation of Desi pigs in Bareilly District of Uttar Pradesh

The present investigation was undertaken in six tehsils of Bareilly district in Uttar Pradesh to evaluate the phenotypic attributes of *Desi* pigs. A total of 658 adult *desi* pigs were randomly taken from Bareilly, Nawabganj, Aonla, Faridpur, Baheri and Meerganj tehsils of Bareilly districts for the study. Field level investigation on morphological, phenotypic, production and reproductive on traits, socio-economic status and managemental practices of native pigs was carried out using a relevant proforma. The results revealed that the predominant coat colour of the *Desi* pigs was black (100%) with a few exceptions like brown tinge (1.70%) and greyish black (2.09%) of the complete black. These *Desi* pigs were reared predominantly under scavenging management systems with occasional tethering. Most of the pigs had erect-leaf shaped ears with upward orientation. They were wild in look and small in size. Head was elongated with triangle shaped face with long snout. About 70.66 % pigs

had narrow straight and curled tails. Desi pigs have sound reproductive performances and medium production potential. Mean adult body weight was 45.85 ± 1.13 kg for males and 47.89 ± 1.08 kg for females. The mean litter size was 6.96 ± 0.11. The mean age at first farrowing and the farrowing interval were 12.12 months ± 0.15 and 7.17 ± 0.36 months, respectively.

Disposal pattern of farm waste, pig excreta etc. / Establishment of biogas plant: The farm waste in the form of pig excreta is being disposed of through water splashing and carrying the same out of the farm through drainage or sewerage channel. The excreta, mixed with water and disposed off to the farm, are being utilized for the agricultural land.

Extension programme with success story:

At Institute:

i) Delivered two lectures on "Pig breeds" and "Pig breeding System" each times twice on 04.02.2016 and 21.07.2015 in KVK Training on "Improved Pig Production.

ii) TV talk: Sukar palan in Hello Kisan, DD at New Delhi on 26.11.15

iii) Farmers Talk: Suker bado ki banavat avam rakh rakhav on 21.7.15 at KVK.

iv) Exposure visit to farmers on 13.07.15 under DBT funded project "*Improving pig production and productivity through integration of conventional and biotechnological interventions for better livelihood of SC/ST community*"

v) Demonstration of improved crossbred pig of IVRI unit at Krishi Unnati Mela, IARI on 19th – 21st March 2016.

At the Farmer's field: Advisory services were given.

Salient achievement during the report period:

The centre produced 352 piglets with 75% exotic blood in the current year to select future breeding stock.

15. Scientific publications

In peer-reviewed journals:

Kalpana Dhruw, A.K.Verma, Neeta Agarwal, P.Singh and B.H.M.Patel. (2015). Effect of Live Lactobacillus acidophilus NCDC 15 and CURD as probiotics on blood Biochemical profile of Early Weaned Piglet. *International journal of Bio-resource and stress Management* 6 (3): 330-334.

Abstracts presented in conferences/ Symposia

Boro P., Patel B.H.M., Sahoo N. R., Gaur G.K., Singh Mukesh, Dutt Triveni, Verma M. R., Naha, B. C., Prakash C., Rawat C. K. and Wagh S. (2016) Phenotype attributes of desi pig of Uttar Pradesh. In national symposium on policy planning for livelihood security through domestic animal biodiversity & XIII annual convention of SOCDAB" held at Sher-e-Kashmir University of Agriculture Science and Technology of Jammu from February 11-12, 2016. Pp: 195.

Naha B. C., Gaur G.K., Sahoo N. R., Patel B. H. M., Prakash C., Boro P., Wagh S., Rawat C. K. (2016) Identifying factors affecting litter traits in landrace crossbred pigs. In national symposium on policy planning for livelihood security through domestic animal biodiversity & XIII annual

convention of SOCDAB" held at Sher-e-Kashmir University of Agriculture Science and Technology of Jammu from February 11-12, 2016. Pp: 268.

Sinha R., Sahoo N. R., Kumar P., Qureshi S., Kumar A., G. V.P. P. S. Ravi Kumar, Kumar S and Bhushan B. (2016) Polymorphism in MUC13 associated with differential adhesion pattern of diarrhogenic E. coli in Indian pigs. In national symposium on policy planning for livelihood security through domestic animal biodiversity & XIII annual convention of SOCDAB" held at Sher-e-Kashmir University of Agriculture Science and Technology of Jammu from February 11-12, 2016. Pp: 246.

Sinha R., Sahoo N. R., Kumar P., Qureshi S., Kumar A., G. V.P. P. S. Ravi Kumar and Bhushan B. (2015). Jejunal expression profiling of MUC 13 in pigs differentially adhesive to diarrhogenic E coli. In XXII Annual Convention (VIBCON-2015) & National Symposium on "Immunomics and Proteogenomics in Livestock Health & Productivity" at ICAR-National Research Centre on Equines, Sirsa Road, Hisar 125001, Haryana from 5-7 November, 2015.

Distinguished visitors:

Prof. M.C. Varshneya, Vice chancellor, Kamdhenu University, Gujarat

Dr. A. S. Nanda, Vice Chancellor, GADVASU, Ludhiana

Crossbred pigs of ICAR-AICRP, IVRI Unit displayed at ICAR- Krishi Unnati Mela, IARI, New Delhi on 19th -21st March 2016

Visit of Accreditation Peer Review Team to ICAR-AICRP, IVRI Unit

Boar training and semen collection on dummy

Newly born piglets with dam (CB 75% Landrace crossbreds)

Desi pigs of Bareilly district at scavenging and farm

ICAR-CENTRAL COASTAL AGRICULTURAL RESEARCH INSTITUTE, GOA

Goa and coastal states are having more per-capita income in the country. The states are popular for tourism, where domestic as well as foreign tourist visit often. Therefore, this state has continuous demand of meat, beef, sausages, chicken etc. Livestock improvement will help rural population to increase the related products which will help them to be more sustainable. The production of pork and pork products is a household activity through the traditional knowledge in most of coastal areas of our country. Availability of higher quantity of pork for preparing the products will help to make the activity self-sustainable. The activity may become self-sustained over a period of time only when there is use of advance techniques. Pig industry is slowly growing in past 10years. This change is not in terms of population but from quality point of view. Livestock census 2012 of the Goa state indicated that there is increase in crossbred pig population in the state indicating pig grower's interest in advance technology. Suitable breed, crossbreeding of local pig breed, controlled breeding using synchronization and AI, standard balanced feeding, comfortable housing of pigs will lead to improved pig production and benefit the growers. AICRP on pig Goa centre is attempting to provide these knowhow to the pig growers of the region through trainings and demonstrations.

Herd dynamics:

Crossbreed 75% (LWY X AG)

Sl. No	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglet(upto42days)	10	207	0	9	165	0	33
2	Grower(42days-5months)	23	0	165	8	68	70	42
3	Finisher(5m-8months)	4	0	68	2	64	2	4
4	Breeding female	22	0	25	0	0	16	31
5	Boar	18	0	39	1	0	30	26
Grand total		77	207	297	20	297	118	136

Breeding strategy of the farm as approved

Four breeds namely Agonda Goan, Large White Yorkshire, Crossbred 50% and crossbred 75% are maintained at the farm. Breeding policy is followed as per the technical program of AICRP where experimental animals are crossbred 75 % (lwy X Aognda goan). 1:3 ratio of boar and breeding female is maintained. Each breeding animal is raised in indivisual pen and are fed with concentrate mixture. Artificial Insemination is strictly followed for breeding. Agonda Goan, Large White Yorkshire and crossbred 50% are maintained for production of crossbred 75% so as to avoid inbreeding.

Performance of 75% crossbred (LWY X Agonda Goan) pigs

Sl. No.	**Traits/Characters**	**Mean±SE**		
		M	**F**	**Total**
1	Litter size at birth (n=32)	3.031±0.35	3.61±0.25	6.50±0.42
2	Litter weight at birth (kg) (n=32)	3.34±0.39	3.80±0.28	7.14±0.47
3	Litter size at weaning(no.) (n=32)	2.84±0.34	3.37±0.25	6.28±0.43
4	Litter weight at weaning(kg) (n=32)	20.20±2.67	24.68±1.97	44.88±3.75
5	Avg. Individual weight at birth (kg)	1.10±0.24 (n 98)	1.09±0.24 (n 109)	1.09±0.17(n 207)
6	Avg. individual weight at weaning(kg)	7.11±2.78 (n 93)	7.36±2.5 (n 105)	7.19±1.45(n 198)

7	Number of days for weaning(d)	40 days		
8	Pre weaning mortality rate (%)	5.1%	3.6%	4.3%
9	Pre weaning growth rate(mg/d)	150.64±4.97(n 93)	156.75±4.88(n 105)	153.88±3.48(n 198)
10	Post weaning mortality rate (%)	3.53%	4.60%	4.15%
11	Post weaning growth rate (mg/d)	305.076±11.07(n 24)	299.62±10.30(n 22)	302.47±7.41(n 46)
12	Overall growth rate (*up to 9m*) (mg/d) (*up to 10m*) (mg/d)	277.96±9.82(n 24) 288.26±9.92(n 24)	281.42±10.85(n 22) 284.20±9.24(n 22)	279.62±7.22(n 46) 286.32±15.9(n 46)
	Bodyweight (Kg)			
	1 month	6.10±0.21 (n 93)	6.625±0.16 (n 105)	6.34±0.13 (n 198)
	2 month	10.87±6.37 (n 90)	11.45±0.49 (n 100)	11.13±0.35(n 190)
	3 month	17.62±0.56 (n 48)	16.35±0.78 (n 35)	16.73±0.46 (n 83)
	4 month	23.65±1.01 (n 38)	24.15±1.58 (n 27)	23.86±0.88 (n 65)
	5 month	35.46±2.49 (n 33)	33.08±2.00 (n 24)	34.46±1.64 (n 57)
	6 month	44.89±1.90 (n 30)	43.14±2.02 (n 22)	44.15±1.38 (n 52)
	7 month	56.04±2.02 (n 30)	55.78±2.03 (n 22)	55.93±1.43 (n 52)
	8 month	67.67±2.10 (n 30)	67.53±2.58 (n 22)	67.61±1.61 (n 52)
	9 month	76.15±2.68 (n 24)	77.05±2.94 (n 22)	76.58±1.95 (n 46)
	10 month (*if available*)	87.58±2.97 (n 24)	86.33±2.78 (n 22)	85.13±2.73 (n 46)

Live weight (Kg.)	76.973±3.79
Dressing percent%	71.14±2081
Carcass length (cm)	105±2.08
Head width (cm)	33.27±1.61
Width at chest(cm)	39.63±1.47
Width at loin(cm)	36.18±1.69
Shoulder weight(Kg.)	16.70±0.94
Ham Weight(Kg.)	15.31±1.64
Rib Weight (Kg.)	18.30±1.28
Head Weight (Kg.)	4.32±0.17
Kidney weight(Kg.)	0.22±0.01
Liver Weight (Kg.)	1.06±0.06
Heart Weight (Kg.)	0.22±0.01
Lung Weight (Kg.)	0.63±0.03
Legs Weight (Kg.)	1.73±0.05
Back Fat Thickness (mm)	23.57±1.36

Lifetime production traits

- Average litter size at birth per sow 6.50±0.42
- Average litter weight at birth per sow 7.14±0.47(Kg)
- Average litter size at weaning per sow 6.28±0.43
- Average litter weight at weaning per sow 44.88±3.75
- Average litter weight at slaughter per sow 534.61 Kg

Specific managemental practice

Identification: Microchips are being used for identification of the experimental animals. This is done after weaning.

Castration: Experimental animals are castrated at 60 days age with open surgical method.

Mortality parameter: Genetic group wise and sex wise mortality rate (*Pre and post weaning*): Preweaning mortality was 4.3% and post weaning 4.15%.

Causes of mortality (*Specific cause*): Preweaning mortality was mostly stamping by mother where as post weaning was due to enteritis and accidental fighting among animals in a group.

Measures to taken minimize mortality:

Managemental measures: For first three days piglets were kept in small caged during night hours.

Prophylactic measures: Changed anthelmintic drug and floor hygiene was improved for which jet

cleaning system was procured which cleans floor with forced water and also saves the quantity of water required for cleaning.

Disposal of diseased carcass: After PM carcass is disposed by proper burial.

Disposal pattern of farm waste, pig excreta *etc*/Establishment of biogas plant: Biogas already exists. This year a slurry pump has been purchased for filling slurry from biogas tank for disposal.

Production economics:

i) Cost of production/pig up to slaughter age :
   a. Rs8664.18/ pig of 85.13 kg body when pig is maintained with balanced commercial feed mixture. Rs.101.77 /kg live weight
   b. Rs. 5356/- when pigs grown with mixture of broiler offal and maize with mineral mix Rs.62.91 /kg live weight

ii) Cost of production/ kg pork
   a. Rs.143.42/- when pig is maintained with balanced commercial feed mixture
   b. R. 88.66/- when pigs grown with mixture of broiler offal and maize with mineral mix

Extension programme with success story:

At the institute: Presently we are focusing on AI as it is easiest way to extend crossbred pig in farmers' field. Whenever farmers demand piglet we are trying to convince them to produce crossbred pig by using AI serviced from AICRP Goa centre. Due to this we are able to achieve more number of AI in farmers' field.

At the farmers' field: We have established crossbred piglet units as part of DBT funded programme in Ugem, south Goa. Using synchronization of estrus the centre has performed AI in five sows and four females already farrowed with average litter size of 9.5 at Smt. Rodrigues's farm.

Scientific publications:

Muthupalani Karunakaran, Upasana Ratnakaran , Prafulla Kumar Naik & Eknath B. Chakurkar	2015	Electrophoretic profile of boar seminal proteins	Journal of Applied Animal Research 17th October 2015 Volume 44, Issue 1 pages 403-405 10.1080/09712119.2015.1091345
M. Karunakaran, E. B. Chakurkar, U. Ratnakaran, P. K. Naik, M. Mondal, A. Mondal & N. P. Singh	2016	Characteristics of boar semen preserved at liquid state	Journal of Applied Animal Research Feb 2016 ISSN: 0971-2119 (Print) 0974-1844 (Online) Journal homepage: http://www.tandfonline.com/loi/taar20 10.1080/09712119.2016.1150848
Dr. E.B. Chakurkar	2015	Produce Pig For Pollution Control and Human Nutrition	Goa Vet A Quarterly Technical Bulletin The Goa Veterinary Association, Reg. No. 58/Goa/93

Distinguish visitors:

Dr. Gurbachan Singh, Chairman, Agricultural Scientist Recruitment Board visited on 1st April 2016. DDG NRM Dr. A K Sikka and Directors from different institutes of NRM Division visited the unit.

Success story: The centre has conducted a training program for AI in pigs for group of 13 farmers from Malkarne (South Goa on 15th October 2014. They were not convinced about technology before training. After training they practiced for estrous detection and correct timing of insemination. Now they are trying to adopt AI in their units and farmers in group also try to help each other i.e. they find out how many pigs are in estrous from their group and one of group member collects semen sample

from our centre and performs AI. Group leader Mr. Bosco Meneges expressed that training has created confidence on breeding pigs otherwise most of them were having fattening unit.

AI in pigs(Farmers Field)

Explaining Integrated farming in farmers field

Visit of Hon. ASRB Chairman to Unit

Visit of DDG (NRM) and Directors of Institute from NRM Division to unit

Base stock of Agonda Goan

Group of crossbred animals in feeding Trail

COLLEGE OF VETERINARY SCIENCES & ANIMAL HUSBANDARY, CENTRAL AGRICULTURAL UNIVERSITY, SELESIH, AIZAWL, MIZORAM

In the state of Mizoram**,** pig is by far the most popular livestock. The pig population of the state was 2,45,238 a*s* per 19th Livestock Census, 2012 and shows the highest percentage of growth in its population. The cross bred population make up for 85 % of the total population, the rest 15 % was of indigenous pig. Considering its vast potentialities and economic importance, Memorandum of Understanding was signed between Central Agricultural University and National Research Centre on Pigs, ICAR to establish a centre of All India Coordinated Research Project on Pigs at College of Veterinary Sciences and A.H. (C.V.Sc. & A.H.), Selesih, Mizoram during XIth Five Year Plan w.e.f. 1.10.2008. The basic principle of the project is to start a comprehensive study at institutional level to develop a farmer's friendly package of practices creating more assets and better opportunities for cash-starved populace. Initially, researches are being considered to conserve of local indigenous pigs for preserving the indigenous gene pool and promote low input animals for rural and less developed areas.

Herd Dynamics:

Age-wise and sex-wise herd strengths of 75% Crossbred (¾ LWY x ¼ Zovawk), Zovawk, 50% Crossbred (1/2 LWY x 1/2 Zovawk), and LWY at the end of reporting period (31.03.2016) were presented in Table 1, 2, 3 and 4 respectively. It was revealed that a total of 218were available at the end of reporting period.

Herd Strength of 75% Crossbred as on 31.03.2016

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance	
			Birth	Transfer	Death	Transfer	Sold	M	F
1	Piglet (upto 42 days)	-	62	-	6	-	-	4	2
2	Grower (42 d-5 m)	12	-	-	3	-	-	18	17
3	Finisher (5-8 m)	18	-	-	-	-	-	4	3
4	Breeding female	25	-	-	-	-	5	39	
5	Boar	10	-		-	-	2	24	
	Grant total	65	62	-	9	-	7	**111**	

Herd Strength of Zovawk as on 31.03.2016

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance	
			Birth	Transfer	Death	Transfer	Sold	M	F
1	Piglet (upto 42 days)	8	11	-	-	8	-	5	6
2	Grower (42 d-5 m)	-	-	-	-	-	-	-	-
3	Finisher (5-8 m)	-	-	-	-	-	-	-	-
4	Breeding female	13	-	-	-	-	2	11	
5	Boar	7	-	-	1	-	2	4	
	Grant total	28	11	-	1	8	4	**26**	

Herd Strength of 50% Crossbred as on 31.03.2016

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance	
			Birth	Transfer	Death	Transfer	Sold	M	F
1	Piglet (upto 42 days)		7	-	-	-	-	5	2
2	Grower (42 d-5 m)	10	-	-	-	-	-	-	-
3	Finisher (5-8 m)	8	-	-	1	-	-	-	-

4	Breeding female	21	-	-	-	-	-	26
5	Boar	10	-	-	-	-	11	11
	Grant total	49	7	-	1	-	11	**44**

Herd Strength of Large White Yorkshire as on 31.03.2016

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance	
			Birth	Transfer	Death	Transfer	Sold	M	F
1	Piglet (upto 42 days)	-	-	-	-	-		-	-
2	Grower (42 d-5 m)	12	-	-	-	-	-	-	-
3	Finisher (5-8 m)	12	-	-	-	-	-	-	-
4	Breeding female	16	-	-	-	-	6	20	
5	Boar	5	-	1	-	-	3	17	
	Grant total	45	-	-	-	-	9	**37**	

Breeding Strategy of the Farm:

Cross breeding of Large White Yorkshire with Zovawk for the production of cross –bred pigs (50% LWY x 50% Zovawk) has already been done to generate cross-bred pigs of 75% LWY x 25% Zovawk. At present a total of 39 breeding sows and 16 boars of 75% LWY and 25% Zovawk genetic group are available as a closing balance. In addition to these, a finisher group (5- 8 months of age) of 7 (4 males and 3 females) had been generated during the reporting year. Regular heat detection has been done with teaser and/or by visual observation. Artificial Insemination has been followed as per the approved technical programme.

Breeding Record: The data on reproduction traits were presented in Table 5 (75% LWY x 25% Zovawk), Table 6 (Zovawk), and Table 7 (50% LWY x 50% Zovawk), For production of 75 % Crossbred, 7 females (75 % crossbred) had been served during the reporting period and conception ratewas 85.7%.In Zovawk, 3 female had been served during the reporting period and conception rate was 66.6%. In 50 % Crossbred, 4 females had been served during the reporting period and conception rate was 75%.

Breeding Performance of 75% crossbred sows to produce

	75% LWY x 25% Zovawk	**Zovawk**	**50% LWY x 50% Zovawk**
Numbers of gilts/sows put to boars	7	3	4
Numbers of boar used	5 + AI	3	5 + AI
Numbers of services given	14	6	8
Av. Services/ female	2	6	2
Conception rate (%)	85.7	66.6	75

Performance of Animals: 75 % Crossbred

SL. NO.	**TRAITS/CHARACTERS**	**¾ LWYx ¼ ZOVAWK (MEAN±S.E)**		
		Male	**Female**	**Total/Average**
1	Litter size at birth (no.)	4.12± 0.39 (8)	3.62± 0.49 (8)	7.75± 0.67 (8)
2	Litter weight at birth (Kg)	4.83 ± 0.77 (8)	4± 0.54 (8)	8.83 ± 1.17 (8)
3	Litter size at weaning (no.)	4 ± 0.48 (7)	3.14 ± 0.40 (7)	7.14 ± 0.85 (7)
4	Litter weight at weaning (Kg)	21.89 ± 4.10 (6)	16.53 ± 1.70 (6)	38.42 ± 5.57 (7)
5	Avg. Individual weight at birth (Kg)	1.08 ± 0.04 (33)	1.10 ± 0.04 (29)	1.09 ± 0.03 (42)
6	Avg. Individual weight at weaning (Kg)	5.47 ± 0.32 (28)	5.26 ± 0.42 (22)	5.39 ± 0.26 (50)
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%) (As on 31.03.2016)	1.61	8.06	9.67%
9	Pre weaning growth rate (g/day) (As on 31.03.2016)	94.44 ± 6.56 (28)	110.75 ± 8.67 (22)	99.65 ± 5.85(50)

10	Post weaning mortality rate (%) (As on 31.03.2016)	1.58	3.17	4.76%
11	Post weaning growth rate (g/day)	292.91± 12.13 (18)	281.92 ± 9.33 (14)	287.41 ± 13.15 (32)
12	Overall growth rate (upto 9 m) (g/d)	262.26 ± 8.7(18)	254.83 ± 9.05(14)	258.55 ± 10.12 (32)
13	Body weight (Kg) (Average) 1 month 2 month 3 month 4 month 5 month 6 month 7 month 8 month 9 month	 4.96±0.24 (19) 7.44±1.04 (18) 10.98±0.42 (17) 18.43±1.43 (33) 29.37±1.45 (33) 44.76±4.25 (31) 55.77±3.12 (27) 63.74±2.31 (15) 71.77±2.80 (10)	 5.03±0.25 (23) 7.75±1.44 (23) 10.54±0.08 (19) 16.74±2.23 (32) 27.45±1.23 (32) 42.26±2.70 (32) 52.35±1.10 (32) 58.70±0.82 (25) 70.04±1.54 (25)	 5.01 ± 0.18 (42) 7.60± 1.21 (41) 10.75 ± 1.12(36) 17.25 ± 1.42(65) 28.41±2.54 (65) 43.45±4.53 (63) 53.6±2.56 (59) 60.99±1.76 (40) 70.90±3.23 (35)
14	Age at slaughter (d)	300(4)	-	300(4)
15	Weight at slaughter (Kg)	83.5±3.52 (4)	-	83.5±3.52(4)
16	Dressing percentage (%)	74.07±2.24(4)	-	74.07±2.24 (4)
17	Carcass length (cm)	102.25±2.04 (4)	-	102.25±2.04(4)
18	Back fat thickness (mm)	3.45±2.14 (4)	-	3.45±2.14(4)
19	Feed conversion efficiency	4.20± 0.15(4)	-	4.20± 0.15(4)

Performance of Animals: Zovawk (Mizo Local)

SL. NO.	TRAITS/CHARACTERS	ZOVAWK (MEAN±S.E)		
		Male	Female	Total/Average
1	Litter size at birth (no.)	2.5±0.28 (2)	3±0.57 (2)	5.5± 0.28(2)
2	Litter weight at birth (Kg)	1.31 (1)	1.8 (1)	3.11 (1)
3	Litter size at weaning (no.)	2 (1)	4 (1)	6(1)
4	Litter weight at weaning (Kg)	7.5 (1)	14.1 (1)	21.6
5	Avg. Individual weight at birth (Kg)	0.53±0.04 (5)	0.60±0.01 (6)	0.56±0.02 (11)
6	Avg. Individual weight at weaning (Kg)	3.73±0.08(2)	3.52±0.11(4)	3.60±0.09 (6)
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%) (As on 31.03.2016)	-	-	-
9	Pre weaning growth rate (g/day) (As on 31.03.2015)	76.15±2.75(2)	69.62±2.64(4)	71.81±2.49
10	Post weaning mortality rate (%) (As on 31.03.2016)	5.2	-	5.2
11	Post weaning growth rate (g/day)	172.85±1.55 (4)	161.78±2.24 (7)	167.38±1.72 (11)
12	Overall growth rate (upto 9 m) (g/d)	156.74±1.25(4)	146.42±2.31(7)	145.14 ±2.01(11)
13	Body weight (Kg) (Average) 1 month 2 month 3 month 4 month 5 month 6 month 7 month 8 month 9 month	 2.40±0.45(5) 5.25±2.3(5) 8.65±2.2(3) 10.67±3.4(3) 15.52±2.1 (3) 17.40±0.61 (3) 25.82±1.24(3) 34.62±1.52 (4) 40.00±2.54 (4)	 2.47±1.1(9) 4.72±3.3(9) 8.28±1.8(5) 10.41±2.8(5) 14.84±1.78(5) 16.91±1.3 (5) 24.87±1.94(5) 34.11±2.46 (7) 37.50±4.11 (7)	 2.45±1.43(14) 4.98±2.1(14) 8.46±2.4(8) 10.54±2.6(8) 15.18±1.26 (8) 17.15±0.32 (8) 25.34±0.59 (8) 34.36±2.44 (11) 38.752±2.45 (11)

Performance of Animals: 50% Crossbred

SL.NO.	TRAITS/CHARACTERS	½ LWY x ½ ZOVAWK (MEAN±S.E)		
		Male	Female	Total/Average
1	Litter size at birth (no.)	5 (1)	2 (1)	7 (1)
2	Litter weight at birth (Kg)	5.3 (1)	2.04 (1)	7.34 (1)

3	Litter size at weaning (no.)	5 (1)	2 (1)	7 (1)
4	Litter weight at weaning (Kg)	20.5 (1)	10.16 (1)	30.66(1)
5	Avg. Individual weight at birth (Kg)	1.06± 0.02 (5)	1.02±0.10 (2)	1.04 ± 0.02 (7)
6	Avg. Individual weight at weaning (Kg)	4.1±4.3 (5)	5.08± 0.72 (2)	4.38±0.38 (7)
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%) (As on 31.03.2016)	-	-	-
9	Pre weaning growth rate (g/day) (As on 31.03.2016)	72.37±10.27 (5)	96.66±14.76 (2)	79.31±8.98 (7)
10	Post weaning mortality rate (%) (As on 31.03.2016)	-	5.5	5.5%
11	Post weaning growth rate (g/day)	250.88 ± 1.49(10)	247.45 ± 14.56(8)	249.90 ± 3.39(18)
12	Overall growth rate (upto 9 m) (g/d)	223.11 ± 2.69(10)	224.00 ± 10.00 (8)	223.36 ± 2.87(18)
13	Body weight (Kg) (Average) 1 month 2 month 3 month 4 month 5 month 6 month 7 month 8 month 9 month	 3.32±0.20(5) 6.29±0.21 (5) 9.74±1.07 (8) 11.97±1.05(8) 23.57±1.06(8) 33.78±1.57(13) 47.25±1.18(13) 53.01±2.42(13) 61.3±2.71 (13)	 3.72±0.19 (2) 6.78±0.53 (2) 10.01±0.94 (9) 12.58±0.42 (9) 23.98±0.14 (9) 34.57±1.24 (12) 46.80±1.21 (11) 53.34±2.16 (11) 61.5±1.05 (11)	 3.52±0.14 (7) 6.54±0.27 (7) 9.96±1.04(17) 12.11±0.95 (17) 23.77±1.08 (17) 34.11±1.65 (25) 46.98±1.11 (25) 53.21±1.11 (25) 61.34±2.45 (25)
14	Age at slaughter (d)	300 (4)	-	300 (4)
15	Weight at slaughter (Kg)	71.5 ± 2.43 (4)	-	71.5 ± 2.43 (4)
16	Dressing percentage (%)	68.61 ± 2.05(4)	-	68.61 ± 2.05 (4
17	Carcass length (cm)	93.15 ± 1.05(4)	-	93.15 ± 1.05 (4)
18	Back fat thickness (cm)	3.83±1.24 (4)	-	3.83±1.24 (4)
19	Feed conversion efficiency (:)	4.64±0.14 (4)	-	4.64±0.14 (4)

Performance of Animals: LWY

SL.NO.	TRAITS/CHARACTERS	LWY(MEAN±S.E)		
		Male	Female	Total/Average
1	Litter size at birth (no.)	-	-	-
2	Litter weight at birth (Kg)	-	-	-
3	Litter size at weaning (no.)	-	-	-
4	Litter weight at weaning (Kg)	-	-	-
5	Avg. Individual weight at birth (Kg)	-	-	-
6	Avg. Individual weight at weaning (Kg)	-	-	-
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%) (As on 31.03.2015)	-	-	-
9	Pre weaning growth rate (g/day) (As on 31.03.2015)	-	-	-
10	Post weaning mortality rate (%) (As on 31.03.2015)	-	-	-
11	Post weaning growth rate (g/day)	339.10± 12.12(11)	330.20± 11.24 (13)	334.65±19.35 (24)
12	Overall growth rate (upto 9 m) (g/d)	304.94±11.17 (11)	297.72±12.25 (13)	301.33±11.40 (24)

13	Body weight (Kg) (Average) 1 month 2 month 3 month 4 month 5 month 6 month 7 month 8 month 9 month	 - 8.97± 3.04 (5) 14.99±1.61 (5) 25.23 ±0.87 (5) 37.65±2.95 (5) 48.58 ± 1.17 (11) 63.22 ±4.43(11) 73.40 ± 2.10 (11) 83.63± 2.40 (11)	 - 8.54± 1.34 (4) 14.08±1.23 (4) 23.65±1.55 (7) 36.89±2.13 (7) 48.12±1.42 (10) 62.55± 2.23 (10) 73.24 ± 2.29 (13) 81.66± 2.29 (13)	 - 8.68± 2.21(9) 14.66±1.45 (9) 24.45±1.32 (12) 37.25 ±3.04 (12) 48.34±1.24(21) 62.74± 2.27 (21) 73.31 ± 1.50(24) 82.65± 1.60 (24)
14	Age at slaughter (d)	300 (2)	-	300 (2)
15	Weight at slaughter (Kg)	106 ± 2.41 (2)	-	106 ± 2.41 (2)
16	Dressing percentage (%)	68.72 ± 1.55 (2)	-	68.72 ± 1.55 (2)
17	Carcass length (cm)	106.12 ± 2.05 (2)	-	106.12 ± 2.05 (2)
18	Back fat thickness (mm)	2.71±3.15 (2)	-	2.71±3.15 (2)
19	Feed conversion efficiency (:)	3.75±1.14 (2)	-	3.75±1.14 (2)

Lifetime Production Traits:

- Average litter size at birth per sow was 7.9±0.55, 7.16±1.43 and 8.6±2.16 in 75% crossbred, 50% crossbred and LWY respectively.
- Average litter weight (Kg) at birth per sow was 8.76±0.85, 6.01±1.55 and 12.22± 1.05 in75% Crossbred, 50% Crossbred and LWY respectively.
- Average litter size at weaning per sow was7.56±1.15, 6.77±1.21 and 8.13±1.42 in 75% Crossbred, 50% Crossbred and LWY respectively.
- Average litter weight (Kg) at weaning per sow was41.77±4.26, 33±4.13 and 50.67±3.71 in 75% Crossbred, 50% Crossbred and LWY respectively.

Specific Managemental Practice:

Presently, pigs are being reared and managed in intensive housing system with adequate floor space as per BIS standards. There is provision of separate feeding trough and water facility. Following activities are being considered to achieve optimum production level at the Unit.

a) Needle teeth cutting and ligation of naval cord of piglets has been done on very first day of birth
b) Iron injection to the newborn piglets carried out on day 4th and 14th of birth.
c) Vitamin B-complex injection done on day 5th and 15th of birth
d) Separate arrangement for creep feeding of piglets started from 2nd week to weaning
e) Weaning of piglets at 8 weeks of age
f) Castration at weaning (2-3 months)
g) Cross fostering and artificial milk feeding of piglets undertaken if necessary.
h) Newly born/ young piglets have been provided with artificial heating arrangement.
i) Data generated are regularly recorded in computer and in registers in scientific formats.

Identification Method: Identification is usually done when the piglets are a day old using plastic ear tags.

Castration Method: Castration has been/was done surgically by open uncovered method.

Mortality Parameter

Group Wise and Sex Wise Mortality Rate (Pre and Post Weaning):

Pre- and Post-weaning Mortality Rate (%)

Age (Month)	MIZO LOCAL			50% CROSSBRED			75% CROSSBRED			LWY		
	M (%)	F (%)	Total (%)	M (%)	F (%)	Total (%)	M (%)	F (%)	Total (%)	M (%)	F (%)	Total (%)
0-2	-	-	-	-	-	-	1.61	8.06	9.67	-	-	-
2-6	-	-	-	-	-	-	1.58	3.17	4.76	-	-	-
6-12	-	-	-	-	5.5	5.5	-	-	-	-	-	-
12 &>	5.2	-	5.2	-	-	-	-	-	-	-	-	-
Total	5.2	-	5.2	-	5.5	5.5	3.19	11.23	14.43	-	-	-

(As on 31.03.2016)

Causes of Mortality (Specific Cause):(As per Post-mortem report)

S.N.	CAUSES	Zovawk			50% Crossbred			75% Crossbred			LWY		
		M	F	T	M	F	T	M	F	T	M	F	T
1	Pneumonia (Acute/Haemorrhagic/Interstitial)	-	-	-	-	1	1	1	3	4	-	-	-
2	Enteritis	-	-	-	-	-	-	1	4	5	-		-
3	Lymphadenitis	-	-	-	-	-	-	-	-	-	-	-	-
4	Accident	1	-	1	-	-	-	-	-	-	-	-	-
5	Dehydration	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1	-	1	-	1	1	2	7	9	-	-	-

(As on 31.03.2016)

Measures Taken to Minimize Mortality:

Managemental Measures:

- All the sheds were disinfected twice weekly with disinfectants (Phenol)
- Use of water sanitizer (Sokrena - WS)
- Use of foot dip ($KMnO_4$) at all the entrance of pig shed
- Restriction of entry of outsiders

Prophylactic Measures: The following prophylactic measures have been taken up-

Prophylactic Measures

Sl. No.	Prophylactic Measures	Zovawk			50% Crossbred			75% crossbred			LWY		
		M	F	T	M	F	T	M	F	T	M	F	T
1	Vaccination against Classical Swine Fever	10	13	23	16	24	40	42	39	81	17	15	32
2	Deworming (Ivermectin /Albendazole)	10	16	26	13	28	41	47	42	89	17	12	29
3	Iron Injection (on 4^{th}& 14^{th} day of birth)	5	6	11	5	2	7	33	29	62	-	-	-
4	Vitamin B-complex Injection (on 5^{th}&15^{th} day of birth)	5	6	11	5	2	7	33	29	62	-	-	-

Disposal of Diseased Carcass: All the diseased carcasses were sent to Department of Veterinary Pathology for post-mortem examination and were incinerated in an incinerator to avoid spreading of infectious diseases.

Nutritional Experimentation: There are two nutritional trials under this project:

i) The nutritional trial is on the study of growth rate of Crossbred pig (grower) by replacing concentrate feed with Kitchen waste. The result indicates that there is no adverse affect on the growth performance of the crossbred pig by replacing concentrate feed with kitchen waste.

ii) A research work is being conducted to study the effect of Low Crude protein Diets Supplemented with Synthetic Amino Acids On Performance of Growing Cross-Bred (Yorkshire × Zovawk) Pigs.

The reduction of dietary protein by 3% unit of NRC(1998) feeding standard in the diet of growing cross-bred (LWY x Zovawk) did not have any adverse effect on the growth performance, nutrient utilization and blood biochemical profile of the pigs. Supplementation of limiting synthetic amino acids to the low crude protein diet of growing cross-bred (LWY x Zovawk) pig did not significantly improve the performance.

Survey on Market Of Pork Production: Survey on pork production in Aizawl district had been started. On an average 4,50,000 kg of pork had been produced in a month. The market rate of pork is Rs.250.00/Kg. The butcher had purchased the live animal by fixing a price on the basis of chest girth. For example, if the animal is of 40 inches chest girth, the approximate carcass weight is around 67- 70 Kg. Some other butchers used a formula for estimation of expected carcass weight, which is given below:

$$\text{Expected carcass weight (Kg)} = \frac{(\text{Chest girth in inches} - 26) \times 10}{2} \pm 2$$

Addition and subtraction of another 2 kg is done to compensate length of the animal.

Disposal pattern of farm waste, pig excreta etc/establishment of biogas plant: Biogas plant is yet to be set up. At present, disposal of pig excreta is done by keeping them in manure pit. The pig urine and cleaning water were drained into the drainage channel which was located at the rear side of each shed.

Production economics:

i) **Cost of Production/Pig up to Slaughter Age**:

a) **For Zovawk**,
Average slaughter weight= 43 kg
Dressing % = 66
Meat production (kg) = 28 kg
Feed consumption from weaning to slaughter age = 202 kg
Cost of feed = 202 kg x Rs. 25 = Rs.5050
Cost of medicine & health care =Rs. 450.00
Labour charge = 300 days x Rs. 4 = Rs.1200
Miscellaneous = Rs.100
Cost of production/pig up to slaughter age = Rs.5050+Rs.450+Rs.100+ Rs.1200 = Rs. 6800.00

b) For 50 % Crossbred,
Average slaughter weight= 71.5 kg
Dressing % = 68.61
Meat production (kg) = 49 kg
Feed consumption from weaning to slaughter age = 304 kg

Cost of feed = 304 kg x Rs. 30 = Rs.9120
Cost of medicine & health care =Rs. 450.00
Labour charge = 300 days x Rs. 4 = Rs.1200
Miscellaneous = Rs.100
Cost of production/pig up to slaughter age = Rs.9120+Rs.450+Rs.100+ Rs.1200= Rs. 10,870.00

c) For 75% Crossbred,

Average slaughter weight= 84 kg
Dressing % = 74
Meat production (kg) = 62 kg
Feed consumption from weaning to slaughter age = 331 kg
Cost of feed = 331kg x Rs. 30 = Rs.9930
Cost of medicine & health care =Rs. 450.00
Labour charge = 300 days x Rs. 4 = Rs.1200
Miscellaneous = Rs.100
Cost of production/pig up to slaughter age = Rs.9930+Rs.450+Rs.100+ Rs.1200= Rs. 11,680.00

d) For LWY,

Average slaughter weight= 108 kg
Dressing % = 68
Meat production (kg) = 74 kg
Feed consumption from weaning to slaughter age = 371 kg
Cost of feed = 371kg x Rs. 30 = Rs.11,130.00
Cost of medicine & health care =Rs. 450.00
Labour charge = 300 days x Rs. 4 = Rs.1200
Miscellaneous = Rs.100
Cost of production/pig up to slaughter age = Rs.11,130+Rs.450+Rs.100+ Rs.1200= Rs. 12,880.00

ii) Cost of Production/Kg Pork

a) For Zovawk = (Rs.5050+Rs.450+Rs.100+ Rs.1200)/ 28 = Rs. 243.00
b) For 50% Crossbred = (Rs.9120+Rs.450+Rs.100+ Rs.1200)/49= Rs. 220.00
c) For 75% Crossbred = (Rs.9930+Rs.450+Rs.100+ Rs.1200)/62= Rs. 188.00
d) For LWY = (Rs.11,130+Rs.450+Rs.100+ Rs.1200)/74= Rs. 174.00

Extension programme with success story:

i) Supply of Piglets to the farmers at subsidized rate.

ii) Supply of Piglets to Non Government Organization (NGO) at subsidized rate.

iii) At the Institute: As course director, and resource person in the training programme (26thFebruary, 2016) conducted by the parent organization on following aspects-

a) Practical Demonstration of Nutritional technologies for Better Health & Production by Dr.A.K.Samanta and Dr.Zosangpuii. Lectures were given to the farmers

iv) At the Farmers' Field: A nutritional trial had been conducted at field level by selecting 5 farmers.

Salient achievement during the report period:

i. A total of 26 Zovawk, 44 Crossbred (50%), 111 Crossbred (75%) and 37 Large White Yorkshire are stock position at the end of the reporting year.

ii. Average litter size at birth and weaning 75% Crossbred (7.75 ± 0.67 and 7.14 ± 0.85) were higher than that of 50% Crossbred (7 and 7).

iii. The average individual weight at birth (Kg) and weaning in 75% Crossbred (1.09 ± 0.03 and 5.39 ± 0.26) were more than that of 50% Crossbred (1.04 ± 0.02 and 4.38 ± 0.38).

iv. The average weights at 8 months in Zovawk, 50 % crossbred, 75 % crossbred and LWY pigs were 34.36±2.44, 53.21±1.11, 60.99±1.76 and 73.31±1.50 Kg respectively.

v. The pre and post-weaning mortality rate (%) in 75% Crossbred were 9.67 and 4.76; there was no pre-weaning mortality in 50% Crossbred and Zovawk. The post-weaning mortality of50% Crossbred was 5.5 and that of Zovawk was 5.2.

vi. Feeding of kitchen waste by replacing standard concentrate mixture had no adversely affected the growth performance of the crossbred pig.

vii. The reduction of dietary protein by 3% unit of NRC(1998) feeding standard in the diet of growing cross-bred (LWY x Zovawk) did not have any adverse effect on the growth performance, nutrient utilization and blood biochemical profile of the pigs. Supplementation of limiting synthetic amino acids to the low crude protein diet of growing cross-bred (LWY x Zovawk) pig did not significantly improve the performance. Development of traditional low cost housing system using locally available materials such as bamboo, woods etc to evaluate the performance of the pigs.

Scientific publications:

Lalthansanga J., Samanta A.K. (2015). Effect of Feeding Chayote (Sechiumedule) meal on growth performance and nutrient utilization in indigenous pig (Zovawk) of Mizoram. Veterinary World 8(7); 918-923

PROJECT WORK OF STUDENTS (M.V.Sc. /Ph.D):

To study the effect of low crude protein diets supplemented with synthetic amino acids on performance of growing crossbred (LWY x Zovawk) pigs.

Twenty pigs were distributed into 4 groups i.e., Group-1, Group-2, Group-3 and Group-4 of 5 animals each with similar age group (2-3months) and average body weights (12.42±0.68 kg) in each group. The feeding plan for the different experimental groups was divided into two phasesi.e Phase-I (10-20kg body weight) and Phase-II (20 to 50 kg body weight). During Phase-I period, control (Group-1) group was fed standard grower ration having 20.9% CP. Group-2, Group-3 and Group-4 were fed isocaloric diet having 18 % CP by reducing 3 % unit reduction of CP level of NRC, 1998. Group 2 was fed concentrate mixture having 18 % CP without any supplementation of synthetic amino acids. Lysine was supplemented to low protein diet (18% CP) of Group-3 as per the requirement (NRC, 1998) and Lysine, methionine and threonine were supplemented to low protein (18% CP) diet of Group 4 as per the requirement (NRC, 1998). During Phase-II period, control (Group-1) group was fed standard grower ration having 18.0% CP. Group-2, Group-3 and Group-4 were fed isocaloric diet having 15 % CP by reducing 3 % unit reduction of CP level of NRC, 1998. Group 2 was fed concentrate mixture having 15 % CP without any supplementation of synthetic

amino acids. Lysine was supplemented to low protein (15% CP) diet of Group-3 as per the requirement (NRC, 1998) and lysine, methionine and threonine were supplemented to low protein(15% CP) diet of Group 4 as per the requirement (NRC, 1998) . During the whole feeding trial of 90 days, the average dry matter (DM) intake (g/head/day) was 1331.7±56.17, 1425.4±56.05, 1459.80±119.94 and 1414.70±68.22 for G1, G2, G3 and G4 respectively. Average daily weight gain (ADG) and Feed conversion ratio (FCR) for G1, G2, G3 and G4 were, 0.438±0.03, 0.433 ± 0.01, 0.475 ± 0.07 & 0.503±0.02 and 3.07±0.19, 3.29±0.04, 3.20±0.27 & 2.81±0.04 respectively. There was no significant difference (P>0.05) in average DM intake, ADG and FCR among the different treatment groups. A digestibility trial of 5 days was also conducted after 12 weeks of the feeding trial to study the effect on digestibility of different nutrients by the experimental animals. From the digestibility trial, it was revealed that digestibility coefficient of DM, CP, CF, EE and NFE was not significantly differ (P>0.05) among different treatment groups. Blood biochemical parameters were also analyzed at 0 (initial), 1st month, 2nd month and 3rd months post feeding to study the effect of low crude protein diets supplemented with synthetic amino acids on blood biochemical parameters. It was observed that serum glucose, total protein, albumin, globulin, urea, creatinine, triglycerides, cholesterol and SGOT value was within normal range and no significant difference (P>0.05) were observed among the treatment groups.

It was concluded that the reduction of dietary protein by 3% unit of NRC(1998) feeding standard in the diet of growing cross-bred (LWY x Zovawk) did not have any adverse effect on the growth performance, nutrient utilization and blood biochemical profile of the pigs. Supplementation of limiting synthetic amino acids to the low crude protein diet of growing cross-bred (LWY x Zovawk) pig did not significantly improve the performance.

Morphological characterization of indigenous (Zovawk) and its crosses with Large White Yorkshire pig under organised farm condition.

The findings revealed that Zovawk pig was predominantly black in colour with white spotting pattern on the forehead and occasional belted type white marking around the chest girth extending to the body along with white metapodials and a long and white tail switch, whereas the cross-bred (75% LWY x 25% Z) pigs were white in colour. Zovawk pigs were predominantly of compact and small body sized, convex head, short erect ears pointed upward, short and cylindrical snout, drooping rumps, short legs, long and straight tail, pot-bellied and swayback backline in adult, but straight belly and backline in young. The cross-bred pigs possesses similar shapes of body, head, ears and snout as in Zovawk, but with slightly drooping rumps, moderately long legs, long and straight tail, straight backline and belly in all stages of growth. Cross-bred pigs were significantly superior in their body weights and body measurement traits than that of Zovawk pigs. Heart girth and hip width was the best predictor for Zovawk boar weight of (R^2= 91.6%). While in female pigs, heart girth and head length was the best predictor (R^2= 91.4%) for adult live weight. Body length and paunch girth (R^2=

90.7%) was best fit for prediction of live weight of cross-bred boars. In cross-bred adult females, heart girth and breast height was the best predictor (R^2= 87.7%), In Male and female adult Zovawk pigs, five and three factors were extracted, with eigen values greater than 1 and accounted for 95.954% and 89.425% of total variance, respectively. Three and two factors were extracted in male and female cross-bred (75% LWY x 25% Zovawk) pigs, with eigen values greater than 1 and accounted for 83.943% and 84.369% of total variance, respectively.

Distinguished visitors:

i) Dr. R.S. Gandhi, ADG (Animal Science), ICAR on 10.04.2015

ii) Dr. G.Venkateshwarlu, Assistant Director General (EQR), ICAR , New Delhi on 13.01.2016

iii) Dr. Veer Singh, Professor & HOD, Department of Veterinary Parasitology, College of Veterinary Science & A.H., SDAU, Gujarat, on 13.01.2016

iv) Dr. P.S.Pathak, Former Director of IGFRI, Lucknow, on 13.01.2016

v) Dr. R.S. Chauhan, Professor and Head, Department of Veterinary Pathology CVSc, GB Pant Agriculture University, Pant Nagar on 01.13.2016

vi) Dr. R.C. Patra, Dean and Professor, Department of Veterinary Medicine, CVSc and AH, OUAT, Bhubaneshwar, Odisha on 01.13.2016

vii) Dr. R.S. Dalvi, Professor and Head, Department of Veterinary Anatomy and Histology, Nagpur Veterinary College, MAFSU on 01.13.2016

	
Visit of Dr. R.S. Gandhi, ADG (AP&B), ICAR	Lactating Sow (25%Zovawk x 75% LWY)

NAGALAND UNIVERSITY, SCHOOL OF AGRICULTURAL SCIENCES AND RURAL DEVELOPMENT, MEDZIPHEMA CAMPUS, NAGALAND

The state of Nagaland depends largely on agriculture, natural resources and livestock to meet their livelihood needs. With the increasing population pressure there are instances of transition from shifting cultivation to a more integrated farming especially the small land holding families adapting to livestock and homestead gardening. Backyard piggery is less labour intensive, more profitable a trade sustainable for the marginal farmers. It converts available resources into cash in the living bank (Rural piggery), brings in additional family income and resolve festive carnivals during which pork meat is an important item. The state also has the highest per capita consumption of pork. As per 2013 state statistical record pork production and number of pig slaughtered recorded are 50.36 M.T. and 5,43,494 nos. respectively, inclusive of locally reared and procured from neighbouring states. Looking at the popularity of pig rearing and importance of pork in Nagaland the Indian Council of Agriculture Research (ICAR) sanctioned the All India Coordinated Research Project on pig (AICRP-Pig) Nagaland Centre during 2008-2009 to the School of Agricultural Sciences & Rural Development, Nagaland University, Medziphema Campus.

The ICAR-AICRP on pig, Nagaland centre started the project maintaining local Indigenous pig (Teny Vo) in the year 2009-2010, and studied the performance of the local breed and up-grade the local germ-plasm by crossing with exotic Hampshire boar. Since the inception of the project, a cross breeding programme of Indigenous local female Tenyi Vo (TV) with Hampshire (H) boar has been initiated for production of 50%TV50%H by Inter-se-mating. Presently the centre is maintaining 75% upgraded Tenyi Vo (25%TV75%H) by inter-se-mating as per ICAR guidelines. Herd strength and detail of the centre given below.

Herd dynamics: As on 31.03.2016

a. Indigenous (Tenyi Vo)

Sl. No.	Categories	Opening balance	Additions		Disposals			Closing Balance
			Births	**Transfer	Deaths	transfers	sold	
1.	Piglet (upto 42 days)	0	6	0	0	0	6	**0**
2.	Growers(42 d- 5 m)	2	5	0	0	0	0	**5**
3	Finisher(5 m -8 m)	0	0	0	0	0	0	**0**
4	Breeding female	3	0	1	0	0	3	**1**
5	Boar	0	0	1	0	0	0	**1**
	Grand total	**5**						**7**

**Pen to pen transfer within farm

b. Upgraded 50%

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing Balance
			Births	**transfer	Deaths	transfers	sold	
1.	Piglet (up to 42 days)	0	82	0	12	0	48	0
2.	Growers(42 d- 5 m)	0	0	22	6	0	0	16
3	Finisher(5 m -8 m)	4	0	0	0	0	1	3
4	Breeding female	8	0	0	0	0	6	2
5	Boar	0	0	0	0	0	0	0

	Grand total	12						21

**Pen to pen transfer within farm

c. Upgraded 75%

Sl. No.	Categories	Opening balance	Additions		Disposals			Closing Balance
			Births	**Transfer	Deaths	transfers	sold	
1.	Piglet (up to 42 days)	48	270	0	14	0	104	**0**
2.	Growers(42 d- 5 m)	30	0	200	10	0	0	**190**
3	Finisher(5 m -8 m)	50	0	30	0	0	1	**51**
4	Breeding female	18	0	16	0	0	0	**34**
5	Boar	0	0	12	0	0	0	**12**
	Grand total	**146**						**287**

**Pen to pen transfer within farm

d. Hampshire

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing Balance
			Births	**transfer	Deaths	transfers	sold	
1.	Piglet (upto 42 days)	0	47	0	14	0	20	0
2.	Growers(42 d- 5 m)	16	0	0	4	0	3	0
3	Finisher(5 m -8 m)	0	0	10	0	0	0	10
4	Breeding female	2	0	10	0	0	0	10
5	Boar	2	0	2	0	0	0	4
	Grand total	20						24

**Pen to pen transfer within farm

N.B.

- Number of piglets produced (April 2015 – March 2016) = 405
- Number of piglets sold = 178
- Number of animal culled =14

Breeding strategy of the farm as approved:

At the initial years of the project during 2009-10, the centre maintained the Nagaland Indigenous local Tenyi Vo (TV) male and female pure line. Selected gilts of Tenyi Vo (TV) were crossed with Hampshire (H) boar for production of up-graded Tenyi Vo 50 % (TV). Selected gilts of 50% TV 50% H crossed with Hampshire boar for production of 25%TV 75%H, from this genetic groups, the progeny male and females of 75%H 25%TV were selected based on selection criteria and crossed by *inter-se*-mating. As per the guidelines, the centre is maintaining 75%H 25%TV genetic make-up.

Performance of pigs: Upgraded Variety (75%)

Sl. No	Trait/Characters	Mean ± SE (no of observation		
		Male	Female	Total
1	Litter size at birth (no)	3..69±0.62(36)	3.58±0.55(36)	7.27±1.17(36)
2	Litter weight at birth (kg)	4.20±0.77(36)	3.99±0.61(36)	8.01±1.38(36)
3	Litter size at weaning (no)	3.27±1.22(36)	3.38±0.69(36)	6.65±1.91(36)
4	Litter weight at weaning (Kg)	18.96±5.34(36)	18.62±4.33(36)	37.58±9..67(36)
5	Avg. Individual weight at birth (Kg)	1.10±0.13(95)	1.11±0.15(90)	1.10±0.14(185)
6	Avg. Individual weight at weaning (kg)	5.49±1.47(54)	5.71±1.28(55)	5.60±1.38(109)
7	No of days for weaning	42	42	42
8	Pre weaning mortality rate (%)	9	10.73	9.8
9	Pre weaning growth rate (gm/d)	110.95	114.76	112.85
10	Post weaning mortality rate (%)	6.5	3.4	4.9
11	Post weaning growth rate (gm/d)	185.15	184.18	184.65

12	Overall growth rate (upto 8 m) (gm/d)	174.76	174.46	174.60
13	Body weight (Kg)			
	1 month	5.96±1.6(10)	6.00±1.53(43)	5.98±1.56(53)
	2 month	9.05±1.4(10)	9.01±1.62(30)	9.03±1.51(40)
	3 month	14.16±0.25(6)	14.0.1±0.75(57)	14.08±0.50(63)
	4 month	19.08±0.14(6)	19.0±1.28(50)	19.04±0.82(56)
	5 month	24.3±0.44(6)	24.0.2±0.49(38)	24.16±0.46(44)
	6 month	28.33±0.54(6)	28.0.1±1.65(35)	28.72±1.09(41)
	7 month	34.6±0.54(6)	34.03±1.7(28)	34.31±1.12(34)
	8 month	39.50±0.54(6)	39.10±3.4(34)	39.35±1.97(40)
	9 month	45.5+0.57(6)	45.15+3.37(19)	45.32+1.97(25)
	10 month	53.5+0.84(6)	53.43+5.09(16)	53.46+2.96(22)
14	Age at slaughter (month)		10	
15	Weight at slaughter (Kg)		53	
16	Dressing percentage (%)		70	
17	Carcass length (cm)		83.5	
18	Back fat thickness (cm)		3	
19	Amount of pork produced per sow (Kg)		37.10	
20	Feed conversion efficiency (ratio)		4.2:1	

Lifetime production traits:

a. Average litter size at birth per sow : 7.23±1.88

b. Average litter weight at birth per sow : 8.05±2.07

c. Average litter size at weaning per sow : 6.42±1.97

d. Average litter weight at weaning per sow : 36.37±11.01

Specific management practices:

Sl. No.	Management Practice	Age in days
1.	Cutting of needle teeth & naval cord at birth	0-1
2.	Creep feeding	10-25
3.	Iron injection	1st. Injection -14 2nd injection - 21
4.	Castration	25-30
5.	De-worming	21-25
6.	Ear tagging	30-35
7.	Weaning	42

Mortality parameter:

i) Pre-weaning mortality

Sl. No.	Traits/Characters	Pre-weaning		
		male	female	Causes of mortality
1	Nagaland Indigenous (Tenyi vo)	-	-	-
2	Upgraded pigs	12	14	Enteritis, pneumonia
3	Hampshire pigs	6	8	Pneumonia, gastro-enteritis, anemia, pulmonary edema

ii) Post-weaning mortality

Sl. No.	Genetic group	Post-weaning		
		male	female	Causes of mortality
1	Nagaland Indigenous (Tenyi vo)	Nil	Nil	-
2	Upgraded pigs	7	3	Enteritis, Pneumonia
3	Hampshire pigs	6	8	Septicemia, Enteritis

iii) Measures taken to minimize mortality:

a) **Management measures:** Warm bedding was provided by gunny bags slings and100 watt electrical bulb in first week post farrowing in the creep area to control cold stress during winter.

Second week provide creep ration and bamboo splits knitted round the creep area

Helping the weak piglets to suckle mother's milk or bottle feedings

Toning up weak animals with vitamins and mineral supplements

Daily morning and evening cleaning of pig sty use of disinfectants twice a week

b) **Prophylactic measures:** Iron injection first and second dose on the 14th & 21th day post farrowing

De-worming done at 21-25 days old piglets, de-worming of adult pig at six month interval

Segregation of sick animal for symptomatic treatment

Vaccination of all 3 months old pigs against Swine Fever and repeat after 6 months, vaccination of adult pig at 6 months interval.

iv) Disposal of diseased carcass: Burial of dead carcass of any kind at a depth of 3 feet below the ground with lime application

Nutritional experimentation: Providing cooked feed to pigs is common in Nagaland. Thousands of trees are used annually in Nagaland due to cooking of pig feed. In order to develop an alternative feeding practice without cooking, a feeding trial using sliced sweet potato tuber soak in molasses solution at a ratio of 10 Kg : 100 gm for 3-4 days and fed as such to pigs. This can replace concentrate feed up to 30% without affecting the normal growth.

Adoption of integrated farming system: Continuation of Integrated pig farming with fodder crops cultivation using pig manure and fishery is farmers friendly. Green fodder crops apart from providing fodders keeps, the environment clean and fresh. The leaves and vines ensilaged fodder incorporated successfully for economic ration, replacing 25% to 30% concentrate feed.

Survey on market pork production: Market survey in and around Medziphema reveals that from three pork retailers each shop sale 2 dressed pig weighing 110-120 kg on week days and 3 numbers of pigs on every Fridays bazaar @ Rs. 180/- per kilo irrespective of the retail cuts. It was reported that the pigs were procured from Orissa, Bihar and Rajasthan. The retailers purchase only dressed pig @ Rs. 135/- at the butchers point at Dimapur 36 Km from Medziphema and transported to the retailers Shop by auto. The survey recorded sales of 56 pigs per month and gross profit of Rs. 2,46,400/- (rupees two lakh forty six thousand four hundred) per month by the three retailers. The survey report concluded that there is huge prospect of pork market as well as pig farmers across the state.

Disposal pattern of farm waste, pig excreta etc: Each shed of the farm washing and pig excreta is directed into: **a**) A pit 5 ft. deep 4 ft. wide, when full direct the washing into the next pit. There are eight similar pits dug and kept ready for rotational use. The filled excreta pits are left to decompose for a month, dug out and manure the fodder garden. b) During the months (May-June)of rain season the excreta from the pig shed is lead into the fishery pond. c) The decomposed manure are sold @ Rs. 1.20 per kg, utilized by Agricultural research Scholars and Horticultural farms, flower- beds and animal fodder plots for pigs and cattle.

Production economics (Assumption)

a. No of sows : 37
b. No of piglets farrowed in 12 months : 312

c. Cost of feed @Rs.25 per kg x 23,634 : Rs. 5,90,850/-
d. Wages 1 person @Rs.150/-p day x 365 days : Rs. 54,750/-
e. Power surcharge @Rs 210/month x 12m : Rs. 2,520/-
f. Medicine & feed additives@Rs.80/sow/month x 12m Rs. 35,520/-

Sub-total : Rs. 6,83,640/-

Production Cost of 1 piglet (Rs.6,83,640 ÷ 312) = Rs.2,191/-

Extension program with success story: The centre has developed a good link with the rural pig farmers through formation of Self Help Groups for progress in pig farming in the rural areas. Detail activities with dates given below, enclosed photographs.

Date/Month	Venue	Program/Activities	Participant/Beneficiaries
02.06.2015	AICRP-Pig Farm	Artificial Insemination and herbal treatment in pig	Farmers from Dimapur District
O6.07.20154	NU, SASRD	Awareness program on Zoonotic Diseases	Staff faulty of NU-SASRD, Farmers from Medziphema
07.100.2015	Medziphema Ward-6	Training on Ensiling Fodder Grasses for pigs	Progressive pig Farmers
23.10.2015	Medziphema Village	Training on Ensiling Fodder Grasses for pigs	Progressive pig Farmers
09.11.2015 to 10.11.2015	NU SASRD	Farmers' Exchange program	Progressive pig Farmers from Kohima & Dimapur

Salient achievement during the reporting period:

1. Successful up-gradation of Indigenous Tenyi Vo (50% & 75%) the supplied piglets performing well in the farmer's field under local housing and feeding system
2. Sale proceeds amounting to Rs. 5,82,227/- (Rupees five lakh eighty two thousand two hundred twenty seven only) from sale of Upgraded piglets, fattened, culled adults all to the rural farmers, a step taken forward to enhance the rural livelihood Progressive pig Farmers condition.
3. Conducted four out-reach programs for the Rural Farmers and one Farmers' Exchange program.
4. Practicing AI using Hampshire boar semen (semen from Mega Seed Project, ICAR Research Complex, Jharnapani till the month of August 2015 in the farm and in the farmer's field.
6. Ensilaged fodder and fermented sliced tapioca incorporated in the pig ration replacing up to 20-30% of concentrate feed
8. Facilities provided to the Students of under Graduate B.Sc. (Ag), P.G. & Ph.D. of the department of Livestock Production & Management, for practical demonstration.
9. Developed innovative tools for pig farmers' that pave way to enhance feed quality and reducing the feeding cost.

Distinguish visitors:

1. Dr. R.S. Gandhi, ADG (AP&B), ICAR, New Delhi
2. Dr. Dilip Kumar Sarma, Director NRC on Pig, Rani Guwahati
3. Prof. B.K. Konwar, Vice Chancellor, Nagaland University, HQ Lumami

Upgraded 75% sow with piglets

Appraisal Team visit headed by ADG, Dr. R.S. Gandhi with faculty and farm staff

Awareness on zoonotic diseases for Staff and Farmers at NU-SASRD Campus

One day training on AI in pig

Innovative tools-tuber slicers

ICAR-CENTRAL ISLAND AGRICULTURAL RESEARCH INSTITUTE, PORT BLAIR

Looking to the high demand of pork and scope of piggery in the region, the AICRP programme of the centre has recently initiated. The technical programme was fixed in last review meet of AICRP Project in 2015.

Herd dynamics:

Details	Andaman LocalPigs		
	M	F	Total
Opening balance as on 1/4/2015	5	6	11
Birth 1/4/2015 to 31/3/2016	36	18	54
Total	41	24	65
Mortality	8	4	12
Sold/ Slaughter/ Field unit	20	8	28
Total	28	12	40
Closing balance as on 31/3/2016	13	12	25

Breeding strategy of the farm as approved: As per the technical programme a foundation stock of indigenous pigs were established in the centre and generation of the same are raised. The methods selected for pure stock of desi animals are maintained.

Performance of animals:

Sl.No.	Traits/ Characters	Mean ± SE (no. of observation)		
		M	F	Total
1	Litter size at birth (no.)	9.33±0.51	6.4±0.71	8.4±0.68
2	Litter Weight At birth (Kg)	12.03±0.59	7.88±0.93	11.16±0.91
3	Litter size at weaning (no.)	7.0±0.73	4.8±0.58	6.6±0.24
4	Litter weight at weaning (kg)	94.17±10.66	69.6±11.73	91.3±12.41
5	Avg. Individual weight at birth (Kg)	2.07 ±0.05	1.95±0.04	2.22±0.02
6	Avg. Individual weight at weaning(Kg)	22.92±1.89	22.25±1.83	24.87±4.40
s7	No. of days for weaning (d)	60	60	60
8	Pre weaning mortality rate (%)	23.5	22.2	23
9	Post weaning mortality rate (%)	0	0	0
10	Pre weaning growth rate (gm/d)	0.38±0.01	0.40±0.02	0.21±0.01
11	Post weaning growth rate (gm/d)	0.43±0.01	0.40±0.01	0.22±0.01
12	Overall growth rate (gm/d)	0.81±0.03	0.81±0.03	0.43±0.02
13	Body weight at different ages (Kg)			
	Birth weight	1.25±0.03	2.32±0.06	1.24±0.03
	1 Month	6.13±0.33	12.09±0.36	6.28±0.24
	2 Month	13.53±0.91	26.77±0.99	13.89±0.67
	3 Month	24.19±1.46	40.11±1.68	23.69±1.13
	5 month	40.40±2.43	62.0±4.25	39.93±2.04

Mortality parameter:

Animal	Pre weaning mortality			Post Weaning Mortality		
	M	F	T	M	F	T
Total animals	36	18	54	28	14	42
Animals Died	8	4	12	-	-	-
Mortality %	22.2	22.2	22.2	-	-	-

Post Weaning Mortality is Nil

Causes of Mortality:

- The major cause for mortality at preweaning stage observed is diarrhea.

- Post weaning mortality till now not observed.

Measures to taken minimize mortality:

Managemental measures:

- Sheds were regularly sanitizing with potassium permanganate
- All pigs were dewormed periodically
- Screening of parasitic diseases and their health
- Early treatment to control piglet diarrhea and anemia
- Efforts to be taken to minimize pre weaning mortality rate

Prophylactic measures:

- To overcome pre weaning mortality giving enrofloxacin oral suspension and imferon injection

Disposal of diseased carcass:Disposal of diseased carcass-the dead animals after conducting the post mortem will be buried properly as per standard practices.

Nutritional experimentation: A study was conducted to compare different traditional feeding practices followed by farmers and effect of dietary zinc supplementation on the reproductive and productive performances of crossbred Andaman local pigs. The results showed that the sow receiving the ration made up of coconut cake, broken rice or maize performed better than the sow receiving ration made up of colocasia leaves and rice bran in respect of reproductive performances. Similarly, inclusion of 80 ppm Zn in stater ration enhanced the daily body weight.

Adoption of integrated farming systems: The centre have started promoting IFS.

Disposal pattern of farm waste:

- Pig manure was collected from pig sty and stored in separate manure pit
- The stored pig manure was used as fertilizer for fodder production
- Pig urine and cleaned water drained into manually

Distinguish visitors: Chairman ASRB visited the farm.

Success story of a Progressive Pig Farmer

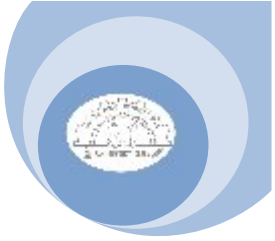
Mr. Rakesh Saha: - Mr. Rakesh Saha Colinpur Village, South Andaman is an unemployed youth and practiced traditional methods of pig rearing.

Then change came in his way. He came to know through scientists of CIARI, Port Blair about the scientific methods of rearing the pigs with the available resources. He actively participated in the training programme on pig farming organized by CIARI. There he learnt to make the balanced feed with the available resources, he also learnt to make the house for giving comfort to the pigs to get maximum return. He procured two piglets from CIARI in the month of June 2012 and started rearing pigs as per the methods learnt during the training programme. Before attending training he mostly fed the pigs with colocasia without any supplementation, but after training he knew that only colocasia could support to maintain the body but it never gave the good return. So he started mixing the other ingredients like wheat, coconut cake, grinded whole paddy and thrash fish as well as mineral mixiture

to get the maximum return from the pig rearing. Within eight months of rearing one pig became pregnant and farrowed with a litter size of 7 piglets and he also able to get 7 weaning litters size. During these 3 years he has earned Rs7.5 lakhs by selling 30 adult pigs and 25 piglets in the market. At present he is having herd strength of 6 adults and 24 piglets of different ages.

The scientists of this division visit his farm in regular interval to observe the different managemental condition and suggest for betterment of the farm. The performance and prospect of his pig farm is very good.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Pig feed preparation going on in the farm</td><td>Mr. Rakesh Saha with his healthy pigs in the pig sty</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Pig shed under AICRP Project</td><td>Local pig in AICRP Shed</td></tr>
</table>



COLLEGE OF AGRICULTURE, CAU, IMPHAL

ICAR, has sanctioned All India Coordinated Research Project on Pig, Manipur Centre, on 12th November, 2014 at the Department of Animal Sciences, College of Agriculture, Central Agricultural University, Imphal with the objective of upgrading the indigenous locally available pigs of Manipur, so as to see the improvement in body weight gain, litter size, survivability at weaning, disease resistance, sexual maturity etc. As per the proceedings of the last Annual Review Meet held at NASC complex, Pusa, New Delhi, the breeding programme of the Centre has been changed to maintain 50% crossbred Hampshire and Ghungroo crossbred. At present we have 27 nos. crossbred of finisher pigs for the project, 71 Hampshire pigs and 6 nos. of local pig.

Herd dynamics

Herd strength of 50% Crossbred pigs (Hs X G) as on 31.03.2016

Sl. No.	Age (months)	Opening Balance	Additions		Disposal			Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (up to 42 days)	-	-	-	-	-	-	
2	Growers (42 d-5 m)	-		30	3	-	-	27
3	Finisher (5 -8 month)	-	-	-	-	-	-	
4	Breeding female	-	-	-	-	-	-	
5	Boar	-	-	-	-	-	-	
	Total	-	-	30	3	-	-	27

Herd strength of Hampshire pigs as on 31.03.2016

Sl. No.	Age (months)	Opening Balance	Additions		Disposal			Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (up to 42 days)	-	67	-	10	-	-	57
2	Growers (42 d-5 m)	-	-	-	-	-	-	
3	Finisher (5 -8 month)	14	-	-	-	-	-	14
4	Breeding female	-	-	-	-	-	-	
5	Boar	-	-	-	-	-	-	
	Total	14	67	-	10	-	-	71

Herd strength of graded local pigs as on 31.03.2016

Sl. No.	Age (months)	Opening Balance	Additions		Disposal			Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (up to 42 days)	-	-	-	-	-	-	-
2	Growers (42 d-5 m)	17	-	-	-	-	11	6
3	Finisher (5 -8 month)		-	-	-	-	-	
4	Breeding female	-	-	-	-	-	-	
5	Boar	-	-	-	-	-	-	
	Total	17	-	-	-	-	-	6

Breeding strategy of the farm as approved: To maintain crossbred of 50% Hampshire X Ghungroo crossbred pigs.

Performance of animals

Sl.No.	**Traits/characters**	**Hampshire pig**		
		M	**F**	**Total**
1	Litter size at birth (no.)	2.33±0.11 (31)	2.60±0.05 (30)	2.47±0.04 (61)
2	Litter weight at birth (kg)	2.34±0.06 (29)	2.57±0.05 (29)	2.45±0.04 (58)

N.B: Figures in the parenthesis are number of observations

Performance of animals: 50% crossbred Hampshire X Ghungroo

Mean±SE of monthly body weight in 50% crossbred pigs

Month	Male	Female	Total
1 month	-	-	-
2 month	-	-	-
3 month	14.18±1.19 (6)	14.65±0.51(21)	14.54±0.47 (27)
4 month	18.08±1.16 (6)	18.75±0.49 (21)	18.60±0.46 (27)
5 month	21.9±1.02 (6)	22.77±0.48 (21)	22.58±0.44 (27)

Specific managemental practices

(a) Identification: The piglets are identified by temporary ear notching procedure on left ear. The permanent ear tagging is done at the time of weaning (42 day) by polyurethane ear tag.

(b) Castration: Not yet practiced.

Mortality parameters

i) Cause of mortality:

	Category of pigs				Total
Sl.No.	**Causes of mortality**	**CB 50%**	**Hampshire**	**Siamese local**	
1	Pneumonia	2			**2**
2	Crushing		2		**2**
3	Enteritis	1			**1**
4	Cannibalism		2		**2**
5	Still birth		3		**3**
6	Agalactia		3		**3**
	Total	**3**	**10**		**13**

ii) Measures taken to minimize mortality

a) Managemental measures:

- Daily cleaning, washing, sanitization & drying.
- Pig sheds were disinfected twice weekly with disinfectants (phenyl)
- Use of water sanitizer (Sanipro-ws)
- Use of foot dip (KMnO4) at the entrance of pig shed.
- Restriction of outside visitors.

b) Prophylactic measures: The iron injection is given on 4th & 14th day while Vitamin B-complex on 5th & 15th day respectively in all piglets. Besides, the vaccination of Swine Fever is regularly done in all the stock at 6 month interval. The deworming is done every 4 months interval. Treatment of sick pigs is also regularly done.

Extension programme with success story:

(i) At the farmer's field: One day training programme cum vaccination camp was done off-campus in two different tribal populated area of the state.

Salient achievements during the report period:

- A total of 104 pigs, consisting of 27 crossbred (Hs50%:Gh50%)), 71 Hampshire and 6 graded Siamese local pig being maintained at the end of the reporting year.
- 57 nos. of Hampshire piglets were produced by 8 sows.


Hampshire sow with piglets


Crossbred (Hs50% X Gh50%)


Farmers training

ICAR-INDIAN VETERINARY RESEARCH INSTITUTE, EASTERN REGIONAL STATION, KOLKATA

Till today, there are only two recognized pig breed in India i.e. Ghungroo whose breeding tract is Tarai Region of West Bengal and another one is Niang Megha from Meghalaya which locally famous as Khasi Local. Ghungroo is one the best known Indian pig breed for its better litter size, good mothering ability, better growth and docile nature. Keeping this idea, Eastern Regional Station, Indian Veterinary Research Institute, Kolkata was entrusted to implement ICAR-AICRP on Pig, ICAR on 9th October 2014 with an idea to develop an elite flock of Ghungroo germplasm through selective breeding, propagate and supply the superior germplasm to cliental which indirectly increase the pork production.

Herd Dynamics:

Sl. No	Age (months)	Opening Balance			Addition			Deduction			Closing Balance		
		M	F	T	Birth	Transfer	Purchase	Death	Transfer	sold	M	F	T
1	Piglet (upto 42 d)	-	-	-	5	-	-	-	-	-	2	3	5
2	Grower (42 d – 5 m)	-	3	3	30	-	-	-	-	23	4	3	7
3	Finisher (5 - 8 m)	2	5	7	3	-	-	-	-	-	3	-	3
4	Adult	-	-	-	-	-	-	-	-	-	2	8	10
5	Total	2	8	10	38	-	-	-	-	23	11	14	25

Breeding strategy of the farm as approved:

As per the guidelines of NRC (P), the approved breed of pig is Ghungroo with following target:

Production target: Average body weight at 8 months of age: 70 kg with an average litter size at weaning at 42 days has to be 8.

Reproduction: Litter size at weaning: 8.Farrowing rate: 3 farrowing in 2 years.

Performance of animals

Sl. No.	Traits / Characters	Mean ± SE (no. of observation)		
		M	F	Total
1	Litter size at birth (no.)	3.2 ±0.46 (5)	4.4 ± 0.39 (5)	7.6 ± 0.57(5)
2	Litter weight at birth (kg)	3.766 ±0.401 (5)	4.858 ± 0.096 (5)	8.634 ± 0.486(5)
3	Litter size at weaning (no.)	3.5 ±0.25 (4)	4.75 ± 0.37(4)	8.25 ± 0.0.44(4)
4	Litter weight at weaning (kg)	32.128 ±3.757(4)	40.769 ±1.191(4)	72.898 ± 4.115(4)
5	Avg. Individual weight at birth (kg)	1.177 ±0.039(16)	1.104±0.022 (22)	1.140±0.021(38)
6	Avg. Individual weight at weaning (kg	9.151 ±0.153(14)	8.583±0.138(19)	8.841±0.105(33)
7	Number of days for weaning (days)	42		
8	Pre-weaning mortality rate (%)	0	0	0
9	Pre-weaning growth rate (gm/day)	189.861±45.58(14)	177.911±69.51(19)	183.857±55.58(33)
10	Post weaning mortality rate (%)	0	0	0
11	Body weight (Kg) 1st month 2nd month 3rd month 4th month	 8.275±0.124(14) 13.434±0.345(14) 19.151±0.401(14) 28.171±0.919(7)	 7.910±0.160 (19) 12.452±0.379(19) 17.356±0.377(19) 26.330±0.0.625(9)	 8.101 ±0.145 (33) 12.789±0.0.284(33) 18.118±0.319(33) 27.138±0.557(16)

Specific management practice: At present, stock is less; therefore tattooing method is followed till 3-4 months of age. This methods identification is facing bit difficulty due black color. So, ear tagging method of identification is following at the age of 3-4 months. Radio Frequency identification can be used.

Open method of castration generally is followed at the early age. But, it can't be practiced due male selection at breeding farm. Therefore, open methods of castration are following at 3-4 months with help of expert surgeon.

Mortality parameter:

I) genetic group wise and sex wise mortality rate (pre and post weaning)

ii) Measures taken to minimize mortality:

Managemental measures: Apart from routine management practices, furrowing pen washed with disinfectant thoroughly to prevent piglet diarrhea.

Prophylactic measures: As prophylactic measures, swine fever, Swine pox and FMD vaccination followed as per recommended scheduled.

Disposal of disease carcass: As per standard procedure.

Nutritional experimentation: Identification of locally available food ingredients are in the process with help of nutritional expert of ERS, NDRI, Kalyani.

Adoption of integrated farming system: An Institute funded project entitled "*Occurrence of common zoonotic pathogens and heavy metals vis-à-vis productivity in fish integrated pig-cum-fish farming system"* with following objective

i) To investigate the occurrence of common zoonotic pathogens in the farm components of integrated pig-cum-fish farming system.
ii) To assess the common heavy metals in the farm components of integrated pig-cum-fish farming system.

Extension programme with success story:

At the institute: A total 250 farmers specially from backward district like Maldah, Uttar Dinajpur, Dakshin Dinajpur, Purulia, Bakura, Murshidaba and Bibhum attended 3 days residential training programme in collaboration with Farmers' Academy and Convention Centre, Bidhan Chandra Krishi Viswa Vidyalaya (BCKV), Lakehall, Kalyani, Nadia. Majority of the farmers are tribal women and they are fully engaged in animal husbandry specially on pig rearing. It was sponsored by Govt. of West Bengal. Theory classes are taken in Lake Hall and farm demonstrations are at IVRI, ERS, Kalyani farm.

At farmers' field: Health camp cum awareness programme was organized at Sapkhali and Pathorpratima village of Sagar Island of South 24 Parganas of West Bengal on 11th December 2015 and 28th March 2016, respectively.

27th *Krishi Shilpo -O- Bannijyo Mela* at Ratanpur, Purbamidnapur on 9th to 15th December 2015 was attended.

Scientific publications: M.H. Khan, K. C. Nath, B. C. Deka and S. Naskar (2015). Electron microscopic studies of porcine sperm: changes during freezing and post-thawing. Indian J. Anim. Sci. *85(7):723-728*.

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<tr><td>Ghungroo pig (Female)</td><td>Ghungroo pig (male)</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Sow with piglets (4days old)</td><td>Sow with piglets (week old)</td></tr>
<tr><td colspan="2">  </td></tr>
<tr><td colspan="2">Farmers training cum visit to pig farm</td></tr>
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ICAR RESEARCH COMPLEX FOR NEH REGION, TRIPURA CENTRE, AGARTALA

In Tripura, smallholder pig farming system is always facing challenges and offering ample opportunities for its improvement for better livelihood. The livestock production team of ICAR, Tripura Centre is working at the farmer's field in 8 districts of Tripura to enhance the capacity of the farmers by demonstrating improved pig shelter management, providing improved pig varieties and extending veterinary services. The programme has already brought a great impact on pig farming community in the state.

ICAR Research Complex for NEH Region, Tripura Centre has one pig farm at Lembucherra, West Tripura, which is only 12 km far from Agartala, Capital city of Tripura. Within the limited facility, farm has the capacity to produce about 100- 120 piglets per annum. Presently, Hampshire x Ghungroo cross and Tripura Mali pigs are maintained at farm. The research programme under AICRP on pig for the centre has been decided in the meeting held on 17-18th September 2015 at NASC Complex, Pusa, New Delhi. Establishment of Tripura local Mali pig breeding stock has been initiated since October 2015.

Herd dynamics:

Date of purchase	Herd strength at the beginning of the project				Herd strength at the end of 31st March 2016			
	Age	Female	Male	Total	Age	Female	Male	Total
05.10.15	2 m	5	2	7	8 mo old	4	2	6
03.12.15	2 m	7	3	10	6 mo old	6	2	8
24.03.16	2 m	8	2	10	2 mo old	6	2	8
				27				22

Breeding strategy of the farm as approved

Inter-se- mating among Mali pigs to establish pure Mali pig breeding stock

Specific managemental practice: Mali pigs are maintained under standard farm management practices. The pigs are tagged using ear tag with manual marking (Allflex® tag, M/s. 4 Quarters Technology systems, Pune, Maharastra). The pig shed is cleaned and washed with running water every day. The disinfectants including lime powder are used in pig shed at regular interval. All the piglets are vaccinated against swine fever and foot and mouth disease (FMD). All the piglets are fed with deworming medicine first at 3 month of age and then dewormed periodically. A pregnancy detector was procured to detect pregnancy in pigs.

Mortality parameter:

i) **Genetic group wise and sex wise mortality rate** (Pre and post weaning):

Mortality for female piglets (post weaning): 20.0%

Mortality for male piglets (post weaning): 14.28%

ii) **Causes of mortality (Specific cause):** Low weaning weight, prolonged diarrhoea

iii) **Measures taken to minimize mortality:**

Managemental measures: The pig shed was cleaned and washed with running water every day. Potassium permanganate diluted water was used during washing the pig house at regular interval. The disinfectants including lime powder were used in pig shed at regular interval. The piglets were fed with commercially available pig grower ration as per recommendations. Fresh and clean water was offered ad libitum by water tough. Once the animal was noticed diseased, the animal was examined immediately and treatment with veterinary medicines was started. If necessary, the diseased animal was segregated and kept in isolated pen for special care and management.

Prophylactic measures: All the piglets were vaccinated against swine fever and foot and mouth disease (FMD). All the piglets were fed with deworming medicine at 3 month of age and then at every 3 month interval.

Disposal of diseased carcass: The dead animals after conducting post-mortem were buried in pit dug 4 to 5 feet depth in the specified area within the farm premises and covered with soil and then lime powder was spread on it.

Nutritional experimentation: *Proximate analysis of locally available pig feed items*: The pigs were mainly fed rice bran mixed with locally made choak (rice bear waste) and all kinds of kitchen waste which were easily available in the villages. Besides, local grass [*Axonopus compressus* (Swartz) P. Beauvois, Ess.], colocasia (*Colocasia esculenta*) and sometimes, a local herb, called taklai aiching (*Commelina paludosa* Blume) were fed to pigs. The commonly used pig feed materials were collected. The botanical names of few plant items were recognized as per botanical survey of India. Besides, the home made choak (rice bear waste) ready to serve pig feed samples were also collected. After sun drying, the samples were dried in a hot air oven (55°C for 72 h) to calculate the dry matter content. After assessing the dry matter content, the samples were ground in a hammer mill to pass through 1 mm sieve. The ground samples were preserved in air tight container until required for chemical analysis. Samples were analyzed for organic matter (OM), ether extract (EE) and crude protein (CP) as per AOAC (2005). Neutral detergent fibre (NDF), acid detergent fibre (ADF), acid detergent lignin (ADL) content of the samples were estimated following the method of Van Soest et al. (1991) with the help of the concerned scientist of Eastern Regional Station of National Dairy Research Institute, Kalyani, West Bengal. The chemical analysis of feed items were determined and shown as follows

Chemical composition of feed items on % DM basis

Chemical composition (on % DM)	**Name of the feed items**			
	Local pig feed [Rice bran mixed with locally made *Choak* (rice bear) waste]	**Local grass** (*Axonopus compressus* (Swartz) P. Beauvois, Ess. Agrostogr.)	**Colocasia** (*Colocasia esculenta*)	**Taklai aiching** (*Commelina paludosa* Blume)
Organic matter (OM)	87.2	89.3	85.6	86.9
Crude protein (CP)	11.3	7.8	7.4	9.5

Ether extract (EE)	3.4	1.3	3.1	5.2
Neutral detergent fibre (NDF)	60.8	68.4	40.4	54.1
Acid detergent fibre (ADF)	35.8	32.7	18.8	18.9
Cellulose	28.2	28.2	16.1	15.4
Acid detergent lignin (ADL)	7.3	4.3	2.5	3.2

Adoption of integrated farming systems: Integrated farming system with Hampshire crossbred pigs is available at this centre.

Survey on market of pork production: Most of the farmers bring one/ two local, non-descript or crossbred piglets at the age of 2- 3 months from the market, while fattening of the animals is taken up to 10- 14 months before they are sold. A limited number of farmers prefer to breed their pigs and allow for piglet production.

Disposal pattern of farm waste, pig excreta etc/Establishment of biogas plant: Pig excreta, waste etc were collected from pig sty and stored in a separate manure pit. The stored pig manure was used in agricultural field. Pig urine and waste water were drained into drainage channel and then into a pit located at the rear side of each shed.

Extension programme with success story:

i) At the institute: Hands on training were imparted among the farmers. The training covered technical know-how of making pig shelter, pig farm managemental practices like cleaning with disinfectant solution, use of lime powder to kill the organisms, care of piglets for growth, care of growing animals, pregnant animals, feeding of concentrate feeds along with local feed stuffs, disease prevention strategies, first-aid treatment, record keeping and pig farm economics. Farmers from different districts were provided the information on pig production on their visit to pig farm.

ii) At the farmers' field: ICAR Research Complex, Tripura Centre located at Lembucherra, West Tripura, has been working since 2011 to build up the capacity of the tribal community through imparting formal as well as informal training, providing pig shelter, piglets and pig ration to the tribal men and women in disadvantaged tribal dominated 14 villages covering 6 districts (West Tripura, Khowai, Gomoti, South Tripura, Dhalai and North Tripura) of Tripura, a State in NEH region of India. To date, a total of 388 tribal people were benefited in terms of asset creation like pig house, availability of more than 750 quality piglets, pig ration, veterinary medicines, veterinary services and above all development of technological knowledge and skill. Since there is always a great demand of piglets in the markets and production of piglets and selling them after weaning is more profitable than the traditional rearing practice of fattening of pigs for one or more year. We implemented the idea of "piglet production farming system" as a technological intervention to increase the production and supply of the same and thus leading to improvement in the livelihood security of the tribal people. Few success stories have already been documented under TSP.

Salient achievement during the report period: Initiation of establishment of Mali pig breeding stock.

Distinguish visitors: Hon'ble Minister of State for Agriculture, Govt. of India, Shri Mohanbhai Kalyanjibhai Kundariya inaugurated the foundation stone of All India Coordinated Research Project (AICRP) on Pigs at ICAR Research Complex Livestock Farm, Tripura Centre, Lembucherra, West Tripura on 16th October 2015.

Mali piglets at the age of 3 month

Mali pigs at the age of 8 months

A Mali male pig is under training for the purpose of collecting semen

The Director, Animal Resource Development Department, Govt. of Tripura is visiting AICRP on pig farm

The farmers are imparted with hands on training on pig rearing and management at farm

Locally available bamboo made, low-cost pig shed at farmer's field after technical guidance and financial support from ICAR Research Complex for NEH region, Tripura Centre

KVK-GOALPARA, ICAR-NRC ON PIG

Assam is having highest pig population amongst India, yet has to import about 1 lakh number of pigs per year from other parts of the country to bridge the gap of demand and production. This is due to the fact that bulk of the pig population (around 75 percent) being poor non-descript type known for its slow growth and poor production. On the other hand, there is a dearth of availability of superior swine germplasm for the farmers of the region. The farmers used to rear the pig at zero to negligible inputs based on free-range, feeding agricultural by-products and kitchen waste which results to malnutrition, poor growth rate and piglet mortality.

Looking to high potential of piggery sector in Assam, the AICRP on Pig unit was sanctioned to Krishi Vigyan Kendra, Goalpara in current five year plan with the initial objective to conserve Doom pig of Assam.

Herd Dynamics:

Sl. No	Age (months)	Opening Balance			Addition			Deduction			Closing Balance		
		M	F	T	Births	transfer	Purchase	Death	Transfer	sold	M	F	T
1	Piglet (upto 42 days)	2	3	5	16	-	-	-	-	-	1	2	3
2	Grower (42 d – 5 m)	-	-	-	-	-	4	2	-	-	6	9	15
3	Finisher (5 - 8 m)	1	7	8	-	-	5	-	-		-	-	-
4	Adult	-	-	-	-	-	-	-	-	1	4	13	17
5	Total	3	10	13	16	-	9	2	-	1	11	24	35

Breeding strategy of the farm as approved:

As recommended by review meet the center was mandated to maintain Doom pigs of Assam for conservation purpose and characterize the germplasm.

Performance of animals:

Sl. No.	Traits/Characters	Mean ± SE (no. of observation)		
		M	F	Total
1	Litter size at birth (no.)	1.57±0.07	2.63±0.08	4.20±0.15
2	Litter weight at birth (kg)	1.62±0.06	1.74±0.07	3.36±0.13
3	Litter size at weaning (no.)	0.87±0.08	0.91±0.06	1.78±0.14
4	Litter weight at weaning (kg)	3.7±0.09	3.72±0.12	7.42±0.21
5	Avg. Individual weight at birth (kg)	0.68±0.04	0.64±0.08	1.32±0.12
6	Avg. Individual weight at weaning (kg)	2.90±0.06	2.77±0.12	5.67±0.18
7	Number of days for weaning (d)	45 days		
8	Pre weaning mortality rate (%)	30.67±1.21	22.46±1.13	53.13±2.34
9	Pre weaning growth rate (gm/d)	0.08±0.02	0.07±0.03	0.15±0.05
10	Post weaning mortality rate (%)	5.32±0.17	4.19±0.16	9.51±0.33
11	Post weaning growth rate (gm/d)	150.2±5.01	122±6.41	272.2±11.45
12	Overall growth rate (*upto 9 m*) (gm/d)	215.06±5.71	200.19±5.92	415.25±11.63
13	Body weight (Kg) 1 month 2 month 3 month 4 month 5 month	 1.42±0.03 3.27±0.12 8.85±0.67 15.08±.76 20.38±.89	 1.37±0.06 3.10±0.09 8.16±0.72 14.69±0.8 19.66±0.91	 2.79±0.09 6.37±0.21 17.01±1.39 29.77±1.56 40.04±1.80

	6 month	28.14±1.07	26.78±1.02	54.92±2.09
	7 month	35.23±1.85	33.42±1.71	68.65±3.56
	8 month	42.63±2.11	39.85±1.72	82.48±3.83
	9 month	50.28±2.45	47.71±2.21	97.99±4.66
	10 month (*if available*)	59.73±2.83	55.42±2.61	115.15±5.44

Lifetime production traits are being recorded

Specific managemental practice: Routine scientific managemental practice is being followed in the farm. Identification is done by ear tagging. Animals of this breed/variety are ferocious and difficult to handle.

Mortality parameter:

Genetic group wise and sex wise mortality rate:

Pre weaning mortality rate: zero

Post weaning mortality: 5.71%

Causes of mortality: Heat stroke

Measures to taken minimize mortality:

i. Managemental measures:

a. Spraying water in the body of pigs during hot weather

ii. Prophylactic measures:

a. Feeding of Increlac bolus® to the farrowed sow to increase milk production

Adoption of integrated farming systems: Integration of Pig –cum-Azolla was initiated at the KVK Campus.

Extension programme with success story:

i) At the institute: 4 nos. of training on scientific pig farming organised at the KVK Campus

A daylong training cum workshop on "Integrated Snail-Pig-Azolla farming" was held at the ICAR-NRC on Pig, Guwahati, Assam on 28th of October, 2015. A total of 45 animal farmers from Pacchim Dairong village, Gargara, Udalguri and Jayantipur participated in this programme. The programme described the detail package of practice for integrated pig framing with azolla and snail. The training program will help in further strengthening of integrated pig farming among the rural mass of the area.

ii) At the farmers' field: Popularized AI technology on pig at farmers' field. A village was adopted for upgraded piglet production. Till date 156 nos. of upgraded piglets produced in the adopted 'Paccim Dairong' village.

Salient achievement during the report period:

The adopted village i.e. Paschim Dairong which is named as '*Borah Gram'* (Pig Village) has extended full cooperation and 215 nos. of farm families residing in the village are taking full advantage of AI in pig. During the reporting period, 156 nos. of upgraded piglets produced which is first time in Goalpara district.

Scientific publications:

A bulletin on "Concept and Strategy for Establishment of Pig Seed Village" was published


Doom Pig at Temporary shed of AICRP on Pig

Doom Pig

Handling of pig

Installation of slaughter equipments in slaughter house at KVK campus

Training cum workshop on integrated Snail-Pig-Azolla farming

Temporary shed of pig under AICRP on Pig

Permanent shed under construction

ICAR RESEARCH COMPLEX FOR NEH REGION, BARAPANI

In North eastern region, pig husbandry is one of the major and important components, which accounts approximately 38% of the country's pig population. So pig farming has special significance and can play important role for improving socio-economic status of tribal farmers. Even though considerable pig population exists in the region, most of them are non-descript and is known for poor productivity. Non-availability of superior exotic germplasm is frequently cited as a major bottleneck in improving pig productivity in the region. Moreover, pig farming fits very well with integrated farming and also be complementary to intensive crop production programme. The AICRP center of ICAR Research Complex for NEH Region, Barapani, Shillong, Meghalaya was started in 2014-15.

Salient Achievement

As per technical programme, region has purchased 45 piglets (2-3 months) of 75% exotic inheritance (HampshireX Local) from AICRP on Pig from Khanapara centre and doing the research activities as per mandate in month of February, 2016. Weekly body weight is being taken. Effect of feeding in terms of locally available feed and standard concentrate feed is being recorded to determine effect on body weight gain and health parameters. Locally available feed resources like root crop (tapioca, sweet potato etc.), and other vegetable wastes like cabbage, collocassia etc. are using for developing economic ration for pig but still they are in infancy stage to clear out any conclusion.

Feeding strategies to mitigate climatic variability in weaned piglets

Three groups of Indigenous grower piglets just after weaning are selected for the experiment. Control group is fed solely with standard concentrate mixture. Rest experimental groups are fed with kitchen waste (60%) mixed with standard concentrate mixture (40%) where one group is treated with 7% molasses. Feeds are offered in the morning and residues are collected and weighed in the following morning. The body weight of animals is recorded at the beginning of the experiment and subsequently at fortnightly interval. Fortnightly record of weight gain and daily feed intake is taken. Blood samples are collected for estimation of cortisol, SOD, HSP etc.

The results of the study revealed that the group which is fed with 7% molasses have better growth rate (280g/d) as compared to control group (230g/d) and molasses may help in protecting the animals from climatic stress.

Management strategy to save orphan piglets on milk replacer/constituents

The present study was aimed to save orphan piglets on milk replacer/alternate high quality feed and its effect on piglet's mortality. A total of eight farrowing was distributed equally in to two group's viz. control group: with normal concentrate mixture without any supplementation; Treatment group: concentrate ration supplemented with cow milk and additional mineral-vitamins their diets. Assisted feeding was provided to piglets when it required during the experiment. The average litter size at birth in control and treatment groups was 8.25±0.47 and 7.50±0.64 which was not significant

to each other. The mortality of piglets (Percentage) was significantly ($P<0.01$) higher in non-supplemented group (31.20±6.97) than treatment group (9.47±3.22) this could be due to high quality feed requirement during pre-weaning period required for survival of piglets. Milk replacer comes in ready to serve form in market however it can be prepared at farm by adding milk or its constituents for enhancing protein quality. The practice of feeding milk replacer could be very economical and profitable to save piglets as death of sow may have very high mortality on piglets due to devoid of proper feeding. Ready to serve milk replacer could also serve better options for raising orphan piglets at pig farm.

	
Low cost-deep litter pig housing model with water conservation model	Pork cut

Mega-Seed Project on Pig

NAME OF THE CENTRE AND INCHARGE

Mega-seed Project on Pig		Name of Incharge
Old centers		
1.	College of Veterinary Science, Assam Agricultural University Khanapara, Guwahati, Assam-781022	Dr. D. Kalita
2.	College of Veterinary Science, Birsa Agricultural University, Kanke, Ranchi, Jharkand -834006	Dr. L. B. Singh
3.	ICAR-RC for NEH region Jharnapani, Medziphema, Dimapur, Nagaland 797 106	Dr. Mahak Singh
4.	A.H. & Vety. Farm Complex, Veterinary Department, Govt of Mizoram Selesih, Aizawl, Mizoram – 796014	Dr. R. Thanghuama
5.	Kerala Veterinary and Animal Science University, Pookode, Kerala-680651	Dr. A.P. Usha
6.	Animal Resource Development Department, Govt. of Tripura, Agartala, Tripura-799006	Dr. Subir Das
7.	State Animal Husbandry and Veterinary Department, Govt. of Arunachal Pradesh, Namsai, Arunachal Pradesh-791110	Dr. H.K. Gogoi
8.	Chhattisgarh Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh-491001	Dr. A. K. Tiwari

INTRODUCTION

1. Brief history:

Rapid urbanization and increased population pressure has resulted in increased demand for quality pork production. The major constraints like non-availability of superior quality seed stock, low-cost feed ingredient, imbalanced ration at reasonable price, unscientific management or inadequate knowledge, lack of financial support as well as marketing channel etc. are hampering the growth and development of piggery sector. But a sizeable number of unemployed educated youth have taken up this venture as means of their livelihood/occupation or as subsidiary income generation. This has opened up a possibility of development of piggery sector of the country.

The mega-seed project on pig was launched by ICAR in 2008. National Research Centre on Pig is coordinating the Mega-seed Project on Pig. The project is having four centers as follows:

- Assam Agricultural University, Khanapara
- Birsa Agricultural University, Ranchi
- ICAR RC for NEH, Nagaland Centre, Medziphema
- State Veterinary Department, Aizawl, Mizoram

Subsequently, looking at the demand of quality pig germplasm four more centres have been sanctioned in current five year plan and the technical programme of this new centre was finalized in 2015.

The project was launched with an objective to produce and supply quality swine germplasm to the local farmers.

2. Objectives:

- Production of at least 900 piglets by each of the centre to target supply of quality pig germplasm covering 300 farm families per annum
- Capacity building in institutes to produce targeted quality piglets
- Initiating gender friendly pro-poor growth through improved pig husbandry

3. Target Fixed:

- Production of upgraded variety of quality piglets and increased farm income through technology lead growth

4. Activity assigned and target fixed
General:

1. Impact assessment along with economics of production at farmers' field need to be carried out.
2. Number of farm families/ beneficiaries should be included in the report.
3. The centres may adopt AI technology as a part of breeding programme.

4. Changing of PI of the centres should be done in consultation of Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, however, scientists from other discipline may be associated with the project as Co-PI.
5. Unless significant progress is made by new centers, the project of individual center will be liable for closing based on the recommendation of review meet.
6. Incharge of different centers should put efforts to increase the piglet production as per technical recommendation.
7. All the new Mega Seed Project on Pig centres should initiate the programme for piglet production with the following breeds:

- Pig Breeding Farm, Namsai, State Animal Husbandry and Veterinary Department, Govt. of Arunachal Pradesh - LWY X Desi
- Kerala Veterinary and Animal Science University, Pookode, Kerala - 75% LWY X Desi crossbred
- Pig Breeding Farm, Animal Resource Development Department, Govt. of Tripura, Agartala, Tripura - LWY and Landrace
- Chhattisgarh Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh - T&D crossbred

Technical programme:

1. All the centers should maintain sufficient number of breeding stock of specific crossbred germplasm as indicated in centre wise recommendation so as to produce targeted number of piglets.
2. Maximum number of farm families need to be targeted for distribution of piglets.

Centre wise recommendation:

1. Mega seed on pig, Assam Agricultural University, Khanapara:

- The centre need to maintain only one crossbred population *i.e.* 50% Hampshire crossbred pigs with a targeted production of 1500 piglets during the period 2015-16.

2. Mega seed on pig, Birsa Agricultural University, Ranchi:

- The centre need to maintain TxD crossess with a targeted production of 1000 piglets during the period 2015-16.

3. Mega seed on pig, ICAR RC for NEH, Nagaland:

- The centre should maintain only one crossbred (Ghungroo X Hampshire 50% exotic inheritance) pigs with a targeted production of 1000 piglets during the period 2015-16.

4. Mega seed on pig, Selesih, A.H. &Veterinary Department, Government of Mizoram:

Necessary steps need to be taken to achieve a production of 900 piglets/annum of Large White Yorkshire. The centers should send the report of piglet production for the year 2015-16 to the coordinating unit, latest by 31st March, 2016 for further review.

5. Action point discussed in Review Meet of 'All India Coordinated Research Project on Pig' and "Mega Seed Project on Pig" held at NASC Complex, Pusa, New Delhi September, 2015

AAU, Khanapara

Recommendation	Action Taken
General	
1. Impact assessment along with economics of production at farmers' field need to be carried out.	1. Initiated
2. Number of farm families/ beneficiaries should be included in the report.	2. Included
3. The centres may adopt AI technology as a part of breeding programme.	3. Initiated
4. Changing of PI of the centres should be done in consultation of Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, however, scientists from other discipline may be associated with the project as Co-PI.	4. Noted
5. Unless significant progress is made by new centers, the project of individual center will be liable for closing based on the recommendation of review meet.	5. Noted
6. Incharge of different centers should put efforts to increase the piglet production as per technical recommendation.	6. Noted
Centre wise recommendation	
1. The centre needs to maintain only one crossbred population i.e. 50% Hampshire crossbred pigs with a targeted production of 1500 piglets during 2015-16.	1. Produced 1404 piglets

BAU, Ranchi

Recommendation	Action Taken
General	
1. Impact assessment along with economics of production at farmers' field need to be carried out.	1. Not done due to lack of fund
2. Number of farm families/ beneficiaries should be included in the report.	2. Included
3. The centres may adopt AI technology as a part of breeding programme.	3. Not done
4. Changing of PI of the centres should be done in consultation of Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, however, scientists from other discipline may be associated with the project as Co-PI.	4. Noted
5. Unless significant progress is made by new centers, the project of individual center will be liable for closing based on the recommendation of review meet.	5. Noted
6. Incharge of different centers should put efforts to increase the piglet production as per technical recommendation.	6. Limited space
Centre wise recommendation	
1. The centre needs to maintain TxD crossess with a targeted production of 1000 piglets during the period 2015-16.	1. Not done due to lack of space- produced 681 piglets

ICAR RC for NEH, Nagaland Centre, Medziphema

Recommendation	Action Taken
General	
1. Impact assessment along with economics of production at farmers' field need to be carried out.	1. Initiated
2. Number of farm families/ beneficiaries should be included in the report.	2. Included
3. The centres may adopt AI technology as a part of breeding programme.	3. Following
4. Changing of PI of the centres should be done in consultation of Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, however, scientists from other discipline may be associated with the project as Co-PI.	4. Noted
5. Unless significant progress is made by new centers, the project of individual center will be liable for closing based on the recommendation of review meet.	5. Noted
6. Incharge of different centers should put efforts to increase the piglet production as per technical recommendation.	6. Noted
Centre wise recommendation	
1. The centre should maintain only one crossbred (Ghungroo X Hampshire 50% exotic inheritance) pigs with a targeted production of 1000 piglets during the period 2015-16.	1. Produced 859 piglets against the target fixed

Veterinary Department, Government of Mizoram, Aizawl

Recommendation	Action Taken
General	
1. Impact assessment along with economics of production at farmers' field need to be carried out.	1. Initiated
2. Number of farm families/ beneficiaries should be included in the report.	2. Not Included
3. The centres may adopt AI technology as a part of breeding programme.	3. Following
4. Changing of PI of the centres should be done in consultation of Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, however, scientists from other discipline may be associated with the project as Co-PI.	4. Noted
5. Unless significant progress is made by new centers, the project of individual center will be liable for closing based on the recommendation of review meet.	5. Noted
6. Incharge of different centers should put efforts to increase the piglet production as per technical recommendation.	6. Noted
Centre wise recommendation	
1. Necessary steps need to be taken to achieve a production of 900 piglets/annum of Large White Yorkshire. The centers should send the report of piglet production for the year 2015-16 to the coordinating unit, latest by 31st March, 2016 for further review.	1. Produced 614 piglets against the target fixed

New Centers:

Targets	KVASU, Kerala	ARDD, Tripura	CKVV, Durg	AH &Vety., Arunachal Pr.
Submission of AUC	Yes	No	No	No
Final Report submission	Yes	Yes	No	No
Breed maintained	LWY cross	LWY, Landrace	T&D (Not recommended breeds LWY, Hampshire, Krishna Shire)	
Construction work		Initiated		
Piglet production	252	14	0	

5. Salient Achievements of the Mega-seed till Date:

Under this project improved variety of piglets were produced and distributed to the farmers. A total of 1388, 2268, 2877, 2851, 3664 and 3824 nos. of improved variety of piglets were produced for distribution in 2010-11, 2011-12 2012-13, 2013-14 2014-15 and 2015-16, respectively.

ASSAM AGRICULTURAL UNIVERSITY, KHANAPARA, GUWAHATI

The Indian Council of Agricultural Research (ICAR), Govt. of India has sanctioned Mega Seed Project on Pig to the Assam Agricultural University, Guwahati in 2008. Accordingly, the activity of the project was started initially with four breeding boars and 13 Sows of 50%H genetic group of pigs purchased from the AICRP on Pig as one of the breeding / foundation stock under the project during 2008. The three genetic groups *viz.* 50%Hampshire, Ghungroo Cross and T&D are maintained under the Mega Seed Project on Pig. The genetic groups are quite popular among the farmers and there is a demand for quality piglets.

Herd dynamics

Age in months	Opening balance as on 01. 04. 2015 of the financial year under report		Total	Closing balance as on 31.03.2016 of the financial year under report		Total
	Male	Female		Male	Female	
0 - 6 wk	94	87	181	121	132	253
6wk – 2 m	43	75	118	50	54	104
5 – 8 m	7	14	21	12	42	54
Over 8 m	18	92	110	11	87	98
TOTAL	162	268	**430**	194	315	**509**

Stock Continuity:

Sex	Stock as on 1.4.15	Addition			Deletion					Stock as on 31.3.16
		Birth	Purchase	Total	Sale	Slaughter	Destroyed	Died	Total	
Male	162	708	-	870	637	8	-	31	696	194
Female	268	696	-	964	607	4	-	38	649	315
Total	430	1404	-	1834	1244	12	-	69	1325	**509**

Average Litter size at birth and at weaning

Genetic Group	Number of Litter	Litter Size at Birth			Litter Size at Weaning		
		Male	Female	Total	Male	Female	Total
50%H	182	3.89±0.09	3.82±0.10	7.71±0.11	3.76±0.10	3.74±0.10	7.51±0.13

Pre weaning and Post weaning mortality

Genetic Group	Pre weaning mortality (%)(0-42 days)	Grower Mortality (%)(42d-5 m)	Finisher (%) (5 m – 8 m)	Adult Mortality (%) (over 8m)
50%H	2.40 (38)	1.32 (22)	0.36(2)	1.08 (7)

Within parenthesis are the number of died animal

Number of piglets produced during the reporting period: April 2015-March'2016

	Total no. of piglets born			**Total no. of piglets died**			**Total no. of live piglets produced**		
	M	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**
1st quarter	112	109	231	4	3	7			
2nd quarter	235	228	463	12	12	24			
3rd quarter	162	144	306	6	8	14			
4th quarter	199	215	414	6	8	14			
Annual	**708**	**696**	**1404**	**28**	**31**	**59**			

Number of piglets sold during the reporting period:

	Total no. of live piglets Produced			Total no. of piglets Sold			Amount realized (Rupees)
	M	**F**	**T**	**M**	**F**	**T**	
1st quarter	108	106	214	117	102	219	**Rs.38, 07,225/-***
2nd quarter	223	216	439	93	99	192	
3rd quarter	156	136	292	207	156	363	
4th quarter	193	207	400	143	144	287	
Annual	**680**	**665**	**1345**	**560**	**501**	**1061**	

* Total receipt included from piglets and adults.

Weaned piglets ready for sale

Sow with piglets

Piglets sold to the farmers, Mangaldoi

Exposure visit of progressive farmers, Meghalaya

Semen collection at ICAR-MSP on Pig, AAU

AI in collaboration with Dept. of ARGO, C.V.Sc, AAU

Private farm at Balipara, Sonitpur

Awareness programme at Dhekidol, Balipara, Sonitpur

BIRSA AGRICULTURAL UNIVERSITY, RANCHI, JHARKHAND

Jharkhand is one of the leading states in the country where piggery has been accepted by rural people as a remunerative enterprise. The farmers have accepted the NATP Mission mode on pigs in past with great enthusiasm which provided tremendous employment opportunity to local people through integrated piggery development programme in limited area mostly in and around Ranchi. Now a day's farmers are getting benefit of Mega seed project. MSP on pig supplying improved variety of pig T&D to the farmers and gradually farmers are interested to rear this variety because of 5-6 times benefit in comparison to desi pigs under traditional management conditions resulted into progressive increases in the number of pig breeders. Approximate more than 300 2nd line pig breeder has been developed which are supplying improved germplasm of pig to the neighboring farmers. But still the centre is not able to fulfill the 100% demand of piglets in Jharkhand. Presently, approx 60% population of pig in Jharkhand are of indigenous/local type. But gradually we shall be able to replace our local pig with improved variety. Success of piggery development programmes in target districts depends on regular supply of "T&D" pigs to farmers because desi pigs of the area can safely be replaced by identical colour "T&D" pigs with significant increase in growth rate and reproductive performances. Demands for "T&D" pigs are increasing day by day.

Herd dynamics:

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1.	Piglet (up to 42 d)	62	681		34		547	54
2.	Grower (42d-5 m)	25	-		18		09	25
3.	Finisher (5- 8 m)	05	-		01			52
4.	Adult	02			-			14
4.	Breeding Female	66	-		05		09	72
5.	Boar	14	-		02		12	22
Grand total		**174**	**681**		**60**		**568**	**229**

Number of piglets produced during the reporting period

	Total no. of piglets born			Total no. of piglets died			Total no. of piglets produced		
	M	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**
1st quarter	105	78	183	2	5	7	103	73	176
2nd quarter	91	114	205	4	4	8	87	110	197
3rd quarter	112	99	211	6	9	15	196	90	196
4th quarter	44	38	82	2	2	4	42	36	78
Annual	352	329	681	14	20	34	368	309	647

Number of piglets sold during the reporting period:

	Total no. of piglets produced			Total no. of piglets sold			Amount realized (Rupees)
	M	**F**	**T**	**M**	**F**	**T**	
1st quarter	103	73	176	40	22	62	109308.00
2nd quarter	87	110	197	99	70	169	295179.00
3rd quarter	106	90	196	67	84	151	304139.00
4th quarter	42	36	78	99	87	188	395120.00
Annual	**338**	**309**	**647**	**305**	**263**	**568**	**1103746.00**

Success Story: Mr. Kartik, A 28-year-old married, educated person. He is residing with his family including father, mother, brother, wife and children in a small house made of soil and bamboo built in

the village, Khunti district of the state of Jharkhand. They have little land for rain-fed agriculture which was not sufficient to meet requirement of huge family. Once, he was inspired from one of his friend doing pig farming on small scale. Accordingly, he contacted Pig Breeding Farm of Ranchi Veterinary College for training and attended 10 days in 2006. After getting training he decided to start his own pig farm on small scale. Kartik raised his small farm in his backyard with thirteen pigs (T&D) purchased from Ranchi Veterinary College in the year 2007. He kept the pigs on household kitchen collected from the nearby hotels and forages. After getting some money by selling the piglets of first farrowing he prepared ten pens for pigs by investing Rs. 40,000 in year 2008. In the year 2014, he constructed twenty pens by spending Rs. 4,00,000/- for maintaining large herd size. After completing the construction he is maintaining approx 70-80 adult pigs at a time and every 2-3 months he is selling the piglets/pigs. After construction of new farm and an auto on loan basis he starts earning approx Rs. 6.0-7.0 lakhs every year. He has paid the loan of auto. Now there is huge market and the unit becomes a resource centre of improved quality of pig. Now he is expending full time in pig farming and promoting the nearby youths for pig farming. His brother has also look after the pig farm alary with he started a poultry and dairy farm to meet the local demand. He is now living a much more comfortable life than ever before. He has bought a new bike and pays the school fees of his school-going children regularly. His future plan is to spend his existing farm in village nearby river for maintaining 100-200 adult pigs. He is also doing now agriculture in better way due to having enough money for investment, irrigation, fertilizer etc. He has sufficient money for her future expansion.

Economic outcome of the interventions

Year	No. of pigs adult pigs maintained	Cost of piglet (Rs)	Construction of pens (Rs) etc	Cost of feed/ fuel (Rs)	Cost of medicine etc (Rs)	Income from selling of piglets/pigs (Rs)	Net Income per year (Rs)
2007	13 piglets	20,000		1000		1,00,000	79,000
2008	20	-	30,000	5000	1000	2,10,000	1,74,000
2009	20	-	2009 (loan)	8000	1000	2,60,000	2,51,000
2010	25			15000	2500	400000	362500
2011	50		40,000	18,000	3000	5,20,000	4,59,000
2012	50	-	-	20000	5000	6,50,000	6,25,000
2013	60	-	-	22,000	6000	6,80,000	6,52,000
2014	70	-	-	20000	5000	700000	650000
2015	90		-	30,000	6000	7,50,000	7,14,000
2016	90		-	60,000	8000	8,50,000	7,82,000


Animals at farmers' field

ICAR RC FOR NEH, MEDZIPHEMA, NAGALAND

Nagaland, one of the hilly states of Eastern Himalaya, is inhabited by tribal communities which are mostly non-vegetarian and hence the demand for animal protein is much more compared to other parts of the country. Pig is one of the most important livestock which play an important role in improving the socio-economic status of the tribal and weaker section of the society. Though among various livestock, pig alone accounts for 48.4% of the total livestock population in Nagaland, there still exists a wide gap between the demand and availability of pork mainly due to rearing of non-descript local pigs which have very poor growth and production. Moreover, the majority of the farmers are fattener farmers. Therefore, the need of the hour is to facilitate a shift in production pattern by way of introducing quality pig germplasm with superior genetic merit and production potential. Keeping this fact in view, an attempt has been made to propagate quality pig germplasm under "Mega Seed Project on Pig" at the centre w.e.f November, 2008. In last four years, under the Mega Seed Project on pig, a total of 2399 no. of piglets were distributed for promotion of breeding in Nagaland, Assam, Manipur and Arunachal Pradesh. Many entrepreneurs have come forward to take up pig breeding and have generated self employment. Under the Mega seed program, ICAR Research Complex has conducted awareness campaign, training cum demonstration for promotion of quality germplasm and scientific rearing practices of pig for better income and sustainable production.

Herd dynamics:

Sl. No.	Categories	Opening Balance	Additions			Disposal		Closing balance
			Birth	Transfer	Death	Transfer	Sold	
1	Piglets (up to 42 d)	223	859	Nil	391	23	559	109
2	Grower (42 d – 5 m)	14	13	Nil	Nil	Nil	22	5
3	Finisher(5 m- 8 m)	10	Nil	Nil	Nil	Nil	4	6
4	Breeding female	63	Nil	10	5	Nil	10	58
5	Boar	8	Nil	Nil	Nil	Nil	3	5
Grand Total		318	872	10	396	23	598	183

Genetic constitution breeding stock maintained at the centre as on 31.03.2015

Breed	Age group	Male	Female	Total
Ghungroo	Breeding female	1	12	13
Hampshire	Breeding female	1	7	8
Hampshire Cross	Breeding female	2	19	21
Large Black	Breeding female	1	20	21
Total		5	58	63

Number of piglets produced during the reporting period:

Quarter	Total no. of piglets Farrowed			Total no. of piglets died			Total piglets produced		
	M	F	T	M	F	T	M	F	T
1st	105	107	212	36	50	86	69	57	126
2nd	137	127	264	43	54	97	94	73	167
3rd	99	93	192	33	43	76	66	50	116
4th	95	96	191	56	76	132	39	20	59
Annual	**436**	**423**	**859**	**168**	**223**	**391**	**268**	**200**	**468**

Number of piglets/adult animal sold during the reporting period:

Quarters	Total no. of piglets produced			Total no. of piglets sold.			Total no. of adult sold			Amount realized (Rs)
	M	F	T	M	F	T	M	F	T	
1st	69	57	126	72	115	187	3	3	6	
2nd	94	73	167	69	83	152	Nil	7	7	
3rd	66	50	116	52	57	109	Nil	Nil	Nil	
4th	39	20	59	51	60	111	Nil	Nil	Nil	
Annual	**268**	**200**	**468**	**244**	**315**	**559**	**3**	**10**	**13**	**16,14,700**

Other information: Artificial insemination in pig is introduced and popularized in Nagaland to enhance the production of piglets from superior breeding stock available under Mega Seed Project on Pig. The performance appraisal of artificial insemination program from adopted organized farms and farmer at field level were conducted. The conception rate was recorded to be 58.23% in the MSP farm following double insemination with average litter size 8.13. The low conception rate could be attributed to outbreaks of FMD among the parent stock. However, in field condition the conception rate was increased from previous years (74.5 %) with litter size averaging 7.15. Farmers' visits to the farm were conducted by different KVKs at the MSP farm for creating awareness about improved techniques of breeding and management.

Performance of AI conducted at farm and field level

Location of AI adopted farm	No. of insemination	No. of animals conceived	Conception rate	Service per conception	Litter size
Mega Seed Project farm	79	46	58.23	1.72	8.13(3-12)
Dimapur town	61	48	78.69	1.27	6.89(4-11)
Kohima	54	41	75.93	1.32	8.31(5-10)
AICRP on Pig, SASRD	20	14	70	1.43	6.28(5-11)
Molvom	18	12	66.67	1.5	5.66(4-9)
Jharnapani	27	20	74.07	1.35	6.9(4-12)
Kukidolong	10	6	60	1.67	7.16(5-9)
Ruzephema	6	4	66.67	1.5	8.25(6-9)
Medziphema Town	4	4	100	1	7.75(5-9)
Total under field condition	200	149	74.5	1.34	7.15(3-12)

New Boar under training

Progressive woman farmer from Jotsoma village carrying out AI in her backyard piggery

VETERINARY DEPARTMENT, GOVT. OF MIZORAM, AIZWAL

Pig rearing is one of the oldest and most common source of subsidiary income for the people of Mizoram in the past and present. Previously, pigs kept by our forefathers are indigenous type and were very small in size. However, since the department of A.H & Vety., Govt. of Mizoram was established as separate department, exotic and improved breeds were introduced in Mizoram and, now-a-days, Large White Yorkshire is one of the most common breed throughout Mizoram.

According to the Reports of Integrated Sample Survey for the Estimation of Major Livestock Products in 2014 – 2015, 7038 tonnes of Pork (Pig Meat) was produced in Mizoram, which accounts for 56.2% of total meat production and consumed (12525.4 tonnes) in Mizoram. This report clearly highlights and shows that Pork Production (and consumption) is higher than any other meat production. In view of this scenario of meat production especially pork in Mizoram, the ICAR-Mega Seed Project on Pig was established since 2009 (29th March) in Mizoram with the main objective of production and dissemination of 900 Large White Yorkshire piglets per year in Mizoram. Although the target for piglet production is not yet achieved so far, we are expecting to achieved the target in the near future *i.e* within two to three years or even earlier.

Herd Dynamics

Sl. No.	Categories	Opening Balance	Addition			Disposal		Closing Balance
			Birth	Transfer	Death	Transfer	Sold	
1.	Piglet (upto 42 d)	82	614	-	55	61	487	93
2.	Grower (43 d – 5m)	10	-	61	26	23	17	5
3.	Finisher (5 – 8m)	22	-	23	-	7	-	38
4.	Breeding Female	41	-	7	1	-	5	42
5.	Boar	1	-	-	-	-	-	1
Grand Total		**156**	**614**	**91**	**82**	**91**	**509**	**179**

Numbers of Piglet produced during the reporting period:

Sl. No.		Total no. of piglet born			Total no. of piglet died			Total no. of piglet produced		
		M	F	T	M	F	T	M	F	T
1.	1st quarter	64	71	135	4	7	11	60	64	124
2.	2nd quarter	16	23	39	6	5	11	10	18	28
3.	3rd quarter	65	62	127	4	6	10	61	56	117
4.	4th quarter	156	157	313	5	9	14	151	148	299
Annual		**301**	**313**	**614**	**19**	**27**	**46**	**282**	**286**	**568**

Numbers of Piglet sold during the reporting period:

Sl. No.		Total no. of piglet produced			Total no. of piglet sold			Amount realized (Rs.)
		M	F	T	M	F	T	
1.	1st quarter	60	64	124	36	30	66	Rs. 1,98,100.00
2.	2nd quarter	10	18	28	25	19	44	Rs. 1,32,000.00
3.	3rd quarter	61	56	117	51	49	100	Rs. 3,01,100.00
4.	4th quarter	151	148	299	148	146	294	Rs. 8,82,000.00
Annual		**282**	**286**	**568**	**260**	**244**	**504**	**Rs. 15,13,200.00**

Constrains faced during the report year: The after-effect of PRRS outbreak in the State: As we have already reported earlier PRRS outbreak occurred in the Mega Seed Farm, Selesih and other areas in Mizoram during 2013-2014. Although, most of the positive pigs were culled, piglet production is tremendously affected and regeneration of the parental stock also takes time. Thereafter, remnants of the after-effect of PRRS outbreak hindered the production of piglets to the level of 900 piglets per year as targeted. However, piglet production in the reporting year is increasing from 362 nos. (in 2015-15) to 568 nos. (in 2015-16). This shows that, the trend of piglet production in the Mega Seed Project on Pig, Selesih, Mizoram Centre is upward and promising.

Success story of beneficiaries:

Majority of beneficiaries reported that they are successful and profit from their Pigs as expected. 504 piglets were sold to 158 beneficiaries. Most of the beneficiaries (farmers) purchasing piglets from our Mega Seed Farm reported their success and no untoward report is heard from any farmers. Here, among many success farmers/beneficiaries, we will highlight the success story of four as exemplary stories.

(i) Name of beneficiary : Lalngaii
Address : Ramhlun Venglai, Aizawl District.
Date of purchase : 9.4.2015
Nos. of animal purchased : 2 nos. (1 male & 1 female).
Purposed : Breeding.

Mrs. Lalngaii purchased 2 nos. of piglets, 1 male and 1 female for breeding purpose. She had been very successful and could get 9 nos. piglets at weaning. She had informed us that she had already earned over Rs.40,000/- from selling her piglets. She had also informed us that her boar had mated 28 Sows during November, 2015 to March, 2016 and earned Rs.1,000/- per service. Now, her Sow is in 1st trimester of pregnancy for next farrowing.

(ii) Name of beneficiary : James
Address : Chanmari West, Aizawl District.
Date of purchase : 19.5.2015
Nos. of animal purchased : 5 + 10 piglets.
Purposed : Fattener.

Mr. James at the beginning purchased 5 nos. of piglets for fattener from Mega Seed Farm, Selesih. He earned over Rupees One Lakh by selling 5 nos. of his fattener. He extended his farm by purchasing another 10 piglets from our farm and at present, his family is depending on pig farming.

(iii) Name of beneficiary : K. Vanlalchhuanga
Address : Reiek, Aizawl District.
Date of purchased : 8.6.2015
Nos. of animal purchase : 3 nos. of male piglets.
Purposed : Breeding.

Mr. K. Vanlalchhuanga purchased 3 nos. of male piglets from Mega Seed Farm, Selesih and he is the one who introduced Large White Yorkshire in this particular village. He reported that his monthly income are mainly from his boar service. At present, he is making a good profit from his boar service charge and spread his boar line in his region.

(iv) Name of beneficiary : C.B Lailiankhuma
Address : Bethlehem, Aizawl District.
Date of purchased : 10.6.2015
Nos. of animal purchase : 5 nos.
Purposed : Breeding and fattening.

Mr. C.B Lailiankhuma purchased 2 nos. of piglets (1 male & 1 female) for breeding purpose and 3 nos. of piglets for fatteners. He reported that he had sold his 3 nos. of fatteners on January, 2016 and earned over Rs.60,000/-. His Sow farrowed on March, 2016 with a litter size of 9 piglets. He also earned Rs.16,000/- from his boar service charge. He also reported that he is planning to extend his farm with a larger number of pig.

Mega seed Farm

Private farm

KERALA VETERINARY AND ANIMAL SCIENCE UNIVERSITY, MANNUTHY CENTRE, KERALA

The Mega seed Project on Pigs was initiated in this Centre on 19-02-2015. In order to fulfil the technical programme of the project 21 Males and 66 Females are maintained as the breeding stock. As per the technical programme foundation stocks of indigenous pigs was established in the Centre and were used for cross breeding with Large White Yorkshire to evolve 75% Cross bred progenies.

Herd dynamics:

Sl. No	Categories	Opening balance	Additions			Disposals		Closing balance
			Birth	Transfers	Purchased	Mortality	Sold	
1	Piglet (up to 42 days)							60
2	Grower (42 d-5 m)						147	30
3	Finisher (5 - 8 m)							
4	Breeding female	42			24			66
5	Boar	10			11			21
	Grand total	52	252		35	15	147	177

Number of piglets produced during the reporting period:

	Total no. of piglets born			Total no. of piglets died			Total no. of piglets produced		
	M	F	T	M	F	T	M	F	T
1st quarter									
2nd quarter	31	37	68		1	1	31	36	67
3rd quarter	42	46	88	2	3	5	40	43	83
4th quarter	49	47	96	4	5	9	45	42	87
Annual	122	130	252	6	9	15	116	121	237

Number of piglets sold during the reporting period:

	Total no. of piglets produced			Total no. of piglets sold			Amount realized (Rupees)
	M	F	T	M	F	T	
1st quarter							
2nd quarter	**31**	**36**	**67**				
3rd quarter	**40**	**43**	**83**	**19**	**15**	**34**	**39,000.00**
4th quarter	**45**	**42**	**87**	**57**	**56**	**113**	**3,28,850.00**
Annual	**116**	**121**	**237**	**76**	**71**	**147**	**3,67,850.00**

Success story:

The centre provides technical support and on farm training to progressive pig farmers in different aspects of farming such as breeding, nutrition, management, waste disposal and other problems

Fattening Unit

Name of Livestock Keeper: Mr. Harison K P, Kalapurayil House, South Kondazhy P O, PIN 679106, Thrissur, Kerala (Phone: 09946412370): Mr. Harison K P expanded his piggery unit from 2015 after attending training at AICRP Mannuthy on October 2015. Now, he owns 300 pigs and earns a good income of about Rs.30,000/month through the sale of finisher pigs. He is also rearing breeding stock from which he is expecting more income.

	
Pigs at farmers' field	AI in pigs using catheter holder
	
Cross Bred Pigs	AI Laboratory

ANIMAL RESOURCE DEVELOPMENT DEPARTMENT, GOVT. OF TRIPURA, AGARTALA

ICAR, Govt. of India has approved establishment of one unit of Mega Seed Project on Pig Tripura. Accordingly, it was approved by the Government to declare Piggery unit of Composite Livestock Farm, Devipur, Sepahijala district as co-operating center from Tripura state under Mega Seed Project on Pig during 12th plan period. Beside this, as prerequisite, a MoU was signed between Director of ARDD, Govt. of Tripura and Director, NRC on Pig, ICAR, Rani as per Govt. approval. Exotic Pig Breeding Farm at CLF Devipur was established in the year 1998-99. First batch of exotic piglets was imported from outside the country. Total area of the pig breeding farm is 25 acre.

Herd dynamics:

Number of piglets produced during the reporting period

	Total no. of piglets born			Total no. of piglets died			Total no. of piglets produced		
	M	F	T	M	F	T	M	F	T
1st quarter	-	-	-	-	-	-	-	-	-
2nd quarter	-	-	-	-	-	-	-	-	-
3rd quarter	-	-	-	-	-	-	-	-	-
4th quarter	6	8	14	-	-	-	6	8	14
Annual	6	8	14				6	8	14

Number of piglets sold during the reporting period:

	Total no. of piglets produced			Total no. of piglets sold			Amount realized (Rupees)
	M	F	T	M	F	T	
1st quarter	-	-	-	-	-	-	
2nd quarter	-	-	-	-	-	-	
3rd quarter	-	-	-	-	-	-	
4th quarter	6	8	14	-	-	-	
Annual	6	8	14	-	-	-	

Animals of Mega Seed on pig shed in ARDD, Tripura

Mega Seed on pig shed in ARDD, Tripura

CHHATTISGARH KAMDHENU VISHWAVIDYALAYA, DURG

The Mega-seed project has been started at January 2015 at this center .The parent stock of 11 sows and 5 boars have been procured and the production of piglets from these parent stocks will possibly be started at the end of this year. The renovation of pig shed is in progress in that the separate feed storage room will be prepared for feed storage.

Herd dynamics

S. No.	Genetic group / Variety	Age	Sex	Numbers
1.	Large white Yorkshire	8	Male	1
2.	Hampshire	8	Male	1
3.	Krishna shire	8	Female	2
4.	Large white Yorkshire	8	Female	2
5.	T&D	6	Male	3
6.	T&D	6	Female	7
	Total			16

Number of piglets produced during the reporting period: NIL
Number of piglets sold during the reporting period: NIL

Constraints faced:

1. The budget allocated for the procurement of livestock to the centre is insufficient to achieve the target of the project (production of 1000 piglets /year).
2. For production of 1000 piglets per year the parent stock should be large (approximately 100 sows and 30 boars).
3. The project was started at January 2015 so there are so many constraints like infrastructure, man power and other facilities and it takes time of near about a year for complete establishment.
4. The biggest constraint is the procurement of adult parent stock from the other established center. They provide the piglets and it is to be is procured and it is being prepared for the parent stock and it takes more than a year to get piglets from these stocks.

Renovation of the shed is under process

T & D sows procured from Ranchi Veterinary College

Three boars of T & D breed obtained from the RVC, Kanke

Large white York shire sows procured from State Govt. Chhattisgarh

STATE ANIMAL HUSBANDRY AND VETERINARY DEPARTMENT, GOVT. OF ARUNACHAL PRADESH

Report not submitted