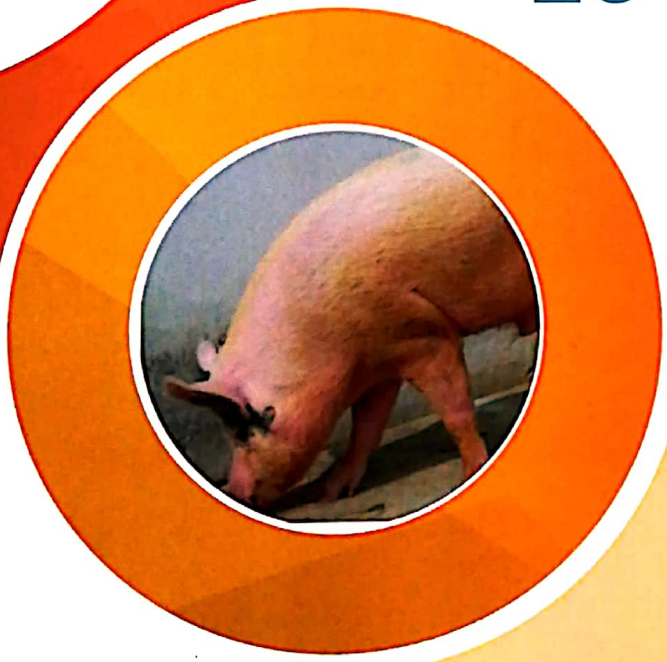
ANNUAL REPORT

AICRP ON PIG & MEGA-SEED PROJECT ON PIG

2018-19



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

ICAR-NATIONAL RESEARCH CENTRE ON PIG
INDIAN COUNCIL OF AGRICULTURAL RESEARCH
RANI, GUWAHATI-781131

Annual Report (2018-2019)
AICRP on Pig
&
Mega Seed Project on Pig

भाकृअनुप
ICAR

राष्ट्रीय सुकर अनुसन्धान केन्द्र
NATIONAL RESEARCH CENTRE ON PIG
RANI GUWAHATI ASSAM

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

Annual Report (2018-2019)
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ICAR-National Research Centre on Pig, Rani, Guwahati, Assam

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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 लानद्रस 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। 01.04.2017 से एआईसीआरपी के निम्नलिखित केंद्र कार्य कर रहें हैं-

- असम कृषि विश्वविद्यालय, खानापाड़ा, गुवाहाटी।
- 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, मेड्ज़ीफेमा
- 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, बारापानी, शिलांग, मेघालय के लिए आईसीएआर अनुसंधान परिसर
- गुरू अंगद देव पशु चिकित्सा और पशु विज्ञान विश्वविद्यालय, लुधियाना, पंजाब
- क्रांतिसिंह नाना पाटिल पशु चिकित्सा विज्ञान महाविद्यालय, शिरवल, महाराष्ट्र

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।

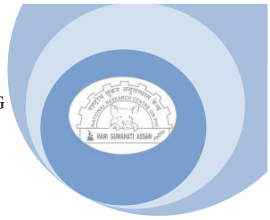
लक्ष्य:

- 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 सात 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 संसाधन विकास विभाग, त्रिपुरा सरकार
- पशु चिकित्सा और पशु पालन विभाग, सिक्किम सरकार।

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. From 1.04.2017 the following AICRP centers were in position.

- Assam Agricultural University, Khanapara, Guwahati.
- 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, Barapani, Shillong, Meghalaya
- Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab
- Krantisinh Nana Patil College of Veterinary Science, Shirval, Maharashtra

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 seven 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.
- Animal resources development department, Government of Tripura
- Dept. of Animal Husbandry and Veterinary Services, Govt. of Sikkim

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. Dhireswar 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, Sri Venkateshwara Vety. University, Tirupati- 517 502, Andhra Pradesh	Dr. D. Suresh Babu
4	ICAR-Central Coastal Agricultural Research Institute, Ela, Old Goa-403402, Goa	Dr. E.B. Chakurkar
5	ICAR-Indian Veterinary Research Institute, Izatnagar, U.P. - 243122	Dr. G.K. Gaur
6	Post Graduate Research Institute in Animal Sciences, Tamil Nadu Veterinary and Animal Sciences University, Kattupakkam, Tamilnadu-603203	Dr. D. Balasubramanyam
7	College of Veterinary Science & AH, CAU, Selesih, Aizawl, Mizoram-796007	Dr. Shyamsana Singh
8	School of Agricultural Science and Rural Development, Nagaland University, Medziphema, Nagaland-797 106	Dr. M. Catherine Rutsa
9	ICAR-Central Island Agricultural Research Institute, Port Blair, A&N Island-744105	Dr. Madhu Sudan Kundu
10.	College of Agriculture, Central Agricultural University, Imphal, Manipur-795004	Dr. Th. Ranadhir Singh
11.	ICAR- Indian Veterinary Research Institute, Eastern Regional Station, Kolkata, West Bengal-700037	Dr. Syamal Naskar
12.	ICAR Research Complex for NEH Region, Barapani, Shillong, Meghalaya-793 103	Dr. Kadirvel Govindasamy
13.	Krishi Vigyan Kendra, NRC on Pig, Dudhnoi, Goalpara, Assam-781131	Dr. Santanu Banik
14.	Krantisinh Nana Patil College of Veterinary Science, Maharashtra Animal and Fishery Sciences University), Shirval, Dist.- Satara, Maharashtra-412801	Dr. Mukund Bhimraoji Amle
15.	Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab- 141004	Dr. Ashwani Kumar Singh

ACTIVITY ASSIGNED AND TARGET FIXED

General:

1. The statement of expenditure (SOE) need to be submitted quarterly for the release of subsequent installment.
2. Monthly report of piglet production and sale is to be sent to the Project Coordinator office by 28th of every month, preferably by e-mail. The period to be covered is from 25th of previous month to 24th of current month.
3. The centres need to submit AUC before June month of preceding financial year and UC quarterly, positively. Final installment should be released after getting SOE up to Nov. 30. PMU should also take expected expenditure statement up to 31st march from PIs of various centers.
4. The unspent amount as on 31st of March must be refunded by 30th April of next financial year positively. All PIs of centers to ensure the timely processing of Bills.
5. The revenue generated from the AICRP on Pig Project should be distributed in the ratio of ICAR (75%) and host institute (25%). Revenue receipt from the project should be refunded to ICAR or be adjusted in the next year's release. In case, the revenue is earned in the preceding year of the project, such revenue would invariably be refunded to the ICAR by the host institution. (Reference the Umbrella MoU between the ICAR and host institutions, as approved by secretary(DARE) and DG (ICAR) vide dated 06-01-2017, the sharing of revenue- Point No. H).
6. Sale-proceed need to be deposited to office at the earliest preferably next day or maximum within the week.
7. Salary component to be utilized for permanent staff of the project 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 centre 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 should visit other centres.
10. Extension activities of the programme including animal distribution record should be maintained as per Direct Benefit Transfer (DBT) norms of Govt. of India.
11. Information on desired qualitative and quantitative traits of nucleus flock under seed project to be maintained and presented generation wise.
12. Consultative workshop for preparing action plan for next 5 year may be organized.

Animal Breeding:

1. Breed registration and conservation: All the AICRP on Pig centres shall take necessary steps for registration of indigenous germplasm in collaboration with ICAR-NRC on Pig and ICAR-NBAGR, Karnal.

2. Crossbred animals of 75% exotic inheritance should be maintained by the old centres. Centres approved in XIIth Five Year Plan should continue to maintain the germplasm as per the recommendation made in review meet of 2014-15.
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 generation-wise data should be presented indicating progress made in each generation over the previous ones. The overall genetic gain, selection differential and heritability need to be calculated and reported. Data should be presented for last three generations.
6. Three number of farrowings per sow need to be recorded. Three farrowings per 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 8months
    - Live weight produced per sow at the time of slaughter.
7. Artificial Insemination should be implemented at all centers. Required training for AI may be obtained from ICAR-NRC on pig or other AICRP on Pig center.
8. The coordinating unit should develop data management system for AICRP and seed projects in consultation with Dr. A. Rai, IASRI, New Delhi, as done by AICRP on Goat. The data management development to be completed by March 2019.

Nutrition, physiology and management:

1. Each centre should develop a parallel strategy/plan for entrepreneurship development in the locality. For this, readymade plan to be prepared for 100/200/500 animal units including capital investment, animal, feed, marketing strategies with complete value-chain in piggery.
2. Each center should try to develop alternate feed resources for profitable farming.
3. Good management practice (GMP) need to be followed by individual centers.
4. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken and compiled on monthly basis.
5. The centers should develop technologies, including shelter management to reduce thermal stress.

Health Management:

1. Regular monitoring of the 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 and to keep it below 10%, 5% and 2%; respectively.
3. Steps need to be taken up to strengthen required bio-security measures at the farm.

Centre wise recommendation:

Assam Agricultural University, Khanapara:

1. The centre should submit the AUC/UC by 30th June.
2. The center should compile the booklet on achievement as well as success story of AICRP on Pig and submit to nodal center.
3. Artificial Insemination should be initiated at the farm without any further delay.
4. Generation wise analysis of data needs to be done to estimate genetic gains and trends.

Kerala Veterinary and Animal Science University, Mannuthy:

1. Initiation of characterization of local pig of Kerala (Ankamali) needs to be carried out.
2. Compile the generation-wise data including genetic gain of Mannuthy White need to be done.

Sri Venkateswara Veterinary University, Tirupati

1. The center reported very high mortality of piglets. Necessary managemental and profileactive measure need to be taken to reduce the mortality.
2. The center should stop administration of Pasteurella vaccine to maintain unique health care measure among the AICRP units.
3. Initiation of characterization of local pig of the state need to be carried out.

ICAR-IVRI, Bareilly:

1. The center should study the performance of Landlly at farmers' field and submit data of last 7 generation to the coordinating unit.

ICAR Research centre for Goa, Goa:

1. Centre should maintain the required breeding stock.
2. The center should continue the breeding programme to develop 75% crossbred animal.

Tamil Nadu Veterinary and Animal Sciences University, Kattupakkam:

1. Initiation of characterization of local pig of Tamil Nadu should be carried out.
2. Carcass characteristics of TANUVAS KPM Gold need to be studied
3. Very early weaning (14 days) reported by the center need to be restricted to experimental purpose. However, economic gain in terms of litter production, weight gain of piglets needs to be studied for this group of animals.

CVSC, Central Agricultural University, Aizawl:

1. The existing strength of 75% crossbred animal should be reduced to 10 sow unit.
2. The center should act as genetic improvement and conservation unit of Zovawk pig of Mizoram. The center needs to maintain at least 20 sow unit of Zovak pig.
3. Selective breeding of Zovawk pig need to carry out in the center.

SASARD, Nagaland University, Nagaland:

1. The existing strength of 75% crossbred animal should be reduced to 10 sow unit.
2. The center should act as genetic improvement and conservation unit of Tenyi Vo pig of Nagaland. The center needs to maintain at least 20 sow unit of Tenyi Vo pig.
3. Selective breeding of Tenyi Vo pig need to carried out in the center.

CAU, Imphal, Manipur:

1. Centre should maintain the Rani pig developed by ICAR-NRC on Pig.
2. Initiation of characterization of local pig of Manipur needs to be carried out.
3. The reported performance of existing Rani Animals in the farm is not upto the mark. The center should improve the managemental condition of the farm and target to have 75 kg at 8 months of slaughter age.
4. Bores may be replaced from ICAR-NRC on Pig.

ICAR-RC, Barapani, Meghalaya:

1. The genetic parameters as reported by the center need to be reanalyzed.
2. Survey and characterization of local pigs of Meghalaya, if any (except Niang Megha which is already characterized)

ICAR- CIARI, Port Blair:

1. The center should take up the initiative to register Andaman Pig.
2. The data of Andaman local pig as reported in the meeting need to be verified with field performance.

IVRI-ERS, Kolkata:

1. Centre should follow selective breeding for further improvement of Ghungroo stock.
2. The centre should complete the survey to find the scope of new germplasm available in the state.

KVK-Goalpara, ICAR-NRC on Pig, Dudhnoi:

1. The centre should compare the performance in the farm with that of available field data of Doom.

GADVASU, Ludhiana:

1. The center should maintain 30 sow unit of Large White Yorkshire, the requisite number of breedable sows as per technical programme.
2. The base animal of the farm need to be purchased from different sources to maintain the variability among the breeding stock.
3. The center should procure 30 sows and 10 sires immediately for its continuation.

MAFSU, Sirwal:

1. The center is to maintain LWY pigs. The center should procure 30 sows and 10 sires immediately for its continuation under the programme.
2. The center should carry out an extensive survey of the state of Maharashtra about the pig genetic resources available.
3. Potential unique population of pigs should to be characterized and registered with ICAR-NBAGR.

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. During the XII plan five more new centers were approved and started functioning in 2014-15. In 2017, two centers, Birsa Agricultural University, Kanke, Ranchi and ICAR Research Complex for NEH Region, Tripura Centre, Agartala, Tripura were dropped and another two new centers were included in the project.

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

- Assam Agricultural University, Khanapara, Guwahati
- 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, ICAR-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, Barapani, Shillong, Meghalaya
- ICAR-Central Island Agricultural Research Institute, Port Blair, Andaman and Nicobar Island
- Krantisinh Nana Patil College of Veterinary Science, Shirval, Satara, Maharashtra
- Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab

ICAR-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 at 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 ICAR-National Research Center on Pig, Guwahati on 23-24th November, 2018.

AAU, Khanapara

Recommendation	Action Taken
General:	
1. Statement of expenditure (SOE) need to be submitted quarterly	Followed
2. Monthly report of piglet production and sold has be sent	Done
3. Submit AUC before June and UC quarterly	Followed
4. The unspent amount must be refunded by 30th April	Under Process
5. Distribution of Revenue in 75%(ICAR) : 25% (host institute)	Under Process
6. Sale proceed need to be deposited to office at the earliest	Followed
7. Salary component to be utilized for sanctioned posts of the project	Followed
8. PI of the centre should have specialization in AGB	Followed
9. AICRP on pig and MSP on pig incharges should visit other centers.	Noted
10. Extension activities/animal distribution record as per direct benefit transfer	Followed
Animal breeding:	
1. Breed registration and conservation	Followed
2. Crossbred animals of 75% exotic inheritance should be maintained	Followed
3. Minimum 30 breedable sows unit should be maintained	Followed
4. Selection of male should be based on weaning weight and 8 month weight and female based on litter size and no of teats	Followed
5. Generation wise Presentation of data	Done
6. Record of three farrowings per sow and report lifetime trait data	Followed
7. Artificial Insemination should be implemented	
Nutrition, Physiology and management:	
1. Entrepreneurship development for 100/200/500 animal	Done
2. Develop alternate feed resources for profitable farming.	Followed
3. Good management practice (GMP) need to be followed	Followed
4. Recording of daily micro and macro climatic data	Done

5. Shelter management to reduce thermal stress	Followed
Health management:	
1. Regular monitoring of the herd	Followed
2. Reduce mortality percentage	Followed
3. Strengthen the bio-security measures	Followed
Centre wise recommendation:	
1. Submission of AUC before 30th June	Followed
2. Compilation of booklet of achievement	Followed
3. Initiation of AI	Followed
4. Generation-wise analysis of data	Followed

KVASU, Mannuthy, Kerala

Recommendation	Action Taken
General:	
1. Statement of expenditure (SOE) need to be submitted quarterly	Followed
2. Monthly report of piglet production and sold has be sent	Done
3. Submit AUC before June and UC quarterly	Followed
4. The unspent amount must be refunded by 30th April	Followed
5. Distribution of Revenue in 75%(ICAR) : 25% (host institute)	Followed
6. Sale proceed need to be deposited to office at the earliest	Followed
7. Salary component to be utilized for sanctioned posts of the project	Followed
8. PI of the centre should have specialization in AGB	Followed
9. AICRP on pig and MSP on pig incharges should visit other centers.	Noted
10. Extension activities/animal distribution record as per direct benefit transfer	Followed
Animal breeding:	
1. Breed registration and conservation	Initiated
2. Crossbred animals of 75% exotic inheritance should be maintained	Followed
3. Minimum 30 breedable sows unit should be maintained	Followed
4. Selection of male should be based on weaning weight and 8 month weight and female based on litter size and no of teats	Followed
5. Generation wise Presentation of data	Followed
6. Record of three farrowings per sow and report lifetime trait data	Followed
7. Artificial Insemination should be implemented	
Nutrition, Physiology and management:	
1. Entrepreneurship development for 100/200/500 animal	Yet to be done
2. Develop alternate feed resources for profitable farming.	Followed
3. Good management practice (GMP) need to be followed	Followed
4. Recording of daily micro and macro climatic data	Done
5. Shelter management to reduce thermal stress	Followed
Health management:	
1. Regular monitoring of the herd	Followed
2. Reduce mortality percentage	Followed
3. Strengthen the bio-security measures	Followed
Centre wise recommendation:	
1. Characterization of local pig of Kerala (Ankamali) needs to be carried out	Initiated
2. Compile the generation-wise data including genetic gain	Done

SVVU, Tirupati

Recommendation	Action Taken
General:	
1. Statement of expenditure (SOE) need to be submitted quarterly	Submitted
2. Monthly report of piglet production and sold has be sent	Reporting

3. Submit AUC before June and UC quarterly	Followed
4. The unspent amount must be refunded by 30th April	Followed
5. Distribution of Revenue in 75%(ICAR) : 25% (host institute)	Followed
6. Sale proceed need to be deposited to office at the earliest	Followed
7. Salary component to be utilized for sanctioned posts of the project	Followed
8. PI of the centre should have specialization in AGB	Followed
9. AICRP on pig and MSP on pig incharges should visit other centers.	Noted
10. Extension activities/animal distribution record as per direct benefit transfer	Followed
Animal breeding:	
1. Breed registration and conservation	Initiated
2. Crossbred animals of 75% exotic inheritance should be maintained	Followed
3. Minimum 30 breedable sows unit should be maintained	Followed
4. Selection of male should be based on weaning weight and 8 month weight and female based on litter size and no of teats	Followed
5. Generation wise Presentation of data	Followed
6. Record of three farrowings per sow and report lifetime trait data	Followed
7. Artificial Insemination should be implemented	Followed
Nutrition, Physiology and management:	
1. Entrepreneurship development for 100/200/500 animal	Yet to be done
2. Develop alternate feed resources for profitable farming.	Followed
3. Good management practice (GMP) need to be followed	Followed
4. Recording of daily micro and macro climatic data	Done
5. Shelter management to reduce thermal stress	Followed
Health management:	
1. Regular monitoring of the herd	Followed
2. Reduce mortality percentage	Followed
3. Strengthen the bio-security measures	Followed
Centre wise recommendation:	
1. Reduce the mortality by managemental and prophylactic measures	Followed
2. Stop administration of Pasteurella vaccine	Done
3. Characterization of local pig of the state	Initiated

TANUVAS, Kattupakkam

Recommendation	Action Taken
General:	
1. Statement of expenditure (SOE) need to be submitted quarterly	Submitted
2. Monthly report of piglet production and sold has be sent	Reporting
3. Submit AUC before June and UC quarterly	Followed
4. The unspent amount must be refunded by 30th April	Followed
5. Distribution of Revenue in 75%(ICAR) : 25% (host institute)	Followed
6. Sale proceed need to be deposited to office at the earliest	Followed
7. Salary component to be utilized for sanctioned posts of the project	Followed
8. PI of the centre should have specialization in AGB	Followed
9. AICRP on pig and MSP on pig incharges should visit other centers.	Noted
10. Extension activities/animal distribution record as per direct benefit transfer	Followed
Animal breeding:	
1. Breed registration and conservation	Initiated
2. Crossbred animals of 75% exotic inheritance should be maintained	Followed
3. Minimum 30 breedable sows unit should be maintained	Followed
4. Selection of male should be based on weaning weight and 8 month weight and female based on litter size and no of teats	Followed
5. Generation wise Presentation of data	Followed

6. Record of three farrowings per sow and report lifetime trait data	Followed
7. Artificial Insemination should be implemented	Followed
Nutrition, Physiology and management:	
1. Entrepreneurship development for 100/200/500 animal	Yet to be done
2. Develop alternate feed resources for profitable farming.	Followed
3. Good management practice (GMP) need to be followed	Followed
4. Recording of daily micro and macro climatic data	Done
5. Shelter management to reduce thermal stress	Followed
Health management:	
1. Regular monitoring of the herd	Followed
2. Reduce mortality percentage	Followed
3. Strengthen the bio-security measures	Followed
Centre wise recommendation:	
1. Characterization of local pig of Tamil Nadu	Initiated
2. Carcass characteristics of TANUVAS KPM GOLD	Done
3. Very early weaning (14 days) reported by the centre need to be restricted to experimental purpose. Economic gain in terms of litter production, weight gain of piglets needs to be studied for this group of animals	Followed

ICAR-CCARI, Goa:

Recommendation	Action Taken
General:	
1. Statement of expenditure (SOE) need to be submitted quarterly	Submitted
2. Monthly report of piglet production and sold has be sent	Reporting
3. Submit AUC before June and UC quarterly	Followed
4. The unspent amount must be refunded by 30th April	Followed
5. Distribution of Revenue in 75%(ICAR) : 25% (host institute)	Followed
6. Sale proceed need to be deposited to office at the earliest	Followed
7. Salary component to be utilized for sanctioned posts of the project	Followed
8. PI of the centre should have specialization in AGB	Followed
9. AICRP on pig and MSP on pig incharges should visit other centers.	Noted
10. Extension activities/animal distribution record as per direct benefit transfer	Followed
Animal breeding:	
1. Breed registration and conservation	Done
2. Crossbred animals of 75% exotic inheritance should be maintained	Followed
3. Minimum 30 breedable sows unit should be maintained	Followed
4. Selection of male should be based on weaning weight and 8 month weight and female based on litter size and no of teats	Followed
5. Generation wise Presentation of data	Followed
6. Record of three farrowings per sow and report lifetime trait data	Followed
7. Artificial Insemination should be implemented	Followed
Nutrition, Physiology and management:	
1. Entrepreneurship development for 100/200/500 animal	Yet to be done
2. Develop alternate feed resources for profitable farming.	Followed
3. Good management practice (GMP) need to be followed	Followed
4. Recording of daily micro and macro climatic data	Done
5. Shelter management to reduce thermal stress	Followed
Health management:	
1. Regular monitoring of the herd	Followed
2. Reduce mortality percentage	Followed
3. Strengthen the bio-security measures	Followed

Centre wise recommendation:	
1. Centre should maintain the required breeding stock	Done
2. Continue the breeding programme to develop 75% crossbred	Followed

ICAR-IVRI, Bareilly

Recommendation	Action Taken
General:	
1. Statement of expenditure (SOE) need to be submitted quarterly	Submitted
2. Monthly report of piglet production and sold has be sent	Reporting
3. Submit AUC before June and UC quarterly	Followed
4. The unspent amount must be refunded by 30th April	Followed
5. Distribution of Revenue in 75%(ICAR) : 25% (host institute)	Followed
6. Sale proceed need to be deposited to office at the earliest	Followed
7. Salary component to be utilized for sanctioned posts of the project	Followed
8. PI of the centre should have specialization in AGB	Followed
9. AICRP on pig and MSP on pig incharges should visit other centers.	Noted
10. Extension activities/animal distribution record as per direct benefit transfer	Followed
Animal breeding:	
1. Breed registration and conservation	Done
2. Crossbred animals of 75% exotic inheritance should be maintained	Followed
3. Minimum 30 breedable sows unit should be maintained	Followed
4. Selection of male should be based on weaning weight and 8 month weight and female based on litter size and no of teats	Followed
5. Generation wise Presentation of data	Followed
6. Record of three farrowings per sow and report lifetime trait data	Followed
7. Artificial Insemination should be implemented	Followed
Nutrition, Physiology and management:	
1. Entrepreneurship development for 100/200/500 animal	Yet to be done
2. Develop alternate feed resources for profitable farming.	Followed
3. Good management practice (GMP) need to be followed	Followed
4. Recording of daily micro and macro climatic data	Done
5. Shelter management to reduce thermal stress	Followed
Health management:	
1. Regular monitoring of the herd	Followed
2. Reduce mortality percentage	Followed
3. Strengthen the bio-security measures	Followed
Centre wise recommendation:	
1. The center should study the performance of Landlly at farmers' field	Done

CVSc & AH, CAU, Aizawl

Recommendation	Action Taken
General:	
1. Statement of expenditure (SOE) need to be submitted quarterly	Submitted
2. Monthly report of piglet production and sold has be sent	Reporting
3. Submit AUC before June and UC quarterly	Followed
4. The unspent amount must be refunded by 30th April	Followed
5. Distribution of Revenue in 75%(ICAR) : 25% (host institute)	Followed
6. Sale proceed need to be deposited to office at the earliest	Followed
7. Salary component to be utilized for sanctioned posts of the project	Followed
8. PI of the centre should have specialization in AGB	Followed
9. AICRP on pig and MSP on pig incharges should visit other centers.	Noted

10. Extension activities/animal distribution record as per direct benefit transfer	Followed
Animal breeding:	
8. Breed registration and conservation	Done
9. Crossbred animals of 75% exotic inheritance should be maintained	Followed
10. Minimum 30 breedable sows unit should be maintained	Followed
11. Selection of male should be based on weaning weight and 8 month weight and female based on litter size and no of teats	Followed
12. Generation wise Presentation of data	Followed
13. Record of three farrowings per sow and report lifetime trait data	Followed
14. Artificial Insemination should be implemented	Followed
Nutrition, Physiology and management:	
1. Entrepreneurship development for 100/200/500 animal	Yet to be done
2. Develop alternate feed resources for profitable farming.	Followed
3. Good management practice (GMP) need to be followed	Followed
4. Recording of daily micro and macro climatic data	Done
5. Shelter management to reduce thermal stress	Followed
Health management:	
1. Regular monitoring of the herd	Followed
2. Reduce mortality percentage	Followed
3. Strengthen the bio-security measures	Followed
Centre wise recommendation:	
1. The existing strength of 75% crossbred animal should be reduced to 10 sow unit	Initiated
2. The center should act as genetic improvement and conservation unit of Zovawk pig with 20 sow unit	Yet to be done
3. Selective breeding of Zovawk pig need to carry out in the center	Done

SASRD, Nagaland

Recommendation	Action Taken
General:	
1. Statement of expenditure (SOE) need to be submitted quarterly	Submitted
2. Monthly report of piglet production and sold has be sent	Reporting
3. Submit AUC before June and UC quarterly	Followed
4. The unspent amount must be refunded by 30th April	Followed
5. Distribution of Revenue in 75%(ICAR) : 25% (host institute)	Followed
6. Sale proceed need to be deposited to office at the earliest	Followed
7. Salary component to be utilized for sanctioned posts of the project	Followed
8. PI of the centre should have specialization in AGB	Followed
9. AICRP on pig and MSP on pig incharges should visit other centers.	Noted
10. Extension activities/animal distribution record as per direct benefit transfer	Followed
Animal breeding:	
1. Breed registration and conservation	Done
2. Crossbred animals of 75% exotic inheritance should be maintained	Followed
3. Minimum 30 breedable sows unit should be maintained	Followed
4. Selection of male should be based on weaning weight and 8 month weight and female based on litter size and no of teats	Followed
5. Generation wise Presentation of data	Followed
6. Record of three farrowings per sow and report lifetime trait data	Followed
7. Artificial Insemination should be implemented	Followed
Nutrition, Physiology and management:	
1. Entrepreneurship development for 100/200/500 animal	Yet to be done

2. Develop alternate feed resources for profitable farming.	Followed
3. Good management practice (GMP) need to be followed	Followed
4. Recording of daily micro and macro climatic data	Done
5. Shelter management to reduce thermal stress	Followed
Health management:	
1. Regular monitoring of the herd	Followed
2. Reduce mortality percentage	Followed
3. Strengthen the bio-security measures	Followed
Centre wise recommendation:	
1. The existing strength of 75% crossbred animal should be reduced to 10 sow unit	Initiated
2. The center should act as genetic improvement and conservation unit of Tenyivo pig with 20 sow unit	Yet to be done
3. Selective breeding of Tenyivo pig need to carry out in the center	Done

Centers included during XIIth Plan and later:

Targets	**ICAR-CIARI, Port Blair**	**CAU, Imphal**	**IVRI-ERS, Kolkata**	**ICAR-RC, Barapani**	**KVK, ICAR-NRCP, Dudhnoi**	**GADVASU, Ludhiana**	**MAFSU, Sirwal**
Submission of (A)UC	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Final Report submission	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Breed maintained	Andaman local and Nicobari pigs	Rani Cross	Ghungroo pig	Lumsniang Cross	Doom Pig	LWY	LWY
Indigenous breed registration	Done	Initiated	NA	Done	NA	NA	Yet to achieve
Maintenance of 30 breeding stock	Yes	Yes	Yes	Yes	Yes	Yet to achieve	Yet to achieve

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:

- Development and release of region specific crossbred variety was done in following centers
    - HD-K75- Assam Agricultural University, Khanapara, Guwahati
    - Jharsuk- Birsa Agricultural University, Kanke, Ranchi
    - Mannuthy White - Kerala Veterinary and Animal Science University, Mannuthy
    - Lumsniang-ICAR Research Complex for NEH Region, Barapani, Shillong, Meghalaya
    - TANUVAS KPM Gold- Tamil Nadu Veterinary and Animal Sciences University, Kattupakkam
    - SVVU T-17- Sri Venkateshwara Vety. University, Tirupati
    - Landlly Pig – ICAR-Indian Veterinary Research Institute, Bareilly

- Breeding programmes were developed to generate the following genotypes/genetic groups:
    - Conservation of indigenous germplasm viz. Ghungroo, Niang Megha, Agonda Goan, Tenyi Vo, Doom and Nicobari.
    - 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 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 other 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 private owner's i.e. weaker sections maintain their pigs either in back out rooms or in some discarded rooms of their houses.

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, and 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.

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.
- Pure Hampshire boar or AI with Pure Hampshire boars were utilized for production of 87.50%H genetic group.
- 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.

Herd dynamics

The herd strength at the beginning of the year and at the end of the year under report was 324 and 90 respectively irrespective of sex and age of HD- K75 (75% H) genetic group. Out of 324 pigs, 14 boars and 40 sows were used as breeding animal during the year under report.

Herd strength

Age in months	Opening balance as on 01.04.2018		Total	Closing balance as on 31.03.2019		Total
	Male	Female		Male	Female	
0 - 6 week	144	104	248	-	-	-
6wk – 2 month	-	-	-	-	-	-
2 – 6 month	-	-	-	-	-	-
6 – 8 month	11	11	22	33	57	90
Over 8 month	14	40	54	-	-	-
TOTAL	169	155	**324**	33	57	**90**

Stock Continuity Details II

Sex	Stock as on 01.04.2018 Parent + (1st Crop + 2nd Crop)	Addition (3rd crop)	Purchase	Total	Grand total
MALE	14 + (11+144) = 169	131	-	300	300
Female	40 + (11 +104) = 155	114	-	269	269
Total	**324**	**245**	**-**	**569**	**569**

Deletion

Sex	Sale of Parent +1st Crop+2nd Crop+ 3rd crop	Slaughter	Died	Transferred	Total	Stock as on 31.03.2019
Male	14+(11+127+83) = 235	13	19	-	267	**33**
Female	32+(11+103+47) = 193	-	12	7*	212	**57**
Total	**428**	**13**	**31**	**7***	**479**	**90**

*7 number of sows of HD- K75 were transferred to Mega Seed project, AAU, Khanapara

Performance of animals (17th Generation):

Sl. No	Traits/ Characters	Male	Female	Overall
1	Av. Litter size at birth (no.)	4.02 ± 0.24	3.43 ± 0.36	7.45 ± 0.51(97)
2	Av. Litter weight at birth (kg)	4.20 ± 0.22	3.44 ± 0.37	7.64 ± 0.37(97)
3	Av. Litter size at weaning (no.)	3.88 ± 0.29	3.38 ± 0.41	7.26 ± 0.24(97)
4	Av. Litter weight at weaning (kg)	38.91 ± 0.81	33.32 ± 1.33	72.23 ± 0.92(97)
5	Av. individual wt at birth (kg)	1.04 ± 0.10(390)	1.00 ± 0.13(331)	1.02 ± 0.80(721)
6	Av. individual wt at weaning (kg) (6w)	10.02 ± 0.49(374)	9.86 ± 0.38(322)	9.94 ± 0.27(696)
7	Number of days for weaning	42 days		
8	Pre weaning mortality rate (%)	4.28 (16)	2.80 (9)	3.59 (25)
9	Pre weaning growth rate (g /day) (0-6w)	213.81±0.44(374)	210.95±0.52(322)	212.38 ± 0.48(696)
10	Post weaning mortality rate (%) (Weaning-5 m)	4.80 (18)	1.86 (6)	3.45 (24)
11	Adult mortality rate (%) (above 5 month)	1.05 (3)	1.48 (4)	1.08 (7)
12	Post weaning growth rate (6 wks to 8th months) (g/day)	342.58 ± 0.78(44)	341.25 ± 1.04(68)	342.10 ± 1.91(112)
13	Overall growth rate (0- 8 m) (g/day)	320.34 ± 0.61(44)	322.12 ± 0.42(68)	320.83 ± 2.52(112)
14	Body weight (kg) at 1 month	7.49 ± 0.34(379)	7.31 ± 0.27(327)	7.40 ± 0.31(706)
15	2 month	12.41 ± 0.41(364)	12.08 ± 0.54(309)	12.25 ± 0.48(673)
16	3 month	18.59 ± 0.41(187)	18.17 ± 0.30(184)	18.38 ± 0.36(371)
17	4 month	30.08 ± 0.56(116)	27.49 ± 0.55(126)	28.79 ± 0.56(242)
18	5 month	42.71 ± 0.81(60)	41.29 ± 0.73(140)	42.00 ± 0.77(200)
19	6 month	53.90± 1.07(58)	52.58 ± 0.65(131)	53.24 ± 0.86(189)
20	7 month	65.15 ± 0.55(56)	65.02 ± 0.91(125)	65.08 ± 0.73(181)
21	8 month	77.92 ± 2.30(44)	77.55 ± 2.01(68)	77.73 ± 2.02(112)
22	Age at slaughter (days) 17th generation	255 days (12 Nos.)		
23	Weight at slaughter (kg)	83.33 ± 2.86		
24	Dressing percentage (%)	68.64 ± 2.60		
25	Carcass Length (cm)	70.23 ± 0.61		
26	Feed conversion efficiency (:)	1: 3.85		

Life time production traits (17th Generation)

Average litter size at birth per sow	7.45 ± 0.51 (97)
Average litter weight at birth per sow	7.64 ± 0.37 (97) (kg)
Average litter size at weaning per sow	7.26 ± 0.24 (97)
Average litter weight at weaning per sow	72.23 ± 0.92 (97) (kg)

Specific managemental practice

Identification The identification number of respective animal is recorded in clip board of individual pen. However, the animal identification number is given on ear tag.

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

Mortality Parameter

Genetic group wise and sex wise mortality rate

i) Pre-weaning mortality: 2nd and 3rd crops, 17th generation (2018-19)

Animal		0 - 14 days			15 - 28 days			29 - 42 days			Overall (Pre-weaning)		
		M	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**
2nd crop	at risk	144	104	248	144	104	248	144	104	248	143	103	246
	died	-	-	-	-	-	-	1	1	2	1	1	**2**
	Mortality%	-	-	-	-	-	-	0.69	0.96	0.81	0.69	0.97	0.81
3rd crop	at risk	131	114	245	129	114	243	128	114	242	125	110	235
	died	2	-	2	1	-	1	3	4	7	6	4	**10**
	Mortality%	1.52	-	0.81	0.77	-	0.41	2.34	3.50	2.89	4.80	3.63	4.25
	Over all	0.72	**-**	**0.40**	0.36	**-**	**0.20**	1.47	2.29	**1.84**	2.61	2.35	**2.50**

ii) Post weaning and adult mortality

Animal		Post weaning (43 days – 5 m)			Adult (Over 5 m)			Over all at farm		
		M	F	T	M	F	T	M	F	T
Parent	No. at risk	-	-	-	14	40	54	14	39	53
	No. died	-	-	-	-	1	1	-	1	1
	Overall Mortality %	-	-	-	-	2.50	1.85	-	2.50	1.88
1st crop	No. at risk	-	-	-	11	11	22	11	11	22
	No. of animals died	-	-	-	-	-	-	-	-	-
	Overall Mortality %	-	-	-	-	-	-	-	-	-
2nd crop	No. at risk	143	103	246	141	102	243	141	102	243
	No. died	2	1	3	-	-	-	2	1	3
	Overall Mortality %	1.39	0.97	1.22	-	-	-	1.41	0.98	1.18
3rd crop	No. at risk	125	110	235	119	107	226	116	104	220
	No. died	6	3	9	3	3	6	9	6	15
	Overall Mortality %	4.80	2.72	3.83	2.52	2.80	2.65	7.75	5.77	6.81
	Overall Mortality %	2.98	1.87	**2.49**	1.05	1.53	**1.28**	3.90	3.12	**3.45**

iii) Causes of mortality (Specific cause)

Table: Details of investigation conducted for causes of mortality 2018-19

Sl. No	**Causes of mortality**	**HD- K75**		
		M	F	T
1	Septicemia	1	1	2
2	Gastroenteritis	5	2	7
3	Hemorrhagic Gastro-enteritis	3	1	4
4	Pneumo-enteritis	3	2	5
5	Necrotic Hepatic-Nephritis	2	-	2
6	Pneumonia	2	4	6
7	Traumatic Injury	2	2	4
8	Cardiopathy	1	-	1
Total		19	12	31

iv) Measures taken to minimize mortality:

a) 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 materials 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 their mother. Debilitated piglets were nourished specially to regain their health. Pre starter (7^{th} - 21^{st} 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:** Almost all piglets were suffered from diarrhoea during the pre-weaning period and medicine viz. Diakur, Zinconia, Tetracycline / Cycline D - T bolus / Gentamycine / Enrofloxacine were used. ORS / Glucose had also been used in affected pigs.
- **Lameness:** A total of 91 piglets and 14 adults were suffered from lameness during the year under report. The animals were treated with Neuroxine and Vetalgin with antibiotics. Injured animals were dressed and treated accordingly. Six pregnant sows and two boars were suffered from lameness due to broken floor.

b) Prophylactic measures:

- **Vaccination:** The Swine Fever Vaccine (Institute of Animal Health & Veterinary Biologicals Hebbal, Kanataka) was given regularly to the piglets and adult pigs as per schedule. The FMD vaccine is given annually as per schedule.
- **De worming:** De worming is done to all the piglets at one and half months, two and half months, five months and at eight months (before breeding) of age and repeated at six months interval. Fecal examinations are routinely examined.

c) Disposal of diseased carcass:

- The carcass after conducting PM was disposed to the 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. The carcass of young pig was disposed of by the Dept. of Veterinary Pathology, CVSc, AAU, Khanapara.

Nutritional experimentation:

Comparative study of the efficacy of mineral supplements from different sources on the growth performance of Crossbred (Hampshire x Local) growing Pigs.

Eighteen crossbred (Hampshire x Local) growing pigs of 3 months of age attaining about 19-20 kg body weight were randomly divided into 3 treatment groups of 6 pigs each and were replicated twice. The pigs under the different treatment groups were offered *ad libitum* standard grower ration supplemented with three different forms of mineral mixtures i.e. inorganic (T_1) @ 1.5 Kg, organic (T_2) @ 100 g and chelated inorganic (T_3) @ 250 g per 100 Kg of the ration for 90 days. Mean values of weight gain, feed intake and feed conversion ratio were 42.50 ± 0.71^a, 47.17± 0.93^b and 41.00± 0.93^a kg; 169.44 ± 3.04^c, 162.28 ± 3.00^a and 167.02 ± 3.45^b kg; 3.99 ± 0.08^b, and 3.44 ± 0.06^a and 4.07 ± 0.04^b for T_1, T_2 and T_3 groups respectively (P>0.05). Mean serum levels were dl/ml for calcium (P<0.05), dl/ml for iron, dl/ml for copper, dl/ml for Zinc and dl/lit for Cobalt for T_1, T_2 and T_3 groups respectively. Results indicated that the organic mineral (T2) was better to inorganic minerals (T_1) and chelated inorganic (T_3) in terms of weight gain, FCR and serum mineral levels.

Survey on market of pork production

Qualification of Pork Seller	:Mostly under Metric an uneducated
Residence	:Mostly rented
Occupation	:Pork business
Caste	:50% Tribal and 50% others
No. of Retail Shop	:109
No. of Wholesaler	:6
Type of Sale Booth	:90% open
INFORMATION ABOUT THE PIG:	
Sources of Pig	:Nalbari, Bonda, Boko, Changsari, Chaigaon, Baksa, Mangaldoi, Sonapur, Panikhaiti, Chandrapur and Peripherial areas of Guwahati.
Breed	:Mostly Hampshire Cross, Hampshire x Ghungroo, Local and Ghungroo
Age	:6 months - 2 ½ Years
Type	:Male - 20%, Female - 40% Castrated - 40%
Weight	:50 - 180 kg
Method of Slaughter	:Direct Stabbing in most cases, occasionally hammering
Price of Pig	: Rs.120/kg- Rs.130/kg live wt. basis or Rs.200/ to Rs.220/ kg pork basis considering D.P.75%.
Basis of Price	: Either live wt. or total pork basis.
No of Pig Slaughtered Per day	:80-100 numbers
Daily Sale	:70-75 qt
Period of Highest Sale	:November to February
Period of Lowest Sale	:June to September
Price per kg of Pork	:Retailer Rs. 250/ - 260/kg,

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

The Bio- Gas project under ICAR- AICRP on Pig, AAU, Khanapara was inaugurated on 3rd April, 2018 by Dr. K.M. Bujarbarua, honorable Vice-chancellor, AAU in presence of Dr. Bhabesh Goswami, Vice-chancellor, Cotton State University. The NISURGUNA Bio-Gas plant manufactured by Global Scientific Inco., Nagpur, Maharashtra with the help of the technology of BARC, Mumbai installed at the premises of ICAR-AICRP on Pig, AAU, Khanapara, Guwahati. The bio-gas plant on recycling of pig dung has been established for the first time in India. The fecal materials of the two projects and kitchen waste of the hostels are collected daily and being utilized as fuel for cooking for staff and farm use. The manure produced from the plant is being utilized in fodder cultivation of the Instructional Livestock Cattle Farm, flower gardens of different establishments of the AAU, Khanapara campus. Proper scientific disposal of

the farm waste materials *i.e.* pig dung has been successfully carried out to create eco-friendly environment in the campus. This has minimized the foul odor, flies and other germs in the farm premises.

Production economics (Considering Feed & Medicine Cost):

Sl. No.	Cost of production up to slaughter / Market age:	At farm condition (12 nos)	At field condition (10 nos)
a	Cost of piglet (3-4 month of age) and carrying charge	Nil	Rs.3000/-
b	Concentrate feed up to 8 month of age (15-255 days) = 420 kg @ Rs.22.00/kg feed	Rs. 9240/-	Nil
c	Cost of feeding - Hotel waste, Vegetable and other available sources of feed including Mineral Mixture and some part of concentrate @ Rs.40/day/animal from 3-8 month (150 days) of age	Nil	Rs.6000/
d	Cost of Medicine & Vaccines / animal	Rs. 300/-	Rs. 300/-
e	Total Cost at 83 kg live weight/animal (b+d)	Rs. 9540/	Nil
f	Total Cost at 95 kg live weight/animal (a+c+d)	Nil	Rs.9300/
g	Cost of production / kg live wt.:	**Rs 115/ kg**	**Rs. 98/ kg**
h	Cost of production/kg pork: (considering 68% Dressing Percentage)	**Rs.170 kg**	Rs**. 138/ kg**

Extension programme with success story:

i) At the institute

The Extension activities organized by the Associate Director of Extension Education (ADEE), AAU, Khanapara, Guwahati involved the Scientist and or Project Fellow of the project as Resource Persons in their different programs. The trainees were given lessons *i.e.* technology on pig production as well as practical demonstration.

Talks/ Demonstration

- Talk on Management Practices Adopted in a Scientific Piggery Farm (Feeding, Breeding Management & Disease control) organized by DEE, AAU, Khanapara on 10th Nov., 2018.
- Talk on Livestock Farming & its role in integrated farming practices - Pig cum Fish on 05th December, 2018 under the training programme on Farming Practices through Animal Husbandry, Horticulture and Fisheries for Sustainable Livelihood at National Institute of Rural Development and Panchyati Raj, Khanapara-22.
- Talk on Prospect and Problems of piggery industry in Assam on 9th January, 2019 under the DBT project- Workshop on "Capacity building on Artificial Insemination in Pig"
- Demonstration on Semen collection and Artificial Insemination in Pig on 09th January, 2019 under the DBT project- Workshop on "Capacity building on Artificial Insemination in Pig".
- Talk on motivating the students for Entrepreneurship Development- Piggery and poultry on 14th February, 2019, organized by Entrepreneurship Development Institute of India in Association with Prabhati Kiran at Borbhag College, Nalbari.
- Talk on Selection, Care & Management of Pigs for Fattening and Breeding Purposes in Fish-Pig-Horticulture Farming on 1st March, 2019, organized by KVK, AAU, Nalbari under the training programme on Integrated Fish -Pig- Horticulture Farming, under the GOI-DBT Fund Project- Establishment of Biotech- KISAN Hub at AAU, Jorhat.

- Talk on Hygiene & Sanitation, Bio security measures, Heat detection and AI on 19th March, 2019 organized by ADEE, AAU, Khanapara for the farmers of KVK, Hengbung.
- Talk on Different Breeds of Pig: Selection of breeding stock, recording, and disposal of animal on 25th March, 2019 jointly organized by ADEE, AAU, Khanapara and Assam State Rural Livelihood Mission (ASRLM) on three days training programme on Scientific Rearing of Pig. 25th - 27th March,2019
- Talk on Farm Practice – Health and Hygiene/ Sanitation and Bio security measures on 25th March, Jointly organized by ADEE, AAU, Khanapara and Assam State Rural Livelihood Mission (ASRLM) on three days training programme on Scientific Rearing of Pig. 25th - 27th March, 2019.

ii) Training Programme organized by the ICAR-AICRP & MSP on Pig

1. One day Awareness Training Programme on" Scientific Pig Rearing" was organized by ICAR-AICRP & MSP on Pig on 29th October, 2018 at the premises of AICRP on Pig. (30 participants from different parts of the state.)
2. Two days Training Programme on "Scientific Pig Rearing" was organized jointly by ICAR-AICRP & MSP on Pig and Directorate of Extension Education, AAU, Khanapara on 28th and 29th March 2019. (30 participants from different parts of the state.)

iii) Training programme at Field

- Two days Training Programme on Scientific Pig Rearing was organized by the ICAR-AICRP &MSP on Pig the at the premises of M/S Mothonga Agro-producers Co. Ltd. Khandikar, Baksa on 25th& 26th April, 2018 for the members and farmers of the organization.
- Awareness programme on Scientific Pig farming was organized at Borhat, Sivsagar District under TSP- Pig Project under the Directorate of Research (Vety) AAU on 08.07. 2018.
- Awareness programme on Scientific Pig farming was organized at Silonijan, Karbi Anglong under TSP- Pig Project under the Directorate of Research (Vety) AAU on 21.11.2018.
- One day Awareness Training Programme on Scientific Pig Rearing was organized by ICAR-AICRP&MSP on Pig on 03.02.2019 at Chakardo village of Rani (Deepor Beel).

iv) Radio/ Doordarshan Programme

- Live telecast on Scientific Pig Farming by Doordarshan Kendra Guwahati on 19.04.2018 and 03.05.2018.
- Live Phone in programme on Scientific Pig Rearing telecast by Doordarshan Kendra Guwahati on 20.06.2018 and 30.10.2018.
- Talk on Scientific pig Rearing was telecast by Doordarshan Kendra Guwahati under Krishi Darshan programme on 03.01.2019.

v) Success Story

- Sri Manoj Basumatary and Sri Khanindra Kalita Dhikidol, Ghoramari started a Piggery farm in the name of **Symbiotic Foods Pvt. Ltd** in the year 2014. The breeding stocks (75%H) were

purchased from the ICAR- AICRP on Pig, AAU, Khanapara. The farm has expanded with a breeding stock of 90 females and produced approximately 1500 piglets per year during 2016, 2017 and 2018. They have a plan to raise 120 female breeding stocks for 2000 piglets production. All the breeding stocks and fatteners are accommodated in the three pigsties. The farm has a Feed Mill and has an outlet of feed for local farmers. The piglets and feed are sold to the local farmers at nominal price. The farm also started **5-Days training programme on paid basis** on piggery. The farm supported the local farmers for feed, treatment /vaccination and marketing. The annual turnover is around 30.00 lakhs.

- Jayanta Kr Sarma, Chepti Rangia, district Kamrup (R) an unemployed Engineer, age 45 years maintaining 10 Sows and 2 breeding males. He is selling 5 fatteners in every month and 60 - 70 piglets / year. He earned Rs. 9.00 to 10.00 lakh annually. He is spending Rs. 15,000/month for concentrate and Rs.5, 000/ month for hotel waste and broiler waste.

Scientific publications

i) In peer- reviewed journals : 5

ii) Others :5

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

M.V.Sc Research Completed:

a) **Evaluation of humoral immune response in FMD vaccinated pigs (veterinary epidemiology and preventive medicine)**

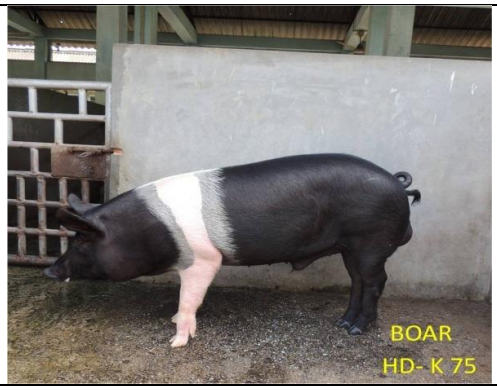
b) **Studies on the effect of feeding tungrymbai as a probiotic supplement on growth performance of post-weaned cross bred (Hampshire× Local) piglets**

Ph.D research completed

a) Genetic studies on growth performance and polymorphism of *IGF-II* and *POU1F1* genes in crossbred pigs

Distinguish Visitors:

- Dr. Bhabesh Goswami, Vice Chancellor, State Cotton University visited the ICAR-AICRP & MSP on Pig on 3rd April 2018 during inaugural function of Bio Gas Plant at the premises of the farm.
- Sri Mrigen Sarania, Mayor GMC Visited the ICAR-AICRP& MSP on Pig and Bio Gas plant on 2nd May, 2018.
- The VCI team members Dr. S.P. Tiwary Dean, Durge Veterinary College, Dr. A.K Patnayak, Principal Scientist, Animal Nutrition Division, IVRI, Dr. P.K.Sukla, Pro-Vice Chancellor and Registrar, U.P PT. Deen Dayal Upadhyaya Pashu Chikitsa Vigyan ViswaVidyalaya Evam Go-Anusandhan Sansthan, Mathura and Prof. Ajit singh Ranade, Dean, KNP College of Veterinary Sciences, MAFSU, Nagpur along with Dr. B.N.Saikia Dean CVSC, AAU visited the ICAR-AICRP & MSP on Pig on 10.10.2018.

	
Breeding Boar HD-K75	Pregnant sow HD-K75
	
Piglet with sow HD-K75	Weaned piglet HD-K75
	
Piglet selected for breeding HD-K75	Piglet sold to Govt. piggery farm, Morigaon
	
One day training at ICAR AICRP on pig	Hands on demonstration

KERALA VETERINARY AND ANIMAL SCIENCES UNIVERSITY, MANNUTHY

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.

Herd dynamics:

				Crossbred 50 %			Crossbred 75 %			LWY		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total
Opening balance	79	163	242	39	79	118	30	75	105	10	9	19
Birth	275	232	507	81	57	138	179	165	344	15	10	25
Purchase/transfer		10	10								10	10
Total	354	405	759	120	136	256	209	240	449	25	29	54
Mortality	63	72	135	16	20	36	47	52	99			
Sold / slaughter	240	197	437	93	71	164	147	126	273			
Total	51	136	187	11	45	56	15	62	77	25	29	54
Closing balance	51	136	187	11	45	56	15	62	77	25	29	54

Breeding strategy of the farm as approved

75% crossbreds are maintained by inter-se mating.

Performance of animals

Sl. No.	Traits/Characters	2018-2019		
		Male	Female	Total
1.	Litter Size at birth (no)	5.28±0.15	4.54±0.18	9.82±0.16
2.	Litter weight at birth (kg)	5.41±0.13	5.21±0.14	10.62±0.14
3.	Litter Size at weaning (no)	5.08±0.12	4.06±0.0	9.14±0.11
4.	Litter weight at weaning (Kg)	45.82±0.18	35.42±0.17	81.24±0.18
5.	Avg. Individual weight at birth (kg)	1.02±0.14	1.20±0.10	1.08±0.14
6.	Avg. Individual weight at weaning (kg)	9.02±0.20	8.72±0.18	8.89±0.19
7.	Number of days for weaning (d)	42	42	42
8.	Pre weaning mortality rate (%)	10.19	10.77	20.95
9.	Pre weaning growth rate(gm/d)	190.47	179.71	185.95
10.	Post weaning mortality rate (%)	2.91	4.93	7.85
11.	Post weaning growth rate (gm/d)	328.10	313.20	320.65
12.	Overall growth rate (up to 9 m) (gm/d)	309.62	300.13	304.88
13	Body wt at different ages (kg) (n=8)			
	at 1st month			5.69±0.22
	2nd month			10.04±0.20
	3rd month			17.24±0.28
	4th month			28.10±0.24
	5th month			37.62±0.40
	6th month			48.12±0.46
	7th month			61.24±0.42
	8th month			75.15±0.47
	9th month			86.14±0.48
	10th month			93.32±0.50
14.	Age at slaughter (d)			300

15.	Weight at slaughter(Kg)			93.47 ±0.52
16.	Dressing Percentage (%)			65.20±0.55
17.	Carcass Length (cm)			76.54±0.70
18.	Back Fat Thickness (mm)			22.05±0.50
19.	Meat Bone ratio (:)			4.21± 0.17
20.	pork produced per sow (kg/year)			1848.82
21.	Feed Conversion efficiency (:)			3.52

Lifetime production traits

Sl. No.	Traits	Mean
1	Live weight produced /sow/litter at birth (kg)	12.08± 0.16
2	Live weight weaned /sow (kg)	85.06± 0.24
3	Live weight produced at slaughter age/sow/litter (kg)	846.25

Specific managemental practice: Identification using microchips

Mortality parameter

Cross bred 50% -Pre-weaning

Parameter	0-14 days			15-28 days			29-45 days			Over all		
	M	F	T	M	F	T	M	F	T	M	F	T
Animals at risk												
Number died	8	6	14	3	3	6	3	1	4	14	10	24
Mortality %	5.8	4.35	10.15	2.16	2.16	4.35	2.16	0.73	2.9	10.15	7.25	17.4

Cross bred 50% -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	6	5	11	1	0	1	7	5	12
Mortality %	4.35	3.63	8.0	0.73	0	0.73	5.1	3.63	8.7

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	24	25	49	7	6	13	4	6	10	35	37	72
Mortality %	6.98	7.28	14.26	2.04	1.75	3.78	1.16	1.75	2.91	10.19	10.77	20.95

Cross bred 75 % Post-weaning

Parameter	45 days - 1 year			Adult			Over all		
	M	F	T	M	F	T	M	F	T
Number died	8	16	24	2	1	3	10	17	27
Mortality %	2.34	4.66	6.96	0.59	0.30	0.87	2.91	4.93	7.85

Causes of mortality (specific cause):

Pre weaning

Causes	Crossbred 50%			Crossbred 75%		
	Male	Female	Total	Male	Female	Total
Gastro enteritis	9	5	14	27	29	56
Hepatosis	3	2	5	5	4	9
Pulmonary congestion and edema	2	3	5	3	4	7
Total	14	10	24	35	37	72

Post weaning

Causes	Crossbred 50%			Crossbred 75%		
	Male	Female	Total	Male	Female	Total
Gastro enteritis	5	4	9	6	8	14
Hepatosis	2	1	3	3	5	8
Pulmonary congestion & edema				1	4	5
Total	7	5	12	10	17	27

Management measures:

- All pigs were dewormed periodically and regular spraying against ecto-parasites was done.

- Early treatment to control piglet diarrhoea and anemia were undertaken
- Farrowing crates to minimize the incidence of crushing of piglets
- Artificial light provided at farrowing pen to prevent piglet mortality due to cold Shock
- Gunny bags were laid over roof and periodically wetted to control the thermal stress
- Soft bedding with hay was provided to minimize the incidence of crushing of piglets
- Early detection and treatment of MMA syndrome
- A disinfectant dip was constructed at the entrance of the centre to control infection
- Practice of one time feeding in the early morning of the day was introduced along with provision of shade to minimize the heat stress
- Efforts are taken to minimize the pre-weaning mortality with suitable interventions.

(ii) Prophylactic measures:

1. All the animals were vaccinated twice annually for swine fever disease (CSF) and FMD
2. Weaned piglets were vaccinated against the FMD three days after weaning and SF after 21 days
3. The wallowing tanks in the pens are routinely cleaned using disinfectants
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 3 weeks in advance and fed with lactation feed to provide individual care and management.
6. Routine inspection and maintenance of farrowing pens for preventing MMA
7. The new born piglets are orally supplemented with 25% Dextrose solution to enhance the immunity and prevent neonatal hypoglycemia.
8. Selenium –Zinc mineral mixture powder is added as a feed additive in adult ration.

Nutritional experimentation:

The feed which is manufactured in School of Animal Nutrition and Feed technology (SANFT-KVASU) is being used in the centre.

Ingredients	**Pig lactation (Mash)**	**Pig grower (Pellet)**
Maize	66	27
Corn gluten fibre	5	18
Fish meal	5	2
Soyabean meal	20	12
Black gram husk		6
Rice bran	2	23.5
Rice polish		10
Miner mixture	1	2
Salt	1	1
Total	100	101.5

Adoption of integrated farming systems

Facilities are created during the reporting year for the collection and reuse of the shed washings for cultivation and recharging of the water sources.

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. Measures are being adopted for installation of water treatment plant.

Production economics:

Market prices of pork

Pork : Rs. 280 kg from University meat plant

Lean pork : Rs. 340 /kg from University meat plant

Private outlets : Rs. 240/kg.

Live weight : Rs.120/ kg depends upon the season

The production economics is calculated on the basis of feed cost, the existing price of pork is Rs.230/kg and Rs.114/kg live weight.

Cost of production/pig up to slaughter age: Rs. 10421/-

Cost production /kg pork: Rs. 106/-

Extension programme with success story:

(i) At the institute:

The Centre could impart 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 323 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 four batches, during 2018. Sixty one 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 421 fattening piglets to 60 farmers. Eighteen 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 421 fattening piglets (crossbreds) and also generated receipt of Rs.15.69 lakhs including the sale of culled animals during the year 2018-19. 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.

Publications In peer review journal 2

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

i) Evaluation of semen quality on liquid storage of specific fractions of LWY boar semen

ii) Storage quality of liquid semen of LWY boar supplemented with cholesterol loaded cyclo dextrin.

iii) Freezability of boar semen supplemented with sodium dodecyl sulphate in low or high sperm concentration doses

iv) Dietary supplementation of corn oil as energy source in LWY sows

Distinguished visitors:

Sl. No.	Name and address of the visitor	Date of visit	Purpose of the visit
1	Dr. Rajesh Dhuria, Dean, CVAS, Udaipur, Rajasthan	19-01-2019	VCI inspection
2	Dr. Saravjeet Yadav, Professor, CV & AH, Mathura	19-01-2019	VCI inspection
3	Dr. Opinder Singh	19-01-2019	VCI inspection
4	Dr. John Williams, Professsor, Royal(Dick)Veterinary College, Edinburgh, Scotland	09-03-2019	Discussion on Research collaboration with KVASU

Success story:

The centre provides technical knowledge to pig farmers in various aspects of pig farming such as housing, health care, management etc. 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.

Fattening Unit: Mr. Rajeevan, is a small scale entrepreneur of a small pig farm at Kannur. He attended training on scientific pig farming at CPPR, Mannuthy and started one small fattening unit at kannur 20 fattener pigs purchased from CPPR. He is using hotel waste for feeding the piglets and has a monthly income of Rs 15000.

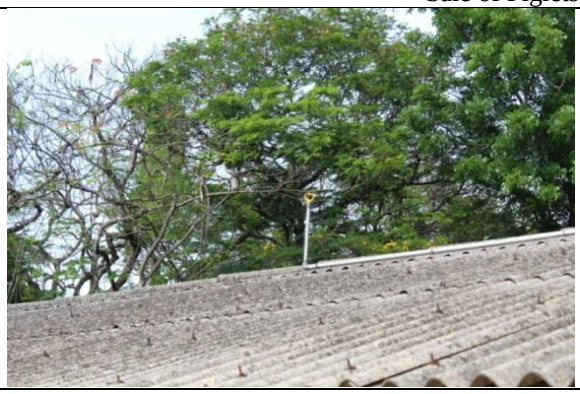
Fattening Unit: Mr. Sabio, is an independent pig farmer having his fattening piggery unit at Kottayam district, Kerala. He is maintaining 60 fattening animals now. He acquired training on profitable pig farming from Centre for pig production and research, Mannuthy. He purchased fattening animals from CPPR and started his own fattening unit. He is earning Rs. 30000 on average per month. He collects food waste from nearby hotels and mess of colleges to feed the animals.

Macroclimatic Data at Mannuthy

Date	Air Temp (°C)	Relative Humidity (%)	Solar Radiation (W/m^2)	Wind Speed (m/s)	Wind Direction (Degree)	Dew Point Temp(°C)	Wet Bulb Temp(°C)	Thermal Humidity Index(THI)
Apr-18	30.45	69	0.34	2.0	0.12	26.62	25.6	80.5
May-18	27.9	79	0.59	1.8	0.35	28.07	24.9	93.4
Jun-18	26.5	89	0.35	1.5	0.57	25.07	24.8	95.3
Jul-18	26.05	88	0.23	1.7	0.13	26.88	24.1	94.6
Aug-18	25.7	87	0.36	1.8	0.75	26.27	24.0	93.5
Sep-18	27.35	75	0.4	1.7	0.01	26.88	24.6	92.5
Oct-18	27.85	76	0.35	2.0	0.54	26.73	24.6	92.7
Nov-18	28.0	68	0.5	4.3	0.35	26.38	23.6	82.4
Dec-18	27.75	63	0.14	4.7	0.26	24.70	22.1	83.2
Jan-19	26.65	55	0.12	6.5	0.19	23.00	19.3	75.4
Feb-19	32.29	59	0.5	5.1	0.06	27.62	26.8	83.1
Mar-19	34.28	65	0.9	2.9	0.25	29.44	27.4	84.7


Farmers Training


Sale of Piglets at the farm premises



Mechanical water sprinkler for summer stress alleviation

Modern farrowing house

Biogas unit

Dung drying machine

SRI VENKATESWARA VETERINARY UNIVERSITY, TIRUAPTI

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 inter-se mating was studied. Presently performance of only 75% LWY crossbreds by inter se mating is being studied.

Herd dynamics:

Sl. No.	Categories	Opening balance 1.4.2018	Additions		Disposals			Closing balance 31.3.2019
			Births	Transfers/ Purchased	Deaths	Transfer/ Slaughter	Sold	
1	**Piglet (up to 42 d)**	**92**	225	-	17	8	-	25
2	**Grower (42 days-5 m)**	245	-	-	41	8	163	146
3	**Finisher (5–8 m)**	-	-	-	4	-	-	
4	**Breeding female**	84	-	-	7	9	29	105
5	**Boar**	20	-	-	3	20	12	74
Grand Total		**441**	**225**	**-**	**72**	**45**	**204**	**345**

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 *inter-se* mating was studied
- The performance of 50% and 75% LWY Crossbreds was studied up to 2009 since then the studies on the performance of 50% LWY crossbreds was discontinued and presently performance of only 75% LWY crossbreds by *inter-se* mating are being studied.

Performance of animals: 22nd Generation II crop

Sl. No	Traits/ Characters	Mean ± SE (no. of observation)		
		M	F	Total
1	Litter size at birth (no.)	4.2±0.32(30)	4.0±0.29(30)	8.2±.035(30)
2	Litter weight at birth (kg)	4.4±0.36(30)	4.3±0.34(30)	8.5±0.43(30)
3	Litter size at weaning (no.)	4.1±0.32(30)	3.9±0.31(30)	8.03±0.37(30)
4	Litter weight at weaning (kg)	30.11±2.6(30)	29.11±2.46(30)	59.22±3.2(30)
5	Avg. individual weight at birth (kg)	1.03±0.017(129)	1.08±0.02(116)	1.05±0.013(247)

6	Avg. individual weight at weaning (kg) (42 d)	7.19±0.08(122)	7.14±0.07(118)	7.16±0.05(240)
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%)	1.5(126)	2.0(121)	1.6(247)
9	Pre weaning growth rate (gm/d)	143±0.002(104)	141±0.002(88)	142±.001(192)
10	Post weaning mortality rate (%)	8.8(124)	5.0(119)	6.9(243)
11	Post weaning growth rate (gm/d) (up to 6 m)	198±0.03(56)	195±0.03(58)	197±0.01(114)
12	Overall growth rate (*up to 10 m*) (gm/d)	179±0.02(54)	180±0.03(58)	179±0.01(112)
13	Body weight (kg) 1 month 2 months 3 months 4 months 5 months 6months 7months 8months 9months 10months	 5.2±0.08(111) 10.3±0.18(111) 16.64±0.33(99) 22.79±0.45(86) 28.31±0.5(71) 34.4±0.59(76) 40.51±0.8(71) 46.37±1.0(67) 50.28±1.01(59) 54.92±.85(55)	 5.3±0.08(107) 10.25±0.24(84) 16.56±0.45(84) 22.69±.55(72) 27.7±0.56(62) 33.3±0.69(63) 39.32±0.82(61) 44.21±0.96(56) 50.06±.97(59) 55.18±.93(58)	 5.2±0.06(218) 10.33±0.14(195) 16.60±0.27(183) 22.75±0.35(158) 27.8±0.35(143) 33.93±0.45(139) 39.96±0.57(132) 45.64±0.7(123) 50.17±.7(118) 55.06±.63(113)
14	Age at slaughter (d)	294±11.2(5)	362.5±32.5 (2)	313.5±16.4(7)
15.	Weight at slaughter (kg)	70.0.±0.00(5)	107.5±16.5(2)	80.71±7.79(7)
16.	Dressing Percentage (%)	48.4±1.3(5)	58.5±0.5(2)	51.2±2.07(7)
17.	Carcass Length (cm)	70.2±.37(5)	71.7±1.1(2)	70.52±.44(7)
18.	Back Fat Thickness (cm)	2.26±0.23(5)	3.06±.83(2)	2.49±0.28(7)
19.	Meat Bone ratio (:)	2:1(5)	2:1(2)	2:1(7)
20.	Amount of pork produced / sow(kg)	32.9±1.34(5)	62.2±9.25(2)	41.28±5.85(7)
21.	Feed conversion efficiency (:)	4.1±0.6(5)	3.5±0.84(2)	3.99±.24(7)

Lifetime production traits

- Average litter size at birth per sow : 8.12
- Average litter weight at birth per sow : 9.19
- Average litter size at weaning per sow : 7.58
- Average litter weight at weaning per sow : 56.53
- Average litter weight at slaughter per sow :81.89

Specific managemental practice:

- Identification is done by ear notching, employing ear notching pliers on fourth day.
- Removal of needle teeth is carried out on fourth day using scissors.
- To combat piglet anemia, iron injection (feritas) was given on 4th day and repeated on 14th day.
- To reduce 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:

	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-42 d)	151	15	9.9	166	2	1.2	317	17	5.3
Post-weaning(42 d-5m)	272	25	9.1	273	19	6.9	545	44	8.0
Adult (>5 m)	267	4	1.4	254	7	2.7	521	11	2.1

ii) Causes of mortality (*Specific cause*):

PRE-WEANING			
	Male	Female	Total
Hydropericardium	1	-	1
Pneumonia	2	-	2
PM changes	2	1	3
Pasteurellosis	2	-	2
Suspected for Lymphosarcoma	2	1	3
Crushing	3	-	3
Pasteurellosis with Lymphosarcoma	3	-	3
Total	15	2	17
POST-WEANING			
HYDROPERICARDIUM	-	1	1
PNEUMONIA	1	-	1
PM Changes	6	9	15
Pasteurellosis	9	4	13
Crushing	1	-	1
Lymphosarcoma	2	1	3
Suspected for lymphosarcoma	4	4	8
Pasteurellosis with trichuris worm	1	-	1
Haemorrhagic Shock	1	-	1
Total	25	19	44
ADULT			
Pasteurellosis	3	2	5
PM Changes	1	4	5
Worm burden	-	1	1
Total	4	7	11
Grand Total	44	28	72

iii. 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.
- All measures to prevent the access of causative factors by way of feed and water were 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.

iv. Disposal of diseased carcass:

The dead animals after conducting the post-mortem will be buried properly as per standard practices.

v. Prophylactic measures:

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

Nutritional experimentation:

i) Effect of inclusion of rice based Dried Distillers Grains with Solubles (DDGS) on the performance and nutrient utilizatization in crossbred pigs.

ii) Effect of managemental interventions on growth performance of large white yorkshire crossbred weaner pigs in tropical environmental conditions

Adoption of integrated farming systems:

At present we are growing tuber crops like sweet potato in the existing land of about 30 cents. About 50 kgs of sweet potatoes were harvested and fed to the animals.

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 Rs.200/- per kg.

A directory of pork eaters comprising about 2000 names along with mobile numbers of Tirupati town is being maintained by the station. The consumers get the information of availability of pork through telephone enquiry.

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

The farm waste or pig excreta is used periodically for the plants as manure in the research station premises. The remaining manure being supplied to LPM department in our 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

i) Cost of production/pig up to slaughter age:

The feed cost is considered for calculation of cost of production per pig. The quantity of feed consumed from 10 days to 10 months is about 294.8 kgs. The average cost of feed per kg is Rs. 25/- . The live weight attained at 10 months of age is around 80 kgs. The dressing percent was taken as 65. The average cost of production per pig upto slaughter age was Rs.7300/-.

ii) Cost of production/ kg pork

Cost of production / kg pork was Rs. 140/-.

Extension programme with success story:

i) At the institute: Regularly interested farmers are visiting the center and are being given technical advice about scientific pig rearing and feeding, vaccination *etc*. Importance of sanitization and hygiene and summer management 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.

ii) At the farmers' field: nil

Salient achievement during the reporting period

a) Survey work on conservation of indigenous germplasm was completed in 5 districts i.e. Chittoor, Kadapa, Kurnool, Ananthapur and Vizag.

b) 22nd Generation is in progress: during the period under report 3 II crop and 15 III crop farrowings were recorded apart from 14 Gynaecological experimental farrowings.

c) During the period under report 225 piglets were born and 204 animals were sold.

d) Receipts: During the reporting period an amount of Rs.1208650/-through sale of piglets and pork.

Scientific publications:

i) In peer-reviewed journals: 1

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

So far 29 M.V.Sc students and 1 Ph.D., student conducted their research in the farm. At present 1 PG students and 1PhD students are doing research in the farm.

1 Effect of inclusion of rice based dried distillers grains with solubles on the performance and nutrient utilizatization in crossbred pigs.

2. A study on the induction and synchronization of oestrous in LWY crossbred gilts.

Distinguished visitors:

Sri B.Sreedhar, Principal Sectary, Dept. Of Animal Husbandry Dairying and Fisheries, Govt. of Andhra Pradesh,has visited on7-3-2019 along with Director of Research Dr. D. Sreenivasulu and Dean Dairy Science, Dr. Padmanabha Reddy, SVVU, Tirupati.

Success story:

1. **Sri M. Prasad Naidu, Kaluva village, Nellore District** has taken 40 growers and finishers from this centre. He told that he is maintaining his pigs on mess waste. He is maintaining the fatteners up to 80 kg body weight and selling on live weight basis to the Bangalore market at the rate of Rs.70/-to 90 per kg. Last year he had earned Rs.5lakhs profit.
2. **Veeraju, Purushottapatnam of East Godavari District** had taken 20 weaners on 24-9-18 and started a breeding farm. He is using mess waste and rice crumbles to feed the pigs. Two pigs were farrowed and 5were pregnant. He has employed one family for the maintenance of the farm spending Rs.10000- per month.

Information on Micro and Macro climatic data

Month	Temperature (ºC)		Humidity (%)	THI
	Minimum	Maximum		
April, 2018	27.10	37.45	86.40	96.27
May,2018	27.40	**40.94**	75.40	99.16
June,2018	27.51	38.02	67.50	92.75
July,2018	24.62	35.40	77.80	90.89
August,2018	26.48	36.83	67.60	91.02
September,2018	22.18	34.60	81.10	90.46
October,2018	26.53	33.50	87.02	89.81
November,2018	23.43	33.66	87.90	90.17
December,2018	**19.60**	30.47	87.20	84.68
January, 2019	20.65	31.90	85.20	86.79
February,2019	24.21	36.82	78.10	93.36
March,2019	25.10	40.40	67.20	96.19

During the reporting period, highest Temperature **(40.94 ºC)** was recorded in the month of May and the lowest **(19.60 ºC)** temperature was recorded in the month of December.

	
Officers of Karnataka AH Department visited the farm on 26-11-2018	Distribution of weaners to Karnataka animal Husbandry dept. on 16-11-2018
	
Animals in the field unit of Sri Veeraju of purushottapatnam village of East Godavari district of AP	Animals in the Field Unit of Prasad Naidu of Nellore district of AP
	
Internees doing treatment to the piglet	Visit of Sri B. Sreedhar, Principal Secretary, Dept of Animal Husbandry, Dairying and Fisheries, Govt. of AP on 7-3-2019

ICAR-CENTRAL COASTAL AGRICULTURAL RESEARCH INSTITUTE, GOA

The challenges faced by our country in securing the food as well as nutritional security to fast growing population need an integrated approach in livestock farming. Among the various livestock species, piggery is most potential source for meat production and pigs are more efficient feed converters after the broiler. Apart from providing meat, it is also a source of bristles and manure. Pig farming will provide employment opportunities to seasonally employed rural farmers and supplementary income to improve their living standards. Goa with more than 50% of its population consuming Pork is one of the highest consumers. Being tourism hub these states have continuous demand of meat, beef, sausages, chicken etc. The crossbreed pigs developed by ICAR-CCARI are hugely popular amongst producers and consumers alike. Availability of higher quantity of pork for preparing the products will help to make the activity self-sustainable. 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 know how to the pig growers of the region through training's and demonstrations and also providing farmers with quality breeding stock.

Herd dynamics

Crossbreed 75% (LWY X AG)

Sl. No.	Categories	Opening balance		Additions		Disposals		Closing balance
			Births	Transfers	Deaths	Transfer	Sold	
1	Piglet(upto42days)	72	165	-	15	166	-	56
2	Grower(42days-5m)	28	X	166	13	17	148	16
3	Finisher(5m-8months)	4	X	17	-	19	2	
4	Breeding female	31	X	15	1	-	8	37
5	Boar	19	X	4	2	-	7	14
	Grand Total	**154**	**165**	**202**	**41**	**202**	**165**	123

Breeding strategy of the farm as approved

Four breeds namely Agonda Goan (Local), 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 %. One breeding boar is allotted for three breeding females. AI is the strictly followed practice for breeding. Presently maintaining 30 breeding females and 10 sire thus maintaining 3:1 ratio.

Performance of animals (cross breed 75%)

Sl. No.	**Traits/Characters**		**Mean ± SE**	
		M	**F**	**Total**
1	Litter size at birth **(20)**	4.20±0.38	4.26±1.44	8.25±0.89
2	Litter weight at birth (kg) **(20)**	4.47±157.86	4.53±155.85	8.83±187.12
3	Litter size at weaning (no.) **(18)**	3.72±0.44	3.76±0.38	7.28±0.49
4	Litter weight at weaning (kg) **(18)**	26.77±3.40	28.71±28.	53.88±36.20
5	Avg. Individual weight at birth (kg)	1.061±25.57(84)	1.063±22.41(81)	1.062±16.99(165)
6	Avg. Individual weight at weaning(kg)	8.33±210.0(67)	8.16±230.79(64)	8.24±155.56(131)
7	Number of days for weaning (d)	40 days (all breeds)		
8	Pre-weaning mortality rate (%)	7.25	5.30	6.27

9	Pre-weaning growth rate(mg/d)	181.75±5.137	177.43±5.981	179. 45±3.917
10	Post-weaning mortality rate (%)	4.00	4.34	4.17
11	Post-weaning growth rate (mg/d)(8m)	351.5±37.07	355.15±64.78	353.35±50.63
12	Overall growth rate mg/d	323.20±68.11	325.52± 87.21	324.36±92.47
13	Bodyweight (Kg)			
	1 month	5.68± 24.10	6.08±39.41	5.88±52.13
	2 month	10.38 ±9.22	11.74 ±18.61	11.06±24.97
	3 month	19.24±5.42	21. 58 ±7.32	20.41 ±11.38
	4 month	30.47±5.37	31.69±7.01	31.08±12.47
	5 month	41.52±10.49	43.43 ±14.98	42.47 ±20.72
	6 month	53.89±16.34	55.68±9.89	54.78±24.6
	7 month	65.93 ± 12.57	68.82 ±7.34	67.37±17.52
	8 month	78.63±7.30	79.19 ±5.58	78.91 ±10.16

Lifetime Production traits: (4 nos of sow which have completed 3 farrowing during reporting year)

Average litter size at birth per sow	8.25 ± 0.65 nos.
Average litter weight at birth per sow	1.19 ± 0.044 kgs
Average litter size at weaning per sow	7.75 ± 0.31 nos.
Average litter weight at weaning per sow	8.16 ± 2.22 kgs
Average litter weight at weaning per sow	77.65± 13.80 kgs

Specific managemental practice

Identification method: Microchip Tagging

Castration Method: Surgical method from 30- 40 days of Age

Mortality Parameters:

Mortality Rate

Parameter	**Male**	**Female**	**Total**
Pre-weaning mortality rate (%)	7.25%	5.30%	6.27%
Post weaning mortality rate (%)	4.00%	4.34%	4.17%

Causes of death

In June 2018 ; 9 piglets aged 25 days of single sow shown symptoms of huddling together, fever, depressed, ataxia while walking, respiratory distress abdominal breathing, recumbence and finally death. Upon post-mortem, thorax was filled with clear fluid, liver and lungs congested, haemorrhages in stomach intestinal mucosa and enteritis lesions were found. The clinical samples and necroscopy samples from five piglets were sent to ICAR-NIVEDI, Bangalore for diagnosis. The samples were found to positive for Porcine Circo Virus 2 by ORF 2 PCR method. Apart from this case no specific cause, with occasional stamping. Vaccination for PCV was undertaken in March 2019 as preventive measure.

Measures taken to minimize mortality

Managemental Measures

Pre washing farrowing room with potassium permanganate on regular basis, restricted entry to visitors in farrowing unit. Spreading lime powder across entire pig unit. Clean water through water nipples, regular lime wash of farrowing pens. Bird netting, halogen light for heat.

Prophylactic Measures

Regular administration of vaccines like Classical Swine Fever FMD**,** Apart from regular deworming of entire herd; deworming of sow on 105th day of pregnancy to prevent trans-placental and

transcolostrol transmission of Strongyloids parasite from sow to piglets as well as it reduces worm egg passed in feces from pregnancy after pregnancy there by prevents postnatal transmission to piglets. This reduces piglet mortality. Vitamin oral suspension for 3 days after birth. Vaccination for PCV was undertaken in March 2019 as preventive measure.

Disposal of diseased carcass

Post mortem report followed by burial by digging deep pit along with adding of lime powder and salt for faster decomposition at institute designated diseased carcass burial site.

Adoption of integrated farming systems:

An upland model of area 0.8 ha comprising of enterprises such as Plantation crops: Cashew (variety Bhaskara) + Pineapple (Variety Giant Kew), Coconut (benaulim) + Pineapple (Giant Kew) + Noni + Tapioca, Areca nut (Mangala) + Banana (G-9), piggery, poultry, vermicompost unit, compost unit was evaluated for upland situations of Goa. Total number of 8 castrated male pigs are maintained in two groups of 4 each. The gross return of the system was around Rs. 166485 and the net profit was Rs.120505. The highest contribution to net profit was from the piggery unit Rs. 72000 (39.5%)) followed by cashew-pineapple system (28%) as both the crops started yielding. The benefit cost ratio of the system was 2.62.

Disposal pattern of farm waste

Biogas is constructed in 2011 and all the excreta is drained to biogas and digested slurry is used for horticultural plantations of the institute.

Production economics

a. **Cost of production/pig up to slaughter age:** Rs. 6117/- per pig (8 months) (Includes feed and labour cost)
b. **Cost of production/kg pork**: Rs. 110/- per kg pork (if dressing is 70%)
   (Avg. Pig Wt- 80 kgs) Rs. 102/- per kg pork (if dressing is 75%)
   i. Selling rate of Pig in Goa is Rs.100/kg live weight (rs.90-rs.120/kg)
   ii. Selling rate of Pork in Goa is Rs.200/kg net weight (rs.180-rs.250/kg)

Extension programme with success story:

I) At the institute

ICAR-sponsored Short Course on "Modern techniques in pig semen processing and AI" organized at ICAR-CCARI, Goa

ICAR-CCARI, Old Goa organized a 10 days short Course on *"Modern techniques in pig semen processing and AI"*during22nd to 31stOctober, 2018. This training course was sponsored by the Agricultural Education Division of ICAR, New Delhi as a part of capacity building program for ICAR Scientists and the Faculty of State Agricultural and Veterinary Universities. A total 14 participants above the grade of Associate Professor from 11 states viz. Assam, Meghalaya, Punjab, Haryana, Rajasthan, Gujarat, Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu participated in the programme.

Dr. E.B. Chakurkar, Director (A), ICAR-CCARI was the Course Director and Scientists Dr. Gokuldas PP and Dr. Susitha Rajkumar, acted as Course Coordinators of the programme. During the course, the participants were exposed to theoretical and practical hands-on sessions on modern techniques in semen evaluation, processing and Artificial Insemination in pigs. Besides this, topics like standard hygienic practices for boar semen processing and screening of semen for fertility markers were also included in the course. Two invited guest lectures on 'importance of modern techniques in boar semen analysis and practical applications of ultrasonography in swine reproduction' were also delivered by resource persons from other Institutes.

II) At the farmers' field

Transfer of AI technology through institute KVK, AICRP worker has attracted farmers to use this technology and also reduce expenditure on maintenance of breeding boar. Scientific procedure for castration has improved piglet survival after castration in farmer's field.

Salient achievement during the report period

Studies on fourth generation crossbred have been initiated which will enable to release crossbred verities.

Scientific publications

Training Manual on Modern Techniques in Pig Semen Processing and Artificial Insemination, by Gokuldas PP, Susitha Rajkumar, Chethan Kumar HB, Sajan Naik, EB Chakurkar.

Distinguish visitors: Group of 15 Ex MLA from Goa Legislative Assembly's Forum visited on 6th March 2019 for study tour to understand scope and potential of piggery in poverty eradication.

Any specific suggestion/recommendation for the overall progress of AICRP on pig:

As we are following ERP/PFMS try to deposit some funds in April so as to continue activities.

Success story:

Mr. Thomas K.D. from Sal, Bicholim, North Goa.; is a progressive pig farmer. He is maintaining 100 -150 nos of pigs since last decade. He suffered huge losses in 2014-15 as many of his breeding stock died. After that he visited ICAR- CCARI, it was found out that he was not maintaining his pigs in scientific manner especially feeding. It was suggested to him to attend training organised by ICAR-CCARI on scientific pig farming and artificial insemination.

After invention of Scientists from our institute he started following scientific feeding method whereby he started boiling hotel waste and poultry waste before feeding, washing off left over feed. Also he started maintain breeding stock separately with 50 % maize and 50% hotel waste meal. Apart from that to improve his genetic material and adapt to new technologies he has started with Artificial insemination. So far 15 A.I. have been performed at his farm in December 2018 and 11 (73.33%) have conceived and farrowed. Average of 8.8 live birth and 1 kg live weight at birth is achieved which is big improvement at his farm as compared to earlier birth weight 600- 800 gms. As a result of the success of artificial insemination he has with the help of scientist from ICAR-CCARI castrated adult breeding boars. Mr Thomas's Pig Farm has holding capacity of approximately 350-400 pigs.

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<tr><td>Pig farm of the Institute</td><td>Field unit Mr.Thomas K.D. Grower pigs</td></tr>
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<tr><td>Swine fever vaccination at Mr. Thomas Pig Farm</td><td>Jalna Maharashtra Expo 3</td></tr>
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INDIAN VETERINARY RESEARCH INSTITUTE, IZATNAGAR, UTTAR PRADESH

IVRI Centre of AICRP on Pig came into existence during the year 1971 in order to study the performance of Landrace pigs under farm conditions. However, subsequently the technical programme was modified time to time to evaluate the indigenous and crossbred genotypes with different proportion of Landrace inheritance. Further, in Sept 1994, it was recommended to merge them to produce a single group of Landrace crossbred pigs. Selection was carried out further on the basis of body weight at 8 and 24 weeks. The crossbreds were further crossed with newly established purebred Landrace stock in the year 2006 due to gradual deterioration of the performance, as per the recommendations made in Scientists' Meet at Goa (2001-02) to produce crossbred stock (81.25% L x 18.75% D). They were evaluated for their performance in the light of the recommendations made in Scientists' Meet at Guwahati in February, 2010. However afterwards, it was decided at AICRP Meet at Jabalpur in November, 2011 to replace the crossbred stock (81.25% L x 18.75% D) with crossbreds (75 % L x 25 % D) in order to bring uniformity across the AICRP centers to have exotic blood of 75%. In order to produce stock of 75% exotic blood line, efforts were initiated in 2012 to cross pure Landrace with desi and further backcrossed with purebred Landrace. Hence, at present this farm has 75 % crossbred pigs.

Herd dynamics

Herd strength of 75% Crossbred pigs

S. No	Age (months)	Opening Balance	Addition	Disposal				Closing balance
			Birth	Death	Transfer	Sold	Slaughter	
1	Piglet (up to 42 days)	89	496	52	-	-	-	12
2	Grower (42 d-5 m)	15	-	15	35	356	-	37
3	Finisher (5 -8 month)	21	-	5	-	33	7	12
4	Breeding female	46	-	1	-	21	-	51
5	Boar	15	-		-	27	-	18
	Total	**186**	**496**	**73**	**35**	**437**	**7**	**130**

Herd strength of Landrace pigs

S. No	Age (months)	Opening Balance	Addition	Disposal				Closing balance
			Birth	Death	Transfer	Sold	Slaughter	
1	Piglet (up to 42 days)	11	120	4	-	-	-	9
2	Grower (42 days-5 month)	11		-	-	66	-	23
3	Finisher (5 -8 month)	15	-	-	-	5	-	7
4	Breeding female	7	-	2	-	6	-	24
5	Boar	3	-	-	-	9	-	12
	Total	**47**	**120**	**6**	**-**	**86**	**-**	**75**

Herd strength of Ghurrah (Desi) pigs

S. No	Age (months)	Opening Balance	Addition	Disposal				Closing balance
			Births/ Purchase	Death	Transfer	Sold	Slaughter	
1	Piglet (up to 42 days)	-	14		-	-	-	-
2	Grower (42 d-5 m)	-	-	-	-	-	-	-
3	Finisher (5 -8 month)	-	7	-	-	1	9	5
4	Breeding female	-			-		-	3
5	Boar	-		-	-		-	3
	Total	**-**	**21**	**-**	**-**	**1**	**9**	**11**

Breeding strategy of the farm as approved

In order to maintain 75% exotic blood line by inter-se- mating, minimum 30 breedable sows 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 496 CB (75%) animals were born. A total of 462 CB pigs were supplied to different farms, farmers as well as divisions for experimental purpose. Selection of male animal was done based on weaning weight and 8 month body weight, based on two stage sequential selection. Selection of female animal was done based on dam's litter size at birth and weaning weight and number of functional teats. Three farrowings per sow in 2 years were recorded. The Landrace herd which was procured from Mannuthy was strengthened with addition of 120 more farm born pigs. The Local pig of Bareilly region (Ghurrah) was characterized and registered as INDIA_PIG_2000_GHURRAH_09008 by the Breed Registration Committee of ICAR. A compilation of technology inventory "*Pig production research at ICAR-IVRI: A five decade journey*" was published which includes all major achievements of the AICRP centre since 1971.

Performance of animals

75% crossbred pigs

S. No.	Trait	Male	Female	Total
1.	Litter size at birth (no.)	4.19±0.23(56)	4.03±0.23(50)	8.23±0.27(56)
2.	Litter weight at birth (kg)	4.26±0.24(56)	4.00±0.24(56)	8.26±0.29(56)
3.	Litter size at weaning (no.)	3.69±0.24(56)	3.64±0.24(56)	7.33±0.34(56)
4.	Litter weight at weaning (kg)	31.52±2.03(56)	31.29±2.19(56)	62.71±2.94(56)
5.	Avg. individual weight at birth (kg)	1.01±0.02(235)	0.97±0.02 (226)	1.00±0.01(461)
6.	Avg. individual weight at weaning(kg)	8.44±0.32(207)	8.22±0.29(204)	8.52±0.25(411)
7.	Number of days for weaning (d)	42	42	42
8.	Pre weaning mortality rate (%)	9.76%	8.68%	9.23%
9.	Pre weaning growth rate (gm/d)	175.90±0.00(249)	177.23±0.00(248)	176.56±0.00(497)
10.	Post weaning mortality rate (%)	2.38%	3.70%	3.08%
11.	Post weaning growth rate (gm/d) (up to 24 weeks)	446±0.03(36)	380.04±0.03(24)	419.77±0.02(60)
12.	Overall growth rate (*up to 8 m*) (gm/d)	360.19±0.01(36)	332.99±0.02(21)	350.17±0.01(57)
13.	Body weight (kg)			
	1 Month	5.90.42±0.08(253)	5.86±0.09(250)	5.88±0.06(503)
	2 Month	10.05±0.17(211)	9.79±0.0.18(199)	9.92±0.12(410)
	3 Month	20.01±0.69(70)	19.31±0.82(51)	19.71±0.53(121)
	4 Month	32.47±1.26(56)	30.53±01.26(40)	31.66±0.90(96)
	5 Month	47.79±2.06(50)	43.07±2.03(39)	45.73±1.74(89)
	6 Month	61.94±3.74(36)	54.85±4.01 (24)	59.11±2.77(60)
	7 Month	71.48±4.08(36)	64.47±5.03(21)	68.90 ±3.18(57)
	8 Month	81.85±4.41(36)	75.70±5.04(21)	79.60±3.34(57)
	9 Month	84.23±4.86(25)	87.84±5.65(20)	85.83±3.66(45)
	10 Month	78.35±3.65(12)	101.63±5.63(20)	92.90±4.24(32)
14.	Age at slaughter (d)	200/6	-	200/6
15.	Weight at slaughter (kg)	81.55±0.88	-	81.55±0.88
16.	Carcass weight (kg)	60.83±0.94	-	60.83±0.94
17.	Dressing percentage (%)	76.71±0.69	-	76.71±0.69
18.	Carcass length (cm)	78.07±0.44	-	78.07±0.44
19.	Back fat thickness (cm)	2.12±0.13	-	2.12±0.13
20.	10th rib fat thickness (cm)	2.05±0.17	-	2.05±0.17
21	Loin eye area (sq cm)	7.08±0.54	-	7.08±0.54

Lifetime production traits

Table 5. Lifetime production parameters in 75% crossbred pigs

S. No.	Sow no.	Furrow wings	Total litter size at birth	Average litter size at birth	Total litter weight at birth (kg)	Average litter weight at birth (kg)	Total litter size at weaning	Average litter size at weaning	Total litter weight at weaning (kg)	Average litter weight at weaning (kg)
1	829	3	25	8.33	27.4	9.13	23	7.66	238.1	79.36
2	809	3	24	8	28.5	9.50	21	7	200.1	66.7
3	825	3	23	7.66	24.2	8.06	13	4.33	134.6	44.86
4	592	3	33	11	30.7	10.23	32	10.66	250.7	83.56
5	447	4	36	9	35.2	8.80	33	8.25	268.8	67.20
6	449	3	15	5	12.6	4.2	10	3.33	74.3	24.76
7	600	3	24	8	26.9	8.96	24	8	212.2	70.73
8	786	3	21	7	23	7.66	21	7	200.5	66.83
	Mean ± SE		25.125 ±2.19	8.0±0.45	26.06± 2.19	8.32±0.61	22.12± 2.66	7.03±0.76	197.41 ±21.32	63.00± 6.37

Specific managemental practices:

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

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. The castration is done by open method at the age below 60 days.

Mortality parameters

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

ii) Causes of mortality:

Causes of mortality in pigs from 01.04.2018 to 31. 03. 2019

S. No.	Causes of mortality	CB 75%
1.	Weakling	9
2.	Pneumonia	6
3.	Pleuropneumonia	2
4.	Gastroenteritis	3
5.	Enteritis	4
6.	Catarrhal entities	11
7.	Hepatitis	5
8.	Hemopericardium	4
9.	Fibrinous pericarditis	5
10.	Vegetative endocarditic	1
11.	Septicemia	2
12.	Still birth	1
13.	NSD/Autolysis	10
	Total	**63**

iii) **Measures taken to minimize mortality**

a. **Managemental measures:** Round the clock farrowing management 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, respectively to all the piglets. Besides, vaccination against FMD and Swine Fever is regularly done at farm. During the year, 520 animals were vaccinated against FMD and 411 animals were vaccinated against Swine Fever. Deworming along with ectoparasitic treatment of animals was done at regular intervals. Apart from this treatment of ailing cases is also being done regularly.

Health care management practices during 2018-2019

S. No.	Symptoms/ Ailments	Number of cases
1.	Lameness	45
2.	Digestive problem/Diarrhea	78
3.	Dermatitis & Skin wound	154
4.	Respiratory distress	2
5.	Fever	28
6.	Weakness/Dullness	241
7.	Hernia	10
8.	Abscess	10
9.	Hypoglycemia	2
10.	Anorexia	3
11.	MMA Syndrome	6
	Total	**579**

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

Nutritional experimentation:

- Evaluation of Betaine as a Feed Additive for Pigs

Disposal pattern of farm waste, pig excreta etc.: The farm waste in form of excreta is being disposed of through water splashing and carrying out to agricultural farm through drainage or sewerage channel. Formation of biogas utilizing pig excreta is being investigated in postgraduate research programs.

Extension program with success story:

i) At Institute:

- NR Sahoo. 2018. Delivered two theory lectures on "Selection and procurement of best animals" and "Integration of fish farming with piggery" and one practical lecture on "Preparing and maintaining farm records" in the ***Entrepreneurship Training Programme on Pig Farming*** conducted 3 times last year on 25th to 30th June 2018, 20thto 25thAugust 2018 and 15th to 20th December 2018**.**
- NR Sahoo. 2018. Delivered one lecture on "SUKAR PRAJANAN BYABASTHA" in KVK Training on "Improved Pig Production" on 06.08.18 to 10.08.2018
- NR Sahoo. 2018. Delivered a lectures on "SUKAR PRAJANAN BYABASTHA" in KVK Training on "Improved Pig Production" on 16.11.2018 to 20.11.2018
- NR Sahoo. 2018. Participated in programme "KRISHI PATHSALA" to deliver on topic "Shukar Palan Se Kishan Karen Aay Doguni" which was recorded at AKASBANI, RAMPUR on 05.01.2018

- GK Gaur. 2018. Panel discussion (*Vichar Vimarsh*) on "*World Veterinary Day 2018*". Recorded on 16 April 2018 at CPC, New Delhi by *DD Kisan*.
- GK Gaur. 2018. Introduction to pig farming. Entrepreneurship Training Programme on Pig Farming at Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh on 25th June 2018.
- GK Gaur. 2018. Record keeping in pigs. Entrepreneurship Training Programme on Pig Farming at Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh on 27th June 2018.
- GK Gaur. 2018. Management of pigs. Entrepreneurship Training Programme on Pig Farming at Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh on 29th June 2018.
- GK Gaur. 2018. *Sookro kee jatia*. Farmers Training at KVK, Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh on 7th August 2018.
- GK Gaur. 2018. Management of various categories of pigs. Entrepreneurship Training Programme on Pig Farming at Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh on 24th August 2018.

GK Gaur. 2018. *Sookro kee jatia*. Farmers Training at KVK, Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh on 16th November 2018.

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

Salient achievement during the report period:

- **Piglet production and supply**: Produced 496 piglets with 75% exotic blood in the current year for supply to farmers as well as to select future breeding stock.
- **Gurrah pig registration:** The local pig of Bareilly region (Gurrah) was characterized, documented and registered as 8th indigenous pig breed of the country (INDIA_PIG_2000_GHURRAH_09008) by the Breed Registration Committee of ICAR.

Scientific publications: 15

Project work students (M.V. Sc. / Ph. D.): Please refer to Annexure IV.

Distinguished visitors:

- Dr. Joykrushna Jena, Deputy Director General (Animal Science), Krishi Anusandhan Bhawan, New Delhi.
- Dr R.S. Gandhi, ADG (Animal Production and Breeding) ICAR-New Delhi.

	
Visit of Honorable Dr. Swaraj Rajkhowa, Director, ICAR-NRC on Pig ICAR-AICRP, IVRI	Visit of Honorable Dr R.S. Ghandi ADG (Animal Production and Breeding) AICRP, IVRI
	
The local pig Rohilkhand region has been characterized and registered as Indigenous breed	ICAR-AICRP staff doing teeth cutting newly born piglet
	
ICAR-AICRP staffs doing regular farm activities like Heat Detection, Measurements feeding and watering.	
	
Crossbred (75 % L x25 % D)sow with piglets	Crossbred (75%L x 25%D) Adult Boar

POST GRADUATE RESEARCH INSTITUTE IN ANIMAL SCIENCES, KATTUPAKKAM

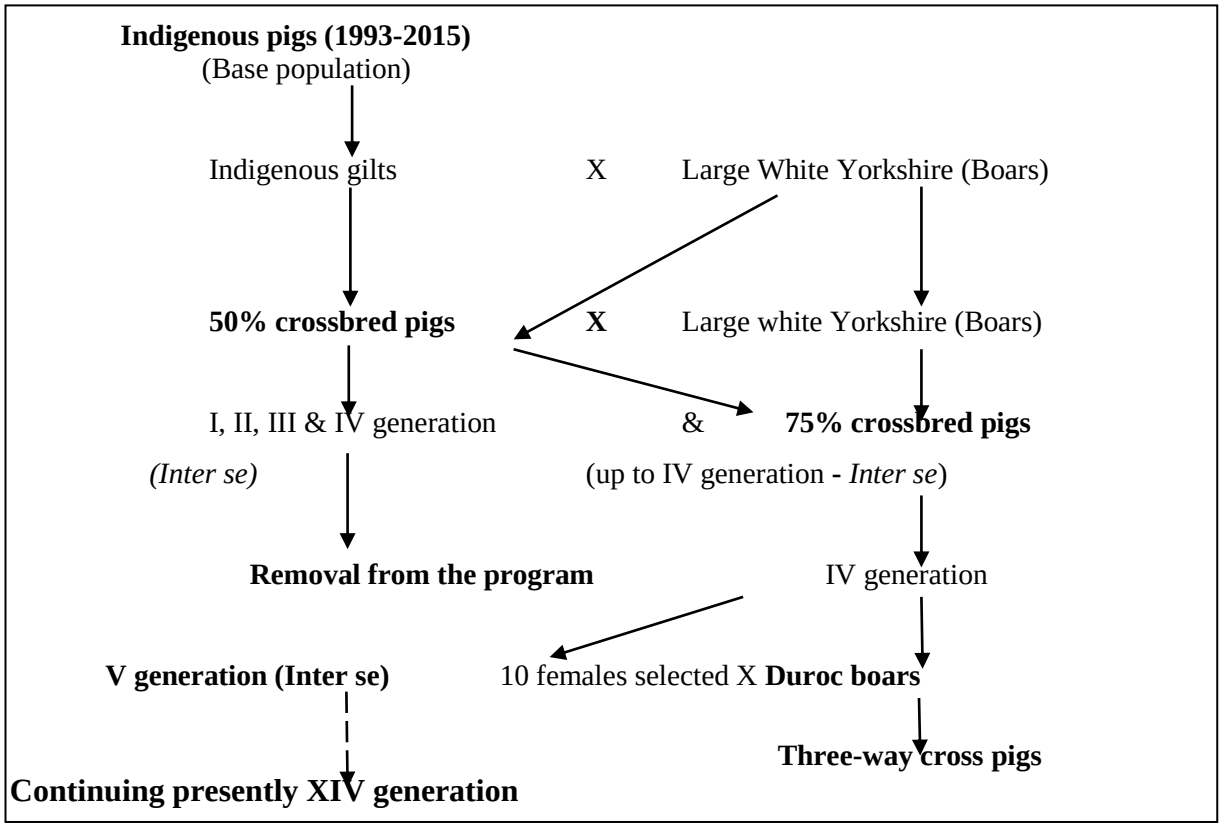
The herd strength as on 01.04.2018 was 189 crossbred pigs. The closing balance on 31.03.2019 was 360 crossbred pigs. During the period under report, parent stock was inter se mated to produce XIII generation progenies (III crop), XIV generation progenies (II crop and III crop) and XV generation progenies (I and II crop).

Herd dynamics (as on 31.03.2019)

Particulars	Adult		Grower		Suckling		Total
	M	F	M	F	M	F	
Opening Balance	**10**	**27**	**75**	**77**	**-**	**-**	**189**
Additions							
Birth	-	-	-	-	292	259	551
Internal transfer	23	43	265	235	-	-	566
Purchase	-	-	5	10	-	-	15
Total Additions	23	43	270	245	292	259	1132
O.B + T.A	**33**	**70**	**345**	**322**	**292**	**259**	**1321**
Deletions							
Death	1	-	7	2	15	12	37
Sold for breeding	-	-	113	94	-	-	207
Sold for slaughter	16	22	78	43	-	-	159
Internal transfer	-	-	24	44	259	231	558
Total Deletions	17	22	222	183	274	243	961
Closing Balance	**16**	**48**	**123**	**139**	**18**	**16**	**360**

Approved breeding program

FLOW CHART OF BREEDING STRATEGY



Breeding strategy

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

- ✓ Litter size at birth
- ✓ Litter size at weaning
- ✓ Litter weight at birth
- ✓ Litter weight at weaning
- ✓ Birth weight
- ✓ Weaning weight
- ✓ Fifth month body weight
- ✓ Eighth month body weight.

Performance

1. XIIIth generation III crop

Sl. No.	Traits / Character	Mean ± SE (No. of observation)		
		Male	Female	Total
1	Litter size at birth (No.)	4.00 ± 0.28 (6)	3.66 ± 0.25 (6)	7.66 ± 0.30 (6)
2	Litter weight at birth (kg)	4.28 ± 0.29 (6)	3.97 ± 0.27 (6)	8.25 ± 0.31 (6)
3	Litter size at weaning (No.)	3.66 ± 0.55 (6)	3.66 ± 0.49 (6)	7.33 ± 0.71 (6)
4	Litter weight at weaning (kg)	29.83 ± 3.35 (6)	27.83 ± 2.35 (6)	57.66 ± 4.21 (6)
5	Individual weight at birth (kg)	1.07 ± 0.01 (24)	1.08 ± 0.02 (22)	1.07 ± 0.01 (46)
6	Individual weight at weaning (kg)	8.14 ± 0.38 (22)	7.59 ± 0.34 (22)	7.86 ± 0.25 (44)
7	Number of days for weaning (d)	42		
8	Pre weaning mortality rate (%)	8.33	4.54	6.52
9	Pre weaning growth rate (gm/d)	168	155	182
10	Post weaning mortality rate (%)	-	4.54	2.27
11	Post weaning growth rate (upto 8 m) (gm/d)	340	322	331
12	Overall growth rate (up to 8 m) (gm/d)	313	294	304
13	Body weight (Kg)			
	1 month	4.11 ± 0.17 (8)	3.95 ± 0.11 (12)	4.03 ± 0.09 (20)
	2 month	13.21 ± 0.43 (8)	12.51 ± 0.38 (12)	12.76 ±0.28(20)
	3 month	23.66 ± 0.52 (8)	22.21 ± 0.54 (10)	22.91 ±0.41(18)
	4 month	36.25 ± 1.38 (5)	32.94 ± 0.71 (8)	34.12 ±0.74(13)
	5 month	43.97 ± 0.34 (4)	41.79 ± 1.28 (7)	42.5 ± 0.85(11)
	6 month	54.73 ± 2.40 (4)	50.21 ± 1.15 (7)	51.75 ±1.16(11)
	7 month	65.23 ± 2.92 (4)	61.17 ± 1.37 (6)	62.86 ±1.36(10)
	8 month	77.67 ± 3.78 (4)	71.62 ± 0.69 (6)	73.47 ±1.50(10)

Carcass characteristics

Sl. No.	Particulars	Observation
1.	Age at slaughter (d)	240 -270 days
2.	Weight at slaughter (kg)	70 – 80 kg
3.	Dressing Percentage (%)	65-66%
4.	Carcass Length (cm)	63
5.	Back Fat Thickness (mm)	2.90
6.	Meat Bone ratio (:)	2.5:1
7.	Amount of pork produced per sow/ Farrowing (kg)	562
8.	Feed conversion efficiency (:)	1:3

Life time production traits

Traits	Mean ± SE (No. of observation)
Average litter size at birth per sow (No.)	24.25 ± 0.25 (4)
Average litter weight at birth per sow (Kg.)	29.07 ± 1.91 (4)
Average litter size at weaning per sow (No.)	23.00 ± 0.25 (4)
Average litter weight at weaning per sow (Kg.)	170.90 ± 5.18 (4)
Average litter weight at slaughter per sow (Kg.) (4 pigs per sow)	301.25 ± 7.73 (4)

Specific managemental practice

(a) Identification

- The new born 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 polyurethane ear tag

(b) Castration: 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

	Pre-weaning (1 days to 42 days)			Post-weaning (42 days to 1 year)		
	M	F	T	M	F	T
Animals at risk	292	259	551	345	322	667
Animals died	15	12	27	7	2	9
Mortality (%)	5.14	4.63	4.90	2.03	0.62	1.35

Causes of mortality

Suckler		
1	Crushing	2
2	Miscellaneous (Weaklings, Runt, Debility etc.)	17
3	Enteritis	4
4	Pneumonia	4
	Total	**27**
Grower		
1	Pneumonia	2
2	Miscellaneous (Weaklings, Runt, Debility etc.)	6
3	Hepatitis	1
	Total	**9**
Adult		
1	Sudden death /shock	1
	Total	**1**
	Grand Total	**37**

Measures to taken minimize mortality

- Health problems such as anorexia, lameness, maggot, 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 Ivermectin 0.08% suspension @ 2.5 ml per 10 kg body weight to prevent the re infection because of intensive rearing.
- Routine health cover measures viz., vitamin and oral calcium supplementation, disinfecting the pig sties and premises, etc. were also carried out.
- Strict supervision and summer managemental practices like foggers were followed.

- Growth promoters such as 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 and lactating sows to boost growth and health.
- The unit 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.
- Field units were advised appropriately

Managemental and prophylactic measures

Particulars	2018-2019
No. of pigs treated	136
No. of pigs dewormed	629
No. of growers castrated	112
No. of animals vaccinated against Swine Fever	161
No. of animals vaccinated against Foot and Mouth Disease	297
No. of animals Vaccinated against Circo virus	508

Disposal of diseased carcass

The carcasses of dead pigs were buried in the disposal pit dug 4 to 5' feet depth after post-mortem and samples were regularly sent for haematological, histo-pathological and virological examination.

Nutritional trails

Evolving Milk Replacer Based Feeding Strategies for Early Weaned Piglets. Experiment duration of 42 days (weaning age)

- Treatment 1 with MR 1 (cow milk + skim milk powder + ghee)
- Treatment 2 with MR 2 (cow milk + skim milk + coconut oil)
- Treatment 3 with MR 3 (cow milk + whey protein + ghee) and
- Treatment 4 with MR 4 (cow milk + whey protein + coconut oil)

Among the four treatments; the piglets fed with MR1 (cow milk+ skm + ghee) has gained 5.3 ± 0.15 kg with FCE 0.61 ± 0.05 when compared with other groups. BWG is highest in T1 (5.3 ± 0.15) when compared to T2 (4.42 ± 0.75), T3 (4.2 ± 0.5) and T4 (4.32 ± 0.26) at the end of 42 days. No mortality was reported during the study.

Adoption of integrated farming systems

IFS with fruits and vegetables

Horti – component		
Guava	:	30 Kg.
Mango	:	150 Nos.
Cucumber	:	90 Nos.
Water Melon	:	20 Nos.
VEGETABLES : (Ladies Finger, Radish, Bitter Guard, Ridge Guard, Bottle Guard, Broad Beans)	:	124 Kg.

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

Pig solid waste collected from pig sty was regularly disposed in the manure pit. Pig urine and shed cleaned water along with urine into collection tank through the drainage channel located at the rear side of each shed. Waste Water treatment plant work is completed and treated water is used for irrigation and efforts are taken to install a biogas unit.

Production economics

1	Cost of production/pig up to slaughter age		
	Concentrate feeding	:	Rs.9222.00
	Swill feeding	:	Rs.4880.00
2	Cost of production/ kg pork		
	Concentrate feeding	:	Rs.136.00
	Swill feeding	:	Rs.72.00

Extension programme with success story

i) At the institute

1.	Farm Advisory Services	:	374
2.	No. of. New farms Established	:	16
3.	No. of. seed stock supplied to the farmers	:	207
4.	Swine fever vaccine supplied to the farmers	:	30

Training conducted

Date	Beneficiaries	Men	Women	Place
One Day Training on pig farming				
13.06.2018	14	13	1	PGRIAS, Kattupakkam
10.10.2018	16	15	1	
31.01.2019	22	19	3	
18.03.2019	29	27	2	
One month Training on pig farming				
11.04.2018 to 09.05.2018	1			PGRIAS, Kattupakkam
21.01.2019 to 15.03.2018	1			
01.02.2019 to 08.03.2018	1			
01.02.2019 to 15.03.2019	1			
11.02.2019 to 01.03.2019	1			

Radio and TV Programme

1. Radio Talk - Kattupakkam Gold Pig on 02.11.2018

Guest Lecture Organized / Delivered

1. Delivered lecture on Swine genetic resources of India - Summer School on "Conservation of Indigenous Livestock Germplasm: An Avant – Garde Approch to Success" – 14.05.2018.
2. Delivered lecture in one day Training Programme on Pig Farming
3. Participated and delivered the Lecture in ICAR –Summer School on "Conservation of Indigenous Livestock Germplasm: an Avant – Garde approach to success" organised by Dept. of Animal Genetics and Breeding, MVC, Chennai. Topic : Status of Swine Genetic Resources in India Date : 14.05.2018`
4. Participated and delivered the Lecture on "Integrated Farming System" in three day work shop (08.05.2018 to 10.05.2018) conducted by Science City, Chennai.
5. Scientist meet at Guwahati – 23rd – 24th November 2018.

6. TANUVAS to organize and coordinate the recording of Akashvani Annual Award 2018.

Exhibition conducted/Participated

Participated Science city exhibition on 22.02.2019

ii) At the farmer's field

Four field units were visited during the year 2018-19.

Salient achievement during the report period

1. Phenotypic Characterization of native pig
2. Developed Piggery Management Software
3. Approved vendor of CPCSEA for breeding and research on pigs
4. Documented success stories of pig farmers
5. Established nuclear breeding units
6. Established Waste Water Treatment Plant
7. Established Integrated Farming System (Pig - Duck - Fish)
8. XII and XIII generation parents of 75% crossbred pigs were pen mated to produce XIII, XIV and XV generation progenies and produced 551 progenies.
9. Breeding sale of 207 piglets to needy farmers.

Scientific publications

i) In peer-reviewed journals -9 nos.

ii) Popular articles – (Tamil) 7 nos.

Ongoing Research

Evolving milk replacer based feeding strategies for early weaned piglets

Distinguished visitors

Date	Name of Visitor	Designation
16.04.2018	Dr. K. Nachimuthu	CPCSEA Nominee, Director Research (Retd)
16.04.2018	Dr. T. P. Sachidanandam	Professor Emeritus, University of Madras, Dr.A.L.M.P.G.I.B.M.S, Taramani campus, Chennai-113
20.07.2018	1. Lionel.J. Dawson 2. Ashish Ranjan 3. Chsis Ross 4. Jerry Malayev	2155 W. Farm Road,,Centre of Veterinary Health Science. Oklahoma State University

Success story

Sl. No.	Name	Address	Stock Position	Economic Impact
1.	Ms. Shanthi	Vedanthangal, Kancheepuram	10	Started new poultry farm with native chicken (300 numbers) and Japanese quail (500 numbers)
2.	Mr. Samraj	Atthur, Salem District,	25	Two new pig shed was constructed around 2500 sq.ft and 3400 sq.ft
3.	Ms. Renuka Devi	Trichy	60	Earning Rs.5000/- per week by sale of pork

	
Pigs in AICRP Field unit	Pigs in AICRP Field unit
	
Pigs in AICRP Field unit	Visit of Oklahoma University faculties

COLLEGE OF VETERINARY SCIENCES, CAU, AIZAWL, MIZORAM

In the state of Mizoram**,** pig is by far the most popular livestock. 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 (31.03.2019) were presented in Table 1, 2, 3 and 4 respectively. It was revealed that a total of 382were available at the end of reporting period.

Herd Strength of 75% Crossbred as on 31.03.2019

Sl. No.	Categories	Opening balance	Additions		Disposals			Closing balance	
			Births	Transfers	Deaths	Transfers	Sold	M	F
1	Piglet (upto 42 days)	48	133	-	25	-	-	49	59
2	Grower (42 d-5 months)	9	-	-	3	-	-	6	10
3	Finisher (5-8 months)	20	-	-	8	-	-	18	22
4	Breeding female	30	-	-	6	-	-	31	
5	Boar	15	-	-	3	-	-	15	
	Grant total	**122**	**133**	**-**	**45**	**-**	**-**	**210**	

Herd Strength of Zovawk as on 31.03.2019

Sl.No.	Categories	Opening balance	Additions		Disposals			Closing balance	
			Births	Procured	Deaths	Transfers	Sold	M	F
1	Piglet (upto 42 days)	17	13	8	-	-	-	10	11
2	Grower (42d-5 months)	-	-	-	-	-	-	-	-
3	Finisher (5-8 months)	-		9	1	-	-	-	9
4	Breeding female	3		5	1	-	-	14	
5	Boar	3		1	-	-	-	13	
	Grand total	**23**	**13**	**23**	**2**	**-**	**-**	**57**	

Herd Strength of 50% Crossbred as on 31.03.2019

Sl.No.	Categories	Opening balance	Additions		Disposals			Closing balance	
			Births	Transfers	Deaths	Transfers	Sold	M	F
1	Piglet (upto 42 days)	-	21	-	-	-	-	10	11
2	Grower (42d-5 month)	-	-	-	-	-	-	-	-
3	Finisher (5-8 months)	-	-	-	-	-	-	-	-
4	Breeding female	9	-	-	1	-		8	
5	Boar	3	-	-	-	-		3	
	Grand total	**12**	**21**	**-**	**1**	**-**	**-**	**32**	

Herd Strength of Large White Yorkshire as on 31.03.2019

Sl.No.	Categories	Opening balance	Additions		Disposals			Closing balance	
			Births	Transfers	Deaths	Transfers	Sold	M	F
1	Piglet (upto 42 days)	52	18					6	12
2	Grower (42d-5 mont)	-						-	-
3	Finisher (5-8 months)	-			2			-	-
4	Breeding female	7			2			33	
5	Boar	5			1			26	
	Grant total	**64**	**18**	**-**	**5**	**-**	**-**	**77**	

Breeding strategy of the farm As Approved:

Initially, the centre maintained Mizo Local Pig (Zovawk) and Large White Yorkshire. From the reporting year 2012-2013, 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. Presently, four breeds namely Zovawk, 50% Crossbred, 75% Crossbred and Large White Yorkshire are maintained at the farm.At present a total of 31 breeding sows and 15 boars of 75% LWY and 25% Zovawkgenetic group are available as a closing balance. In addition to these, a finisher group (5- 8 months of age) of 31 (18 males and 21 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.

Performance of Animals: 75 % Crossbred (Parent generation)

SL. NO.	TRAITS/CHARACTERS	¾ LWYx ¼ ZOVAWK (MEAN±S.E)		
		Male	Female	Total/Average
1	Litter size at birth (no.)	3.16 ± 0.40 (6)	3.83 ± 0.30 (6)	7.00 ± 0.44 (6)
2	Litter weight at birth (Kg)	4.68 ± 0.59 (6)	4.23 ± 0.68 (6)	8.91 ± 0.68 (6)
3	Litter size at weaning (no.)	3.00 ± 0.51 (6)	3.83 ± 0.54 (6)	6.80 ± 0.60 (6)
4	Litter weight at weaning (Kg)	17.93 ± 2.00 (6)	22.43 ± 1.99 (6)	40.36 ± 2.99 (6)
5	Individual weight at birth (Kg)	1.08 ±0.04 (19)	1.10 ±0.04 (23)	1.09 ± 0.03 (42)
6	Individual weight at weaning (Kg)	5.66 ± 0.28 (18)	5.85 ± 0.29 (23)	5.76 ± 0.20 (41)
7	Pre weaning growth rate (g/day)	159.59 ± 7.71 (18)	135.39 ± 8.10 (23)	147.20 ± 5.84 (41)
8	Post weaning growth rate (g/day)	276.16 ± 18.05 (10)	255.53 ± 5.40 (25)	268.42 ± 11.56 (35)
9	Body weight (Kg) at 5th month	31.50±1.45	31.75±1.23	31.66±1.37
10	Body weight (Kg) at 8th month	61.50±2.93	58.66±0.92	60.43±1.85

Performance of Animals:75 % Crossbred (1stGeneration 1stCrop)

SL. NO	TRAITS/CHARACTERS	¾ LWYx ¼ ZOVAWK (MEAN±S.E)		
		Male	Female	Total/Average
1	Litter size at birth (no.)	3.77± 0.61 (9)	4.66± 0.70 (9)	8.4± 0.8 (9)
2	Litter weight at birth (Kg)	3.60 ± 0.59 (9)	4.34± 0.70 (9)	7.94 ± 0.88 (9)
3	Litter size at weaning (no.)	3.85 ± 0.67 (7)	4.57 ± 0.71 (7)	8.4± 0.94 (7)
4	Litter weight at weaning (Kg)	23.91 ± 5.82 (7)	26.32 ± 3.68 (7)	50.24 ± 6.9 (7)
5	Individual weight at birth (Kg)	0.95 ± 0.03 (34)	0.93 ± 0.03(42)	0.94 ± 0.02(76)
6	Individual weight at weaning (Kg)	6.2 ± 0.39 (27)	5.75 ± 0.29 (32)	5.96 ± 0.24 (59)
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%)	4.7	1.58	6.3
9	Pre weaning growth rate (g/day)	124.44 ± 9.19 (27)	115.71 ± 7.06 (32)	119.71± 5.67(59)
10	Post weaning mortality rate (%) (As on 31.03.2018)	1.5	3.17	4.7
11	Post weaning growth rate (g/day)	294.43± 11.72 (25)	281.68 ± 7.86(18)	287.56 ± 6.81 (43)
12	Overall growth rate (upto 9 m) (g/d)	276.44 ± 12.72 (25)	275.04± 20.45(18)	261.44± 6.98 (43)

13	Body weight (Kg) (Average)			
	1 month	4.30±1.21 (34)	4.60±0.55 (42)	4.54 ± 0.18(76)
	2 month	10.37±1.24 (27)	7.58±1.28 (32)	8.7± 0.96 (59)
	3 month	17.27±1.25 (27)	17.89±1.15 (32)	17.64 ± 0.84(59)
	4 month	26.62±2.30 (20)	23.88±2.24 (27)	24.7 ±1.69 (47)
	5 month	30.27±2.33 (20)	32.63±1.96 (27)	31.84±1.51 (47)
	6 month	42.94±3.35 (20)	42.25±2.32 (27)	42.54±0.85 (47)
	7 month	52.28±1.94 (20)	50.55±1.4 (27)	51.1±1.14 (47)
	8 month	60.76±3.22 (20)	61.60±2.29 (27)	61.31±1.81 (47)
	9 month	73.40±3.13 (25)	69.98±2.38 (18)	71.56±1.91 (43)
14	Age at slaughter (d)	300	NA	300
15	Weight at slaughter (Kg)	86.00±2.7(5)	NA	86.00±2.7(5)
16	Dressing percentage (%)	70.14±0.96 (5)	NA	70.14±0.96 (5)
17	Carcass length (cm)	109.40±2.87(5)	NA	109.40±2.87(5)
18	Back fat thickness (mm)	2.63±0.24 (5)	NA	2.63±0.24 (5)
19	Feed conversion efficiency	4.17± 2.13	NA	4.17± 2.13

Performance of Animals:75 % Crossbred (1st Generation 2nd Crop)

SL. NO.	TRAITS/CHARACTERS	¾ LWYx ¼ ZOVAWK (MEAN±S.E)		
		Male	Female	Total/Average
1	Litter size at birth (no.)	5.8± 0.96 (5)	2.8± 1.24 (5)	8.60± 1.02 (5)
2	Litter weight at birth (Kg)	5.07 ± 1.10 (5)	2.49± 1.26 (5)	7.56 ± 0.83 (5)
3	Litter size at weaning (no.)	5 ± 1.08 (4)	2.25 ± 1.43 (4)	7.25± 0.85 (4)
4	Litter weight at weaning (Kg)	31.89 ± 7.70 (4)	12.95 ± 9.02 (4)	44.84 ± 3.46 (4)
5	Avg. Individual weight at birth (Kg)	0.87 ± 0.04 (29)	0.89 ± 0.10 (14)	0.88 ± 0.04(43)
6	Individual weight at weaning (Kg)	6.37 ± 0.36 (20)	5.75 ± 0.85 (9)	6.18 ± 036 (29)
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%)	9.3	-	9.3
9	Pre weaning growth rate (g/day)	123.36 ± 10.02 (20)	111.56 ± 17.78 (9)	119.82± 8.70(29)
10	Post weaning mortality rate (%)	-	-	-
11	Post weaning growth rate (g/day)	274.43± 8.5 (15)	251.68 ± 6.66(7)	259.26 ± 5.42 (22)
12	Overall growth rate (upto 9 m) (g/d)	252.42 ± 10.12(15)	240.05± 18.54(7)	246.12± 13.45 (22)
13	Body weight (Kg) (Average)			
	1 month	4.28±1.11 (29)	4.12±0.15 (14)	4.19 ± 0.38(43)
	2 month	10.25±1.54 (20)	8.88±1.22 (9)	9.7± 0.93 (29)
	3 month	17.22±1.32 (20)	16.99±1.22 (9)	17.01 ± 0.45(29)
	4 month	26.21±2.30 (15)	24.18±2.24 (7)	25.6 ±1.88 (22)
	5 month	30.34±2.33 (15)	32.25±1.66 (7)	31.64±1.21 (22)
	6 month	42.75±3.65 (15)	41.65±2.46 (7)	42.25±0.79 (22)
	7 month	53.28±2.14 (15)	51.05±1.4 (7)	52.22±1.52 (22)
	8 month	59.98±3.22 (15)	59.40±2.29 (7)	59.67±1.63 (22)
	9 month	72.15±3.25 (15)	69.46±2.63 (7)	71.46±1.87 (22)
14	Age at slaughter (d)	300	NA	300
15	Weight at slaughter (Kg)	80.16 ± 5.18	NA	80.16 ± 5.18
16	Dressing percentage (%)	69.08 ± 1.65	NA	69.08 ± 1.65
17	Carcass length (cm)	107.33± 3.92	NA	107.33± 3.92
18	Back fat thickness (mm)	3.49±0.63	NA	3.49±0.63
19	Feed conversion efficiency	4.20±2.1	NA	4.20±2.1

Performance of Animals: Zovawk (Mizo Local)

SL. NO.	TRAITS/CHARACTERS	ZOVAWK (MEAN±S.E)		
		Male	Female	Total/Average
1	Litter size at birth (no.)	3.10±0.26(10)	3.40±0.53 (7)	6.50± 0.66(17)
2	Litter weight at birth (Kg)	1.40±0.32 (10)	1.6±0.24 (7)	3.0±0.29 (17)
3	Litter size at weaning (no.)	3.10±0.34 (10)	3.40±0.35 (7)	6.50± 0.41(17)
4	Litter weight at weaning (Kg)	14.45±1.20.05 (10)	12.2±1.05(7)	26.65±1.42 (17)
5	Avg. Individual weight at birth (Kg)	0.46±0.03 (10)	0.45±0.05 (7)	0.46±0.02 (17)
6	Individual weight at weaning (Kg)	4.06±0.41 (10)	4.12±0.26 (7)	4.09±0.98 (17)

7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%)	-	-	-
9	Pre weaning growth rate (g/day)	65.1±3.21 (10)	69.0±2.94 (7)	67.2±2.58 (17)
10	Post weaning mortality rate (%)	5.26	5.26	10.52
11	Post weaning growth rate (g/day)	158.19 ±2.13 (10)	166.46±2.40 (7)	162.32±1.72 (17)
12	Overall growth rate (upto 9 m) (g/d)	141.25±3.18 (10)	150.62±2.2 (7)	145.93.5±3.4 (17)
13	Body weight (Kg) (Average)			
	1 month	2.26±0.18(16)	2.38±0.22(14)	2.33±1.25(30)
	2 month	4.06±0.36(10)	4.12±0.38(7)	4.1±0.26(17)
	3 month	6.96±2.14(10)	7.23±2.3(7)	7.1±2.2(17)
	4 month	8.38±2.4(10)	9.25±2.8(7)	8.82±2.6(17)
	5 month	12.10±1.33 (9)	12.52±1.42(7)	12.31±1.32 (16)
	6 month	14.95±0.92 (9)	15.72±0.58 (7)	15.36±0.86 (16)
	7 month	16.92±1.12(9)	17.65±1.35(7)	17.28±1.15 (16)
	8 month	21.13±1.15 (9)	21.95±1.96 (7)	21.54±1.34 (16)
	9 month	22.12±1.24 (9)	23.66±1.32 (6)	23±1.49(15)

Lifetime Production Traits:

- Average litter size at birth per sow was 8.2 ±1.32, 5.1±0.86 and 9.2±0.91 in 75% crossbred, Zovawk and LWY respectively.
- Average litter weight (Kg) at birth per sow was 8.41 ± 0.41, 2.81±0.16 and 10.12±0.62 in75% Crossbred, Zovawk and LWY respectively.
- Average litter size at weaning per sow was 8.21± 0.20, 5.12±0.37 and 8.50±1.03 in 75% Crossbred, Zovawk and LWY respectively.
- Average litter weight (Kg) at weaning per sow was 47.02 ± 1.05, 15.18±1.06 and 54.19± 2.41 in 75% Crossbred, Zovawk 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 which was started from 2nd week to weaning
e) Weaning of piglets at 6 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 respective registers in 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

i) 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	-	-	-	-	-	-	10.5	8.27	18.79	-	-	-
2-6	-	-	-	-	-	-	-	3.4	3.4	2	2.16	4.16
6-12	5.26	5.26	10.52	-	-	-	4	2	6	-	-	-
12 &>		-	-	-	12.5	12.5	3.5	2.1	5.6	1.5	1.5	3
Total	-	-	10.52	-	-	09	18	15.77	33.77	-	-	7.16

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

S.N.	CAUSES	Zovawk			50% Crossbred			75% Crossbred			LWY		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
1	Pneumonia/Bronchopneumonia/Verminous pneumonia	-	-	-	-	-	-	5	8	13	1	2	3
2	Enteritis/Gastro-enteritis	-	-	-	-	-	-	4	4	8	-	-	-
3	Suspected for PRRS	1	1	2	-	1	1	9	8	17	1	-	1
4	Septicaemia/ Post -operative septicaemia	-	-	-	-	-	-	1	1	2	-	-	
5	Dehydration	-	-	-	-	-	-	2	2	4	-	-	-
6	Diarrhoea	-	-	-	-	-	-	-	1	1	-	-	-
7	Pyelonephritis	-	-	-	-	-	-	-	-	-	-	1	1
	Total	1	1	2	-	1	1	21	24	45	2	3	5

i) Measures Taken to Minimize Mortality:

Managemental Measures:

- All the sheds were disinfected twice weekly with disinfectants (Phenol or Clinar)
- 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-

Sl. No.	Prophylactic Measures	Zovawk			50% Crossbred			75% crossbred			LWY		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
1	Vaccination against CSF	12	16	28	3	8	11	39	62	101	12	46	58
2	Deworming (Ivermectin /Albendazole)	12	16	28	3	8	11	46	94	140	18	41	59
3	Iron Injection (on 4^{th}& 14^{th} day of birth)	6	7	13	10	11	21	50	59	109	6	12	18
4	Vitamin B-complex Injection (on 5^{th}&15^{th} day of birth)	6	7	13	10	11	21	50	59	109	6	12	18

ii) 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.

Adoption of integrated farming system: Initiated in collaboration with the College KVK.

Survey on market of pork production:

Survey on pork production in Aizawl, Kolasib and Mamit districts showed that almost all the household reared pigs as backyard system of farming by providing the kitchen waste mixed with locally available feed ingredients such as Colocasia. Japan hlo, banana pseudo stems, squash fruits, sweet potato leaves etc. Most of the farmers rear the breed like LWY, Hampshire and their crossbred with local pigs. Farmers usually preferred to rear fatteners pig rather than rearing the breeders. Farmers usually sold out the finisher pig at the age of 12 – 14 months to the butchers directly by fixing the price based on the chest girth measurement.

Most of the pigs are being slaughtered unscientifically in the open area. The market rate of pork is Rs.280.00/Kg. The demand of the pork remains almost same throughout the year. To fill up the gap between the demand and supply of porks, pigs are being imported from the neighbouring states.

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 is Rs. 12000/- to Rs. 15,000/-

ii) Cost of Production/Kg Pork is Rs. 170/- to Rs.190/-

Extension programme with success story:

i) **At the Institute**:

1. Dr. Shyamsana Singh, Principal investigator, acted as resource persons in the Vocational Training Programme (14th December, 2018 to 14th March, 2019) on Scientific Management of Pig conducted by the Department of Livestock Production Management.
2. Dr. J.B. Rajesh, Co- Investigator of the ICAR-AICRP (pig) acted as resource persons in the Vocational Training Programme (14th December, 2018 to 14th March, 2019) on Scientific Management of Pig conducted by the Department of Livestock Production Management

ii) **At the Farmers' Field**:

1. The staff of the centre regularly visited the nearby pig farmers and give advisory services to them about the improved farming system.
2. Scientists of the project attended the Animal Health Camps conducted from time to time by the College. They interacted with the pig farmers during the camps and provided scientific inputs for better productivity of the piggery.
3. Distributed booklets on Piggery farming in Mizo languages (Module I and Module II)

Salient achievement during the report period:

i. A total of 210 Crossbred (75%) and 55Zovawk pigs are stock position to fulfil the objectives at the end of the reporting year.

ii. The average performance in the selected traits showed positive response in the progeny generation.

Scientific Publications:

a) 3 nos.

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

1. Comparative efficacy of different methods of castration on the growth performance and carcass quality of male pigs. (On the verge of completion).

	
75% Crossbred Sow	75% Crossbred Boar
	
Zovawk boar	Visit of farmers

NAGALAND UNIVERSITY, SASRD-MEDZIPHEMA

Agrarian in nature the state of Nagaland depends largely on agriculture, natural resources and livestock to meet their livelihood needs. Backyard piggery is common among the people with less labour requirement, more profitable a trade sustainable for the marginal farmers of the tribal state. 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 543494 nos. respectively, inclusive of locally reared and imported from neighbouring states. Seeing 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 (Tenyivo) in the year 2009-2010, and gradual up-gradation of local breed germ-plasm by crossing with exotic Hampshire boar was carried out. Since the inception of the project in the campus, a deliberate continuity of cross breeding of Indigenous local female Tenyivo (TV) with Hampshire (H) boar producing 50%TV50%H by Inter-se-mating. Presently the centre is maintaining 75% upgraded Tenyivo (25%TV75%H) by inter-se-mating as per ICAR guidelines.

Herd dynamics:

Tenyivo pig

Sl. No.	Categories	Opening balance	Additions		Disposals			Closing Balance
			Births/ purchase	**Transfer	Deaths	transfers	sold	
1.	Piglet (up to 42 day)	**0**	10	0	4	0	0	**0**
2.	Growers(42 d- 5 m)	**6**	15	6	4	0	0	**19**
3	Finisher(5 m -8 m)	**4**	4	0	0	0	2	**6**
4	Breeding female	**2**	0	0	0	0	0	**2**
5	Boar	**2**	0	0	0	0	0	**2**
	Grand total	**14**						**29**

**Pen to pen transfer within farm and purchase of animal from outside

Upgraded Tenyivo 50%

Sl. No.	Categories	Opening balance	Additions		Disposals			Closing Balance
			Births/ purchase	**Transfer	Deaths	transfers	sold	
1.	Piglet (up to 42 day)	**0**	0	0	0	0	0	**0**
2.	Growers(42 d- 5 m)	**15**	0	0	0	0	15	**0**
3	Finisher(5 m -8 m)	**8**	0	0	0	0	0	**8**
4	Breeding female	**4**	0	0	0	0	0	**4**
5	Boar	**0**	0	0	0	0	0	**0**
	Grand total	**27**						**12**

**Pen to pen transfer within farm.

Upgraded Tenyivo 75%

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing Balance
			Births/ purchase	**transfer	Deaths	transfers	sold	
1.	Piglet (up to 42 day)	**40**	157	0	27	0	117	**53**
2.	Growers(42 d- 5 m)	**2**	0	0	0	0	2	**0**
3	Finisher(5 m -8 m)	**77**	0	0	0	0	8	**69**
4	Breeding female	**30**	0	0	4	0	3	**23**
5	Boar	**11**	0	0	1	0	3	**7**
	Grand total	**160**						**152**

**Pen to pen transfer within farm

Hampshire

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing Balance
			Births /purchase	**transfer	Deaths	transfers	sold	
1.	Piglet (up to 42 days)	**0**	32	0	7	0	16	**0**
2.	Growers (42 d- 5 months)	**10**	9	0	3	0	0	**0**
3	Finisher (5 m -8 m)	**0**	14	0	0	0	0	**14**
4	Breeding female	**5**	0	2	0	0	3	**4**
5	Boar	**4**	0	0	0	0	0	**4**
	Grand total	**19**						**22**

**Pen to pen transfer within farm

The total number of piglet Born =199

The total No. of piglet sale = 148

Breeding strategy of the farm as approved:

Nagaland Indigenous gilts Tenyivo X Hampshire boar

Up-Graded Tenyivo 50% X Hampshire boar

Up-Graded Tenyivo gilt (75%) X Upgraded Tenyivo (75%) boar

Performance of pigs: 75% Upgraded Tenyivo

Sl. No.	Trait/Characters	Mean ± SE (no. of observation		
		Male	Female	Total
1	Litter size at birth (no)	4.48±0.57(25)	4.10±0.59(25)	8.52±0.64 (25)
2	Litter weight at birth (kg)	5.07± 0.58(25)	4.18± 0.52(25)	8.95 ±0.63 (25)
3	Litter size at weaning (no)	3.67 ±0.57 (25)	3.53 ±0.55(25)	7.12± 0.58 (25)
4	Litter weight at weaning (Kg)	18.42± 1.05(25)	17.76± 1.18 (25)	36.49± 1.33 (25)
5	Individual weight at birth (Kg)	1.08± 0.19(112)	1.01± 0.18 (87)	1.05± 0.00 (199)
6	Individual weight at weaning (kg)	5.15 ±0.40(91)	5.09± 0.49 (70)	5.12± 0.05 (161)
7	No of days for weaning	42	42	42
8	Pre weaning mortality rate (%)	16%	19%	17%
9	Pre weaning growth rate (gm/d)	95	95	95
10	Post weaning mortality rate (%)	3%	6%	4.5%
11	Post weaning growth rate (gm/d)	168	168	168
12	Overall growth rate (gm/d)	170	171	170
13	Body weight (Kg)			
	1 month	3.97± 0.11 (23)	3.93± 0.19(31)	3.95± 0.10 (54)
	2 month	8.82± 0.08 (23)	8.74± 0.17 (20)	8.78± 0.11 (43)
	3 month	14 ±0.18 (20)	13.94 0.16 (19)	13.97 ±0.01 (39)
	4 month	19± 0.15 (20)	18.94± 0.23 (19)	18.97± 0.13 (39)
	5 month	24.05± 0.49 (20)	23.93 ±0.14 (17)	24 ±0.27 (37)
	6 month	29.05± 0.42 (20)	29 ±0.34 (17)	29 ±0.27(37)
	7 month	34.12 ±0.19 (16)	34± 0.19 (14)	34.06± 0.13 (30)

	8 months 9 months 10 months	39.56± 0.3 (16) 45± 0.27 (13) 50.4± 0.64 (10)	39.33± 0.29 (14) 44.92± 0.32 (13) 50.3 ±0.58(10)	39.46 ±0.21 (30) 44.96 ±0.20(20) 50.35 ±0.42 (20)
14	Age at slaughter (d)		10 months	
15	Weight at slaughter (Kg)		50	
16	Dressing percentage (%)		70	
17	Carcass length (cm)		85	
18	Back fat thickness (cm)		2.5	
19	Amount of pork produced per sow upgraded (Kg)		125	
20	Feed conversion efficiency (☺		4.2:1	

Life time production traits:-

a) **Average litter size at birth per sow :** 8.58±0.64

b) **Average litter weight at birth per sow:** 8.95±0.63

c) **Average litter size at weaning per sow:** 7.12±0.58

d) **Average litter weight at weaning per sow:** 36.49±1.33

Specific management practices:

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

Mortality parameter:

Pre-weaning mortality:

Sl. No.	Traits/Characters	Pre-weaning		
		male	female	Causes of mortality
1	Nagaland Indigenous (Tenyivo)	3	1	-
2	Upgraded pigs	14	13	Enteritis, pneumonia
3	Hampshire pigs	4	3	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)	2	2	-
2	Upgraded pigs	3	1	Enteritis, Pneumonia
3	Hampshire pigs	1	2	Septicaemia, Enteritis

iii) Measures taken to minimize mortality:

Management measures:

After farrowing providing warm bedding**, gunny bags slings** and100 watt electrical bulb in the creep area to control cold stress during winter season and chilled weather even during summer. Helping the weak piglets to suckle mother's first milk colostrum within 24 hours and later bottle feedings. Second week provide creep ration. Toning up weak animals with vitamins, glucose and mineral supplements. Daily morning and evening cleaning of pig pen and change the litter materials in the creep area, use of disinfectants twice a week

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. Swine Fever Vaccination of all 3 months old pigs 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 & phenyl application

Nutritional experimentation: Feeding of sliced fermented tapioca tubers replacing 30% concentrate ration successful

Adoption of integrated farming system: Tapioca and sweet potato plantation using pig manure gave a good harvest of 6-8 kg tubers per plant within eight to ten months

Survey on market pork production: survey of pork production conducted at Medziphema area and Kohima district recorded ₹220/- ₹240/- per Kilo raw retail cuts respectively. Medziphema daily slaughtering of five to six pigs with average live weight of 90-110 kg of supplied pigs, coming from Uttar Pradesh, Bihar, Assam etc.

Disposal pattern of farm waste, pig excreta etc: The farm washing and excreta is channelled into the fish-pond which is dry from December to May, natural decomposition of manure is collected on to a shallow pit and used for the farm garden. The remaining manure utilized by Agricultural research Scholars and Horticultural farms, flower- beds and animal fodder plots for pigs and cattle.

Production economics:

i) Cost of production of a fattened pig up to 10 months of age = ₹10,060
ii) Cost of production of a kg of pork = ₹220

Extension program with success stories:

Events organized:

Sl. No.	Name of Events	Sponsoring Agents	Venue	Date
1.	On campus hands on training on Livestock farm Sanitation	ICAR-AICRP on Pig, NU, SASRD Medziphema	Dept. of LPM, NU, SASRD	30.05.2018
2.	Off campus Awareness Programme on Deworming of pig	ICAR-AICRP on Pig, NU, SASRD Medziphema	Mezoma village	14.09.2018
3.	On campus awareness programme on control of Endoparasite and Ectoparasite	ICAR-AICRP on Pig, NU, SASRD Medziphema	Dept. of LPM, NU, SASRD	24.09.2018
4.	World animal Day	ICAR-AICRP on Pig, NU, SASRD Medziphema	Dept. of LPM, NU, SASRD	04.10.2019
5.	Hands on training on pig Management (three days)	ICAR-AICRP on Pig, NU, SASRD Medziphema	Dept. of LPM, NU, SASRD	26.03.2019 – 28.03.2019

Salient achievement during the reporting period:

a. Successful up-gradation of Indigenous Tenyivo and producing healthy Upgraded piglets desired by the resources poor rural farmers, and the Upgraded Tenyivo is performing well in farm as well as in the farmer's field condition.
b. Sale proceeds amounting to Rs. 4, 98,186 from sale of Upgraded piglets, fattened, culled adult pig to the Rural Farmers to enhance the rural livelihood condition.
c. Conducted five successful out-reach programme
d. 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.
e. Ensilaged fodder and fermented sliced tapioca incorporated in the pig ration replacing up to 20-30% of concentrate feed.
f. Two success stories documented and under process for publication

Project work of students:

1. Post Graduate student M. Sc. (Ag) completed the observation on the "**Effect of weaning age on the production performance of upgraded Tenyivo pig"**.
2. Post Graduate student M.Sc. (Ag) completed the observation on the "**Performance of Tenyivo pig on Diet replaced with Dried Distiller Grain with Soluble (DDGS)"**.
3. Ph.D student ongoing observation on the **"Behavioural Characteristic of Different Genotype of Pig**".

Distinguish visitors:

1. Dr. Hovithal Sothu, Principal Administrative Training Institute, Nagaland Kohima
2. T. Lanusosang, Pro Vice chancellor, NU, SASRD, Medziphema

Hands on training on pig management

Hands on training on pig management

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 AICRP programme was initiated in XIIth Plan and technical programme was finalized in review meet of AICRP Project in 2015. The objective of the centre is to study the performance of indigenous pigs (Andaman Local pigs) along with production and distribution of good quality piglets to farmers

Herd dynamics:

Details	Andaman local pigs		
	male	female	total
Opening balance as on 31/3/2018	8	16	24
Birth 1/4/2018 to 31/3/2019	34	32	66
Total	42	48	90
Mortality	10	4	14
Sold	11	14	25
Total	27	43	51
Purchase	9	14	24
Closing balance as on 31/3/2019	36	57	75

The present breedable stock is 33 in numbers with 20 female and 13 male and 42 growers/ piglets.

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 were raising .The method selected for crossing is natural and pure stock of desi animals are maintained.

Performance of animals:

Sl. No.	Traits/ Characters	Mean ± SE		
		Male	Female	Total
1	Litter size at birth (no.)	3.09 ± 0.50	2.91± 0.53	5.5 ±0.95
2	Litter Weight At birth (Kg)	5.96 ± 1.45	4.63 ± 0.72	10.23 ± 1.64
3	Litter size at weaning (no.)	2.18 ± 0.0.52	2.54 ±0.52	4.33 ±0.90
4	Litter weight at weaning (kg)	55.32 ± 12.39	48.12 ± 8.42	98.45 ± 11.76
5	Avg. Individual weight at birth (Kg)	1.63 ± 0.10	1.41 ± 0.09	1.52 ± 0.10
6	Avg. Individual weight at weaning(Kg)	14.20 ± 0.52	13.55 ± 0.36	15.01 ± 0.47
7	No. of days for weaning (d)	56	56	56
8	Pre weaning mortality rate (%)	29.41	12.5	21.21
9	Post weaning mortality rate (%)	0	0	0
10	Pre weaning growth rate (Kg/d)	0.32 ± 0.005	0.34 ± 1.56	0.33 ± 0.003
11	Post weaning growth rate (Kg/d)	0.37 ± 0.009	0.38 ± 0.008	0.36 ± 0.005
12	Overall growth rate (gKg/d)	0.34 ± 0.01	0.39 ± 0.031	0.38 ± 2.50
13	Body weight at different ages (Kg)			
	Birth weight	1.63 ± 0.10	1.41 ± 0.09	1.52 ± 0.10
	1 Month	5.57 ± 0.15	6.01 ± 0.2	5.9 ± 0.11
	2 Month	13.42 ± 0.47	14.23 ± 0.23	14.05 ± 0.33
	3 Month	20.41 ± 0.95	22.42 ± 0.51	21.05 ± 0.46
	4 Month	27.25 ± 0.46	29.25 ± 0.53	28.62 ± 0.45
	5 Month	45.40 ± 2.56	43.93 ± 3.56	44.78 ± 3.45
	6 Month	59.46 ± 3.25	56.45 ± 5.31	57.45 ± 4.32
	7Month	72.45 ± 2.13	70.81 ± 4.25	70.56 ± 3.25
	8 Month	81.40 ± 5.48	78.45 ± 8.56	78.60 ± 5.89
	9 Month	82.50 ± 5.56	79.45 ± 6.35	80.21 ± 5.26

Mortality parameter:

Animal	Pre weaning mortality			Post Weaning Mortality		
	Male	Female	Total	Male	Female	Total
Total animals	34	32	66	27	43	51
Animals Died	10	4	14	0	0	0
Mortality %	29.41	12.5	21.21	0	0	0

Post Weaning Mortality: Nil

ii) **Causes of Mortality**:

- The major cause for mortality at pre-weaning stage is overlaying.

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

i. **Managemental measures**:

- Importance are given to regular sanitization of the with spraying of bleaching powder and potassium permanganate
- Periodical dewormed are done to the pigs. periodically
- Screening of parasitic diseases and their health
- Iron tonic is used to control piglet diarrhea and anemia
- Efforts to be taken to minimize pre weaning mortality rate

ii. **Prophylactic measures**:

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

iv) **Disposal of diseased carcass**:

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

Nutritional Experimentation: Locally available feed maters are use to feed the pigs. This center has developed to balance the farmers ration by supplementing the deficient nutrient, like adding thrash fish from the sea, coconut cake.

Adoption of integrated farming systems: Six farmer have been trained with IFS and now practicing the IFS with Pig, Poultry fodder and horticultural crops.

Survey on market of pork production: No

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

Production economics:

A. Cost of pork production at Farm condition:

Average Feed requirement up to 8 months of age = 360 Kg

i. Cost of feed at the Institute (ARC)@ Rs 30.50/ kg = 10980.00

ii. Cost of medicine and vaccines @ Rs 600.00

Total Cost of production (i+ii) = 11580.00 at 78 Kg live weight/ animal.

Cost of production/ kg live wt: 148.46 / kg live weight.

Cost of production/kg pork: Rs 212.00{Total port produced 54.6 kg @70% dressing percentage}

B. Field Condition: (Amal Baidya Chouldary)

i. Cost of weaned Piglets @ Rs 2500.00

ii. Cost of feed Locally available with balancing of nutrient @ Rs 20/Kg

Total cost calculated Rs 5400.00 (@ Rs 30/ day collection cost)

iii. Cost of Medicine Rs 600.00

Total Cost (i to iii) Rs 8500.00 t at 6 months of rearing, weight 75 Kg

Cost of production/ kg live wt: 113.33 / kg live weight.

Cost of production/kg pork: Rs 161.9 {Total port produced 52.5 kg @70% dressing percentage}

Extension programme with success story:

Salient achievement during the report period: Six farmer have been trained with IFS and now practicing the IFS with Pig, Poultry fodder and horticultural crops.

Scientific publications:

Book Chapters: 1 no

Training manuals: 2 nos.

Distinguish visitors: Chairman RAC and QRT Visited the farm

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Training programme</td><td>Pig at farmers' field</td></tr>
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<tr><td>Inaguration of new shed</td><td>Vistit of Dirctor, ICAR-NRC on Pig</td></tr>
</table>

COLLEGE OF AGRICULTURAL, CAU, IMPHAL, MANIPUR

The National Research Project on Pig, ICAR, has sanctioned All India Co-ordinated 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 traits, survivability at weaning, disease resistance, sexual maturity etc. However, as per the resolution of the Annual Review Meet (2015-16), the breeding programme of the Centre has been changed to maintain Rani Variety (50% Hampshire X 50% Ghungroo). At the end of the reporting year, the centre maintains 167 nos. of Rani Pig of different age group.

Herd dynamics of Rani pig

Sl. No.	Age (months)	Opening Balance as on 01.04.2018	Additions		Disposal			Closing balance on 31.03.2019
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (up to 42 days)	30	276	-	24	-	-	71
2	Growers (42 d-5 m)	45	-	-	41	-	99	27
3	Finisher (6 -8 month)	-	-	-	-	-	34	19
4	Breeding female	35	-	-	-	-	26	45
5	Boar	5	-	-	-	-	-	5
	Total	**115**	**276**	**-**	**65**	**-**	**159**	**167**

Breeding strategy of the farm as approved:

- At the beginning, the breeding strategy was to upgrade locally available indigenous pigs of Manipur, so as to see the improvement in body weight gain, litter traits, survivability at weaning, disease resistance etc.
- Afterwards, as per the resolution of the Annual Review Meet (2015-16) held at NASC complex, Pusa, New Delhi, the breeding programme of the Centre has been changed to maintain Rani breed (50% Hampshire X 50% Ghungroo).
- Accordingly, the study on the performance of the Rani pig (50% Hampshire X 50% Ghungroo) has been continuing.
- The breeding females are selected on the basis of litter traits, individual weaning weight, 6 pairs of functional teats etc, while the breeding male are selected on the basis of litter traits, individual weaning weight, weight at 8 months etc. The dams are meant to keep only upto 3 farrowing.

Performance of animals of various production parameters in Rani Pig

Sl. No.	Traits/characters	Mean±SE (no. of observation)		
		M	F	Total
1.	Litter size at birth (no.)	4.73±0.25(30)	4.47±019(30)	9.20±0.36(30)
2.	Litter weight at birth (kg)	5.29±0.28 (30)	5.08±0.23(30)	10.37±0.42(30)
3.	Litter size at weaning (no.)	4.33±0.25(30)	4.07±0.18(30)	8.40±0.32(30)
4.	Litter weight at weaning (kg)	28.09±1.70(27)	27.11±1.26(27)	55.20±2.31(27)
5.	individual weight at birth (kg)	1.12±0.01(142)	1.14±0.01(134)	1.13±0.01(276)
6.	individual weight at weaning (kg)	6.54±0.01(116)	6.72±0.02(109)	6.62±0.01(225)
7.	Number of days for weaning (d)	42		
8.	Pre-weaning mortality rate (%)	6.21%	3.42%	9.63%

9.	Pre-weaning growth rate (gm/d)	142.29±1.26(116)	132.63±0.45(109)	137.61±0.76(225)
10.	Post weaning mortality rate (%)	0.6%	0.58%	1.18%
11.	Post weaning growth rate (gm/d)	213.23±1.36(29)	220.71±0.83(48)	217.89±0.83(77)
12.	Overall growth rate (birth to 8th months of age) (gm/d)	281.23±2.33(7)	280.48±1.20(15)	280.72±1.08(22)
13.	Body weight (kg)			
	1 month	3.71±0.02(129)	3.67±0.02(120)	3.69±0.11(249)
	2 month	8.78±0.03(86)	8.87±0.02(82)	8.82±0.02(168)
	3 month	12.71±0.05(71)	12.71±0.04(67)	12.71±0.03(138)
	4 month	17.65±0.04(55)	18.24±0.03(66)	17.65±0.04(121)
	5 month	29.59±0.14(29)	30.59±0.08(48)	30.21±0.09(77)
	6 month	40.35±0.12(7)	43.03±0.17(17)	42.25±0.28(24)
	7 month	53.75±0.30(7)	55.89±0.08(15)	55.21±0.24(22)
	8 month	68.67±0.58(7)	68.51±0.29(15)	68.56±0.26(22)
	9 month	74.63±0.75(3)	74.49±0.37(12)	74.52±0.32(15)
14.	Age at slaughter (days)			8 months
15.	Weight at slaughter (kg)			68 kg
16.	Dressing percentage (%)			70%

Specific managemental practices

(a) Cutting of needle teeth is done at 1-2 days after farrowing.

(b) Feed supplementation (creep feeding) for piglets is done after 2nd week.

(c) Identification: The piglets are identified by plastic ear tags during the time of weaning.

(d) Age: It is determined from the records of the date of birth.

(e) Castration: Not yet practiced.

(f) Weaning is practiced from 42 days onwards.

Mortality parameters

i) Genetic group wise and sex wise mortality rate (2018-19)

ii) Causes of mortality

Sl. No.	Causes of mortality	Rani pig (50% Hampshire X 50% Ghungroo)					
		Pre-weaning			Post-weaning		
		Male	Female	Total	Male	Female	Total
i)	Pneumonia	2	-	2	14	12	26
ii)	Crushing	4	4	8	-	-	-
iii)	Enteritis	2	2	4	4	3	7
iv)	Stillbirth	1	1	2	-	-	-
v)	General weakness	4	4	8	2	2	4
vi)	Cardiac failure	-	-	-	-	1	1
vii)	Shock	-	-	-	1	2	3
Total		**13**	**11**	**24**	**21**	**20**	**41**

iii) Measures taken to minimize mortality

Managemental measures

- Daily cleaning, washing, sanitization & drying.
- Pig sheds were disinfected twice weekly with disinfectants (Pot. Permanganate, phenyl etc.)
- Use of water sanitizer (Sanipro-WS)
- Daily use of foot dip (KMnO4) at the entrance of pig shed.
- During cold season, the piglets are provided with straw bedding and for adult animals are sprayed/bathed with cold water during the hottest part of the day in order to reduce heat stress.

- Unauthorized visitors are avoided.

Prophylactic measures: The iron injection is given on 4th and 14th day (Feritas/Inferon) while Vitamin B-complex (Belamyl) on 5th and 15th day respectively, in all the piglets. The deworming is done every 4 months interval (Parid/ Panacur). Treatment of sick pigs is also regularly done. Besides, the vaccination against Swine Fever and FMD is regularly done in all the stock at 6 months interval.

iv) Disposal of diseased carcass:

The diseased carcass is disposed far away from the pig shed by deep burial and covered with lime. Afterwards, the gap is filled with thick earth.

Nutritional experimentation

Use of kitchen waste has shown considerable reduction in input expenditure for 3-4 fattening pigs, indicating scope of piggery as a source of self-employment for small holders in rural and hilly areas.

Adoption of integrated farming system

Shri Kh. Indrakumar Singh of Imphal East district has adopted Integrated Farming system. He has 4 sows with some followers. He also grows local vegetables, alocacia, tree beans, Jackfruit, banana tree, mango etc. He successfully used pig manure for growing the above-mentioned horticultural crops. Banana stems, alocacia and other left over leaf and stems from the farming and local market have been utilized after boiling as pig feed in addition to the using of leftover residue from brewing of local liquor. He could earn Rs. 2 lakh annually apart from meeting vegetable requirement of his family.

Survey on market of pork production

A survey on pork market was carried out in Imphal East and Imphal West districts and salient points are given below:

Qualification of pork seller:		Mostly under-metric
Residence:		Local unemployed people from valley
Occupation:		Pork business
Category:		80% General/OBC community and 10 % ST and SC
No. of retail Shop:		30
No. of wholesaler:		9
Type of sale booth:		Mostly open type stall
Information about the pigs		
1.	Source of pig:	Mostly from local pig rearers
2.	Breed:	Crossbred
3.	Age:	1 year above
4.	Weight:	70- 160 kg
5.	Method of slaughter:	Mostly hammering and heart puncture in bigger size animals.
6.	Price of pig:	140-160/-kg on live weight basis
7.	Daily sale:	a) Big shop: 120 – 140 kg b) Small Shop:40-60 kg (summer) b) Big shop:150-180kg b) Small Shop:60-120 kg (Winter)
8.	Period of highest sale:	November-March of the year
9.	Period of lowest sale:	May-July of the year
10.	Price per kg of pork:	Rs. 260- Rs.280/kg in most of the market

Disposal pattern of farm waste, pig excreta:

Manual cleaning of the solid pig excreta with shovel has been carried out for removal from the pig farm premises and disposed in the Pit by trolley. The liquid faecal materials from the final washing have been removed in low lying part through drain.

Production economics:

- **Farm condition**

  Slaughter weight: 68 kg

  Dressing %: 75

  Meat yield: 51 kg

  Investment on feed: 342 kg xRs.25/- = Rs.8550/-

  Investment on health care: Rs.700/-(approx.)

  Miscellaneous: Rs.300/-

  Cost of production of pig up to slaughter age: Rs.8550 + Rs.700 + Rs.300=Rs. 9550/-

  Cost of production/kg live weight: Rs.140/-

  Cost of production/kg pork: Rs.190/-

- **Field condition (Lenin Singh, Imphal West)**

  Slaughter weight: 75 kg

  Dressing %: 70

  Meat yield: 52 kg

  Investment on feed: @Rs.4950/animal/180 days at the rate of Rs.27/animal/day

  Investment on health care: Rs.800/-(approx.)

  Miscellaneous: Rs.500/-

  Cost of production of pig up to slaughter age: Rs.4950 + Rs.800 + Rs.500=Rs. 6250/-

  Cost of production/kg live weight: Rs.85/-

  Cost of production/kg pork: Rs.120/-

Extension programme with success story:

i) At the Institute

Training programme for the Veterinary Officers of State Veterinary & A.H. Department; Technical Officer, ICAR, KVK and field Veterinarian

In campus training programme on "Scientific Advances in pig management" was organized on 4th March, 2019 for the Veterinary Officers of State Veterinary & A.H. Department, Technical officers from ICAR, KVK and field Veterinarian. Hon'ble Vice-Chancellor Prof. M. Premjit Singh and Dr. Ng. Ibotombi Singh, Joint Director, Vety. & A.H, Government of Manipur graced the function as Chief Guest and Guest of Honour, respectively.

Exposure visit of farmers from KVK and Field Assistant from State veterinary Dept.

Farmers from different parts of the State visited the AICRP on Pig Farm, time to time during their training programme as field exposure visit, organized by various institutions and NGO's, such as College of Agriculture, ICAR, KVK, State Veterinary Department and others. In this way technical

know- how of scientific pig rearing such as scientific feeding, breeding, health care, vaccination programmes, sanitation practices were demonstrated and taught to the farmers during their visit.

ii) At the farmer's field:

Four (4) training programmes and four (4) Health-cum- vaccination camp were organized during the year. The details of the location and dates were given as below:

Training programmes

Sl.	Particulars	Date	Place
1.	Training on "Profitable pig rearing"	25.03.19	Andro, Imphal- East district(S/C village)
2.	Training on "Profitable pig rearing"	27.03.19	Awang Sekmai Makha Leikai, Imphal West(S/C village)
3.	Training on "Profitable pig rearing"	29.03.19	Uran Chiru, Kangpokpi District(S/T village)
4.	Training on "Profitable pig rearing"	31.03.19	Leimaram, Bishnupur District. (S/C village)

Health-cum-vaccination camp

Sl.	Particulars	Date	Place
1.	Health camp cum Vaccination programme	25.03.19	Andro, Imphal- East district (S/C village)
2.	Health camp cum Vaccination programme	27.03.19	Awang Sekmai Makha Leikai, Imphal West (S/C village)
3.	Health camp cum Vaccination programme	29.03.19	Uran Chiru, Kangpokpi District(S/T village)
4.	Health camp cum Vaccination programme	31.03.19	Leimaram, Bishnupur District.(S/C village)

Salient achievements during the reporting period:

- A total of 167 Rani Pigs, consisting of 45 breeder sows pigs, 5 breeder boars, 19 finishers, 27 grower and 71 piglets are being maintained at the end of the reporting year.
- 276 nos. of Rani Piglets were produced during the year.
- **Rs 7, 71, 000/-** (Rupees Seven lakh seventy-one thousand) only was generated as revenue from the sale of different categories of pigs during the reporting year.
- Linkage with the pig rearing villages has been strengthened through training and vaccination programme in collaboration with other organization like Local NGO's/Farmers group from different parts of the State.
- Four (4) off-campus training programmes were organized at Andro, Imphal-East district, Awang Sekmai, Imphal-West district, Uran Chiru, Kangpokpi District and Leimaram, Bishnupur district in the theme "Profitable pig rearing" during the reporting year.
- Another four (4) off-campus health camps-cum-vaccination programme against Swine Fever was conducted at Andro, Imphal-East district, Awang Sekmai, Imphal-West district, Uran Chiru, Kangpokpi District and Leimaram, Bishnupur district.
- Repairing of 10 (ten) rooms of old Departmental pig shed has been initiated under the project, at the cost of Rs.5,00,000/- (Rupees five lakh) only.

Scientific publication: One training Manual on Pig Rearing released.

Distinguished Visitors:

i) Shri. Iboyaima Singh, Advisor (Agri), NEC, Shillong visited AICRP on Pig, CAU, Manipur Centre on 20/10/18.

ii) Prof. K.R.S. Sambasiva Rao, Hon'ble, Vice-Chancellor, Mizoram University along with Prof. M. Premjit Singh, Hon'ble, Vice-Chancellor, CAU, visited the AICRP on Pig, CAU, Manipur Centre on 26/11/2018.

iii) Prof. Surendra Nath Pasupalak**,** Hon'ble, Vice-Chancellor, OUAT, Bhubaneswar, along with Hon'ble, Vice-Chancellor, CAU, Prof. M. Premjit Singh visited the AICRP on Pig, CAU, Manipur Centre on 1/12/2019.

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<tr><td>Rani sow with piglets.</td><td>Rani breed</td></tr>
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<tr><td>Vaccination of SF vaccine at Andro, Imphal East District.</td><td>Training programme at Awang Sekmai, Imphal-West District.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Training programme at Leimaram, Bishnupur District.</td><td>Health Camp cum vaccination at Leimaram, Bishnupur District.</td></tr>
</table>

ICAR RESEARCH COMPLEX FOR NEH REGION, BARAPANI

All India coordinated Research Project(AICRP) on Pig, ICAR-RC NEH, Barapani has played important role since its inception for the development of pig production in the state and neighbouring states through various ways like organizing training, awareness programs at farmer level and distribution of improved piglets as beneficiary to the interested farmer. Artificial insemination was done for crossbreeding/ upgrading of indigenous germplasm in the farmers doorsteps.

In order to improve the pig productivity in the region, AICRP on Pig, ICAR-RC for NEH region has successfully developed crossbred pig variety called "Lumsniang" for better adaptability and performance in hill ecosystem of the north eastern region of India. Banana pseudostemis plenty available to the NE region without much care. The AICRP center has been working on developing low cost feed formulation with locally available unconventional feed resource to reduce the feed cost. The wild banana pseudo-stem (dry matter basis) and fortified fermented with kitchen waste by product feeding has a very bright future as a feed ingredient in animals especially in the North Eastern region of India. Pig wastewater filtration unit was established for effective recycling of the water. Pig dung based Vermicomposting unit has been established under the AICRP on Pig by comprising of three low cost vermin bed. Artificial Insemination (AI) has been carried out regularly at farmers door step to produce the crossbred piglets. About 500-700/year through different AI delivery models and obtained farrowing rate of 72-75% and litter size of 8-12. To popularize the crossbred pig variety, "Lumsniang", 3670 piglets were distributed to the farmer thought TSP farmer first, KVK, TSP and other external project, besides training and capacity building on pig production and management has been organizing regularly.

Herd dynamics: Herd Strength of Crossbred pig "Lumsniang" (75% × 25% NM)

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (upto 55 d)	32	220		21		116	26
2	Grower(56 d- 5m)	16			8		24	14
3	Finisher(5-8 m)	10			2		13	10
4	Breeding female	20			2			30
5	Boar	6						10
	Grant total	84	220		33		153	90

Crossbred (50% H × 50% NM)

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (upto 55 d)	27	113		11		61	22
2	Grower(56 d- 5m)	15			5		16	13
3	Finisher(5-8 m)	12			1		11	8
4	Breeding female	19						15
5	Boar	4						4
	Grant total	77	113		17		88	62

Niang Megha

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (upto 55 d)	26	143		14		66	18
2	Grower(56 d- 5m)	19			7		23	11
3	Finisher(5-8 m)	15			5		16	6
4	Breeding female	18					3	14
5	Boar	6					1	5
	Grant total	84	143		26		109	54

Breeding strategy of the farm as approved

A number of selected Niang Megha was maintained in the pig nucleus breeding farm, ICAR-NEH sinceyear-1987.A group of indigenous gilts was bred with pure Hampshire boars to get 50% Hampshire (H)×50% Niang Megha (NM) crossbred pigs. Another group of indigenous gilts were maintained for indigenous line. The progeny of F_1 crossbred 50%H × 50% NM was again backcrossed with Hampshire boar to produce crossbred (F_2) pig with (75% Hampshire X 25% Niang Megha). The crossbreeding program *i.e. inter-se-mating* was adopted to maintain 50% H:50% NM and 75%H: 25% NM genetic groups. Recommended was maintained in order to avoid inbreeding effect in the farm.

Selection of crossbred (75% Hampshire X 25% Niang Megha) male and female for inter-se-mating and breeding based on the life-lime productivity and performance. Selection of crossbred boar (75% Hampshire X 25% Niang Megha) for inter-se-mating based on index methods which include its pedigree records, body conformity, well developed testicles, birth weight, weaning weight and individual body weight as per age. For female animals will be based on litter size at birth and weaning, litter weight at birth and weaning and number of functional teats etc. Artificial Insemination (AI) was carried out to produce F1 crossbred (50% H X 50% NM) and F_2 crossbred (75% H X 25% NM) pigs, besides for *inter-se-mating* between F_2.Developed crossbred pig variety (Lumsniang) was further selection for further improvement and to get genetic gain for enhance productivity.

Performance of animals

Sl. No.	**Traits/Characters**	**Mean ± SE (no. of observation)**		
		M	**F**	**Total**
1	Litter size at birth (no.)	4.74±0.32	4.28±0.25	9.02±0.55
2	Litter weight at birth (kg)	4.09±0.24	4.47±0.31	8.56±1.39
3	Litter size at weaning (no.)	4.53±0.37	3.53±0.21	8.12±0.81
4	Avg. Individual weight at birth (kg)	0.88±0.11	0.82±0.18	0.85±0.16
5	Avg. Individual weight at weaning (kg)	9.49±0.0.02	9.44±0.05	9.46±1.14
6	Number of days for weaning (d)	56		
7	Pre weaning mortality rate (%)	9.5		
8	Pre weaning growth rate (gm/d)	143.50±8.36		
9	Post weaning mortality rate (%)	4.6		
10	Post weaning growth rate (gm/d)	317.33±21.64		
11	Body weight (kg)			
	1 month	5.17±0.04	5.13±0.07	5.15±0.54
	2 month	9.50±0.04	9.42±0.03	9.46±0.26
	3 month	14.38±0.02	14.18±0.01	14.28±0.52
	4 month	23.18±0.04	22.08±0.03	22.63±0.35
	5 month	34.50±0.07	33.99±0.03	34.24±0.12
	6 month	44.18±0.01	44.08±0.02	44.13±0.24
	7 month	56.52±0.03	56.34±0.08	56.43±0.46

	8 month	67.03±0.01	67.19±0.04	67.11±0.08
	9 month	74.21±0.09	72.71±0.03	73.25±0.89
	10 month	86.23±0.04	85.13±0.09	85.68±0.19
12	Age at slaughter (d)	300		
13	Weight at slaughter (kg)	87.78±2.29		
14	Dressing Percentage (%)	72.33		
15	Carcass Length (cm)	70.62±1.27		
16	Back Fat Thickness (mm)	2.30		
17	Amount of pork produced per sow (kg)	61.48 (by considering 72.33 dressing percentage)		
18	Feed conversion efficiency (:)	1:4.30		

Lifetime production traits

- Average litter size at birth per sow : 9.13 ± 0.17
- Average litter weight at birth per sow: 7.75 ± 0.14
- Average litter size at weaning per sow : 8.29 ± 0.20
- Average litter weight at weaning per sow : 78.46 ± 1.91
- Average litter weight at slaughter per sow : 85.68±0.19

Generation wise performance for Lumsniang Pigs Variety.

Traits	1st generation	2nd generation	3rd generation
Litter size at birth (kg)	8.11±1.04	8.52±1.21	9.02±0.55
Litter size at weaning (kg)	7.41±1.25	8.09±0.21	8.12±0.81
Av. individual weight at birth(kg)	0.74±0.26	0.81±1.46	0.85±0.16
Av. individual weight at weaning (kg)	8.87±1.48	9.21±2.07	9.46±1.14
Av. litter weight at birth (kg)	7.42±0.84	8.17±1.05	8.56±1.39
Av. litter weight at weaning (Kg)	73.29±1.05	74.55±1.38	75.73±1.23
Body weight			
1 month	4.54±0.43	4.91±0.78	5.15±0.54
2 month	8.62±0.76	9.00±0.74	9.36±0.26
3 month	12.95±1.81	13.84±1.11	14.28±0.52
4 month	20.74±0.21	21.93±0.46	22.63±0.35
5 month	30.43±1.78	33.04±1.12	34.24±0.12
6 month	39.92±0.23	42.62±0.93	44.13±0.24
7 month	54.03±1.72	55.56±1.71	56.43±0.46
8 month	64.43±0.11	66.34±0.28	67.11±0.08
9 month	69.11±0.29	71.37±0.30	73.25±0.89
10 month	80.75±1.35	83.23±0.87	85.68±1.19

Heritability, Selection differential (1st& 2st year) and Overall genetic gain of Lumsniang Pig

Traits	Heritability	Selection differential (1st year)	Selection differential (2st year	Overall genetic gain
Litter size at birth (kg)	0.12	0.41	0.5	0.054
Litter size at weaning (kg)	0.23	0.68	0.03	0.081
Av. individual weight at birth(kg)	0.06	0.07	0.04	0.003
Av. individual weight at weaning (kg)	0.03	0.34	0.25	0.008
Av. litter weight at birth (kg)	0.02	0.75	0.39	0.011
Av. litter weight at weaning (Kg)	0.51	1.26	1.18	0.622
1 month	0.04	0.37	0.24	0.012
2 month	0.23	0.38	0.36	0.085
3 month	0.15	0.89	0.44	0.099
4 month	0.29	1.19	0.7	0.274
5 month	0.21	2.61	1.2	0.400
6 month	0.21	2.7	1.51	0.442
7 month	0.17	1.53	0.87	0.204
8 month	0.18	1.91	0.77	0.241
9 month	0.04	2.26	1.88	0.082
10 month	0.07	2.48	2.45	0.172

Climatic data at AICRP on Pig farm ICAR-RC Barapani, Meghalaya

Month	Mean Temperature (ºC)	Mean Relative Humidity (%)	THI	Total monthly Rainfall (mm)	Wind speed (Kmph)
April	20.8	72.25	67.65	208.2	2.2
May	21.55	81.55	69.5	281.3	1.9
June	23.95	84	73.58	424.3	1.6
July	24.65	82.45	74.52	354.7	1.5
August	24.9	79.7	74.62	435.7	1.4
September	23.75	81.35	72.97	258.6	1.7
October	20.3	77.5	68.54	214.9	1.4
November	17.5	70.1	62.57	17.3	1.7
December	14.7	69.9	58.37	28.6	1.5
January	13.9	64.5	57.19	22.8	1.6
February	15.75	67.65	59.92	13.6	2.4
March	18.5	58.5	63.62	19.9	2.8

Daily micro environmental data viz. temperature (ºC), relative humidity (%), wind speed (Kmph) etc. were recorded in pig breeding farm with the help of temperature, humidity data logger. Highest mean temperature was founded in the month of July (24.65ºC) whereas lowest mean temperature was found 13.9ºC (January). The most thermos-comfortable month was March, April and October as for pig most comfortable temperature is 10-20ºC. In the month of June, July, August and September pig experience slightly mild heat stress as THI index value is nearly touching to critical range (75-83) for pig. Animals were experienced cold stress in the month of December (14.7ºC), January (13.9ºC) and February (15.75ºC). Similarly, highest rainfall was found in the month of June (424.3mm) and August (435.7mm) and lowest was 13.6mm (February).

Specific managemental practice

Presently pigs are being reared and managed in organized intensive housing system with adequate floor space as per BIS standards. There is provision of separate feeding trough and water facility. Different groups of animals kept in separate pens under uniform housing and managerial conditions. The pigs were fed with balanced concentrate mesh feed twice daily at 9.0AM and 3.PM. The following Specific managemental practice followed in the pig breeding farm.

Identification: In pig breeding farm, pigs were identified using both permanent plastic ear tag and hair clipping method. The permanent ear tags were provided with uniform coding for different genetics groups. The uniform code starting from 1 represent as Pure Hampshire, 2 represent Niang Megha (NM), 3 denote 50% Hampshire (H)×50% Niang Megha (NM), 4 indicate 75% Hampshire (H)×25% Niang Megha (NM) respectively. Hair clipping was also practiced for identification adult sow/boar from distance.

Needle teeth cutting: Needle teeth regularly clip by using tooth cutter at the age of 7-10 days of birth, which prevent teat/udder damage of sow during milk suckling. It also prevents injuries from fighting among piglets/littermates.

Creep feeding: Creep feeding was practiced-feeding a solid diet to piglets during suckling. The creep feed provided to piglets 20-35 days of age. Creep feeding initiates and promotes gut and digestive

enzyme development, which enables the piglet to digest nutrients from solid food. The specific practice reduces pre weaning piglet mortality particularly where the sow had low milk yield.

Castration: It has been carried out at the age of 2-2 ½ month by open surgical method.

Mortality parameter:

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

i) Pre weaning mortality

Parameter	Age											
	0-14 days			15-28 days			29-55 days			Overall		
No. of animal at risk	M	F	T	M	F	T	M	F	T	M	F	T
Number died	7	5	12	4	2	6	2	2	4	13	9	21
Mortality %												9.5

ii) Post weaning and adult mortality

Parameter	Age								
	56 days to 5 month			Finisher(5-8 month)			Overall		
No. of animal at risk	M	F	T	M	F	T	M	F	T
Number died	2	2	4	0	1	2	2	3	5
Mortality %									4.6

Causes of mortality:

i) Cause of mortality (Specific cause): Crossbred with 75% Hampshire inheritance

Sl. No.	Conditions/disorders	Total No.
A. Pre-weaning		
1.	Crushing	9
2.	Piglets Diarrhoea	10
3.	Pneumonia	1
5.	Weak piglets	1
Total		21
B. Post- weaning		
1.	Enteritis	2
2.	Pasteurellosis	1
Total		3
C. Adult		
1.	Lameness, multiple abbesses and tumor	2

Mortality pattern in swine herd serves as a useful indicator for assessing the status of herd heath and management programme and their efficacy. Its pattern and occurrence of different diseases and disorders may also vary with different genetic groups of pigs. The overall mortality for pre-weaning and post weaning were 14.1% in the entire reporting year. Further, for pre-weaning 0-14 days was highest mortality whereas 29-55 days was lowest mortality recorded in the reporting year. Similarly, for post-weaning, 5-8 month of age group was lowest mortality recorded. As regards to the cause of death, piglets diarrihoea was principal cause of death followed by Crushing, Pneumonia, Enteritis, Pasteurellosis, weak piglets and Lameness, multiple abbesses and tumor The breed wise mortality results revealed that there was higher mortality in Lumsniang pigs than 50% H: 50%NM and NiayangMegha. The mortality percentage was higher in both genetic groups in 0-14 days of age group. Among different seasons, higher mortality was observed during post-monsoon and winter compared to other seasons.

Measures to taken minimize mortality

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 sucking piglets which was provided from 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 farrowing. Just after birth each piglets was cleaned with clean cloth and the mucous was removed from its mouth and nostrils. The needle teeth of the piglets were nipped and ligation of naval cord of piglets has been done on very first day of birth. The piglets were given identification mark through plastic ear tags. The piglets were assisted to suckle their dam and allowed to remain with her. New born young piglets have been provided with artificial heating arrangement. The placenta after farrowing removed immediately and 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 the newborn piglets on day 4th and 14thof birth. Separate arrangement for creep feeding of piglets was done started from 2nd week to weaning. The newly born piglets were provided with paddy straw during winter season as a bedding material to protect the piglets against cold effects. Castration has been done surgically by open uncovered method on surplus male piglets after weaning. Weaning of piglets was done at 56 days. The piggery shed was cleaned daily and the manure removed completely from the floor and wall through manual scraping.

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.

i. **Prophylactic measures**:

All the pigs were vaccinated against the Swine Fever and FMD vaccine annually. Animals were allowed to feed with balance ration twice daily and water adlibitum. Pig sheds were clean daily and kept dry to prevent from any abnormal disease condition. Regular Veterinary service and treatment were done to the disease condition/ disorder to prevent from mortality. Special Crest was fitted in the furrowing pen to prevent from piglet crushing by mother. The iron injection (Inferon) to all the piglets at 3rd and 14th days of age and weaned at 56 days. The furrowing pens were kept clean and dry to prevent from piglet diarrhoea. The pigs were dewormed regularly (Albendazole, Fenbendazole, Ivermectin alternatively) to control parasitic infestation. For ecto-parasite, regular administered Ivermectin either injection or oral, besides spray with 2% Butox before winter season.

- **Disposal of diseased carcass:**

Trench burial method is commonly done in ICAR-RC for NEH, Barapani. Carcass of pigs was disposed by trench burial method only. Usually, a trench was made large enough to

accommodate the carcasses. Once buried, pigs were slowly decomposed. The minimum depth of trench pit was 3- 4 feet length and minimum depth of 6 feet. The carcass completely covered with enough quantity of belching powder and lime powder.

Nutritional experimentation

- Growth performance of grower pigs fed processed banana pseudostem diet replaced with maize
- Fortified fermented banana pseudo-stem with kitchen waste plus concentrate feed on the performance of grower and fattening pigs
- Innovative hot feed formulation to alleviate heat stress in grower pigs
- Innovative cold feed formulation to alleviate cold stress on growth performance

Survey on market of pork production

A preliminary survey on market of pork production for small holder was carried out in Shillong and salient points are as follows: Most of the pocks selling vendors are under matriculation and most of them are in rented shops. Approximately 650 retailed shops are in shilling own by mainly tribal people. Most of the farmers are selling off farm @ Rs. 140/ kg live weight and very few are doing on farm. The method of slaughter was traditional method, heart puncturing in most case, occasionally hammering.

Further, among the 254 households surveyed, 78.8 % of the farmers were smallholders having only one to two pigs, and the remaining farmers practiced pig farming in either semi commercial (18 %) or commercial (3.2 %) scale. The majority of pig population (77%) was of nondescript local type. In general, the pigsties were made up of locally available materials. The floor of pigsty was made up of concrete (36 %), wooden plank (26%), bamboo pole (22%), or earthen floor. The sidewalls were made of wooden plank (62%), bamboo pole (26 %), stems of some plants (9 %), and brick-cement (11%). Tin roof (68%) was the most commonly used material in covered area of the house, followed by thatched roof with locally available grass and weeds (23%), and other materials like plastic etc (9%). Generally, the pigs were fed with local vegetation, agro-wastes, and household kitchen wastes. About 73.8% of farmers fed the pigs solely with locally available materials. Remaining farmers fed their pigs with different level of concentrate feed purchased from market in addition to the locally available agro-waste. In the surveyed area, only 29.7% of farmers reared the pigs for breeding purpose and remaining farmers reared the pigs for fattening purpose. About 67.7 % of the pig holders kept only one to two females for breeding, but no boar was maintained for breeding. They depended totally on the community boar, which are nondescript type with poor health and body condition.

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

i. **Manure pit:** Pig waste/excreta are disposed in scientifically constructed manure pit along with pig-washing. The pig dung allowed for maturation about 6-8 months and it is used for fodder production in the pig farm and other agricultural land. The net yield was about 6-8 tone.

ii. **Vermicomposting:** Vermicompost unit was established under AICRP on Pig by comprising of three low cost vermin- bed along with biomass. A fungus based calcus was added @ 1kg calcus

to 1000 kg pig dung for early maturation. It takes around 90 days for maturation. Around 5000 numbers of bigger size earthworms were sold to CAU, Barapani. Further, 150 kg of vermicompost manure were sold @ Rs. 8/ kg.

iii. **Established water recycling plan:** The main aim for establishment of water recycling plan is to recycle pig wastewater of around 3000 Lt. from cleaning pig sty and output water is around 750 Lt. which is used in cleaning pig shed and irrigation in agricultural fields. The filtration process is that waste water is first pass in manual bar screen with different size of pore for removal macro particle or suspended solid and impurity and then pass to sedimentation tank which allow to sediment minute solid particle and then pass to the purification tank which content suitable sand and charcoal for removing waste particle, absorption of toxin material and straining of bacteria or parasitic eggs. Then pass water to the chemical treatment tank with alum to precipitate micro particle and outcome water is treated with chlorine. The details water quality of outcome water is under process.

Production economics:

i) Cost of production/ pig up to slaughter age: 10 Month
ii) Concentrate feed up to 10 month of age(15-300 days)=315kg/ pig
iii) Considering @ Rs. 22/kg of feed for 315 kg=Rs 6930/-
iv) Cost of medicine and Vaccines Rs. 350/animal
v) Laborer charge per pig for 300 days=Rs 1800/ animal
vi) Total cost Rs. 9080/animal at 85 Kg live weight
vii) Cost of production Rs107/ kg live weight
viii) Cost of production/ kg pork: Rs 147 /kg (Considering 72.33% Dressing Percentage).

Cost benefit analysis for breeding unit: Cost of piglets for 1 unit (3 female and 1 male) @ 2500/ piglets: **10,000/-**

Feeding cost per day per piglets

i. Rice bran @ 0.5/day @ Rs. 10/kg: Rs.5/-
ii. Pig concentrate feed @ 0.5 kg @ Rs.22 /Kg: Rs.11/-
iii. Broken rice/low quality rice @ 0.4 kg @ Rs. 15/kg: Rs.7.5/-
iv. Kitchen waste(vegetable and peels)/Colacasia @ 3kg

Feeding cost per piglet/day: Rs. 23.5/-

Feeding cost per unit/day (3+1 piglets): Rs.94/-

Feeding cost unto 10 month of age (60-300 days): Rs.**28, 200/-**

Cost of Veterinary service @ Rs.350/ pig: Rs.**1400/-**

Monetisation labour @ 1 hours per day for 37.5 man-days @ Rs.300/man-days: Rs. **11,250/-**

Total piglets born 8 (litter size)/sow: 24; considering 10% mortality

Total number of piglets per farrowing per unit: 22

Cost of piglets @ Rs.3000: Rs. **66,000/-**Net profits of piglets per farrowing/ unit: Rs. **26,550/-**

Extension programme with success story:

i) At the institute:

Under the mobile base artificial insemination (AI) delivery model, a total of 710 numbers of AI were carried out in two districts of Meghalaya *viz.*, Ri-Bhoi, West khasi hill and East khasi hill districts at farmer's doorstep. Two training were organized to the educated rural tribal youth of 36 numbers and provide technological backup for small scale rural enterprise to enhance their viable and sustainable small scale rural pig enterprises. A total of two training were organized for improved housing, feeding, breeding and health management practices of livestock and poultry for tribal farmer including 73 beneficiaries. Besides these, farmers are regularly visited to farm and are being given technical advises about scientific pig rearing and feeding, vaccination etc. Two hands on training were organized on pork processing and value added pork products for 24 potential educated youth for entrepreneurship development in the pork processing in the region. Total of 23 pig breeding unit were established with Lumsniang pigs in different villages of Meghalaya and demonstrated the benefits Lumsniang pig variety in term of productivity and economic benefit.

ii) At **the farmers' field**:

In the farmers' field, train technical person regularly visited and demonstrated improved management practice in housing, feeding, breeding and disease management practices in different villages of Meghalaya. Provided technological backup with critical inputs like Lumsniang Pig Variety was distributed to farmers through Farmer First, KVK, TSP and other internal and external projects. The productive and reproductive performance of the crossbred pig variety was evaluated under farmers' field. Lumsniang pig variety had significantly higher performance in term of growth rate and litter size at weaning. Total of 710 AI was carried out in three districts of Meghalaya viz., Ri-Bhoi, West khasi hill and East Khasi Hill through mobile based artificial insemination (AI) for producing crossbred piglets at formers door step and obtained farrowing rate of 72-75% and litter size of 8-12. Total of 3237 piglets were produced through AI in the current year.

Performance of non-descriptive local and crossbred pigs(Lumsniang) under village condition

Parameters	**Lumsniang**	**Non descriptive local**
Body weight at (kg)		
3 months	12.65±1.52**	7.12±0.76
6 months	32.73 ± 3.18**	16.89 ± 1.43
9 months	57.45 ±4.76**	32.23 ±1.83
12 months	81.32±5.12**	45.32±2.65
Age at puberty (days)	276.66 ± 11.19*	223.7±4.67
Litter size at birth	8.83 ± 0.15**	6.8±0.56
Ind. litter wt at birth (kg)	0.87 ± 0.28**	0.628±0.46
Litter size at weaning	7.86±0.67**	5.63±0.43

** (P<0.01) deferrer significantly from corresponding value of non-descriptive local

Scientific publications:

In peer-reviewed journals: 4

Project work of students (M.V.Sc./Ph.D.) One Ph.D scholar from the department of Animal Reproduction Gynaecology and Obstetrics, College of Veterinary Science, Khanapara are doing Research work on tittle- Optimizing Cryopreservation and Artificial Insemination in Pig".

Distinguish visitors: No

Budget allocation and utilization: 40.84 Lakh (Allocation) and 39.57 Lakh (Utilization)

Details of the construction work/infrastructural development work:

Under the AICRP on Pig, construction of two portable steel pig sty and costing of 2.5 Lakh with the dimension of 8 ft×16ft and height 5ft×6ft.

Constrains faced during the report year: No

Any specific suggestion/recommendation for the overall progress of AICRP on pig:

Success story:

Success stories on livelihood improvement through improved crossbred pig variety

Mr G. Marwein, Sohkyndor: Mr G. Marwein of around 40 years is an inhabitant of Sohkyndor, Sumer, Ri-Bhoi District, Meghalaya which is at a distance of around 18 km from ICAR-RC for NEH Region. He has completed his education till 8th standard. He has four family members. He maintains piggery as well as poultry business. He is into the poultry business for the past two years. The houses for the poultry is constructed with wooden tin roofs which is netted from all sides. The farm includes Broiler birds. She keeps 400-500 chicks in one batch, for his farm he purchases starter, grower and finisher feed at a rate of Rs1400/bag for 50 kg bag. In a month around 30 bags of feed are required for the farm. He purchases Broiler chicks at a rate of Rs42 per chick from the dealer of Shillong market. He keeps them for 45-50 days and sells the full grown at 2-2.5 kg at a rate of Rs90-120/ kg. The piggery farm has been started Mr G. Marwein three years back.

To begin his piggery farm, at present he has four piglets out of four three is male and one is female, he purchased the piglets at a rate of Rs3000-3500 per piglet from the Umsning market. He sells 7-8 months old pigs of 60-70 kgs. at a rate of Rs8000-10000/- approx. He is practicing primarily fattening of pigs. Regular deworming and other health measures are being carried out for the animals. Considering his expenses on feed, medicine and maintenance of his farm, his earnings can be calculated to be Rs.80 thousand to 1.0 lakhs. He spends his earnings on buying household necessities and other needs of his children. He also saves a part of his income for future security and expansion of his business.

Mr WilkystarKharmuti, Nongumlong Village, Upper Shillong: Mr. Wikystar Kharmuti of 24 years old is an inhabitant of Nongumlong village, East Khasi hills, which is at a distance of around 30 km from ICAR. He is a graduate and has six family members in his family. His primary source of income is pig rearing and Polyhouse. He started his pig farm by 5-6 years back. At present he has 13 male piglets, He is continuing a similar trend and practicing primarily fattening of pigs but thinking for breeding in future. He purchased the piglets of 3-4 months at a rate of Rs3000-4000 per piglet from the market. After the piglets attained adulthood of 80-90 kgs., he sold all of them in the market at a rate of

Rs10000-12000 each. He generally purchases 9-10 piglets and sells them after growing them for around 9-10 months. He maintains wooden shelter for the pigs. He takes utmost care to maintain the health of the fattening pigs and also deworms them properly. He purchases hotel kitchen waste to feed the pigs, at a rate of Rs400 per month, every day he collects kitchen waste from 2-3 hotel.

He has also having a poly house in which he keeps different types of flower like gerbera, orchid, rose, lily etc. he purchases seeds at Rs200 per packet for each varieties of flowers in which he kept for 6-8 months and sold at different rate for different varieties, it varies from Rs.30-90 each. He annually earns around Rs.25000/- approx. He utilizes the income in maintaining the regular expenses of his dependants which includes food, children's education and assuring a better life for the family. He also saves a part of his income in bank to meet emergency expenses.

Portable Elevated Steel Pig sty

Portable Elevated Steel Pig sty

Pig Dung Vermicompost Unit

Lumsniang Pig Breeding Unit

ICAR-INDIAN VETERINARY RESEARCH INSTITUTE, EASTERN REGIONAL STATION

Ghungroo is one of the best known Indian pig breed so far recognized by ICAR-National Bureau of Animal Genetics Resources, Karnal, Haryana. The breed is well known for better litter size, good mothering ability, better growth and docile in nature.

ICAR-IVRI, Eastern Regional Station, Kolkata was entrusted to implement ICAR-AICRP on Pig, by Director, ICAR-NRC on Pig, Rani, Guwahati 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:

Herd strength of Ghungroo Pig:

Sl. No.	Age (months)	Opening Balance	Addition		Deduction		Closing Balance
			Births	Purchase	Death	sold	
1	Piglet (up to 42 days)	4	125	16	12	38	11
2	Grower (42 days – 5 m)	2			9	16	41
3	Finisher (5 months - 8 m)	13			0	19	10
4	Breeding female	30			2	9	
5	Boar	10			0	8	
	Total	**59**	**125**	**16**	**23**	**90**	**87**

Breeding strategy of the farm as approved:

As per the guidelines of NRC (P), the approved breed of pig (Ghungroo) is being maintained for conservation, improvement, propagation and distribution to the cliental. Two stage sequential selection is being followed for male as recommended - initially based on weaning weight (>10kg) and finally based on 6 month body weight (>50kg). For selection of female, dam's litter size at birth (>7), weaning weight (>9kg) and number of functional teats (at least 6 pairs) are considered. Owing to small population size less stringent selection is being followed during this period.

Performance of animals:

Sl. No.	Traits / Characters	First Generation: Mean ± SE		
		M	F	Overall
1	Litter size at birth (no.)	4.25±0.35	4.15±0.45	8.40±0.25
2	Litter weight at birth (kg)	4.835±0.315	4.665±0.335	9.515±0.25
3	Litter size at weaning (no.)	4.10±0.20	3.95±0.25	8.05±0.18
4	Litter weight at weaning (kg)	35.495±1.425	32.695±1.150	68.195±1.68
5	Avg. Individual weight at birth (kg)	1.138±0.065	1.124±0.075	1.132±0.096
6	Avg. Individual weight at weaning (kg	8.650±0.250	8.345±0.225	8.471±0.315
7	Number of days for weaning (days)	42	42	42
8	Pre-weaning mortality rate (%)	3.22	1.61	4.83
9	Pre-weaning growth rate (gm/day)	178.85±10.60	171.95±15.25	174.74±12.45
10	Post weaning mortality rate (%)	0	3.12	3.12
11	Post weaning growth rate (gm/day)	287.341±16.581	276.291±21.273	281.922±18.683
12	Overall growth rate (up to 9 months)	272.16±26.25	261.68±33.14	266.92±30.75
13	Body weight (Kg)			
	1st month	7.887±0.132	7.755±0.135	7.821±0.115
	2nd month	12.765±0.575	12.225±0.370	12.495±0.455
	3rd month	16.835±0.445	16.558±0.515	16.696±0.501
	4th month	26.815±0.835	26.195±0.765	26.505±0.786
	5th month	34.543±1.662	33.756±1.415	34.149±1.431

	6th month	42.320±2.367	41.859±2.545	42.152±2.192
	7th month	53.465±5.513	51.792±4.927	52.628±5.165
	8th month	64.205±5.723	62.94±5.264	63.575±5.550
	9th month	73.248±5.651	72.756±4.965	73.025±5.016
	10th month	82.786±6.852	79.628±5.934	81.207±6.136

Specific management practice:

1. Animals are identified through ear tagging methods which are widely used as a method of pig identification.
2. 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 followed.

Mortality parameter:

i) Age wise and sex wise mortality :

Group	**Pre weaning (up to 42 days)**			**Post weaning (42 days and above)**		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**
Parent population	69	56	125			
Animal died	29	11	39			
Mortality (%)						

ii) Causes of mortality *(specific cause):*

Suckler		
1	Crushing by mothers	
2	Piglet diarrhea	
3	Miscellaneous (runt, weakling, anorectic, injury etc)	

Due to piglet diarrhea, acute enteritis, compression by the mother and hip dislocation (adult).

iii) Measures taken to minimize mortality:

a. Management measures: Apart from routine management practices, furrowing pen is washed with disinfectant thoroughly to prevent piglet diarrhea.
b. Prophylactic measures: As prophylactic measures, swine fever, Swine pox and FMD vaccination followed as per recommended scheduled.
c. Routine treatment

iv) Disposal of disease carcass: As per the standard procedure.

Adoption of integrated farming system:

An Institute sponsored 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.

Findings during this period:

A total of 72 samples (pig-cum-fish rearing in field condition) including slurry from pig shed (24); water (12 each) and fish (12 each) from the fresh and slurry added ponds. *Clostridium perfringens* A was detected in 16.7% (4/24) of pig slurry followed by Enterotoxigenic and

Shigatoxic *E.coli* [(8.33% each) 2/24]. *C. perfringens* were recovered both in slurry added and not added pond water (8.33% each (1/12) and in fish samples (8.33% each) (1/12) of that ponds. NaOH (8%) solution was effective decontaminant in cleaning of organized pig farm floor. After cleaning with plain water, the farm floor was subsequently washed with NaOH (8%) and found considerable difference and reduction of TBC from $1.9X10^4$ to $1X10^4$ per unit of floor area; however, efficacy of Na_2Co_3 (8%) was found comparatively less than NaOH (8%).

Survey on market of pork production:

Survey was carried out in some localities of two districts i.e. in 24 parganas, and Nadia on pork production system. Primary markets are located at Bhatpara, Sodhpur, kangkinara and Halisahar of 24 Parganas and Phulia, Chakdaha and Ranaghat of Nadia district. There is no organized market for processing and marketing of pork. The butchers purchase pigs from farmers of the same and adjacent districts. Farmers get Rs. 70-100 per kg of live weight depending on the breed, age and sex of the pig. There is comparatively more demand for white pig than the black coloured pig. Market price per kg of pork varies Rs 150-230 depending on season and quality of pork.

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

We use certain quantity of pig excreta/slurry in the pond as feed for fish which is a part of our integrated farming. Rest of the excreta is decomposed first and then used as manure in the agriculture field.

Extension programme with success story:

i) At the institute: Training programmes were conducted on 31st Jan 2018 to 2nd Feb 2018 for farmers, progressive farmers and unemployed youth.

ii) Imparted training on pig production and management was provided to Diploma in Animal Husbandry student from 1st February 2018 to 28th February 2018.

iii) More than 200 tribal farmers visited at Pig farms at ERS, IVRI, Kalyani from different districts of West Bengal.

iv) 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 under MGMG programme..

Salient achievement during the report period:

- Targeted herd strength with 30 sows and 10 boars was achieved.
- Started producing of 2nd generation offspring.
- Distributed good quality piglets to the tribal farmers.
- Imparted training to the tribal farmers and entrepreneurs.
- Construction of pig shed.
- Health camp cum awareness programme was organized under MGMG programme as well as NE programme.

Distinguish Visitors:

a) Director, ICAR-IVRI, Joint Director (Research) and Joint Director (Academic) visited Pig Farm in August, 2017.

Details of the construction work / infrastructural development work:

One more pig shed completed under this project. Total pen: 17.

Constrains faced during the report year:

i) Slow execution of paper work

ii) Not receiving the contingency arising from revenue

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Newly Constructed Pig shed</td><td>Piglet: second generation</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Grower pig</td><td>Breeding Boar</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Tribal Farmers visited Pig farm</td><td>Imparted one month training to Diploma in Animal Husbandry students, ERS, NDRI</td></tr>
</table>

KVK-GOALPARA, ICAR-NRC ON PIG

According to the 19th livestock census of India, the pig population of the country is 10.29 million out of which 76.14% are indigenous and non-descript. Most of these indigenous non-descript pigs are yet to be characterized with proper scientific intervention. Doom pig is a unique indigenous germplasm of Assam which is adaptable to local climatic condition and thrives with very low to negligible nutritional input. Further, it has the capacity to survive in migratory scavenging system which makes it very popular among local communities of the state for rearing. Looking to the uniqueness and importance of the breed, it has been registered with National Database of ICAR-National Bureau of Animal Genetic Resources (INDIA_PIG_0200_DOOM_09006).

Looking to importance of local germplasm in Assam, the AICRP on Pig unit was sanctioned to Krishi Vigyan Kendra, Goalpara in XIIth 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	Birth	transfer	purchase	death	transfer	sold	M	F	T
1	Up to 42 d			2	14	-	-	12	-	-	-	-	-
2	42 d-5 m	2		2	-	-	-	-	-	-	5	4	9
3	5-8 months	11	4	15	-	-	-	2	-	-	-	-	-
4	Adult	10	28	40	-	-	3	11	-	-	8	30	38
5	Total	23	32	55	14	-	-	25	-	-	13	34	47

**Occurrence of PRRS like symptom causes expulsion of aborted foetus and adult mortality*

Breeding strategy of the farm as approved: As recommended by review meet the center was mandated to maintain the Doom pigs of Assam for conservation purpose. The breed was maintained by selective breeding.

Performance of animals:

Sl No	Traits/ characters	Mean±SE		
		M	F	Total
1	Litter size at birth(no)	1.75±0.8 (4)	2.50±0.08 (4)	4.25±0.08 (4)
2	Litter weight at birth(Kg)	1.03±0.06 (4)	1.58±0.07 (4)	1.45±0.11 (4)
3	Litter size at weaning	1.25±0.08 (4)	2.25±0.09 (4)	3.50±0.10 (4)
4	Litter weight at weaning(Kg)	3.70±0.27 (4)	5.70±0.30 (4)	4.70±0.28 (4)
5	Individual weight at birth(kg)	0.70±0.05 (7)	0.66±0.07 (9)	0.68±0.08 (16)
6	Individual weight at weaning (Kg)	2.95±0.10 (7)	2.82±0.15 (9)	2.90±0.23 (16)
7	Number of days for weaning	45 days		
8	Pre weaning mortality rate (%)	5.0		
9	Pre weaning growth rate(gm/d)	52.13±4.15(10)	49.51±3.11 (11)	50.96±3.61 (21)
10	Post weaning mortality rate (%)	4.92		
11	Post weaning growth rate(gm/d)	218.59±16.81(10)	203.11±15.72 (11)	210.53±18.21(21)
12	Overall growth rate (upto 9 m)(gm/d)	189.51±14.26(8)	183.32±18.33(6)	186.51±19.02(14)
13	Body weight(Kg)			
	1 month	1.53±0.06 (10)	1.46±0.05 (11)	1.49±0.09 (21)
	2 month	3.33±0.12 (10)	3.20±0.17 (11)	3.22±0.26 (21)
	3 month	8.92±0.14 (10)	8.29±0.62 (11)	8.53±1.85 (21)
	4 month	15.30±0.61 (10)	15.02±0.97 (11)	15.21±1.66 (21)
	5 month	20.95±0.64 (10)	20.91±0.89 (11)	20.92±1.81 (21)

	6 month 7 month 8 month 9 month 10month	29.06±1.16 (10) 35.99±2.52 (10) 43.07±2.99 (10) 50.92±3.56 (8) 54.81±3.71 (8)	27.71±1.59 (11) 34.91±2.16 (11) 41.52±2.21 (11) 47.87±3.37 (6) 52.12±3.92 (6)	28.56±2.32(21) 35.09±3.52 (21) 42.54±3.81 (21) 49.31±4.42 (14) 53.59±5.67 (14)
14	Age at slaughter(d)			8 months
15	Weight at slaughter (kg)			42 Kg
16	Dressing percentage (%)			77.54%
17	Carcass length(cm)			48 cm
18	Back Fat Thickness(mm)			28 mm

Lifetime production traits: (considering 3 farrowing)

- No. of litter produced at birth, per sow : 12.75±0.08
- Live weight produced per sow at birth : 6.16±0.11
- No. of litter produced at weaning, per sow : 10.50±0.13
- Live weight produced per sow at weaning: 49.60±4.55
- Live weight produced per sow at 8months: 405.26±23.55

Specific management practice:

Presently pigs are being reared and managed in organized intensive housing system with routine scientific managemental practice. However, the animals of these breed/variety are ferocious in nature and difficult to handle, following routine managemental practice are being followed at the farm.

- *Identification:* In pig breeding farm, pigs were identified using both permanent plastic ear tags. Tagging is done during the time of weaning.
- *Needle teeth cutting:* Needle teeth regularly clip by using tooth cutter at the age of 7-10 days of birth, which prevent teat/udder damage of sow during milk suckling. It also prevents injuries from fighting among piglets/littermates.
- *Weaning:* The piglets were separated from months at the age of 42-49 days depend on body condition of piglets.
- *Creep feeding:* Creep feeding was practiced-feeding a solid diet to piglets during suckling. The creep feed provided to piglets 20-35 days of age.
- *Castration:* It has been carried out at the age of 2-2 ½ month by open surgical method.
- *Feeding:* The animals are fed concentrate feed as per BIS standard.
- *Mating system:* Doom pigs are mostly allowed to naturally mate due to its ferocious nature. Training to boars and collection of semen is difficult in this breed.
- *Artificial Insemination*: Besides conservation of Doom pig, the centre is also engaged in popularizing the improved crossbred Rani Pig developed by ICAR-NRC on Pig. The Rani crossbred variety was distributed at farmers' field and maintained by artificial insemination by the semen produced from ICAR-NRC on Pig.

Mortality parameter: Mortality was very less. The pre- weaning mortality was 4.85 percent whereas, post weaning mortality was observed was 5 percent. However, the reproduction ability of the animals ware reduced due to occurrence of PRRS like syndrome.

Causes of mortality:

a) Occurrence of PRRS like symptoms causes maximum mortality of adult pigs including expulsion of aborted foetus.

b) Poor mothering ability of the sow along with poor milk production caused weak and debilitated piglets resulting to death.

c) Heat stroke caused post weaning mortality

Measure to be taken for minimizes mortality:

Management measures

1. Apart from routine management practices, furrowing pen is washed with disinfectant thoroughly by Phenyl to prevent piglet diarrhea.
2. Sows are very ferocious during farrowing. Sows did not need any help at the time farrowing. Just after birth each piglets was cleaned with clean cloth and the mucous was removed from its mouth and nostrils.
3. Intramuscular injection of iron (dextran injection/ Imferon) was given to the new-born piglets on day 4^{th} and 14^{th} of the day of birth.
4. The newly born piglets were provided with bedding material during winter season to prevent cold effects.
5. The piggery shed was cleaned daily and the manure removed completely from the floor and wall through manual scraping.
6. To reduce heat stress water is sprinkled over the animal during summer season.
7. The piglets were vaccinated against swine fever. Deworming was also carried out soon after weaning and repeated if needed.

Prophylactic measures

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

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

(b) Lactating sows are given Increlac bolus to increase milk production.

(c) Animals are allowed to feed with balance ration twice daily and water *ad-libitum*.

(d) Pig sheds were clean daily and kept dry to prevent from any abnormal disease condition.

(e) Regular Veterinary service and treatment to disease condition/ disorder to prevent from mortality.

(f) The furrowing pens were kept clean and dry to prevent from piglet diarrhoea.

(g) The iron injection (Inferon) to all the piglets at 4^{rd} and 14^{th} days of age.

(h) The pigs were dewormed regularly (Albendazole, Fenbendazole, Ivermectin alternatively) to control parasitic infestation.

(i) For ecto-parasite, regular administered Ivermectin either injection or oral, besides dipping with 2% Butox before winter season.

Disposal of disease carcass: Trench burial method: Carcass of pigs disposed of by trench burial method approximately 100 meter away from the shed. Generally, a trench was made large enough to

accommodate the carcasses. Once buried, pigs were slowly decomposed. The minimum depth of trench pit was 3- 4 feet length and minimum depth of 6 feet. The carcass completely covered with enough quantity of belching powder and lime powder.

Disposal pattern of farm waste, pig excreta *etc*/: Farm waste are collected in tank.

Extension programme with success story:

ii) At the institute :

A 3 days residential farmers training programme was organized by KVK, Goalpara from 25/07/18 to 27/07/18 under *Krishi Kalyan Abhiyan*. Extensive training on "A.I in pig" and "piggery management" were taken during the period. Emphasis was given for establishment of pig breeding units with suitable breeds. As rearing of boar is a costly affair, different topics related to A.I in pigs were taught to the participants. Other topics like management of piglets, growers, finishers and management of pregnant sows, feed requirement at different stages, hygienic measures, clean and hygienic pork production etc were included in the training program.

iii) At the farmers' field:

- *Krishi Kalyan Abhiyan* I and II held at 125 villages of Goalpara district. In this program 12 trainings related to A.I in pig and 3 trainings related to scientific pig farming were organized at 15 villages. The rural educated youths were advised to involve in piggery venture for their self-employment. The beneficial effect of pig farming was explained to rural youth. Recently, the upgradation of "Sarpak Livelihood Promotion Society" to "Sarpak Agroproducers Company Ltd" attracted many rural youth to the piggery venture.
- Importance of A.I in pig and vaccination of pig was organized in some of the villages. Also vaccination schedule of pig was explained to prevent occurrence of various diseases.
- On 21/08/18 an awareness camp was held on importance of pig farming and pig health under TSP at Taplakhowa village, Goalpara organized by ICAR, NRC on pig, Rani in collaboration with KVK, Goalpara. Animal feed was distributed in the camp amongst the pig farmers. The animals were also vaccinated. In these villages all the 69 households were involved in pig farming in a small scale.

Details of the construction work/infrastructural development work:

a) Repairing of the floor and pens of the farm.
b) Nets were newly fitted in the farm.

Success story, if any:

KVK Goalpara adopted Pacchim Dairong village as pig seed village or 'Borah gram' and introduced artificial insemination (A.I) technology or piglet production and artificial insemination (A.I) technology for piglet production. A society named as "Sarpak Livelihood Promotion Society" was formed by KVK, Goalpara to look after the plan and programmes formulated by KVK office in the village. Till date, more than 1500 upgraded piglets have been produced through A.I. The chairperson of

the society, MRS Dipika Rabha has received *Mahila Kissan* Award from Ministry of Agriculture, Govt of India and felicitation from honorable Governor, Govt of Assam. The society has now been registered as a company in the name of "Sarpak Agro Farmer Producer Company" in the month of November, 2018. The piglets produced from A.I generated more than Rs 40 lakhs rupees. Gradually five more neighbouring villages have joined in this company to bring positive impact and to develop pig breeding farms in their respective villages. In addition to this prime objectives the company has now taken various steps to promote horticulture crops and development of integrated farming system.

A new activity initiated by KVK Goalpara is that female members of a society in addition to their male counterparts, even the chairperson of that society, Mrs Deepika Rabha were actively involved in doing A.I in pig as an AI technician.

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<tr><td>Doom Sow with piglet at AICRP Center</td><td>A Doom Boar</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Extension activities at the field</td><td>Extension activities at the Institute</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Extension activities at the Institute</td><td>Involvement of woman farmer (AI in field)</td></tr>
</table>

GURU ANGAD DEV VETERINARY AND ANIMAL SCIENCES UNIVERSITY, LUDHIANA

The project was sanctioned in December 2016 with date of commencement of the Project from April 1, 2017. A budget of Rs 5035000/- (ICAR share) was released during the financial year 2017-18 which was utilized to maximum extent (>95%). In the current fiscal year (2018-19), budget of Rs 3720667/- (ICAR share) was received under different subheads of which an expenditure of Rs 3634592 (>95%) was made. Strategies of scientific pig farming as approved by the Council have been initiated. Survey on current reproductive management practices in pigs of Punjab was under progress. Specific managemental practices of identification, castration etc. were performed regularly. Nutritional experimentation governed by the Nodal centre practiced. Efforts were made to reduce genetic group wise and sex wise mortality rate. Regular monitoring of pig herd for health care management was undertaken. Construction of new pig shed is under pipeline.

Herd dynamics:

Sr. No.	Age (Months)	Opening balance (01-04-2018)			Closing balance (31-03-2019)		
		Male	Female	Total	Male	Female	Total
1	Piglet (up to 42 d)	-	-	-	7	6	13
2	Grower (42 d – 5 m)	-	-	-	6	2	8
3	Finisher (5 m – 8 m)	2	12	14	2	4	6
4	Adult	-	-	-	1	7	8
	Total	**2**	**12**	**14**	**16**	**19**	**35**

Performance of animals

Sr. No.	Traits / Characters	Mean ± SE (No. of observation)		
		M	F	Total
1	Litter size at birth (no.)	5.3 ± 1.4 (4)	4.0 ± 0.9 (4)	9.3 ± 1.8 (4)
2	Litter weight at birth (kg.)	4.5 ± 1.6 (4)	6.8 ± 1.9 (4)	11.3 ± 1.6 (4)
3	Litter size at weaning (no.)	4.8 ± 1.7 (4)	3.8 ± 0.9 (4)	8.6 ± 1.8 (4)
4	Litter weight at weaning (kg.)	28.3 ± 8.0 (4)	24.7 ± 5.0 (4)	53.0 ± 7.9 (4)
5	Average individual weight at birth (kg.)	1.13 ± 0.05 (20)	1.16 ± 0.06 (17)	1.15 ± 0.04 (37)
6	Average individual weight at weaning (kg.)	6.5 ± 0.4 (18)	6.2 ± 0.4 (16)	6.2 ± 0.3 (34)
7	Number of days for weaning (d)	30	30	30
8	Pre-weaning mortality rate (%)	10 (2/20)	5.9 (1/17)	8.1 (3/37)
9	Pre-weaning growth rate (gm/d)	160.0 ± 0.9 (18)	176.0 ± 0.8 (16)	166.0 ± 1.0 (34)
10	Post-weaning mortality rate (%)	5.6 (1/18)	0.0 (0/16)	2.9 (1/34)
11	Post-weaning growth rate (gm/d) *(upto 4 m)*	27.8 ± 0.8 (6)	22.2 ± 1.6 (2)	25.6 ± 0.6 (8)
12	Overall growth rate *(upto 9 m)* (gm/d)	-	-	-
13	Body weight (kg)			
	1 month	6.3 ± 0.4 (18)	6.2 ± 0.4 (16)	6.2 ± 0.3 (34)
	2 month	10.8 ± 1.2 (18)	10.0 ± 1.1 (16)	10.4 ± 0.8 (34)
	3 month	17.8 ± 2.1 (9)	13.2 ± 1.8 (5)	16.1 ± 1.6 (14)
	4 month	24.3 ± 1.7 (6)	19.0 ± 7.0 (2)	23.0 ± 2.0 (8)

Lifetime production traits

Average litter size at birth per sow	9.3 ± 1.7 (4)
Average litter weight at birth per sow	11.3 ± 1.6 (4)
Average litter size at weaning per sow	8.6 ± 1.8 (4)
Average litter weight at weaning per sow	53.0 ± 7.9 (4)
Average litter weight at slaughter per sow	NA

Specific managemental practice

i. **Identification:** Ear tagging between 15-30 days

ii. **Castration:** Open surgical method at 15 days of age

iii. **Iron supplementation:** 3 days after farrowing

iv. **Needle teeth cutting:** On the day of birth

v. **Early weaning:** 30 days

Mortality parameter

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

ii. Causes of mortality (Specific cause):

iii. Measures to taken minimize mortality:

a) Managemental measures: Creep area, provision of guard rail, cut and ligation of naval cord, needle teeth cutting, iron dextran injection.

b) Prophylactic measures: Vaccination against FMD, swine fever and HS at 6 monthly intervals. Deworming at 3 monthly interval.

iv. Disposal of diseased carcass: The diseased and dead carcass, if any, was disposed in the postmortem hall of the University through the Department of Veterinary Pathology.

Nutritional experimentation:

Growth performance and nutrient digestibility of gilts fed different level of mineral mixture in their ration

Eight gilts of 3-4 months age and body weight 40-41 kg were randomly selected for the current study. The gilts were divided into two groups (n = 4 animals/ group). The animals of group-I were fed with diet containing 1.0% MM and that of group-II with diet containing 1.5% MM. The ingredients (%) as well as chemical composition (%) of the experimental ration (ICAR, 2013) were as follows:

Ingredient (%) and chemical composition (%) of the experimental ration

Ingredients	**Treatment 1**			**Treatment 2**		
	Ingredients (%)	**Chemical composition (%)**		**Ingredients (%)**	**Chemical composition (%)**	
Maize	58.5	CP	15.02	58	CP	14.98
Wheat bran	12	CF	6.0	12	CF	6.0
Rice Polish	12	EE	3.15	12	EE	3.13
Soybean meal	16	Ash	6.87	16	Ash	7.31
Common salt	0.5	NFE	65.69	0.5	NFE	65.28
Mineral mixture	1.0	ME (Kcal/Kg)	3295.5	1.5	ME (Kcal/Kg)	3288.6

Growth performance of gilts following 60 days of mineral mixture supplementation

Parameter	**Treatment 1 (n = 4; 1.0 MM)**	**Treatment 2 (n = 4; 1.5 MM)**
Initial body weight (Kg)	40.3 ± 2.9	40.3 ± 2.8
Final Body weight (Kg)	60.0 ± 3.6	64.5 ± 4.1
Average Body weight gain (Kg)	19.7 ± 3.2	24.5 ± 3.5
Average feed intake (Kg)	59.0	59.0
Feed conversion ratio (FCR)	2.99 ± 0.21	2.41 ± 0.17
Daily AFI (Kg)	0.98	0.98
Daily ABWG (Kg)	0.33	0.41

Mineral mixture supplementation @ 1.5% in gilt ration exhibited better growth performance and FCR as compared to that supplemented @ 1.0%.

Survey on market of pork production

Survey was conducted in the districts of Ludhiana, Sangrur, Patiala, Barnala and Fatehgarh Sahib. Currently, there is no organized market for processing and marketing of pork. Butchers purchase pigs from farmers of the different districts. Local consumption is practiced by labour community. Farmers get Rs. 80-100 per kg of live weight depending on the breed, age and sex of the pig. Market price per kg of pork varies Rs 150-350 per Kg depending on season and quality of pork.

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

Recycling of farm waste in the biogas plant established in the University.

Extension programme with success story

i. **At the institute**

Delivery of lectures on scientific pig farming provided to pig farmers (n = 207) in 5 training and SC farmers (n = 59) in 3 training programmes organized by the Department of Veterinary and Animal Husbandry Extension Education of the University. A practical manual titled "Swine Production Manual" and Punjabi book titled "Sur Palan" written and supplied to the farmers. Supply of elite germplasm is done.

ii. **At the farmers' field**

Collection of semen from boar and subsequent insemination in the gilts of progressive pig farmers.

Salient achievement during the report period

a) Steps taken for utilization of budget of current financial year.
b) Delivered lectures on scientific pig farming to pig farmers.
c) Supply of elite germplasm.
d) Performed semen collection from boar and its insemination in gilts for the first time under field conditions in Punjab.
e) Project related work given to two MVSc students.
f) The revenue (ICAR share) generation during the current year from the sale of pigs was Rs 112110/-.

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

Work pertaining to project given to two students (Ms. Sukhjinder Kaur, L-2018-V-44-M; M.V.Sc., "Effect of flaxseed supplementation on reproductive performance of sows" and Mr. Kanwar Pal, L-2018-V-21-M; M.V.Sc., "Resource use efficiency and welfare of grower-finisher pigs under different heat stress mitigation strategies").

Distinguish visitors

Vice-Chancellor of the University, Officials of the Polar Genetics, Canada, Pvt Ltd and Polar Genetics, India, Pvt Ltd visited the centre for future collaborations (30.4.18).

Details of the construction work/infrastructural development work: Construction of second phase of new pig shed in progress and funds in the form of 2nd installment transferred to the Estate Office of

the University. Tender for 2nd installment has been floated and work under progress. Efforts were made to purchase the required consumables.

Success story:

Collection of semen from boar and subsequent Artificial Insemination in gilts was performed for the first time under field conditions in Punjab.

Name and address of the farmer: S. Sukhwinder Singh Grewal, VPO Kotli, District Ludhiana, Mobile No.: 9915632577, E-mail: sukhwindergrewal109@gmail.com

Herd strength: 50 pig heads; Number of gilts inseminated: Three

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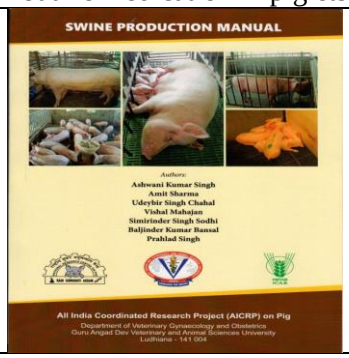
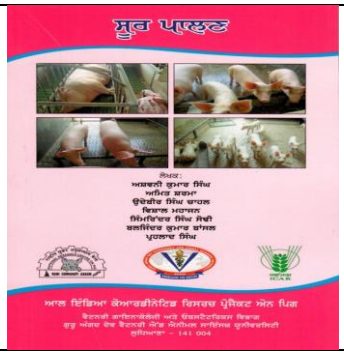
<tr><td>Routine medication in piglets</td><td>Collection of semen from boar</td></tr>
<tr><td> 
</td><td> 
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<tr><td>A</td><td>B</td></tr>
<tr><td colspan="2">Supply of literature to the farmers to adopt scientific pig farming (A: Swine production manual; B: Soor Palan)</td></tr>
</table>

KRANTISINH NANA PATIL COLLEGE OF VETERINARY SCIENCE, SHIRVAL, SATARA, MAHARASHTRA

AICRP on Pig was sanctioned in year 2017-18 at KNP College of Veterinary Science, Shirval Dist Satara (Maharashtra). Construction pig shed (Area: 45.6 feet x 54 feet) had been completed during this year. Total 13 piglets (5 males and 8 females) of LWY breed were purchased for breeding purpose. The breeding is in progress in newly purchased pigs.

During the year 2017-18, ICAR has granted AICRP on Pig centre to Krantisinh Nana Patil College of Veterinary Science, Shirval Dist Satara (Maharashtra state) functioning under Maharashtra Animal and Fishery Sciences University, Nagpur. This was the first year of establishment of AICRP on Pig (ICAR) centre at this institute during XII five year plan.

Herd Dynamics:

Large White Yorkshire

Age in Months	Opening Balance as on 01.04.2018			Closing Balance as on 31.03.2019		
	Male	Female	Total	Male	Female	Total
Over 8 Months Breeding Stock	-	-	-	05	08	13

Stock Continuity Details (LWY)

Sr No	Categories	Opening Balance as on 01.04.2018	Additions		Disposals			Closing Balance
			Birth	Transfer/ Purchase	Deaths	Transfer/ Slaughter	Sold	
1	Piglets(Up to 42 d)	-	-	-	02	-	-	-
2	Grower (42d–5 M)		31		-			29
3	Finisher (5-8 M)	-	-	-	-	-	-	-
4	Breeding Female	-	-	08	-	-	-	08
5	Boar	-	-	05	-	-	-	05
	Grand Total	-	**31**	**13**	**02**	-	-	**42**

Breeding Strategy of the Farm as Approved

a. As per the technical program a foundation stock of Large White Yorkshire breed has been maintained for conservation and propagation since inception and establishment of this centre (2017-18). Their performance has been studied and being utilized as breeding stock (male and female) to raise the generation.

b. This parent stock will be maintained up to few farrowings. This stock has been conserved and will be propagated so as to achieve the target of maintaining 30 sows and 10 sires.

c. The approved breeding strategy of AICRP on Pig centre is to undertake research work on indigenous pigs and then adopting crossbreeding by crossing indigenous female with LWY exotic breed.

d. In this context the survey about pig genetic resources available in Maharashtra state has been completed. The performance of pure stock indigenous breed will be studied. Breeding policy will be followed where cross breeding program between LWY and local breed will be adopted immediately.

Performance of Animals

Sr. No	Traits/ Characters	Mean ± SE (No. of Observation)		
		M	F	Total
1	Average Litter size at birth (no.)	5.00±00(15)	5.33±0.33(16)	10.33±0.33(31)
2	Average Litter weight at birth (kg)	6.65±0.18(15)	6.58±0.37(16)	13.23±0.53(31)
3	Average Litter size at weaning (no.)	4.33±0.66(13)	5.33±0.33(16)	9.67±0.33(29)
4	Average Litter weight at weaning (kg)	30.63±5.28(13)	31.98±2.4(16)	62.60±7.10(29)
5	Average individual weight at birth (kg)	1.33(15)	1.23(16)	1.28(31)
6	Average individual weight at weaning (kg)	7.07(13)	6.00(16)	6.48(29)
7	Number of days for weaning (d)	42 days		
8	Pre weaning mortality rate (%) 2 died	13.33	00.00	6.45

Specific Managemental Practices:

Animal Identification: Plastic ear tags are being used and animal number is given on ear tag of adult pigs as well as piglets in the farm.

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

Managemental Measures:

- All the pigs are being dewormed periodically.
- A disinfection dip has been constructed at the entrance of the pig shed to control infection from outside.
- Regular spraying of pig shed against ectoparasites is followed.
- Fly killer machines have been fixed in the shed to control house fly and other flies population.
- Farrowing crates/guards (straight and round bars) have been fabricated in farrowing pens for keeping away/feeding the piglets at regular interval and to minimize the incidence of crushing of piglets.
- Soft bedding with hay/paddy straw regularly being provided for the comfort of piglets after farrowing.
- Early treatment to control piglet diarrhea and anaemia are being undertaken. Piglets are injected with Inj. iron dextarn on 4th day and repeat on 14th day post farrowing.
- Pigs in the farm are being fed twice with balanced ration depending on body weight and clean water is being provided for drinking.
- Early detection and treatment of health problems like foot lesions, lameness, limping, metritis, mastitis, enteritis, agalctia, aural haematoma etc. in pigs are being followed using appropriate medicines.
- Efforts are being taken to minimize the pre weaning mortality with suitable interventions.

Prophylactic Measures:

- Periodical spraying of pig shed with antimicrobial solution is being followed.
- All the animals are being immunized twice annually against swine fever and FMD diseases.

- Weaned piglets are being vaccinated against CSF three days after weaning and FMD after 21 days post weaning.
- The animals are daily washed and cleaned.
- Treatment of ailing animals is being done regularly and efforts are being taken to minimize mortality through prophylactic measures.
- Pregnant sows are transferred to farrowing pens 2-3 weeks in advance to provide individual care and management.
- Pregnant sows are daily allowed for walk and exercise at least for 1 hour in the open enclosed paddock.
- Pregnant sows are orally fed with anti-stress medicine and are injected with B complex as an additional source of vitamins to boost growth and health of animals.

Mortality Parameter:

Genetic group wise and sex wise mortality rate:

	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 (upto 42 d)	15	2	13.33	16	nil	0	31	2	6.45
Post weaning (42d to5m)	13	Nil	0	16	nil	0	29	nil	0
Adult (>5 m)	05	Nil	0	08	nil	0	13	nil	0

Measures to taken minimize mortality:

Managemental Measures:

- Farrowing crates/guards (straight and round bars) are fabricated in farrowing pens for keeping away/feeding the piglets at regular interval and to minimize the incidence of crushing of piglets.
- Immediately after farrowing, piglets are being cleaned with clean cloth and mucus being removed from nostril and mouth. Umbilical cord being cut from 2.5 cm from umbilicus of each piglet using scissor and disinfectant to avoid complications.
- Soft bedding with hay/paddy straw regularly being provided for the comfort of piglets after farrowing.
- A disinfection dip has been constructed at the entrance of the pig shed to control infection from outside.
- Fly killer machines have been fixed in the shed to control house fly and other flies population.
- Early treatment to control piglet diarrhea and anaemia are being undertaken. Piglets are injected with Inj. iron dextarn on 4th day and repeat on 14th day post farrowing.

Prophylactic Measures:

Periodical spraying of pig shed with antimicrobial solution is being followed.

- Weaned piglets are being vaccinated against CSF three days after weaning and FMD after 21 days post weaning.
- Pregnant sows are orally fed with anti-stress medicine and are injected with B complex as an additional source of vitamins to boost growth and health of animals.

Disposal of diseased carcass: Post mortem of pig/piglet is being performed in the post mortum room of department of Veterinary Pathology in the institute. PM report is being prepared by the pathologist. Carcass is being buried at institute designated diseased carcass burial site by digging deep pit and adding lime powder and salt for faster decomposition.

Extension Program with success story:

At the Institute: Farmers use to visit AICRP on Pig unit of college. Training program on pig farming for farmers will be started soon in regular batches at this institute.

At the Farmers' Field: Principal investigator has visited few organized pig farms in Gadchiroli, Nagpur, Pune and Nasik districts of Maharashtra state and pig owners were advised to adopt economic managemental practices in terms of housing, raring, feeding etc.

Distinguish Visitors:

1. **Dr A.M. Paturkar**, Hon'ble Vice Chancellor, Maharashtra Animal and Fishery Sciences University, Nagpur
2. **Dr Ashok Kumar**, Hon'ble Assistant Director General, Indian Council of Agricultural Research

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<tr><td colspan="2">Visit of dignatories</td></tr>
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<tr><td>Survey about pig genetic resources available in Maharashtra state</td><td>Farm LWY</td></tr>
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Mega-Seed Project on Pig

NAME OF THE CENTRE AND INCHARGE

Sl. No.	Name of the Centers	Name of Incharge
1.	College of Veterinary Science, Assam Agricultural University Khanapara, Guwahati, Assam-781022	Dr. Dhireswar Kalita
2.	College of Veterinary Science, Birsa Agricultural University, Kanke, Ranchi, Jharkand -834006	Dr. Ravindra Kumar
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. K. Lalchhuanawma
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. Shyamal Dasgupta
7.	Veterinary Services, Dept. of Animal Husbandry and Veterinary Services, Krishi Bhawan, Todong, Gangtok -737102, Sikkim	Dr. Sharman Rai

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 XIIth Five Year Plan. However, from 1st April, 2017 the centres of Chhattisgarh Kamdhenu Vishwavidyalaya, Durg and State Animal Husbandry and Veterinary Department, Govt. of Arunachal Pradesh were discontinued. New Mega Seed Centre on Pig was initiated in Dept. of Animal Husbandry and Veterinary Services, Govt. of Sikkim.

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. Extension activities of the programme including animal distribution record should be maintained as per Direct Benefit Transfer (DBT) norms of Govt. of India.
2. The Mega Seed on Pig centers should act as a capacity building unit in the area. For this purpose, the farm should act as demonstration unit and necessary training to the stake holders

may be provided by each centre. At least two trainings on scientific pig production for beneficiaries should be conducted in each year by all the centers.

3. Impact assessment along with economics of production at farmers' door need to be carried out by individual centers.
4. The centres should adopt AI technology as a part of breeding programme.
5. 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.
6. Full amount (100%) revenue generated under Mega Seed Project on Pig should be refunded to ICAR-NRC on Pig.

Breeding:

1. The center should maintain sow unit to achieve the targeted pig production.
2. The centers should promote second line breeding unit at farmers' field.
3. The centers should adopt village and promote SHGs and entrepreneurs for promotion of piggery in the state.

Centre wise recommendation:

AAU, Khanapara:

1. The centre should maintain only HD K75 pig variety in the farm.
2. The existing 50% crossbred animals should be replaced gardually with HD K75 variety
3. The center should maintain 100 sow unit to target a production of 1500 piglets during 2018-19.
4. Outcome of the project w.r.t. benefit to farmers, economic realization, impact of pork quality production need to be assessed.
5. The centre should submit the AUC/UC in time.
6. The new location (Lakhimpur) of the centre should act as a outreach unit for distribution of germplasm in the adjacent area till finalization of next Plan.

BAU, Ranchi:

1. The centre should maintain Jarshuk cross with a target to produce 1200 piglets in 2018-19.
2. AI should be initiated in the farm immediately.
3. The center may take additional contractual manpower from contingency fund of the project.

ICAR RC for NEH, Nagaland:

1. In view of damage to the existing shed due to construction of highway, the center should target to produce 500 live piglets during 2018-19.
2. The center should initiate AI extensively in the field and cover a minimum of 500 successful AI in field using Rani semen to already existing Rani population under field conditions.
3. Data on piglet production after AI service should be recorded. The Target of AI born piglet in field should be 3000.

A.H. &Veterinary Department, Government of Mizoram:

1. Necessary steps need to be taken to achieve production of 900 piglets/annum of pure Large White Yorkshire during the year 2018-19.
2. At least 60 sow unit of LWY needs to be maintain to achieve the target.

Kerala Veterinary and Animal Science University, Mannuthy:

1. The centre should target producing 1000 piglets during the year 2018-19.
2. A separate propsal regarding continution of center in current location till finalization of next Plan needs to be send to the Council for consideration.

ARDD, Tripura:

1. Production target should be accelerated.
2. The centre should target producing 900 piglets during the period 2018-19.
3. 60 sow unit should be mentained for the purpose.

State Vety. Department, Govt. of Sikkim:

1. The center should initiate production of 900 piglet per year.
2. At least 60 sow unit needs to be maintain to achieve the target.
3. Half of sow should be HD K75 developed by AICRP center Khanapara and half of the sow should be of Rani Variety developed by ICAR-NRC on Pig.
4. Requisition of Rani Pigs should be sent to ICAR-NRC on Pig in this regard.
5. Existing animals of farm need to be replaced in phased manner to accommodate the recommended germplasm.
6. The centre should take initiative to characterize the local pig of the state for registration.

5. Action point discussed in Review Meet of 'All India Coordinated Research Project on Pig' and "Mega Seed Project on Pig" held at ICAR-NRC on Pig, Rani, Guwahati on 23-24th Nov., 2018.

AAU Khanapara

Recommendation	Action taken
General:	
1. Extension activities/ distribution as per Direct Benefit Transfer norm	Followed
2. Demonstration unit and conduction of two trainings	Followed
3. Impact assessment along with economics of production at farmers' field	Will be followed
4. AI technology should be used as breeding programme	Followed
5. PI of the centre should have specialization in AGB	Followed
6. Full revenue generated under project should be refunded to ICAR-NRCP	Under process
Breeding:	
1. Sow unit should be maintained to achieve the targeted pig production.	Followed
2. Promote second line breeding unit at farmers' field.	Followed
3. Adoption of village and promote SHGs and entrepreneurs	Followed
Centre wise recommendation:	
1. Maintain only HD K-75 pig variety in the farm.	Done
2. Existing 50% crossbred should be replaced gradually with HD K-75	Done
3. Maintain 100 sow unit to produce 1500 piglets during 2018-19.	followed
4. Outcome of the project need to be assessed	To be Done
5. The centre should submit the AUC/UC within time.	Under process

6. The new location (Lakhimpur) of the centre should act as an outreach unit	Done

BAU, Ranchi

Recommendation	Action taken
General:	
1. Extension activities/ distribution as per Direct Benefit Transfer norm	Followed
2. Demonstration unit and conduction of two trainings	Done
3. Impact assessment along with economics of production at farmers' field	Done
4. AI technology should be used as breeding programme	Followed
5. PI of the centre should have specialization in AGB	Followed
6. Full revenue generated under project should be refunded to ICAR-NRCP	Done
Breeding:	
1. Sow unit should be maintained to achieve the targeted pig production.	Followed
2. Promote second line breeding unit at farmers' field.	Followed
3. Adoption of village and promote SHGs and entrepreneurs	Followed
Centre wise recommendation:	
1. Maintain Jharsuk cross with a target to produce 1200 piglets in 2018-19	Done
2. AI should be initiated at the farm immediately	Done
3. May be take additional contractual manpower from contingency funds	Done

ICAR RC for NEH, Nagaland Centre, Medziphema

Recommendation	Action taken
General:	
1. Extension activities/ distribution as per Direct Benefit Transfer norm	Followed
2. Demonstration unit and conduction of two trainings	Done
3. Impact assessment along with economics of production at farmers' field	Done
4. AI technology should be used as breeding programme	Followed
5. PI of the centre should have specialization in AGB	Followed
6. Full revenue generated under project should be refunded to ICAR-NRCP	Done
Breeding:	
1. Sow unit should be maintained to achieve the targeted pig production.	Followed
2. Promote second line breeding unit at farmers' field.	Followed
3. Adoption of village and promote SHGs and entrepreneurs	Followed
Centre wise recommendation:	
1. To produce 500 piglets in 2018-19	Done
2. Initiate AI extensively in the field and cover a minimum of 500 successful AI in field using Rani semen	Will be done
3. The Target of AI born piglet in field should be 3000	Will be done

Veterinary Department, Government of Mizoram, Aizawl

Recommendation	Action taken
General:	
1. Extension activities/ distribution as per Direct Benefit Transfer norm	Maintained
2. Demonstration unit and conduction of two trainings	Done
3. Impact assessment along with economics of production at farmers' field	Done
4. AI technology should be used as breeding programme	Followed
5. PI of the centre should have specialization in AGB	Followed
6. Full revenue generated under project should be refunded to ICAR-NRCP	Done
Breeding:	
1. Sow unit should be maintained to achieve the targeted pig production.	Followed
2. Promote second line breeding unit at farmers' field.	Followed
3. Adoption of village and promote SHGs and entrepreneurs	Followed
Centre wise recommendation:	

1. To achieve production of 900 piglets in 2018-19	Not achieved due to PRRS
2. At least 60 sow unit of LWY needs to be maintained	Will be done

KVASU, Kerala

Recommendation	Action taken
General:	
1. Extension activities/ distribution as per Direct Benefit Transfer norm	Maintained
2. Demonstration unit and conduction of two trainings	Done
3. Impact assessment along with economics of production at farmers' field	Done
4. AI technology should be used as breeding programme	Followed
5. PI of the centre should have specialization in AGB	Followed
6. Full revenue generated under project should be refunded to ICAR-NRCP	Done
Breeding:	
1. Sow unit should be maintained to achieve the targeted pig production.	Followed
2. Promote second line breeding unit at farmers' field.	Followed
3. Adoption of village and promote SHGs and entrepreneurs	Followed
Centre wise recommendation:	
1. To achieve production of 1000 piglets in 2018-19	Achieved
2. A separate proposal regarding continuation in the centre in current location till finalization of next plan needs to be sent to the council	Done

ARDD, Tripura

Recommendation	Action taken
General:	
1. Extension activities/ distribution as per Direct Benefit Transfer norm	Maintained
2. Demonstration unit and conduction of two trainings	Done
3. Impact assessment along with economics of production at farmers' field	Yet to be done
4. AI technology should be used as breeding programme	Yet to be done
5. PI of the centre should have specialization in AGB	Noted
6. Full revenue generated under project should be refunded to ICAR-NRCP	Yet to be done
Breeding:	
1. Sow unit should be maintained to achieve the targeted pig production.	Followed
2. Promote second line breeding unit at farmers' field.	Followed
3. Adoption of village and promote SHGs and entrepreneurs	Yet to be done
Centre wise recommendation:	
1. To achieve production of 900 piglets in 2018-19	Not achieved
2. 60 sow unit should be mentained for the purpose	Yet to be done

STATE VETY. DEPARTMENT, GOVT. OF SIKKIM

Recommendation	Action taken
General:	
1. Extension activities/ distribution as per Direct Benefit Transfer norm	Maintained
2. Demonstration unit and conduction of two trainings	Done
3. Impact assessment along with economics of production at farmers' field	Done
4. AI technology should be used as breeding programme	Followed
5. PI of the centre should have specialization in AGB	Followed
6. Full revenue generated under project should be refunded to ICAR-NRCP	Done
Breeding:	
1. Sow unit should be maintained to achieve the targeted pig production.	Followed
2. Promote second line breeding unit at farmers' field.	Followed
3. Adoption of village and promote SHGs and entrepreneurs	Followed
Centre wise recommendation:	

1. To achieve production of 900 piglets in 2018-19	Yet to be done
2. 60 sow unit should be mentained for the purpose	Yet to be done
3. Half sow of Rani variety and half of HDk-75	Yet to be done
4. Charatarize local pig of Sikkim	Yet to be done

5. Salient Achievements of Mega Seed Project on Pig till Date:

Under this project improved variety of piglets were produced and distributed to the farmers. Total 18027 piglet of improved variety were produced for distribution during XIIth Plan Period. A total of 5879 and 4403 nos. of improved variety of piglets were produced for distribution in 2017-18 and 2018-19, respectively.

ASSAM AGRICULTURAL UNIVERSITY, KHANAPARA, GUWAHATI

Rapid urbanization and increased population pressure has demanded the scope for production of qualitative and quantitative meat in the country particularly in the North Eastern region. The major constraints like non-availability of superior quality seed stock, imbalanced ration at reasonable price, unscientific management or inadequate knowledge, lack of financial support as well as marketing channel etc. are hampering in the growth and development of pig industry. But a sizeable number of unemployed educated youth, retired persons from the affluent families / societies have taken up this venture as means of their livelihood / occupation or as subsidiary income generation. This development has opened up a new chapter in the entire scenery of piggery development in the state. The AICRP 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 awareness program, exhibition, demonstration, distribution of leaflet/booklet, selling of piglets and elite gilts / sows at nominal price.

The Indian Council of Agricultural Research (ICAR), Govt. of India has sanctioned MEGA SEED PROJECT ON PIG to the Assam Agricultural University, Khanapara. 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 MEGA SEED PROJECT during 2008. The three genetic groups viz. 50%Hampshire, Ghungroo and T&D were 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

Sl. No.	Categories	Opening balance				Total	Closing balance				Total
		50%H		HD-K75			50% H		HD-K75		
		M	F	M	F		M	F	M	F	
1.	Piglet (up to 6 wk)	82	98	-	-	**180**	84	50	25	26	**185**
2.	Grower (6 wk – 5 m)	101	63	-	-	**164**	33	38	-	-	**71**
3.	Finisher (5 – 8 m)	17	23	-	-	**40**	03	2	2	8	**15**
4.	Over 8 month	17	91	-	-	**108**	14	61	2	25	102
	Total	217	27	-	-	**492**	**134**	**151**	**29**	**59**	**373**

Stock Continuity Details II: 50% H

Sex	Opening Stock	Addition				Deletion				Closing Stock
		Birth	Purchase	Transfer	Total	Sale	Slaughter	Died	Total	
Male	217	492	-	-	709	526	02	43	571	138
Female	275	435	-	-	710	525	-	38	563	147
Total	492	927	-	-	1419	1051	02	81	1134	285

Stock Continuity Details II: HD-K75

Sex	Opening Stock	Addition				Deletion				Closing Stock
		Birth	Purchase	Transfer	Total	Sale	Slaughter	Died	Total	
Male	-	26	4	-	30	-	-	1	1	29
Female	-	26	26	7	59	-	-	-	-	59
Total	-	52	30	7	89	-	-	1	1	88

Total animal (A +B= 285 +88 =373)

Number of piglets produced during the reporting period**: 50%H**

	Total no. of piglets born			Total no. of piglets died			Total no. of live piglets produced		
	M	F	Total	M	F	Total	M	F	Total
1st quarter	119	111	230	8	4	12	111	107	218
2nd quarter	115	102	217	4	2	6	111	100	211
3rd quarter	112	104	216	15	11	26	97	93	190
4th quarter	146	118	264	15	14	29	131	104	235
Annual	492	435	927	42	31	73	450	404	854

Number of piglets produced during the reporting period**: HD-K75**

	Total no. of piglets born			Total no. of piglets died			Total no. of live piglets produced		
	M	F	Total	M	F	Total	M	F	Total
1st quarter	-	-	-	-	-	-	-	-	-
2nd quarter	-	-	-	-	-	-	-	-	-
3rd quarter	-	-	-	-	-	-	-	-	-
4th quarter	26	26	52	1	-	1	25	26	51
Annual	26	26	**52**	1	-	**1**	25	26	**51**

Total no. of live piglets produced: 854 +51= 905

Number of piglets sold during the reporting period: **50%H**

	Total no. of piglets Produced			**Total no. of piglets sold**			**Amount realized (Rupees)**
	M	**F**	**Total**	**M**	**F**	**Total**	
1st quarter	111	107	218	162	127	289	**Rs. 37,44,850/-**
2nd quarter	111	100	211	124	111	235	
3rd quarter	97	93	190	103	122	225	
4th quarter	131	104	235	119	89	208	
Annual	**450**	**404**	**854**	**508**	**449**	**957**	
HD-K75	25	26	51	-	-	-	
Overall	475	430	**905**	**-**	**-**	**-**	

Average Litter Size at birth and at weaning

Genetic group	**Number of Litter**	**Litter Size at Birth**			**Litter Size at weaning**		
		M	**F**	**Total**	**M**	**F**	**Total**
50%H	119	4.14 ± 1.05	3.66 ± 1.25	7.79 ± 1.14	3.96 ± 1.12	3.45 ± 0.95	7.40 ± 1.01
HD- K75	6	4.33 ± 3.25	4.33 ± 3.25	8.67 ± 2.27	4.17 ± 2.95	4.33 ± 3.25	8.50 ± 1.61
Total	125	-	-	-	-	-	-

Pre weaning and post weaning mortality of 50%H and HD-K75

Genetic group	**Pre weaning mortality (%) (0-42 days)**	**Grower Mortality (%) (42 days – 5 months)**	**Finisher (%) (5month – 8 months)**	**Adult Mortality (%) (over 8 months)**
50%H	4.16(46)	2.54 (27)	4.54 (5)	3.01 (03)
HD- K75	1.92 (01)	Not attained	Not attained	Not attained

	
Collection of semen for A.I. & demonstration	Bio- gas plant
	
One day training at Silonijan, Karbi Anglong	Exposure visit of farmers, Kamrup (R)
	
Piglet with sow 50%H	Distribution of piglets under TSP at Baksa

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 adopted the rearing of our improved variety JHARSUK with great enthusiasm which provided tremendous employment opportunity to local people through integrated piggery development programme. Now a day's farmers are getting benefit of Mega seed project. MSP on pig supplying improved variety of pig named JHARSUK to the farmers and gradually farmers are interested to rear this variety because of 2-3 times economical as comparison to desi pigs under village management conditions resulted into progressive increases in the number of pig breeders. Approximate more than 250 2nd line pig breeder have been developed which are supplying improved germplasm of pig to the neighboring farmers. But still we are not able to fulfill the 100% demand of piglets in Jharkhand. As per census 2012, major pig population in rural areas of Jharkhand are of indigenous/local type. ICAR-MSP on Pig project gradually replacing our local pig with Jharsuk variety. Demands for "Jharsuk" pigs are increasing day by day. In Jharkhand, pig production has assumed great importance even among extremely low resource poor farmers.

Herd dynamics

Sl. No.	Categories	Opening balance	Additions		Disposals		Closing balance
			Births	Transfers	Deaths	Sold	
1.	Piglet (up to 42 days)	306	1160	-	42	-	198
2.	Grower(42days-5 months)	77	-	01	216	939	148
3.	Finisher (5m- 8 months)	41	-	-	01	06	15
4.	Breeding Female	104	-	05	06	20	98
5.	Boar	24	-	-	06	04	24
Grand total		**552**	**1160**	**06**	**266**	**969**	**483**

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	130	127	257	31	25	56	99	102	201
2nd quarter	148	165	313	24	20	44	124	145	269
3rd quarter	117	146	263	41	31	72	76	115	191
4th quarter	169	158	327	39	54	93	130	104	234
Annual	564	596	1160	135	130	265	429	446	895

Number of piglets sold during the reporting period

	Total no. of piglets born			**Total no. of piglets sold**			**Amount realized (Rs)**
	M	**F**	**T**	**M**	**F**	**T**	
1st quarter	130	127	257	78	61	139	1,87,650.00
2nd quarter	148	165	313	109	97	206	3,19,275.00
3rd quarter	117	146	263	86	83	169	2,95,070.00
4th quarter	169	158	327	198	257	455	9,12,510.00
Annual	**564**	**596**	**1160**	**471**	**498**	**969**	**17,14,550.00**

	
JHARSUK Pig rearing on small scale by landless farmers	Farmers under training
	
Group of farmers from different state	Booklet on sukar palan, inauguration
	
Pig rearing by new 2nd line breeder at Farmers' door	Deaf-and-dumb youth adopted pig farming after training for livelihood

ICAR-RC FOR NEH REGION, JHARNAPANI

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. Under the Mega Seed Project on pig, a total of 4560 no. of piglets have been distributed till date 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)	108	606		126	39*	403	146
2	Grower (42 d – 5m)	4	-	39*	11	16*	-	16
3	Finisher (5 m- 8 m)	19	-	16*	-	20*	-	15
4	Breeding female	55	-	14*	8	-	14	47
5	Boar	3		6*	2	-	2	5
Grand Total		189	606	-	147	-	419	229

*selection, addition and transfer within farm between different age group categories.

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	71	74	145	11	12	23	60	62	122
2nd Quarter	97	87	184	21	19	40	76	68	144
3rd Quarter	52	37	89	15	9	24	37	28	65
4th Quarter	96	92	188	17	22	39	79	70	149
Annual	316	290	606	64	62	126	252	228	480

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 (rupees)
	M	F	T	M	F	T	M	F	T	
1st Quarters	60	62	122	17	22	39	-	3	3	2046960
2nd Quarters	76	68	144	59	61	120	-	-		
3rd Quarters	37	28	65	51	39	90	2	2	4	
4th Quarters	79	70	149	82	72	154	-	9	9	
Annual	**252**	**228**	**480**	**209**	**194**	**403**	**2**	**14**	**16**	

Other information:

Artificial insemination in pig has been 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 AI program from adopted organized farms and farmer at field level were conducted. The conception rate was recorded to be 86.4% in the MSP farm following double insemination with average litter size 8.42. In field the conception rate was increased from previous years to 87.94 with litter size averaging 9.49. It may be attributed to the younger stock maintained at field level and also the trainings imparted to farmers. Over 500 farmer beneficiaries were benefited through the availability of better quality piglets and semen for Artificial insemination from the centre.

FMD AND Classical swine fever vaccination was carried out in the farm. Additionally 5000 doses of classical swine fever vaccine has been obtained and distributed to farmers.

A new shed has been constructed for boar training and a new shed is under construction.

Trainings conducted: Two trainings for farmers were conducted.

<table>
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<tr><td>Livestock service providers training for Kiphire district.</td><td>Ghungro sow and piglets</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Boars being trained and followed by successful collection</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Hands on training on AI</td><td>Showing of video on AI to farmers</td></tr>
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VETERINARY DEPARTMENT, GOVT. OF MIZORAM, AIZAWL

Pig rearing has always been the preferred backyard livestock for the common mizo families since early days. The demand for piglets has always been high in the state (either for fattener and breeder). Mega Seed on pig centre, Mizoram has always trying its best to meet the demand of the people of Mizoram.

However in April 2019 there was state wide outbreak of PRRS which result the complete shutdown of Artificial Insemination and movement of animals. The restriction was only raised on October 2018 which result in decline in pig production as there was huge gap. However the sow which are serviced on November 2018 has shown sign of good prolificacy and piglets production is again rising in the centre.

Herd dynamics

Sl. No.	Categories	Opening Balance	Additions		Disposal			Closing balance
			Birth	Transfer	Death	Transfer	Sold	
1	Piglets (up to 42 d)	86	163		59	117		73
2	Grower (42 d – 5m)	3		117	23		97	
3	Finisher (5 m- 8 m)	23			1		4	18
4	Breeding female	55			7		19	29
5	Boar	1			1			0
Grand Total		**168**	**163**	**117**	**91**	**117**	**120**	**120**

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	7	10	17	19	21	40	9	12	21
2nd Quarter	NIL	NIL		4	5	9	10	17	27
3rd Quarter	NIL	NIL		3	3	6			
4th Quarter	71	75	146	2	2	4	29	40	69
Annual	78	85	163	28	31	59	48	69	117

Number of piglets sold during the reporting period

Quarters	Total no. of piglets produced			Total no. of piglets sold			Amount realized (rupees)
	M	F	T	M	F	T	
1st Quarters	9	12	21	1	1	2	3000
2nd Quarters	10	17	27	NIL	NIL	NIL	NIL
3rd Quarters				8	11	19	57000
4th Quarters	29	40	69	33	43	76	217000
Annual	48	69	117	42	55	97	280000

Constrains faced during the report year:

a) During 2018-2019 there was PRRS outbreak in Mizoram which result in decline in Piglet production due to shut down of Artificial Insemination and movement of animals in the state by the government of Mizoram

b) Secondly, high cost of animal feed is again, a major constraint in the state of Mizoram. The expenditure is also very high for feeds, even medium quality

Success story:

1) Mrs Laltlanthangi is a resident of Tlangnuam, a locality in Aizawl, she purchased 2 female piglets from Megaseed pig farm in April 2018. Here two sow now farrowed 16 piglets, which she sell for Rs 5000/- per piglet. She is hoping to increase her sow in near future
2) Mr Kamlova, resident of Saitual which is 40 kms from Aizawl purchase one male piglet for breeding purpose which now service all his village sow with Large white yorkshire to produce high yielding breed in his village.

	
Mr Kamlova, progressive farmer's herd	LWY sow feeding her days old piglet. Sand bag used for cushion and bedding in cold climate
	
Weaned piglets ready for sale	Collection of fodder for pig feed in the farm

KERALA VETERINARY AND ANIMAL SCIENCES UNIVERSITY, 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 as on 01-04-18	Additions			Disposals			Closing balance
			Birth	Transfers	Purchased	Mortality	Sold	Culled	
1	Piglet (up to 42 d)	85	1014	0	2	169	842	34	97
2	Grower(42 d-5 m)	11							27
3	Finisher (5 - 8 m)	68							42
4	Breeding female	66							45
5	Boar	20							10
	Grand total	250	1014	0	2	169	842	34	221

**** Mortality during September due to flood***

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	142	114	256	10	15	25	132	99	231
2nd quarter	108	96	204	38	32	70	70	64	134
3rd quarter	153	168	321	23	27	50	130	141	271
4th quarter	115	118	233	14	12	26	105	106	211
Annual	518	496	1014	81	88	169	437	408	845

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	**Fattening sale: 28,65,273 Culled sale:3,04080**
1st quarter	132	94	226	97	71	168	
2nd quarter	90	79	169	95	82	177	
3rd quarter	130	141	271	126	159	285	
4th quarter	85	94	179	112	100	212	
Annual	437	408	845	430	412	842	

Success story:

The centre provides technical support and scientific advice to entrepreneurs on profitable pig farming. Hands on training to progressive pig farmers are conducted in different aspects of such as breeding, nutrition, management, waste disposal and other problems related pig farming by experts. Many farmers have started pig farming as the source of income for livelihood.

Fattening Unit

Name of Livestock Keeper: Sabu.V.R. Vattapparambil house, Panangad, Kochi, Ernakulam

Mr.Sabu is a young entrepreneur interested in livestock rearing especially pig farming. He purchased tha fattening stock of animals from CPPR, Mannuthy during the last financial year and started a unit containing 30 crossbred animals. He had undergone training in Scientific and profitable pig farming from KVASU. Currently he is earning an amount of 35000/month from his fattening unit.

Name of the farmer: Sahildev, Painadath house, Madavana, Ernakulam

Mr. Sahildev is an emerging pig farmer from Ernakulam. He purchased his first fattening stock of animals from CPPR, Mannuthy during the last financial year and started a unit containing 10 crossbred animals and now he has a stock of 65 crossbred animals ready to sale. He had undergone training in Scientific and profitable pig farming from KVASU. Currently he is earning an amount of 40000/month from his fattening unit.




Animals under Mega seed project in CPPR

ANIMAL RESOURCES DEVELOPMENT DEPARTMENT, TRIPURA

ICAR, Govt. of India has approved and sanctioned 04 new centres under Mega Seed Project on Pig during 12th plan period, out of which one centre to be established in Tripura state. Accordingly, it was approved by the Government to declare Piggery unit of Composite Livestock Farm, Debipur under Sepahijala District as co-operating centre from Tripura state under Mega Seed Project on Pig during 12th plan period. Beside this, as prerequisite, a fresh MoU was signed between Director of ARDD, Govt. of Tripura and Director, NRC on Pig, ICAR, Rani on 5th Jan, 2018 as per Govt. approval.

Herd dynamics

Date	LANDRACE								LARGE WHITE YORKSHIRE							
	Boar	Sow	Gilt	0-8 wk		5-9 m [female]		**Total**	Boar	Sow	Gilt	0-8 wk		5-9 m		**Total**
				M	F	M	F					M	F	M	F	
Opening stock		30	0	6	10	0	0	**46**	2	27	10	22	21	2	8	**92**
Closing Stock		19	3	5	3	1	5	**36**	2	34	11	8	11	2	18	**86**

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
	LR	LWY	LR	LWY		LR	LWY	LR	LWY		LR	LWY	LR	LWY	
1st quarter	45	55	41	42	183	5	2	5	4	16	40	53	36	38	167
2nd quarter	48	28	46	26	148	1	5	5	6	17	47	23	41	20	131
3rd quarter	11	13	6	10	40	1	2	0	4	7	10	11	6	6	33
4th quarter	12	22	9	25	68	2	3	0	4	9	10	19	9	21	59
Annual	116	118	102	103	**439**	9	12	10	18	**49**	107	106	92	85	**390**

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	Piglet sale	Culled pig sold	TOTAL
	LR	LWY	LR	LWY		LR	LWY	LR	LWY				
1st quarter	40	53	36	38	167	26	49	33	42	150	300800	42400	343200
2nd quarter	47	23	41	20	131	39	34	36	19	128	300500	28000	328500
3rd quarter	10	11	6	6	33	32	25	20	17	94	263700	68800	332500
4th quarter	10	19	9	21	59	19	10	13	25	67	189000	82800	271800
Annual	107	106	92	85	**390**	**116**	**118**	**102**	**103**	**439**	**1054000**	**222000**	**1276000**

Other information:

During this year, total **439** nos. of quality piglets have been distributed among 252 numbers of rural pig farmer as well as in Govt. Sector schemes, North-East National Rural Livelihood project and

SHGs. Also conducted training programme where 76 nos. of farmers attended in 5 batches. In addition, all the 252 farmers were given on hand training in respect of housing, feeding and vaccination etc. who received piglets from the farm under MSP.






Different activates of Mega Seed Center of Tripura

ANIMAL HUSBANDRY AND VETERINARY SERVICES, SIKKIM

MSP centre Assam Lingzay; Sikkim has got infrastructural capacity to hold 50-60 Sows Units at optimum and overtaking target to produce 900 Piglets/Annum.

Herd dynamics

Sl No.	Category	Opening Balance	Increase By		Decrease By			Closing Balance	Remark
			Birth	Trans.	Death	Trans.	Sale		
1.	HDK75	28	--	29	02**	--	01*	54	15M:39F
2.	HDK50	--	--	19	02**	--	--	17	17F
3.	YS(Rani)	--	--	10	01***	--	--	09	1m;8F
4.	Piglets 42+	41	--	--	12	03	26	03	
5	Dry Sow	26	--	--	01	--	25	00	
6	Old Boar	02	--	--	--	--	02	00	
							Total	83	16M:67F

***: Crypto-orchid **: Transportation Stress *** Transport Injury.**

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	14	27	41	06	06	12	08	18	26
2nd Quarter	12	13	25	05	01	06	07	12	19
3rd Quarter	22	23	45	03	05	08	19	18	37
4th Quarter	20	19	39	03	02	05	17	17	34
Annual	68	82	150	17	14	31	61	65	116

Number of piglets sold during the reporting period

Quarters	Total no. of piglets produced			Total no. of piglets sold			Amount realized (rupees)
	M	F	T	M	F	T	
1st Quarters	08	18	26	08	18	26	82,000.00
2nd Quarters	07	12	19	00	00	00	
3rd Quarters	19	18	37	19	25	44	1,76000.00
4th Quarters	17	17	34	12	07	19	76,000.00
Annual	51	65	116				3,34,000.00

First Farrowing Litter Size HDK75

Second Farrowing Litter Size HDK75