ANNUAL REPORT
AICRP ON PIG
&
MEGA-SEED PROJECT ON PIG
(2016-17)

भाकृअनुप
ICAR

Icar-National Research Centre on Pig
Indian Council of Agricultural Research
Rani, Guwahati-781131

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

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

Annual Report (2016-2017)
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&
Mega Seed Project on Pig

Project Coordinator

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

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

New Centers

1.	College of Veterinary Science, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab- 141004	Dr. Ashwani Kumar Singh
2.	Krantisinh Nana Patil College of Veterinary Science, Shirval, Dist.- Satara, Maharashtra-412801	Dr. Mukund Bhimraoji Amle

ACTIVITY ASSIGNED AND TARGET FIXED

General:

1. The most significant achievements *w.r.t.* pig breed/variety developed, nutritional package developed, field validation report and major success stories made since inception by individual centers need to be compiled in the form of a booklet and sent to the project coordinating unit by 31st December, 2016.
2. The centres having stable crossbred pig variety should sent separate report along with generation wise data to ICAR-NRC on Pig within 31st December, 2016 for necessary initiation of release of the variety.
3. The monthly report of piglet production and sold are to be sent to the Project Coordinator office by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.
4. The centres need to submit AUC before July month of preceding financial year and UC quarterly, positively.
5. The unspent amount as on 31st of March must be refunded by 30th April of next financial year positively.
6. Final annual report should be submitted as per format to ICAR-NRC on Pig by April of the preceding financial year.
7. The 75 percent of revenue receipt from sale proceed should be retained in the SAU/institute and 25 percent should be sent to the Project coordinating unit. 50% of the 75% retained with the institute can be utilized by the concerned project centre.
8. No additional budget will be provided in "salary component" for promotion of scientists to higher position other than sanctioned post. Increase of emolument for JRF/SRF or other contractual persons involved in the project should be borne from contingency fund. No additional fund will be provided for this purpose. The funds under salary head of AICRP on Pig should be used for payment of salary of regular staff only.
9. Changing of PI/In-charges of the centre should be done in consultation with Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, as the major mandate of each centres is on breeding aspect, however scientists from other disciplines may be associated with the project as Co-PIs.
10. The AICRP on pig and Mega Seed Project on pig incharges shall make a programme to visit other centres.

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. Centres may take initiatives at their respective states.

2. Crossbred animals of 75% exotic inheritance should be maintained by the old centres. New centres should continue to maintain the germplasm as per the last year recommendation(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 males should be selected based on cyto-genetics screening.
6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. The overall genetic gain due to selection, selection differential and heritability need to be calculated and reported. Data should be presented for last three generation in the report.
7. Three number of farrowings per sow need to be recorded. Three farrowings par sow should be completed in 2 years. Following lifetime production traits should be reported:
    - Live weight produced per sow at birth
    - Live weight produced per sow at weaning
    - Live weight produced per sow at 8months
    - Live weight produced per sow at the time of slaughter.
8. 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 centres.
9. All the new AICRP on Pig centres should initiate the programme for genetic improvement as per the technical recommendation.
10. The new centres should start construction of new shed only if it can be finished by 31st March, 2017.

Nutrition, physiology and management:

1. Feeding packages developed by AICRP on pig centers need to be documented.
2. Database should be developed on locally available feed resources and their utilization in pig feeding.
3. Each of the AICRP on Pig centres should explore the possibility of adopting villages for technology validation and transfer.
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 on animals.

Health Management:

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

Centre wise recommendation:

All the AICRP on pig centers should follow the above recommendations. Besides, some of the specific points mentioned against each of the centers should be noted for subsequent necessary actions.

Assam Agricultural University, Khanapara:

1. The data should be reported based on generation instead of crop-wise data.
2. Necessary decision for use of HS cattle vaccine in pig along with CSF and FMD vaccine should be taken up in consultation with health committee of the institute.
3. Artificial insemination should be followed in AICRP on pig.
4. The centre should take necessary steps to submit the AUC/UC in time.

Kerala Veterinary and Animal Science University, Mannuthy:

1. Steps should be taken up for compilation of data of the developed crossbred pig variety for atleast six generations.

Birsa Agricultural University, Ranchi:

1. Critical evaluation of genetic gain in selection experiment needs to be assessed.
2. The centres should initiate Artificial Insemination programme in the farm.

ICAR-IVRI, Bareilly:

1. Probiotic developed by the centre should be given to other centres for evaluation.

Sri Venkateswara Veterinary University, Tirupati

1. Breeding data need to be properly assessed regarding the generation of the animal.

ICAR Research centre for Goa, Goa:

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

Tamil Nadu Veterinary and Animal Sciences University, Kattupakkam:

1. Budgetary requirement for salary component need to be informed to coordinating unit.
2. Experiment should be undertaken to reduce the heat stress.

CVSC, Central Agricultural University, Aizawl:

1. The centre should improve as per technical programme assigned to them.

SASARD, Nagaland University, Nagaland:

1. The centre should initiate cyto-genetic analysis of breeding boars.

2. Approded technical programme should be followed for breeding programme.

CAU, Imphal, Manipur:

1. The centre should maintain already recommended genetic stock.
2. The centre should follow strict bio-security measure to reduce the mortality of the farm.

ICAR-RC Tripura Centre, Agartala:

1. The centre should continue to maintain pure Mali pig of Tripura.
2. Attempts to be made for registration of indigenous pig germplasm with National Database.

ICAR-RC, Barapani, Meghalaya:

1. The centre should work as per approved technical programme.
2. AUC should be submitted in time as mentioned in general recommendations.

ICAR- CIARI, Port Blair:

1. The centre may initiate collection of field-data for local germplasm.
2. Proper health care should be initiated to check the mortality of the farm.

IVRI-ERS, Kolkata:

1. The centre should follow selective breeding for further improvement of Ghungroo stock.
2. Survey on breeding tract of Ghungroo pig should be undertaken.

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

1. The centre should complete the construction work in the plan period.

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, 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, Dist.- Satara, Maharashtra
- Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab

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

2. Original objectives and modification thereof:

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

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

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

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

The above technical programme was followed till Xth plan.

3. Revision of Technical Programme in XIth Plan:

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

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

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

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

4. Action point discussed in Review Meet of 'All India Coordinated Research Project on Pig' and "Mega Seed Project on Pig" held at ICAR-Central Coastal Agricultural Research Institute, Goa on 6-7th June, 2016.

AAU, Khanapara

Recommendation	Action Taken
General:	
1. Preparation of booklet based on success stories of AICRP	1. Yet to be done
2. Release of crossbred pig variety	2. Done
3. Submission of monthly report	3. Done
4. Submission of AUC	4. Not submitted
5. Submission of Annual report	5. Done
Animal Breeding:	
1. Breed registration and conservation	1. Done
2. Maintenance of crossbred animals of 75% exotic inheritance	2. Done
3. Minimum 30 breedable sows unit should be maintained	3. Done
4. Selection of male animals should be based on weight	4. Done
5. Selection of female animals based on dam's litter size at birth	5. Done
6. Generation wise presentation of data	6. Done
7. Three number of farrowings per sow need to be recorded	7. Done
8. Artificial Insemination should be implemented	8. Initiated
Nutrition, physiology and management:	
1. Feeding packages need to be documented.	1. Done
2. Development of database on locally available feed resources	2. Done
3. Adopting villages for technology validation and transfer	3. Done
4. Recording of daily micro and macroclimatic data	4. Done
5. Shelter management to reduce thermal stress on animals.	5. Will be initiated
Health Management:	
1. Regular monitoring for diseases of the herd.	1. Done
2. Reduce mortality percentage	2. Done
3. Strengthen the bio-security measures	3. Done
Centre-specific recommendation:	
1. Report of generation wise date	1. Done

2. Use of HS cattle vaccine in pig	2. Not reported
3. Intensifying AI in Pig	3. Done
4. Timely submission of AUC	4. Will be initiated

BAU, Ranchi

Recommendation	Action Taken
General:	
1. Preparation of booklet on success stories of AICRP	1. Yet to be done
2. Release of crossbred pig variety	2. Done
3. Submission of monthly report	3. Done
4. Submission of AUC	4. Done
5. Submission of Annual report	5. Done
Animal Breeding:	
1. Breed registration and conservation	1. Initiated
2. Maintenance of crossbred animals of 75% exotic inheritance	2. Done
3. Minimum 30 breedable sows unit should be maintained	3. Done
4. Selection of male animals should be based on weight	4. Done
5. Selection of female animals based on dam's litter size at birth	5. Done
6. Generation wise presentation of data	6. Done
7. Three number of farrowings per sow need to be recorded	7. Done
8. Artificial Insemination should be implemented	8. Not done
Nutrition, physiology and management:	
1. Feeding packages need to be documented	1. Done
2. Development of database on locally available feed resources	2. Done
3. Adopting villages for technology validation and transfer	3. Done
4. Recording of daily micro and macroclimatic data	4. Not done
5. Shelter management to reduce thermal stress on animals.	5. Not done
Health Management:	
1. Regular monitoring for diseases of the herd.	1. Done
2. Reduce mortality percentage	2. Done
3. Strengthen the bio-security measures	3. Done
Centre-specific recommendation:	
1. Evaluation of genetic gain due to selection	1. In progress
2. Intensifying AI in Pig	2. Not done

KVASU, Mannuthy, Kerala

Recommendation	Action Taken
General:	
1. Preparation of booklet on success stories of AICRP	1. Yet to be done
2. Release of crossbred pig variety	2. Done
3. Submission of monthly report	3. Done
4. Submission of AUC	4. Done
5. Submission of Annual report	5. Done
Animal Breeding:	
1. Breed registration and conservation	1. Initiated
2. Maintenance of crossbred animals of 75% exotic inheritance	2. Done
3. Minimum 30 breedable sows unit should be maintained	3. Done
4. Selection of male animals should be based on weight	4. Done
5. Selection of female animals based on dam's litter size at birth	5. Done
6. Generation wise presentation of data	6. Done
7. Three number of farrowings per sow need to be recorded	7. Done
8. Artificial Insemination should be implemented	8. Done
Nutrition, physiology and management:	
1. Feeding packages need to be documented	1. Done

2. Development of database on locally available feed resources	2. Done
3. Adopting villages for technology validation and transfer	3. Done
4. Recording of daily micro and macroclimatic data	4. Done
5. Shelter management to reduce thermal stress on animals.	5. Done
Health Management:	
1. Regular monitoring for diseases of the herd.	1. Done
2. Reduce mortality percentage	2. Done
3. Strengthen the bio-security measures	3. Done
Centre-specific recommendation:	
1. Evaluation of crossbred based on six generation data	1. Done

SVVU, Tirupati

Recommendation	Action Taken
General:	
1. Preparation of booklet on success stories of AICRP	1. Yet to be done
2. Release of crossbred pig variety	2. Initiated
3. Submission of monthly report	3. Done
4. Submission of AUC	4. Done
5. Submission of Annual report	5. Done
Animal Breeding:	
1. Breed registration and conservation	1. Initiated
2. Maintenance of crossbred animals of 75% exotic inheritance	2. Done
3. Minimum 30 breedable sows unit should be maintained	3. Done
4. Selection of male animals should be based on weight	4. Done
5. Selection of female animals based on dam's litter size at birth	5. Done
6. Generation wise presentation of data	6. Done
7. Three number of farrowings per sow need to be recorded	7. Done
8. Artificial Insemination should be implemented	8. Done
Nutrition, physiology and management:	
1. Feeding packages need to be documented	1. Done
2. Development of database on locally available feed resources	2. Done
3. Adopting villages for technology validation and transfer	3. Done
4. Recording of daily micro and macroclimatic data	4. Done
5. Shelter management to reduce thermal stress on animals.	5. To be done
Health Management:	
1. Regular monitoring for diseases of the herd.	1. Done
2. Reduce mortality percentage	2. Done
3. Strengthen the bio-security measures	3. Done
Centre-specific recommendation:	
1. Breeding data to be checked and reanalyzed	1. Done

TANUVAS, Kattupakkam

Recommendation	Action Taken
General:	
1. Preparation of booklet on success stories of AICRP	1. Yet to be done
2. Release of crossbred pig variety	2. Initiated
3. Submission of monthly report	3. Done
4. Submission of AUC	4. Done
5. Submission of Annual report	5. Done
Animal Breeding:	
1. Breed registration and conservation	1. Initiated
2. Maintenance of crossbred animals of 75% exotic inheritance	2. Done
3. Minimum 30 breedable sows unit should be maintained	3. Done
4. Selection of male animals should be based on weight	4. Done

5. Selection of female animals based on dam's litter size at birth	5. Done
6. Generation wise presentation of data	6. Done
7. Three number of farrowings per sow need to be recorded	7. Done
8. Artificial Insemination should be implemented	8. Done
Nutrition, physiology and management:	
1. Feeding packages need to be documented	1. Done
2. Development of database on locally available feed resources	2. Done
3. Adopting villages for technology validation and transfer	3. Done
4. Recording of daily micro and macroclimatic data	4. Done
5. Shelter management to reduce thermal stress on animals.	5. Done
Health Management:	
1. Regular monitoring for diseases of the herd.	1. Done
2. Reduce mortality percentage	2. Done
3. Strengthen the bio-security measures	3. Done
Centre-specific recommendation:	
1. Experiment to reduce the heat stress	1. Initiated

ICAR-IVRI, Bareilly

Recommendation	Action Taken
General:	
1. Preparation of booklet on success stories of AICRP	1. Yet to be done
2. Release of crossbred pig variety	2. Initiated
3. Submission of monthly report	3. Done
4. Submission of AUC	4. Done
5. Submission of Annual report	5. Done
Animal Breeding:	
1. Breed registration and conservation	1. Initiated
2. Maintenance of crossbred animals of 75% exotic inheritance	2. Done
3. Minimum 30 breedable sows unit should be maintained	3. Done
4. Selection of male animals should be based on weight	4. Done
5. Selection of female animals based on dam's litter size at birth	5. Done
6. Generation wise presentation of data	6. Done
7. Three number of farrowings per sow need to be recorded	7. Done
8. Artificial Insemination should be implemented	8. Done
Nutrition, physiology and management:	
1. Feeding packages need to be documented	1. Done
2. Development of database on locally available feed resources	2. Done
3. Adopting villages for technology validation and transfer	3. Done
4. Recording of daily micro and macroclimatic data	4. Done
5. Shelter management to reduce thermal stress on animals.	5. Done
Health Management:	
1. Regular monitoring for diseases of the herd.	1. Done
2. Reduce mortality percentage	2. Done
3. Strengthen the bio-security measures	3. Done
Centre-specific recommendation:	
1. Probiotic developed by the centre should be given to other centres	1. Done

ICAR-CCARI, Goa

Recommendation	Action Taken
General:	
1. Preparation of booklet on success stories of AICRP	1. Yet to be done
2. Release of crossbred pig variety	2. Yet to be done
3. Submission of monthly report	3. Done
4. Submission of AUC	4. Done

5. Submission of Annual report	5. Done
Animal Breeding:	
1. Breed registration and conservation	1. Done
2. Maintenance of crossbred animals of 75% exotic inheritance	2. Done
3. Minimum 30 breedable sows unit should be maintained	3. Done
4. Selection of male animals should be based on weight	4. Done
5. Selection of female animals based on dam's litter size at birth	5. Done
6. Generation wise presentation of data	6. Done
7. Three number of farrowings per sow need to be recorded	7. Done
8. Artificial Insemination should be implemented	8. Done
Nutrition, physiology and management:	
1. Feeding packages need to be documented	1. Done
2. Development of database on locally available feed resources	2. Done
3. Adopting villages for technology validation and transfer	3. Done
4. Recording of daily micro and macroclimatic data	4. Done
5. Shelter management to reduce thermal stress on animals.	5. Done
Health Management:	
1. Regular monitoring for diseases of the herd.	1. Done
2. Reduce mortality percentage	2. Done
3. Strengthen the bio-security measures	3. Done
Centre-specific recommendation:	
1. Presentation of generation wise data with genetic gain	1. Analysed

CVSc & AH, CAU, Aizawl

Recommendation	Action Taken
General:	
1. Preparation of booklet on success stories of AICRP	1. Yet to be done
2. Release of crossbred pig variety	2. NA
3. Submission of monthly report	3. Done
4. Submission of AUC	4. Not submitted
5. Submission of Annual report	5. Done
Animal Breeding:	
1. Breed registration and conservation	1. Initiated
2. Maintenance of crossbred animals of 75% exotic inheritance	2. Done
3. Minimum 30 breedable sows unit should be maintained	3. Done
4. Selection of male animals should be based on weight	4. Done
5. Selection of female animals based on dam's litter size at birth	5. Done
6. Generation wise presentation of data	6. Done
7. Three number of farrowings per sow need to be recorded	7. Done
8. Artificial Insemination should be implemented	8. Done
Nutrition, physiology and management:	
1. Feeding packages need to be documented	1. Done
2. Development of database on locally available feed resources	2. Done
3. Adopting villages for technology validation and transfer	3. Done
4. Recording of daily micro and macroclimatic data	4. Done
5. Shelter management to reduce thermal stress on animals.	5. To be done
Health Management:	
1. Regular monitoring for diseases of the herd.	1. Done
2. Reduce mortality percentage	2. Done
3. Strengthen the bio-security measures	3. Done
Centre-specific recommendation:	
1. Follow approved technical programme	1. Followed

SASARD, Nagaland

Recommendation	Action Taken
General:	
1. Preparation of booklet on success stories of AICRP	1. Yet to be done
2. Release of crossbred pig variety	2. NA
3. Submission of monthly report	3. Done
4. Submission of AUC	4. Not submitted
5. Submission of Annual report	5. Done
Animal Breeding:	
1. Breed registration and conservation	1. Done
2. Maintenance of crossbred animals of 75% exotic inheritance	2. Done
3. Minimum 30 breedable sows unit should be maintained	3. Done
4. Selection of male animals should be based on weight	4. Done
5. Selection of female animals based on dam's litter size at birth	5. Done
6. Generation wise presentation of data	6. Done
7. Three number of farrowings per sow need to be recorded	7. Done
8. Artificial Insemination should be implemented	8. Done
Nutrition, physiology and management:	
1. Feeding packages need to be documented	1. Done
2. Development of database on locally available feed resources	2. Done
3. Adopting villages for technology validation and transfer	3. Done
4. Recording of daily micro and macroclimatic data	4. Done
5. Shelter management to reduce thermal stress on animals.	5. To be done
Health Management:	
1. Regular monitoring for diseases of the herd.	1. Done
2. Reduce mortality percentage	2. Done
3. Strengthen the bio-security measures	3. Done
Centre-specific recommendation:	
1. Follow approved technical programme	1. Followed

New Centers in XIIth Plan:

Targets	ICAR-CIARI, Port Blair	CAU, Imphal	IVRI-ERS, Kolkata	ICAR-RC Tripura, Agartala	ICAR-RC, Barapani	KVK, ICAR-NRCP, Dudhnoi
Submission of AUC	Yes	Yes	Yes	No	Yes	Yes
Final Report submission	Yes	Yes	Yes	Yes	Yes	Yes
Breed maintained	Andaman local and Nicobari pigs	Rani Cross	Ghungroo pig	Mali pig	Lumsniang Cross	Doom Pig
Construction work	Completed	Completed	Completed	Not done	Completed	Completed

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
- Breeding programmes were developed to generate the following genotypes/genetic groups:
  - Conservation of indigenous germplasm
  - Improved indigenous pigs
  - Crossbreds having 50:50 inheritance from Landrace and indigenous pigs
  - Large White Yorkshire crossbreds having 50% indigenous inheritance
  - Crossbreds having 75% Large White and 25% indigenous inheritance
  - Landrace crossbreds having 25% indigenous inheritance
  - Hampshire crossbreds carrying 25% and 50% indigenous inheritance
  - Landrace X indigenous half-breds from reciprocal crosses
- Exotic pig *viz.* Landrace, Large White Yorkshire and Hampshire could be successfully raised and multiplied under organized farm conditions.
- Genetic improvement of indigenous pig through pure breed selection programme was conducted in all eight centres of AICRP under different agro- climatic conditions.
- Litter size at birth and weaning showed continuous improvement over the years. Similarly, the growth rate and body weight at 32 weeks was also increased significantly.
- However, the genetic improvement of indigenous breed through pure breed selection programme has been slow.
- All groups of crossbred had higher litter size and weight, growth rate and better feed conversion efficiency than indigenous pig.
- Large White Yorkshire crossbred (75%) and Hampshire crossbred (75%) had higher value of litter traits than their respective 50% crossbred.
- Pig can be utilized effectively as a component in integrated farming system which shall act as an insurance cover. Significant improvement on economic gain could be observed under integrated farming system.
- The crossbreds had lower back fat thickness and higher lean cuts in their carcasses than the indigenous pigs.

B. Pig Husbandry and Management:

- Collection of boar semen and artificial insemination: Technology was developed for collection of boar semen using a dummy. Artificial insemination technology by using liquid semen has been standardized and widely been used in different centres.
- Artificial milk feeder: To feed orphan piglets when suitable foster dams are not available, artificial milk feeder was developed which can be recommended to breeder farmer.
- Sprinkler system: This was designed and installed in the open pig styes for alleviating

summer stress in pigs. This can be recommended to commercial farmers rearing more than 250 pigs in tropical areas where there are chances of heat stress. Wallowing can be avoided in this system, thereby saving water and labour.

- Pressure cleaning system: The system helps considerable savings in labour and time in cleaning of sheds and ensures effective cleaning of pens. In this system cleaning of a pen can be done in 4-5 minutes against 10-15 minutes in traditional system. This can be recommended for larger commercial breeding farms rearing more than 200 numbers of breeding stocks. Labour can be saved up to 1/3rd of the normal requirement in commercial farms.
- Automatic waterers: It ensures continuous drinking water availability to pigs. It can be fitted at varying heights from the floor for various categories of pigs (25 cm for weaners, 65 cm for growers and 85-90 cm for sows and boars).

C. Animal Nutrition:

- Energy protein ratio for optimum production:
  - 18.2 to 18.5 kcal energy per g CP for Landrace and Large White grower pigs.
  - 20.4 to 21.3 kcal energy per g CP for finishing exotic pigs.
  - A diet with 15.44% CP and 3.0 MCal DE per kg feed for indigenous grower pigs.
  - For crossbred pigs, ratio of 16% C.P. and 3000 kcal digestible energy per kg of feed was found to be optimal.
- Locally available feed resources like root crop (tapioca, sweet potato etc.), brewery waste, used tea leaves and other vegetable wastes like cabbage, collocassia etc. could be used for developing economic ration for pig.
- Various alternate sources of energy and protein were identified
  - Energy sources: rice polish, molasses, tamarind seed, wheat bran, tea waste, pine apple waste, jackfruit waste and cashew apple.
  - Protein sources: silk worm pupae, sunflower cake
- Economic ration was developed by partial or complete replacement of costly ingredient of the standard ration with the alternate feed sources.
  - Replacement of maize with 20% tamarind seed and 5% molasses or 30% tamarind seed and 10% molasses increased average daily gain and lowered cost/kg body weight gain.
  - Cabbage is an important vegetable crop of North East India. Generally 50 to 70% of the biological yield cabbages are used as human consumption and remaining portion is discarded as waste which is primarily the green leaves. This waste can be fed to grower and finisher pig replacing 10% of the concentrate mixer in the daily feed allowances.
  - Graded replacements of maize with 40, 30 and 12 parts of rice polish/supplemented with zinc sulphate) were found to be superior in terms of ADG, feed per kg gain and cost of ration per kg gain for Large White grower pigs.

- Replacing maize partly or completely with 20% tamarind seed and 5% molasses or 30% tamarind seed and 10% molasses was found to give higher ADG (423 g) and lower cost/kg gain as compared to ADG 401 g under the standard ration.
- In pregnant and lactating gilts, maize (36% in standard ration) could be replaced with 30% rice polish or tamarind seed along with 20% molasses without affecting the performance characteristics.
- An economic ration was developed by graded replacement of maize with wheat bran.
- In indigenous grower pigs, 20 parts of maize can be replaced with bagasse and molasses mixture without any adverse effect on FCR.
- In crossbred finisher pigs, tamarind seed waste replaced up to 75% of maize without any detrimental effect on performance, carcass-characteristics and nutrient utilization.
- No significant reduction in ADG (420 Vs 408 g) and FCR (4.13 Vs 4.26) when GN cake in the standard ration was replaced with sunflower cake in crossbred growers.
- Replacement of wheat bran up to 50% level with de-caffeinated tea waste lowered the cost of production in crossbred pigs.

- Supplementation of yeast culture product containing useful enzyme improved average daily gain and feed conversion efficiency by 5 and 8%, respectively.
- Chelated mineral could be supplemented at a dose of 0.05% along with Dicalcium Phosphate in diet for better growth and feed conversion efficiency in pig.
- Fish meal can be replaced with dried cuttla fish waste silage without causing any deleterious effect on growth, feed conversion efficiency or carcass quality.
- Dried *Cuttla* fish bone meal could be used as calcium supplement in the ration for growing pigs replacing calcium carbonate.

D. Pig Reproduction and Endocrinology

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

E. Health Management

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

ASSAM AGRICULTURAL UNIVERSITY, KHANAPARA, GUWAHATI

North Eastern Region covered an area of 26.12 million hectare with a total population of 3.90 million. Assam, the second largest state in North Eastern Region having 27 districts and shares its boundary with Meghalaya, Arunachal Pradesh and Nagaland and internationally with Bangladesh and Myanmar. Agriculture and Animal husbandry practices are the main source of income for majority of the population. In tribal and weaker section of the population, pig husbandry is very popular and lucrative occupation in NE Region in particular and country in general. Though pig is popular yet it is a small scale unorganized rural activity and is an integral part of diversified agriculture. The region has around 38.42 percent of country's pig population. Farmer keeps livestock as supplementary source of income. Farmers belonging to the general community usually rear cattle, buffaloes, goat and poultry. However, the majority of the farmer belonging to tribal and other backward class community prefer to keep 2-3 pigs along with poultry and goat. The majority of the people of the North Eastern Region are non-vegetarian and among them a good number of people consume pork. This is because the NE Region comprises of a high proportion of tribal people and pig rearing is an integral part of their way of life since time immemorial. 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 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 ICAR-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 training, awareness program, exhibition, demonstration, distribution of leaflet /booklet. The ICAR- AICRP/ MSP on Pig, AAU, Khanapara has played a significant role in developing piggery sector by selling of quality piglets, elite gilts / sows and boars at nominal price to the interested farmers of the state.

Herd dynamics: 01.04.2016 - 31.03.2017

Age in months	Opening balance as on 01.04.16			Closing balance as on 31.03.2017		
	Male	Female	Total	Male	Female	Total
	75% H	75% H		75% H	75% H	
0 - 6 w	-	-	-	-	-	-
6w – 2 m	-	-	-	-	-	-
2 – 6 m	50	57	107	-	-	-
6 – 8 m	-	-	-	12	6	18
Over 8 m	13	51	64	28	44	72
Total	63	108	**171**	40	50	**90**

Stock Continuity Details:

Sex	Stock as on 01.04.2016	Addition (3rd Crop)	Purchase	Total	Grand total
	1	2	3	4 (1+2)	5
Male	63	125	-	188	188
Female	108	112	-	220	220
Total	171	237	-	408	408

Deletion

Sex	Sale	Slaughter	Destroyed	Died	Total	Stock as on 31.03.2017	Grand total
	6	7	8	9	10	11 (5-10)	
Male	118	21	-	9	148	40	40
Female	154	8	-	8	170	50	50
Total	272	29	-	17	318	90	**90**

Breeding strategy of the farm as approved:

- The Exotic breed, Landrace was maintained since inception (1971) of the project and studied their performances and genetic parameters under agro-climatic condition of Assam.
- A number of selected indigenous gilts were maintained since 1981. A group of indigenous gilt was bred (1987) with pure Hampshire boars to get 50% Hampshire inheritance from 24 normal farrowings. Another group of indigenous gilts were maintained for indigenous line.
- The progenies of 50%H50%I were again grouped to produce 50%H50%I (*Inter se mating*) and 75%H25%I by crossing with pure Hampshire Boar.
- The cross breeding program *ie inter se* mating was adopted initially to maintain 50%H50%I and 75%H25%I genetic groups since 1987.
- The Annual Scientist Meet'2007 (Manuthy) recommended for the production of 87.50%H12.50%I genetic group in addition to 75%H25%I genetic group for the Centre.
  - Pure Hampshire boar or AI with Pure Hampshire boars were utilized for production of 87.50%H genetic group.
  - Annual Scientist Meet (Jabbalpur 21st Nov.'2011) recommended to maintain sufficient number of 75%Hampshire genetic group only for the AAU, Khanapara Centre.
- The breeding females are selected on the basis of litter traits and functional teat size (12 nos,). Age at sexual maturity and Body weight are also considered in selection of breeding female.
- Selection of male animals should be based on weaning weight (25%) and 8 month body weight (best 5%) ,based on two stage sequential selection. Selection of female animals should be based on dam's litter size at birth (7) and weaning weight (best 25%) and number of functional teats (at least 6 pairs of functional teats). NASC Complex, Pusa New Delhi 17-18 Sept'2015)
- The body weights are recorded at monthly interval up to 8 months of age.
- Boars are selected on Intra-Sire basis.
- The parent stocks are maintained up to 3rd farrowing and weaning of piglets at 42 days of age.

Performance of animals 75% H Genetic group

Sl. No	Traits/ Characters	Mean ± SE (No. of observation)		
		M	F	T
1	Av. Litter size at birth (no.)	4.31 ± 0.26	3.86 ± 0.25	8.17 ± 0.15
2	Av. Litter weight at birth (kg)	4.29 ± 0.25	3.80±0.24	8.09±0.91
3	Av. Litter size at weaning (no.)	4.14±0.26	3.79±0.25	7.93±0.16
4	Av. Litter weight at weaning (kg)	42.19±2.65	38.60±2.51	80.79±1.23
5	Av. individual wt at birth (kg)	0.99 ±0.01 (125)	0.98 ± 0.01(112)	0.99 ± 0.01 (237)
6	Av. individual wt at weaning (kg) (6)	10.19 ±0.02(120)	10.16± 0.02(110)	10.17 ±0.01(230)
7	Number of days for weaning	42 days		
8	Pre weaning mortality rate (%)	4.00(5)	1.79(2)	2.95(7)
9	Pre weaning growth rate (g /day) (0 to 6 w)	219.05 ± 0.56	218.57 ± 0.46	218.57 ± 0.34
10	Post weaning mortality rate(%)(Weaning to 5m)	2.50(3)	1.82(3)	2.17(6)
11	Adult mortality rate (%) (above 5 month)	0.56(1)	1.40(3)	1.01(4)
12	Post weaning growth rate (6 wks to 8th months) (g/day)	327.17± 0.99	315.17 ± 1.14	320.56 ± 0.99
13	Overall growth rate 0 to 8th m of age) (g/d)	308.28 ± 0.85	298.05 ± 0.99	302.75 ± 0.85
14	Body weight (kg) at 1 month	7.27 ± 0.02 (120)	7.24 ± 0.02 (110)	7.26 ± 0.02 (230)
	2 month	12.31 ±0.03(120)	12.28 ±0.02(109)	12.29±0.02(229)
	3 month	18.28 ±0.04(102)	17.79 ± 0.04 (94)	18.05 ±0.03(196)
	4 month	24.70 ± 0.06 (71)	23.84 ± 0.05 (89)	24.22 ±0.05(160)
	5 month	33.75 ± 0.19 (53)	32.23 ± 0.14 (58)	32.95± 0.14(111)
	6 month	45.08 ± 0.25 (47)	43.32 ± 0.18 (53)	44.15 ±0.17(100)
	7 month	58.11 ± 0.24 (44)	56.13 ± 0.20 (52)	57.04 ± 0.19 (96)
	8 month	74.95 ±0.19(387)	72.53 ± 0.23 (50)	73.62 ± 0.19 (88)
15	Age at slaughter (days) (2nd Crop)	255 days (12 Nos.)		
16	Weight at slaughter (kg)	75.00 ± 1.89		
17	Dressing percentage (%)	68.95 ± 1.31		
18	Carcass Length (cm)	69.06 ± 0.73		
19	Back Fat Thickness (mm)	25.80± 0.67		
20	Feed conversion efficiency (:)	1:4.17		

Life time production traits:

Considering three crops of 16th generation

- Average litter size at birth per sow : 7.80
- Average litter weight at birth per sow : 7.71 kg
- Average litter size at weaning per sow : 7.41
- Average litter weight at weaning per sow: 74.95 kg

Specific managemental practice:

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

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

Mortality Parameter:

i) Genetic group wise and sex wise mortality rate:

Mortality rate in HD K75 genetic group of pigs during the period 1.4.2016 to 31.03.2017

A. Pre-weaning mortality:

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
Animals at risk	125	112	237	120	111	231	120	110	230	125	112	237
Animals died	5	-	5	-	1	1	-	1	1	5	2	7

Mortality %	4.00	Nil	2.11	Nil	0.90	0.43	Nil	0.91	0.43	4.00	1.79	2.95
Overall %	4.00	Nil	1.69	Nil	0.89	.43	Nil	0.09	0.43	**4.00**	**1.79**	**2.95**

B. Post weaning and adult mortality

Animal	Post weaning (43 days to 5 months)			Adult (over 5 months)			Overall at Farm		
	M	F	T	M	F	T	M	F	T
Animals at risk	120	109	229	180	215	395	188	220	408
Animals Died	3	3	6	1	3	4	9	8	17
` Mortality %	**2.50**	**2.75**	**2.62**	**0.56**	**1.40**	**1.01**	**4.78**	**3.64**	**4.17**

ii) **Causes of mortality**

Sl No	Causes of mortality	HDK 75 (75%H)		
		M	**F**	**T**
1	Pneumonia	2	2	4
2	Haemorrhagic Enteritis	2	1	3
3	Septicemia	1	1	2
4	Pneumo-enteritis	1	1	2
5	Catarrhal enteritis	-	1	1
7	Ulcerative Enteritis	1	-	1
8	Chronic debility	1	1	2
9	Putrefied	1	1	2
Total		**9**	**8**	**17**

iii) Measures taken to minimize mortality:

Managemental measures:

- **General management and disease control**: Regular cleaning and washing of pig sheds with Potassium Permanganate /Caustic soda/ Bleaching powder and proper disposal of sewage materials were practiced routinely. The floor, corners and crevices inside the pig sheds we 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 the mother. Debilitated piglets were nourished specially to regain their health. Pre starter (7^{th} - 20^{th} day) and Starter (22^{nd} day – weaning) rations were provided to the piglets. Sometime Buffalo milk, Glucose etc. Crealac/ Lactogen are also provided to debilitated piglets. Iron therapy in the form of intra muscular injection "Feritas" were given to all piglets at 4^{th} and 14^{th} day after birth to combat the occurrence of piglet anemia.
- **Diarrhoea:** Almost all piglets were suffered from diarrhoea during the pre weaning period and medicine viz. Zinconia, Furoxon /Tetracycline / Cycline D- T bolus / Gentamycine/, Enrofloxacine were used. ORS /Glucose had also been used in affected pigs.
- **Lameness:** A total of 41 piglets were suffered from lameness during the year under report. The animals were treated with Neuroxine and Vetalgin with antibiotics. Injured piglets were dressed and treated. Six Pregnant Sows were suffered from lameness due to broken floor.

Prophylactic measures:

- **Vaccination:** The FD Swine Fever Vaccine (Institute of Animal Health & Veterinary Biologicals, Govt. of West Bengal, Kolkata) was given regularly to the piglets and adult pigs as per schedule. Blood samples were collected after vaccination of Swine Fever for routine screening at the ADMAC, CVSc, AAU, Khanapara. The FMD vaccine is given annually as per schedule.
- A total of 6 Pre weaned piglets (3rd Crop) showed symptoms like enteritis / and pneumonia during the month of July - August 2016.,The deptt.of Veterinary Pathology CVSc ,AAU Khanapara reported the mortality of some piglets may be due Septicemia / Pneumonia /Enteritis
- **De worming:** De worming is done to all the piglets after weaning and repeated after one month. The breeding animals were also dewormed before breeding. Fecal examinations are routinely examined.

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

Nutritional experimentation:

Topic of Research: 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 (2nd Crop) 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 was superior to chelated inorganic and inorganic minerals in terms of weight gain, FCR and serum mineral levels.

Survey on market of pork production:

A Preliminary survey on pork market was carried out in Greater Guwahati as follws:

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: 85
No. of Wholesaler: 6
Type of Sale Booth: 90% open

INFORMATION ABOUT THE PIG:

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

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

Production economics: (Considering Feed & Medicine Cost)

A. Farm Condition:

Cost of production / pig upto slaughter / Market age: (14 castrated male 2nd Crop)

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

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

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

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

Cost of production/kg pork: **Rs.158/ kg** pork (considering 68% Dressing Percentage)

B. Field Condition: (Tutumoni Rajbongshi Nalbari)

Cost of production / pig upto Market age: (8 Castrated male)

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

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

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

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

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

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

Extension programme with success story:

i) At the institute: The Extension activities organized by the Associate Director of Extension Education (ADEE), AAU, Khanapara, Chief Scientist, Goat Research Station, Burnihat, SIRD Govt.

of Assam and NIRD-NERC Guwahati involved the Scientist of the project as Resource Persons in their different programs. The trainees were given lessons on theory as well as practical demonstration in various aspects of pig production.

Talks/ Demonstration: 30 nos.

- Talk on Pig Rearing – Fattening Technology- Low Cost Housing, Preventive Measures against Diseases, Administration of Vaccines, Nutrition and Feed Management. held on 15th June, 2016 at Bosco Reach out, Ulubari, B.K.Kakoty Road, ,B.M.Lane Guwahati-07
- Talk on Upliftment of Rural Economy through Pig farming under the Course –"Exposure Visit Cum Training of Farmers/Extension Facilitator", Govt. of Arunachal Pradesh ,held on 22.09.2016 at Seminar Hall of ADEE, AAU, Khanapara, Guwahati -22
- Talks (6) on Manage mental Practices – Farm Practical demonstration ,organized by SIRD, Govt. of Assam,Khanapara, Guwahati -22, on 19.12.2016 ,26.12.16, 02.01.17,01.02.17, 08.03.17 and 14.03.17
- Talks (7) on different breeds of Pig and their selection for improved production organized by SIRD, Govt. of Assam,Khanapara, Guwahati -22, on 20.12.2016 ,27.12.16, 03.01.17, 21.01.17, 01.02.17, 06.03.17 and 15.03.17
- Talk on Selection of Breeds of Pig and their Characteristics and Breeding System under the "Training Prog. on Pig Farming and Meat Processing " for the entrepreneurs of West Garo hill District of Meghalaya. Organized by NIRD ,Govt. of India,Khanapara on 21.11.2016
- Talks (2) on Choice of Breed, Breeding and Management for Increase Productivity under the "Training Prog. on Pig Farming and Meat Processing" for the entrepreneurs of West Garo hill District of Meghalaya., Organized by NIRD ,Govt. of India,Khanapara on 19.10.2016 and 20.10.16.
- Talks (4) on Pig Farming – Demonstration on Manage mental Practices at ICAR-AICRP/MSP on Pig ,AAU Khanapara Organized by ADEE, AAU, Khanapara on 13.02.17 ,20.02.17 ,20.03.17 and 27.03.17
- Talks (4) on "Different breeds of Pig and their selection for improved production" under the training Prog. on "Skill development training on Livestock and Poultry Production" Organized by ADEE, AAU, Khanapara on 14.02.17 ,21.02.17 ,21.03.17 and 28.03.17
- Talk on Pig Breeding in Assam ,Organized by Dept. of ARGO,CVSc,AAU, Khanapara under DBT funded Project "Capacity Building on Artificial Insemination in Pig" held on 16th February,2017
- Talk on Scientific Rearing of Pig under the Exposure Visit Prog of farmers of Workha district to the AICRP/MSP on Pig. Organized by Deptt.of Veterinary and A.H, Nagaland on 25.10.16

- Talk on Scientific Pig Production under the Model Training Course on "Value addition and post harvest management of Pork for ensuring hygienic pork production". Exposure Visit Prog of Extension functionaries to the AICRP/MSP on Pig. Organized by ICAR-NRC on Pig on 5.11.16
- Talk on Scientific Rearing of Pig under the Exposure Visit Prog of progressive farmers of Mizoram to the AICRP/MSP on Pig. Organized by Deptt. LPM, CAU, Aizwal, Mizoram on 21.09.16

At Field:

- Participation in the interactive session in the Agricultural Crop Seminar under "Mass Media Support to Agriculture Extension" of Doordarshan Kendra, Guwahati organized at Centre of Excellence on Citrus, Deptt.of Horticulture Bamunigaon Boko on 18. 02.2017.
- Attended as Panelist in the Farmers- Scientist Interaction programme on 28.01.2016 organized by ICAR-NRC on Pig during Pig –Expo at Rani
- Talks (2) on "Scientific Rearing of Pig and Rural Employment" organized By Prasar Bharati, Doordarshan Kendra, Guwahati under the Programme KRISHIDARSHAN Live Telecast on 09.02.17 and 09.03.17

Success Story:

- Jayanta Kr Sarma Chepti Rangia, district Kamrup (R) an unemployed Engineer. age 45 years maintaining 5 Sows and 2 breeding males. He is selling 5 fatteners in every 2 month interval and earning Rs. 4,00 lakh annually. He is spending Rs. 6,000/ month for concentrate and Rs.3000/month for hotel waste and broiler waste.
- Kamal Talukdar, Chandkushi, district Nalbari, age 45 year maintaining two herds of pig (70+80). He is spending Rs. 500/day for carrying Hotel/Kitchen waste/left out from Nalbari and Rs. 3000/ pm for two labourours. He is earning Rs. 10.00 lakh annually from piggery by regular selling of 10-12 fatteners/pm. and piglets.
- Debojyoti Nath, Gokhaihat Mirza is an unemployed Engineer, age 45 years maintaining 12 Sows, 4 breeding males since 2014. He has now 43 piglets. Attempt is made to sale piglets to the local farmers. He has a plan to develop fatteners in every month in cyclic manner.
- Sri Manoj Basumatary and Sri Khanindra Kalita Dhikidol, Ghoramari started a breeding farm in the name of **Symbiotic Foods Pvt. Ltd** in the year 2014. The breeding stocks (75%H) were purchased from the AICRP on Pig, AAU, Khanapara. The organization has a plan to raise 120 female breeding stocks at two different premises along with Feed Mill. At present they have 54 nos. of breeding females and 35 nos. of fattener. The piglets were sold to the local farmers at nominal price and have a Network with organizer for support in respect to feed, treatment / vaccination and marketing.
- Sri Manash Phukon, City based unemployed youth started piggery with two friends at Topatoli (Sonapur) and small units at Sonari (Sivsagar) and Mekurikushi (Rani) in the name of **ZHARNA**.

The organization have 35 adult breeding females The piglets were sold to local farmers at nominal price and have a Network with organizer for support in respect to feed,treatment, vaccination and marketing.

Distribution of booklet:

- **A leaflet** on Scientific Rearing of Pigs' was published and distributed to the farmers.
- A book on ***Byaboshike Padhatit Gahori Palon*** in local language and published by the KVK, AAU, Jorhat, are distributed to the farmers.
- A leaflet on New Variety of **HDK 75** published by the Directorate of Research (Vety.), AAU, Khanapara are distributed to the farmers
- A booklet on **Rearing of Pigs: A Subsidiary Enterprise** published by the Directorate of Research (Vety.), AAU, Khanapara are distributed to the farmers

Salient achievement during the report period (2016- 17)

- The genetic group *i.e*. 75%H is developed and released as Variety at the ICAR- AICRP on Pig, AAU, Khanapara Named as **HDK 75**
- 237 piglets were obtained from 29 farrowing (3rd Crop) during 2016- 17. The average litter size at birth, litter weight at birth, litter size at weaning and litter weight at weaning in were found to be 8.17 ± 0.15, 8.09 ± 0.91 kg, 7.93 ± 0.16 and 80.79 ± 1.23 kg respectively. The average body weight at birth, at 6th week, The average body weight at birth, at 6th week (weaning) and at 8 month of age were found to be 0.99 ± 0.01 kg,10.17 ± 0.01 kg and 73.62 ± 0.19 kg respectively.
- A total of 272 **(**118+154**)** pigs of different categories were sold to the farmers during the year under report. 33 farmers and 226 farmers are benefited from the piglets of ICAR-AICRP and ICAR-MSP on Pig respectively.

Scientific publications: 7

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

M.V.Sc Research Completed: Prevalence and control of porcine ascariasis (Deptt. Veterinary Epidemiology & Preventive Medicine)

A study was carried out on the prevalence and control of porcine ascariasis during the period from April, 2015 to March, 2016. In addition to prevalence study, it also included formulation of an effective deworming schedule for breeding sows and piglets for control of *Ascaris suum* infection. A total of 418 faecal samples were collected from seven locations of Kamrup and Jorhat district of Assam. Two organized pig farms of Assam Agricultural University were also included in the study. Out of the total samples collected, 82 samples were found to be positive revealing overall prevalence of 19.62 per cent. The prevalence of *A. suum* infection was found to be highest during pre-monsoon (25.90%) followed by monsoon (18.89%), winter (13.91%) and post-monsoon (12.76%) season. A higher prevalence was recorded in females (20.67%) than male (17.76%) pigs. The group of 6 months-1 year was found to be infected highest (30.47%), followed by age group below 6 months

(19.75%), 1-2 years (16.09%) and above 2 years (10.34%). Breed-wise, the prevalence was recorded higher in local pigs (24.25%) than cross-bred (Un-defined) (16.54%) pigs. Pigs maintained under unorganized condition recorded a higher prevalence (21.35%) of *A. suum* than organized condition (6.25%).A survey on 75 respondents conducted through a designed questionnaire to assess the socio-economic condition as well as the management and health care practices adopted by the pig farmers, it revealed that mostly the females (73.30%) with an average of 42 years of age were associated with pig farming. The tribal communities particularly schedule tribe (74.70%), schedule caste (16.00%) and other backward classes (9.30%) were primarily involved in pig rearing. Among the respondents, the literacy level varied and it consisted up to primary education (61.30%), high school education (21.30%) and only 5.30 per cent had education up to higher secondary and above level. The primary occupation of most respondents (44.00%) had been agriculture apart from involvement in daily wages (34.70%), private sector (16.00%) and government sector (5.30%) and animal husbandry was an integral part of existing framing system to livelihood security. Majority of the farmers maintained their pigs through scavenging system (42.66%), followed by tethered (26.66%), semi-intensive (24.00%) and intensive (6.00%) system. The prime purpose of pig rearing by most of the farmers was for fattening and only 5.30 per cent went for breeding purpose whereas, 22.00 per cent of the overall respondents shared pig rearing for both fattening and breeding purposes.

In response to health coverage aspects, it revealed that the farmers rarely preferred vaccination of their pigs and only 24.00 per cent of the respondents were found to undertake treatment of ailing animals regularly. Deworming was also not practiced by majority of the farmers (73.33%) and only 13.33 per cent had dewormed their pigs regularly. Analysis of correlation showed that age of the respondents was significantly related with the semi-intensive system of rearing and the experiences of respondents were significantly related to veterinary health care.

A deworming schedule with fenbendazole @ 5 mg/kg b. wt. orally administered one dose each to sows 10 days before mating and 10 days prior to farrowing and another to piglets at 10^{th} day of age was found to be effective in controlling naturally acquired ascariasis till weaning age. A significant difference ($p < 0.01$) in the mean EPG values was found in different days of treatment with fenbendazole as per the above schedule.

From the findings of the investigation the following conclusion were drawn:

- Pigs reared by the tribal population of Assam under unorganized farms are highly susceptible to *Ascaris suum* infection. Results revealed that in the study area there was minimum ten per cent *A. suum* consistently present throughout the year.
- Pig vaccination is not properly done or cared for, this aspect needs attention from other infectious disease point of view. Treatment with anthelmintics also needs attention.
- In present study, the deworming schedule found to be without any visible side effect in controlling naturally acquired *Ascaris suum* infection by pigs may be advisable for prevention and control of ascariasis in pig by farmers.

Ph.D. Research Completed: Growth performance of pigs in response to Seasonal stress under varying dietary energy levels. (Dept. of LPM)

Eighteen weaned piglets (at 56 days) from each of the two different genetic groups viz. Hampshire and Hampshire x Local irrespective of sex were selected and randomly divided into three dietary groups viz. Gr.I, Gr.II and Gr.III consisting of 6 animals of almost similar body weight in each experimental group for winter months in 1st phase and summer months in 2nd phase to find out the status of important season related thermal stress biomarkers as well as most suitable germplasm in terms of growth performance under the agro-climatic condition of Assam. The experiment was also aimed to study the role of different level of energy ration in the growth performance of pigs in different seasons.

A total of 3 rations were prepared for grower and finisher stage as per the NRC feeding standard for pig (NRC, 1998). The ration having 110, 100 and 90 per cent energy of NRC (1998) designated as high energy (HE), medium energy (ME) and low energy (LE), respectively. The ME, LE and HE treatment were represented three dietary groups of pigs i.e. Gr.I, Gr.II and Gr.III, respectively for both winter and summer. The Gr.I (ME) was considered as control group for both winter and summer season.

Temperature-Humidity Index (THI) was calculated out from the data of ambient temperature and relative humidity (RH). The physiological parameters such as respiration rate (RR) and rectal temperature (RT) were recorded following conventional methods in two phases in a month *i.e.*, consecutively for three days in a week in each animal and twice daily at 8:30 A.M. and 5:30 P.M. for a period of 12 months. About 5 ml of blood was collected from each experimental animal aseptically at 15 days interval for the whole experimental period. The level of thermal stress related blood hormones such as triiodothyronine (T_3), thyroxine (T_4) and cortisol were estimated by Radioimmunoassay (RIA) technique. The animals were weighed in the morning before feeding and watering at fortnightly intervals. The linear body measurements of the animals were recorded at monthly intervals. The feed intake, feed conversion efficiency and economics of feeding were also recorded. The ambient temperature was significantly ($P<0.01$) higher in the evening (23.60-29.51 ^{0}C) than in the morning (20.02-28.03 ^{0}C). The present experiment indicated that average ambient temperature during summer months (27.33-29.51 ^{0}C) were above the comfort zone for pigs (22 ^{0}C). The significantly ($P<0.01$) higher RH (%) was recorded in outdoor environment (87.26-91.10%) and in the morning time (86.60-91.10%). The THI during the study period was found to be indicative of thermal stress to the experimental animals during summer (79.55 – 82.56) as compared to the winter seasons. Physiological parameters *viz.*, RR and RT were significantly ($P<0.01$) higher in summer season (43.75-72.12 breaths/min. and 102.29-103.23 ^{0}F/min.) than the winter season and non-significantly higher values were recorded in Hampshire as compared to Hampshire x Local during summer season. It was also found that the significantly ($P<0.01$) lower RR as well as RT was recorded in the pigs fed with high energy (HE) ration during summer season. Serum T_3 and T_4

concentrations were significantly (P<0.01) lower during summer as compared to winter in both Hampshire and Hampshire x Local pigs, while both the genetic groups showed significantly (P<0.01) higher concentration of serum cortisol during summer season. It was also observed that thyroid hormone and cortisol concentrations were maintained in groups of pig fed HE diet during summer. The average body weight was significantly (P<0.01) higher in winter and Hampshire pigs attained higher body wt. but observed that Hampshire pigs shed more body wt. in summer as compared to crossbred. It was also recorded that energy level of diet had significant (P<0.01) influence on the body weight gain and minimizes the production losses in terms of body wt. gain during summer. The coefficient of correlation of linear body measurements with the body weight of experimental pigs was found to be positively correlated and found that linear body measurements were in progressively increasing trend along with increase in body weight. The study also revealed higher FCE during winter season and Hampshire x Local pigs had higher FCE. The lower feed intake and higher FCE was recorded in HE incorporated group. The present study revealed that the cost of concentrate feed decreased along with reduction in the energy level of the diet. The cost of feeding per kg body weight gain was higher in summer than winter season and lower cost of feeding per kg gain was recorded in HE incorporated group. On the basis of this finding it can be concluded that winter is the best time for raising growing-finishing pigs. During summer most of the time the state remains under tropical high heat and humid dominance which may drastically affect the production and eventually economy of pig farming. From the present observation, it is suggested that Hampshire x local pigs may rear economically in the agro-climatic condition of Assam and increasing the energy density of diet can also help to minimize the effects of thermal stress during summer.

Ongoing M.V.Sc./Ph.D. Research:

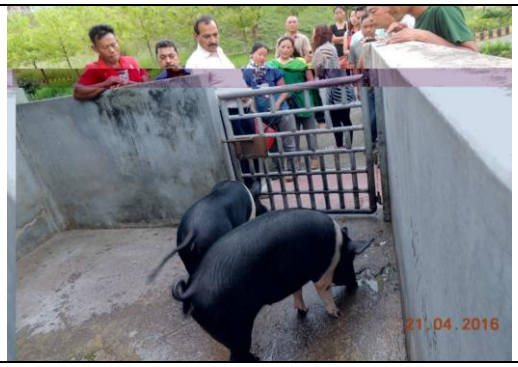
Comparative Efficacy of Probiotics (Swine & Dairy origin) Growth and Nutrient Utilization in Growing Pigs.

Title of the Research: Performance of Growing Pigs on Corn based diet Supplemented with Phytase and Non phytase phosphorous

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

Distinguish Visitors:

- Members of the Peer Review Team for Accreditation visited the ICAR-AICRP/MSP on Pig on 10.05.2016
- Members of VCI visited the ICAR-AICRP/MSP on Pig on 24.05.2016
- Members of the Monitoring and Review Team of the Agricultural Education Division ICAR visited the ICAR-AICRP/MSP on Pig on 23.03.2016

	
DDG (AS) ICAR,Govt of India released HDK 75 (75%H) at AICRP on Pig, AAU, Khanapara	Exposure visit of Progressive Farmers, Govt. of Nagaland
	
Piglets sold to ICAR –Research Complex ,Umium, for TSP Programme	Breeding female and piglets of HDK 75
	
Breeding female HDK 75 (75% H)	Training to VAS, Govt. of Assam
	
Private Breeding Farm Symbiotic Foods Pvt. Ltd. Ghoramari,Sonitpur	Private Breeding Farm ZHARNA,Topatoli,Sonapur

BIRSA AGRICULTURAL UNIVERSITY, RANCHI, JHARKHAND

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

Herd dynamics (T&D):

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1.	Piglet (up to 42 d)	46	263		33		226	50
2.	Grower (42d-5 m)	28			8		5	15
3.	Finisher (5- 8 m)	8						8
	Adult	21			3			11
4.	Breeding Female	44			4		7	40
5.	Boar	15			1		3	11
	Total	**162**	**263**		**49**		**241**	**135**

Herd dynamics (75% Tam):

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1.	Piglet (upto 42 d)	-	151		8		67	18
2.	Grower (42d-5 m)	-			4		5	21
3.	Finisher (5- 8 m)	-						-
	Adult	-						19
4.	Breeding Female	-					3	2
5.	Boar	-						4
	Total	**-**	**151**		**12**		**75**	**64**

Breeding strategy of the farm as approved:

- To study the performance of "T&D" and 75% Tamworth pigs under optimum management conditions.
- To select the animals within each genetic group for faster growth rate with better reproductive performances.

Performance of animals: T&D

Sl.	Traits/Characters	Mean ± SE (no. of observation)		
1	Litter size at birth	6.14±0.44(37)		
2	Litter weight at birth(kg)	7.17±0.53(37)		
3	Litter size at weaning(no.)	5.81±0.42(37)		
4	Litter weight at weaning (kg)	51.92±3.30(37)		
		Male	**Female**	**Overall**
5.	Avg. weight at birth(kg)	1.17±0.01(139)	1.17±0.01(125)	1.17±0.01(264)
6	Avg. weight at weaning (kg)	8.86±0.25(112)	9.27±0.26(94)	8.98±0.17 (214)
7	Number of days for weaning(d)	42 days	42 days	42 days
8	Pre weaning mortality rate (%)	6.06	8.81	7.43
9	Pre weaning growth rate (gm/d) (6 w)	173.81	167.62	170.71
10	Post weaning mortality rate (%)	2.06	0.69	1.39
11	Post weaning growth rate, up to 8 m (gm/d)	271.21	299.14	289.09
12	Overall growth rate (up to 9 m) (gm/d)	291.96	299.67	296.96
13	Body weight (kg) 1 Month 2 Month 3 Month 4 Month 5 Month 6 Month 7 Month 8 Month 9 Month 10 Month	 4.99±.11(129) 8.86±.25(112) 15.1±.7(12) 20.2±1.2(7) 28.8±2.4(4) 42.3±2.9(3) 60.5±22.5(2) 64.0±10(3) 63.0±10(2)	 4.94±.12(107) 9.27±0.26(94) 15.18±.47(27) 19.18±.52(27) 23.85±1.18 (22) 36.92±1.96(25) 47.97±2.97(17) 53.60±3.27(15) 72.70±3.77(10) 78.60±6.10(5)	 4.97±0.08(236) 8.98±0.17(214) 15.07±.38(40) 19.29±.47(35) 24.61±1.11(26) 37.38±1.74(29) 49.13±3.83(20) 55.33±3.19(18) 71.08±3.52(12) 78.60±6.10(5)

Performance of animals: 75% Tamworth

Sl.	**Traits**	**Mean ± SE**		
1	Litter size at birth(no.)	6.79±0.59 (19)		
2	Litter weight at birth(Kg)	7.30±0.66(19)		
3	Litter size at weaning (no.)	6.42±0.59(19)		
4	Litter weight at weaning (Kg)	55.83±4.69(19)		
		Male	**Female**	**Overall**
5	Avg. weight at birth(kg)	1.08±0.02(76)	1.08±0.01 (68)	1.08±0.01(144)
6	Avg. weight at weaning (kg)	9.30±0.32(63)	8.04±0.30 (56)	8.70±0.22(122)
7	Number of days for weaning(d)	42 days		
8	Pre weaning mortality rate (%)	5.26	4.14	4.71
9	Pre weaning growth rate(gm/d)	170.48	172.62	171.67
10	Post weaning mortality rate (%)	11.20	10.29	10.73
11	Post weaning growth rate(gm/d) up to 8 m	241.62	222.63	229.04
12	Overall growth rate (up to 9 m) (gm/d)	244.44	208.63	222.96
13	Body weight (Kg)			
	1 Month	4.78±0.16(74)	4.44±.13(63)	4.62±.11(137)
	2 Month	9.30±0.32(63)	8.04±.30(56)	8.70±.22(122)
	3 Month	11.66±0.44(41)	10.29±0.47(36)	11.02±0.33(77)
	4 Month	16.69±0.65(24)	13.74±.73(29)	15.08±.53(53)
	5 Month	22.26±0.95 (21)	17.97±1.04 (29)	19.77±0.78(50)
	6 Month	30.65±1.31(20)	25.15±1.47(20)	27.9±1.07(40)
	7 Month	36.69±1.69(16)	29.28±3.73(9)	34.02±1.82(25)
	8 Month	43.75±2.16(16)	10.19±4.658(8)	42.56± 2.08(24)
	9 Month	53.94±2.68(16)	50.88±6.27(8)	52.92± 2.69(24)
	10 Month	59.53±3.24(15)	56.50±7.36(8)	58.48±3.23(23)

Lifetime production traits

Reproductive traits	**AICRP (T&D)**
Litter size at birth	7.21±0.24(58)
Litter weight at birth (Kg)	8.41±0.33 (58)
Litter size at weaning	6.83±0.26 (57)
Litter weight at weaning (Kg)	65.89±2.31(57)

Specific Managerial Practices

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

i) Care during pregnancy: Farrowing pens were thoroughly cleaned and flushed with water and disinfect by Phenyle. The farrowing pens were provided with creep box for feeding creep ration to suckling piglets, which was provided from 3rd week i.e. 15 days. A few days before farrowing the pregnant sows were separated from the herd and transferred to farrowing pens. She was then confined to farrowing pen till the weaning of their piglets.

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

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

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

Mortality parameter:

i) Genetic group wise and sex wise mortality rate:

	AICRP (T&D)			**AICRP 75% Tamworth**		
	Male	Female	Total	Male	Female	Total
Pre weaning	5	10	15	02	02	04
Post weaning	11	23	34	02	06	08
Total	**16**	**33**	**49**	**02**	**08**	**12**

ii) Causes of mortality (Specific cause): T&D

SL.NO	**DISEASE**	**TOTAL NO.**
Preweaning		
1.	Gastritis	06
2.	Piglet anemia	03
3.	Pneumonia	15
4.	Trampling	04
5.	Premature/ putrified/predator attack etc	06
	Total	**34**
Postweaning		
1.	Pneumonia	04
2.	Gastritis	05
3.	Hepatitis, Gastritis	06
	Total	**15**

75% Tamworth

SL.NO	**DISEASE**	**TOTAL NO.**
Preweaning		
1.	Pneumonia	01
2.	Gastritis	02
4.	Piglet anaemia	01
	Total	**04**
Post weaning		
1.	Pneumonia/pneumoenteritis	03
2.	Enteritis/Gastritis	02
3.	Piglet anemia	01
4.	putrified	02
	Total	**08**

iii) Measures to taken minimize mortality:

a) **Management measures:** Provision of bedding specially during winter season

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

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

ii) The imferon were injected to all piglets at 3rd and 14th days of age and weaned at 42 days of age.

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

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

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

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

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

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

Age	T&D	75% Tamworth	Significance
O day	1.17±0.01 (264)	1.08±0.02 (144)	**
2 week	3.29±0.05(259)	2.97±0.06(138)	**
4 weeks	4.97±0.08(236)	4.62±0.11(137)	**NS**
6 weeks	6.82±0.12(236)	6.55±0.14(130)	**NS**
8 week	8.98±0.17(214)	8.70±0.22(122)	**NS**

abc Means bearing different superscripts in a row differ significantly from each other **P<0.01), NS= Non-significant. Figure in parenthesis indicate no. of observations.

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

Age	**T&D**	**75% Tamworth**	**Significance**
3 months	15.07±.38(40)	11.02±0.33(77)	**NS**
4 months	19.29±.47(35)	15.08±.53(53)	**NS**
5 months	24.61±1.11(26)	19.77±0.78(50)	**
6 months	37.38±1.74(29)	27.9±1.07(40)	* *
7 months	49.13±3.83(20)	34.02±1.82(25)	**
8 months	55.33±3.19(18)	42.56± 2.08(24)	**
9 months	71.08±3.52(12)	52.92± 2.69(24)	**
10 months	78.60±6.10(5)	58.48±3.23(23)	**NS**

abc Means bearing different superscripts in a row differ significantly from each other (*P<0.05, **P<0.01),

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

Reproductive performance of different genetic groups of pigs

Reproductive traits	**T&D**	**75% Tamworth**	**Significance**
Litter size at birth	6.14 ± 0.44 (37)	6.79 ± 0.59 (19)	NS
Litter size at weaning	5.81 ± 0.42 (37)	6.42 ± 0.59 (19)	NS
Litter weight at birth (Kg)	7.17 ± 0.53 (37)	7.30 ± 0.66 (19)	NS
Litter weight at weaning (Kg)	51.92 ± 3.30 (37)	55.83 ± 4.69 (19)	NS

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

Salient findings: Comparative growth performance of "T&D" and 75% Tamworth pigs were studied. Average body weight at birth, 6th and 8th week of age was observed to be higher in T&D (1.17±0.01,

6.82±0.11 and 8.98±0.17 Kg) pigs in comparison to "75% Tamworth" (1.08±0.01, 6.55±0.11 and 8.70±0.22 Kg) respectively. Body weight at 32nd and 40th weeks of age was also observed to be higher in T&D than 75% T. Body weights at 32nd and 40th weeks of age were recorded in "T&D" (55.35±3.19 and 78.60±6.10 Kg) and 75% Tamworth (42.56±2.08 and 58.48±3.23 Kg), respectively.

Comparative reproductive performance of "T&D" and 75% Tamworth pigs were studied. No significant differences were observed between these two groups. However, slightly better reproductive performances (LSB, LSW and LWW) were noticed in "75% Tamworth" pigs than T&D. Litter size at birth, Litter size at weaning and Litter weight at birth and Litter weight at weaning for T&D and 75%T were observed to be 6.14±0.4, 5.81±0.42, 7.17±0.53 Kg, 51.92±3.30 Kg and 6.79±0.59, 6.42±0.59, 7.30±0.66 Kg, 55.83±4.69 Kg, respectively.

Performance of grower pigs maintained on different rations containing different protein concentration

Composition of rations

Item	GI	GII	GIII	GIV	GV
Maize	70	66	64	73	97.3
GNC	0.10	5.5	10	15	0.1
Wheat Bran	27.3	22	14	1.5	
Salt	0.5	0.5	0.5	0.5	0.5
Fish Meal	0.10	4	9.5	8	0.1
Agrimin	2	2	2	2	2
Total	100	100	100	100	100
Cost/Rs/Qtls	2126	2510	2967	3026	2151

Feed Consumption

	GI	GII	GIII	GIV	GV
1ST	5.86±0.31	5.31±0.31	6.14±0.24	5.86±0.32	4.98±0.37
2nd	6.89±0.24	6.88±0.16	7.68±0.08	7.69±0.07	6.21±0.32
3rd	7.31±0.20	8.07±0.31	10.17±0.37	9.99±0.34	6.04±0.14
4th	7.43±0.25	8.09±0.34	12.44±0.42	11.98±0.49	4.67±0.32
5th	7.02±0.22	9.35±0.37	14.78±0.36	13.44±0.44	4.06±0.19
6th	7.10±0.27	10.05±0.22	15.68±0.25	14.60±0.29	3.45±0.14
7th	7.31±0.14	11.47±0.18	16.16±0.35	14.16±0.29	3.14±0.09

Growth performance

	GI	GII	GIII	GIV	GV
1st	16.3±1.09	16.88±1.31	16.66±1.50	18.03±1.96	16.40±1.77
2nd	22.64±1.60	24.33±2.22	26.00±2.58	28.75±2.43	20.29±2.23
3rd	24.57±1.73	28.67±2.42	32.57±2.97	37.17±3.54	21.86±2.60
4th	27.57±2.06	34.17±2.47	39.71±3.35	44.50±3.33	22.57±2.97
5th	31.00±2.40	42.00±2.77	50.57±4.02	57.17±3.92	23.36±3.07
6th	32.79±2.12	46.00±2.53	56.36±4.32	61.75±4.03	24.14±3.14
7th	35.93±2.56	53.50±2.45	65.43±4.93	71.67±4.07	24.43±3.29

Economics

	GI	GII	GIII	GIV	GV
B.wt.Gain	19.63	36.62	48.77	53.64	8.03
Total Feed Con	97.84	138.16	193.80	181.31	75.93
Cost of feed	21.26	25.10	29.67	30.26	21.15

Total Feed Cost	2080	3,467	4929	5,487	1376.5
Cost of /kg b. wt gain	105.97	94.70	101.06	102.29	171.42

Salient findings: Performance of grower pigs feed on different rations with varying amount of protein was observed. Total five groups were made on the basis of rations given to growing pigs. Feed consumption were observed to be higher for group III followed by IV, II, I & V. Growth performance of piglets of group IV were observed to be highest by III, II, I & V. Economic on the basis of cost per kg body weight gain were calculated and lowest value were observed for group II (94.70), followed by group III (101.06), group IV (102.29), group I (105.97) and group V (171.42)

Reproduction performance of pigs during summer season under different management

Body weight of preweaning piglets

	Group I (45)	Group II (91)	Group III (92)
0 Day	1.15±0.02	1.24±0.03	1.28±0.01
2Week	3.15±0.12	2.24±0.16	3.48±0.03
4Week	5.84±1.21	3.33±0.35	5.54±0.06
6 Week	6.11±0.28	5.47±0.45	7.29±0.09
8Week	7.23±0.33	7.91±0.59	9.55±0.15

I. Provision of natural tree shed.

II. Shed under direct sunlight with water sprinkling 3 time/day

III. Shed under direct sunlight.

Reproductive performance

	G I	G II	G III
Farrowing %	83.33	83.33	66.67
Days at 1st farrowing	363.2±5.24	399±1.69	390.6±10.22
LSB	9.4±0.87	5.6±1.5	6.25±0.75
LWB	10.74±0.94	6.76±1.87	7.98±1.13
LSW	8±1.05	3.4±0.87	5±0.79
LWW	57.86±11.33	26.9±5.36	47.73±6.48

Weekly dry bulb thermometer temperature recording (^{0}C)

Week	GI		GII		GIII	
	Max	Min	Max	Min	Max	Min
1Week	36.43±0.48	32.71±0.68	38.86±0.51	35.29±0.52	38.86±0.51	35.29±0.52
2week	54.71±0.80	34.43±0.53	40±0.22	36.57±0.30	40±0.22	36.57±0.30
3week	36.43±0.37	32.43±0.30	38.43±0.37	34.29±0.71	38.43±0.37	34.29±0.71
4w	33.86±0.86	30.86±0.67	36.71±0.78	33.57±0.48	36.71±0.78	33.57±0.48
5w	36±0.93	31.57±0.65	35.86±0.80	33.14±0.80	35.86±0.80	33.14±0.80
6w	33.71±0.94	30.57±0.57	36.29±0.84	31.43±0.95	36.29±0.84	31.43±0.95
7w	33.57±0.72	29.00±0.53	37. ±0.38	31.86±0.59	37. ±0.38	31.86±0.59
8w	32.86±3.28	30.29±2.94	35.43±0.30	31.29±1.27	35.43±0.30	31.29±1.27
9w	35.29±0.52	32.29±0.61	36.71±0.71	33.57±0.90	36.71±0.71	33.57±0.90
10w	31.29±0.81	28.43±0.87	33.29±1.02	28.86±0.67	33.29±1.02	28.86±0.67
11w	37.86±8.20	27.71±0.81	30.9±3.1	29.0±2.9	30.9±3.1	29.0±2.9
12w	28.71±0.23	27.14±0.17	30.29±0.75	28.86±0.59	30.29±0.75	28.86±0.59
13w	28±0.44	26.14±0.46	28.71±0.75	27.57±0.57	28.71±0.75	27.57±0.57
14w	27.71±0.36	26.43±0.30	28.86±0.51	27±0.62	28.86±0.51	27±0.62
15w	28.71. ±0.36	26.86±0.34	31.57±0.48	28.43±0.84	31.57±0.48	28.43±0.84

Dry bulb THI

	THI 45		THI92	
Week	Max	Min	Max	Min
1 week	86.37±0.91	81.06±0.70	94.15±0.65	89.39±0.72
2 week	108.82±11.07	87.10±0.94	95.6±0.30	91.04±0.41
3 week	90.74±0.50	85.30±0.40	89.04±0.71	83.10±0.85
4 week	83.03±0.81	79.41±0.72	87.53±1.02	82.95±0.44
5 week	85.53±1.01	80.54±0.67	86.83±1.00	82.83±0.83
6 week	83.76±1.02	80.21±0.60	89.01±1.44	81.89±1.14
7 week	85.31±0.45	78.27±0.33	91.52±0.51	84.06±0.97
8 week	83.16±9.16	80.21±0.60	88.97±0.43	82.10±1.42
9 week	85.64±0.57	81.77±0.32	88.66±1.21	83.36±0.84
10 week	81.64±0.84	78.63±0.85	84.21±1.02	79.11±0.66
11 week	92.43±8.14	79.41±0.94	81.7±9.4	79.6±9.2
12 week	80.92±0.49	78.17±0.37	82.08±1.11	79.83±0.73
13 week	81.03±2.85	76.29±0.46	79.33±0.82	77.93±0.67
14 week	78.07±0.30	76.47±0.34	80.29±0.78	77.66±0.67
15 week	79.22±0.38	77.01±0.40	82.80±0.61	78.99±0.89

Mortality of preweaning piglets

Age	GI (45)	GII(91)	GIII(92)
0-2 Week	-	6	4
3-4 Week	2	2	1
4-8 Week	1	1	-
Total	3	9	5
%	6.82	32.14	20

Salient findings: Reproductive performances of pigs during summer season under difference management condition were observed. Breeding pigs of some parity and age groups were divided into 3 group having six pigs in each. Group I were provided shed under natural tree environment all the day. Shed Group II & III have allotted sheds having direct sun light round the day along with this three times water sprinkling were given to group III. Reproductive performance viz Days at 1st farrowing, LSB, LSW, LWB, LWW were observed to be better for GI followed by G III & II. Body weight of preweaning piglets was observed to significantly higher for Group III followed by II & I. However no significant difference was observed between Group I & II. Mortality percentage of preweaning piglets at different ages was much higher for Group II followed by III & I. By providing natural tree shed to the pigs of group I we could be able to reduce the climatic stress by 2-5^{0}C.

Adoption of integrated farming systems: One farmer, Sri Krishna kumar, Chatra, Jharkhand has adopted integrated farming system with piggery as a major component. His IFS components include Piggery, Fishery and Duckery. Total area of the farm is approx 10 acre. He is utilizing waste of piggery for fish pond and manure for horticulture and by-product of horticulture field is utilized for piggery.

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

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

Production economics:

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

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

Extension programme with success story:

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

A. 10 days duration: 105

B. 1 day duration 449

At the farmers' field:

i) Livestock (Pig) show during **Kisan Mela** at Birsa Agricultural University.

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

iv) T.V. Telecast (**Doordarsan Ranchi**) **08**

v) Radio 02

Salient achievement during the report period:

Comparative growth performance of "T&D" and 75% Tamworth pigs were studied. Average body weight at birth, 6th and 8th week of age was observed to be higher in T&D (1.17±0.01, 6.82±0.11 and 8.98±0.17 Kg) pigs in comparison to "75% Tamworth" (1.08±0.01, 6.55±0.11 and 8.70±0.22 Kg) respectively. Body weight at 32nd and 40th weeks of age was also observed to be higher in T&D than 75% T. Body weights at 32nd and 40th weeks of age were recorded in "T&D" (55.35±3.19 and 78.60±6.10 Kg) and 75% Tamworth (42.56±2.08 and 58.48±3.23 Kg), respectively.

Comparative reproductive performance of "T&D" and 75% Tamworth pigs were studied. No significant differences were observed between these two groups. However, slightly better reproductive performances (LSB, LSW and LWW) were noticed in "75% Tamworth" pigs than T&D. Litter size at birth, Litter size at weaning and Litter weight at birth and Litter weight at weaning for T&D and 75%T were observed to be 6.14±0.4, 5.81±0.42, 7.17±0.53 Kg, 51.92±3.30 Kg and 6.79±0.59, 6.42±0.59, 7.30±0.66 Kg, 55.83±4.69 Kg, respectively.

Reproductive performances of pigs during summer season under difference management condition were observed. Breeding pigs of some parity and age groups were divided into 3 group having six pigs in each. Group I were provided shed under natural tree environment all the day. Shed Group II & III have allotted sheds having direct sun light round the day along with this three times water sprinkling were given to group III. Reproductive performance viz Days at 1st farrowing, LSB, LSW, LWB, LWW were observed to be better for GI followed by G III & II. Body weight of preweaning piglets was observed to significantly higher for Group III followed by II & I. However no significant difference was observed between Group I & II. Mortality percentage of preweaning piglets

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Distinguish visitors:

Sl. No.	Date	Name & Address
1.	10.4.2017	Dr. H Rahman DDG (AS), ICAR, New Delhi.
2.	17.5.2016	Dr. KV Venkaterwaram, P&H, Medras vety. college Chairman
4.		Dr. D N Deoheafy, HOD, ARGO, COSC&AU
5.		P.G Chevyapp, Vice Chancellor UAS, Bangalore

Success story of Mr Victor Nag, Village- HEC, PS – Namkum, Ranchi

Mr. Victor Nag is an educated B. Tech graduate. He was unemployed and searching for a good job. He joined a few job with litle salary, but not satisfied. Then he head about the piggery farming from one of his friend. He visited to Pig Breding Farm of Ranchi veterinary college along with the progressive pig farmers. Then he decided to purchase a 20 Jharsuk female and male piglet to start. Due to the productive traits of Jharsuk breed he could get the desired result of first farrowing after about 10 months of their hard work. In the mean time he felt like attending a training programme at Pig Breeding farm of Ranchi Vetinary college for technical knowhow on pig farming. He kept the pigs in well maintained clean shed. He arranged low cost balanced feed from hostel canteen wastes and feed his pigs. He always maintains 35 to 40 sows and a proven boar of Jharsuk and regularly receive good weaned piglets for sale. On an average he earns a net income of Rs 200,000-3,00,000 by the selling weaned piglets @ Rs 2,500/ per piglet and fattening pigs. He also targets to rear castrated male for pork production depending upon the availability of surplus feed. Now his family member also looks after the stock and he arranges the feed. Now he is happy and satisfied with their profession. He targets to stat processing pork plant in future.

AICRP field Unit

KERALA VETERINARY AND ANIMAL SCIENCE UNIVERSITY, MANNUTHY

CENTRE, KERALA

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

Herd dynamics:

Details	Desi			Crossbred 50 %			Crossbred 75 %		
				M	F	Total	M	F	Total
Opening balance as on 01/04/2016	16	18	34	3	36	39	14	24	38
Birth 01/04/16 to 31/3/2017	8	9	17	15	16	31	25	27	52
Purchase of animals									
Total	24	27	51	18	52	70	39	51	90
Mortality		5	5	1	3	4	3	2	5
Sold / Field unit / slaughter	12	2	14	12	9	21	22		22
Total	12	7	19	13	12	25	25	2	27
Closing balance as on 31/3/2017	12	20	32	5	40	45	14	49	63

Breeding strategy of the farm as approved

75% crossbreds are maintained by inter-se mating

Performance of animals:

Sl.N	Traits/Characters	Mean # SE (no. of observation)		
		M	F	**Total**
1.	Litter Size at birth (no)	5.42±0.13	4.83±0.10	10.25±0.12
2.	Litter weight at birth (kg)	5.92±0.12	5.78±0.12	11.71±0.12

3.	Litter Size at weaning (no)	5.20±0.13	4.15±0.12	9.35±0.12
4.	Litter weight at weaning (Kg)	46.42±0.20	36.63±0.19	83.05±0.20
5.	Avg. Individual weight at birth (kg)	1.09±0.06	1.19±0.06	1.14±0.06
6.	Avg. Individual weight at weaning (kg)	8.92±0.22	8.82±0.20	8.88±0.21
7.	Number of days for weaning (d)	42	42	42
8.	Pre weaning mortality rate (%)	7.23	7.73	7.48
9.	Pre weaning growth rate(gm/d)	186.42	181.66	184.16
10.	Post weaning mortality rate (%)	1.10	1.13	1.12
11.	Post weaning growth rate (gm/d)	341.00	321.40	331.20
12.	Overall growth rate (up to 9 m) (gm/d)	328.67	308.81	318.74
13	Body weight at different ages (kg) (n=8)			
	at 1st month			5.78±0.30
	2nd month			10.21±0.28
	3rd month			17.76±0.35
	4th month			28.43±0.39
	5th month			38.34±0.50
	6th month			49.39±0.55
	7th month			62.38±0.65
	8th month			76.33±0.75
	9th month			87.20±0.80
	10th month			94.25±0.85
14.	Age at slaughter (d)			300
15.	Weight at slaughter(Kg)			89.38 ±0.85
16.	Dressing Percentage (%)			65.35±0.75
17.	Carcass Length (cm)			76.54±0.70
18.	Back Fat Thickness (mm)			22.05±0.50
19.	Meat Bone ratio (:)			4.21± 0.10
20.	Amount of pork produced per sow (kg/year)			1838.54
21.	Feed Conversion efficiency (:)			4.34
22	Live weight produced /sow/litter at birth (kg)			11.71
23	Live weight weaned /sow (kg)			83.05
24	Live weight produced at slaughter age/sow/litter (kg)			804.42
22.	Any other information relevant to this table			Nil

5) Lifetime production traits

Sl No	Traits	Mean
1	Live weight produced /sow/litter at birth (kg)	12.25±0.12
2	Live weight weaned /sow (kg)	87.33±0.20
3	Live weight produced at slaughter age/sow/litter (kg)	912.53

Mortality parameter:

Desi -Pre-weaning

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

Desi - Post- weaning

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

Cross bred 50% -Pre-weaning

Parameter	Age											
	0-14 days			15-28 days			29-45 d			Over all		
	M	F	T	M	F	T	M	F	T	M	F	T

animals at risk	-	-	-	-	-	-	-	-	-	-	-	-
Number died	1	3	4		1					1	4	5
Mortality %	4.16	5.76	4.96		3.54					3.54	4.65	4.10

Cross bred 75 % -Pre weaning

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

Cross bred 75 % -Post- weaning

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

Causes of mortality (specific cause):

Pre weaning

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

Post weaning

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

(iii) Measures to taken minimize mortality:

Management measures:

(i) All the pigs were dewormed periodically and regular spraying against ecto-parasites was carried out.

(ii) Early treatment to control piglet diarrhea and anemia were undertaken

(iii) Farrowing crates to minimize the incidence of crushing of piglets

(iv) Artificial light provided at farrowing pen to prevent piglet mortality due to cold Shock

(v) Gunny bags were laid over roof and periodically wetted to control the thermal stress inside the shed

(vi) Soft bedding with hay was provided to minimize the incidence of crushing of piglets

(vii) Early detection and treatment of MMA syndrome

(viii) A disinfectant dip was constructed at the entrance of the centre to control infection from outside.

(ix) Practice of one time feeding in the early morning of the day was introduced along with provision of shade to minimize the heat stress

(x) Efforts are taken to minimize the pre-weaning mortality with suitable interventions.

Prophylactic measures:

All the animals were vaccinated twice annually for swine fever disease (CSF) and FMD

Weaned piglets were vaccinated against the CSF three days after weaning and FMD after 21 days

The wallowing tanks in the pens are routinely cleaned using disinfectants and maintained hygienically.

The sows were dewormed and thoroughly scrubbed and cleaned prior to shifting them into the farrowing pens.

Pregnant sows were transferred to farrowing pen 2-3 weeks in advance to provide individual care and management.

Routine inspection and maintenance of hygienic practices of farrowing pens for preventing MMA

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

Nutritional experimentation:

The feed with following composition is used in the centre.

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

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.

Production economics:

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

Market prices of pork

Pork : Rs. 260 kg from University meat plant
Lean pork : Rs. 320 /kg from University meat plant
Private outlets : Rs. 220/kg.
Live weight : Rs.100/ kg depends upon the season

The production economics is calculated on the basis of feed cost, the existing price of pork is Rs.220/kg and Rs.100/kg live weight.

Cost of production/pig up to slaughter age: Rs. 9458/-

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 347 piggery units throughout the State of which sizable number of farmers took up this as a full time engagement and this unit is proud to report that it could provide a sustainable income for the farmers and many of them now totally depend on their pig farm as their regular income. Training programmes on "Profitable Rearing of Pigs "were held at Centre for Pig Production & Research, Mannuthy in three batches, during August 16-20, 2016. Ten 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 396 fattening piglets to 78 farmers. Ten new units have been established during this period.

Salient achievements during the report period:

The centre has successfully fulfilled the demand of the farmers by supplying 396 fattening piglets (crossbreds) and also generated receipt of Rs.13.08 lakhs during the year 2016-17. 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: 4 nos

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

Nutritional management of early weaned Large White Yorkshire piglets by functional amino acid supplementation.

A study was conducted at Centre for Pig Production and Research, Mannuthy to study the effects of dietary supplementation of functional amino acids in early weaned Large White Yorkshire piglets on growth performance, nutrient digestibility, villus height, gut health and technoeconomics of production. Forty LWY piglets of either sex, weaned at three weeks of age belonging to Centre for Pig Production and Research, Mannuthy were used as experimental animals.The piglets were divided into four groups as uniformly as possible with regard to age, sex and weight and were randomly allotted to four dietary treatments. There were five replicates for each treatment with two piglets in each replicate. Piglets were fed with pre-starter ration (22 per cent CP and 3200 kcal ME) upto body weight of 5.5 kg and starter/creep ration (20 per cent CP and 3200 kcal ME) from 5.5 to 18 kg body weight. Ration formulation was as per NRC (1998).

All the animals were maintained under uniform management conditions. The animals were fed twice daily *adlibitum* for one hour and the balance of feed was collected and weighed after each

feeding. The record of daily feed intake was maintained throughout the experimental period upto attainment of 18 kg body weight. The bodyweight of all the experimental animals was recorded weekly. At the end of the feeding trial a digestibility study for three days was conducted in all the experimental animals by total collection method. For evaluation of intestinal development, one piglet per treatment group was slaughtered at the end of the experiment and the small intestine was collected for histological measurements. The samples of feed, faeces and small intestine collected in this study are undergoing analysis.

Effect of weaning age on performance of Large White Yorkshire pigs

A study was conducted at Centre for Pig Production and Research, Mannuthy to evaluate the effect of weaning on the performance of LWY pigs. 18 LWY sows in last week of gestation were selected, weighed and randomly assigned into three groups of T1, T2 and T3. Sows in T1, T2 and T3 were weaned at 42, 35 and 21 day post-farrowing respectively. Piglets in T1, T2 were fed with creep ration containing 20% CP and T3 with 22% CP. T2 and T3 feed were supplemented with lactose @ 10% and 15% inclusion level respectively. Sows were fed as per the feeding plan existing in farm. Average daily feed intake of piglets, body weight of sows and piglets at fortnight interval was recorded. Visual fecal score was done for a period of 10 days post weaning to study the occurrence of diarrhea. Weekly Body Condition Score (BCS) of sows was taken till weaning. Piglets of T2 and T3 were also fed with same creep ration as that of T1 after attaining the age of 42 day. Behavior of sows and piglets was also recorded and evaluated as part of the study. Feed samples of all three treatments were collected for analysis.

Distinguished visitors:

	Name and address of the visitor	Date of visit
1	Dr. H.Rahman, DDG (AS), ICAR	8th February 2017
2	Dr. R.S. Gandhi, ADG (Animal Production and Breeding), ICAR	8th February 2017
3	Dr. Vineet Bhasin, Principal Scientist, ICAR	8th February 2017
4	Dr. D.K. Sarma, Director ICAR NRC on Pig	8th February 2017
5	Dr. Bharath Bhushan, Principal Scientist, IVRI	9th February 2017
6	Dr. Siobhan Mullan, Scientist, Vet School, University of Bristol	7th December 2016

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

Breeding Unit Name of Livestock Keeper: Mr. Praveen George, Full Address: Parayil House, Mukkom, Calicut. Kerala (Phone: 7012933174)

Mr. Praveen George was a partner of a small pig farm at Calicut. He attended training on scientific pig rearing at AICRP Mannuthy and started one independent pig farm at Mukkam, Calicut with 200 fattener pigs. Praveen George started breeding unit on the advice of AICRP on pig with 25 pigs and increased the breeding pigs number to 48. He has remodeled the pig farm with tubular square

pipes. He started Hill Top Multi Farm and food waste clearing service and his monthly income increased to Rs.30,000/-.

Macroclimatic Data at Mannuthy

Date	Air Temp (^{0}C)	Relative Humidity (%)	Solar Radiation (W/m^2)	Wind Speed (m/s)	Wind Direction (Degree)	Dew Point Temp (^{0}C)	Wet Bulb Temp (^{0}c)	Thermal Humidity Index (THI)
Apr-16	29.78	82.21	0.23	0.66	157.21	27.42	28.29	82.86
May-16	29.38	87.71	0.20	0.63	165.76	26.88	27.47	82.62
Jun-16	26.56	95.35	0.14	0.49	177.21	25.69	25.90	79.09
Jul-16	26.76	93.63	0.17	0.57	173.93	25.57	25.86	79.19
Aug-16	27.20	92.05	0.19	0.61	183.12	25.68	26.05	79.72
Sep-16	27.08	91.28	0.19	0.66	182.30	25.40	25.82	79.40
Oct-16	27.19	90.39	0.18	0.46	129.91	25.30	25.77	79.39
Nov-16	27.36	85.35	0.18	0.47	116.28	24.25	25.08	78.78
Dec-16	26.94	83.11	0.18	0.64	163.57	23.38	24.37	77.80
Jan-17	27.80	69.68	0.20	0.93	100.33	20.94	23.04	77.24
Feb-17	28.77	66.40	0.23	0.97	90.51	20.62	23.24	78.15
Mar-17	29.36	80.24	0.22	0.69	92.66	25.04	26.20	81.32


Release of new pig variety developed at Mannuthy


Farm Visit of dignitaries | Mannuthy White the crossbred pig variety developed


Mannuthy White the crossbred pig variety developed | Distribution of Piglets under Tribal Sub Plan

SRI VENKATESHWARA VETERINARY UNIVERSITY, TIRUPATI

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

Herd dynamics:

Sl. No	Categories	Opening balance as on 1.4.2016	Additions		Disposals			Closing balance as on 31.3.2017
			Birth	Transfers/ Purchased	Death	Transfers/ Slaughter	Sold	
1	Piglet (upto 42 d)	-	319	-	31	-	-	-
2	Grower (42 d-5m)	123	-	-	13	-	170	99
3	Finisher (5 – 8 m)	-	-	-	3	9	-	4
4	Breeding female	13	-	-	3	6	30	62
5	Boar	3	-	-	-	-	6	22
Grand Total		**139**	**319**	**-**	**50**	**15**	**206**	**187**

Breeding strategy of the farm as approved

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

Performance of animals: (22nd generation I crop)

Sl. No	Traits/ Characters	Mean ± SE (no. of observation)		
		M	F	Total
1	Litter size at birth (no.)	4.26±0.28(31)	3.84±0.32(31)	8.1±0.36(31)
2	Litter weight at birth (kg)	5.4±0.39(31)	4.8±0.43(31)	10.2±0.53(31)
3	Litter size at weaning (no.)	3.97±0.31(31)	3.55±0.31(31)	7.52±0.37(31)
4	Litter weight at weaning (kg)	31.85±2.37(31)	28.51±2.65(31)	60.36±3.07(31)
5	Avg. individual weight at birth (kg)	1.27±0.02(132)	1.25±0.02(119)	1.26±0.02(251)
6	Avg. individual weight at weaning (kg)	8.03±0.12(123)	8±0.11(110)	8.02±0.08(233)
7	Number of days for weaning (d)	42 days		

8	Pre weaning mortality rate (%)	7.58	6.72	7.17
9	Pre weaning growth rate (gm/d)	160.64±2.73(123)	161.45±2.71(110)	161.02±1.92(233)
10	Post weaning mortality rate (%)	4.88	2.73	3.86
11	Post weaning growth rate (gm/d) (up to 9 m)	271.22±4.13(7)	273.07±3.18(6)	272.07±2.57(13)
12	Overall growth rate (*upto 4 m*) (gm/d)	248.58±1.72(7)	246.37±2.03(6)	247.56±1.3(13)
13	1 month 2 months 3 months 4 months 5 months 6 months	6.35±0.09(129) 9.78±0.06(123) 14.71±0.05(122) 24.08±0.08(101) 35.19±0.5(61) 46.01±0.3(7)	6.35±0.09(113) 9.75±0.06(110) 14.64±0.05(109) 24.29±0.08(88) 35.88±0.12(59) 45.5±0.35(6)	6.35±0.07(242) 9.77±0.04(233) 14.68±0.04(231) 24.18±0.06(189) 35.53±0.26(120) 45.78±0.23(13)

Lifetime production traits:

- Average litter size at birth per sow : 8.1
- Average litter weight at birth per sow : 10.2
- Average litter size at weaning per sow : 7.52
- Average litter weight at weaning per sow : 60.36
- Average litter weight at slaughter per sow : 82.75 (21st III crop)

Specific managemental practice:

- Identification is done by ear notching, employing ear notching pliers on fourth day.
- Castration is not followed in the farm.
- Removal of needle teeth is carried out on fourth day using scissors.
- To combat piglet anemia, iron dextran injection will be given on 4th day and repeated on 14th day.
- To reduce the heat stress of the animals in hot summer farmers were advised to reduce the stocking density in sheds and to 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 to 42d)	163	17	10.43	156	14	8.97	319	31	9.71
Post weaning (42 d to 5 m)	177	12	6.78	234	4	0.17	411	16	3.89
Adult(> 5 m)	47	-	-	111	3	2.7	158	3	1.90

Causes of mortality:

	Male	Female	Total
PRE WEANING			
PM changes	5	3	8
Worm Burden	1	-	1
Pasteurellosis	3	1	4
Pulmonary edema and pneumonia	6	7	13
Traumatic shock	-	1	1
Lymphosarcoma	2	2	4
Total	**17**	**14**	**31**

POST-WEANING			
Pneumonia	3	1	4
PM Changes	1	-	1
Fibrinocystitis	1	-	1
Lymphosarcoma	-	1	1
Prolapse of Internal Viscera	-	1	1
Parasitic enteritis	1	-	1
Pasteurellosis	5	-	5
Suspected for HS/ Swine fever	1	1	2
Total	**12**	**4**	**16**
ADULT			
PM changes	-	1	1
Pasteurellosis	-	1	1
Pneumonia	-	1	1
Total	**0**	**3**	**3**
Grand Total	**29**	**21**	**50**

Measures taken to minimize mortality:

Managemental measures:

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

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

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

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

Nutrition experiment

Studies on the influence of foxtail millet replacement grower diets on the growth performance of LWY crossbred pigs

Fox tail millet (*Setaria italica*) is minor millet crop grown in different parts of Rayalaseema region of Andhra Pradesh along with other millets like Jowar, Bajra, Ragi etc. The nutritive value in terms of protein and energy are slightly more than other millet crops like maize which are commonly used in pig rations. But fibre content is more in it. In the present study replacement of fox tail millet in the grower rations at the rate of 25 to 100 percent of maize was done and the growth performance was studied to find out the most suitable replacement percent.

Thirty growing pigs were divided into five experimental groups in such a way that in each group 6 grower pigs (3male and 3female) were present in a randomized block design. Out of the five groups G1 to G4 are the experimental groups and G5 is the control group. Four experimental rations

R1 to R4 were prepared replacing Maize with Fox tail millet at the rate of 25, 50, 75 and 100% while R5 is conventional grower ration. The ingredient composition and proximate composition of experimental rations were shown in the table 1. The fox tail millet was purchased from Mark fed feed mixing plant, Nandyal, Kurnool district at the rate of Rs. 21/- per Kg.

The experimental animals were dewormed with Panacur 150 mg tablets before the starting of experiment. The animals were fed at the rate of 250 gm per day per animal and the feeding is increased at the rate of 100 gm per week. Each animal is weighed weekly upto the time the animal reaches the body weight 35 kg body weight. The growth parameters like Average Daily Gain, Feed efficiency, Average daily feed intake and cost of feed per kg gain were studied. The data were analysed statistically for significant variation by standard procedures.

Ingredient and chemical composition (%) of experimental grower diets

Ingredient	R1	R2	R3	R4	R5(Control)	Fox tail millet
Maize	45	30	15	0	60	-
De-oiled Rice Bran	14.1	15.1	16.1	16.6	14.1	-
Soybean meal	24	23	22	21.5	24	-
Mineral Mixture	1.3	1.3	1.3	1.3	1.3	-
Lysine	0.09	0.09	0.09	0.09	0.09	-
ZnSo4	0.01	0.01	0.01	0.01	0.01	-
Salt	0.5	0.5	0.5	0.5	0.5	-
Fox tail millet	15	30	45	60	0	-
	100	**100**	**100**	**100**	**100**	**-**
AB_2D_3	0.02	0.02	0.02	0.02	0.02	-
Proximate composition (%) [a]						
DM	93.1	93.4	91.2	90.6	89.9	94.4
CP	13.8	15.2	15.6	15.5	15.6	12.3
TA	6.7	7.3	8.9	9.7	6.5	4.5
EE	2.5	2.4	1.3	0.9	0.8	2.5
CF	8.8	10.0	14.4	16.1	8.0	9.3
DE (kcal/kg)*	3100	3100	3100	3100	3100	-

[a] on Dry Matter basis except for DM ***** Calculated

The data on growth performance was presented in table 2. It was found that there was no significant variation ($p<0.05$) observed with respect to the growth performance i.e Average Daily Gain, Feed efficiency, Average Daily Feed intake and Cost of feed per kg gain among the different treatment groups.On comparison of different replacement groups and control, it was found that 50% replacement group had shown better performance than 25, 75, 100 and control groups.

Effect of dietary treatments on growth performance of cross-bred pigs during Growth phase

Parameter	G1	G2	G3	G4	G5(Control)
Initial weight (kg) [NS]	9.2±0.37	8.68±0.21	7.7±0.73	8.73±0.43	8.46±0.33
Final weight (kg) [NS]	38.63±0.89	37.43±0.92	36.45±0.43	36.4±0.54	37.31±0.63
Weight gain (kg) [NS]	29.43±1.01	28.75±0.87	28.75±1.07	27.66±0.77	28.85±0.79
No. of days [NS]	84±3.13	81.66±3.46	91±6.26	94.5±3.94	86.33±2.95
ADG (g) [NS]	352.04±14.01	354.61±15.50	319.95±12.92	296.19±18.01	335.60±12.19
ADFI (g) [NS]	800±22.36	793.33±24.72	850.44±44.72	875±28.14	816.67±21.08
Feed / kg gain [NS]	2.30±0.13	2.24±0.16	2.70±0.24	3.04±0.27	2.46±0.14
Cost of feed/kg gain (Rs.) [NS]	56.28±3.18	53.85±3.94	63.52±5.62	69.81±6.27	61.42±3.41

[NS] Not significant

The study shown the fox tail millet at 50% replacement group had given better results than other groups and control.

Studies on the influence of foxtail millet replacement finisher diets on the meat quality and fatty acid profile of LWY crossbred pigs

Foxtail millet (*Setaria italica*) is one of the minor millet food crops grown in different parts of Rayalaseema region of Andhra Pradesh. It is considered as diabetic food since it releases glucose steadily without affecting the metabolism of the body. It reduces heart attack risk, high in Anti-oxidants, low fat reduces gastric problems and helps in weight loss. Replacement of this food for maize in finisher rations at different levels is attempted to find out any change in the fatty acid profile of lard and meat quality so that the beneficial effects of foxtail millet may be transferred to the human beings through the consumption of pork.

Experimental diets: Four finisher diets were prepared by replacing maize with foxtail millet at the rate of 25,50,75 and 100 per cent levels. Conventional diet was kept as control. The four experimental diets were designated as R1 (25%), R2 (50%), R3(75%), R4(100%) and R5 as control.

Experimental animals: Thirty finisher pigs were divided into five groups such hat six animals in each group. Three males and three females kept in each group. This was done in a randomized block design. The experimental groups are designated as G1(25%),G2(50%),G3(75%),G4(100%) and G5 control. The experimental diets were fed to the respective groups at the rate of 2.0kg.per animal for a period of 90 days. At the end of the trail, the meat quality parameters, Slaughter traits, Fatty Acid composition and sensory evaluation was studied. Two animals in each group were slaughtered. Lard samples were sent for Fatty Acid composition to Animal feed analytical quality control lab, Namakkal, Tamilnadu. The physicochemical parameters and sensory evaluation was done in Department of LPT, College of Veterinary Science, Tirupati. The proximate composition of the Fox tail millet and the experimental diets are as follows

Ingredient and Chemical composition (%) of experimental finisher diets

Ingredient	T1	T2	T3	T4	T5(Control)	Fox tail millet
Maize	37.5	25	12.5	0	50	-
Deioled Rice Bran	30	30.5	31	31.75	29.5	-
Soybean meal	18.5	18	17.5	16.75	19	-
Mineral Mixture	0.99	0.99	0.99	0.99	0.99	-
Lysine	0.01	0.01	0.01	0.01	0.01	-
Salt	0.5	0.5	0.5	0.5	0.5	-
Fox tail millet	12.5	25	37.5	50	0	-
	100	**100**	**100**	**100**	**100**	**-**
AB_2D_3	0.02	0.02	0.02	0.02	0.02	-
Proximate composition (%) [a]						
DM	93.6	94.0	90.4	90.0	90.1	94.4
CP	12.6	15.8	14.6	14.7	16.6	12.3
TA	7.6	8.8	7.7	8.5	7.7	4.5
EE	3.4	2.0	1.2	1.2	0.5	2.5
CF	11.3	12.6	12.6	14.5	9.5	9.3
DE (kcal/kg)*	3100	3100	3100	3100	3100	-

[a] on Dry Matter basis except for DM * Calculated

The carcass characteristics, meat quality parameters of the pork are as follows.

Experimental diets	Parameter	T1 (25%)	T2 (50%)	T3 (75%)	T4 (100%)	Control
Carcass characters	Carcass Length (cm)	88	70	79.5	81	79
	Loin eye area (Sq. inch)	9.47	12.11	12.34	10.05	11.16
	Back fat thickness (cm)	5.6	1.9	4.3	3.6	2.2
	Weight at slaughter (kg)	153	135	137	142	170
	Dressing percent	62.45	57	60.5	63.5	60
Physico-chemical parameters	pH	5.99	6.04	5.98	5.94	6.04
	2-TBARS Value (mg. Malanaldehyde/kg meat)	0.204	0.199	0.213	0.217	0.199
	Free Fatty Acid Value (%)	0.122	0.116	0.113	0.116	0.116
	Moisture (%)	73.93	75.12	74.91	74.38	75.12
	Total Protein (%)	20.23	19.11	19.87	19.50	19.11
	Total fat (%)	3.94	3.10	3.63	3.11	3.10
	Total Ash (%)	2.11	2.03	2.24	2.04	2.03
Fatty acid composition	Linoleic acid	11.12	17.78	11.08	12.85	14.9
	Eichosapentanoic acid (EPA)	0.14	0.15	0.1	0.17	0.0
	Docosahexanoic acid(DHA)	0.14	0.1	0.09	0.12	0.0
Sensory evaluation	Colour	6.5	6.5	6	5.75	6.5
	Flavour	6.75	7	6	6.75	7
	Juiceness	7	7.5	6	6.75	7.5
	Tenderness	7	6.5	6.5	6.25	6.5
	Overall acceptability	7.25	7	6	6.5	7

The data on slaughter parameters, physico chemical properties, omega -3- fatty acids and sensory evaluation parameters of pork were presented in table 2. The weight at slaughter was ranged from 135 – 170 kgs in the groups 50% and control respectively. The dressing percentage is more in 100% group and minimum in 50% group. The loin eye area is more in 75% and less in 25% group. The back fat thickness is more in 25% and less in 50% group. Carcass length is more in 25% group and less in 50% group. It is observed that the carcass characters were better than that of control group.

With respect to physico chemical properties, the pH ranges from 5.94 to 6.04 among treatment and control groups. The 2-TBARS values ranges from 0.199mg to 0.217mg among treatment and control groups. The free fatty acid values ranges from 0.113(%) to 0.122(%). The moisture ranges from 73.93(%) to 75.12 (%). The total protein, total fat and total ash ranges from 19.11(%) to 20.23(%), 3.10(%) to 3.94(%) and 2.03(%) to 2.24(%), respectively in treatment and control groups.

On comparison with control group the Eichosapentanoic acid and Docosahexanoic acid were present in treatment groups. The linoleic acid levels were more in control group. Among different treatment groups Eichosapentanoic acid levels were more in 100% group and Docosahexanoic acid levels were more in 25% group.

Sensory evaluation: The score card for the different treatment groups and control was ranging from just good to moderately good (between 6 and 7). The overall acceptability is moderately good.

The study shown that replacement of Foxtail millet at different levels had improved the carcass characters, Omega-3 fatty acid levels, physicochemical characters and sensory characters over the conventional ration. However as far as the omega-3 fatty acids were concerned, 50% treatment group had shown better results than the other treatment groups.

Adoption of integrated farming systems: At present we are growing tuber crops like sweet potato in the existing land of about 30 cents. About 100 kgs of sweet potatoes were harvested and fed.

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

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

Disposal pattern of farm waste, pig excreta *etc*/Establishment of biogas plant: The farm waste or pig excreta are used periodically for the plants as manure in the research station premises. The remaining manure being supplied to LPM department in college for growing green fodder. During the year 2013-14 a biogas unit was established in the project. Pig manure was stored in a separate manure pit and used for production of biogas.

Production economics:

i) Cost of production/pig up to slaughter age: The 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 was Rs. 142/-.

Extension programme with success story:

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

Training programmes conducted: Two training programmes on **"Economic Pig rearing and marketing of pigs and pork"** was conducted on 18.1.2017 and 19.01.2017 to 60 number of pig beneficiaries of different regions of Andhra Pradesh on various aspects of economic pig rearing in management, feeding, Breeding and marketing of pork and animals *etc*. for getting more profits through pig farming.

ii) In the field: One training programme on **"Economic Pig rearing and marketing of pigs and pork"** was conducted on 3.3.2017 to 30 number of pig beneficiaries of Pakalavari palle village of Chandragiri Mandal, Chittoor district.

Supply of Germplasm: A total of 206 pigs were supplied to beneficiaries of different regions of Andhra Pradesh and feedback as impact study was collected from the field.

Success stories:

Sri. K L N Raju, Rayachoti (M), Kadapa District, Andhra Pradesh: This farmer has newly set up a pig farm by taking 15 growers from this center. He has constructed a pucca shed to house the animals and feeding the animals with vegetables waste, Rice bran and rice crumbles. He personally supervising the farm and wanted to breed the animals and sell the piglets to the local market. The cost of pigs in the local market is around Rs. 90-100/- per kg live weight.

Sri. Kishore kumar, Kurnool, Kurnool District: He is a new pig farmer started pig farm with 40 number of weaners purchased from this centre. He is feeding the animals with leafy vegetables, hydrophonic fodder and concentrates. He has constructed a pucca shed for housing the animals. He wanted to sell the animals and pork. He is expecting fair profits after 6 months.

Sri. Krishnam naidu, Irala mandal, Chittoor district: He is an existing pig farmer and has taken 30 piglets from this center. He is maintaining the animals in a chain link enclosure erected in the mango garden. He fed the animals with vegetable waste, bran and concentrate feed. He wanted to breed the animals to produce the piglets for the market. He is selling the animals at the rate of 90/- per kg live weight. He himself supervising the farm.

Salient achievement during the report period:

During the year 2016-17, 22nd generation I crop animals performance was recorded upto 6 months of age and the performance of 21st generation IIIrd crop animals was recorded upto 10 months.

22nd generation I Crop: At the beginning of the year 2016-17 (as on 01-04-2016) there were 123 no. of 21st generation III crop animals (31 males and 92 females) present. 31 farrowings were occurred during the reporting year and 251 piglets were born (132 male and 119 females). 122 growers were disposed. The data was recorded on litter traits and body weights upto 6 months of age. The litter size and weight at birth and weaning were recorded as 8.1nos, 10.2 kg. & 7.52nos, 60.74 kg, respectively. The average individual weight at birth was 1.26 kg, and at weaning was 8.02 kg. The overall monthly body weights from 1st to 6th month were 6.35, 9.77, 14.68, 24.18, 35.53 and 45.78 kg, respectively. The mortality rates during pre-weaning (7.17%) & post-weaning (3.86%) were within the permissible level. The overall growth rate upto 6 months of age was 247.56 g/day.

21st generation III Crop: The overall body weights (kg) at 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 months of age were recorded as 6.27 (n=234), 9.82 (n=233), 14.92 (n=210), 25.20 (n=199), 36.30 (n=165), 46.81 (n=128), 60.45 (n=119), 69.74 (n=119), 75.55 (n=118) and 79.49 kg (n=116), respectively.

Purchase of animals: Four growers *i.e* two males and two females were purchased from ICAR-AICRP on Pigs, Kattupakkam centre at a cost of Rs.66,667/- for breeding purpose.

Life time production traits: The life time production traits for the 22nd generation with respect to litter size at birth and weaning (nos) were 8.1 and 7.52. The litter weight (kg) at birth and weaning were 10.2 and 60.74, respectively.

Distinguish visitors

1. Dr. E. Raghava Rao, Director of Research, SVVU, Tirupati visited the centre on 19.10.2016.

2. Dr.D.Sreenivasulu, Director of Extension, SVVU, Tirupati visited the centre on 18-1-2017
3. Dr. T.Madhava Rao, Member Board of Management, Tirupati visited the centre on 18-1-17.
4. Dr. T.Chandra Sekhara Rao, Dean, FVSc, SVVU, Tirupati visited the centre on 19.1.2017.

Month	Temperature (ºC)		Humidity	THI
	Minimum	Maximum		
April, 2015	29.38	**40.06**	61.52	95.12
May	29.53	38.75	63.04	92.86
June	27.37	34.78	63.86	87.33
July	27.07	34.24	73.86	88.51
August	27.81	34.9	64.68	87.67
September	23.76	31.96	71.9	84.66
October	25.63	33.99	69.32	87.25
November	22.77	30.54	71.11	82.37
December	22.53	29.73	77.62	82.13
January, 2016	**20.86**	29.39	73.89	81.04
February	22.58	31.33	70.75	83.5
March	23.22	33.35	72.19	86.82

AI infrastructure

Artificial Insemination

Training and piglet distribution

Newly constructed Pig Shed at Kishore kumar Pig farm, Kurnool

Pigs at farmers' field

TAMILNADU VETERINARY AND ANIMAL SCIENCE UNIVERSITY, KATTUPAKKAM

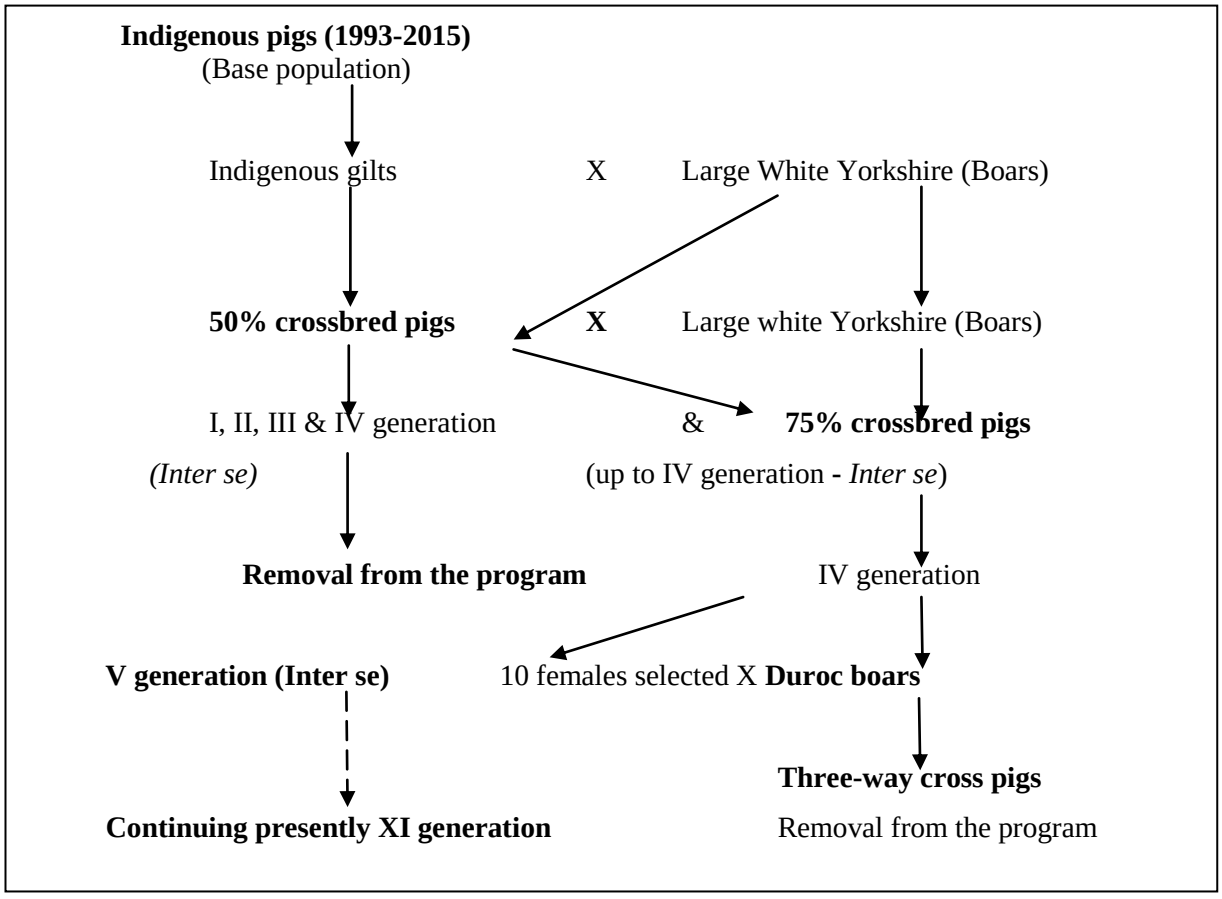
The scheme on "AICRP on Pigs" is functioning at Livestock Research Station, Kattupakkam since 1993-1994. During the period under report, thirty sows of VIII and IX generation parents were inter se mated to produce IX generation progenies and X generation progenies. The closing balance on 31.03.2017 was 131 crossbred pigs.

Herd dynamics

Particulars	Adult		Grower		Suckling		Total
	M	F	M	F	M	F	
Opening Balance	**8**	**26**	**49**	**75**	**1**	**5**	**164**
Additions							
Birth	-	-	-	-	278	279	557
Internal transfer	20	60	259	266	-	-	605
Purchase	-	-	-	-	-	-	-
Total Additions	20	60	259	266	278	279	1162
O.B + T.A	28	86	308	341	279	284	1326
Deletions							
Death	-	1	6	4	20	18	49
Sold for breeding	-	3	230	210	-	-	443
Sold for slaughter	14	35	25	24	-	-	98
Internal transfer	-	-	20	60	259	266	605
Total Deletions	14	39	281	298	279	284	1195
Closing Balance	**14**	**47**	**27**	**43**	**-**	**-**	**131**

1) Breeding strategy of the farm as approved

FLOW CHART OF BREEDING STRATEGY



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

(i) Sex ratio : 1: 3

(ii) No. of breedable pigs

75% crossbred : 10: 30

(iii) Selection procedure : Sequential selection

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

Performance:

XI th generation Ist crop

Sl.	Traits / Character	**Mean ± SE (no. of observation)**		
		Male	female	total
1	Litter size at birth(no.)	2.69 ± 0.30(23)	3.17 ± 0.31 (23)	5.86 ± 0.30(23)
2	Litter weight at birth (kg)	3.48 ± 0.41 (23)	4.06 ± 0.37 (23)	7.74 ± 0.46 (23)
3	Litter size at weaning(no.)	2.60 ± 0.30 (23)	3.13 ± 0.31 (23)	5.60 ± 0.39 (23)
4	Litter weight at weaning(kg)	15.96 ± 1.66(23)	18.52± 1.89(23)	33.69 ± 2.10 (23)
5	Avg. Individual weight at birth (kg)	1.29 ± 0.02 (62)	1.28 ± 0.02 (73)	1.28 ± 0.01 (135)
6	Avg. Individual weight at weaning (kg)	6.02 ± 0.14 (61)	5.90 ± 0.12 (68)	5.96 ± 0.09 (129)
7	Number of days for weaning(d)	30th Day		
8	Pre weaning mortality rate (%)	1.61	6.84	4.44
9	Pre weaning growth rate(gm/d)	157	154	156
10	Post weaning mortality rate(%)	-	-	-
11	Post weaning growth rate (gm/d)	287	303	298
12	Overall growth rate (uto 9 m)(gm/d)	273	288	283
13	Body weight (Kg)			
	1 month	6.14 ± 0.13 (44)	6.18 ± 0.10 (27)	6.16 ± 0.09 (67)
	2 month	11.26 ±0.28(12)	12.94 ±0.72(22)	12.36 ±0.33(34)
	3 month	20.59 ±0.48(11)	21.08 ±0.96(21)	20.64 ±0.48(32)
	4 month	29.23 ±0.25(10)	29.85 ±0.21(21)	29.38± 0.63 (31)
	5 month	40.12 ±0.12(10)	39.26± 0.53 (21)	40.01 ± 0.28 (31)
	6 month	52.25 ± 0.35 (9)	50.25± 0.25 (16)	51.67± 0.28(25)
	7 month	64.04±0.29(3)	62.54 ± 0.16(7)	64.05 ± 0.18(10)
	8 month	72.06 ± 0.29 (3)	71.09±0.50(6)	72.13± 0.16 (9)
	9 month	75.02± 0.15 (2)	79.08 ±0.29 (5)	77.86 ±0.28(7)

Life time production traits

Traits	**Mean ± SE (no. of observation)**
Average litter size at birth per sow	21.16 ± 0.84 (10)
Average litter weight at birth per sow	25.38 ± 0.90 (10)
Average litter size at weaning per sow	20.00 ± 0.85 (10)
Average litter weight at weaning per sow	101.88 ± 3.81 (10)
Average litter weight at slaughter per sow	235 ± 28.67 (10)

Specific managemental practice

(a) Identification

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

(b) Castration: In swine farming, castration is useful for fattener production. Only a few selected male piglets were left intact as potential sires (boars) for future breeding and remaining males were

castrated and put for fattener pig production. Castration was performed by open method prior to weaning or at the time of weaning.

Mortality Parameter

Genetic group-wise mortality rate - 75 % crossbred,

(Pre- weaning and post weaning)

	Pre-weaning (1 days to 42 days)			Post-weaning (42 days to 1 year)		
	M	F	T	M	F	T
Animals at risk	279	284	563	308	341	649
Animals died	20	18	38	6	4	10
Mortality (%)	7.16	6.33	6.74	1.94	1.17	1.54

Causes of mortality

Suckler		
1	Crushing	7
2	Stress(Vardha cyclone)	23
3	Miscellaneous (Weaklings, Runt, Anorectic,)	3
4	Enteritis	2
5	Atresia ani	1
6	Nervous	1
	Total	38
Grower		
1	Enteritis	4
2	Debility	1
3	Hepatitis	1
4	Miscellaneous (Weaklings, Runt, Anorectic)	2
5	Paralysis	1
6	Pneumonia	1
	Total	10
Adult		
1	Haemorrhagic shock	1
	Total	1

Measures to taken minimize mortality:

- Health problems such as anorexia, lameness, maggot wound, metritis, mastitis, enteritis, etc. were treated with appropriate medicines and efforts were taken to minimize mortality through prophylaxis.
- 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 Measure

Particulars	01-04-2016 to 31-03-2017
No. of pigs treated	230
No. of pigs dewormed	763
No. of growers castrated	110
No. of animals vaccinated against Swine Fever	455
No. of animals vaccinated against Foot and Mouth Disease	151
No. of animals Vaccinated against Circo virus	527

Nutrition Trails Conducted

1. Isolation and identification of species specific probiotic in swine and its impact on growth performance in piglets
2. Effect of dietary supplementation of betaine on reproductive performance in sows during summer

Adoption of Integrated Farming Systems:

Horti – Silvi – Pasture component

Horti – component		
Guava	:	120 Nos.
Lemon	:	69 Nos.
Mango	:	145 Nos.
Sapota	:	49 Nos.
Total		383 Nos.
Pasture component		
Desmanthus virgatus	:	2.5 ac.
Seed collected	:	350.0 Kg.
Stylosanthus hamata	:	2.5 ac.
Seed collected	:	320.0 Kg.
Fish varieties		
Mirgal-Rogu-and Cutla	:	Under Progress
Vegetables		yield
Pumpkin, Ladies finger,Bitter guard, bottle guard, Brinjal, Spinach, Snake guard	:	436 kgs

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 under progress and efforts are taken to install a biogas unit.

Production economics:

1	Cost of production/pig up to slaughter age	:	Rs. 3500.03
2	Cost of production/ kg pork	:	Rs. 67.30

Extension programme with success story:

At the institute:

I) Training Conducted

Training	Date	Place
One day training programme on pig farming	20.01.2017 and 06.03.207	PGRIAS,Kattupakkam

Radio Talk

1. "Venpanri inangalum thervu muraigalum " in All India Radio,Puducherry
2. "Ulnattu matinangalin melanmai" in All India Radio, Tamil Nadu

Guest Lecture Organized / Delivered

Sl.no	Topic	Date	Place
1.	Venpanri Kazhivu Melanmai	Work shop on Scientific ways of farm waste management (6th October 2016)	PGRIAS, Kattupakkam

Exhibition conducted/Participated

Exhibited live specimens of Large White Yorkshire, Duroc and 75% Large White Yorkshire pigs and explained to school students and visitors about importance of pig rearing in Science City Festival organised by Government of Tamil Nadu at Queen Marry's College, Chennai on 10.02.2017 – 12.02.2017.

Salient Achievement during the Report Period:

1. VIII ,IX ,X and XI generation parents of 75 % crossbred pigs were pen mated to produce IX, X,XI and XII generation progenies, and desi pigs were hand mated and produced 557 progenies.
2. Breeding sale of 443 piglets to needy farmers and four new field units were established.
3. Breed validation – A Crossbred breed (75% LWY + Desi) was developed at AICRP unit, Kattupakkam. The same was validated by Dr.A.P.Usha, Professor and Head, Centre for Pig Production and Research, Mannuthy, Kerala.

Project work of students (MVSc./Ph.D.)

1. Isolation and Identification of Species Specific Probiotic in Swine and its Impact on Growth Performance in Piglets
2. Effect of Dietary Supplementation of Betaine on Reproductive Performance in Sows during summer
3. Genetic Evaluation of Large White Yorkshire for Production and Reproduction performance

Distinguished visitors:

Date	Name of Visitor	Affiliation
14.06.2016	Wazne Ganpat	Dean, Faculty of Food and Agriculture University, West Indies.
09.07.2016	S.Madhumathi	Director, Technical Education,Chennai
22.08.2017	Dr.V.P.Chahal	ADG(Agriculture Extension), ICAR
12.07.2016	P.Balakrishna Reddy	Minister for Animal Husbandry, Govt.of. Tamilnadu
18.07.2016	Tithankar Das	Additional Director, Lok sabha
29.07.2016	Dr.Hollie Schramm and students	Virginia Tech College of Veterinary Medicine
27.08.2016	Mr.Ponmani Mr.Jayaram Mr.P.Narayan	Rotary club of Mahindra Industrial city.

Installed nipple drinker to all the sheds

Installed foggers in the pig sheds

Training activities

Intigrated farming unit

Damage by cyclone

Visit of dignitories

Field unit

INDIAN VETERINARY RESEARCH INSTITUTE, IZATNAGAR, BARIELLY

IVRI Centre of All India Coordinated Research Project on Pig came in existence during the year 1971 (IV Five Year Plan) in order to study the performance of Landrace pigs under farm conditions. However, subsequently the technical programme was modified to evaluate the indigenous and crossbred genotypes with Landrace blood of 75% and 50%. 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 purebred Landrace 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 felt and 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 of 265 numbers.

1. Herd dynamics Herd strength of 75% Crossbred pigs

Sl.No	Age (months)	Opening Balance	Additions Births/ Transfer	Disposals				Closing balance
				Deaths	Transfers	Sold	Slaughter	
1	Piglet (upto 42 days)	33	591	35	-	-	-	108
2	Grower (42 d-5 m)	9	-	15	53	286	-	44
3	Finisher (5 -8 m)	42	-	-	-	23	-	41
4	Breeding female	44	-	03	-	19	-	54
5	Boar	22	-	01	-	41	-	18
	Total	**150**	**591**	**54**	**53**	**369**	**-**	**265**

Herd strength of Landrace pigs

Sl.No	Age (months)	Opening Balance	Additions Births/ Purchase	Disposals				Closing balance
				Deaths	Transfers	Sold	Slaughter	
1	Piglet (up to 42 days)	-	-	-	-	-	-	-
2	Grower (42 d-5 m)	-	10	-	-	-	-	-
3	Finisher (5 -8 m)	-	-	-	-	-	-	-
4	Breeding female	-	-	-	-	-	-	7
5	Boar	-	-	-	-	-	-	3
	Total	**-**	10	**-**	**-**	**-**	**-**	**10**

Herd strength of Desi pigs

Sl.No	Age (months)	Opening Balance	Additions Births/ Transfer	Disposals				Closing balance
				Deaths	Transfers	Sold	Slaughter	
1	Piglet (up to 42 days)	-	16	-	-	-	-	-
2	Grower (42 d-5 m)	-	-	2	-	-	-	
3	Finisher (5 -8 m)	4	-	-		17	1	-
	Total	**4**	**16**	**2**	**-**	**17**	**1**	**Nil**

2. Breeding strategy of the farm as approved

In order to maintain 75% exotic blood line by inter-se- mating, minimum 30 breedable sows unit are maintained with a sex ratio of 1:3 with 10 sires (2 sires from each 5 unrelated lines). During this year, a total of 591 CB (75%) animals were born. Selection of male animals was done based on weaning weight and 8 month body weight, based on two stage sequential selection. The selection of breeding animals was done considering cyto-genetic screening of population. Selection of female animals should be based on dam's litter size at birth and weaning weight and number of functional teats. Three numbers of farrowings per sow completed in 2 years were recorded.

Performance of animals (75% Crossbreds Pigs)

Sl No.	**Traits/characters**	**M**	**F**	**Total**
1.	Litter size at birth (no.)	4.22±0.22(74)	3.77±0.21(74)	7.99± 0.26(74)
2.	Litter weight at birth (kg)	4.23±0.24(74)	3.59±0.21(74)	7.82±0.27(74)
3.	Litter size at weaning (no.)	3.83±0.23(60)	3.63±0.25(60)	7.46±0.32(60)
4.	Litter weight at weaning (kg)	32.38±2.14(60)	30.19±2.25(60)	62.57±2.94(60)
5.	Avg. individual weight at birth (kg)	0.98±0.02(312)	0.96±0.02(279)	0.97±0.01(591)
6.	Avg. individual weight at weaning (kg)	8.33±0.34(230)	8.51±0.32(218)	8.46±0.31(448)
7.	Number of days for weaning (d)	42		
8.	Pre weaning mortality rate (%)	4.49%	6.89%	5.60%
9.	Pre weaning growth rate (gm/d)	177.98(253)	177.62(228)	178.22(481)
10.	Post weaning mortality rate (%)	1.96%	4.09%	3.17%
11.	Post weaning growth rate (gm/d) (up to 24 weeks)	510.31±0.01(19)	480.60±0.01(37)	487.01±0.01(56)
12.	Overall growth rate (*up to 8 m*) (gm/d)	469.27±0.01(11)	444.77±0.02(17)	454.40±0.01(28)
13.	Body weight (kg) 1 Month	5.90±0.11(253)	5.71±0.11(231)	5.81±0.08(484)
	2 Month	11.76±0.20(252)	11.78±0.22(224)	11.77±0.15(476)
	3 Month	22.60±0.34(230)	22.15±0.40(194)	22.39±0.26(424)
	4 Month	37.91±0.56(147)	36.31±0.75(124)	37.18±0.46(271)
	5 Month	55.11±0.85(66)	53.31±0.93(86)	54.09±0.65(152)
	6 Month	69.58±1.65(20)	67.18±2.05(37)	68.02±1.46(57)
	7 Month	88.41±3.00(12)	85.06±4.94(17)	86.45±3.15(29)
	8 Month	105.47±3.89(12)	100.67±5.19(17)	102.65±3.45(29)
14.	Age at slaughter (d)	-	200 (2)	200 (2)
15.	Weight at slaughter (kg)	-	85.5±5.58(2)	85.5±5.58(2)
16.	Dressing percentage (%)	-	70.29±2.26(2)	70.29±2.26(2)
17.	Carcass length (cm)	-	188.9±7.56(2)	188.9±7.56(2)
18.	Back fat thickness (cm)	-	3.69±0.03(2)	3.69±0.03(2)

Lifetime production traits

s. no	**sow no.**	**total furrow -wing**	**total litter size at birth**	**Avg litter size at birth**	**total litter weight at birth**	**avg litter weight at birth**	**total litter size at weaning**	**avg litter size at weaning**	**total litter weight at weaning**	**avg litter weight weaning**
1	31	4	29	7.25	25.00	6.25	26	6.50	240.70	60.17
2	32	4	29	7.25	23.70	5.92	20	5.00	156.60	39.15
3	197	4	28	7.00	35.00	8.75	28	7.00	257.50	64.37
4	34	3	34	11.33	35.00	11.66	32	10.66	287.00	95.66
5	167	3	20	6.66	18.10	6.03	20	6.66	165.20	55.06
6	217	3	28	9.33	26.10	8.70	23	7.66	208.30	69.43
7	235	3	27	9.00	31.20	10.40	24	8.00	225.80	75.26
8	256	3	27	9.00	22.70	7.56	27	9.00	142.40	47.46
9	C-260	3	16	5.33	15.30	5.10	14	4.66	120.30	40.10
MEAN ± SE			**26.44±1.77**	**8.01±0.59**	**25.78±2.30**	**7.81±0.74**	**23.77±1.76**	**7.23±0.62**	**200.42±19.01**	**60.74±6.03**

Specific managemental practices:

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

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

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

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 of age, respectively, in all piglets. Besides, the vaccination of FMD and Swine Fever is regularly done in all the stock. During the year, 323 animals were vaccinated against FMD and 346 animals were vaccinated against Swine Fever. The deworming of animals and disinfection was also done. Treatment of ailing cases is also being done regularly.

Disposal of diseased carcass: Dead animals are incinerated after the PM examination.

Causes of mortality in pigs during 2016-17

Sl. No.	Causes of mortality	Desi	CB 75%
1.	Autolysis/NSD	-	1
2.	Pneumonia	1	10
3.	Enteritis	-	4
4.	Nephritis	-	1
5.	Pneumo- enteritis	-	4
6.	Acute enteritis	-	1
7.	Fibrous polyserositis	-	1
8.	Catarrhal enteritis	1	6
9.	Septicemia	-	5
10.	Fibrinous Peritonis	-	1
11.	Hepatitis	-	1
12.	Hepatitis and intestinal pneumonia	-	3
13.	Supportive Pneumonia	-	1
14.	Haemothorex pneumonia	-	1
15.	Brain hemorrhage	-	1
16.	Internal hemorrhage	-	1
17.	Hemorrhagic gastritis	-	2
18.	Haemorrhagic colitis & typhitis	-	2
19.	Cold stress	-	1
20.	Lung abscess with pleuritis	-	1
21.	Pseudomembraneous colitis and typhitis	-	1
22.	Umbilical pneumonia	-	1
23.	Trauma	-	1
24.	Pulmonary edema	-	1
25.	Fibrinous plueropneumonia and pericarditis	-	1
26.	Volvulous of small intestine	-	1
27.	Still birth	-	31
28.	Mummified	-	2
	Total	**2**	**87**

Experimentation:

Characterization and documentation of Desi pigs of Bareilly District

The present investigation was undertaken in six tehsils of Bareilly district in Uttar Pradesh to evaluate the phenotypic attributes of Desi pigs for the first time ever. A total of 632 Desi pigs were selected for the study. The results revealed that the predominant coat colour of Desi pigs was black with skin pigmentation of complete black (96.14%), greyish-black (2.42%) and brownish (1.73%). Mean adult body weight was 53.10±0.47 kg and 53.50±0.40 for males and females, respectively. Head was elongated with triangle shaped face with long and short snout. Majority of them had erect leaf shaped ears (82.98%), with upward or horizontal orientation.

The average age at first farrowing, farrowing interval, gestation period, piglet weight at birth, litter size, litter weight at birth and piglet mortality were 12.16±0.13 months, 7.10±0.30 months, 113.67±0.17 days, 0.85±0.03 kg, 6.85±0.16, 5.83±0.18 and 25.15±0.79% respectively. Desi pigs were reared mostly in scavenging system (92.16%) followed by extensive system. They were bred mainly through natural mating using any male (97.17%). Majority of farmers kept their desi pig in confinement during night only (87.7%). They housed their pigs in kachcha house (80.17%). Under molecular characterization using FAO-ISAG microsatellite markers, the mean number of observed alleles (Na), Effective number of alleles (Ne), the observed (Ho) and expected (He) heterozygosity values, polymorphic information content (PIC) and F-values were 8.5±0.99, 5.01±0.57, 0.47±0.04, and 0.71±0.05, 0.74±0.04 and 0.39±0.03, respectively.

Assessment of sexual behavior and its association with training and semen quality in AI boars

The present study on assessment of sexual behaviour and its association with training and semen quality in AI Boars was conducted at ICAR- AICRP on pig, IVRI unit. The study was conducted in three phases. In phase-I, 23 crossbred piglets of identical physical and physiological parameters and age were selected and grouped in three pens based on their body weight. Pre pubertal mounting behaviour was recorded by direct observation in 15 observation sessions. Simultaneously, recording of body weight, testicular size and testosterone level were also done. In Phase-II, training of these boars after attainment of puberty and assessment of sexual activity during training on two different dummies (portable vs fixed) was done. Phase-III was related with assessment of libido of 11 trained boars at the time of semen collection and evaluation of seminal parameters for subsequent six months. In classified mounting sexual mounting was most common.

Most mounting events were between one and 10 s. Sexual mounts were longer than nonsexual mounts and provoked more screaming by the recipients being mounted. Frequency of sexual mounting with time was decreased in all treatment groups. Peak for testosterone level was recorded at 130 days of age in higher body weight group, 145 days in medium body weight group and 160 days in low body weight group. Testicular volume and testicular index were higher at all days of recording in higher body weight group. Correlation between prepubertal sexual mounting and body weight, ADG, testicular volume, testosterone index and testosterone level were inconsistent. Success rate of training

on portable dummy in 14 days schedule was 100% with average days of 8.45, while on fixed dummy no boar could be trained. Sexual behaviour expression on portable dummy was significantly higher as compared to fixed one. There was non-significant difference of sexual behaviour expression between dummy with estrus and non estrus urine. As age and sexual experience increases, boars spent more time on productive period. Libido index was also increased with time. Results of sexual behaviour parameters like false mount, penile reaction, urination, biting the dummy and rubbing on dummy were not consistent with age. False mount was significantly positively correlated with reaction time. Colour of semen, sperm motility, live sperm % and pH had inconsistent correlation with seminal parameters.

Study on pig manure conditioning for efficient biogas production

Pig manure is a poor substrate for biogas production and the reason identified were higher ammonical nitrogen, lesser C: N ratio and slightly more pH. In- vitro conditioning of pig manure was done using dilution, carbonization and acidification to rectify amonical nitrogen, C: N ratio and pH in pig manure. The best combination for biogas substrate from pig manure was dilution by 1:8, carbonization by addition of 4.4% (w/v) carbonaceous material and acidification by addition of 0.375% (v/v) of inorganic acid, which was further used for final validation through in-vitro biogas production. The biogas digester and collector were fabricated using low cost locally available production materials. Four treatment groups, comprising of NC (negative control; dilution), PC (Positive control; dilution with ruminal microflora from cow dung at the rate 2% w/v), T_1 (Treatment 1; dilution and carbonization and acidification along with ruminal microflora; 2% w/v), T_2 (Treatment 2; dilution, carbonization and acidification along with ruminal microflora; 2% w/v), were designed. The hydraulic retention time (HRT) was lower in T_1 group (41days) than T_2 group (43 days), PC group (54 days) and NC group (92 days). The average biogas production was significantly (($P \leq 0.01$) higher in both treatment groups than control groups. The methane content was significantly ($P \leq 0.01$) higher in both treatment groups than control groups. The total solid content of the spent slurry was significantly ($P \leq 0.05$) higher in control groups than the treatment groups, however, opposite trend was observed for crude protein content. Similarly, the crude fiber percentage was significantly (($P \leq 0.05$) higher both in NC and T_1 group than PC and T_2 group. The electrical conductivity (EC) and total dissolve solid (TDS) content in the treatment groups was significantly ($P \leq 0.01$) higher than control groups, whereas, the pH and temperature of the slurry has non- significant among groups. While comparing the manure value with the soil as control, except sulfur other manure constituents were higher in treatment groups. Both the treatment groups had higher economical gain then control groups for biogas production. It was concluded that pig manure conditioning has a great potential for biogas production from pig manure with more methane content. Furthermore, spent slurry has enough germination potential manure value and this technology can be directly helpful in better income generation from swine enterprise.

Health care management of practices at SPF during 2016-2017

Sl. No.	Symptoms/ Ailments	Number of cases
1.	Wound/Injury	623
2.	Lameness	30
3.	Digestive problem/ Diarrhea	130
4.	Skin lesions/ Dermatitis/ Pox like lesions	88
5.	Fever	30
6.	Weakness/ Dullness	90
7.	Hernia	14
8.	Abscess	04
9.	Hypoglycemia	10
10	Anorexia	03
11	MMA syndrome	12
12	Abdomen hematoma	01
	Total:	**1035**

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

Extension programme with success story:

At Institute:

i) NR Sahoo. 2016. Delivered two lectures on “Sukar Prajanan Byabastha” and “Sukar Prajatiya” in KVK Training on “Improved Pig Production” on 30.08.16

ii) NR Sahoo. 2016. Delivered a lectures on “Sukar Prajanan Byabastha” in KVK Training on “Improved Pig Production” on 07/01/17

iii) NR Sahoo. 2016. Participated in programme "Sukar Palan' which was telecasted live under "Hello Kisan" on DD KISAN channel in 14th JUNE 2016 at 06:00 to 07:00 P.M

iv) NR Sahoo. 2016. Participated in programme “Krishi Pathsala” to deliver on topic “Byabasaya Ke Rup Me Shukar Palan” which was recorded at AKASBANI, RAMPUR on 31.01.2017

v) G K Gaur. 2016. Pig management. 9th Livestock Championship & Expo at Shri Mukatsar Sahib, Punjab on 4 December 2016.

vi) Gaur G K. 2016. Vagyanic sukar palan avam prabandhan kaise karai. Farmers Training at JDE, Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh on 28th May 2016.

vii) Gaur G K. 2017. Sukar jatia. Farmers Training at KVK, Indian Veterinary Research Institute, Izatnagar, Uttar Pradesh on 4 January 2017.

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

Scientific publications in Journal- 8

Distinguished visitors:

- Dr.Trilochan Mohapatra, Secretary, DARE and Director General ICAR
- Dr. H. Rahman, DDG (Animal science), ICAR
- Dr.V.R.Katoch, Former secretary DHR & DG, NASI, ICAR, Chair in Public Health Resource, Jaipur
- Prof. P. K. Uppal, Adviser Animal Husbandry Dairy and Fisheries, Punjab govt. Chandigarh

Visit of Honorable Secretary, DARE and Director General ICAR Dr. Trilochan Mohapatra and DDG (Animal science), ICAR Dr. H. Rahman to ICAR-AICRP, IVRI unit

ICAR-AICRP staffs doing regular farm activities like semen collection feeding and watering.

Crossbred (75 % L x 25 % D) sow piglet

Newly purchased Landrace stock

Bio-security arrangements at farrowing shed

Farrowing shed (Internal view)

ICAR-CENTRAL COASTAL AGRICULTURAL RESEARCH INSTITUTE, GOA

Goa and coastal states are having more per capital income in the country. The states are popular for tourism, where domestic as well as foreign tourist visit often. Therefore, this state has continuous demand of meat, beef, sausages, chicken etc. Livestock improvement will help rural population to increase the related products which will help them to be more sustainable. The production of pork and pork products is a household activity through the traditional knowledge in most of coastal areas of our country. Availability of higher quantity of pork for preparing the products will help to make the activity self-sustainable. The activity may become self-sustained over a period of time only when there is use of advance techniques. Pig industry is slowly growing in past 10years. This change is not in terms of population but from quality point of view. Livestock census2012 of the Goa state indicated that there is increase in crossbred pig population in the state indicating pig grower's interest in advance technology. Suitable breed, crossbreeding of local pig breed, controlled breeding using synchronization and AI, standard balanced feeding, comfortable housing of pigs will lead to improved pig production and benefit the growers. AICRP on pig Goa centre is attempting to provide these knowhow to the pig growers of the region through trainings and demonstrations 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	Sol	
1	Piglet(upto42days)	33	242	-	11	208	-	56
2	Grower(42days-5months)	42	X	208	5	65	148	32
3	Finisher(5m-8months)	4	X	65	1	16	43	9
4	Breeding female	31	X	13				44
5	Boar	26	X	3			4	29
Grand total		**136**	**242**	**289**	**16**	**289**	**195**	**170**

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. AgondaGoan, Large White Yorkshire and crossbred 50% are maintained for production of crossbred 75% so as to avoid inbreeding.

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

Sl. No.	**Traits/Characters**	**Mean±SE**		
		M	**F**	**Total**
1	Litter size at birth (n=32)	4.46±0.85	3.60±0.95	8.06±0.89
2	Litter weight at birth (kg) (n=32)	4.49±0.65	3.51±0.59	8.01±0.78
3	Litter size at weaning(no.) (n=32)	4.3±0.46	3.4±0.36	7.7±0.48
4	Litter weight at weaning(kg) (n=32)	31.43±3.40	24.68±2.92	55.73±4.51
5	Avg. Individual weight at birth (kg)	1.007±0.29(n=134)	0.975±0.38(n=108)	0.993±0.23(n=242)
6	Avg. individual weight at weaning(kg)	7.30±3.00(n=128)	7.25±4.47(n=103)	7.23±2.56(n=231)

7	Number of days for weaning(d)	40 days		
8	Pre weaning mortality rate (%)	4.47%	4.62%	4.54%
9	Pre weaning growth rate(mg/d)	157.32±7.71	156.87±12.33	155. 9±8.86
10	Post weaning mortality rate (%)	3.89%	4.13%	4.01%
11	Post weaning growth rate (mg/d)	281.85±11.07(n=37	271.4±10.30 (n=30)	314.35±7.41(n=67)
12	Overall growth rate (*up to 9m*) (mg/d) (*up to 10m*) (mg/d)	267.82±9.82(n=25) 278.57±9.92(n=20)	259.16±10.85(n=30) 271.1±9.24(n=20)	263.49±7.22(n=55) 274.83±15.9(n=40)
	Bodyweight (Kg) 1 month 2 month 3 month 4 month 5 month 6 month 7 month 8 month 9 month 10 month	 6.10±0.21 (n=130) 12.87±6.37 (n=90) 19.62±0.56 (n=65) 27.65±1.01 (n=37) 35.46±2.49 (n=37) 45.89±1.90 (n=37) 54.04±2.02 (n=37) 63.67±2.10 (n=37) 72.15±2.68(n=25) 83.58±2.97 (n=20)	 6.625±0.16 (n=102) 12.45±0.49 (n=100) 18.35±0.78 (n=35) 26.15±1.58 (n=30) 33.08±2.00 (n=30) 44.14±2.02 (n=30) 52.78±2.03 (n=30) 61.53±2.58 (n=30) 70.05±2.94 (n=30) 81.33±2.78 (n=20)	 6.34±0.13 (n=232) 12.66±0.35 (n=190) 18.98±0.46 (n=83) 26.86±0.88 (n=67) 34.27±1.64 (n=67) 45.01±1.38 (n=67) 53.41±1.43 (n=67) 62.10±1.61 (n=67) 71.10±1.95 (n=55) 82.45±2.73 (n=40)

Specific managemental practices

Identification - Microchip numbering on the ears at 45-60 days.

Castration - Surgical procedure at the age of 40-50 days

Mortality Parameter:Genetic group wise and sex wise mortality rate

75% crossbreed (LWY + AG) a) Pre-weaning Mortality - 4.47% b) Post-weaning Mortality – 4.62 %

Measures taken to minimise Mortality

Managemental measures- Bird net, wall railings, milk replacer, light heat during rainy and winter seasons.

iv) Disposal of diseased carcass: Following Post mortem, burial by digging deep in soil away from piggery, adding lime powder.

Nutritional experimentation: Swill feeding is a common practice in pig rearing in the area but the quality of material is not sure. Many times only poor carbohydrates like rice or barkers products are available and most of the time very low proteins are available. To study scientific way of utilizing biological waste a trial on feeding of broiler offal is initiated. Proximate analysis of different parts of offal like head, shanks, was undertaken. To prepare balanced diet head and shanks were minced and used as major portion of ration. The average body weight gains of individual groups were compared and FCR (Feed conversion ratio) was calculated by dividing total feed consumed with total weight gain during experimental period and analyzed. It was observed that treatment group fed with broiler offal like (head and shanks, along with maize powder) had average body weight of 81.68 ± 4.49kgs, (range of 52.4-109.6) where as control group fed with standard grower feed (maize powder, soyameal, rice polish, mineral mixture) had average body weight of 83.79 ± 4.86 kgs(range of 58.6-110.3). Both the samples are not significantly different at 5% Significance level. Average growth rate of 277.22 gm/day for treatment group as compared to average growth rate of 279.33 gm/day for control group. Feed conversion ratio of the control was 2.99 where as it was 3.82 for treatment group and thus there was significant difference between the two. It may be concluded that although there is

not a significant difference in the body weight gain among the two experimental groups, there was slight difference in FCR with 3.82 for treatment group as compared to 2.99 for control group. But easy viability and relatively cheaper rates of broiler offal in Goa, broiler offal can be included in the daily ration for grower pigs.

Adoption of integrated farming systems: Integrated farming system model which includes Piggery Unit + Elephant Yam + Maize fodder + Tapioca is being adopted in the institute farm. This model works very well in coastal conditions especially in Goa. Elephant Yam which grows as root and requires minimum irrigation and manpower is great source of additional income. Maize can be incorporated as intercrop of elephant yam. Pig excreta is used as only source of fertilization enhancing growth of both maize fodder and elephant yam and maize fodder is used as feed for pigs to reduce the body fat. Tapioca is also used as feed for pigs and also draws good additional income.

Disposal pattern of farm waste: Biogas is constructed in 2011 and all the excreta are drained to biogas and digested slurry is used for horticultural plantations of the institute.

Production economics:

Cost of production/pig up to slaughter age: Rs. 5270/- per pig (8 months)

Cost of production/kg pork: Rs. 112/- per kg pork (if dressing is 70%) Rs. 106.76/- per kg pork (if dressing is 75%)

Extension programmer with success story:

At the farmers' field: Mr. Felipe AgneloGracias, H. No. - 745, Malwara, Aggasaim- Goa (Mob-9527537470) is a progressive pig farmer. He is maintaining around 250 crossbreed pigs. Draws monthly profit of approx. 60-70 thousands rupee from sale of pigs. His entire unit was setup with complete guidance of ICAR- CCARI, Goa. He attended various training and demonstration program on scientific piggery and artificial insemination at ICAR-CCARI under AICRP- Pig Project. He was provided with quality breeding stock of 75% Crossbreed pigs. He strictly follows AI technology for breeding and after training he himself does AI not only in his farm but in surrounding locality too. ICAR- CCARI provide semen doses. At present he is rearing mainly 75% Crossbred pigs scientifically and has adopted integrated farming system model of Piggery + Coconut + Mango, to get additional income.

Salient achievement during the report period: National Training on artificial insemination was conducted and veterinary professionals from Maharashtra, Kerala, and Andhra Pradesh attended training. Boar semen extenders (NBSE) have been formulated and field study is being conducted.

ICAR- CCARI held annual review meeting of AICRP on Pigs and Megaseed project on pigs on 6th - 7th June 2016.

Scientific publications:1

Technical Bulletin/ Book Chapter Classical Swine Fever; an important disease in Pigs and its preventation. 2016. Susutha R, Shivasharanappa N, Chetan Kumar HB, Chakurkar EB. Folder 79.

Distinguish visitors

Dr.Trilochan Mohapatra; Secretary (DARE) and Director General ICAR	8th September 2016
Shri Chhabilendra Roul; IAS, Secretary (ICAR) and Additional Secretary (DARE)	
Hon. Shri. Francis D'Souza, Deputy Chief Minister, Govt. of Goa	6th June 2016
Shri Purshottam Rupala, Hon. Union Minister of State for Agriculture and Farmer Welfare, Govt. of India	4th October 2016
Dr. Gurbachan Singh, Chairman, ASRB	1st April 2016
Dr R.S. Gandhi (ADG AP&B, ICAR), Dr D.K. Sarma (Director, NRC on Pig), Dr Vineet Bhasin (PS, ICAR)	6-7th June 2016

Success story: Mr. Melvin Fernandes, AldonaBardez, Goa was maintaining 50 dairy animals and was facing problems of profit margin. After attending institute events for pig rearing he has switched over to pig rearing and within two years he has closed dairy unit and maintaining a pig unit of about 200 pigs with mostly swill feeding. His profit of margin is satisfactory and he is also selling piglets to neighbors farmers.

Dr. Trilochanmohapatra, Secretary (Dare) Director General ICAR and Shri Chhabilendra Roul, IAS, Additional Secretary (DARE) and Secretary (ICAR)

Annual Review Meeting of AICRP on Pigs and Mega Seed project

Training on Artificial Insemination

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

In the state of Mizoram**,** pig is by far the most popular livestock. The pig population of the state was 2,45,238 as per 19th Livestock Census, 2012 and shows the highest percentage of growth in its population. The cross bred population make up for 85 % of the total population, the rest 15 % was of indigenous pig. Considering its vast potentialities and economic importance, Memorandum of Understanding was signed between Central Agricultural University and National Research Centre on Pigs, ICAR to establish a centre of All India Coordinated Research Project on Pigs at College of Veterinary Sciences and A.H. (C.V.Sc. & A.H.), Selesih, Mizoram during XIth Five Year Plan w.e.f. 1.10.2008.

Herd Dynamics: 75% Crossbred as on 31.03.2017

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance	
			Birth	Transfer	Death	Transfer	Sold	M	F
1	Piglet (upto 42 days)	6	69	-	8	-	-	-	-
2	Grower (42 d-5 m)	35	-	-	5	-	78	-	4
3	Finisher (5-8 m)	7	-	-		-	2	7	3
4	Breeding female	39	-	-		-	6	6	
5	Boar	24	-			-	12	12	
	Grant total	**111**	**55**	**-**	**10**	**-**	**98**	**98**	

Herd Strength of Zovawk as on 31.03.2017

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance	
			Birth	Transfer	Death	Transfer	Sold	M	F
1	Piglet (upto 42 days)	11	9	-	-		-	5	4
2	Grower (42 d-5 m)	-	-	-	-	11	-		
3	Finisher (5-8 m)	-	-	-	-	-	-		
4	Breeding female	11	-	-	-	-	1	10	
5	Boar	4	-	-		-	-	4	
	Grant total	26	9	-		11	1	**23**	

Herd Strength of 50% Crossbred as on 31.03.2017

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance	
			Birth	Transfer	Death	Transfer	Sold	M	F
1	Piglet (upto 42 days)	7	-	-	-	-	-		
2	Grower (42 d-5 m)	-	-	-	-	-	3	-	-
3	Finisher (5-8 m)	-	-	-	-	-	1	-	-
4	Breeding female	26	-	-	-	-	15	12	
5	Boar	11	-	-	-	-	5	8	
	Grant total	44	-	-	-	-	24	**20**	

Herd Strength of Large White Yorkshire as on 31.03.2016

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance	
			Birth	Transfer	Death	Transfer	Sold	M	F
1	Piglet (upto 42 days)	-	36	-	3	-		6	13
2	Grower (42 d-5 m)	-	-	-	1	-	4	-	-
3	Finisher (5-8 m)	-	-	-	-	-	-	4	1
4	Breeding female	20	-	-	-	-	14	9	
5	Boar	17	-	-	-	-	13	5	
	Grant total	37	36	-	4	-	31	**38**	

Breeding Strategy of the Farm:

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 this farm. At present a total of 33 breeding sows and 22 boars of 75% LWY and 25% Zovawk genetic group are available as a closing balance. In addition to these, a finisher group (5- 8 months of age) of 10 (7 males and 3 females) had been generated during the reporting year. Regular heat detection has been done with teaser and/or by visual observation. Artificial Insemination has been followed as per the approved technical programme. Selection differential (SD) and genetic gain observed in the selected traits are as follows:

Breeding Performance of 75% crossbred sows to produce

	75% LWY x 25% Zovawk	Zovawk	50% LWY x 50% Zovawk
Numbers of gilts/sows put to boars	-	1.50	1.50
Numbers of boar used	1.55	1.61	1.58
Numbers of services given	4.90	4.52	4.71
Av. Services/ female	-	1.50	1.50
Conception rate (%)	1.55	1.61	1.58

Performance of Animals: 75 % Crossbred (Parent generation)

SL. NO	TRAITS/CHARACTERS	¾ LWY x 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	Avg. Individual weight at birth (Kg)	1.08 ± 0.04 (19)	1.10 ± 0.04 (23)	1.09 ± 0.03 (42)
6	Avg. 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 (Progeny generation)

SL. NO	TRAITS/CHARACTERS	¾ LWYx ¼ ZOVAWK (MEAN±S.E)		
		Male	Female	Total/Average
1	Litter size at birth (no.)	3.42± 0.75 (9)	4.42± 1.06 (9)	7.85± 0.85 (9)
2	Litter weight at birth (Kg)	3.22 ± 0.62 (9)	4.58± 1.21 (9)	7.81 ± 1.12 (9)
3	Litter size at weaning (no.)	2.85 ± 0.70 (9)	4.14 ± 0.98 (9)	7.00± 1.13 (9)
4	Litter weight at weaning (Kg)	17.89 ± 4.2 (9)	27.63 ± 7.85 (9)	45.54 ± 9.17 (9)
5	Avg. Individual weight at birth (Kg)	0.94 ± 0.04 (30)	1.03 ± 0.03 (39)	0.99 ± 0.03 (69)
6	Avg. Individual weight at weaning (Kg)	6.48 ± 0.48 (24)	6.53 ± 0.44 (37)	6.51 ± 0.32 (61)
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%)	8	2.6	10.6
9	Pre weaning growth rate (g/day)	126.35±10.74(24	134.28 ±10.33 (37)	131.05± 7.47(61)
10	Post weaning mortality rate (%)	0.9	3.9	4.9
11	Post weaning growth rate (g/day)	305.21±13.54(15	302.63 ± 24.53(10)	304.44 ±11.22(25)
12	Overall growth rate (upto 9 m) (g/d)	276.44±12.72(15	275.04 ± 20.45(10)	276.02 ±10.17(25)

13	Body weight (Kg) (Average) 1 month 2 month 3 month 4 month 5 month 6 month 7 month 8 month 9 month	 4.30±1.21 (30) 8.01±1.43 (24) 16.36 ±0.42 (34) 20.82±1.12 (34) 27.37±2.15 (15) 37.11±2.21 (15) 51.84±2.41 (15) 62.12±2.21 (15) 70.88±2.11 (15)	 4.60±0.55 (39) 9.18±1.25 (37) 16.99 ±0.08 (52) 22.46±2.03 (52) 32.27±2.11 (17) 44.67±3.50 (10) 49.14±2.23 (10) 60.49±1.82 (10) 75.2±2.13 (10)	 4.54 ± 0.18 (69) 8.69± 1.99 (61) 16.68 ± 2.25(86) 21.50 ±1.42 (86) 29.88±2.13 (32) 40.69±5.13 (25) 50.32±2.46 (25) 61.39±2.06 (25) 71.87±3.02 (25)
14	Age at slaughter (d)	300	NA	300
15	Weight at slaughter (Kg)	92.6±3.12	NA	92.6±3.12
16	Dressing percentage (%)	73.68±1.23	NA	73.68±1.23
17	Carcass length (cm)	101±1.54	NA	101±1.54
18	Back fat thickness (mm)	4.01±1.16	NA	4.01±1.16
19	Feed conversion efficiency	4.18± 1.24	NA	4.18± 1.24

Performance of Animals: Zovawk (Mizo Local)

SL. NO	TRAITS/CHARACTERS	ZOVAWK (MEAN±S.E)		
		Male	Female	Total/Average
1	Litter size at birth (no.)	2.50±0.28(2)	2.00±0.50 (2)	4.50± 0.40(2)
2	Litter weight at birth (Kg)	1.49±0.26 (2)	1.37±0.23 (2)	2.86±0.27 (2)
3	Litter size at weaning (no.)	2.50±0.50 (4)	3.00±1.00 (4)	5.50±0.50 (4)
4	Litter weight at weaning (Kg)	6.50±2.05 (4)	9.65±3.05(4)	16.20±1.00 (4)
5	Avg. Individual weight at birth (Kg)	0.56±0.03 (5)	0.53±0.05 (4)	0.55±0.02 (9)
6	Avg. Individual weight at weaning (Kg)	2.62±0.30 (10)	3.22±0.19 (10)	2.88±0.20 (20)
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%)	-	-	-
9	Pre weaning growth rate (g/day)	48.93±7.67 (5)	63.59±6.14 (6)	56.26±5.43 (11)
10	Post weaning mortality rate (%)	-	-	-
11	Post weaning growth rate (g/day)	165.10±2.13 (5)	174.23±2.31 (6)	169.52±1.72 (11)
12	Overall growth rate (upto 9 m) (g/d)	150.1±2.31 (5)	151.25±2.5 (6)	150.5±2.1 (11)
13	Body weight (Kg) (Average) 1 month 2 month 3 month 4 month 5 month 6 month 7 month 8 month 9 month	 1.96±0.18(10) 4.14±0.36(5) 7.35±2.2(5) 9.17±3.4(5) 12.52±2.1 (5) 15.40±0.61 (5) 17.22±1.24(5) 20.62±1.52 (5) 22.00±2.54 (5)	 2.26±0.22(10) 4.66±0.38(6) 7.65±1.8(6) 9.85±2.8(6) 12.84±1.78(6) 15.91±1.3 (6) 17.97±1.94(6) 20.11±2.46 (6) 22.50±4.11 (6)	 2.10±1.25(20) 4.42±0.26(11) 7.46±2.4(11) 9.54±2.6(11) 12.68±1.26 (11) 15.67±0.32 (11) 17.61±0.59 (11) 20.38±1.34 (11) 22.25±2.45 (11)

Performance of Animals: 50% Crossbred

SL. NO	TRAITS/CHARACTERS	½ LWY x ½ ZOVAWK (MEAN±S.E)		
		Male	Female	Total/Average
1	Litter size at birth (no.)	-	-	-
2	Litter weight at birth (Kg)	-	-	-
3	Litter size at weaning (no.)	5 (1)	2 (1)	7 (1)
4	Litter weight at weaning (Kg)	23.32 (1)	7.78 (1)	31.1 (1)
5	Avg. Individual weight at birth (Kg)	-	-	-
6	Avg. Individual weight at weaning (Kg)	4.66 (5)	3.89 (2)	4.44 (7)
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%)	-	-	-
9	Pre weaning growth rate (g/day)	86.08±1.23 (5)	69.99±1.05 (2)	81.48±1.15 (7)
10	Post weaning mortality rate (%)	-	5.5	5.5
11	Post weaning growth rate (g/day)	276.56 ± 3.21(5)	253.09 ± 5.46(2)	268.73 ± 4.45(7)
12	Overall growth rate (upto 9 m) (g/d)	223.11 ± 2.69 (5)	224.00 ± 10.00 (2)	223.36 ± 2.87(7)

13	Body weight (Kg) (Average) 1 month 2 month 3 month 4 month 5 month 6 month 7 month 8 month 9 month	 3.81±0.11(5) 5.78±0.21 (5) 10.11±1.07 (5) 19.79±1.05 (2) 26.53±1.11 (2) 36 (1) 44 (1) 54 (1) 65.97±2.25 (7)	 3.64±0.21 (2) 5.28±0.53 (2) 9.45±0.94 (2) 17.05±0.42 (2) 23.41±1.13 (2) 34.06±1.24 (2) 40.08±1.21 (2) 53.14±2.16 (2) 65.05±1.32 (6)	 3.72±0.14 (7) 5.54±0.27 (7) 9.96±1.04(7) 18.5±0.95 (4) 24.69±2.10 (4) 34.8±1.65 (3) 42.7±1.11 (3) 53.56±1.52 (3) 65.55±2.36 (13)
14	Age at slaughter (d)	300	NA	300
15	Weight at slaughter (Kg)	72.3 ± 2.45	NA	72.3 ± 2.45
16	Dressing percentage (%)	69.42 ± 2.05	NA	69.42 ± 2.05
17	Carcass length (cm)	95.36 ± 2.25	NA	95.36 ± 2.25
18	Back fat thickness (cm)	3.53±1.15	NA	3.53±1.15
19	Feed conversion efficiency (:)	4.24±1.13	NA	4.24±1.13

Performance of Animals: LWY

SL. NO	TRAITS/CHARACTERS	LWY(MEAN±S.E)		
		Male	**Female**	**Total/Average**
1	Litter size at birth (no.)	4.50±0.57 (4)	4.50±0.85(4)	9.00±0.40(4)
2	Litter weight at birth (Kg)	5.82±1.5 (4)	6.01±0.83(4)	11.8±0.99(4)
3	Litter size at weaning (no.)	4.50±0.57 (2)	4.00±0.42 (2)	8.5±0.35(2)
4	Litter weight at weaning (Kg)	31.16±5.96 (2)	26.40±6.28(2)	57.56±12.24(2)
5	Avg. Individual weight at birth (Kg)	1.45±0.09 (16)	1.20±0.05 (20)	1.31±1.24(36)
6	Avg. Individual weight at weaning (Kg)	6.90±0.08 (9)	6.60±1.01 (8)	6.77±0.62 (17)
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%)	5.5	2.7	8.2
9	Pre weaning growth rate (g/day)	150.74±19.76 (17)	152.40±24.43 (17)	151±14.98 (17)
10	Post weaning mortality rate (%)	-	2.7	2.7
11	Post weaning growth rate (g/day)	339.10± 12.12(11)	330.20± 11.24(13)	334.65±19.35 (24)
12	Overall growth rate (upto 9 m) (g/d)	304.94±11.17 (11)	297.72±12.25 (13)	301.33±11.40 (24)
13	Body weight (Kg) (Average) 1 month 2 month 3 month 4 month 5 month 6 month 7 month 8 month 9 month	 6.10± 1.21(9) 7.99± 3.04 (9) 17.99±1.61 (9) 21.11 ±0.87 (9) 34.65±2.95 (5) 41.58 ± 1.17 (5) 57.22 ±4.43(5) 70.40 ± 2.10 (5) 83.15± 2.40 (5)	 5.80± 1.64(8) 7.44± 1.34 (8) 16.08±1.23 (8) 20.05±1.55 (8) 33.89±2.13 (8) 39.12±1.42 (8) 55.45± 2.23 (8) 69.24 ± 2.29 (8) 81.66± 2.29 (8)	 5.90± 2.21(17) 7.68± 2.21(17) 16.9±1.45 (17) 20.66±1.32 (17) 34.18 ±3.04 (13) 40.86±1.24(13) 56.65± 2.27 (13) 70.09 ± 1.50(13) 82.25± 1.60 (13)
14	Age at slaughter (d)	300	NA	300
15	Weight at slaughter (Kg)	103 ± 1.55	NA	103 ± 1.55
16	Dressing percentage (%)	68.86 ± 1.23	NA	68.86 ± 1.23
17	Carcass length (cm)	110.25 ± 2.42	NA	110.25 ± 2.42
18	Back fat thickness (cm)	2.89±2.15	NA	2.89±2.15
19	Feed conversion efficiency (:)	3.65±1.14	NA	3.65±1.14

Lifetime Production Traits:

- Average litter size at birth per sow was 7.5±1.25, 7±1.32, 5.5±1.25 and 8.5±2.21 in 75% crossbred 50 % Crossbred, Zovawk and LWY respectively.
- Average litter weight (Kg) at birth per sow was 8.17±1.24, 6.23±2.05, 2.47±1.15 and 11.21± 2.15 in 75% Crossbred, 50% Crossbred, Zovawk and LWY respectively.
- Average litter size at weaning per sow was 6.7±1.57, 6.5±1.64, 4.5±2.14 and 8.10±1.13 in 75% Crossbred, 50% Crossbred, Zovawk and LWY respectively.

- Average litter weight (Kg) at weaning per sow was 43.55±3.17, 38.35±3.15, 19.69 ±2.56 and 53.89±2.92 in 75% Crossbred, 50% Crossbred and LWY respectively.

Specific Managemental Practice:

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

a) Needle teeth cutting and ligation of naval cord of piglets has 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 has 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 as well as in respective registers in scientific formats.

Identification Method: Identification is done day old piglets by plastic ear tags.

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

Mortality Parameter

Group Wise and Sex Wise Mortality Rate:

Pre- and Post-weaning Mortality Rate (%) (As on 31.03.2017)

Age (Month)	MIZO LOCAL			50% CROSSBRED			75% CROSSBRED			LWY		
	M (%)	F (%)	Total (%)	M (%)	F (%)	Total (%)	M (%)	F (%)	Total (%)	M (%)	F (%)	Total (%)
0-2	-	-	-	-	-	-	8	2.6	**10.6**	5.5	2.7	**8.2**
2-6	-	-	-	-	-	-	0.9	3.9	**4.9**	-	2.7	**2.7**
6-12	-	-	-	-	-	-	-	-	-	-	-	-
12 &>	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	**8.9**	**6.5**	**15.4**	**5.5**	**5.4**	**10.9**

Causes of Mortality (Specific Cause):(As per Post-mortem report) **(As on 31.03.2017)**

S.N.	CAUSES	Zovawk			50% Crossbred			75% Crossbred			LWY		
		M	F	T	M	F	T	M	F	T	M	F	T
1	Pneumonia(Acute/Haemorrhagic/Interstitial)	-	-	-	-	-	-	3	3	6	1	1	2
2	Enteritis	-	-	-	-	-	-	4	3	7	1	1	2
3	Lymphadenitis	-	-	-	-	-	-	-	-	-	-	-	-
4	Accident	-	-	-	-	-	-	-	-	-	-	-	-
5	Dehydration	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	7	6	13	2	2	4

Measures Taken to Minimize Mortality:

Managemental Measures:

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

- Use of water sanitizer (Sokrena - WS)
- Use of foot dip ($KMnO_4$) at all the entrance of pig shed
- Restriction of entry of outsiders

Prophylactic Measures: The following prophylactic measures have been taken up

Sl. No.	Prophylactic Measures	Zovawk			50% Crossbred			75% crossbred			LWY		
		M	F	T	M	F	T	M	F	T	M	F	T
1	Vaccination against Classical Swine Fever	14	21	35	16	28	44	80	100	180	32	41	73
2	Deworming (Ivermectin /Albendazole)	14	21	35	16	28	44	80	100	180	32	41	73
3	Iron Injection (on 4th& 14th day of birth)	10	10	20	5	2	7	30	39	69	15	21	36
4	Vitamin B-complex Injection (on 5th&15th day of birth)	10	10	20	5	2	7	30	39	69	15	21	36

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

Nutritional Experimentation: Two nutritional trials were conducted:

This experiment was conducted to study the performance of growing pigs fed diet having different levels of palm oil sludge as a replacement of maize. Fifteen (15) growing crossbred pigs (Large White Yorkshire x Zovawk) of average BW 27.06 kg were randomly selected and divided into three groups in a completely randomized design with 5 pigs per group. Three experimental iso-nitrogenous and iso-caloric rations were formulated (NRC, 1998) where dried palm oil sludge was incorporated at the rate of 0%, 15%, and 25% level by replacing maize. Average daily weight gain was 509.70±39.78, 432.57± 26.73 and 424.76 ± 25.64 for Group-1, Group-2 and Group-3 respectively and feed conversion ratio for Group-1, Group-2, and Group-3 was 3.72 ± 0.39, 4.11±0.28 and 4.20 ± 0.31 respectively There was no significant difference (P>0.05) in average daily gain and feed conversion ratio among the different treatment groups. Blood biochemical parameters did not differ significantly (p>0.05), irrespective of different dietary treatments and were within the physiological range of pigs. It was concluded that palm oil sludge up to 25% can be incorporated in the diet of cross bred pigs by replacing maize grain without adverse affect the growth performance and blood biochemical parameters in pigs.

A nutritional trial was conducted at field level by selecting five farmers. Each farmers were supplied two number of 75% Crossbred piglets. In this trial one piglet was fed with concentrate feed (Control group) and the other was offered boiled kitchen waste (Treatment group) and the it was conducted for 3 months. The total body weight gain in control group was 28.46 ± 2.83 kg and that of treatment group was 23.4± 1.37 kg. The total feed consumption in control group was 98.23± 4.96 kg and that of treatment group was 109.04± 4.22 kg. As the feed consumption was significantly different in the two groups, the FCR also shows significant difference in both the groups i.e. 3.49 ± 0.22 in control group and 4.69± 0.10 in treatment group.

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.250.00/Kg The demand of the pork remains almost same throughout the year. To fill up the gap between the demand and supply of pork, 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: Cost of Production/Pig up to Slaughter Age:

i) Cost of Production/Pig up to Slaughter Age is Rs. 10000/- to Rs. 12,000/-

ii) Cost of Production/Kg Pork is Rs. 170/- to Rs.180/-

Extension programme with success story:

At the Institute:

1. The members of the ICAR-AICRP (pig) acted as resource persons in the training programme (22^{nd} -24^{th} ,November 2016) on Scientific Management of Pig conducted by the parent organization on following aspects-
    1) Housing system of pig by Dr. Zosangpuii
    2) Practical on cleaning and disinfection of the sty by Dr. Zosangpuii
    3) Theory and Practical on feeding of pigs By Dr. A. K. Samanta & Dr. Zosangpuii
2. Dr. Zosangpuii, Assistant Prof. acted as Course coordinator for the training programme (29^{th} - 30^{th}, March 2017) on Scientific Management of Pig conducted. In this training programme, the pig farmers were given technical know how about the importance of improved feeding and management to fetch more income from the pig farming. The various topics covered during the training were -
    1) Practical on cleaning and disinfection of the Pig sty by Dr. Zosangpuii
    2) Nutrient Requirement & Feeding of different Categories of Pigs by Dr. A. K. Samanta
    3) Care and Management of Different Categories of Pigs by Dr. Zosangpuii
    4) Reproductive problems in pig by Dr. K. Lalrintluanga
    5) Practical on Iron injection to piglets, Vaccination and Deworming by Dr. Zosangpuii
3. Dr. T. C. Tolenkhomba, Co-PI of the project attended the CAU Agri fair on 10^{th} -12^{th} November, 2016, held at College of Agriculture, CAU, Imphal, Manipur.

At the Farmers' Field:

1. Ninety seven (97) piglets had been supplied to 20 farmers at subsidized rate.
2. Miss Lalthangliani, who had purchased two 75% Crossbred piglets from our centre could able to reared the pigs exclusively on kitchen waste upto marketable age. She was very much satisfied with the performance of the 75 % LWY x 25 % Zovawk crossbred pigs produced in our centre. Another farmer named, Mr. Lallawmzuala also expressed satisfaction about the performance of the 75 % crossbred pigs in the backyard system of rearing by utilizing kitchen waste mixed with locally available feedstuffs viz. Banana pseudostem, Japan hlo, sweet potato leaves etc. It indicated that this cross bred pig is becoming popular among the pig farmers of the region. This pig also showed positive signs of its adaptability in backyard system of rearing.
3. The staff of the centre regularly visited the nearby pig farmers and give advisory services to them about the improved farming system.
4. Scientists of the project attended the Animal Health Camps conducted from time to time by the College (24th August, 2016 at Sesawng village, 14th September, 2016 at Sairang village and on 21st November, 2016 at Sihphir village). They interacted with the pig farmers during the camps and provided scientific inputs for better productivity of the piggery.
5. Conducted two times one day training for the registered pig farmers under Distance Education Certificate Course (DECC) on Piggery farming on 7th December, 2016 in Mutthi village and on 28th February, 2017 at Durtlang village.

In other institute

Dr. N. Shyamsana Singh, In-charge of the ICAR-AICRP on pig participated in the Pig Expo held on 28th -29th, Nov. 2016 at NRC on Pig, Rani, Guwahati to display the various activities of the AICRP (pig) unit of the college.

Salient achievement during the report period:

i. All the necessary information along with the relevant documents had been submitted to NBAGR, Karnal for the registration of local pig 'Zovawk' as a breed of the country.
ii. A total of 69 Crossbred (75%) and 23 Zovawk pigs are stock position to fulfil the objectives at the end of the reporting year.
iii. The average performance in the selected traits showed positive response in the progeny generation.
iv. Conducted Hands on Training for the pig farmers two times ie. on 22nd -24th November, 2016 and 29th -30th March, 2017.
v. Conducted two one-day training for the registered pig farmers under Distance Education Certificate Course (DECC) on Piggery farming on 7th December, 2016 in Mutthi village and on 28th February, 2017 at Durtlang village.

vi. In the diet of cross bred pigs, palm oil sludge up to 25% can be incorporated by replacing maize grain without adverse affect the growth performance and blood biochemical parameters in pigs.

Scientific Publications: In Peer-reviewed Journals: 1

Project Work of Students (M.V.Sc. /Ph.D):

1. Effect of melatonin on quality of boar semen during liquid storage
2. Effect of semen packing material and AI catheters on fertility of sow
3. Effect of feeding palm oil (*Elaeis guineensis*) Sludge as a partial replacement of maize on the performance of growing- Finishing Pigs

Distinguished Visitors:

Dr. B. Plain, State Mission Manager (Livelihoods), Meghalaya State Rural Livelihoods & Joint Director (Retired), Department of A.H. & Vety, Government of Meghalaya on 04.03.2017

<table>
<tr><td colspan="2">   </td></tr>
<tr><td colspan="2">Piglets (75%LWY x 25% Zovawk)</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Dr.B.Plain, State Mission Manager, Meghalaya State Rural Mission, visiting AICRP Farm</td><td>Nutritional trial at field level</td></tr>
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NAGALAND UNIVERSITY, SCHOOL OF AGRICULTURAL SCIENCES AND RURAL DEVELOPMENT, MEDZIPHEMA CAMPUS, NAGALAND

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

The ICAR-AICRP on pig, Nagaland centre started the project maintaining local Indigenous pig (Tenyvo) in the year 2009-2010, and studied the performance of the local breed and up-grade the local germ-plasm by crossing with exotic Hampshire boar. Since the inception of the project in the campus, a deliberate continuity of cross breeding of Indigenous local female Tenyi Vo (TV) with Hampshire (H) boar producing 50%TV50%H by Inter-se-mating. Presently the centre is maintaining 75% upgraded Tenyi Vo (25%TV75%H) by inter-se-mating as per ICAR guidelines.

Herd dynamics: As on 31.03.2017

a. Indigenous (Tenyi Vo)

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

**Pen to pen transfer within farm

b. Upgraded 50%

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing Balance
			Births	**transfer	Deaths	transfers	sold	
1.	Piglet (up to 42 days)	**0**	20	0	3	0	17	**0**
2.	Growers(42 d- 5 m)	**16**	0	0	0	0	0	**0**
3	Finisher(5 m -8 m)	**3**	0	10	0	0	2	**10**
4	Breeding female	**2**	0	7	0	0	5	**4**
5	Boar	**0**	0	0	0	0	0	**0**
	Grand total	**21**						**14**

**Pen to pen transfer within farm

c. Upgraded 75%

Sl. No.	Categories	Opening balance	Additions		Disposals			Closing Balance
			Births	**Transfer	Deaths	transfers	sold	
1.	Piglet (up to 42 days)	**0**	110	0	4	0	104	**2**
2.	Growers(42 d- 5 m)	**190**	0	0	3	0	59	**0**
3	Finisher(5 m -8 m)	**51**	0	128	0	0	0	**178**
4	Breeding female	**34**	0	1	0	0	5	**30**
5	Boar	**12**	0	0	0	0	0	**12**
	Grand total	**287**						**222**

**Pen to pen transfer within farm

d. Hampshire

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing Balance
			Births	**transfer	Deaths	transfers	sold	
1.	Piglet (upto 42 days)	**0**	46	0	3	0	36	**0**
2.	Growers(42 d- 5 m)	**0**	2	7	0	0	0	**9**
3	Finisher(5 m -8 m)	**10**	0	0	0	0	0	**0**
4	Breeding female	**10**	0	6	0	0	8	**8**
5	Boar	**4**	0	4	0	0	3	**5**
	Grand total	**24**						**22**

**Pen to pen transfer within farm

Breeding strategy of the farm as approved:

Nagaland Indigenous gilts Tenyi Vo X Hampshire boar

Up-Graded Tenyi Vo 50% X Hampshire boar

Up-Graded Tenyi Vo gilt (75%) X Upgraded Tenyi Vo (75%) boar

Performance of pigs: Upgraded Variety (75%)

Sl. No	Trait/Characters	Mean ± SE (no of observation		
		Male	Female	Total
1	Litter size at birth (no)	4.63±1.83(19)	4.63±1.80(19)	9.26±3.63(19)
2	Litter weight at birth (kg)	5.18±2.03(19)	4.91±1.93(19)	10.98±1.94(19)
3	Litter size at weaning (no)	4.26±1.79(19)	4.42±1.83(19)	8.68±3.62(19)
4	Litter weight at weaning (Kg)	19.21±7.68(19)	18.91±8.54(19)	38.12±16.22(19)
5	Avg. Individual weight at birth (Kg)	1.11±0.20(88)	1.06±0.15(88)	1.09±0.15(176)
6	Avg. Individual weight at weaning (kg)	4.68±1.62(81)	4.27±0.84(84)	4.39±0.73(165)
7	No of days for weaning	42	42	42
8	Pre weaning mortality rate (%)	7.95	4.54	6.25
9	Pre weaning growth rate (gm/d)	85	76	80.5
10	Post weaning mortality rate (%)	1.21	-	1.21
11	Post weaning growth rate (gm/d)	199	200	199.5
12	Overall growth rate (upto 8 m) (gm/d)	0.182	0.183	0.183
13	Body weight (Kg)			
	1 month	3.12±0.45(81)	2.97±0.55(84)	3.10±0.47(165)
	2 month	9.00±1.34(27)	8.91±0.56(24)	8.96±0.40(51)
	3 month	14.83±1.20(27)	14.79±0.85(24)	14.81±0.38(51)
	4 month	20.76±1.14(27)	20.86±1.10(24)	20.81±0.02(51)
	5 month	26.6±0.75(27)	26.65±0.63(24)	26.62±0.081(51)
	6 month	32.49±0.53(25)	32.53±0.54(24)	32.51±0.00(49)
	7 month	38.33±0.49(25)	38.58±0.44(24)	38.45±0.03(49)
	8 month	44.25±2.09(24)	44.55±1.68(22)	44.40±0.28(46)
	9 month	50.05±0.66(24)	50.46±0.83(19)	50.26±0.12(43)
	10 month	55.93±0.75(24)	56.12±0.62(19)	56.02±0.09(43)
14	Age at slaughter (month)		10 months	
15	Weight at slaughter (Kg)		56	
16	Dressing percentage (%)		70	

17	Carcass length (cm)	83
18	Back fat thickness (cm)	4.2
19	Amount of pork produced per sow (Kg)	105
20	Feed conversion efficiency (ratio)	4.2:1

Lifetime production traits:

a) Average litter size at birth per sow : 9.26±3.63
b) Average litter weight at birth per sow : 10.98±1.94
c) Average litter size at weaning per sow : 8.68±3.62
d) Average litter weight at weaning per sow : 38.12±16.22

Specific management practices:

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

Mortality parameter:

i) Pre-weaning mortality

Sl. No.	Traits/Characters	male	female	Causes of mortality
1	Tenyi Vo	-	-	-
2	Upgraded pigs	5	3	Enteritis, pneumonia
3	Hampshire pigs	2	1	Pneumonia, gastro-enteritis, anemia, pulmonary edema

ii) Post-weaning mortality

Sl. No.	Genetic group	male	female	Causes of mortality
1	Tenyi vo	Nil	Nil	-
2	Upgraded pigs	1	1	Pneumonia
3	Hampshire pigs	Nil	Nil	

iii) Measures taken to minimize mortality:

a) 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 colostrums within 24 hours and later bottle feedings

Toning up weak animals with vitamins 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

b) Prophylactic measures:

Iron injection first and second dose on the 14th & 21st 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.

Adoption of integrated farming system: Tapioca 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:

Location	No of pig slaughtered/day	Price of retailed cut per kg		Source	Remark
		Locally reared	Supplied Pig		
Kohima	105 - 110	Rs. 220.00	Rs. 200.00	Nagaland, Assam, Bihar, Jharkhand, WB, UP, Orissa	39,500 pig annually valued at Rs. 58 crores
Medziphema	3-4	Rs. 200.00	Rs. 190.00		1270 pigs annually valued at Rs. 1.77 crores

Disposal pattern of farm waste, pig excreta etc: The farm washing and excreta is channeled 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 (Assumption)

i) Cost of production of a fattened pig up to 10 months of age = Rs. 10,060.00

ii) Cost of production of a kg of pork = Rs. 180.00

Extension program with success story: Awareness programs and hands on training with the piggery Self Help Group of Dimapur and Kohima districts has finally started to bear fruits.

Sl.	Name of Events	Date
1.	NU-SASRD Faculties Interactive session with DDG (AS) ICAR, Krishi Bhavan, New Delhi & NRC-Mithun Scientists, Jharnapani	30.04.16
2.	Awareness program on Malaria & its control	13.07.16
3.	Awareness on importance of Swine fever vaccination & formation of piggery Self Help Group	22.07.16
4.	Awareness program on scientific pig breeding management 7 bio security	05.08.16
5.	Awareness program on Economic pig feeding in collaboration with NABARD Nagaland	18.11.16
6.	One day on hands training on economic livestock feeds	10.03.17
7.	Strengthening of piggery Self Help Group	22.03.17

Salient achievement during the reporting period:

a. Successful up-gradation of Indigenous Tenyi Vo and producing healthy Upgraded piglets desired by the resources poor rural farmers, and the Upgraded Tenyi Vo is performing well in farm as well as in the farmer's field condition.

b. Registration of Nagaland indigenous pig "Tenyi Vo " as a pig breed of India on the 21st June 2016 with the Accession Number INDIA_PIG_1400_TENYIVO_09004

c. Ensilaged fodder and fermented sliced tapioca incorporated in the pig ration replacing up to 20-30% of concentrate feed.

Project work of students: Post Graduate student M. Sc. (Ag)

- Studies on the growth performance of Naga Indigenous Upgraded Pigs
- Effect of different housing system on the physiology, ethology and growth performance of Upgraded Tenyi Vo Pigs in Nagaland

Distinguish visitors:

1. Dr. H Rah man, DDG (AS) ICAR New Delhi

2. Dr. R.S. Gandhi, ADG (APB), ICAR New Delhi
3. Dr. Satender Singh Arya, Chief Executive Officer, Agricultural Skill Council of India
4. Grabriel D. Wangsu, MLA, Kambani Arunachal Pradesh

Success story: Mr. Petevilie Thepa, a progressive pig farmer from Medziphema town was a regular attendee of ensilaging demonstrations and trainings imparted by ICAR-AICRP on Pig. The learning from these trainings was methodically applied at his family pig farm. He gradually encouraged his neighbours and friends to form a Self Help Group having interest in commercial pig farming. He said, sweet potato and/or tapioca based ensilage feeding of pig has not one but 3-prone benefit: i. Saves firewood, ii.Saves time and iii. Better profit margin. He now imparts trainings on ensilaging using both grown and wild forages to other farmers at his farm as and when required. He and his family is maintaining five sows. The family sells at least 80 weaned piglets annually at the rate Rs.3500/- per piglets. The net family income from the sales of piglet is about Rs. 2.5 – 3.0 lakh per year according to Mr Petevilie.


Visit of dignitaries

Glimpses of training programme

Glimpses of training programme

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.

Herd dynamics:

Details	Andaman Local Pigs		
	M	F	Total
Opening balance as on 1/4/2015	16	10	26
Birth 1/4/2015 to 31/3/2016	26	18	44
Total	42	28	70
Mortality	6	6	12
Sold/ Slaughter/ Field unit	25	14	39
Total	31	20	51
Closing balance as on 31/3/2016	11	8	19

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

Performance of animals:

Sl.No.	Traits/ Characters	Mean ± SE (no. of observation)		
		M	F	Total
1	Litter size at birth (no.)	3.71 ±0.47	2.57 ± 0.43	6.29 ±0.52
2	Litter Weight At birth (Kg)	5.42 ± 1.55	3.5 ± 0.82	8.92 ± 1.84
3	Litter size at weaning (no.)	3.00 ± 0.06	2.29 ±0.10	5.29 ±0.05
4	Litter weight at weaning (kg)	46.32 ± 13.39	36.12 ± 9.42	82.45 ± 13.76
5	Avg. Individual weight at birth (Kg)	1.23 ± 0.10	1.21 ± 0.09	1.22 ± 0.10
6	Avg. Individual weight at weaning(Kg)	12.90 ± 0.53	13.25 ± 0.33	13.01 ± 0.45
s7	No. of days for weaning (d)	56	56	56
8	Pre weaning mortality rate (%)	19.23	16.67	18.18
9	Post weaning mortality rate (%)	0	0	0
10	Pre weaning growth rate (gm/d)	0.19 ± 0.005	0.27 ± 1.56	0.25 ± 0.003
11	Post weaning growth rate (gm/d)	0.34 ± 0.009	0.36 ± 0.008	0.35 ± 0.006
12	Overall growth rate (gm/d)	0.34 ± 0.01	0.39 ± 0.031	0.36 ± 2.50
13	Body weight at different ages (Kg)			
	Birth weight	1.23 ± 0.10	1.21 ± 0.09	1.22 ± 0.10
	1 Month	5.47 ± 0.15	5.86 ± 0.2	5.62 ± 0.11
	2 Month	13.23 ± 0.37	13.13 ± 0.33	13.15 ± 0.23
	3 Month	18.41 ± 0.95	18.42 ± 0.51	18.05 ± 0.48
	5 month	25.25 ± 0.25	24.25 ± 0.25	24.62 ± 0.23

Mortality parameter:

Animal	Pre weaning mortality			Post Weaning Mortality		
	M	F	T	M	F	T
Total animals	26	18	44	21	15	36
Animals Died	5	3	8	-	-	-
Mortality %	19.23	16.67	18.18	-	-	-

Post Weaning Mortality is Nil

Causes of Mortality:

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

- Post weaning mortality till now not observed.

Measures to taken minimize mortality:

Managemental measures:

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

Prophylactic measures:

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

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

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

Radio Talk

- Interview: on "Feeding of Nicobari Pigs and its Importance in livelihood of the tribal Farmer" Recorded on 8th Otober 2016 & broadcasted on 10th October 2016.

Door Darshan

- Participated as an expert in the Phone in live programme entitled to apke sawal topic "Pig Farming." date of broad casting 6th July 2016 from DDK Port Blair.
- Participate as an expert in the Krishi Prog. Topic "Rearing of Nicobari Pig for Livestock." Date of recording 12th August 2016 and date of broad casting 13th August 2016.

Andaman local pig in institute farm

COLLEGE OF AGRICULTURE, CAU, IMPHAL

The ICAR, has sanctioned All India Coordinated Research Project on Pig, Manipur Centre, on 12th November, 2014 at the Department of Animal Sciences, College of Agriculture, Central Agricultural University, Imphal with the objective of upgrading the indigenous locally available pigs of Manipur, so as to see the improvement in body weight gain, litter size, survivability at weaning, disease resistance, sexual maturity etc. As per the proceedings of the last Annual Review Meet held at NASC complex, Pusa, New Delhi, the breeding programme of the Centre has been changed to maintain 50% crossbred Hampshire and Ghungroo crossbred. At the end of the reporting year, we have 99 nos. Rani (Hs x Gh) crossbred of different age group for the project, 58 Hampshire pigs and 17 nos. of Siamese local pig.

Herd dynamics of 50% Crossbred pigs (H X Gh) as on 31.03.2017

Sl. No.	Age (months)	Opening Balance	Additions		Disposal			Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (up to 42 days)	-	8	-	2	-	-	6
2	Growers (42 d-5 m)	-	39	-	2	-	-	37
3	Finisher (5-8 m)	-	30	-	1	-	-	29
4	Breeding female	21	-	-	-	-	-	21
5	Boar	6	-	-	-	-	-	6
	Total	27	79	-	5	-	-	99

Herd strength of Hampshire pigs as on 31.03.2017

Sl. No.	Age (months)	Opening Balance	Additions		Disposal			Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (up to 42 days)	5	24	-	4	-	-	25
2	Growers (42 d-5 m)	57	-	-	-	-	33	24
3	Finisher (5-8 m)	-	-	-	-	-	-	-
4	Breeding female	10	-	-	1	-	2	7
5	Boar	4	-	-	-	-	2	2
	Total	76	24	-	5	-	37	58

c) Herd strength of Siamese graded local pigs as on 31.03.2017

Sl. No.	Age (months)	Opening Balance	Additions		Disposal			Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (up to 42 days)	-	28	-	7	-	11	10
2	Growers (42 d-5 m)	-	-	-	-	-	-	-
3	Finisher (5-8 m)	-	-	-	-	-	-	
4	Breeding female	6	-	-	-	-	6	nil
5	Boar	-	-	-	-	-	-	
	Total	6	28	-	7	-	17	10

Breeding strategy of the farm as approved: To maintain crossbred of Rani crossbred pigs.

Performance of animals Rani (HsXGh) pigs

Sl. No.	**Traits/characters**	**Rani (HsXGh) pig**		
		M	**F**	**Total**
1.	Litter size at birth (no.)	2.45±0.25 (11)	4.55±0.41 (11)	7.00±0.12 (11)
2.	Litter weight at birth (no.)	2.34±0.06 (11)	5.16±0.06 (12)	7.50±0.12 (11)
3.	Litter size at weaning (no.)	2.20±0.33 (10)	4.20±0.36 (10)	6.40±0.02 (10)
4.	Litter weight at weaning (kg)	11.97±0.36 (10)	29.31±0.21 (10)	41.28±0.10 (10)

5.	Av. individual weight at birth (kg)	0.95±0.04 (27)	1.14±0.03 (50)	1.07±0.02 (77)
6.	Av. individual weight at weaning (kg)	5.44±0.24 (22)	6.82±0.10 (43)	6.13±0.04(65)
7.	Number of days for weaning (d)	42		
8.	Pre-weaning mortality rate (%)	3.79%	2.53%	6.32%
9.	Pre-weaning growth rate (g/d)	108.33±6.03(21)	136.10±2.69(42)	122.22±0.68(63)
10.	Post weaning mortality rate (%)	-	2.53%	2.53%
11.	Post weaning growth rate (g/d) (6 w to 5m)	178.57±6.70(6)	188.78±1.53 (17)	183.68±1.56(23)
12.	Overall growth rate (0 to 5 m) (gm/d)	159.21±5.13(6)	172.99±1.71(17)	166.10±0.89(23)
13.	Body weight (kg)			
	1 month	3.35±0.26 (22)	4.13±0.16 (43)	3.74±0.01 (65)
	2 month	7.96±0.28 (20)	9.29±0.12 (38)	8.63±0.05(58)
	3 month	10.73±0.50 (7)	12.26±0.35 (19)	11.49±0.02 (26)
	4 month	14.37±0.60(7)	16.25±0.57 (18)	15.31±0.11 (25)
	5 month	24.92±0.83 (7)	27.01±0.26 (18)	25.96±0.15(25)
	6 month	31.24±0.85 (4)	34.70±0.46 (12)	32.97±0.04 (16)

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

Mortality parameters

i) Genetic group wise (2016-17) & ii) Causes of mortality

Sl.No.	Causes of mortality	Genetic group			Total
		CB 50%	Hampshire	Siamese local	
1	Pneumonia	-	2	2	**4**
2	Crushing	1		2	**3**
3	Enteritis	-			
4	Cannibalism	2	2		**4**
5	Still birth	-	1	2	**3**
6	Diarrhoea	2		1	**3**
	Total	**5**	**5**	**7**	**17**

iii) Measures taken to minimize mortality

i)) 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)
- Use of foot dip (KMnO4) at the entrance of pig shed.
- During cold the piglets are provided with straw bedding and for adult animals the animals are sprayed/bathed with cold water during the hottest part of the day to reduce heat stress.

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

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.

Adoption of integrated farming system

The work on the adoption of integrated farming system have been initiated by imparting scientific knowledge of pig rearing through organizing training, health camp cum vaccination

programme in Schedule Caste inhabited village like Andro village, Phayeng, Khurkhul area, Sekmai, Chandel, where there is available of local feed source through their brewery activities and also their customary way of pig rearing habit.

Survey on market of pork production: A survey on pork market was carried out in Imphal East, Imphal West, Senapati District and salient points are given below:

Qualification of pork seller:	Mostly under-metric in proper Imphal and uneducated in the hill areas
Residence:	50% rented
Occupation:	Pork business
Category:	75% tribal and others SC
No. of retail Shop	60
No. of wholesaler:	8
Type of sale booth:	Mostly open market

Information about the pigs

1.	Source of pig:	Schedule caste inhabited village like Sekmai, Andro, Phayeng, Moreh and some private farm in the valley.
2.	Breed:	Siamese local pigs, crossbred of Hampshire
3.	Age:	1 year above
4.	Weight:	80- 160 kg
5.	Method of slaughter:	Hammering
6.	Price of pig:	Rs. 130-150/kg live weight basis
7.	Daily sale:	On an average 500-1000 kg of pork sold in most of the pork stall
8.	Period of highest sale:	December-March of the year
9.	Period of lowest sale:	June-October of the year
10.	Price per kg of pork: Retailer	Rs. 230-250/kg but at the end of the year due to economic blockade imposed by UNC the price have been increased to Rs. 270-280/kg in most part of the State

Disposal pattern of farm waste, pig excreta Manual cleaning of the pig excreta has been carried out time to time for removal from the pig farm premises and disposed in the low lying part through drain.

Production economics: As the centre is just at the establishment stage, it will take some time to collect all the information for calculation of economics. It will be initiated soon.

Extension programme with success story:

i) **At the Institute:** Farmers from different parts of the State visited the farm time to time during the training programme as field exposure, organized by the college of Agriculture, AICRP-pig project, ICAR, Lamphelphat, KVK, Hengbung, College of Agriculture, AICRP-pig, NGO, YVU & others. In this way technical know- how of scientific pig rearing such as scientific feeding, breeding, health care, vaccination programmes to be followed, sanitation practices were demonstrated and taught to the farmers during their visit.

Training programmes conducted: One day training programme on "Scientific rearing of pigs" was organized on 21.03.2017 under AICRP on pig to 53 numbers of pig farmers, consisting trainees from Andro, Phayeng, Chandel, Sekmai. Talks on breeds & breeding of pigs, management and housing of pigs, feeding of pigs, reproduction on pigs, diseases and its control measures were delivered by various resource persons.

(ii) At the farmer's field: Four (4) training programmes and eight (8) vaccination camp were organized. The details of the location and dates were given as below:

Sl.no	Particulars	Date	Place
1.	Vaccination of Swine fever in collaboration with North Eastern Region Community Management Project (NERCOMP) under DoNER ministry	28.01.2017	Moreh, Tengnoupal district (A border town near Myanmar)
2.		04.02.2017	Purumpantha village, Chandel district
3.		14.02.2017	Kanankhu village, Chandel district
4.		17.02.2017	Moreh, Tengnoupal district.
5.	Training on scientific pig rearing and Health camp cum Vaccination programme	18.03.2017	Andro village, Imphal East(SC village)
6.		19.03.2017	Phayeng village, Imphal West, (SC village)
7.		22.03.2017	Khurkhul village, Imphal West (SC village)
8.		26.03.2017	Sekmai, Imphal West(SC village)

Success stories: Shri. Huidrom Ramananda Singh, age 44 years, a self determined entrepreneur of Lamsang village, Imphal West. At present, this particular entrepreneur is maintaining about 100 pig unit. To establish a small unit of pig farming, he has procured 10 numbers of Hampshire finisher pigs (7 female:3 male) from our pig farm in three phases during the past 2 years. Feedback information given by this particular entrepreneur is; for feeding he collected wheat bran, rice bran, locally available wild alocacia plant, vegetable waste from the market and sometime waste from the hotel to make a ration. He also mixed some concentrate at the rate of 30% of the total ration given. He fed the above ration after boiling and cooling. For reproductive performance of the farm he informed that 2 (two) farrowing per sow per year is carried out with an average of 7-10 piglets per farrowing. As such, he could produce about 100 piglets per year. He sold the piglets to the local pig farmers at the rate of Rs. 4, 000/- per piglet and last year he could earn about Rs. 1, 80, 000/- from his small unit. As there is good market in his area, he informed us that next year he will be adding another 10 more breeding female to the stock and he is planning to earn about Rs. 4.00 lakh per year.

Dr. Vanrami of Sielmat village, Churachandpur district, an unemployed lady who has approached for technical advice on pig farming to centre several times and after given the chance to participate in the training programme on pig rearing and field exposure on different occasion during the past years conducted in the institute, she has taken up the challenge to start a pig farm of her own. She has procured 10 grower Hampshire female from our farm in three phases during 2015. For feeding she used wheat bran, rice bran, wild colocasia, banana stem, locally available wild plant leaves, kitchen waste from home and hotel and also concentrate in 1/3rd of the ration. She has informed that 7-9 piglets per sow in every 6 months were produced in her farm and in a year she could produce 150-180 piglets. During last year her annual income was estimated to be about Rs. 4,50, 000/- By the end of this year, she is maintaining 20 breeding female and 4 breeding boars.

Salient achievements during the report period:

- A total of 167 pigs, consisting of 99 Rani crossbred pigs, 58 Hampshire and 10 graded Siamese local pig being maintained at the end of the reporting year.

- Rs 3, 57, 550/- (Rupees three lakh fifty-seven thousand & five hundred & fifty) only, was generated as revenue from the sale of 54 (eleven) nos. of different categories/genetic group of pigs during the reporting year.
- Linkage with the pig rearing villages has been initiated through training and vaccination by linkage with other organization like NERCOMP, Ministry of DoNER, KVKs and SHGs from different parts of the State.
- Four (4) training programmes were organized at phayeng, Andro, Khurkul,Sekmai area on scientific pig rearing and eight (8) health camp cum vaccination programme of swine fever was conducted at Moreh, Kanankhu village (Chandel district), Purumpantha village (Chandel district), Moreh (Tengnoupal district), Andro village, Sekmai village, Phayeng village, and Khurkul village.

Rani (HsXGh) sow with piglets

Rani piglets

Training at Chandel district in collaboration with NERCOMP, Ministry of DoNER

Vaccination of SF vaccine at Moreh, a border town near Myanmar

Animals (successful farmers field)

Animals (successful farmers field)

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

Out of six recognized pig breed in India, Ghungroo is one of the most important and first registered pig breed. The breeding tract of Ghungroo pig is the Tarai Region of West Bengal. Ghungroo, so far, is one the best known Indian pig breed for its better litter size, good mothering ability, better growth and docile nature. Keeping this idea, Eastern Regional Station, Indian Veterinary Research Institute, Kolkata was entrusted to implement ICAR-AICRP on Pig, 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:

Sl. No	Age (months)	Opening Balance			Addition			Deduction			Closing Balance		
		M	F	T	Births	transfer	Purchase	Death	Transfer	sold	M	F	T
1	Piglet (upto 42 d)	2	3	5	12	-	-	-	-	-	3	9	12
2	Grower (42 d – 5 m)	4	3	7	29	-	-	-	-	10	12	5	17
3	Finisher (5- 8 m)	3	-	3	0	-	-	-	-	-	0	0	0
4	Adult	2	8	10	-	-	-	-	-	1	7	17	25
5	Total	11	14	25	41	-	-	-	-	11	22	31	54

Breeding strategy of the farm as approved: As per the guidelines of NRC (P), the approved breed of pig was maintained for conservation, improvement, propagation and distribution to the cliental.

Performance of animals

Sl. No.	Traits / Characters	Mean ± SE (no. of observation)		
		M	F	Total
1	Litter size at birth (no.)	4.2 ±0.42	4. 30± 0.36	8.5 ± 0.38
2	Litter weight at birth (kg)	4.836 ±0.316	4.791± 0.425	9.627 ± 0.396
3	Litter size at weaning (no.)	3.9 ±0.20	4.20± 0.15	8.10± 0.18
4	Litter weight at weaning (kg)	35.509 ±1.435	35.595 ± 1.1562	71.104± 1.106
5	Avg. Individual weight at birth (kg)	1.150 ±0.068	1.114 ±0.082	1.132±0.106
6	Avg. Individual weight at weaning (kg	9.105 ±0.250	8.475 ±0.326	8.778 ±0.440
7	Number of days for weaning (days)	42	42	42
8	Pre-weaning mortality rate (%)	7	2	4.7
9	Pre-weaning growth rate (gm/day)	189.405±12.60	177.833±11.25	182.048±09.38
10	Post weaning mortality rate (%)	0	0	0
11	Post weaning growth rate (gm/day)	277.663 ±36.352	261.665 ± 24.181	269.667 ± 20.383
12	Overall growth rate (upto 9 months) (gm/ day)	272.268 ± 24.56	258.015 ± 35.12	265.343 ± 32.78
13	Body weight (Kg)			
	1st month	7.987 ±0.131	7.865±0.151	7.925 ±0.135
	2nd month	13.101±0.275	12.125±0.379	12.613 ± 0.316
	3rd month	18.655±0.375	17.358±0.316	18.011±0.348
	4th month	28.150±0.862	27.095±0.695	27.623 ±0.775
	5th month	36.543± 1.682	35.725± 1.541	36.135±1.431
	6th month	45.322 ± 2.367	44.946±2.569	45.134 ± 2.291
	10th month	82.956 ± 5.625	78.515 ± 6.680	80.735 ± 6.250

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 following at 3-4 months of age

Mortality parameter: Pre-weaning is 4.5 per cent and there was no post weaning mortality.

I) genetic group wise and sex wise mortality

ii) Causes of mortality*:* due piglet diarrhea

ii) Measures taken to minimize mortality:

Management measures: A part from routine management practices, furrowing pen washed with disinfectant thoroughly to prevent piglet diarrhea.

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

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

Nutritional experimentation*:* Planted Colocasia esculenta, as a local pig feed supplement.

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.

A total of 49 samples including slurry from pig shed (14); pig feed samples (3); water samples (7 samples each) from control and experimental ponds, mud (slit) (3 each) from control and experimental farm and intestinal and gill samples of fish (6 each) from control and experimental pond were screened for detection of C. *perfringengs and* Shigatixic *E. coli.* C. *perfringengs* was recovered from all the slurry and mud samples from experimental ponds and also recovered from two (28.57%) of the 7 water samples and 2 (33.3%) of 6 fish samples from experimental ponds; however, none form the feed samples and water, mud and fish samples from the control pond. Shigatixic *E. coli.* was detected in 21.42% (3/14) of pig slurry samples; however, not recovered from other samples.

Extension programme with success story:

At the institute: A total 90 farmers specially from back ward district like Paschim Midnapur, Jhargram, Purulia, Bakura, and Bibhum attended 3 days residential training programme in collaboration Farmers' Academy and Convention Centre, BidhanChandra KrishiViswaVidyalaya (BCKV), Lakehall, Kalyani. Majority of the farmers are tribal women and they are fully engaged in

animal husbandry specially on pig rearing. It was fully sponsored by Govt. of West Bengal. Theory classes are taken in Lake Hall and farm demonstrations are at IVRI, ERS, Kalyani.

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.

Distinguish Visitors: Dr. A. K. Badyopadhyay, Ex. National coordinator, NAIP. New Delhi.

<table>
<tr><td colspan="2">  </td></tr>
<tr><td colspan="2">Newly Constructed Pig shed</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Ghungroo Grower</td><td>Ghungroo pig (Female)</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Sow with piglets (week old)</td><td>Farmers training cum visit to pig farm</td></tr>
</table>

ICAR RESEARCH COMPLEX FOR NEH REGION, TRIPURA CENTRE, AGARTALA

Rearing pigs and eating pork are the part of culture of the people in Tripura. Besides non-tribal farmers, the tribal farmers, who account 30.2% of the total population (32 lakhs) in Tripura, rear pigs traditionally in a small numbers from 1 to 4/5 at the backyard for either meat or piglet production. Thus, smallholder pig farming is an important livelihood resource for the poor and tribal people in Tripura. Pig feeding system is entirely different from the standard system in smallholder pig farming system. The farmers of the region practiced almost a zero grain pig production system. ICAR Research Complex for NEH Region, Tripura Centre has one pig farm at Lembucherra, West Tripura, which is only 12 km far from Agartala, Capital city of Tripura. Within the limited facility, farm has the capacity to produce about 100- 120 piglets per annum. Presently, Hampshire x Ghungroo cross and Tripura Mali pigs are maintained at farm. The research programme under AICRP on pig for the centre has been decided in the meeting held on 17-18th Sept. 2015 at NASC Complex, Pusa, New Delhi. Establishment of Tripura local Mali pig breeding stock has been initiated since October 2015.

Herd dynamics:

Herd strength at the beginning of April 2016					Herd strength at the end of 31st March 2017				
Adult Female	Adult Male	Piglets		Total	Adult Female	Adult Male	Piglets		Total
		F	M				M	F	
4 (8 mo old)	2 (8 mo old)	12 (2-6 mo old)	4 (2-6 mo old)	22	14 (14-20 mo old)	6 (14-20 mo old)	10 (10 d to 2 m old)	10 (10d - 2m old)	40

Breeding strategy of the farm as approved

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

Performance of animals:

Sl.	Traits/Characters	Male	Female	Total
1	Litter size at birth (no.)	2.47±0.4	2.88±0.7	5.35±0.6 (17)
2	Average Litter weight at birth (kg)	1.9±0.36	2.35±0.57	4.25±0.64 (10)
3	Litter size at weaning (no.)	1.28±0.4	1.57±0.7	2.85±0.5 (7)
4	Average Litter weight at weaning (kg)	5.64	10.42	14.55±2.08 (7)
5	Avg. Individual weight at birth (kg)	0.93±130.41(7)	0.82±33.18(16)	0.85±45.27(23)
6	Avg. Individual weight at weaning (kg)	5.64±430.31(7)	4.87±321.00 (16)	4.89±263.06(23)
7	Number of days for weaning (d)	42		
8	Pre weaning mortality rate (%)	47.61	63.26	56.04
9	Pre weaning growth rate (gm/d)	84.17	73.33	76.62
13	Body weight (Kg)	Male (8)	Female (14)	Total (22)
	1 month	-	-	-
	2 month	8.12 ± 0.66	8.27 ± 0.73	8.20 ± 0.51
	3 month	10.02 ± 0.84	10.39 ± 1.06	10.20 ± 0.74
	4 month	13.62 ± 1.16	13.34 ± 1.46	13.40 ± 1.00
	5 month	17.93 ± 0.69	16.19 ± 1.48	16.80 ± 0.98
	6 month	20.15 ± 2.04	19.47 ± 1.49	19.70 ± 1.17
	7 month	26.32± 2.18	25.04 ± 1.58	25.50 ± 1.26
	8 month	33.45± 2.65	30.20 ± 1.52	31.38 ± 1.34
	9 month	37.11± 2.89	33.52 ± 1.55	34.82 ± 1.45
	10 month	38.32± 4.17	36.32 ± 2.14	37.05 ± 1.99

Specific managemental practice

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

Mortality parameter:

i) Genetic group wise and sex wise mortality rate:

Mortality for male piglets (pre weaning): Total 20 piglets died (47.61%)

Mortality for female piglets (pre weaning): Total 31 piglets died (63.26%)

ii) Causes of mortality: Poor mothering ability, crushing by mother, premature birth, still birth, low birth weight during preweaning period.

iii) Measures taken to minimize mortality:

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

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

iv) Disposal of diseased carcass: The dead animals after conducting post-mortem were buried in pit dug 4 to 5 feet depth in the specified area within the farm premises.

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

Extension programme with success story:

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

ii) At the farmers' field: ICAR Research Complex, Tripura has been working since 2011 to build up the capacity of the tribal community through imparting formal as well as informal training, providing pig shelter, piglets and pig ration to the tribal men and women in disadvantaged tribal dominated 14 villages covering 6 districts (West Tripura, Khowai, Gomoti, South Tripura, Dhalai and North Tripura). During this period 27 nos of piglets are distributed to tribal farmers under TSP programme. To date, a total of 415 tribal people were benefited in terms of asset creation like pig house, availability of more than 777 quality piglets, pig ration, veterinary medicines, veterinary services and above all development of technological knowledge and skill. Since there is always a great demand of piglets in the markets and production of piglets and selling them after weaning is more profitable than the traditional rearing practice of fattening of pigs for one or more year. We implemented the idea of "piglet production farming system" as a technological intervention to increase the production and supply of the same and thus leading to improvement in the livelihood security of the tribal people.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Dr. D.K. Sarma, Director, ICAR - NRC on Pigs, Rani, Guwahati, visited Pig Farm</td><td>Students visited the pig farm ICAR Research Complex, Tripura Centre, Lembucherra</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Mali Pig with their piglets at farm</td><td>Mali Pig at farm</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Piglet distribution by Dr. K. K. Barman, Principal Scientist, ICAR, Tripura Centre</td><td>Mali pig at farmers field</td></tr>
</table>

KVK-GOALPARA, ICAR-NRC ON PIG

Pig is one of the major sources of animal protein besides being most-efficient food converter after broiler chicken. Pig production in India has enormous potential to upscale the economics of rural masses of the country due to its high fecundity, good feed conversion efficiency, shorter generation interval and relatively smaller space requirement. According to the 19th Livestock Census of India its pig population is 10.29 million in comparison to the world population of 977.02 million (FAOSTAT, 2013 data (http://faostat.fao.org), which constitutes 1.05% of world pig population. Pig constitutes a mere two percent of total livestock population (512.05 million) of the country; still needs much attention for its improvement. Out of total pig population, 76.14% are indigenous and non-descript type. Most of these breeds/varieties are yet to be characterized with proper scientific intervention. These pigs are of smaller size and little efforts have been made for their conservation and quality improvement programme for its economic traits, such as litter size, birth weight, weaning weight, average daily gain, feed conversion efficiency and carcass traits. These animals are well-adapted to hot and humid environment and supposed to have better disease tolerance. The indigenous pigs of India are identified as a distinct group as a result of gradual domestication of wild pigs to their surroundings. These pigs differ in their characteristics and colour from region to region within the country depending on the topography and climatic conditions.

Looking to high potential of piggery sector 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	Births	transfer	Purchase	Death	Transfer	sold	M	F	T
1	Piglet (upto 42 days)	1	1	2	26	-	-	5	-	-	2	4	6
2	Grower (42 d – 5 m)	6	9	15	-	-		1	-	1	3	-	3
3	Finisher (5 - 8 m)	-	-	-	-	-		-	-	10	-	-	-
4	Adult	4	12	18	-	-	2	-	-	-	8	22	30
5	Total	11	22	33	26	-	2	6	-	10	13	26	39

Breeding strategy of the farm as approved:

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

Performance of animals:

Sl. No.	**Traits/Characters**	**Mean ± SE (no. of observation)**		
		M	F	Total
1	Litter size at birth (no.)	1.62±0.08	3.28±0.09	4.90±0.17
2	Litter weight at birth (kg)	1.67±0.07	1.83±0.08	3.50±0.15
3	Litter size at weaning (no.)	1.25±0.08	2.17±0.09	3.42±0.17
4	Litter weight at weaning (kg)	4.10±0.09	3.94±0.11	8.04±0.20
5	Avg. Individual weight at birth (kg)	0.72±0.06	0.67±0.09	0.69±0.07

6	Avg. Individual weight at weaning (kg)	2.95±0.07	2.82±0.09	2.89±0.08
7	Number of days for weaning (d)	45 days		
8	Pre weaning mortality rate (%)	Nil		
9	Pre weaning growth rate (gm/d)	49.33±3.92	45.77±4.01	48.66±3.99
10	Post weaning mortality rate (%)	4.0		
11	Post weaning growth rate (gm/d)	210.2±15.01	198.65±12.41	202.55±14.45
12	Overall growth rate (*upto 9 m*) (gm/d)	185.22±17.71	175.69±14.92	180.37±15.63
13	Body weight (Kg)			
	1 month	1.42±0.03	1.37±0.06	1.40±0.09
	2 month	3.27±0.12	3.10±0.09	3.15±0.21
	3 month	8.85±0.67	8.16±0.72	8.42±1.39
	4 month	15.08±.76	14.69±0.8	14.89±1.56
	5 month	20.38±.89	19.66±0.91	20.04±1.80
	6 month	28.14±1.07 (4)	26.78±1.02	27.92±2.09
	7 month	35.23±1.85 (3)	33.42±1.71	34.65±3.56
	8 month	42.63±2.11 (3)	39.85±1.72	40.48±3.83
	9 month	49.28±2.45 (2)	45.71±2.21	46.99±4.66
	10 month	53.73±2.83 (2)	54.42±2.61	53.99±5.44

Lifetime production traits are being recorded

Specific managemental practice: Routine scientific managemental practice is being followed in the farm. Identification is done by ear tagging. Animals of this breed/variety are ferocious and difficult to handle. The identification of animals ate done by ear tagging at the time of weaning. Castration is practiced by open method at the age of 2 months.

Mortality parameter:

Genetic group wise and sex wise mortality rate:

Pre weaning mortality rate: 9.2 (major cause was piglet diarrhoea and crushing injury due to shortage of space)

Post weaning mortality: 3.0%

Measures to taken minimize mortality:

i. Managemental measures:

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

ii. Prophylactic measures:

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

Disposal of diseased carcass: disposal is done by burring of diseased carcasses at a distance of 100 meter from the farm following all disposal guidelines.

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

Extension programme with success story:

i) At the institute:

a. 3 nos. of trainings on scientific pig farming organised at the institute.
b. 3 nos. of trainings on hygienic pig slaughter organised at the institute.
c. 2 nos. of trainings on the importance of conservation of indigenous germplasm.

ii) At the farmers' field: AI in pig was popularized at the farmer's field which can be followed in Doom pig too. A village was adopted for quality piglet production. Till date 320 nos. of upgraded piglets produced in the adopted 'Paccim Dairong' village.

Scientific publications: A bulletin in local vernacular (Assamese) on "*Gahari Palon aru atmah sansthapanot eyar buumika*" was published and distributed among the farmers.


Doom Pig at Temporary shed of AICRP on Pig


Newly established pig shed


Doom Pig at frmers' field

ICAR RESEARCH COMPLEX FOR NEH REGION, BARAPANI

Pig husbandry is important and integral component of farming system practiced in North Eastern Hill (NEH) region India. It has a special significance as it can play an important role in improving socio-economic status of the farmers in the region. Almost every tribal house hold rears 2 – 3 pigs in their backyard. Pig rearing is an omnipresent activity in Meghalaya and state owns indigenous pig population of 4.31 lakh and crossbred pig population of 1.38 lakh (19th Livestock Census 2012). Pig rearing is an integral part of rural life of Meghalaya. In spite of good pig population and interest of people to rear pig, the pork production in the state is lower than the requirement. Its high adaptability to a wide range of environments, resistance to disease, high reproductive efficiency and adjustable feeding habits makes the pig the ideal meat animal of choice for the NE States like Meghalaya which can meet the challenge of protein hunger in this state. But the pig keeping system in the state is mainly subsistence oriented and heavily constrained by non-availability to limited availability of resources. Traditionally, integrated pig production system is being practiced in the state utilizing the common property resource like forest to obtain inputs for pig production. The farmers based on the local resources have evolved this system, in which pigs are mainly dependent on local vegetations, crop residues and kitchen waste. This system has been followed generation by generation. 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 neighboring 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, All India coordinated Research Project(AICRP) on Pig, ICAR Research Complex for NEH region has successfully developed crossbred pig varetiy with Niang Megha (Khasi local) as indigenous germplasm and Hampshire as exotic germplasm for better adaptability and performance in hill ecosystem of the north eastern region of India. The performance was evaluated in stallholder tribal pig production system in the hill eco-system of north eastern region under Jai-Vigyan Project on House Hold food and Nutritional Security for Tribal Backward and Hilly Areas (NATP), NAIP and AICRP on pig.

Herd dynamics: Crossbred (75% Hampshire X 25% Niang Megha inheritance)

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (upto 55 days)	0	118		11		22	44
2	Grower(56 d- 5 m)	11			4		27	13
3	Finisher(5-8 m)	6			1		3	10
4	Breeding female	16						16
5	Boar	4						4
	Grant total	37	118		16		52	87

Herd Strength of Crossbred (50% Hampshire X 50% Niang Megha inheritance)

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (upto 55 days)	32	84		8		29	38
2	Grower(56 d- 5 m)	6			3		26	15
3	Finisher(5-8 m)	6					8	12
4	Breeding female	12						12
5	Boar	0						0
	Grant total	56	84		11		63	77

Herd Strength of Local pig (Niang Megha)

Sl.No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1	Piglets (upto 55 days)	21	34		3		21	15
2	Grower(56 d- 5 m)	6			1		13	10
3	Finisher(5-8 m)	16					11	8
4	Breeding female	8					3	8
5	Boar	5					1	4
	Grant total	56	34		4		49	37

Breeding strategy of the farm as approved:

- A number of selected Niang Megha (Local pig) was maintained in the ICAR-NEH Pig farm since year-1987.
- A group of indigenous gilts was bred with pure Hampshire boars to get 50% Hampshire inheritance crossbred pigs. Another group of indigenous gilts were maintained for indigenous line.
- The progeny of F_1 crossbred 50% H X 50% I was again backcrossed with male Hampshire boar to produce crossbred (F_2) with (75% Hampshire X 25% Khasi local pig inheritance).
- The crossbreeding program *i.e*. inter-se-mating was adopted to maintain 50% H: 50% I and 75%H: 25%I genetic groups. Pure breed Hampshire boar was utilized for production of 87.5%H genetic groups. Sex ratio of 1:3 was maintained in order to avoid inbreeding effect in the farm.

Performance of animals: (75% Hampshire X 25% Khasi local inheritance)

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
5	Avg. Individual weight at birth (kg)	0.88±0.11	0.82±0.18	0.85±0.16
6	Avg. Individual weight at weaning (kg)	9.49±0.0.02	9.44±0.05	9.46±1.14
7	Number of days for weaning (d)	56		
8	Pre- weaning mortality rate (%)	9.3		
9	Pre weaning growth rate (gm/d)	143.50±8.36		
10	Post weaning mortality rate (%)	4.6		
11	Post weaning growth rate (gm/d)	317.33±21.64		
12	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
14	Age at slaughter (d)	300		
15	Weight at Slaughter (kg)	87.78±2.29		
16	Dressing Percentage (%)	72.33		
17	Carcass Length (cm)	70.62±1.27		
18	Back Fat Thickness (mm)	2.30		
19	Feed conversion efficiency (:)	1:4.30		

Lifetime production traits of crossbred pigs (75% Hampshire X 25% Khasi local inheritance)

I.	Life time production traits (Average of 6 farrowing/sow)		
1.	Total litter size at Birth	II.	51.83 ± 2.70
2.	Average litter size at Birth	III.	9.13 ± 0.17
3.	Total Litter Weight at Birth (kg)	IV.	44.07 ± 2.29
4.	Average Litter weight at Birth (kg)	V.	7.75 ± 0.14
5.	Total Litter size at weaning	VI.	47.17 ± 2.69
6.	Average Litter size at weaning	VII.	8.29 ± 0.20
7.	Total Litter weight at weaning (kg)	VIII.	446.19 ± 25.43
8.	Average Litter weight at weaning (kg)	IX.	78.46 ± 1.91

Heritability of reproductive traits in crossbred pigs (75% Hampshire X 25% Khasi local inheritance)

Sl.No.	Reproductive traits	h^2	Standard Error
1	Litter size at Birth	0.126	0.116
2	Litter size at Weaning	0.937	0.210
3	Av. Weight at Birth	0.560	0.105
4	Av. Weight at Weaning	0.867	0.241
5	Litter Weight at Birth	0.425	0.158
6	Litter Weight at Weaning	0.761	0.241

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.

a) *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 local pig, 3 denote crossbred with 50% Hampshire (F1),4 indicate crossbred with 75% Hampshire (F2) and 5 represent crossbred with 87.5% Hampshire respectively. Hair clipping was also practiced for identification adult sow/boar from distance.

b) 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.

c) *Weaning:* The piglets were separated from months at the age of 55-65 day depend on body condition of piglets. If the piglets are good body condition, weaning carried out at early age.

*d) 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 food sources other than that of milk. The specific practice reduces pre weaning piglet mortality particularly where the sow had low milk yield.

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

f) Artificial Insemination: Estrus detection was carried out twice daily and the sows exhibiting standing estrus were inseminated with a golden pig catheter (IMV Technologies, France) and cock-screw catheter (mini-tube, Germany). The cervical insemination was carried out at 30 onset of oestrus with 2-3 billion sperm in 95 ml of extended liquid semen in a sachet per insemination. The pregnant sow/gilts were separated from the non-pregnant sows after confirmation of pregnancy and kept in individual pens. The farrowing rate and litter size at birth were calculated after farrowing.

g) Data generated are regularly recorded in computer as well as in respective registers in scientific formats.

Mortality parameter:

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	3	4	7	1	1	2	1	1	2	5	6	11
Mortality %												9.3

ii). Post weaning 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

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

Sl.No.	Conditions/disorders	Total No.
Pre-weaning		
1.	Crushing	3
2.	Piglets Diarrohea	2
3.	Enteritis	2
4.	Pneumonia	1
5.	Weak piglets	3
	Total	11
Post- weaning		
1.	Enteritis	2
2.	Pasteurellosis	1
3.	Debility	2
	Total	5

iv) Measure to be taken for minimizes mortality:

Management measures:

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 3rd week i.e. 15 days. A few days before farrowing the

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

Care during the time of farrowing: Mostly sows did not need any help at the time 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, iron dextran injection (Imferon) was given intramuscularly to the newborn piglets on day 4^{th} and 14^{th} of birth. Vitamin B-complex injection was done on 5th and 15th of birth. Separate arrangement for creep feeding of piglets was done started from 2nd week to weaning. Castration has been/was done surgically by open uncovered method on surplus male piglets at the age on 3-4 weeks. Weaning of piglets was done at 56 days. The newly born piglets were provided with paddy straw during winter season as a bedding material to protect the piglets against cold effects. 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.

v). Prophylactic measures:

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

- All the pigs were vaccinated against the Swine Fever and FMD vaccine.
- Animals are allowed to feed with balance ration twice daily and water at libitum.
- Pig sheds were clean daily and kept dry to prevent from any abnormal disease condition.
- Regular Veterinary service and treatment to disease condition/ disorder to prevent from mortality.
- Special Crest was fitted in the furrowing pen to prevent from piglet crushing by mother.
- Regular vaginal dosing with 2% potassium permanganate solution within 12 hour of furrowing to prevent from MMA syndrome.
- The furrowing pens were kept clean and dry to prevent from piglet diarrhoea.
- The iron injection (Inferon) to all the piglets at 4^{th} and 14^{th} days of age and weaned at 56 days.
- The pigs were dewormed regularly (Albendazole, Fenbendazole, Ivermectin alternatively) to control parasitic infestation.
- 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. Usually, a trench was made large enough to accommodate the carcasses. Once buried, the

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:

Formulation of fortified feed from kitchen waste for pig: Supplementing poor quality feed like kitchen or vegetable waste with molasses will improve palatability of feed and increase feed intake as well as may overcome feed scarcity. The aim of experiment was to study the effect of fortified feed from kitchen waste on growth performance of piglets and to estimate stress Biomarkers. Experimental group-1 was fed with kitchen waste (60%) mixed with standard concentrate mixture (40%) and group-2 was fed kitchen waste (53%) and 7% molasses mixed with standard concentrate mixture (40%) while the control group-3 was fed solely with standard concentrate mixture. The body weights of animals were recorded fortnightly and blood samples were collected at monthly interval for estimation of stress parameters. The details of the growth performance and concentration of blood stress biomarkers presented. The results showed that the pigs (group-2) were fed with kitchen waste with 7% molasses were found higher growth rate (179g/day) as compared to control. Similarly lowest serum cortisol level was observed in group-2 as compared to control and group-2. The study concludes that feeding of the new formulated fortified feed from kitchen waste with 7% molasses had better growth rate in village condition.

Adoption of integrated farming systems:

Pig based integrated farming System: Pig-Duck-Fish integrated model

Performance of pigs and ducks: The average body weight of crossbred pig in improved system at 11 months age was 90 kg. The body weight of ducks in improved system at 11 months age was 1740 g with an average daily weight gain of 6.44g.

Manure production and quality assessment: On an average, 1200 k of fresh manure was added to the fish pond by a single pig. The average dung production by pig weighing less than 50 kgs and 50 – 90 kg was 2.5 kg and 5 kg dung per day, respectively. Pig manure contained approximately 39.65 per cent dry matter. The average levels of N, P and K in dried pig manure was 0.9, 0.7 and 0.6 per cent, respectively. On an average, a duck produced 5.7 kg of manure (dry matter basis) during the study period. Each duck gave about 65.7g wet manure per day with an average dry matter of 26.25 per cent. The average level of N, P and K in dried duck manure was 1.3, 0.6 and 0.5 per cent, respectively.

Fish productivity: The growth rate of different carps in pig-fish and duck-fish integration was assessed. The fish yield was 2, 209 kg/ha in integrated pig – fish culture. The fish yield was 2, 964 kg/ha in integrated duck – fish culture.

Total biomass (animal and fish) production: The total biomass production was calculated based on the live body weight of animals and fish produced at the end of the experiment.

Monetary input: output pattern: The input: output ratio was calculated for both the systems. The input costs comprised both of nonrecurring (animal sheds, pond preparation) and recurring costs

(animal, feed and veterinary expenses). The results revealed that both the systems were economically viable. that both the systems were economically viable with input: output ratio of 1:1.06, 1: 1.12 and 1: 1.09 for pig-fish, duck-fish and pig-duck-fish systems, respectively while the corresponding ratios were 1:1.38, 1: 1.30 and 1: 1.33, respectively in second year.

10. Survey on market of pork production:

A preliminary survey on pork market was carried out in Shillong and salient points are as follows

i. *Qualification of Pork Selling*: Mostly under Metric and uneducated

ii. *Residence:* Mostly rented

iii. *Occupation*: Pork selling

iv. *Cast*: Tribal people

v. *No. of retail Shop*: Approx. 600 numbers

Information about the Pig

i. *Sources of Pig*: Barnihart, West Khasi hill, Peripherial areas of Shillong, Assam

ii. *Breed*: Mostly local pig, Crossbred Hampshire pigs

iii. Age: 9 months to 2 Years

iv. *Weigh*t: 80-150 kg

v. *Method of Slaughter*: traditional method, Heart puncturing in most case, occasionally hammering

vi. *Price per kg of Pork*: Rs. 250/kg

vii. *No. of Pig Slaughter per day*: 300-450

viii. *Whether diseases Pig are slaughter or not*: Disease pig never slaughter.

11. Disposal pattern of farm waste, pig excreta:

a) *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 agriculture field.

b) Vermicomposting: Part of pig dung utilized for vermicomposting using low cost vermi-bed along with the biomass.

c) Established water recycling plan from pig-washing: The main aim for established for water recycling plan is recycling of pig waste water from cleaning pig sty. Waste water is first pass in manual bar screen with different size of pore for removal of big particle 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. Then pass water to the water treatment tank for chemical treatment process. Outcome water can be used for cleaning water at farm and other purposed.

Production economics:

Cost of production/ pig up to slaughter age: 10 Month

Concentrate feed up to 10 month of age (15-300 days) =315kg/ pig

Considering @ Rs. 20/kg of feed for 315 kg=Rs 6300/-

Cost of medicine and Vaccines Rs. 350/animal

Labourer charge per pig for 300 days=Rs 1800/ animal

Total cost Rs. 8450/animal at 86 Kg live weight

Cost of production Rs 98/ kg live weight

Cost of production/ kg pork: Rs 136 /kg (Considering 72.33% Dressing Percentage)

Extension programmed with success story:

i. **At institution**:

- To promote viable and sustainable small scale rural pig enterprises, two training (6 days) were organized for educated rural tribal youth (46) and provided technological backup for small scale rural enterprise
- A total of seven training were organized for improved housing, feeding, breeding and health management practices of livestock and poultry for tribal farmer including 430 beneficiaries.
- Regularly farmers are visiting the farm and are being given technical advises about scientific pig rearing and feeding, vaccination etc. Importance of sanitation and hygiene and winter management practices of piglets are also explained to the beneficiaries and visitor farmers.
- Developed innovative value added products by incorporating functional herbs and plants such as bamboo shoot, manipuri lomba (sage) and Khasi jaiur (Zanthoxylum khasianum) in meat sausage. Innovative products developed also included semi roasted curry cuts and dried sausage. Promoted entrepreneurship development through training of three MBA students under Agri-business Incubator (ABI) of the institute
- Provided training and capacity building in meat processing to seven potential educated youth for entrepreneurship development

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

- Demonstrated improved management practise in housing, feeding, breeding and disease management practices in different villages of Meghalaya. Provided technological backup with critical inputs like upgraded variety- 277 piglets for 120 beneficiaries with grower feed and medicine.
- Mobile based artificial insemination delivery model was established for timely insemination at farmers door step and 157 inseminations were carried out in different villages through mobile van to produce crossbred piglets. Resulted in the farmers saved the mating cost (INR1000-1500) and transport of cost (INR 300-400) of female to boar premises. In addition to genetic improvement, this technology can overcome the breeding constraints in the smallholder backyard pig production for increasing productivity

Salient achievement during the report period:

- A new crossbred pig variety released called *Lumsniang* (Niyang Megha (Khasi local pig) as indigenous germplasm and Hampshire as exotic germplasm). The planned crossbreeding program with rigorous selection resulted in developed "crossbred pig variety called "Lumsniang" with Better

adaptability in hill ecosystem, climatic resilient traits, promising growth rate, good mothering ability with higher litter size It has better adaptability and performance in hill ecosystem of the north eastern region of India. Crossbred pig was popularized to the pig growers of the region.

- Estimated the heritability and repeatability of growth performance and reproductive traits for the crossbred pigs besides the life time productivity traits of the crossbred pig
- Many farmers have initiated crossbred pigs by providing piglets and AI facility to the farmers' doorsteps. Synchronization of estrous and AI were undertaken at institute as well as the farmers field.
- Mobile based artificial insemination delivery model was established for timely insemination at farmers door step and 157 inseminations were carried out in different villages through mobile van to produce crossbred piglets. Resulted in higher economic return/pig/year due to the crossbred pigs.
- Pigwash water filtration techniques was optimized and about 4000 litre pigwash water recycle unit was established in pig breeding farm, besides the vermi-compose for effective pig waste management.
- To promote viable and sustainable small scale rural pig enterprises, two training (6 days) were organized for educated rural tribal youth (46) and provided technological backup for small scale rural enterprise
- A total of seven training were organized for improved housing, feeding, breeding and health management practices of livestock and poultry for tribal farmer including 430 beneficiaries.
- Survey was conducted and documented on the popular traditional/ethnic pig products of the different Northeastern states of India (Doh Jem, Tungrymbai, etc. of Meghalaya, Bongsha Rep, Vawksha Rep, Bongsung of Mizoram) including study on methodology, market potential and scope for commercialization.
- Established well equipped pork processing unit and obtained FSSAI license for processing different meat products including fish products as well
- Created sustainable business model in Private-Public Partnership model in the meat processing unit in the institute. Established market linkage through non-exclusive licensing/agreement with private partners M/S Tynrai Farms, Dongktieh, Nongrah, Shillong for marketing of the processed products.
- Evaluated the Pig based integrated farming system (Pig-Duck-Fish integrated model) and analysed the cost-benefit.

Scientific publications: Peer-reviewed journals: 4, Lead paper: 1, Training Manual:1, Leaflet:2

Distinguish visitors:

a) Dr. R S Gandhi, Assistant Director General, ICAR, New Delhi visited and reviewed the AICRP on pig centre and suggested the future work on 4th November 2016

b) Shri. Sudarshan Bhagat, Honourable Ministry of State, Ministry of Agriculture and farmers welfare, Govt. of India visited the Pig Breeding farm and AICRP on pig of the centre on 8th Nov 16.

c) Dr. H Rahman, Deputy Director General (Animal Science) ICAR, New Delhi; Dr. R S Gandhi, Assistant Director General, ICAR, New Delhi, Dr. S V Ngachan, Director of the institute; Dr. B C Deka, Director, ATARI, Zone III, Umiam; Dr. D K Sarma, Director, NRC on Pig, Guwahati; Dr. Vineet Bhasin, Principal Scientist, ICAR, New Delhi; Shri B. K. Sohliya, OSD, Meghalaya Institution of Enterpreneurship & In-Charge Piggery Mission, Govt. of Meghalaya and other dignitaries from Central Agricultural University, Umiam; ICAR-NBPGR; Officials from Government of Meghalaya representing animal husbandry, horticulture and other departments. In the presence of all above dignitaries the centre released a new variety of Pig named Lumsniang on 6th March, 2017.

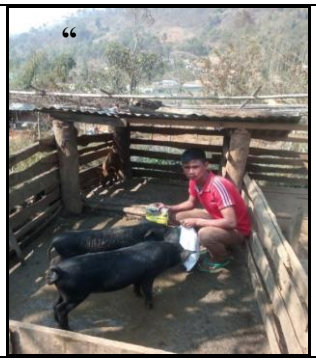
Success story, if any:

Mr. Banrilang Sohsten, Umroi Laban Saro village: Mr. Banrilang Sohsten (28 years) is tribal farmer residing at Umroi Laban Saro village, Ri-Bhoi District, Meghalaya. The village is 8 km away from ICAR. His family consists of five members-himself, his wife, mother and his two children. He and his family were fully dependent on piggery for their livelihood before attaining training from ICAR i.e., Apart from this he also has bee-keeping and cultivated few crops such as ginger, turmeric, cabbage, cauliflower, tomato, etc. as a subsidiary occupation. During this time he usually rear around 15-20 local pigs. With them, he obtained 7-8 piglets in each delivery at birth and 5-6 piglets at the time of weaning. He sold per piglet at a rate of Rs.1,500-2,000. Thus he got an income of Rs. 8,000-10,000 from each delivery. He is one of the beneficiaries who received 2 crossbred piglets (1 male and 1 female) after the successful completion of the training programme conducted in ICAR under the Tribal Sub Plan. After the training, he improved the existing traditional pigsty with locally available bamboo as per ICAR suggestions. He fed the piglets with vegetables like sweet potato, colocasia, tapioca, bamboo shoots, leaves and stems of banana plant. The leaves and stem of plants were cooked and mixed with rice bran, wheat bran, broken rice along with kitchen wastes. The ICAR staff regularly monitored the growth performance at monthly intervals. Deworming was carried out at three months interval and other health measures were carried out routinely. The gilt showed heat signs at the age of nine months. Before attaining training the farmer made use of the bore from his farm itself for mating. But after he received the training and made aware of Artificial Insemination (A.I.), he contacted the Mobile Artificial Insemination vehicle whenever the animal comes to heat. As he has obtained Regular advice from ICAR on care and management of pregnant pig particularly during the last three months of pregnancy, the pigsty was repaired and bedding materials were applied for better comfort of the pregnant gilts. Additional feed such as wheat bran and broken maize was provided 10 days before delivery. Mr. Sohsten obtained around 10-18 piglets per AI. This time the piglets were sold at a rate of Rs. 2,000-2,500 per piglet. The manure generated was used for cultivation of crops. The profit obtained by him per year ranges from Rs. 40,000-50,000. Thus, the livelihood of the farmer was improved in terms of income, feeding and health care management of the pigs. He was extremely happy and satisfied with all the help and assistance he received from ICAR.

Mr. Shemphang Nongrum, Mawlai Umjaiur village: Mr. Shemphang Nongrum is an educated youth residing at Mawlai Umjaiur village, East Khasi Hills, Meghalaya. The village is located about 21 km from ICAR. His family consists of six members including his mother, father and his siblings. Being unemployed he has decided to take up piggery as a source of income to provide for the daily needs of his family. He started his farm in the year 2016 with 2 male piglets (Burmese) purchased from Mawngap village, East Khasi Hills, Meghalaya. He attended the Youth Residential Training Programme on "Integrated Scientific Livestock and Poultry Production for Small Scale Rural Entrepreneurship Development in Hill Ecosystem" conducted at ICAR from 11th to 16th July 2016 and received 3 female crossbred piglets (Hampshire) after the completion of the training programme. After few weeks, his brother also joined him and together they again purchased 6 piglets (Burmese) from Byrnihat and Mawngap. They usually fed the pigs twice a day with rice bran and kitchen wastes. They also supplemented the feed with mineral mixture as per ICAR suggestions. The ICAR staff monitored the growth of these pigs from time to time. Feed, mineral mixture and medicines were given from ICAR at the time of monitoring. Deworming at three months interval and other health care measures were also carried out. At present, he is having a total of 11 pigs including 6 male and 5 female. The manure generated was given free of cost to farmers for cultivation. He will be selling 2 adult male pigs weighing around 85-90 kg at an average rate of Rs. 13,000-15,000 per pig. Having the awareness of the advantages and benefits he received after the training programme he attended in ICAR, he is interested and is also planning to go for breeding in the mere future.

Lumsniang" crossbred pig variety developed by the centre

Lumsniang" pig variety released by DDG (Animal Sciences), ADG and other dignitaries



Pigs at farmers' field

Mega-Seed Project on Pig

NAME OF THE CENTRE AND INCHARGE

Mega-seed Project on Pig		Name of Incharge
Old centers		
1.	College of Veterinary Science, Assam Agricultural University Khanapara, Guwahati, Assam-781022	Dr. D. Kalita
2.	College of Veterinary Science, Birsa Agricultural University, Kanke, Ranchi, Jharkand -834006	Dr. L. B. Singh
3.	ICAR-RC for NEH region Jharnapani, Medziphema, Dimapur, Nagaland 797 106	Dr. Mahak Singh
4.	A.H. & Vety. Farm Complex, Veterinary Department, Govt of Mizoram Selesih, Aizawl, Mizoram – 796014	Dr. R. Thanghuama
5.	Kerala Veterinary and Animal Science University, Pookode, Kerala-680651	Dr. A.P. Usha
6.	Animal Resource Development Department, Govt. of Tripura, Agartala, Tripura-799006	Dr. Subir Das
7.	State Animal Husbandry and Veterinary Department, Govt. of Arunachal Pradesh, Namsai, Arunachal Pradesh-791110	Dr. H.K. Gogoi
8.	Chhattisgarh Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh-491001	Dr. A. K. Tiwari
New Centers		
1.	Veterinary Services, Dept. of Animal Husbandry and Veterinary Services, Krishi Bhawan, Todong, Gangtok -737102, Sikkim	

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 was 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. Impact assessment along with economics of production at farmers' door need to be carried out by individual centers through third party/outside agency/ICAR-NCAP.
2. Number of farm families/ beneficiaries should be included in the report.
3. The centres should adopt AI technology as a part of breeding programme.

4. Changing of PI of the centres should be done in consultation of Project Coordinator. In-charges should have specialization in Animal Genetics and Breeding, however, scientists from other discipline may be associated with the project as Co-PI.
5. All the new centres should initiate the programme for piglet production.

Centre wise recommendation:

AAU, Khanapara:

1. The centre will maintain only 50% Hampshire crossbred population with a target to produce 1500 piglets in 2016-17.

BAU, Ranchi:

1. The centre will maintain T&D crossess (50% exotic inheritance) with a target to produce 1000 piglets in 2016-17.
2. AI should be initiated at the earliest.

ICAR RC for NEH, Nagaland:

1. The centre will maintain only one 50% exotic inheritance crossbred (Ghungroo X Hampshire) pigs with the target to produce 1000 piglets in 2016-17.
2. Proper vaccination against FMD should be ensured. In case of out-break of FMD, the centre should report to ICAR-NRC on Pig/ National Institutes.
3. AI done in farm and field may be reported separately.

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.

CKVU, Durg:

1. The centre should maintain the T&D (50% exotic inheritance) crosses as recommended by the review committee.
2. The centre should submit UC/AUC in time.
3. The centre should target maintaing 30 breedable sow unit along with production of 400 piglets during the year 2016-17.

Kerala Veterinary and Animal Science University, Mannuthy:

1. The centre should target producing 1000 piglets during the year 2016-17.

ARDD, Tripura:

1. The centre should target producing 600 piglets during the period 2016-17.

State Govt., Arunachal Pradesh:

1. The house expressed concern about the absence of PI and presentation of progress of the centre. The centre should initiate the assigned activities as recommended by the review committee.
2. The centre should submit quarterly progress of work and number of piglets produced during the year 2015-16.
3. The centre should target producing 600 piglets during the year 2016-17.

5. Action point discussed in Review Meet of 'All India Coordinated Research Project on Pig' and "Mega Seed Project on Pig" held at ICAR-Central Coastal Agricultural Research Institute, Goa on 6-7th June, 2016.

AAU, Khanapara

Recommendation	Action Taken
General	
General:	
1. Impact assessment along with economics of production	1. Initiated
2. Number of farm families/ beneficiaries should be included	2. Done
3. Adoption of AI technique.	3. Initiated
Centre wise recommendation:	
4. Target to produce 1500 piglet	4. Piglet produced 1451

BAU, Ranchi

Recommendation	Action Taken
General	
General:	
1. Impact assessment along with economics of production	1. Initiated
2. Number of farm families/ beneficiaries should be included	2. Done
3. Adoption of AI technique.	3. Not Done
Centre wise recommendation:	
4. Target to produce 1000 piglet	4. Piglets produced: 703

ICAR RC for NEH, Nagaland Centre, Medziphema

Recommendation	Action Taken
General	
General:	
1. Impact assessment along with economics of production	1. Initiated
2. Number of farm families/ beneficiaries should be included	2. Done
3. Adoption of AI technique.	3. Done
Centre wise recommendation:	
4. Target to produce 1000 piglet	4. Piglets produced: 682

Veterinary Department, Government of Mizoram, Aizawl

Recommendation	Action Taken
General	
General:	
1. Impact assessment along with economics of production	1. Initiated
2. Number of farm families/ beneficiaries should be included	2. Done
3. Adoption of AI technique.	3. Done
Centre wise recommendation:	
4. Target to produce 900 piglet	4. Piglets produced: 620

New Centers:

Targets	KVASU, Kerala	ARDD, Tripura	CKVV, Durg	AH &Vety., Arunachal
Submission of AUC	Yes	No	No	No information
Final Report submission	Yes	Yes	No	
Breed maintained	LWY cross	LWY, Landrace	T&D	
Construction work		Initiated		
Piglet production	832	186	25	

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

Under this project improved variety of piglets were produced and distributed to the farmers. A total of 1388, 2268, 2877, 2851, 3664, 3824 and 4499 nos. of improved variety of piglets were produced for distribution in 2010-11, 2011-12 2012-13, 2013-14 2014-15, 2015-16 and 2016-17, respectively.

ASSAM AGRICULTURAL UNIVERSITY, KHANAPARA, GUWAHATI

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

Herd dynamics

Age in months	Opening balance as on 01. 04. 2016 of the financial year under report		Total	Closing balance as on 31.03.2017 of the financial year under report		Total
	Male	Female		Male	Female	
0 - 6 wk	121	132	253	197	174	371
6wk – 2 m	50	54	104	33	29	62
5 – 8 m	12	42	54	12	19	31
Over 8 m	11	87	98	14	106	120
TOTAL	194	315	**509**	256	328	**584**

Stock Continuity:

Sex	Stock as on 1.4.15	Addition			Deletion					Stock as on 31.3.16
		Birth	Purchase	Total	Sale	Slaughter	Destroyed	Died	Total	
Male	194	745	-	939	636	6	-	37	679	**260**
Female	315	706	-	1021	661	2	-	34	697	**324**
Total	509	1451	-	1960	1297	8	-	71	1376	**584**

Average Litter size at birth and at weaning

Genetic Group	Number of Litter	Litter Size at Birth			Litter Size at Weaning		
		Male	Female	Total	Male	Female	Total
50%H	189	3.88±0.09	3.80±0.10	7.68±0.11	3.78±0.10	3.75±0.10	7.53 ±0.13

Pre weaning and Post weaning mortality

Genetic Group	Pre weaning mortality (%)(0-42 days)	Grower Mortality (%)(42d-5 m)	Finisher (%) (5 m – 8 m)	Adult Mortality (%) (over 8m)
50%H	1.93 (28)	2.81 (40)	1.18(1)	0.98 (2)

Within parenthesis are the number of died animal

Number of piglets produced during the reporting period: April 2016-March'2017

	Total no. of piglets born			**Total no. of piglets died**			**Total no. of live piglets produced**		
	M	**F**	**T**	**M**	**F**	**T**	**M**	**F**	**T**
1st quarter	67	90	157	3	6	9	64	84	148
2nd quarter	220	219	439	6	4	10	214	215	429
3rd quarter	165	135	300	8	7	15	157	128	285
4th quarter	293	262	555	9	14	23	284	248	532
Annual	**745**	**706**	**1451**	**26**	**31**	**57**	**719**	**675**	**1394**

Number of piglets sold during the reporting period:

	Total no. piglets Produced			Total no. of piglets Sold			Amount realized (Rupees)
	M	**F**	**T**	**M**	**F**	**T**	
1st quarter	64	84	148	111	125	236	**Rs.39,46,890/-** (Total receipt included from piglets and adults)
2nd quarter	214	215	429	103	124	227	
3rd quarter	157	128	285	179	164	343	
4th quarter	284	248	532	217	195	412	
Annual	**719**	**675**	**1394**	**610**	**608**	**1218**	

BIRSA AGRICULTURAL UNIVERSITY, RANCHI, JHARKHAND

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

Herd dynamics:

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1.	Piglet (up to 42 d)	54	703		30		529	63
2.	Grower (42d-5 m)	25	-		42		06	34
3.	Finisher (5- 8 m)	52	-		-			
4.	Adult	14			-			20
4.	Breeding Female	72	-		11		30	87
5.	Boar	22	-		03		10	22
Grand total		**229**	**703**		**86**		**575**	**223**

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	95	84	179	4	1	5	91	83	177
2nd quarter	80	82	162	3	4	7	77	78	155
3rd quarter	98	86	184	6	4	10	92	82	174
4th quarter	75	93	178	1	7	8	84	86	170
Annual	358	345	703	14	16	30	344	329	673

Number of piglets sold during the reporting period:

	Total no. of piglets produced			Total no. of piglets sold			Amount realized (Rupees)
	M	**F**	**T**	**M**	**F**	**T**	
1st quarter	91	83	177	38	30	68	139789.00
2nd quarter	77	78	155	57	70	127	191256.00
3rd quarter	92	82	174	52	58	110	166354.00
4th quarter	84	86	170	130	140	270	696672.00
Annual	344	329	673	**277**	**298**	**575**	**1144071.00**

Adopted village Kharsidag, Namkom, Ranchi

We have adopted one village named Kharsidag, Namkom, Ranchi. In the village there is population of tribal poor farmers, taking one seasonal rain fed crop and vegetables for livelihood. Twelve farmers were selected and given three pigs to each farmer by some other scheme during the year 2016. The performance was observed to be very satisfactory. They allow to fed their pigs like vegetable waste, garbage, rice fermented waste, some grains etc. Now most of the pigs farrowed once with litter size 7-10. Some farmers sold the piglets @ Rs 2500 each. They are very happy and trying to increase the herd strength Economic outcome of the interventions**.**

Success story of Sir Ghanshyam Gilwa

A 35-year-old married, educated person. He is residing with his family in a small house made of soil and bamboo built in the village, Hatia, Pithia Toli, Namkom, Ranchi district of the state of Jharkhand. Ghanshyam is an Ex Army person. After taken VRS he was unemployed. He was seching for a good job. The economic status of his family becomes very poor. They don't have enough land to fulfill the basic requirements. He was very worried and always thinking to short out the problems of his family. One day her wife advised her to start pig farming. He raised his small farm in his backyard with fifteen pigs (Jharsuk) purchased from Ranchi Veterinary College in the year 2012. He kept the pigs on household kitchen collected from the nearby hotels and forages. In the first year he earned unexpected amount by selling the piglets. After getting some money by selling the piglets of first farrowing he prepared six pens for pigs by investing Rs. 30,000 in year 2013. Now, he started to collect hotel waste from town by hired auto with the help of his neighbors. After two years the adult herd strength was increased to approx 30-40. Thereafter he purchases one auto on loan basis for collecting large quantity hotel waste from town (15-20 KM) in the year 2013. He used to sell a pig within the village and to middle man per months, usually during Christmas or festivals, earning Rs 100000–180000 each time.

There was significant improvement in socio-economic status of the family of Ghanshyam. Now he is expending full time in pig farming and promoting the nearby youths for pig farming. He is now living a much more comfortable life than ever before.

Animals at farmers' field

ICAR RC FOR NEH, MEDZIPHEMA, NAGALAND

Nagaland, one of the hilly states of Eastern Himalaya, is inhabited by tribal communities which are mostly non-vegetarian and hence the demand for animal protein is much more compared to other parts of the country. Pig is one of the most important livestock which play an important role in improving the socio-economic status of the tribal and weaker section of the society. Though among various livestock, pig alone accounts for 48.4 % of the total livestock population in Nagaland, there still exists a wide gap between the demand and availability of pork mainly due to rearing of non-descript local pigs which have very poor growth and production. Moreover, the majority of the farmers are fattener farmers. Therefore, the need of the hour is to facilitate a shift in production pattern by way of introducing quality pig germplasm with superior genetic merit and production potential. Keeping this fact in view, an attempt has been made to propagate quality pig germplasm under "Mega Seed Project on Pig" at the centre w.e.f November, 2008. Under the Mega Seed Project on pig, a total of 4157 no. of piglets have been distributed till date for promotion of breeding in Nagaland, Assam, Manipur and Arunachal Pradesh.

Herd dynamics:

Sl. No.	Categories	Opening Balance	Additions			Disposal		Closing balance
			Birth	Transfer	Death	Transfer	Sold	
1	Piglets (up to 42 d)	109	968		285		720	72
2	Grower (42 d – 5 m)	5		29*		22		12
3	Finisher(5 m- 8 m)	6		22*		14*		14
4	Breeding female	58		14*	4		6	62
5	Boar	5		4*			4	5
Grand Total		183	968	69	289	36	730	165

Genetic constitution breeding stock maintained at the centre as on 31.03.2017

Age Group	Ghungroo	Hampshire	Cross Breed	Total
Replacer	3	4	19	26
Sow	12	11	39	62
Boar	0	1	4	5
Total	15	16	62	93

Number of piglets produced during the reporting period:

Quarter	Total no. of piglets Farrowed			Total no. of piglets died			Total piglets produced		
	M	F	T	M	F	T	M	F	T
1st	103	112	215	37	37	74	66	75	141
2nd	138	141	279	32	35	67	106	106	212
3rd	149	139	288	40	41	81	109	98	207
4th	103	82	186	31	32	63	72	50	123
Annual	**493**	**474**	**962**	**140**	**145**	**285**	**353**	**329**	**682**

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

Quarters	Total no. of piglets produced			Total no. of piglets sold.			Total no. of adult sold			Amount realized (Rs)
	M	F	T	M	F	T	M	F	T	
1st	66	75	141	85	82	167		1		
2nd	106	106	212	76	102	178	3			
3rd	109	98	207	101	104	205		2		
4th	72	50	123	88	82	170	3	2		
Annual	**353**	**329**	**682**	**350**	**370**	**720**	**6**	**5**	**11**	**24,34,695.00**

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 artificial insemination program from adopted organized farms and farmer at field level were conducted. The farrowing rate was recorded to be 79.74% in the MSP farm following double insemination with average litter size 10.21. The largest litter farrowed was 20 by a Ghungroo. The low farrowing rate and longer heat interval could be attributed to the overage parent stock. However, in field condition the farrowing rate was increased from previous years to 87.94 with litter size averaging 9.39. It may be attributed to the younger stock maintained at field level and also the trainings imparted to farmers. Over 300 farmer beneficiaries were benefited through the availability of better quality piglets and semen for Artificial insemination from the centre. The Centre conducted two trainings for farmers which are given below:

- "Promotion of Pig Breeding through Artificial Insemination and Scientific Management techniques" 20-22 July 2016.
- "Training on Scientific Pig and Poultry Production: Avenues for Entrepreneurship Development" 15-18 November 2016.

Performance of AI conducted at farm and field level

Location of AI adopted	No. of animals inseminated	No. of animals farrowed	Farrowing rate	AI per farrowing	Litter size average
MSP Pig Farm	153	122	79.74 %	2.50	10.21 (1-20)
Medziphema	46	40	86.96 %	2.3	8.85 (6-15)
Kohima	44	41	93.18 %	2.14	9.42(6-10)
Dimapur	36	34	94.44 %	2.11	11.33(7-13)
Diphu	7	5	71.43 %	2.8	9.6 (7-13)
Jalukie	8	4	50 %	4.0	7.75(7-9)
Total	**141**	**124**	**87.94%**	**1.13**	**9.39(6-15)**

Piglets being transported to the field.

Lady farmer at Peren district.

Training under Mega Seed Project on Pig

Pigs at farmers' field

VETERINARY DEPARTMENT, GOVT. OF MIZORAM, AIZWAL

Pig rearing is one of the most important source of subsidiary income for the peasants and well to do and middle income groups of Mizoram. The Pig meat (pork) is also most common food of animal origin in Mizoram. According to the Reports of Integrated Sample survey for the estimation of Major Livestock Products in 2016 to 2017, 7368.48 tonnes of pork was produced and consumed by the people of Mizoram, which accounts for 49.82% of total meat production/consumption (*i.e* out of 14788.93 tonnes of meat) in Mizoram. In view of this scenario of meat production, especially pork, in Mizoram, the ICAR-Mega Seed Project on Pig was established since 2009 (29th March) in Mizoram with the main objective of production and dissemination of 900 Large White Yorkshire piglets per year in Mizoram. Although the target for piglet production is not yet achieved so far, we are expecting to achieve the target in the near future *i.e* within two to three years or even earlier.

Herd Dynamics

Sl. No.	Categories	Opening Balance	Addition			Disposal		Closing Balance
			Birth	Transfer	Death	Transfer	Sold	
1.	Piglet (upto 42 d)	93	620	-	- 33	- 582	-	98
2.	Grower (43 d – 5m)	5	-	+ 582	- 1	- 3	582	1
3.	Finisher (5 – 8m)	38	-	+ 3	-	- 4	-	37
4.	Breeding Female	42	-	+ 4	-	-	- 5	41
5.	Boar	1	-	-	-	-	-	1
Grand Total		**179**	**620**	**589**	**34**	**589**	**587**	**178**

Numbers of Piglet produced during the reporting period:

Sl. No.		Total no. of piglet born			Total no. of piglet died			Total no. of piglet produced		
		M	F	T	M	F	T	M	F	T
1.	1st quarter	81	106	187	5	4	9	76	102	178
2.	2nd quarter	78	77	155	2	5	7	76	72	148
3.	3rd quarter	67	14	131	3	2	5	64	62	126
4.	4th quarter	73	74	147	7	6	13	66	68	134
Annual		**299**	**321**	**620**	**17**	**17**	**34**	**282**	**304**	**586**

Numbers of Piglet sold during the reporting period:

Sl. No.		Total no. of piglet produced			Total no. of piglet sold			Amount realized (Rs.)
		M	F	T	M	F	T	
1.	1st quarter	76	102	178	75	76	151	Rs. 4,53,000.00
2.	2nd quarter	76	72	148	80	75	155	Rs. 5,45,000.00
3.	3rd quarter	64	62	126	68	82	150	Rs. 4,50,000.00
4.	4th quarter	66	68	134	64	62	126	Rs. 3,78,000.00
Annual		**282**	**304**	**586**	**287**	**295**	**582**	**Rs. 18,26,000.00**

Success story of beneficiaries:

Name of Beneficiary : Mr. Rongena, Rawpuichhip, Aizawl District.
Date of purchased : 3rd May, 20164 (2 male + 2 female)
Purpose : Partly breeding and partly fattening.

Mr. Rongena purchased 4 piglets (2 male and 2 female) for fattening purpose from Mega Seed Pig Farm. He is a faithful client of Mega Seed Pig Farm and had already purchased several piglets in the previous years. He set up private pig farm in his village and is the main supplier of pork in his locality. He had earned over Rs.1,50,000/-per annum from the sale of his fattener pigs.

Name of beneficiary	:	Mrs. Biaknii, Chhiahtlang, Serchhip District
Date of Purchased	:	10th January, 2016 3(3 female)
Purpose	:	For Breeding.

Mrs. Biaknii is a single mother who resides in Chhiahtlang Village which is 80 kms. from state capital Aizawl. She had purchased 3 female piglets for breeding purpose. She had been very successful and attained an average of 9 litter size at weaning and had earned over Rs.1,00,000/- from selling her piglets. She had proudly informed us that her Sows will shortly be on heat again and will be ready for service in few days.

Name of Beneficiary	:	Mr. C. Lalruala, Sihphir, Aizawl District
Date of Purchased	:	25th June, 2016, 2 (1 male + 1 female)
Purpose	:	Fattening.

Mr. C. Lalruala is a senior citizen who had taken up a hobby of pig rearing. He had purchased 2 piglets for fattening and had sold both the fattener after 8 months and earned over Rs.56,000/-. He enthusiastically told us that he is ready to purchase another piglets from Mega Seed Pig Farm on larger scale.

Name of Beneficiary	:	Mrs. Lalfakzauvi, Ngopa, Champhai District
Date of purchased	:	29th May, 2016, 2 (2 female)
Purpose	:	Breeding

Mrs. Lalfakzauvi of Ngopa village purchased 2 female piglets for breeding purpose to extend her pig farm which she had started in the year 2014 by piglets which she had purchased from Mega Seed Pig Farm. She informed us that her farm is very productive and the piglets which she purchased are now in heat and serviced. She expects that she will be having a good litter from her Sow. Her farm presently earned over Rs.2,00,000/- per annum and her family is depending fully on pig farming.

In addition majority of our clients, who had purchased piglets for various purposes, reported their success and progress in pig farming from various corner of Mizoram.

Mega seed Farm

Pigs in farm

Private farm

KERALA VETERINARY AND ANIMAL SCIENCE UNIVERSITY, MANNUTHY CENTRE, KERALA

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

Herd dynamics:

Sl. No	Categories	Opening balance	Additions			Disposals		Closing balance
			Birth	Transfers	Purchased	Mortality	Sold	
1	Piglet (up to 42 days)	60	832		150*	63	656	323
2	Grower (42 d-5 m)	30						25
3	Finisher (5 - 8 m)				7			7
4	Breeding female	66						74
5	Boar	21						18
	Grand total	177	832		157	63	656	447

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	96	77	173	10	6	16	86	71	157
2nd quarter	77	101	178	4	9	13	73	92	165
3rd quarter	108	97	205	4	9	13	104	88	192
4th quarter	136	140	276	15	6	21	121	134	255
Annual	417	415	832	33	30	63	384	385	769

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**	**16,70,163.00**
1st quarter	96	77	173	68	27	95	
2nd quarter	77	101	178	71	59	130	
3rd quarter	108	97	205	78	94	172	
4th quarter	136	140	276	131	128	259	
Annual	417	415	832	348	308	656	

Success story:

The centre provides technical support to entrepreneurs on profitable pig rearing. 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: Mr. K.R. Mohanan

Full Address: Kanjavalappil House, Kolangattukara, P O, Choolissery, Mundur (Via), Thrissur Kerala. Mr. Mohanan after attending training at AICRP Mannuthy during 2016. expanded his existing piggery unit. He has started breeding unit and started sale of piglet also. Now, he owns 150 pigs and earns an income of Rs.35,000/month through the sale of piglets and finisher pigs.

<table>
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<tr><td>Pigs at farmers’ field</td><td>Distribution of piglets</td></tr>
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<tr><td colspan="2">Distribution of piglets</td></tr>
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ANIMAL RESOURCE DEVELOPMENT DEPARTMENT, GOVT. OF TRIPURA, AGARTALA

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 MoU was signed between Director of ARDD, Govt. of Tripura and Director, NRC on Pig, ICAR, Rani as per Govt. approval.

Herd dynamics:

Number of piglets produced during the reporting period

	Total no. of piglets born			Total no. of piglets died			Total no. of piglets produced		
	M	F	T	M	F	T	M	F	T
1st quarter									
2nd quarter									
3rd quarter									
4th quarter									
Annual	83	103	186	4	7	11	79	96	175

Number of piglets sold during the reporting period:

	Total no. of piglets produced			Total no. of piglets sold			Amount realized (Rupees)
	M	F	T	M	F	T	
1st quarter				5	5	10	20,000.00
2nd quarter				38	38	76	1,52,000.00
3rd quarter				18	33	51	1,04,500.00
4th quarter				18	17	35	70,000.00
Annual				**79**	**93**	**172**	**3,46,500.00**

Animals of Mega Seed on pig shed in ARDD, Tripura

Mega Seed on pig shed in ARDD, Tripura

CHHATTISGARH KAMDHENU VISHWAVIDYALAYA, DURG

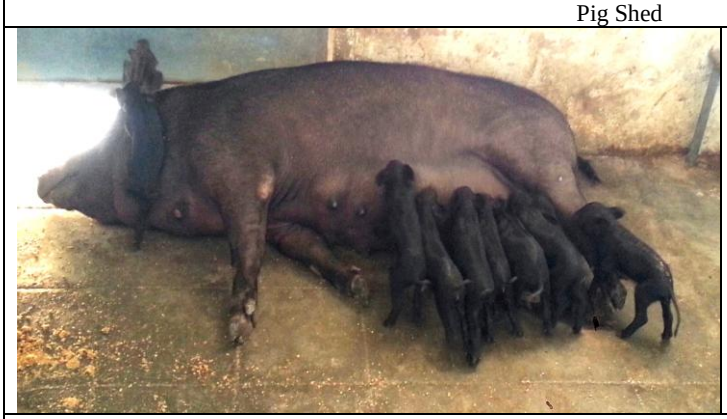
The Mega-seed project has been started at January 2015 at our center. The parent stock of 7 sows and 3 boars of T & D breed have been procured from Veterinary college Ranchi on 28th March 2016 and the breeding programme parent stock of piglets has been started at the end of the year 2016 after completion of renovation of the sty and maturity of the parent stock. The renovation of pig shed has been completed along with separate feed storage room and small office room.

Herd dynamics

S. No.	Genetic group / Variety	Age	Sex	Numbers
1.	T&D	6	Male	3
2.	T&D	6	Female	7
	Total			10

Number of piglets produced during the reporting period: 25
Number of piglets sold during the reporting period: NIL


Pig Shed




Sow along with piglet

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

Report not submitted