

ANNUAL REPORT

AICRP &
MEGA-SEED PROJECT
ON PIG
(2013-14)



राष्ट्रीय शुकर अनुसंधान केन्द्र
NATIONAL RESEARCH CENTRE ON PIG

INDIAN COUNCIL OF AGRICULTURAL RESEARCH
RANI, GUWAHATI-781131



Annual Report of AICRP on Pig
(2013-2014)



National Research Centre on Pig
(Indian Council of Agricultural Research)
Rani, Guwahati, Assam- 781 131



NATIONAL RESEARCH CENTRE ON PIG

Annual Report of AICRP on Pig (2013-2014)

Project Director

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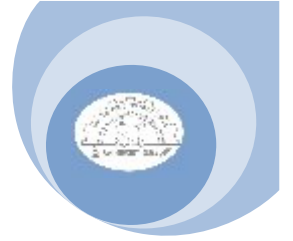
Annual Report of AICRP and Mega-seed Project on Pig
(2013-2014)

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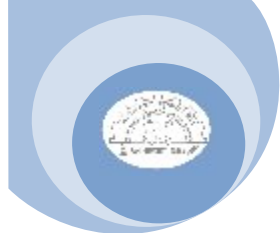


Mega-Seed Project on Pig

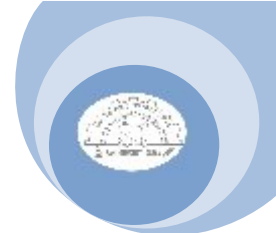
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AICRP on Pig

**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. Stephen Mathew
3	College of Veterinary Science, Birsa Agricultural University, Kanke, Ranchi, Jharkand -834006	Dr. L. B. Singh
4	College of Veterinary Science, Sri Venkateshwara Vety. University, Tirupati- 517 502, Andhra Pradesh	Dr. K. Sakunthala Devi
5	ICAR Research Complex for Goa, Ela, Old Goa-403402, Goa	Dr. E.B. Chakurkar
6	Indian Veterinary Research Institute, Izatnagar, U.P. -243122	Dr. Bharat Bhushan
7	Post Graduate Research Institute in Animal Sciences, Tamil Nadu Veterinary and Animal Sciences University, Kattupakkam, Tamilnadu-603203	Dr. H. Gopi
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



ACTIVITY ASSIGNED AND TARGET FIXED

General:

1. The monthly report of piglet production and sold has be sent to the Project Coordinating centre by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.
2. The centers need to submit AUC before September month of preceding financial year and UC quarterly, positively.
3. The unspent amount, if any, must be refunded by the month of March of each financial year positively.
4. Final annual report should be submitted for AICRP and Mega-seed project on pig as per format provided by the month of April of the preceding financial year.

Technical:

Animal Breeding:

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

1. Crossbred animals of 75% exotic inheritance should be maintained by *inter-se*-mating.
2. In-case of non-availability of 75% germplasm, the centre should develop a plan to produce it and then maintain it by *inter-se*-mating. The first batches of 75% exotic animals, in such centers, should be produced by 31st March 2014. (Action to be taken: AICRP on pig centres at SASARD, Nagaland University, Medziphema and Central Agricultural University, Aizawl).
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 index method of selection, including birth weight, weaning weight and 8 month body weight.
5. Selection of female animals should be based on index method of selection, including litter size at birth and weaning, litter weight at birth and weaning and number of functional teats (at least 6 pairs of functional teats).
6. The selection of animals should preferably be done by considering cyto-genetics screening of population for all the genetic abnormalities.
7. The selection criteria should include following points:
 - a. 8 months body weight should be ≥ 65 kg for crossbred (except Tanye-Vo and Zowak crosses)



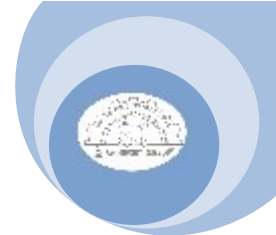
- b. 8 months body weight should be ≥ 35 kg for crossbred (for Tanye-Vo and Zowak crosses)
- c. Litter size at birth should be ≥ 7
8. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection.
9. Artificial Insemination should be implemented at all centers and necessary collaboration for this purpose may be established with the relevant department of SAU/CAU/ICAR institutes. If required, training on AI may be obtained from NRC on pig.
10. Three number of farrowing per sow need to be recorded. Three farrowing par sow should be completed in 2 years.

Nutrition, physiology and management:

1. Validation of existing feeding packages developed by AICRP units at field level needs to be carried out.
2. Compilation of technologies developed by the AICRP centers since its inception should be done.
3. Efforts to develop location specific technologies for farmers to reduce the heat stress to the animals in changing climate scenario. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.

Health Management:

1. Outbreak of any infectious diseases needs to be communicated to NRC on Pig at the earliest.
2. Health calendar (as provided by coordinating centre) should be maintained by all the centres.
3. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.
4. Mortality parameters should be recorded with utmost care. Still birth/abortion/mummification should not be included while recording pre-weaning mortality.
5. Proper managerial care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2% respectively.
6. Steps need to be taken to strengthen the bio-security measures at the farm.



INTRODUCTION

1. Brief history:

AICRP on pig started its journey during IVth five year plan (1970-1971) with the main objective of studying the performance of purebred exotic pigs under existing managerial 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 Kattupakkam (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.

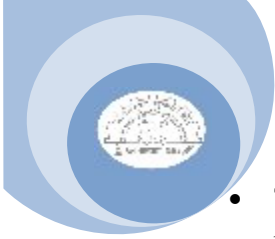
All existing AICRP centres on pig as listed below are coordinated by NRC on Pig.

- Assam Agricultural University, Khanapara, Guwahati
- Birsa Agricultural University, Kanke, Ranchi
- Kerala Veterinary and Animal Science University, Mannuthy
- Sri Venkateswara Veterinary University, Tirupati
- Tamilnadu Veterinary and Animal Science University, Kattupakkam
- Indian Veterinary Research Institute, Izatnagar
- ICAR Research Complex for Goa, Old Goa.
- Central Agricultural University, Aizawl, Mizoram
- SASARD, Nagaland University, Medziphema.

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 diverse 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:

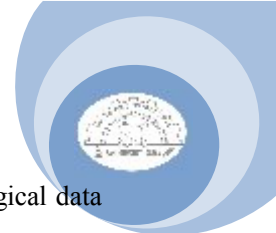
- To study the performance of indigenous pigs under optimal managerial conditions
- To produce crossbred by crossing indigenous gilts with exotic boars and to assess their performance in respect of their efficiency of feed conversion, production and reproduction
- To evolve economic pig ration with locally 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



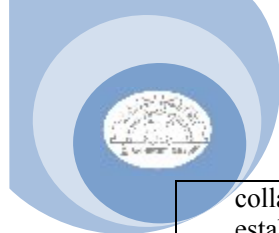
5. Efforts need to be adopted to reduce overall mortality below 10% level. Meteorological data need to be recorded in order to forecast the disease outbreaks so that appropriate prevention measures can be adopted.
6. Region based suitable developed economic feed formula(e) is(are) yet to come up for 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 Indian Veterinary Research Institute, Bareilly in October, 2013.

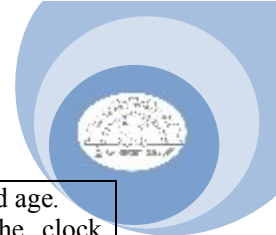
4. Action point discussed in Review Meet of 'All India Coordinated Research Project on Pig' and "Mega Seed Project on Pig" held Indian Veterinary Research Institute, Bareilly in 2013

AAU, Khanapara

Recommendation	Action Taken
Animal Breeding	
1. Crossbred animals of 75% exotic inheritance should be maintained by <i>inter-se</i> -mating	1. 75% Hampshire (15th generation) are maintained by inter-se mating at AAU, Khanapara centre.
2. 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.	2. 12 male and 42 female piglets of 14th generation were selected during the later part of the year 2012-13. Subsequently as per technical programme 33 gilts were bred that produced two crops during the year 2013-14. The same sows were also placed in breeding for production of 3 rd crop during 2013-14.
3. Selection of male animals should be based on index method of selection, including birth weight, weaning weight and 8 month body weight.	3. A total of 25 male and 50 female piglets are selected at weaning and finally 12 male and 35 female will be selected for breeding and expected to breed during December'2014. <ul style="list-style-type: none"> The selection of male piglets is done by index method considering the birth weight, weaning weight and 8 month body weight.
4. Selection of female animals should be based on index method of selection, including litter size at birth and weaning, litter weight at birth and weaning and number of functional teats (at least 6 pairs of functional teats).	4. The selection of index for the said reproductive traits is not calculated due to smaller size of the population. The female piglets are selected from each dam to avoid full sib mating and inbreeding. Further, the gilt will be selected on the basis of their dam's record and functional teats.
5. The selection of animals should preferably be done by considering cyto-genetics screening of population for all the genetic abnormalities.	5. In collaboration with the Department of AG&B, the cyto-genetic studies will be conducted at maturity age.
6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection.	6. The data of the 3 rd crop piglets are recorded since May'2014 and will be analyzed after completion of growth data.
7. Artificial Insemination should be implemented at all centers and necessary	7. The infrastructure for Artificial Insemination will be developed at AICRP Centre. A.I. is practiced in the Mega Seed Project with the



<p>collaboration for this purpose may be established with the relevant department of SAU/ICAR institutes. If required, training on AI may be obtained from NRC on pig.</p> <p>8. Three number of farrowing per sow need to be recorded. Three farrowing per sow should be completed in 2 years.</p>	<p>help of Animal Reproduction and Gynecology department, College of Veterinary Science, AAU, Khanapara.</p> <p>8. Three farrowings per sow are obtained in 2 years of age. Attempts are being made to reduce the inter-farrowing period</p>
Nutrition, physiology and management	
<p>1. Validation of existing feeding packages developed by AICRP units at field level needs to be carried out.</p> <p>2. Compilation of technologies developed by the AICRP centers since its inception should be done.</p> <p>3. Efforts to develop location specific technologies for farmers to reduce the heat stress of the animals in changing climate scenario. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.</p>	<p>1. A package of rations for pre-weaned piglets, grower and lactating sows have been developed by combining different ingredients and chemicals for optimum growth. The cost per kg creep ration (2nd to 11th weeks) <i>ie.</i> Starter I, Starter II, Grower I and Lactating sow are calculated as Rs. 62.85, 38.15, 23.55, 20.85 and 19.16, respectively.</p> <p>a) Development of 50% Hampshire cross b) Development of 75.50% Hampshire cross c) Development of 87.50% Hampshire cross d) Construction Selection Index (Body weight)</p> <p>3. Not yet done Proposed Research Project under i) Bimolecular expression on Melatonin and Vitamin E supplementation during summer and winter in pigs. ii) Productive performance of weaned piglets to environmental stress by manipulating dietary energy level.</p>
Health Management	
<p>1. Outbreak of any infectious diseases needs to be communicated to NRC on Pig at the earliest.</p> <p>2. Health calendar should be maintained by all the centres.</p> <p>3. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.</p> <p>4. Mortality parameters should be recorded with utmost care. Still birth/abortion/mummification should not be included while recording pre-weaning mortality.</p>	<p>1. The outbreak of Classical Swine Fever was informed immediately to the NRC on Pig and samples were sent for screening of antibody titer during the month of Nov-Dec'2013.</p> <p>a) Iron injection given to piglets at 4th & 14th day.</p> <p>b) Deworming - At one and half months, two and half months, five months and at eight months (before breeding in female) and repeated six months interval. Vaccination:</p> <p>c) CSF- First dose at one and half months of age, booster at two and half months and repeated after six months interval d) FMD- First dose at one and half months of age, booster at two and half months and repeated after six months interval</p> <p>3. As per the guide line and proforma given by NRC on Pig, Rani, serum samples are regularly sent for screening.</p> <p>4. Mortality parameters are recorded after post-mortem conducted by the Department of Veterinary Pathology, College of Veterinary Science, AAU, Khanapara. The mortality is</p>



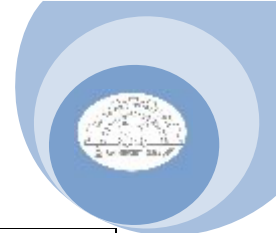
5. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5 months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2% respectively.	recorded as per genetic group, Sex and age.
6. Steps need to be taken to strengthen the bio-security measures at the farm.	<p>a) Special care was given round the clock during farrowing. Newborn piglets were kept under observation to avoid injury from mother and debilitated piglets were nourished specially to regain their health. Pre starter (7th-20th day) and starter (22st day to weaning) rations were provided to the piglets. Sometime buffalo milk is also provided to debilitated piglets. Iron therapy in the form of intra muscular injection was given to all piglets at 4th and 14th day of birth to combat the occurrence of piglet anemia.</p> <p>b) Regular cleaning and washing of pig sties with Potassium Permanganate /caustic soda/ bleaching powder and proper disposal of sewage were practiced routinely. The floor, corners and crevices inside the pig sheds were burned at fortnight interval. A solution of 3% Formaldehyde spray is also routinely practiced.</p> <p>a) Routine works – Iron injection, deworming, and vaccinations are practiced to prevent the respective diseases.</p> <p>b) Various steps that are taken as:</p> <p>c) Restriction of visitors, trainee and outsiders in to the farm premises.</p> <p>d) Restriction of other livestock, streets animals in to the farm.</p> <p>e) Provision of foot bath.</p>

BAU, Ranchi

Recommendation	Action Taken
General	
1. The monthly report of piglet production and sold has be sent to the Project Coordinating centre by 28 th of every month, preferably by mail. The period to be covered is from 25 th of previous month to 24 th of current month.	1. The monthly reports of piglet produced and sold (25 th of previous month and 24 th of current months) are sent regularly.
2. The centers need to submit AUC before September month of preceding financial year and UC quarterly, positively.	2. U.C. was sent on time. It has been observed that there were some mistakes in current AUC. Hence, need to revise and the same was sent.
3. The unspent amount, if any, must be refunded by the month of March of each financial year.	3. The unspent amount, has been refunded/adjusted in current financial year.
4. Final annual report should be submitted for AICRP on pig by the month of April	4. Final annual report for AICRP and MSP on Pig has been submitted as per format in time.
Animal Breeding	
1. 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.	1. Presently the centre achieved the target and the centre is maintaining 30 breedable sow unit with a sex ratio 1:3
2. Selection of male animals should be based on index method of selection, including birth,	2. The centre starts selecting males for breeding purpose on index method of selection



<p>weaning and 8 month weight.</p> <p>3. Selection of female animals should be based on index method of selection, including litter size at birth and weaning, litter weight at birth and weaning and number of functional teats (at least 6 pairs of functional teats).</p> <p>4. The selection of animals should preferably be done by considering cyto-genetics screening of population for all the genetic abnormalities.</p> <p>5. The selection criteria should include following points:</p> <p>a. 8 months body weight should be ≥ 65 kg for crossbred</p> <p>6. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection.</p> <p>7. Artificial Insemination should be implemented at all centers.</p> <p>8. Three number of farrowing per sow need to be recorded. Three farrowing par sow should be completed in 2 years.</p>	<p>including Birth, weaning and 8 months weight.</p> <p>3. The centre is selecting females for breeding purpose on the basis of index method of selection including birth weight, weaning weight, litter weight at birth and weaning and number of functional teats.</p> <p>4. The centre is having necessary facilities for cyto-genetics screening of population for all the genetic abnormalities.</p> <p>5. The selection criteria are being followed on the basis of body weight (> 65 Kg at the age of 8 months).</p> <p>6. Data has been prepared showing progress in each generation over previous year due to genetic selection.</p> <p>7. Due to lack of facilities the centre is unable to start Artificial insemination.</p> <p>8. Three farrowings per sow is recorded and is almost completed in two years.</p>
Nutrition, Physiology and Management	
<p>1. Validation of existing feeding packages developed by AICRP units at field level needs to be carried out.</p> <p>2. Compilation of technologies developed by the AICRP since its inception should be done.</p> <p>3. Efforts to develop location specific technologies for farmers to reduce the heat stress to the animals in changing climate scenario. Recording of daily micro and macroclimatic data.</p>	<p>1. Existing feeding package developed at this unit is validated.</p> <p>2. Compilation of technologies is going on.</p> <p>3. The centre is trying to develop location specific technologies for farmers to reduce heat stress. Micro and macro climatic data is being recorded.</p>
Health Management	
<p>1. Outbreak of any infectious diseases needs to be communicated to NRC on Pig at the earliest.</p> <p>2. Health calendar should be maintained.</p> <p>3. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.</p> <p>4. Mortality parameters should be recorded with utmost care. Still birth/abortion/mummification should not be included while recording pre-weaning mortality.</p> <p>5. Proper management care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2% respectively.</p> <p>6. Steps need to be taken to strengthen the bio-security measures at the farm.</p>	<p>1. No outbreak is recorded. It will be informed if any.</p> <p>2. Health calendar is being maintained.</p> <p>3. Regular monitoring for infectious disease is being done and will be collaborated with NRC if required.</p> <p>4. Mortality parameters are being recorded.</p> <p>5. Proper management care is followed to reduce mortality in different stages.</p> <p>6. The centre strengthened the bio-security measures at the farm.</p>

**KVASU, Mannuthy, Kerala**

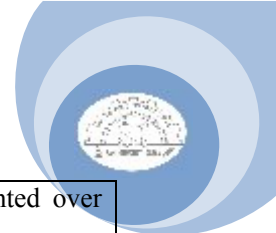
Recommendation	Action taken
General	
1. The monthly report of piglet production and sold has been sent to the Project Coordinating centre by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.	1. Now, reports are being sent on 31 st , hereafter it will be done on every 25 th as prescribed.
2. The centers need to submit AUC before September month of preceding financial year and UC quarterly, positively.	2. It is being done.
3. The unspent amount, if any, must be refunded by the month of March of each financial year positively.	3. Will be adhered to.
4. Final annual report should be submitted for AICRP and Mega-seed project on pig as per format provided by the month of April of the preceding financial year.	4. It is being followed.
Animal Breeding	
1. Crossbred animals of 75% exotic inheritance should be maintained by <i>inter-se- mating</i> .	1. It is being maintained.
2. 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.	2. It is being done.
3. Selection of male animals should be based on index method of selection, including birth weight, weaning weight and 8 month body weight.	3. It is being done. Fresh index based on current information will be evolved.
4. Selection of female animals should be based on index method of selection, including litter size at birth and weaning, litter weight at birth and weaning and number of functional teats (at least 6 pairs of functional teats).	4. Will be attempted.
5. The selection of animals should preferably be done by considering cyto-genetics screening of population for all the genetic abnormalities.	5. Will be attempted.
6. The selection criteria should include following points: a. 8 months body weight should be ≥ 65 kg for crossbred (except Tanye-Vo and Zowak cross) b. 8 months body weight should be ≥ 35 kg for crossbred (for Tanye-Vo and Zowak cross) c. Litter size at birth should be ≥ 7	6. All suggestions will be scrupulously followed.
7. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection.	7. It will be done.
8. Artificial Insemination should be implemented at all centers and necessary collaboration for this purpose may be established with the relevant department of SAU/CAU/ICAR institutes. If required, training on AI may be obtained from NRC on pig.	8. Training was done from AICRP Goa unit was contacted and they have offered all help. One Scientist from this centre is now deputed for four days training from 19.8.2014.
9. Three number of farrowing per sow need to be recorded. Three farrowing par sow should be completed in 2 years.	9. It is being practiced.
Nutrition, Physiology and Management	
1. Validation of existing feeding packages developed by AICRP units at field level needs to be carried out.	1. It is being carried out.
2. Compilation of technologies developed by the AICRP	2. In the Annual Progress report all the



centers since its inception should be done.	research outcomes are being given.
3. Efforts to develop location specific technologies for farmers to reduce the heat stress of the animals in changing climate scenario. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	3. A Master level research in this line has been just now completed and soon the result will be published.
Health Management	
1. Outbreak of any infectious diseases needs to be communicated to NRC on Pig at the earliest.	1. It is being adhered to.
2. Health calendar (as provided by coordinating centre) should be maintained by all the centres.	2. No health calendar has been seen received from NRC.
3. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	3. It is being practiced.
4. Mortality parameters should be recorded with utmost care. Still birth/abortion/ mummification should not be included while recording pre-weaning mortality.	4. Being done.
5. Proper managerial care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2% respectively.	5. All actions are being taken.
6. Steps need to be taken to strengthen the bio-security measures at the farm	6. Measures are being taken.

SVVU, Tirupati

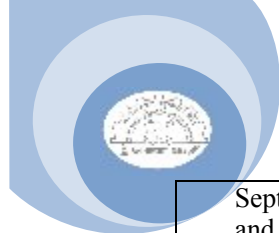
Recommendation	Action Taken
Animal Breeding	
1. Crossbred animals of 75% exotic inheritance should be maintained by <i>inter-se</i> -mating.	1. Presently performance of only 75% crossbreds of LWY by interse mating is being studied.
2. In-case of non-availability of 75% germplasm, the centre should develop a plan to produce it and then maintain it by <i>inter-se</i> -mating.	2. 75% crossbreds of LWY are available at this center and completed 20 th generation of selection.
3. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres.	3. Breeding stock size containing 30 females bred to 10 boars to generate three crops of piglets (10 boars in each crop; each mated to 3 females).
4. Selection of male animals should be based on index method of selection, including birth weight, weaning weight and 8 month body weight.	4. Males are selected based on index method of selection including birth weight, weaning weight and 8 month body weight.
5. Selection of female animals should be based on index method of selection, including litter size at birth and weaning, litter weight at birth and weaning and number of functional teats (at least 6 pairs of functional teats).	5. Females are selected based on index method of selection including litter size and litter weight at birth and weaning by giving weightage to number of functional teats for sows.
6. The selection of animals should preferably be done by considering cyto-genetics screening of population for all the genetic abnormalities.	6. Selected animals will be subjected for cytogenetic screening to find out genetic abnormalities if any.
7. The selection criteria should include following points:	7. Body weight recorded at 8 months is 66.21 kgs
a. 8 months body weight should be ≥ 65 kg for crossbred	Weightage given for litter size at birth with ≥ 7



8. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection.	8. To indicate the progress data presented over previous generation (20 th generation)
9. Artificial Insemination should be implemented at all centers.	9. AI will be started at this centre very soon <i>i.e.</i> for mating of breeding stock to produce 3 rd crop piglets. Artificial insemination is under progress.
10. Three number of farrowing per sow need to be recorded. Three farrowing par sow should be completed in two years.	10. Three number of farrowings will be completed in two years
Nutrition, Physiology and Management	
1. Validation of existing feeding packages developed by AICRP units at field level needs to be carried out.	1. Nutritionist post is vacant since 27.12.2013 onwards as the Scientist has granted deputation for one year for joining in-service Ph.D. Programme Validation of feeding packages at field level will be carried out.
2. Compilation of technologies developed by the AICRP centers since its inception should be done.	2. The available data on technologies developed at this centre is compiled.
3. Efforts to develop location specific technologies for farmers to reduce the heat stress to the animals in changing climate scenario. Recording of daily micro and macroclimatic data.	3. The centre is recording the temperature humidity data of the farm.
Health Management	
1. Outbreak of any infectious diseases needs to be communicated to NRC on Pig at the earliest.	1. No outbreaks are recorded.
2. Health calendar should be maintained	2. Health calendar is being maintained at this center. Regular vaccination is carried out for HS, FMD and Swine fever diseases etc.
3. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	3. No emerging infectious diseases are recorded in the farm.
4. Mortality parameters should be recorded with utmost care. Still birth/abortion/mummification should not be included while recording pre-weaning mortality.	4. Regularly recording data on mortality parameters.
5. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2% respectively.	5. Pre-weaning, Post-weaning and adult mortality percentages are within permissible level.
6. Steps need to be taken to strengthen the bio-security measures at the farm.	6. All possible bio-security measures were adopted.

TANUVAS, Kattupakkam

Recommendation	Action Taken
General	
1. The monthly report of piglet production and sold has be sent to the Project Coordinating centre by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.	1. Every month, piglet production is being regularly reported to the coordination centre. Sale details have been furnished from July 2014 and the same will be continued in future
2. The centers need to submit AUC before	2. Actions are being taken to submit AUC and UC before the stipulated period



<p>September month of preceding financial year and UC quarterly, positively.</p> <p>3. The unspent amount, if any, must be refunded by the month of March of each financial year positively.</p> <p>4. Final annual report should be submitted for AICRP and Mega-seed project on pig as per format provided by the month of April</p>	<p>3. Actions are being taken to refund the unspent amount, if any, during the last week of March</p> <p>4. Annual report has been submitted.</p>
Animal Breeding	
<p>1. Crossbred animals of 75% inheritance should be maintained by <i>inter-se</i> mating</p> <p>2. 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.</p> <p>3. Selection of male animals should be based on index method of selection, including birth weight, weaning weight and 8 month body weight.</p> <p>4. Selection of female animals should be based on index method of selection, including litter size at birth and weaning, litter weight at birth and weaning and number of functional teats (at least 6 pairs of functional teats).</p> <p>5. The selection of animals should preferably be done by considering cyto-genetics screening of population for all the genetic abnormalities.</p> <p>6. The selection criteria should include following points:</p> <p>a. 8 months body weight should be ≥ 65 kg</p> <p>b. Litter size at birth should be ≥ 7</p> <p>7. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection.</p> <p>8. Artificial Insemination should be implemented at all centers and necessary collaboration for this purpose may be established with the relevant department of SAU/CAU/ICAR institutes. If required, training may be obtained from NRC on pig</p> <p>9. Three number of farrowing per sow need to be recorded. Three farrowing per sow should be completed in 2 years.</p>	<p>1. Crossbred pigs of 75% inheritance are being maintained by <i>inter-se</i> mating.</p> <p>2. At present 37 breedable sows and 14 sires are being maintained. The sex ratio of 1:3 is also being maintained.</p> <p>3. Selection is being practised based on birth weight, weaning weight and 6 month body weight. Efforts are being taken to follow index selection in pigs.</p> <p>4. Selection is being practiced based on litter size at birth and weaning, litter weight at birth and number of functional teats. Efforts are being taken to go for index selection in pigs.</p> <p>5. Action will be taken for cyto-genetics screening of population for genetic abnormalities, if any. However, at present there is no such abnormalities noticed at this farm</p> <p>6. 8 months body weight in this centre is > 65 kg for crossbred and also Litter size at birth is > 7.</p> <p>7. The collected data will be analysed statistically and the same will be presented by comparing with the performance of the previous generation</p> <p>8. AI in pigs has already been standardized in other pure breeds at this farm. The same will be continued in crossbreds also.</p> <p>9. Already two farrowing per sow has been recorded and the mating for the third farrowing was completed. The performance of third farrowing will be recorded and the same will be completed within two years</p>
Nutrition, physiology and management	
<p>1. Validation of existing feeding packages developed by AICRP units at field level needs to be carried out.</p> <p>2. Compilation of technologies developed by the AICRP centers since its inception should be done</p> <p>3. Efforts to develop location specific technologies for farmers to reduce the heat</p>	<p>1. Actions are being taken for the validation of existing feeding packages developed by AICRP units at field level needs.</p> <p>2. Action will be taken to compile the technologies developed by this center</p> <p>3. Micro and macroclimatic data (Temp, Humidity and calculation of THI) of each</p>



stress of the animals in changing climate scenario. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	shed are being collected regularly and it will be reported in the coming monthly reports
Health Management	
<ol style="list-style-type: none"> 1. Outbreak of any infectious diseases needs to be communicated to NRC on Pig at the earliest. 2. Health calendar should be maintained. 3. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes. 4. Mortality parameters should be recorded with utmost care. Still birth/abortion/mummification should not be included while recording pre-weaning mortality. 5. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2% respectively. 6. Steps need to be taken to strengthen the bio-security measures at the farm. 	<ol style="list-style-type: none"> 1. No outbreak recorded for this year. If any, it will be promptly reported to NRC on pig 2. Health calendar is being maintained. 3. Action will be taken to regularly monitoring the pigs for emerging infectious diseases 4. Mortality parameters are properly recorded. 5. Scientific management practices are being carried out to reduce the mortality and at present the mortality rates are below the recommended level 6. Steps taken: <ul style="list-style-type: none"> • Disinfectants such as Khorsolin and Potassium Permanganate were regularly used to clean the piggery shed. • Sokrena – water sanitizer were added to drinking water for sanitization. • Periodical cleaning and white washing of water troughs

IVRI, Bareilly

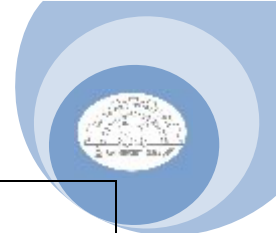
Recommendation	Action Taken
General	
<ol style="list-style-type: none"> 1. The monthly report of piglet production and sold has be sent to the Project Coordinating centre by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month 2. The centers need to submit AUC before September month of preceding financial year and UC quarterly, positively 3. The unspent amount, if any, must be refunded by the month of March of each financial year positively 4. Final annual report should be submitted for AICRP and Mega-seed project on pig as per format provided by the month of April. 	<ol style="list-style-type: none"> 1. Being submitted regularly on monthly basis 2. Already sent in-time 3. Refunded 4. Submitted
Animal Breeding	
<ol style="list-style-type: none"> 1. Crossbred animals of 75% exotic inheritance should be maintained by <i>inter-se</i> mating. 2. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres. 3. Selection of male animals should be based on index method of selection, including birth, weaning and 8 month body weight. 4. Selection of female animals should be based on index method of selection, including litter size at birth and weaning, litter weight at birth and weaning and number of functional teats (at least 6 	<ol style="list-style-type: none"> 1. Achieved 2. Under process and will be achieved 3. Under process 4. Under process



pairs of functional teats).	
5. The selection of animals should preferably be done by considering cyto-genetics screening of population.	5. Under process
6. The selection criteria should include following points: a. 8 months body weight should be ≥ 65 kg for crossbred b. Litter size at birth should be ≥ 7	6. Achieved
7. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection	7. Will be provided in the Annual Report
8. Artificial Insemination should be implemented at all centers and necessary collaboration for this purpose may be established with the relevant department of SAU/CAU/ICAR institutes. If required, training on AI may be obtained from NRC on pig.	8. Initiated and will be used in few females
9. Three number of farrowing per sow need to be recorded. Three farrowing par sow should be completed in 2 years.	9. Followed
Nutrition, Physiology and Management	
1. Validation of existing feeding packages developed by AICRP units at field level needs to be carried out.	1. Will be undertaken
2. Compilation of technologies developed by the AICRP centers since its inception should be done.	2. Compiled with update
3. Efforts to develop location specific technologies for farmers to reduce the heat stress of the animals in changing climate scenario. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	3. Will be undertaken
Health Management	
1. Outbreak of any infectious diseases needs to be communicated to NRC on Pig at the earliest.	1. Noted
2. Health calendar should be maintained.	2. Maintained
3. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	3. Being done
4. Mortality parameters should be recorded with utmost care. Still birth/abortion/mummification should not be included while recording pre-weaning mortality.	4. Noted
5. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2% respectively.	5. All efforts has been Initiated to control the same
6. Steps need to be taken to strengthen the bio-security measures at the farm.	6. Already taken

ICAR RC- Goa, Old Goa

Recommendation	Action taken
General	
1. The monthly report of piglet production and sold has be sent to the Project Coordinating centre by 28 th of every month, preferably by mail. The period to be covered is from 25 th of previous month to 24 th of current month.	1. monthly reports are being sent regularly
2. The centers need to submit AUC before September month of preceding financial year and UC quarterly.	2. Followed
3. The unspent amount, if any, must be refunded by the month of March of each financial year positively.	3. It will be followed



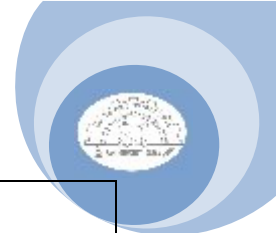
4. Final annual report should be submitted for AICRP and Mega-seed project on pig as per format provided by the month of April of the preceding financial year.	4. Followed
Animal Breeding	
1. Crossbred animals of 75% exotic inheritance should be maintained by <i>inter-se- mating</i> .	1. It is maintained
2. 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.	2. It is being maintained
3. Selection of male animals should be based on index method of selection, including birth weight, weaning weight and 8 month body weight.	3. It will be followed
4. Selection of female animals should be based on index method of selection, including litter size at birth and weaning, litter weight at birth and weaning and number of functional teats (at least 6 pairs of functional teats).	4. It will be followed
5. The selection of animals should preferably be done by considering cyto-genetics screening of population for all the genetic abnormalities.	5. Could not be follow due to lack of facilities
6. The selection criteria should include following points: a. 8 months body weight should be ≥ 65 kg for crossbred b. Litter size at birth should be ≥ 7	6. It will be followed
7. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection.	7. It will be followed
8. Artificial Insemination should be implemented at all centers and necessary collaboration for this purpose may be established with the relevant department of SAU/CAU/ICAR institutes. If required, training on AI may be obtained from NRC on pig.	8. It is being followed
9. Three number of farrowing per sow need to be recorded. Three farrowing par sow should be completed in 2 years.	9. It is being followed
Nutrition, physiology and management	
1. Validation of existing feeding packages developed by AICRP units at field level needs to be carried out.	1. It will be done
2. Compilation of technologies developed by the AICRP centers since its inception should be done.	2. It will be compiled
3. Efforts to develop location specific technologies for farmers to reduce the heat stress of the animals in changing climate scenario. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	3. It will be taken up
Health Management	
1. Outbreak of any infectious diseases needs to be communicated to NRC on Pig at the earliest.	1. Noted
2. Health calendar (as provided by coordinating centre) should be maintained by all the centres.	2. Maintained
3. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	3. Carried out



4. Mortality parameters should be recorded with utmost care. Still birth/abortion/ mummification should not be included while recording pre-weaning mortality.	4. Done
5. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2% respectively.	5. It is followed
6. Steps need to be taken to strengthen the bio-security measures at the farm	6. It is followed

CVSc & AH, CAU, Aizawl

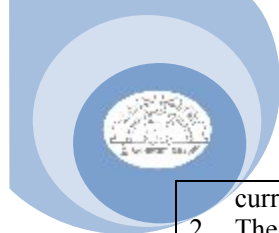
Recommendation	Action taken
General	
1. The monthly report of piglet production and sold has be sent to the Project Coordinating centre by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of current month.	1. The monthly report of piglet production and sold had been sent to the Project Coordinating centre by 28th of every month
2. The centers need to submit AUC before September month of preceding financial year and UC quarterly, positively.	2. UC had been sent quarterly
3. The unspent amount, if any, must be refunded by the month of March of each financial year positively.	3. There is no unspent amount during the financial 2013-2014
4. Final annual report should be submitted for AICRP and Mega-seed project on pig as per format provided by the month of April of the preceding financial year.	4. Final annual report for the year 2013-2014 had already been sent
Animal Breeding	
1. Crossbred animals of 75% exotic inheritance should be maintained by <i>inter-se-mating</i> .	1. The centre has developed to produced the required number of animals by crossing Large White Yorkshire with local pig (Zovawk)
2. In-case of non-availability of 75% germplasm, the centre should develop a plan to produce it and then maintain it by <i>inter-se-mating</i> . The first batches of 75% exotic animals, in such centers, should be produced by 31st March 2014. (Action to be taken: AICRP on pig centres at SASARD, Nagaland University, Medziphema and Central Agricultural University, Aizawl).	2. A total of 13 numbers of 50% LWY gilts of around 7-9months of age are available for the production of 75% LWY piglets
3. Minimum 30 breedable sows unit should be maintained with a sex ratio of 1:3 and thus 10 sires (2 sires from each 5 unrelated sire lines) need to be maintained by each of the centres.	3. Another group of young females (50% LWY) in the age group of 4-7 months have been produced for the generation of 75% LWY piglets
4. Selection of male animals should be based on index method of selection, including birth weight, weaning weight and 8 month body weight.	4. The centre has initiated to produce 75% LWY. Four Sows has already produced 36 piglets of 75% LWY. Another four sows (50% LWY) are pregnant for the production of 75% LWY.
5. Selection of female animals should be based on index method of selection, including litter size at birth and weaning, litter weight at birth and weaning and number of functional teats (at least 6 pairs of functional teats).	5. Selection of breeding males and females were done as per the prescribed selection criteria
6. The selection of animals should preferably be done by considering cyto-genetics screening of population for all the genetic abnormalities.	6. Three farrowings had been obtained from one sow in two year.
7. The selection criteria should include following points: a. 8 months body weight should be ≥ 65 kg for crossbred	



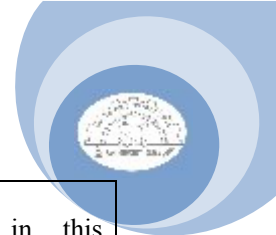
(except Tanye-Vo and Zowak cross) b. 8 months body weight should be ≥ 35 kg for crossbred (for Tanye-Vo and Zowak cross) c. Litter size at birth should be ≥ 7 8. The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. 9. Artificial Insemination should be implemented at all centers and necessary collaboration for this purpose may be established with the relevant department of SAU/CAU/ICAR institutes. If required, training on AI may be obtained from NRC on pig. 10. Three number of farrowing per sow need to be recorded. Three farrowing par sow should be completed in 2 years.	
Nutrition, physiology and management	
1. Validation of existing feeding packages developed by AICRP units at field level needs to be carried out. 2. Compilation of technologies developed by the AICRP centers since its inception should be done. 3. Efforts to develop location specific technologies for farmers to reduce the heat stress of the animals in changing climate scenario. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	1. Two nutritional trial had been conducted and compilation of the results are under process: 2. Physiology: One physiological experiment had been conducted on the topic of "Dynamics of mitogen stimulated cytokine gene expression in peripheral blood mononuclear cells of local and exotic breeds of pigs reared in Mizoram".
Health Management	
1. Outbreak of any infectious diseases needs to be communicated to NRC on Pig at the earliest. 2. Health calendar (as provided by coordinating centre) should be maintained by all the centres. 3. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes. 4. Mortality parameters should be recorded with utmost care. Still birth/abortion/ mummification should not be included while recording pre-weaning mortality. 5. Proper managemental care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2% respectively. 6. Steps need to be taken to strengthen the bio-security measures at the farm	1. The individual health card is prepared to document symptoms of illness 2. Sending of blood, faeces, nasal samples to Pathology, Microbiology and Parasitology departments to find out the causative agents. 3. Animals were vaccinated against Swine Fever after weaning and every 6 month interval and deworming monthly for piglets and quarterly for adult. 4. Proper managemental care are being followed to minimize the mortality in all age groups 5. Other sanitary and bio-security measures are being followed as per the standard procedure.

SASARD, Nagaland

Recommendation	Action taken
General	
1. The monthly report of piglet production and sold has be sent to the Project Coordinating centre by 28th of every month, preferably by mail. The period to be covered is from 25th of previous month to 24th of	1. The centre is complying as desired



<p>current month.</p> <ol style="list-style-type: none"> The centers need to submit AUC before September month of preceding financial year and UC quarterly, positively. The unspent amount, if any, must be refunded by the month of March of each financial year positively. Final annual report should be submitted for AICRP and Mega-seed project on pig as per format provided by the month of April of the preceding financial year. 	<ol style="list-style-type: none"> Submitted, vide SAMN/ADM/PRJ/E-83/12806. Dt. 11.6.2014 Not applicable Final annual report of 2013-14 sent on time
Animal Breeding	
<ol style="list-style-type: none"> In-case of non-availability of 75% germplasm, the centre should develop a plan to produce it and then maintain it by <i>inter-se-mating</i>. The first batches of 75% exotic animals, in such centers, should be produced by 31st March 2014. (Action to be taken: AICRP on pig centres at SASARD, Nagaland University, Medziphema and Central Agricultural University, Aizawl). 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. Selection of male animals should be based on index method of selection, including birth weight, weaning weight and 8 month body weight. Selection of female animals should be based on index method of selection, including litter size at birth and weaning, litter weight at birth and weaning and number of functional teats (at least 6 pairs of functional teats). The selection of animals should preferably be done by considering cyto-genetics screening of population for all the genetic abnormalities. The selection criteria should include following points: <ol style="list-style-type: none"> 8 months body weight should be ≥ 65 kg for crossbred (except Tenyi-Vo and Zowak cross) 8 months body weight should be ≥ 35 kg for crossbred (for Tenyi-Vo and Zowak cross) Litter size at birth should be ≥ 7 The data should be presented to indicate the progress made in each generation over previous ones due to genetic selection. Artificial Insemination should be implemented at all centers and necessary collaboration for this purpose may be established with the relevant department of SAU/CAU/ICAR institutes. If required, training on AI may be obtained from NRC on pig. Three number of farrowing per sow need to be recorded. Three farrowing per sow should be completed in 2 years. 	<ol style="list-style-type: none"> A breeding plan developed to produce and maintain 75% exotic inheritance through inter-se-mating. As on 31.07.2014, the centre has 24 gilts of 75% exotic inheritance. Maintaining 30 breedable sows unit under progress Selection of male based on index method of selection following the criteria Selection of female animals done as per criteria Followed For selection of breeding stock (Graded & Tenyi Vo) the criteria given is followed. Progress data recording under progress Artificial Insemination implemented in collaboration with ICAR-Jharnapani Mega-seed project, Nagaland Centre. AI training of JRF at NRC-Pig successful Three farrowing achievable per sow within 2 years
Nutrition, physiology and management	
<ol style="list-style-type: none"> Validation of existing feeding packages developed by AICRP units at field level needs to be carried out. Compilation of technologies developed by the AICRP 	<ol style="list-style-type: none"> Validation is carried out in few villages, more field validation is planned during current year On-going process



centers since its inception should be done.	
3. Efforts to develop location specific technologies for farmers to reduce the heat stress of the animals in changing climate scenario. Recording of daily micro and macroclimatic data (Temp, Humidity and calculation of THI) needs to be undertaken by all the AICRP and mega-seed project centres and compiled on monthly basis.	3. Awareness programme in this regard is recently carried out. Demonstration and application of location specific shall be done accordingly.
Health Management	
1. Outbreak of any infectious diseases needs to be communicated to NRC on Pig at the earliest.	1. Noted
2. Health calendar (as provided by coordinating centre) should be maintained by all the centres.	2. Noted
3. Regular monitoring of the pig herd for emerging infectious diseases should be undertaken in collaboration with NRC on Pig/National Institutes.	3. Noted
4. Mortality parameters should be recorded with utmost care. Still birth/abortion/ mummification should not be included while recording pre-weaning mortality.	4. Recording
5. Proper managerial care should be taken up to reduce pre-weaning (upto 42 days), post-weaning (42 days to 5months) and adult (5 months to 8 months) mortality to keep below 10%, 5% and 2% respectively.	5. All measures taken care of.
6. Steps need to be taken to strengthen the bio-security measures at the farm	6. Regular vaccinations, disinfection of farm premise, restriction of visitors, hygienic disposal of farm wastes etc are some of the routine farm practices to strengthen bio-security.

5. Salient Achievements of the AICRP till Date

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

A. Animal Breeding & Production:

- Breeding programmes were developed to generate the following genotypes/genetic groups:
 - 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 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 under systematic management condition.
- However, the genetic improvement of indigenous breed through pure breed selection programme was 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.

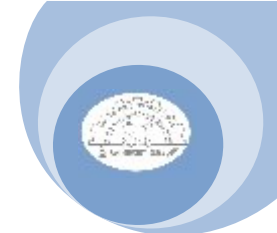
B. Pig Husbandry and Management:

Some salient features of achievements made and technologies generated in various aspects of pig husbandry and management are as follows:

- Collection of boar semen and Artificial insemination: Technology was developed for collection of boar semen on 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 sties 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, colocassia 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 difference 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.



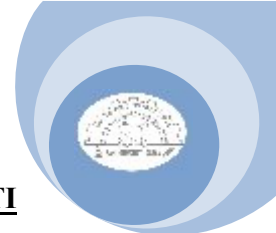
- Replacement of wheat bran up to 50% level with de-cafeinated tea waste lowered the cost of production in crossbred pigs.
- Supplementation of yeast culture product containing useful enzyme improved average daily gain and feed conversion efficiency by 5 and 8%, respectively.
- Chelated mineral could 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 and pre & post weaning mortality could be achieved in most of the AICRP centers for better health care and management.



ASSAM AGRICULTURAL UNIVERSITY, KHANAPARA, GUWAHATI

As per the Livestock Census, Govt. of Assam (2007), the total pig population in Assam is 2000430. There is substantial increase of 5.00 lakhs pig over 2003. Pig farming as a commercial venture is still to be set up in the state. The major constraints like non-availability of superior quality seed stock, unbalanced 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 pig sector. But a sizeable number of unemployed educated youth, retired persons from the affluent families/societies have taken up this venture as means of their livelihood/occupation or as subsidiary income generation. This development has opened up a new chapter in the entire scenery of piggery development in the state.

The AICRP on pig, AAU, Khanapara has played an important role since its inception for development of pig production in the state and neighboring states through various ways. The centre has played a significant role in developing piggery sector by supply of quality piglets, elite gilts/sows and boars to the interested farmers of the state.

1) Herd dynamics:

Herd Strength I: 01.04.2013 - 31.03.2014

Age in months	Opening balance as on 01.04.2013 of the financial year under report		Total	Closing balance as on 31.03.2014 of the financial year under report		Total
	Male	Female		Male	Female	
	75% H	75% H		75% H	75% H	
0 - 6 week	-	-	-			
6wk – 2 m	-	-	-			
2 – 6 m	-	-	-			
6 – 8 m	-	-	-			
Over 8 m	9	31	40	1	26	27
Total	9	31	40	1	26	27

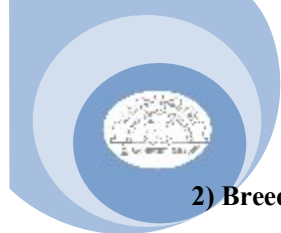
Stock Continuity Details II:

Sex	Stock as on 01.04.13	Addition (1 st Crop + 2 nd Crop)	Purchase	Total	Grand total
	1	2	3	4	5
MALE	9	89 + 116 = 205	Nil	214	214
Female	31	83 + 102 = 185	Nil	216	216
Total	40	172 + 218 = 390	Nil	430	430

Deletion:

Sex	Sale	Slaughter	Destroyed *	Died	Total	Stock as on 31.3.14	Grand total
	6	7	8	9	10	11 (4-10)	
Male	143	15	8	47	213	1	1
Female	135	Nil	18	37	190	26	26
Total	278	15	26	84	403	27	27

* Due to poor health and debilitated during outbreak of Swine Fever

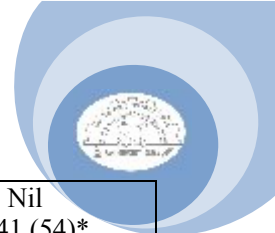


2) Breeding strategy of the farm as approved:

- A number of selected indigenous gilts were maintained since 1981. A group of indigenous gilt was bred with pure Hampshire boars to get 50% Hampshire inheritance. Another group of indigenous gilts were maintained for indigenous line.
- The progeny 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 *i.e. inter-se*-mating was adopted initially to maintain 50%H50%I and 75%H25%I genetic groups since 1987.
- The Annual Scientist Meet'2007 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 was utilized for production of 87.50%H genetic group.
- Annual Scientist Meet (2011) recommended maintaining sufficient number of 75%Hampshire genetic group only for the centre.
- The 75%H25%I breeding males are selected on the basis of body weight and litter size at weaning (6 wks) and thereafter on the basis of body weight and sex libido at 6 months of age.
- The breeding females are selected on the basis of body weight and litter size at weaning.
- Age at sexual maturity and Body weight are considered in selection of breeding female.
- Boars are selected on Intra-Sire basis.
- Incorporating 24 week body weight (X_2) and 32 week body weight (X_3) in Selection Index give better result in selection of pigs ($0.981x X_2 - 0.403 x X_3$).
- The parent stocks are maintained up to 3rd farrowing

3) Performance of animals:

Sl. No	Traits/ Characters	Crop	Mean \pm SE (No. of observation)		
			75% H Genetic group		
			M	F	T
1	Av. Litter size at birth (no.)	1 st	3.56 \pm 0.35	3.32 \pm 0.35	6.88 \pm 0.34 (25)
		2 nd	4.30 \pm 0.25	3.78 \pm 0.31	8.07 \pm 0.28 (27)
2	Av. Litter weight at birth (kg)	1 st	3.50 \pm 0.32	3.21 \pm 0.32	6.71 \pm 0.30 (25)
		2 nd	4.16 \pm 0.22	3.56 \pm 0.29	7.72 \pm 0.19 (27)
3	Av. Litter size at weaning (no.)	1 st	3.48 \pm 0.34	3.04 \pm 0.30	6.52 \pm 0.34 (25)
		2 nd	3.81 \pm 0.19	3.48 \pm 0.28	7.30 \pm 0.19 (27)
4	Av. Litter weight at weaning (kg)	1 st	32.46 \pm 3.20	27.79 \pm 2.47	60.24 \pm 2.99 (25)
		2 nd	35.22 \pm 2.97	31.12 \pm 2.61	66.42 \pm 1.98 (27)
5	Av. individual wt at birth (kg)	1 st	0.98 \pm 0.01 (89)	0.97 \pm 0.01 (83)	0.97 \pm 0.01 (172)
		2 nd	0.97 \pm 0.01 (116)	0.94 \pm 0.01 (102)	0.96 \pm 0.01 (218)
6	Av. individual wt at weaning (kg) (6 weeks)	1 st	9.33 \pm 0.07 (87)	9.14 \pm 0.08 (76)	9.24 \pm 0.05 (163)
		2 nd	8.75 \pm 0.41 (103)	8.61 \pm 0.53 (94)	8.68 \pm 0.39 (197)*
7	Number of days for weaning	1 st 2 nd	42 days		
8	Pre weaning mortality rate (%)	1 st	2.25 (2)	8.43 (7)	5.23 (9)
		2 nd	11.21 (13)	7.84 (8)	9.63 (21)*
9	Pre weaning growth rate(g /day) (0 to 6wks)	1 st	198.71 \pm 1.67	194.71 \pm 1.95	196.83 \pm 1.29
		2 nd	185.31 \pm 1.15	182.86 \pm 1.23	183.92 \pm 0.84



10	Post weaning mortality rate (%)	1 st 2 nd	Nil 31.07 (32)	Nil 23.40 (22)	Nil 27.41 (54)*
11	Post weaning growth rate (6 wks to 8 th months) (g/day)	1 st 2 nd	276.62 ± 2.20 NA	272.53 ± 2.42 NA	275.37 ± 1.72 NA
12	Overall growth rate 0 to 8 th months of age (g/day)	1 st 2 nd	264.56 ± 1.58 NA	257.74 ± 2.03 NA	262.49 ± 1.41 NA
13	Body weight (kg) at 1 month	1 st 2 nd	5.94±0.03 (115) 5.74 ± 0.32(110)	5.87±0.04 (98) 5.64 ± 0.47(102)	5.90±0.06 (213) 5.69 ± 0.28(212)
	2 month	1 st	12.29 ± 0.10 (49)	12.44 ± 0.14 (30)	12.34 ± 0.08 (79)
	3 month	1 st	17.87 ± 0.23 (34)	18.21 ± 0.27 (24)	18.01 ± 0.18 (58)
	4 month	1 st	26.17 ± 0.23 (21)	25.55 ± 0.42 (21)	25.86 ± 0.24 (42)
	5 month	1 st	34.42 ± 0.34 (18)	33.66 ± 0.42 (16)	34.06 ± 0.27 (34)
	6 month	1 st	42.94 ± 0.30 (18)	41.81 ± 0.81 (16)	42.41 ± 0.26 (34)
	7 month	1 st	53.19 ± 0.64 (18)	52.09 ± 0.36 (16)	52.68 ± 0.38 (34)
	8 month	1 st	64.50 ± 0.39 (16)	62.79 ± 0.49 (7)	63.98 ± 0.35 (23)
14	Age at slaughter (days)		243 days		
15	Weight at slaughter (kg)		73.19 ± 1.74		
16	Dressing percentage (%)		68.36 ± 0.67		
17	Carcass Length (cm)		69.05 ± 0.79		
18	Back Fat Thickness (mm)		25.36± 0.48		
19	Feed conversion efficiency (:)		1: 4.33		

* There was an outbreak of Swine Fever during later part of the weaning in 2nd Crop. Some piglets were died and destroyed due to high morbidity and poor growth for which body weight of 2nd Crop piglets after weaning was not recorded.

4) Mortality Parameter:

Mortality rate in 75%H genetic group of pigs during the period 1.4.2013 to 31.03.2014

A. Pre weaning mortality:

Animal	Crop No	0 - 14 days			15 - 28 days			29 - 42 days			Overall		
		M	F	T	M	F	T	M	F	T	M	F	T
Animals at risk	1 st	89	83	172	88	81	169	88	78	166	89	83	172
	2 nd	116	102	218	114	102	216	110	102	212	116	102	218
Animals died	1 st	1	2	3	-	3	3	1	2	3	2	7	9
	2 nd	2	-	2	4	-	4	7	8	15	13	8	21
Mortality %	1 st	1.12	2.41	1.74	-	3.70	1.78	1.14	2.56	1.81	2.25	8.43	5.23
	2 nd	1.72	-	0.92	3.51	-	1.85	6.36	7.84	7.08	11.21	7.84	9.63
Overall %		1.46	0.01	1.28	1.98	1.64	1.82	4.04	5.56	4.76	7.32	8.11	7.69

B. Post weaning mortality:

Animal	Crop	43 - 56 days			57 days - 5 months			Adult (>5m)			Overall		
		M	F	T	M	F	T	M	F	T	M	F	T
Anim at risk	Parent	-	-	-	-	-	-	9	31	40	9	31	40
	1st	86	71	157	86	71	157	86	71	157	86	71	157
	2nd	103	94	197	82	82	164	70	73	143	103	94	197
No. of anim. died	Parent	-	-	-	-	-	-	-	-	-	-	-	-
	1st	-	-	-	-	-	-	-	-	-	-	-	-
	2nd	21	12	33	11	10	21	-	-	-	32	22	54
Mortality %	Parent	-	-	-	-	-	-	-	-	-	-	-	-
	1st	-	-	-	-	-	-	-	-	-	-	-	-
	2nd	20.39	12.77	16.75	13.42	12.20	12.81	-	-	-	31.07	23.40	27.41
Overall %		11.11	7.27	9.32	6.55	6.54	6.54	-	-	-	16.16	11.23	13.71



5) Life time production traits:

Considering 1st and 2nd crop: 2013-14

- Average litter size at birth per sow: 7.51 ± 0.22 (52)
- Average litter weight at birth per sow: 7.29 ± 0.17 kg
- Average litter size at weaning per sow: 6.96 ± 0.15 (52)
- Average litter weight at weaning per sow: 63.39 ± 1.74 kg
- Average litter weight at slaughter per sow: Not calculated

6) Specific managerial practice

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

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

ii) Causes of mortality

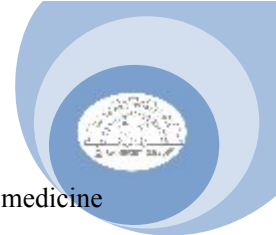
Details of investigation conducted for causes of mortality:

Sl No	Causes of mortality	75 %H (1 st + 2 nd crop)		
		M	F	T
1	Enteritis	2	3	5
2	Pneumonia	2	2	4
3	Traumatic injury	3	-	3
4	Pneumo-enteritis	2	1	3
5	Hydrothorax	-	1	1
6	Hemorrhagic gastro-enteritis	1	2	3
7	Septicemia	9	3	12
8	Putrefied	4	3	7
9	Anemia and debility	3	1	4
10	Pericarditis	1	-	1
11	Classical swine fever	20	21	41
Total		47	37	84

iii) Measures taken to minimize mortality:

a. Managerial measures:

- General management and disease control: Regular cleaning and washing of pig sheds with Potassium Permanganate/caustic soda/bleaching powder and proper disposal of sewage were practiced routinely. The floor, corners and crevices inside the pig sheds were burned at fortnight interval. A solution of 3% formaldehyde spray is also routinely practiced.
- Action taken to minimize mortality: Comfortable beddings were provided to all the pregnant sows. Special care and attention were given round the clock during farrowing. Newborn piglets were kept under observation to avoid injury from mother and debilitated piglets were nourished separately to regain their health. Pre starter (7th-20th day) and Starter (22st day – weaning) rations were provided to the piglets. Sometime buffalo milk was also supplemented to debilitated piglets. Iron therapy in the form of intra muscular injection “Feritas” were given to all piglets of both genetic groups of pig at 4th and 14th day after birth to prevent piglet anemia.



- **Diarrhoea:** Many piglets suffered from diarrhoea during the pre weaning period and medicine viz. Furoxon/Tetracycline/Gentamycine/Enrofloxacin/C-flox were used. ORS/Glucose had also been used in affected pigs.
- **Abscess:** Few animals suffered from abscess. By incision and proper dressings, the animals were treated. A course of antibiotics were provided.
- **Lameness:** A total of 125 piglets suffered from lameness during the year under report. The animals were treated with Neuroxine or Vetalgine or Melonex. Adult animals were disposed immediately if the prognosis was not favourable. Few animals suffered from lameness.
- **Hernia:** Two piglets were suffered from umbilical hernia and operated in the Deptt. of Surgery and Radiology, C.V.Sc, Khanapara.

Prophylactic measures:

- **Vaccination:** Due to the non-availability of Swine Fever Cell Culture Vaccine, the FD Swine Fever Vaccine was given to the weaned piglets followed by booster dose after one month and then 6 months interval. The FD Swine fever Vaccine is procured from the Institute of Biological Products, A.H & Vety. Deptt. Govt. of Assam.

The FMD and HS vaccine were given annually after weaning.

- **Deworming:** Deworming was done to all the piglets after weaning and repeated after one month. The breeding animals were also dewormed. Fecal examinations were routinely examined.

iv) Disposal of diseased carcass:

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

7) Nutritional experimentation:

Performance of growth under different feeding system:

A study was conducted to compare the growth performance of 75% Hampshire pigs under different feeding systems. The experimental animals i.e. Group II and III comprise of twelve piglets (castrated male) in each group of two months of age and were allotted in a herd belonging to a farmer Sri Kamal Talukder (Chandkushi, Nalbari). The farmer regularly utilizing hotel waste hence the experiment was conducted in his farm as under. The Chemical compositions (DM- 25.92%, CP- 13.67%, E.E. - 1.47, C.F. - 2.5%, Total Ash- 5.0% and NFE- 77.36%) of hotel waste were analyzed by the department of Animal Nutrition, CVSc, Khanapara. However, the group I (control) was maintained under standard management in AICRP on pig, Khanapara.

Group I (control) – Concentrate ration only

Group II – 25% concentrate ration and 75% hotel waste

Group III – Only hotel waste



The animals were maintained upto 8 months of age and body weights were recorded from 2 to 8 months of age at monthly interval. The concentrate feeds formulated at AICRP on Pig *i.e.* grower (2-5 month) and finisher (6- 8 months) rations were provided in group I and II.

Monthly body weight of pigs under different feeding systems:

Groups	Monthly body weight (Kg)						
	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
Group I	12.48 ^a ± 0.23	19.87 ^a ± 0.41	26.21 ^a ± 0.79	36.89 ^a ± 0.94	47.17 ^a ± 1.11	59.43 ^a ± 1.31	73.19 ^a ± 1.74
Group II	12.31 ^b ± 0.11	19.14 ^b ± 0.68	27.51 ^b ± 0.77	38.05 ^b ± 1.07	50.75 ^b ± 0.97	64.07 ^b ± 1.41	79.03 ^b ± 2.01
Group III	12.13 ^b ± 0.33	19.62 ^c ± 0.71	27.02 ^c ± 0.82	37.63 ^c ± 0.91	49.97 ^c ± 1.09	61.33 ^c ± 1.23	75.39 ^c ± 1.76

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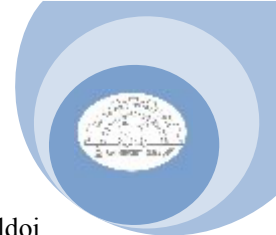
It is revealed that there are significant differences in all stages of growth and group II *i.e.* 25% concentrate ration and 75% hotel waste feeding showed comparatively higher body weight which might be due to better utilization of hotel waste and a portion of balanced feed. The group III animals showed significantly higher body weight than that of group I in all stages of growth. The feeding of 25% concentrate ration and 75% hotel waste which might be due to feeding of a portion of balance feed and mixing of vegetable oil in hotel waste. The cost of production in group I, II and III were calculated as Rs. 91/, 56/ and 46/ respectively.

8) Adoption of integrated farming systems: Talks on Integrated farming system were rendered at different extension programme.

- Mrs. Rumi Saikia Kalita, farmer of Titabar, Jorhat has adopted integrated farming system (Pig cum Fishery) comprising three ponds and 28 pigs as on 5th May'2013. Horticultural crops- banana and lemon are also planted. Earlier, she had a pig farm, started during 2004 with a five fattener. Subsequently, herd size increases and produced piglets and were sold to the farmers of Tea gardens and Nagaland. At Present, She is maintaining Hampshire cross and T&D.
- Sri Lakhyadhar Sarma, unemployed Youth, Haripur, Soneshar (Kamalpur) has maintaining Hampshire cross and Hampshire x Ghungroo since last five years. He is maintaining 37 pigs, out of which 8 fatteners are ready to sale, 2 breeding males and 8 females and 19 piglets. The price of piglets is Rs.2500/ piglet at weaning. He is earning about Rs. 4.50 lakhs annually. Rice polish, boiled colocassia and broilar's waste are utilized as feed. He is spending Rs.6000/ pm on feed and medicine. He is also maintaining 12 nos. of Betel goat and selling Rs. 4500/ to Rs. 5000/ kid.

9) Survey on market of pork production: A Preliminary survey was carried out in Guwahati.

Qualification of pork seller : Mostly under Metric
 Residence : Mostly rented
 Occupation : Pork business
 Cast : 50% Tribal and 50% others
 No. of Retail shop : 95
 No. of wholesaler : 8
 Type of Sale Booth: 90% open

**Information about the pig:**

1. Sources of pig : Nalbari, Bonda, Boko, Changsari, Chaigaon, Baksha, Mangaldoi, Sonapur, Marigaon, Panikhaiti, Chandrapur, Peripheral of Guwahati
2. Breed : Mostly Hampshire Cross, Hampshire x Ghungroo & Local.
3. Age : 9 months- 2 ½ Years
4. Type : Male- 20%, Female - 40% Castrated - 40%
5. Weight : 60 - 180 kg
6. Method of slaughter : Direct Stabbing in most cases, occasionally hammering
7. Price of pig : Rs.110/kg- Rs.120/kg live wt. basis or Rs.160/ to Rs.170/ 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: 60-70 numbers.
10. Daily sale : 50- 55 qt.
11. Period of highest Sale: November and February
12. Period of lowest Sale: 20th July- 20th Aug of the year (Religious Period)
13. Price per kg of pork : Retailer Rs. 180/ - 200/kg,
14. Whether diseased pig are slaughtered or not: Sometime disease pigs are slaughtered.

10) 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.

11) Production economics:**a. Farm Condition - AICRP on Pig:**

Cost of production/pig upto slaughter / Market age: (14 male)

Cost of concentrate feed up to 8 month of age is 317 kg (240-15=225 days) = **Rs. 5865/-**

(Considering, @ Rs.18.50/kg feed, Cost of Medicine & Vaccines = **Rs. 750/pig**)

Total cost upto 8 months (73 kg) = **Rs. 6615/pig**

Cost of production/kg live wt. = **Rs. 91/kg**

Cost of production/kg pork = **Rs. 135/kg** (considering 68% Dressing Percentage)

b. Field Condition: (Kamal Talukder, Chandkushi, Nalbari)**i) Feeding of 25% concentrate and 75% hotel waste:**

Cost of production/pig upto slaughter/market age: (10 male):

Cost of feeding of hotel waste (75%) (Considering @ Rs.12/day/pig from 2 to 8 month of age)
Rs. 2160/pig

Cost of concentrate feed (25% of 317 kg=80kg) upto 8 months of age Rs. 1480/pig

Cost of medicine & vaccines Rs. 750/pig.

Total Cost upto 8 months (live weight 79 kg) **Rs. 4390/pig**

Cost of production/kg live wt. = **Rs. 56/kg**

Cost of production/kg pork = **Rs. 83/kg** (considering 68% Dressing Percentage)

ii) Only hotel waste:

Cost of production/pig upto slaughter/Market age: (20 male)

Cost of feeding of hotel waste from 2 to 8 month (6 months)

of age considering @ Rs.15/day/pig

Rs. 2700/ pig

Cost of medicine & vaccines

Rs. 750/ pig

Total Cost upto 8 months (75 kg)

Rs. 3450/pig

Cost of production/kg live wt. = **Rs. 46/kg**

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



11) Extension programme with success story:

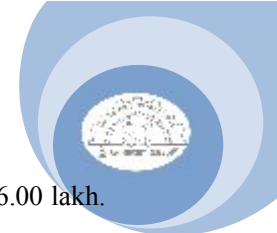
i) At the institute: The Extension activities organized by the Director of Research (Vety.), AAU, Khanapara, Associate Director of Extension Education (ADEE), AAU, Khanapara, Chief Scientist, Goat Research Station, Burnihat and NIRD-NERC Guwahati involved the scientist of the project as resource persons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

Talks/ Demonstration:

- Talks on “Selection of different breeds of Pig and their physical characteristics and study the manage mental practices” under the “Scientific Management of Pig Farm” was Organized by ADEE, AAU, Khanapara on 30.04.2013,
- Talks on “Selection of breeds of pigs and their Characteristics; Piglets Selection, their management and breeding system” was conducted by NIRD –NERC Guwahati on 13. 05.13, 18.02.2014 under the program on Profitable pig farming & meat processing.
- Talks on “Scientific Pig Farming” Conducted by Goat Research Station, AAU, Khanapara under the Scientific Rearing of Goat. Programme on 07.06.13, 12.09.13, 18.09.13, 16.02.14, 23.02.14, 05.03.14 and 14.03.14.
- Talks on “Breeding Strategy for enhancement of production efficiency in pigs” was Organized by ADEE, AAU, Khanapara on 02.07.13, 27.08.13, 03.09.13, 17.09.13, 11.02.14 and 25.02.14,
- Talk on “Piggery breed – breeding aspects, selection of boar and sow” on 20.08.2013 organised by Assam Gramin Vikash Bank – Rural Self Employment training institute
- Talk on “General management of piggery unit-maintenance of cleanliness and hygiene, feeding and fodder management of pig” on 21.08.2013 organized by Assam Gramin Vikash Bank – Rural Self Employment Training Institute.
- Talk on “Prospect and perspective of pig rearing in Assam, selection of breed for rearing of pigs and up-gradation strategy against pig” organized by ARIAS Society, Govt. of Assam, Khanapara on 24.10.2013.
- Talk on “Introduction and importance of piggery, breeds of pig and selection”. Organized by NEDFi on 28.10.2013.
- Talk on “Selection and breeding system for optimum production in pig” organized by ADEE, AAU, Khanapara on 24.03.2014.

Success story:

- Sri Ranjit Das, unemployed educated youth of Mathgharia, Narengi maintaining a piggery farm since 1998 and took guidance from the AICRP centre. He is maintaining both Hampshire Cross and T&D. He has been benefited from his farm and extended another unit at Bonda in 2009.
- Ratul Kalita, Bali Lesha, Nalbari, an unemployed youth, age 45 years maintaining 56 nos. of pig. Out of which, 8 sows, 3 boars, 25 piglets and 20 fatteners of different groups. He is



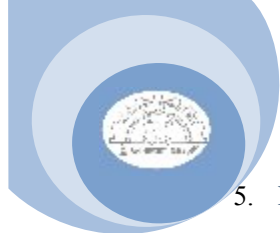
utilizing only hotel waste as feed, spending Rs. 2,000/ year and annual income is Rs.6.00 lakh. He has constructed his residential house from the income of piggery business.

- Biju Kalita, Baltera, district Nalbari, an unemployed youth, age 40 years maintaining 10 Sows and 3 breeding males. He is selling 4 fatteners in every 2 month and raising from his farm. He is earning Rs. 7, 50 lakh annually by spending only Rs. 10,000/ month on hotel waste and broiler waste. He is having two ponds of fishery and broiler unit.
- Kamal Talukdar, Chandkushi, district Nalbari, age 45 year maintaining two herds of pig (70+80). He is spending Rs. 500/day for carrying Kitchen waste/left out from Amingaon and Rs. 50,000/annually for two labourours. He is earning Rs. 12.00 lakh annually from piggery by regular selling of fatteners.
- Bipul Kalita, Mirza is an unemployed youth, age 40 years maintaining 18 gilts, 3 breeding males and 12 fatteners purchased from AICRP during November'13. All females are pregnant and 6 fatteners are disposed. Attempt is made to sale fatteners in every month in cyclic manner.
- Madhurya Sarma, age 40 years, Amguri Sivasagar maintaining a herd of pig (40). He has started a pig farm during 2013 with the piglets of AICRP on Pig. Mr. Sarma earned Rs. 7.00 lakh by selling fatteners monthly and breeding piglets @ Rs.3500/.

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

13) Scientific publications:

1. Ilakshy Deka, Babul Chandra Sarmah, Jeetendra Goswami, Suresh Kumar, Digendra Nath Sarma, Devojiyoti Dutta and Dhireswar Kalita (2013): Effect of Supplementation of Zinc: Copper with or without Phytase on Bodyweight gain, Average daily weight gain and Feed Conversion Efficiency of Weanling piglet. *IIOABJ* Vol.4 Issue 4, 15-19
2. S.Bora, B.C.Sarmah, P. Chakravarty, S.Naskar, D.J.Dutta and D.Kalita (2013): Effect of Zinc Supplementation on Serum biochemicals in Grower pig. *Journal of Applied Animal Research* DOI: 10. 1080/09712119.2013.824888
3. S.Bora , B.C.Sarmah, P. Chakravarty, S.Naskar, D.J.Dutta and D.Kalita (2013) : Effect of Zinc Supplementation on Growth, Reproductive performance , Immune and Endocrine response in Grower pig. *Indian Journal of Animal Science* 84 (2), 186-190.
4. M. K. Nath, D. Kalita and B. K. D. Borah (2014). Pre, Peri and post farrowing behavioural signs in cross-bred sows of Assam. *Indian Veterinary Journal*.91(4): 46-47



5. M. K. Nath, A. K. Gohain, A. K. Gogoi, H. F. Ahmed and N. K. Sarma (2013). Performance of growing and finishing pigs fed CuSO_4 treated MOC. *Indian Journal of Animal Production and Management*. 29(1-2): 120-123.
6. M. K. Nath, A. K. Gohain, D. Kalita and H. F. Ahmed (2013). Studies on the performance of growing and finishing pigs on cabbage waste. *Indian Veterinary Journal*, 90(8): 59-61

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

M.V.Sc Research:

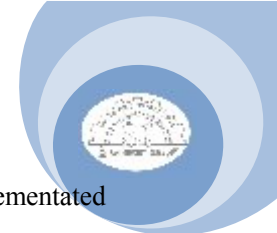
- i) **Topic:** Effect of Zinc on endocrine control with special reference to growth and reproduction in growing male pig. (Department of Animal Physiology))

ABSTRACT: The experiment was conducted to study the growth performance of male growing piglets (60 days old) following supplementation of three different combination of zinc and copper. Twenty four numbers crossbred (Hampshire X Assam Local) piglets were allocated to control, T_1 , T_2 and T_3 groups comprising 6 piglets in each group. Animals of T_1 , T_2 and T_3 were supplemented with zinc and copper combination ratio of 125 ppm: 12.5 ppm, 150 ppm: 15 ppm and 175 ppm: 17.5 ppm respectively and no supplementation was given to control group. The highest body weight gain was recorded (52.70 ± 0.69 kg) in T_3 group followed by T_2 (45.78 ± 0.45 kg), T_1 (43.72 ± 0.44 kg) and control (42.90 ± 0.32 kg) groups. The serum level of growth hormone, insulin, ghrelin, thyroxine, triiodothyronine, testosterone, zinc and copper were found to be the highest in T_3 group and the lowest in the control group. A linear and apparent increasing trend of serum zinc and copper concentration irrespective of groups were recorded with increasing body weight. Analysis of variance revealed that insulin and triiodothyronine level differs significantly ($P < 0.01$) between the groups. Also, testosterone levels differ significantly ($P < 0.05$) between the groups. Supplementation of zinc: copper found to be beneficial on growth performance in growing piglets and highest growth was recorded with supplementation of zinc: copper at 175 ppm: 17.5 ppm per day.

- ii) **Topic: Supplementation of Curry leaves (*Murraya koenigii*) on growth and nutrient utilization of Grower pigs.** (Department of Animal Nutrition)

Abstract: An experiment was conducted to study the effects of dietary supplementation of curry leaves powder (*Murraya koenigii*) on growth performance, nutrient utilisation, feed conversion efficiency and blood biochemical of cross bred grower pigs for a period of 70 days followed by digestion cum metabolic trial for 5 days. Eighteen Hampshire cross bred pigs of about 2 months of age and almost 14.73 ± 1.24 kg mean body weight were randomly divided into 3 groups of 6 animals in each group. An experimental ration was prepared by incorporating curry leaves powder at 0%, 0.5% and 1% in grower ration of pig as per BIS 1992.

The dry matter intake per 100 kg body weight did not differ significantly ($P > 0.05$) among the treatment groups. The average rate of mean daily gain in body weight and feed conversion efficiency of pigs were 391.13 ± 23.65 , 418.56 ± 13.19 and 469.28 ± 9.03 g and 4.07 ± 0.25 , 3.91 ± 0.30 and 3.55 ± 0.26 in control, T_1 (0.5% curry leaves powder) and T_2 (1% curry leaves powder) respectively. Significantly



highest average daily gain and feed conversion efficiency were found in T₂ group supplemented with 1% curry leaves powder. The digestibility coefficient of DM, OM, EE, CF and NFE didn't differ significantly ($P>0.05$) between control and treatment group. But the digestibility coefficient of crude protein of T₂ group (1% curry leaves powder) differ significantly ($P<0.05$) from the control and T₁ group. Similarly, in case of percent retention of intake nitrogen was found significantly highest in T₂ group where 1% curry leaves powder was incorporated. In respect of blood biochemical, serum protein was found highest in T₂ group. The concentration of glucose and cholesterol was found lowest in T₁ group (0.5% curry leaves powder). In respect of liver enzyme activity the SGPT and SGOT concentration was found lowest in T₂ group (1% curry leaves powder supplementation). The cost of production was found lowest in T₂ (Rs.79.45) group where 1% curry leaves powder was incorporated in the ration than that of control and T₁ group.

Thus it is revealed that supplementation of 1% curry leaves powder as additives in the diet of grower pigs showed better performance in respect of nutrient utilization, growth, FCR, blood biochemicals and economics of production.

Ongoing:

Topic: Effect of zinc on physiological performance of post-weaned piglets during hot-humid season. (Department of Veterinary Physiology)

Objective: To study the influence of piglet stocking density on the growth performance and certain physiological and hormonal parameters of post-weaned piglets during hot humid climate following zinc supplementation.

Ph.D Research:

i) Topic: Determination of protective antibody and cell mediated immune response in Classical Swine Fever (CSF) vaccinated pigs. (Department of Epidemiology & Preventive Medicine)

Abstract: A study was undertaken during the period of December, 2011 to November, 2013 with a view to establish an effective vaccination schedule against classical swine fever on the basis of humoral and cell mediated immune responses in pigs vaccinated with cell culture adapted classical swine fever vaccine with different vaccine schedules. Twenty four numbers of apparently healthy two months old pigs selected for the study were divided into four groups viz. group A, B, C and D comprising of 6 animals in each and were maintained in All India Co-ordinated Research Project on Pig, Assam Agricultural University, Khanapara, Guwahati. A live attenuated Cell Culture adapted vaccine developed by National Fellow Project (ICAR), Department of Veterinary Microbiology, College of Veterinary Science, Assam Agricultural University, Khanapara was taken for the study.

A dose of 1 ml of the vaccine was administered intramuscularly to each animal. Animals of group A were immunized on 2nd month ('0' day) of age followed by booster on 6th month (180 dpv) and then allowed for breeding in time. Similarly, immunization in animals of group B started on 2nd month ('0' day) of age followed by a booster on 28th day (28 dpv) post vaccination and at last on 6th



month (180 dpv) post booster vaccine. Thereafter the animals were placed for breeding. Animals of group C were also immunized primarily on 2nd month ('0' day) of age followed by booster on 28th day (28 dpv) post vaccination and 6th month (180 dpv) post booster vaccine. Thereafter the animals were allowed to breed and a subsequent booster dose was given after one month (270 dpv) of conception. The animals of group D were kept as unvaccinated control.

Blood samples from all the groups were collected on the day of vaccination ('0' day) and thereafter every 14th and 28th day after each vaccination. On farrowing, blood samples from piglets born from group A, B, C and D were collected on 21st and 42nd day of their age to evaluate maternally derived antibodies. Indirect-ELISA and liquid phase blocking ELISA (LPB-ELISA) were employed to detect the CSFV specific antibodies and protective antibodies whereas cell mediated immunity was evaluated by leukocyte migration inhibition test (LMIT).

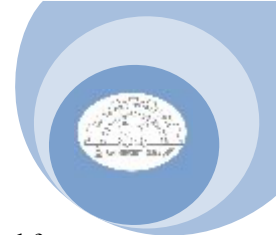
Pigs vaccinated at 2 months of age and repeated at 180 day post vaccination showed 100 per cent protective antibody levels upto 8 months. Only 17 per cent of the piglets born from these sows carried maternally derived passive antibody at 21st day and none of the piglets at 42nd days of age. In another group, pigs vaccinated at 2 months followed by a booster dose at 28 day post vaccination and second booster at 180 days maintained good level of protective antibody titres upto 8 months and 83 per cent of the piglets born from these sows carried maternally derived passive antibody at 21st day and only 17 per cent at 42nd days of age. Pigs vaccinated at 2 months of age followed by booster doses at 28 day and at 180 day and thereafter an another dose at one month of pregnancy maintained 100 per cent protective antibody upto 8 months and 100 per cent piglets born out of these sows carried maternally derived protective passive antibody at 21st day and 66.66 per cent at 42nd day of age. Besides that the cell culture adapted classical swine fever vaccine was found to be safe for use in pigs at different ages and vaccination during one month of pregnancy had no any adverse effects on litter size and litter weight at birth.

Based on evaluation of protective immune response of vaccinated pigs and maternally derived passive immunity levels in piglets born from immunized sows of different groups, the ideal vaccination schedule for CSF with the cell culture adapted classical swine fever vaccine is primary vaccination at 2 months of age followed by booster doses at 28 and 180 days of the primary vaccination and at one month of pregnancy.

Indirect-ELISA could effectively be used to evaluate the immune response of pigs vaccinated against CSF and on comparison it revealed a significant positive correlation between indirect-ELISA and LPB-ELISA. Leucocytes migration inhibition test was successfully used to evaluate the cell mediated immune response of pigs after vaccination against CSF and on comparison a highly significant positive correlation between LMIT and LPB-ELISA could be established.

Ongoing:

- i) **Topic: *Streptococcus suis* infection in pigs and evaluation of bacterin efficacy** (Department of Epidemiology & Preventive Medicine)

**Objectives:**

- i) To study the prevalence of *S. suis* infection in pigs under organized and unorganized farms.
- ii) To isolate and identify *S. suis* from infected as well as healthy pigs.
- iii) To determine the antibiogram of the isolates.
- iv) To attempt detection of certain important virulence factors associated with the organism through use of suitable techniques.
- v) To evaluate the efficacy of the bacterin produced from non-pathogenic strains.

ii) Topic: Biomolecular expression on melatonin and vitamin E supplementation during summer and winter in pig. (Department of Veterinary Physiology).**Objectives:**

1. To study certain physio- biochemical profiles in melatonin and vitamin E supplemented pigs and their co-relations with basic meteorological variables.
2. To study the effects of melatonin and vitamin E supplementation on growth.
3. To study biomolecular expressions of HSP and IGF-I in experimental pigs

15) Distinguish Visitors:

- An expert team of DBT, Govt. of India visited the AICRP on Pig during Annual Review Meet on “Network Project on Classical Swine Fever with special reference to North-Eastern Region” dated 27.04.2013.
- A team of SAMARTH, Nepal Market Development Programme, Kathmandu visited the AICRP on Pig on 06.03.2014.



75% Hampshire lactating sow with their piglets



75% Hampshire Grower Pig



Women farmers of Tengakhat, Dibrugarh



Farmers demonstration on cutting of nipple teeth, Dhemaji



Exposure visit of women farmers, Dhekiajuli



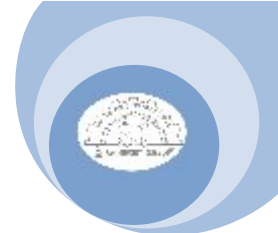
Women farmer demonstration, Najira, Sivsagar



An expert team of DBT, Govt. of India visited the project on 27.04.2013



A team of CEAPRED-SAMARTH/NMDP, Kathmandu, Nepal visited on 06.03.2014



BIRSA AGRICULTURAL UNIVERSITY, RANCHI, JHARKHAND

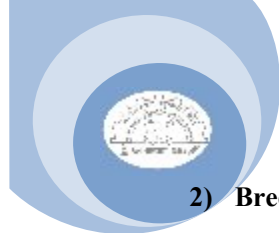
Pig production is considered as one of the important activities of A.H. programme specially for the improvement of economic status of tribes and some weaker section of society of Jharkhand. There is tremendous scope for employment and earning with subsidiary occupation in livestock production, pig being one of the important among them. 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. 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. 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. 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 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. 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.

1) Herd dynamics (T&D):

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Birth	Transfer	Death	Transfer	Sold	
1.	Piglet (up to 42 d)	32	298		15			25
2.	Grower (42d-5 m)	30			15		248	46
3.	Finisher (5m- 8 m)	14			01		4	7
4.	Breeding Female	20			06		3	23
5.	Boar	3			-		1	3
	Total	99	298		37		256	104

Herd dynamics (75% H):

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Birth	Transfer	Death	Transfer	Sold	
1.	Piglet (upto 42 d)	50	207		26			23
2.	Grower (42d-5 m)	37		193	17		192	21
3.	Finisher (5m- 8 m)	4		6	3			7
4.	Breeding Female	33		4	4		1	32
5.	Boar	4		25	1		3	5
	Total	128	207		51		196	88



2) Breeding strategy of the farm as approved:

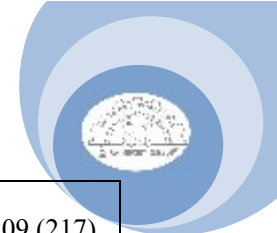
- To study the performance of “T&D” and 75% Hampshire pigs under optimum management.
- Selection within each group for faster growth rate with better reproductive performances.

3) Performance of animals: T&D

Sl.	Traits/Characters		Mean ± SE (no. of observation)		
1	Litter size at birth		7.62±0.38 (26)		
2	Litter weight at birth(kg)		8.68±0.37 (26)		
3	Litter size at weaning(no.)		7.15±0.46 (26)		
4	Litter weight at weaning (kg)		54.08±3.20 (26)		
			Male	Female	Overall
5.	Avg. weight at birth(kg)		1.19±0.02 (122)	1.09±0.02 (132)	1.14±0.02 (254)
6	Avg. weight at weaning (kg)	6 wk	6.10±0.17 (118)	5.93±0.14 (123)	6.02±0.11 (244)
		8 wk	8.41±0.28 (117)	8.04±0.20 (122)	8.23±0.23 (242)
7	Number of days for weaning(d)		42 days	42 days	42 days
8	Pre weaning mortality rate (%)		-	-	4.55
9	Pre weaning growth rate (gm/d) _(6 w)		116.90	115.24	116.19
10	Post weaning mortality rate (%)		-	-	5.76
11	Post weaning growth rate, up to 8 month (gm/d)		320.71	321.77	321.26
12	Body weight (kg)				
	1 Month		4.20±0.11 (118)	4.11±0.10 (124)	4.16±0.05 (242)
	2 Month		8.41±0.28 (117)	8.04±0.20 (128)	8.23±0.16 (245)
	3 Month		15.21±0.37 (9)	14.68±0.52 (11)	14.92±0.33 (20)
	4 Month		21.84±1.11 (9)	22.29±1.39 (10)	22.08±0.88 (19)
	5 Month		32.07±0.89 (7)	31.51±1.13 (13)	31.71±0.79 (20)
	6 Month		43.14±1.79 (7)	41.88±1.38 (13)	42.33±1.07(20)
	7 Month		57.38±3.80 (4)	56.73±1.26 (16)	56.86±1.21 (20)
	8 Month		69.60±1.77 (5)	69.64±0.76 (14)	69.63±0.70 (19)
	9 Month		80.93±1.33(7)	81.49±1.54 (12)	81.28±1.07(19)
	10 Month		92.14±1.34(7)	92.0.92±1.66(12)	92.63±1.14(19)

Performance of animals: 75% Hampshire

Sl.	Traits		Mean ± SE		
1	Litter size at birth(no.)		7.08±0.22 (25)		
2	Litter weight at birth(Kg)		9.27±0.35 (25)		
3	Litter size at weaning (no.)		6.64±0.26 (25)		
4	Litter weight at weaning(Kg)		55.72±2.69(25)		
			Male	Female	Overall
5	Avg. weight at birth(kg)		1.32±0.03 (108)	1.28±0.02 (117)	1.30±0.02 (225)
6	Avg. weight at weaning (kg)	6w	6.35±0.18 (102)	5.94±0.17 (111)	6.14±0.12 (213)
		8w	8.62±0.25 (102)	8.11±0.23 (110)	8.35±0.17 (212)
7	Number of days for weaning(d)		42 days		
8	Pre weaning mortality rate(%)		-	-	10.12
9	Pre weaning growth rate(gm/d)		119.76	110.95	115.24
10	Post weaning mortality rate (%)		-	-	8.09
11	Post weaning growth rate(gm/d) up to 8 m		269.95	274.60	272.63



12	Body weight (Kg)			
	1 Month	4.50±0.13 (113)	4.27±0.12 (114)	4.38±0.09 (217)
	2 Month	8.62±0.25 (102)	8.11±0.23 (110)	8.35±0.17 (212)
	3 Month	16.66±0.72 (7)	14.05±0.96 (14)	14.92±0.73 (21)
	4 Month	24.19±0.67 (8)	23.34±0.61 (14)	23.65±0.46 (22)
	5 Month	30.25±1.25 (4)	33.95±0.98 (11)	32.97±0.88 (15)
	6 Month	36.67±3.30 (6)	44.20±4.25 (10)	41.38±3.00 (16)
	7 Month	42.33±3.44 (6)	51.75±4.77 (10)	48.22±3.42 (16)
	8 Month	59.80±2.29 (5)	60.31±6.04 (8)	60.12±3.71 (13)
	9 Month	70.60±1.26 (5)	69.00±8.10 (5)	69.50±3.87 (10)
	10 Month	81.90±0.80 (5)	81.60±6.24 (5)	81.75±2.97 (10)

4) Lifetime production traits

Reproductive traits	T&D	75%	Significance
Litter size at birth	7.67±0.41(21)	6.58±0.29 (20)	NS
Litter size at weaning	7.24±0.48 (21)	6.08±0.36 (20)	NS
Litter weight at birth (Kg)	8.63±0.34 (21)	8.66±0.45 (20)	NS
Litter weight at weaning (Kg)	59.55±3.09 (21)	50.50±3.13 (20)	NS

5) Specific Managerial Practices

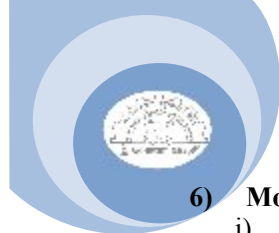
Different groups of animals kept in separate pens under uniform housing and managerial conditions. The newly born piglets were provided with paddy straw during winter season as a bedding material to protect the piglets against extreme cold effects.

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 at the age of 8 weeks. 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. The centre is using ear notching for identification of piglets after farrowing. The centre is 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 FMD. 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 atleast one week. Proper aid whenever necessary was also provided to the animal.



6) Mortality parameter:

i) Genetic group wise and sex wise mortality rate:

Genetic group	75% H			T&D		
	Male	Female	Total	Male	Female	Total
Pre weaning	10	16	26	10	8	18
Post weaning	10	15	25	10	16	26
Total	20	31	51	20	21	44

ii) Causes of mortality (Specific cause):

Disease	T&D	75% H	Disease	T&D	75% H
Pre-weaning			Post-weaning		
Pneumonia	08	16	Pneumonia	12	17
Gastritis	05	05	Gastritis	10	03
Trempling	03	05	Trempling	01	04
Endotoxine	02	0	Piglet anemia	01	01
Total	18	26	Hepatitis	02	0
			Total	26	25

iii) Measures to taken minimize mortality:

- Management measures:** Provision of bedding specially during winter season.
- Prophylactic measures:** Following prophylactic measures were taken:
 - All the pigs were vaccinated against the Swine Fever and FMD vaccine.
 - The imferon were injected to all the piglets at 3rd and 14th days of age.
 - The shed was cleaned daily and the manure removed completely from the floor and walls through manual scraping.
 - Providing plenty of sheds around the piggery shed by planting trees.
 - The pigs were dewormed regularly to control parasitic infestation.
- Disposal of diseased carcass:** Carcass of pigs disposed of by burial method.

7) Experimentation:

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

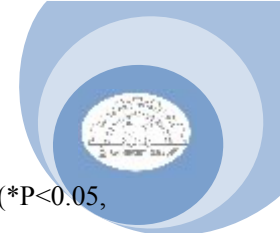
Age	T&D	75% Hampshire	Significance
0 day	1.14 ± 0.02 ^a (259)	1.30 ± 0.02 ^b (225)	**
2 week	2.70 ± 0.05 (246)	2.75 ± 0.5 (223)	NS
4 weeks	4.16 ± 0.08(245)	4.38 ± 0.09 (217)	NS
6 weeks	6.02 ± 0.11 (244)	6.14 ± 0.12 (213)	NS
8 week	8.23 ± 0.23 (242)	8.35 ± 0.17 (212)	NS

^{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% Hampshire	Significance
3 months	14.92 ± 0.33 (20)	14.92 ± 0.73(21)	NS
4 months	22.08 ± 0.88 (19)	23.65 ± 0.46 (22)	NS
5 months	31.71 ± 0.79(20)	32.97 ± 0.88(15)	NS
6 months	42.33± 1.07 (20)	41.38 ± 3.00 (16)	NS
7 months	56.86 ± 1.21 ^a (20)	48.22 ± 3.42 ^b (16)	*
8 months	69.63 ± 0.70 ^a (19)	60.12± 3.71 ^b (13)	*
9 months	81.28 ±1.07 ^a (19)	69.80 ± 3.87 ^b (10)	**
10 months	92.63 ± 1.14 ^a (19)	81.75 ± 2.97 ^b (10)	**



^{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% Hampshire	Significance
Litter size at birth	7.62 ± 0.38 (26)	7.08 ± 0.22 (25)	NS
Litter size at weaning	7.15 ± 0.46 (26)	6.64 ± 0.26 (25)	NS
Litter weight at birth Kg)	8.68 ± 0.37 (26)	9.27 ± 0.35 (25)	NS
Litter weight at weaning (Kg)	54.08 ± 3.20 (26)	55.72 ± 2.69(25)	NS

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

Average sow performance of different genetic groups of pigs

Reproductive traits	T&D	75%	Significance
Litter size at birth	7.67±0.41(21)	6.58±0.29 (20)	NS
Litter size at weaning	7.24±0.48 (21)	6.08±0.36 (20)	NS
Litter weight at birth (Kg)	8.63±0.34 (21)	8.66±0.45 (20)	NS
Litter weight at weaning (Kg)	59.55±3.09 (21)	50.50±3.13 (20)	NS

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

Effect of litter size and weaning age on the performance of piglets

Effect of litter size on the performance of piglets weaned at 6 weeks of age

	Litter Size			
Age (Wks)	3-5	6-8	9 and above	Significance
0	1.15±0.04 ^{ab} (54)	1.21± 0.02 ^a (170)	1.14± 0.02 ^{cb} (108)	*
2	2.95± 0.12 ^{ab} (41)	3.00± 0.08 ^a (115)	2.68± 0.08 ^{cb} (92)	*
4	5.56± 0.21 ^a (28)	4.91± 0.10 ^b (116)	4.52± 0.15 ^c (83)	**
6	7.19± 0.33 ^a (31)	6.88± 0.13 ^b (121)	6.06± 0.18 ^c (83)	**
8	8.29± 0.36 ^a (32)	8.16± 0.19 ^a (101)	6.89± 0.22 ^b (72)	**
10	10.31± 0.57 ^a (20)	9.39± 0.26 ^a (77)	7.66± 0.28 ^b (60)	**
12	12.55± 0.71 ^a (17)	10.90± 0.35 ^b (44)	9.36± 0.50 ^c (25)	**
16	17.28± 0.33 ^a (7)	11.44± 0.64 ^b (9)	10.11± 0.58 ^b (8)	**

^{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.

Effect of litter size on the performance of piglets weaned at 8 weeks of age

	Litter Size			
Age (wk)	3-5	6-8	9 and above	Significance
0	1.45± 0.06 ^a (10)	1.12± 0.03 ^b (58)	1.07± 0.03 ^b (58)	**
2	3.75± 0.13 ^a (10)	2.75± 0.13 ^b (37)	2.63± 0.08 ^b (34)	**
4	6.06± 0.16 ^a (10)	3.99± 0.21 ^b (36)	4.42± 0.13 ^b (33)	**
6	8.54± 0.34 ^a (10)	6.60± 0.30 ^b (28)	5.89± 0.17 ^c (33)	**
8	11.10± 0.27 ^a (10)	9.42± 0.46 ^b (28)	8.84± 0.27 ^b (33)	**
10	12.35± 0.30 (10)	11.19± 0.67 (22)	10.59± 0.37(29)	NS
12	14.17± 0.29 (10)	12.96± 0.98 (14)	12.54± 0.61(15)	NS
16	18.09± 0.46 (10)	17.01± 0.60 (8)	15.93± 0.87 (8)	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.



Performance of piglets weaned at different periods having same litter size (3-5)

Age (Wk)	Weaned at				Significance
	6 week	8 week	Difference	T value	
0	1.15±0.04 (54)	1.45± 0.06 (10)	0.30	3.15	*
2	2.95± 0.12 (41)	3.75± 0.13 (10)	0.80	4.40	*
4	5.56± 0.21 (28)	6.06± 0.16 (10)	0.50	186	NS
6	7.19± 0.33 (31)	8.54± 0.34 (10)	1.35	2.84	*
8	8.29± 0.36 (32)	11.10± 0.27 (10)	2.81	6.20	**
10	10.31± 0.57 (20)	12.35± 0.30 (10)	2.04	3.17	**
12	12.55± 0.71 (17)	14.17± 0.29 (10)	1.62	2.09	NS
16	17.28± 0.33 (7)	18.09± 0.46 (10)	0.81	1.30	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.

Performance of piglets weaned at different periods having same litter size (6-8)

Age (Wks)	Weaned at				Significance
	6 Weeks	8 weeks	Difference	T value	
0	1.21± 0.02 (170)	1.12± 0.03 (58)	0.09	2.41	*
2	3.00± 0.08 (115)	2.75± 0.13 (37)	0.25	1.51	NS
4	4.91± 0.10 (116)	3.99± 0.21 (36)	0.92	4.12	*
6	6.88± 0.13(121)	6.60± 0.30 (28)	0.28	0.90	NS
8	8.16± 0.19(101)	9.42± 0.46 (28)	1.26	2.55	*
10	9.39± 0.26 (77)	11.19± 0.67 (22)	1.80	2.51	*
12	10.90± 0.35(44)	12.96± 0.98 (14)	2.06	1.98	NS
16	11.44± 0.64 (9)	17.01± 0.60 (8)	5.57	6.29	*

^{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.

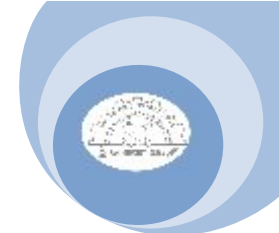
Performance of piglets weaned at different periods having same litter size (≥9).

Age (Weeks)	Weaned at				Significance
	6 Weeks	8 weeks	Difference	T value	
0	1.14± 0.02 (108)	1.07± 0.03 (58)	0.07	1.89	NS
2	2.68± 0.08 (92)	2.63± 0.08 (34)	0.05	0.42	NS
4	4.52± 0.15 (83)	4.42± 0.13 (33)	0.10	0.45	NS
6	6.06± 0.18 (83)	5.89± 0.17 (33)	0.17	0.68	NS
8	6.89± 0.22 (72)	8.84± 0.27 (33)	1.95	5.17	**
10	7.66± 0.28 (60)	10.59± 0.37(29)	2.93	6.15	**
12	9.36± 0.50 (25)	12.54± 0.61(15)	3.18	3.92	*
16	10.11± 0.58 (8)	15.93± 0.87 (8)	5.82	5.32	**

^{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.

The composition of the concentrate mixture for preweaning piglets

Ingredients (%)	T ₁
Crushed maize	61.5
Groundnut Cake	20.0
Wheat Bran	06.0
Fish Meal	10.0
Mineral and Vitamin mixture	1.5
Common Salt	1.0
Total	100



Salient findings:

Piglets (T&D) were weaned at different periods to know the effect of weaning age on the performance of piglets. Piglets of same litter size (up to 5, 6 to 8, 8 and above) were weaned at 6 weeks and 8 weeks of age. Performance of piglets having higher litter size weaned at 8 weeks of age was observed to be better in comparison to piglets weaned at 6 weeks of age. However, piglets having low litter size does not have any significant effect of weaning ages. Hence, it may be suggested that piglets having higher litter size (6 and above) should be weaned at 8 weeks for better growth of piglets and piglets having low litter size (<6) may be weaned at 6 weeks of age. Piglets having higher litter size can only be recommended for early weaning with supplementation of milk replacer.

Effect of photoperiods on the performance of grower pigs

a. Fortnightly body weight (kg)

Fortnight	T ₁ (Control)	T ₂ (18 hrs light)	T ₃ (24hrs light)	Significance
0 day	35.67±0.25	35.63 ± 0.16	35.58 ± 0.24	NS
1 st	39.08 ± 0.30 ^a	40.92 ± 0.85 ^b	39.67 ± 0.46 ^a	**
2 nd	43.00 ± 0.37 ^a	46.42 ± 0.45 ^b	43.83 ± 0.75 ^a	**
3 rd	47.08 ± 0.57 ^a	51.92 ± 0.55 ^b	48.17 ± 1.19 ^a	**
4 th	51.33 ± 0.88 ^a	58.67 ± 0.89 ^b	53.17 ± 1.64 ^a	**
5 th	55.33 ± 1.11 ^a	64.92± 1.26 ^b	58.58 ± 1.47 ^a	**
6 th	59.92 ± 1.51 ^a	72.17 ± 1.68 ^b	64.83 ± 1.42 ^c	**
7 th	66.08 ± 1.43 ^a	81.58 ± 2.27 ^b	70.97 ± 1.74 ^a	**
Total Wt. gain (kg)	30.41	45.95	35.39	
Fortnightly Wt. gain (kg)	4.34	6.56	5.06	
Daily Wt. gain (g)	289.93	437.33	337.33	

T₁ = Control (Provision of 10-12 hrs light), T₂ = provision of 18 hrs light, T₃ = provision of 24 hrs light

^{abc} Means bearing different superscripts in a row differ significantly from each other (**P<0.01), NS= Non-significant. Each value is an average of 6 observations.

b. Average daily Feed Consumption

Fortnight	T ₁	T ₂	T ₃	Significance
1 st	1.24±0.05 ^{ab}	1.31±0.03 ^a	1.18±0.03 ^b	NS
2 nd	1.31±0.02 ^a	1.56±0.02 ^b	1.45±0.06 ^c	**
3 rd	1.45±0.03 ^a	1.66±0.04 ^b	1.64±0.03 ^b	**
4 th	1.66±0.02 ^a	1.71±0.02 ^a	1.72±0.03 ^a	NS
5 th	1.76±0.01 ^{ab}	1.71±0.05 ^a	1.84±0.02 ^{ab}	*
6 th	1.79±0.03 ^a	1.88±0.01 ^b	2.06±0.02 ^c	**
7 th	1.80±0.05 ^a	1.94±0.02 ^b	2.10±0.02 ^c	**

T₁ = Control (Provision of 10-12 hrs light), T₂ = provision of 18 hrs light, T₃ = provision of 24 hrs light

^{abc} Means bearing different superscripts in a row differ significantly from each other (*P<0.05, **P<0.01), NS= Non-significant. Each value is an average of 6 observations.

c. Daily body weight gain (g)

Fortnight	T ₁	T ₂	T ₃	Significance
1 st	226.67±11.08	351.67±23.44	270.00±24.41	**
2 nd	261.67±11.08	368.33±23.44	278.33±24.41	**
3 rd	271.67±16.00	368.33±21.97	290.00±32.14	*
4 th	285.00±27.77	450.00±24.89	335.00±31.17	**



5 th	268.33±23.44	415.00±32.22	361.67±16.21	**
6 th	306.67±26.54	483.33±32.62	418.33±22.12	**
7 th	411.67±14.00	626.67±45.21	410.00±24.63	**

T₁ = Control (Provision of 10-12 hrs light), T₂ = provision of 18 hrs light, T₃ = provision of 24 hrs light

^{abc} Means bearing different superscripts in a row differ significantly from each other (*P<0.05, **P<0.01), Each value is an average of 6 observations.

d. Economics of grower pigs under different treatments

Particulars	T1	T2	T3
Total feed consumed/pig	165.10	176.87	180.19
Total cost of feed (Rs.)	3647.06	3907.06	3980.04
Total gain in body weight (kg)	30.41	45.95	35.39
Feed cost/kg	22.09	22.09	22.09
Average cost/ gain in body weight (Rs.)	119.93	85.03	112.46

T₁ = Control (Provision of 10-12 hrs light), T₂ = provision of 18 hrs light, T₃ = provision of 24 hrs light

Salient findings: Effects of photoperiod on the performance of grower pigs were studied.

Performance of grower pigs getting 18 hrs duration of light (T₂) performs well. The higher body weight and recorded in T₂ (provision of 18 hrs light duration) followed by T₃ (provision of 24 hrs light duration) and T₁ (provision of 10-12 hrs light duration). The body weight at the end of experiment were higher in T₃ (70.97±1.74 Kg) and T₂ (81.58±2.27 Kg) then T₁ (66.08±1.43 Kg). It was also observed that average daily feed consumption at 7th fortnight was observed to be highest in T₃ (2.10±0.02) followed by T₂ (1.94±0.02) and T₁ (1.80±0.05). Average cost per kg body weight gain (Rs.) was observed to be lowest in T₂ (85.03) followed by T₃ (112.46) and T₁ (119.93).

8) 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. 160-170 per kg.

9) Disposal pattern of waste, pig excreta etc/ Establishment of biogas plant: No biogas plant but the centre is using the pig excreta as manure for agricultural land.

10) Production economics:

- i) Cost of production/pig up to slaughter age: Rs. 5000 - 11000 depending on feed and marketing
- ii) Cost of production/Kg pork: Rs. 49.34 per kg body weight gain on 100% concentrate ration

11) Extension programme with success story:

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

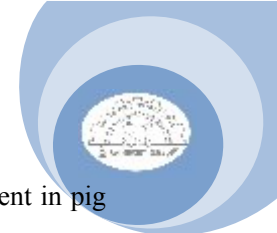
A. 10 days duration:	135
B. 1 day duration	1873

At the farmers' field:

- i) Livestock (Pig) show during *Kisan Mela* at different KVKs of University.
- ii) *Kisan gosti* at different places of state during Livestock Show.
- iii) T.V. Telecast (Doordarsan Ranchi) 14
- iv) Radio 1

12) Scientific publication:

Ravindra Kumar and L. B. Singh (2013) Effect of replacing fish meal and ground Nut Cake by soybean meal on the performance of pigs. Sent for publication. *Ind. Veterinary Journal*.



Ravindra Kumar and L. B. Singh (2013). Use of silkworm pupae as a protein supplement in pig ration. Sent for publication. *Ind. veterinary Journal*.

13) Project work of students: Completed project: Effect of poly-herbal preparations on growth performance and haemato-biochemical profile of growing pigs.

14) Distinguish visitors:

- 14.6.13 Dr. U. K. Mishra, VC, Chhattisgarh Kamdenu Vishwavidyalaya Durg And Dr. S .K. Sanyas formar VC BCCV.
- 19.6.13 Dr. R.P. Singh, former V.C, NDUAT, Lucknow. (0522-2393657)
- 7.20.13 Elizabeth Spain Cassity. Hughes Say Saysombath.8/10 PT601 N.Muany Soi T. Nonghoi A. Muany. Chiang Nai, Thailand. 50000
- 14.9.13 Prof. Dileep Kumar .field visit of 128 Dy. Collector (P) of ATI, Ranchi. (2285806)
- 18.12.13 T.A. More, VC MPKV Rahur. B. Bandyopadhyay, VC. UBKV, West Bengal. KK Kayoch.VC, CSKHPKV Palampur Casuli, Prof. O.P. Gill, VC, MPUAT Udaipur Dr. Bhagwan Singh, Director Research M.P. University. (8975750345)
- 27.12.13 Bandhu Tirkey M.L.A (Mandar) (9431100324)
- 27.12.13 मथुरा प्रसाद महतो विधायक टुण्डी, धनबाद (9431507453)

Success Story:

Sri Mangal Murmu started his pig farm by 2 piglets of improved breeds from Green Dream Farm (Pig breeding farm of Mr. Jerome Soreng), Gorgora, Baliguma in the year 2008. Consistent support and expert knowhow of scientists of Birsa Agricultural University, made him feel confident in going with the project. He attended programmes organized by KVK both on and off the farms. He bought a carry van (Tata Ace) to collect kitchen waste from Jamshedpur on loan received from Gramin Bank, Dimna, Jamshedpur. In the mean time he received some good T& D Pigs from Krishi Vigyan Kendra for demonstration too. Gradually he expanded my farm and increased the number of breeding stock in my farm. He got some pigs of Ghunghroo breed from KVK for experimenting its performance and is very much liked by the rural farmers. About three hundred plus families have been benefited with improved pig rearing through him. About fifty farmers come to visit his farm every month. By the end of 2013 he has expanded his farm for keeping about 150 (one hundred and fifty) pigs in Bhagaband, near Pipla, Jamshedpur. I have sold pigs (both piglets and fatteners) for Rs five lakhs in 2013 by spending about Rs one lakh eighty thousand only. He has projected to sell pigs for Rs eight lakhs in this year by spending about Rs three lakhs only.



Farm of Mangal Murmu



Pigs at Mangal Murmu's farm



Mangal Murmu's pig shed



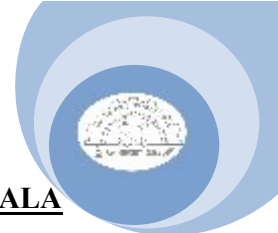
Pig maintained by Mangal Murmu



Pig of Mangal Murmu



Vice Chancellor from different Universities interact at AICRP centre, BAU, Ranchi



KERALA AGRICULTURAL UNIVERSITY, MANNUTHY CENTRE, KERALA

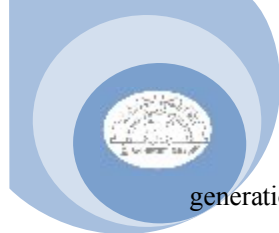
This farm was started on 12-05-1965 as a small pig breeding unit along with an auxiliary pork production scheme under the Department of Animal Husbandry. It was taken up by Kerala Agricultural University in 1972 and renamed as University Pig Breeding Farm. The All India Co-ordinated Research Project 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 fatterer 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, the local Desi breed and varieties of crossbred animals.. The major activities of this centre are to conduct research on various aspects of pig production, operate as an instructional farm to students, production and distribution of good quality piglets to farmers and to function as a demonstration unit to farmers. Under the AICRP on Pig, two breed (Desi x LWY) and three breed ((Desi x LWY) x Duroc) crosses are produced and supplied to farmers for fattening. So far the Centre has completed various projects including Master’s, Doctoral projects. Academic activities include conducting internship training for under graduate students, providing facilities and technical advice for conduct of research of post graduate and doctorate students. The extension activities of the Centre include provision of technical advice to progressive pig farmers, issue of project reports and establishment of field units.

1) Herd dynamics:

Details	Desi			Crossbred 50 %			Crossbred 75 %		
	M	F	Total	M	F	Total	M	F	Total
Opening balance as on 01/04/13	47	67	114	1	79	80	175	218	393
Birth (01/04/13 to 31/3/14)	34	31	65	0	0	0	443	424	867
Purchase of animals	5	2	7	0	0	0	0	0	0
Total	86	100	186	1	79	80	618	642	1260
Mortality	3	1	4	0		0	35	34	69
Sold / Field unit / slaughter	19	2	21	0	1	2	390	385	775
Total	22	3	25	0	1	2	425	419	844
Closing balance as on 31/3/14	64	97	161	1	78	78	193	223	416

2) Breeding strategy of the farm as approved:

All India Coordinated Research Project on Pigs was started in this Centre on 01-08-1993. As per the technical programme a foundation stock of indigenous pigs was established in the Centre and two generation of the same were raised for cross breeding with Large White Yorkshire. Ten



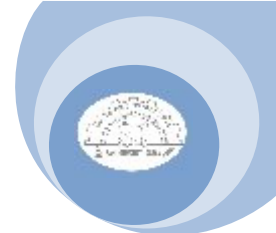
generations of 50% crossbred and seven generations of 75% crossbred were produced and their production, reproduction and carcass traits were studied. Pure line stock of Desi and Large white Yorkshire animals are also maintained.

3) Performance of animals:

Sl. No.	Traits/Characters	Mean # SE (no. of observation)		
		M	F	Total
1	Litter Size at birth (no)	5.81	4.83	10.64
2	Litter Size at weaning (no)	5.31	4.39	9.7
3	Avg. Individual weight at birth (kg)	1.04	1.01	1.026
4	Number of days for weaning (d)	42	42	42
5	Pre weaning mortality rate(%)	8.61	9.11	8.83
6	Pre weaning growth rate(gm/d)	197	193	195
7	Post weaning mortality rate(%)	0.5	0.5	0.5
8	Post weaning growth rate (gm/d)	376	358	357
9	Overall growth rate (upto 9 m) (gm/d)	324	321	315
10	Body weight at different ages (kg) (n=8)			
	at 1st month			5.92±0.20
	2nd month			10.20±0.30
	3rd month			17.10±0.40
	4th month			27.02±0.40
	5th month			35.68±0.50
	6th month			47.87±0.55
	7th month			59.63±0.60
	8th month			73.80±0.70
	9th month			81.70±0.75
	10th month			91.02±0.80
11	Age at slaughter (d)			300
12	Weight at slaughter(Kg)			91.02 ±0.80
13	Dressing Percentage (%)			68.81±0.70
14	Carcass Length (cm)			77.50±0.65
15	Back Fat Thickness (mm)			22.40±0.45
16	Meat Bone ratio (.)			4.15± 0.10
17	Amount of pork produced per sow (kg)			1152.36
18	Feed Conversion efficiency (.)			4.20
19	Live weight produced /sow/litter at birth (kg)			10.74
20	Live weight weaned /sow (kg)			82.67
21	Live weight produced at slaughter age/sow/litter (kg)			1674.70

4) Specific managerial practice:

Identification is done using microchip implantation for breeding stock at five months of age. Fattener stock is identified by ear notching done at two weeks of age. Castration of males is done at three weeks of age by open surgical method.

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

Parameter	Age											
	0-14 days			15-28 days			29-45 days			Over all		
	M	F	T	M	F	T	M	F	T	M	F	T
Number of animals at risk	-	-	-	-	-	-	-	-	-	-	-	-
Number died	1	1	2	-	-	-	-	-		1	1	2
Mortality %	3.0	2.9	3.0	-	-	-				2.0	1.9	2.0

Desi - Post- weaning

Parameter	45 days - 1 year			Adult			Over all		
	M	F	T	M	F	T	M	F	T
Number of animals at risk									
Number died	1		1				1		1
Mortality %	0.5		0.5				0.5		0.5

Cross bred 50% -Pre-weaning***Nil***

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

Cross bred 50% -Post- weaning: Nil***Cross bred 75 % -Pre weaning***

Parameter	Age											
	0-14 days			15-28 days			29-42 days			Over all		
	M	F	T	M	F	T	M	F	T	M	F	T
Number died	36	28	56	5	4	11	2	1	2	43	33	76
Mortalitytly %	6.2	5.7	6.02	1.15	0.8	1.2	0.5	0.01	0.4	9.15	9.2	9.18

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	4	3	7						
Mortality %			0.7						

a. Causes of mortality (specific cause):***Pre weaning***

Causes	Number died								
	Desi			Crossbred 50%			Crossbred 75%		
	M	F	Total	M	F	Total	M	F	Total
Gastro enteritis	-	-	-				28	24	52
Hepatitis	1		1				8	3	11
Pulmonary congestion and edema	-	1	1				7	6	15
Total	1	1	2				43	33	76

Post weaning

Causes	Number died								
	Desi			Crossbred 50%			Crossbred 75%		
	M	F	Total	M	F	Total	M	F	Total
Gastro enteritis	-	1	1	-	-	-	3	1	5
Pulmonary congestion and edema	-	-	-	-	-	-	2	1	2
Total	-	1	1	-	-	-	5	2	7



(iii) Measures to taken minimize mortality:

(i) Management measures:

1. All the pigs were dewormed periodically and regular spraying against ecto-parasites was done.
2. Early treatment to control piglet diarrhea and anemia were undertaken
3. Soft bedding with hay was provided to minimize the incidence of crushing of piglets
4. Early detection and treatment of MMA syndrome
5. A disinfectant dip was constructed at the entrance of the centre to control infection from outside.
6. Practice of one time feeding in the early morning of the day was introduced along with provision of shade to minimize the heat stress
7. Efforts are taken to minimize the pre-weaning mortality with suitable interventions.

(ii) Prophylactic measures:

1. All the animals were vaccinated annually for swine fever using swine fever live attenuated freeze dried vaccine from IVRI and the weaned piglets were vaccinated three days after weaning
2. Annual vaccination is also done against FMD and HS.
3. The wallowing tanks in the pens are routinely cleaned using disinfectants.
4. The sows were dewormed and cleaned prior to shifting them into the farrowing pens.
5. Pregnant sows were transferred to farrowing pen 2-3 weeks in advance to provide individual care.
6. Routine inspection and maintenance of hygienic of farrowing pens for preventing MMA

b. Disposal of diseased carcass:

Carcasses are disposed into the carcass pit located in the campus.

6) Nutritional experimentation:

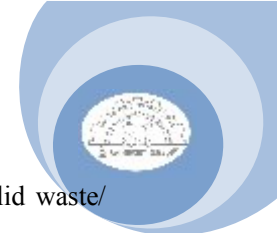
The feed with following composition is used in the centre.

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

7) Survey on market of pork production:

Market prices of pork

Pork with fat : Rs.250/kg from University meat plant
Lean pork : Rs.360/kg from University meat plant
Private outlets : Rs.230/kg.
Live weight : Rs.100/ kg depends upon the season



8) Disposal pattern of farm waste, pig excreta etc/Establishment of biogas plant: Solid waste/excreta is collected in the manure pit and sold @ Rs.0.20/kg to farmers and government agricultural farms. Liquid waste is collected in the slurry pit and pumped to the grass lands along with water.

9) Production economics: The production economics is calculated on the basis of only concentrate feeding, the existing price of pork is Rs.230/kg and Rs.100/kg live weight.

Cost of production/pig up to slaughter age : Rs.9460/-

Cost production /kg pork : Rs.105/-

10) Extension programme with success story:

(i) At the institute: The Centre provides technical knowledge to the progressive farmers in establishing the piggery units with respect of the construction of the pig house, health care, management, waste disposal and other problems faced on day to day basis over telephone and personal call. The Centre could establish 200 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 programme on “Scientific feeding & Management “was held at Centre for Pig Production & Research, Mannuthy from 18th to 22nd December 2012. Eight farmers of which six from within the state and two from Tamil Nadu attended the programme. Many progressive pig farmers have been participating and discussing the prospects and problems of pig rearing in Kerala and many of the pig farmers expressed their success stories.

(ii) At the farmer’s field: Centre had supplied 740 fattening piglets to 93 farmers. Seven new units have been established during this period.

11) Scientific publications:

A) Research Papers

Venkatachalapathy R.T, Gopalakrishnan S, Pramod S and Usha A.P. (2013) Effect of Probiotic supplementation on the permormance of Pre weaned piglets Probiotics in sustainable food production: Current status and future concepts – Probiotics in food production (2) 281-283.

Ragavendran, V.B., R.T. Venkatachalapathy and Usha, A.P. (2013) Genetic Polymorphism of Retinol Binding Protein 4 and its Association with litter traits in pigs I. J. Anim Sci. (Accepted)

Elanchezhian N Ally K Mercey A.D Gangadevi P, Kuttinarayanan P and Usha A.P. (2013) Effect of replacement of maize by animal fat on plasma and muscle lipid profile of Large White Yorkshire pigs. Intl J. food Nutri Sci. 2:2 pp 59-64.

Elanchezhian N Ally K Mercey A.D Gangadevi P, Kuttinarayanan P and Usha A.P. (2013) Effect of supplementation of animal fat in the diet of Large White Yorkshire pigs on carcass and sensory parameters. Intl J. food Nutri Sci.

Deepa C.N., R Thirupathy Venkatachalapathy[#] and Usha A.P. (2013) Genetic variability at Follicle Stimulating Hormone Beta locus and its association with litter traits in Indian pig lines, Journal of Animal and Veterinary Advances.



Sankarankutty Pramod, Narayanadas Vijayan., Narayanan.D.Nair, Usha A.P., Ramachandran Gopalakrishna., Venkatachalapathi Thirupathy., and Chettikkunnel R.Lalithkunjamma(2014).Gross and Immunochemical studies on undifferentiated ethmoid carcinoma in an indigenous pig. Veterinary Archive 84(1) pp 95-100

B). Papers Presented: 9

C) Non-Technical Reports published:

Sl. No.	Authors	Title	Name of the Journal / Magazine / Daily etc.	Date
	Dr.A.P.Usha Dr.E.D.Benjamin Dr George Sherin K	Pannivalarthalinu sadhyathayere	Niravu Farm journal	March 2014

D) Pamphlets / Leaflets / Handbooks released :

Sl. No.	Title	Authors / Department	Language
	Leaflet: Pannivalarthalinu sadhyathayere (for farmers.)	Kerala Veterinary and animal sciences university	Malayalam

E) Books / Monographs / Manuals:

Sl. No.	Authors	Year	Title	Publisher
	Dr.A.P.Usha Dr.E.D.Benjamin Dr.George Sherin.K.	2014	Pannivalarthal	Kerala Veterinary and Animal Sciences University

F) Radio talk

1. Question Answer programme in Vayalum veedum on Production and marketing of quality pork in All India Radio
2. Question Answer programme in Vayalum veedum on Pig Production and waste management in All India Radio

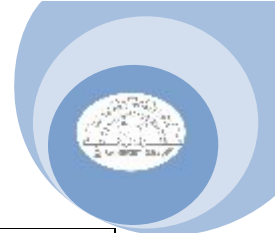
12) Project work of students (M.V.Sc/Ph.D.)

PhD

1. Characterisation of candidate genes and their association with litter traits in pig

MVSc

1. Development and Evaluation of a Model for Waste water management in pig farms
2. Expression profile and genetic variability of *porcine beta-defensin (pBD-1)* gene.
3. Assessment of biogas production potential of monogastric farm animal waste
4. Effect of dietary supplementation of probiotic, prebiotic and synbiotic on growth performance and carcass characteristics in crossbred pigs
5. Litter performance of Large white Yorkshire pigs raised in different farrowing housing system

**16) Distinguished visitors:**

Sl. No.	Name and address of the visitor	Date of visit	Place of visit	Purpose of the visit
1.	Dr C Renukaprasad, Vice Chancellor, KVAFSU, Karnataka	12-1-2014	CPPR, Mannuthy	Inauguration of a conference
2.	C R Pradhan, Prof & Head, Dept of LPM, OVAT, Bhubaneswar	21-10-2013	CPPR, Mannuthy	To study about the functioning of farm
3	Alfred Wahl, Sikander Singh, Polar Genetics, Ottawa, Canada	20.2.2014	CPPR, Mannuthy	To familiarize the scope of introducing AI in the farm using superior quality frozen semen



Identification using microchip reader



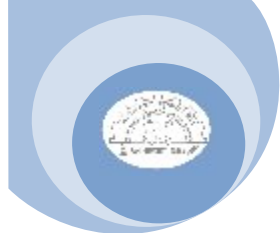
Aerobic compost unit



Vaccination using vaccinator



Providing shade using shade net for reducing heat stress to animals



SRIVENKATESHWARA VETERINARY UNIVERSITY, TIRUPATI

The All India Coordinated Research Project on Pigs, 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 managerial conditions. During the VI Five Year Plan, research work was conducted to study the performance of indigenous pigs under improved managerial condition 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. From the year 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 is being studied (21st generation).

1) Herd dynamics

Sl. No	Categories	Opening balance	Additions		Disposals			Closing balance
			Birth	Transfers / Purchased	Deaths	Transfers/ Slaughter	Sold	
1	Piglet (upto 42 d)	0	496	-	11	-	-	
2	Grower (4 d-5 m)	172	-	6	32	-	351	
3	Finisher (5- 8 m)	26	-	-	5	22	5	
4	Breeding female	44	-	-	-	-	-	
5	Boar	15	-	-	-	-	-	
Grand Total		257	496	6	48	22	356	333

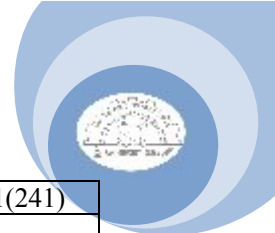
2) Breeding strategy of the farm as approved:

- Started during IV Five year plan in the year 1970-71 to study performance of LWY pigs and was continued upto end of V Five year plan
- During VI Five year plan the performance of indigenous breeds was studied under best managerial conditions
- Research work on breeding of indigenous gilts with boars of LWY was carried out during VII Five year plan
- Studies on indigenous pigs were discontinued from the year 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 (21st generation)

3) Performance of animals:

a) (20th generation I crop)

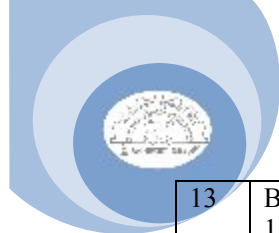
Sl. No	Traits/ Characters	Mean \pm SE (no. of observation)		
		M	F	Total
1	Litter size at birth (no.)	4.10 \pm 0.42 (30)	3.93 \pm 0.40 (30)	8.03 \pm 0.33(30)
2	Litter weight at birth (kg)	5.17 \pm 0.52 (30)	4.75 \pm 0.47 (30)	9.87 \pm 0.37(30)
3	Litter size at weaning	3.90 \pm 0.41 (30)	3.80 \pm 0.37 (30)	7.70 \pm 0.37(30)
4	Litter weight at weaning(kg)	29.25 \pm 3.10 (30)	28.61 \pm 2.88 (30)	57.90 \pm 2.78(30)



5	Individual weight at birth (kg)	1.26±0.01 (123)	1.21±0.15 (118)	1.23±0.01(241)
6	Avg. individual weight at weaning (kg) (42 days)	7.50±0.03 (117)	7.53±0.03 (114)	7.52±0.02(231)
7	Number of days for weaning(d)	42 days	42 days	42 days
8	Pre weaning mortality rate (%)	4.87 % (123)	3.39 % (118)	4.15 % (241)
9	Pre weaning growth rate(gm/d)	148.55±0.82(117)	150.60±0.85 (114)	149.56±0.59 (231)
10	Post weaning mortality rate (%) (up to 9 months)	11.11% (117)	7.01% (114)	9.09% (231)
11	Post weaning growth rate (gm/d) (up to 9 months)	279.62±0.84 (20)	281.83±0.71 (55)	280.10±0.46 (75)
12	Overall growth rate (upto 9 m) (gm/d)	259.13±0.35(20)	260.02±0.24(55)	259.61±0.24(75)
13	Body weight (kg)			
	1 month	6.24±0.03 (121)	6.25±0.03 (114)	6.25±0.02 (235)
	2 months	9.75±0.02 (115)	9.66±0.03 (113)	9.71±0.02 (228)
	3 months	14.35±0.08 (112)	14.26±0.08 (110)	14.30±0.06 (222)
	4 months	20.16±0.05 (104)	20.13±0.05 (108)	20.14±0.03 (212)
	5 months	32.66±0.08 (100)	32.62±0.08 (102)	32.64±0.06 (202)
	6 months	42.13±0.02 (71)	42.12±0.08 (81)	42.14±0.07 (152)
	7 months	55.10±0.06 (22)	55.59±0.05 (59)	55.38±0.13 (81)
	8 months	65.81±0.12 (20)	66.62±0.13 (57)	66.21±0.11 (77)
	9 months	70.86±0.13 (20)	71.98±0.12 (55)	71.40±0.13 (75)
	10 months	76.32±0.21 (18)	77.85±0.18 (53)	77.11±0.12 (71)
14	Age at slaughter (d)	269±24.15 (7)	286 ± 23.14 (8)	277±14.56 (15)
15	Weight at slaughter (kg)	84.63±7.84	86.64±9.53	85.48±5.56
16	Dressing Percentage (%)	58.02±1.15	61.32±2.45	59.60±1.25
17	Carcass Length (cm)	75.10±3.59	75.13±4.36	75.12±2.34
18	Back Fat Thickness (mm)	15.12±0.25	15.98±0.18	15.55±0.12
19	Meat Bone ratio (:)	2:1	2:1	2:1
20	Amount of pork produced per sow (kg)	49.08	52.85	50.96
21	Feed conversion efficiency (:)	3.28	3.45	3.36

b) Performance of animals (20th generation II crop)

Sl. No	Traits/ Characters	Mean ± SE (no. of observation)		
		M	F	Total
1	Litter size at birth (no.)	4.00±0.29 (28)	3.89±0.30 (28)	7.89±0.33 (28)
2	Litter weight at birth (kg)	5.30±0.36 (28)	4.98±0.37 (28)	10.28±0.38 (28)
3	Litter size at weaning (no.)	3.78±0.31 (28)	3.67±0.30 (28)	7.49±0.35 (28)
4	Litter weight at weaning (kg)	28.84±2.40 (28)	28.15±2.35 (28)	57.30±2.70 (28)
5	Avg. individual weight at birth(kg)	1.32±0.02 (112)	1.28±0.02 (109)	1.30±0.01 (221)
6	Individual weight at weaning (kg)	7.63±0.02 (106)	7.67±0.02 (103)	7.65±0.01 (209)
7	Number of days for weaning(d)	42 days	42 days	42 days
8	Pre weaning mortality rate (%)	5.35 (112)	5.50 (109)	5.42 (221)
9	Pre weaning growth rate (gm/d)	150.46±0.34 (106)	152.14± 0.52(103)	151.50±0.49(209)
10	Post weaning mortality rate (%)	7.54 (106)	6.79 (103)	7.17 (209)
11	Post weaning growth rate (gm/d) (up to 4 months)	161.42±1.54 (16)	161.84±1.69 (9)	161.64±1.63 (25)
12	Overall growth rate (upto 4 m) (gm/d)	158.02±1.26 (16)	158.51±2.53 (9)	158.2±1.19 (25)



13	Body weight (kg)			
	1 month	6.15±0.02 (112)	6.13±0.02 (109)	6.14±0.01 (221)
	2 months	9.63±0.02 (97)	9.63±0.02 (96)	9.63±0.01 (193)
	3 months	14.21±0.11 (58)	14.34±0.08 (49)	14.27±0.07 (107)
	4 months	20.27±0.14 (16)	20.24±0.23 (9)	20.26±0.13 (25)

b) Performance of animals (21st generation I crop)

Sl. No	Traits/ Characters	Mean ± SE (no. of observation)		
		M	F	Total
1	Litter size at birth (no.)	3.50±0.27 (40)	3.65±0.23 (40)	7.15±0.24 (40)
2	Litter weight at birth (kg)	4.50±0.35 (40)	4.54±0.33 (40)	9.04±0.38 (40)
3	Litter size at weaning (no.)	3.32±0.26 (40)	3.50±0.25 (40)	6.82±0.26 (40)
4	Litter weight at weaning (kg)	26.82±2.17 (40)	27.73±2.06 (40)	54.55±2.13 (40)
5	Avg. individual weight at birth(kg)	1.28±0.02 (140)	1.24±0.02 (146)	1.26±0.01 (286)
6	Avg. individual weight at weaning (kg) (42 days)	8.06±0.10 (133)	7.92±0.09 (140)	7.99±0.07 (273)
7	Number of days for weaning (d)	42 days	42 days	42 days
8	Pre weaning mortality rate (%)	5% (140)	4.10 (146)	4.54 (286)
9	Pre weaning growth rate (gm/d)	160.01±0.17 (133)	160.65±0.15(140)	160.30±0.16(273)
10	Body weight (kg)			
	1 month	6.37±0.08 (134)	6.23±0.07 (142)	6.30±0.05 (276)
	2 months	9.76±0.04 (132)	9.71±0.05 (139)	9.73±0.03 (271)

4) Lifetime production traits for 20th generation

- Average litter size at birth per sow : 7.96
- Average litter weight at birth per sow : 10.07
- Average litter size at weaning per sow : 7.60
- Average litter weight at weaning per sow : 57.60
- Average litter weight at slaughter per sow : 85.48

5) Specific managemental practices:

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.

6) Mortality parameter:

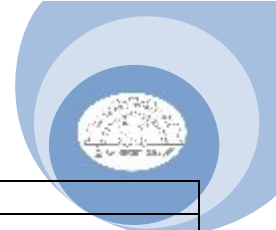
i) Genetic group wise and sex wise mortality rate:

75% LWY (20th Generation II Crop & 21st Generation I Crop)

	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	252	13	5.15	255	12	4.70	507	25	4.93
Post weaning	106	8	7.54	103	7	6.79	209	15	7.17

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

PRE-WEANING	
Pulmonary edema	2
Haemorrhagic enteritis	6



Pasteurellosis	3
Total	11
POST-WEANING	
Pasteurellosis	18
Lymphosarcoma	4
Hemorrhagic enteritis	10
Total	32
ADULTS	
Hypovolemic shock	4
Metritis Mastitis Agalactia syndrome	1
Total	5
Grand Total	48

iii) Measures taken to minimize mortality: Managemental measures: All possible bio-security measures were adopted including regular sanitation, screening of animals for parasitic diseases, regular deworming, identification of sick animals in time, proper treatment for the sick animals, regular visits of health committee constituted for the purpose comprising of specialists from department of Medicine, Surgery, Gynaecology, Parasitology, Pathology, Microbiology and Epidemiology.

Prophylactic measures: Regular vaccination as per the schedule covering the diseases of HS, Foot and Mouth, Swine fever etc.

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

7) Nutritional experimentation:

Effect of dietary supplementation with multienzyme on the growth performance and nutrient utilization in crossbred pigs

The global trend in the swine management was focused on reduction in the cost of production, met by the use of agro-industrial by-products in the diets, which contain low levels of starch and higher levels of fibre in the form of non-starch polysaccharides (NSP) and resistant starch. Their inclusion in the diets at higher levels lead to the reduced performance in the growth of the animals due to the increased digesta viscosity, increased endogenous nutrient losses and reduced feed intake. Further, NSP are not hydrolyzed by digestive enzymes. The fibre matrix and nutrients entrapped in fibre usually bypass digestion limiting the nutrient digestion and absorption. They also reduce protein digestion by entrapping amino acids which make them unavailable for the digestion and absorption.

Five dietary treatments, T1 (standard diet), T2 (economic diet with 12% dietary fibre by inclusion of sunflower cake without multienzyme supplementation), T3 (T2 + multienzyme supplementation @ 500g/ton), T4 (T2 + multienzyme supplementation @ 750g/ton) and T5 (T2 + multienzyme supplementation @ 1000g/ton) were evaluated for their effect on growth performance and nutrient utilization of crossbred pigs during grower and finisher phases.



Animals were allotted at random to the dietary treatments with six animals per each treatment with an initial average body weight of 15.4 ± 0.16 for growth studies during grower phase and were shifted to the corresponding diet during finisher phases (35-70 kg live weight). A metabolism trial was conducted during grower phase at about 30 kg body weight and finisher phase at about 55 kg body weight. The animals were slaughtered at about 70 kg body weight to record the carcass parameters.

During grower phase the percent DM digestibility was highest ($P < 0.01$) in pigs fed T1 than in other treatments. The percent OM digestibility was higher ($P < 0.01$) in pigs fed T1 or T5 or T4 than in T2 and T3 fed pigs. The percent CP digestibility was higher ($P < 0.01$) in pigs fed T1 than those fed T2, T3, T4 or T5. The percent CF digestibility was higher ($P < 0.05$) in pigs fed T5 than those fed with other diets. The percent digestibility of NDF was higher ($P < 0.01$) in T5 than those fed with T1 and T2 while the values for T3 and T4 were comparable.

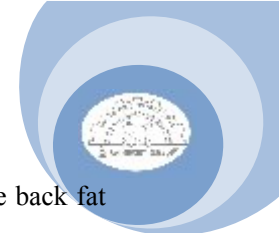
The nitrogen intake (g/d) during grower phase was significantly higher ($P < 0.01$) in T3 or T2 than in T1, T4 or T5 fed pigs. The nitrogen loss (g/d) in faeces and urine were higher ($P < 0.05$) in T2 than in other treatments. The total nitrogen loss (g/d) was higher ($P < 0.05$) in T2 followed by T3, T4, T1 and T5 fed pigs. The nitrogen retained as % of intake, nitrogen retained as % of absorbed were comparable among treatments.

During finisher phase, the percent CP digestibility was higher ($P < 0.01$) in pigs fed T1 than those fed with other diets. The percent CF digestibility was higher ($P < 0.01$) in pigs fed T5 than in other treatments. The percent digestibility of NDF was higher ($P < 0.05$) in T5 or T4 than those fed with T1, T2 and T3. The percent ADF digestibility was higher ($P < 0.05$) in pigs fed T5 and the lowest ADF digestibility was observed in T1. The percent digestibility of cellulose was higher ($P < 0.05$) in T5 or T4 than those fed with T1, T2 and T3.

The nitrogen loss (g/d) in faeces and the total nitrogen loss (g/d) were higher ($P < 0.05$) in T2 than in other treatments in the finisher phase. The nitrogen retained (g/d) was higher ($P < 0.05$) in T1, followed by T5, T3, T4, T2 fed pigs. The nitrogen retention as % intake was also higher ($P < 0.01$) in T1 followed by T5, T4, T3, T2 fed pigs. The nitrogen intake, nitrogen loss in urine, nitrogen retention as % of absorbed were comparable among treatments.

During grower phase, the pigs fed T1 or T5 have taken less ($P < 0.01$) number of days than those fed T2, T3 or T4 than T1 to T5 diets. The ADG (g) was higher ($P < 0.05$) in T1 or T5 fed pigs than in T2, T3 or T4 fed pigs. The cost of feed / kg gain was in the order $T1 > T2 > T4 > T3 > T5$ without any significant difference.

During overall growth performance, the number of days taken was less ($P < 0.01$) in T1 followed by T5, T4, T3, T2 fed pigs. The ADG (g) was higher ($P < 0.01$) in T1 followed by T5, T4, T3, T2 fed pigs. The ADFI (kg) was higher ($P < 0.01$) in T1 than in other treatments. The feed intake per kg gain (kg) was higher ($P < 0.01$) in T2 followed by T3, T4, T5, T1. The cost of feed per kg gain (Rs.) was highest ($P < 0.01$) in T2 and lowest in T5 than in T1, T3 or T4 fed pigs.



The carcass traits such as hot carcass weight, carcass length, loin eye area, average back fat thickness, primal cuts and dressing percentage were not significantly different among the treatments.

The following conclusions were drawn:

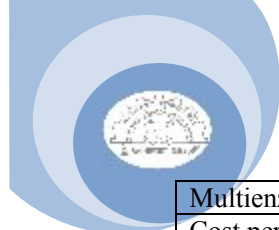
1. The increase in the fibre content from 8 to 12% has reduced the digestibility and growth performance of the pigs during grower and finisher phases which can be improved by supplementation of multienzyme.
2. The increase in the dose of multienzyme supplementation has increased the nutrient digestibility and growth performance of the crossbred large white Yorkshire during grower and finisher phases.
3. The CF, NDF, ADF, hemicellulose and cellulose digestibilities were better in finisher phase when compared with grower phase in all the treatments.
4. The effect of enzyme supplementation on digestibility was more pronounced in finisher phase as compared to grower phase.
5. It can be concluded that the sunflower cake can be included along with multienzyme supplementation at the rate of 1000g/ton in swine diets without causing reduction in nutrient digestibility, growth performance but reducing cost/kg gain in crossbred large white Yorkshire.

Chemical composition (%) of feed ingredients used in experimental diets

Constituent	Ingredient			
	Maize	Soybean meal	Sunflower cake	De-oiled rice bran
Dry matter	88.9	90.9	91.1	88.9
Crude protein	10.6	42.9	27.2	15.0
Ether extract	4.1	1.0	0.5	1.5
Crude fibre	2.7	7.2	25.5	17.8
Total ash	6.9	10.0	10.4	15.9
Nitrogen free extract	75.7	40.0	37.4	51.8
NDF	14.5	39.7	52.3	47.2
ADF	9.7	22.4	34.2	34.3
Hemicellulose	4.8	17.3	18.1	12.9
Cellulose	6.8	16.1	21.8	17.2
Lignin	2.1	5.2	6.7	1.2

Ingredient and chemical composition (%) of experimental grower diets

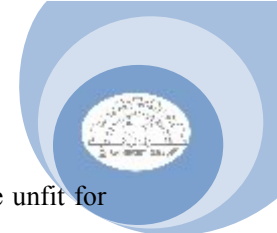
Ingredient	T1	T2	T3	T4	T5
Maize	50.00	32.00	32.00	32.00	32.00
Soybean meal	24.50	13.50	13.50	13.50	13.50
Sunflower Cake	-	14.00	14.00	14.00	14.00
Deioled Rice bran	23.00	38.00	38.00	38.00	38.00
Mineral mixture #	2.00	2.00	2.00	2.00	2.00
Salt	0.50	0.50	0.50	0.50	0.50
	100	100	100	100	100
Lysine (%)	0.33	0.25	0.25	0.25	0.25
Methionine (%)	0.03	0.09	0.09	0.09	0.09
AB ₂ D ₃	0.02	0.02	0.02	0.02	0.02
Biovital	0.02	0.02	0.02	0.02	0.02



Multienzyme(g)	-	-	50	75	100
Cost per 100 Kg (Rs.)	2373	2073	2085	2090	2096
Proximate composition (%) ^a					
DM	89.1	88.7	88.7	88.8	88.6
OM	89.5	89.5	89.4	89.5	89.5
CP	18.4	18.3	18.4	18.2	18.2
TA	9.1	10.4	10.5	10.4	10.4
EE	1.4	1.5	1.5	1.6	1.4
CF	7.4	12.6	12.5	12.6	12.5
NFE	62.2	57.0	56.8	57.0	57.2
Cell wall composition (%) ^a					
NDF	28.6	38.4	38.4	38.3	38.5
ADF	17.1	24.7	24.7	24.7	24.7
Hemicellulose	11.5	13.7	13.6	13.5	13.7
Cellulose	11.8	13.9	13.8	13.8	14.0
Lignin	3.6	4.8	4.8	4.9	4.8
# contained, Ca 32%; P 6%; Mn 0.27%; Zn 0.26%; Cu 100 ppm; Fe 1000 ppm, Iodine 0.01%; Fluorine (max.) 0.03%					
^a on Dry Matter basis except for DM					

Ingredient and chemical composition (%) of experimental finisher diets

Ingredient	T1	T2	T3	T4	T5
Maize	56	35	35	35	35
Soybean meal	19	8.5	8.5	8.5	8.5
Sunflower Cake	-	12.5	12.5	12.5	12.5
Deioled Rice bran	22.5	41.5	41.5	41.5	41.5
Mineral mixture #	2.00	2.00	2.00	2.00	2.00
Salt	0.50	0.50	0.50	0.50	0.50
	100	100	100	100	100
Lysine (%)	0.41	0.44	0.44	0.44	0.44
Methionine (%)	0.01	0.60	0.60	0.60	0.60
AB ₂ D ₃	0.02	0.02	0.02	0.02	0.02
Biovital	0.02	0.02	0.02	0.02	0.02
Multienzyme(g)	-	-	50	75	100
Cost per 100 Kg (Rs.)	2164	1835	1847	1853	1859
Proximate composition (%) ^a					
DM	88.6	88.0	88.1	88.0	88.2
OM	87.9	88.2	88.2	88.2	88.2
CP	16.5	16.5	16.5	16.4	16.4
TA	9.8	11.7	11.7	11.7	11.7
EE	1.6	1.5	1.5	1.5	1.5
CF	7.8	11.9	12.0	12.0	11.9
NFE	61.9	58.1	58.1	58.2	58.2
Cell wall composition (%) ^a					
NDF	29.7	38.4	38.5	38.4	38.5
ADF	16.2	25.1	25.1	25.2	25.0
Hemicellulose	13.4	13.3	13.3	13.1	13.4
Cellulose	12.4	13.8	13.6	14.0	13.8
Lignin	3.7	5.0	4.9	4.6	4.5
# contained, Ca 32%; P 6%; Mn 0.27%; Zn 0.26%; Cu 100 ppm; Fe 1000 ppm, Iodine 0.01%; Fluorine (max.) 0.03%					
^a on Dry Matter basis except for DM					



8) 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 were studied are slaughtered and the pork is sold at the rate of 156/- per kg through the college pork counters / outlets.

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.

9) Disposal pattern of farm waste, pig excreta etc/Establishment of biogas plant: The farm waste or pig excreta is collected and made into a heap. This will be 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.

10) Production economics:

i) Cost of production/pig up to slaughter age: The slaughter age is usually about 10 months or if as the animals reach 75 kg body weight. The average cost of production per pig upto slaughter age ranges from Rs.6500/- to 6700/- and it depends on the cost the ingredients which fluctuate periodically.

ii) Cost of production/ kg pork: Cost of production / kg pork was Rs. 135/- to Rs. 145/-.

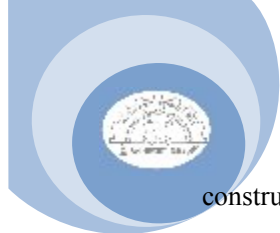
12) Extension programme with success story:

i) **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 is 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. As a resource person Senior Scientist & Head involved in conducting one day training programme to 35 number of pig beneficiaries of Chittoor District of Andhra Pradesh. Non-government organization Prajavydyasala farmers of Ananthapur district of Andhra Pradesh were given training on housing, sanitation and management for better production of pig farming. A total of 356 numbers of piglets were supplied to pig beneficiaries of different regions of Andhra Pradesh and feedback information as impact study was collected from the field in the form of success stories.

ii) At the farmers’ field: Study was done to assess the effect of pig rearing on the livelihoods of beneficiaries of pig units. The study was carried out in different districts of Andhra Pradesh.

13) Success stories:

1. Sri. K. Murali, Peruru village, Tirupati Rural Mandal: This farmer is supplied with 100 number of piglets during the year 2013-14. He has been maintaining pig farming since 2009 onwards by feeding of pigs with leftovers. Farmer is procuring garbage from local hostels, hotels and markets. Employment is given for one labour family for maintenance of pigs. Farmer has



constructed a pig breeding centre and running farm successfully. He claims that profit of Rs. 6,00,000/- per annum through pig farming.

2. Sri. Dakshanamurthy, Melpadi Post, Tiruvalamdari, Vellore District: He is one of the pig beneficiaries who started rearing of pig unit in the year of 2009 with 100 number of piglets purchased from this centre. Presently 250 numbers of pigs are available in the farm and farmer getting profits through sale of live animals and pork. Net profit of this farm is Rs. 7.00 lakhs in the year. The feedback information given from this farmer is very much encouraging.

3. Sri. P. Kiran, Kodur, Kadapa Dist: He is holding sheep, cattle and pig units. He has presently 100 number of pigs of 75% LWY and producing 2-3 crops per each generation. Farmer is spending money for labour and transport cost towards getting garbage from local markets. Concentrated feed is offered to the pregnant animals and creeper ration is given to the piglets. He also provided employment for 2 labour families and getting profits through sale of live animals to Coimbatore and Bangalore. His earnings from pig units are around 4.00 lakhs per year. New stock is being added through breeding of his own farm animals. Feedback information is given by the farmer is encouraging.

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

1) M.V.Sc. on “Effect of dietary supplementation of multi-enzymes on the growth performance and nutrient utilization in crossbred pigs”

Objectives:

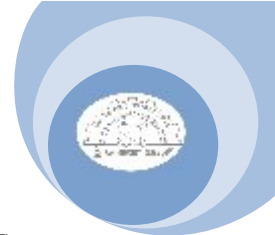
1. To study the effect of exogenous multi-enzymes on the growth performance of crossbred pigs.
 2. To study the effect of exogenous multi-enzymes on the nutrient digestibility in crossbred pigs.
- 2) M.V.Sc. on impact studies on piggery units on the livelihood of beneficiaries.

Objectives:

1. To estimate the costs and returns from pig production.
2. To assess the economic impact of productive assets on family expenditure, income and savings.
3. To study the pattern of income distribution among the beneficiaries.
4. To identify the constraints of pig production

15) Other information:

DBT Project: A research project entitled *Evaluation of herbal residues and nutraceuticals as alternatives to antibiotics for improving the performance of pigs* was sanctioned by Department of Biotechnology, Ministry of Science & Technology, New Delhi with a financial outlay of Rs. 35.71 lakhs under the Principal Investigatorship of Dr. MVAN. Suryanarayana, Scientist (AN) for a period of 3 years w.e.f 15.3.2011 vide proc. No. BT/PR13932/AAQ/01/435/2010, dt. 15.3.2011. The project is working in collaboration with



NIANP, Bangalore whose financial component includes Rs. 17.44 lakhs.

RKVY Project: A central government sponsored Rastriya Krishi Vikas Yojana (RKVY) research project entitled *Establishment of a pig unit for the supply of superior germ plasm to the farmers* is in progress since 2008-09 for a period of 6 years with a financial out lay of Rs. 191.31 Lakhs (as on now) under the Principal Investigator ship of Dr. K. Sakunthala Devi, Senior Scientist, AICRP on Pigs, Tirupati. The project goes with the objective of establishing/developing a “Modern Pig Unit” for taking up research and to supply superior germplasm to the pig farmers. So far **2559** piglets of superior germplasm were supplied to **130** enterprising farmers to initiate pig farming.



Germplasm maintained by pig beneficiary



Recording of field data by researcher



Supply of germplasm to the farmer



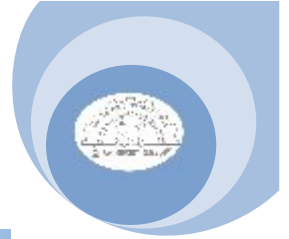
Hands on practice by internship students of College of Veterinary Science, Tirupati
Identification by Ear notching



Model pig sheds constructed by the farmers



Field Units



Extensive system of rearing



Inauguration of new model pig sheds by Hon'ble Vice-Chancellor
Dr. V. Prabhakara Rao, Sri Venkateswara Veterinary University, Tirupati



TAMILNADU VETERINARY AND ANIMAL SCIENCE UNIVERSITY, KATTUPAKKAM

The scheme on “AICRP on Pigs” is functioning at Livestock Research Station, Kattupakkam since 1993-1994. At the beginning foundation stock of *desi* pigs was established procured from different field units and animals maintained as per recommendation of different meet.

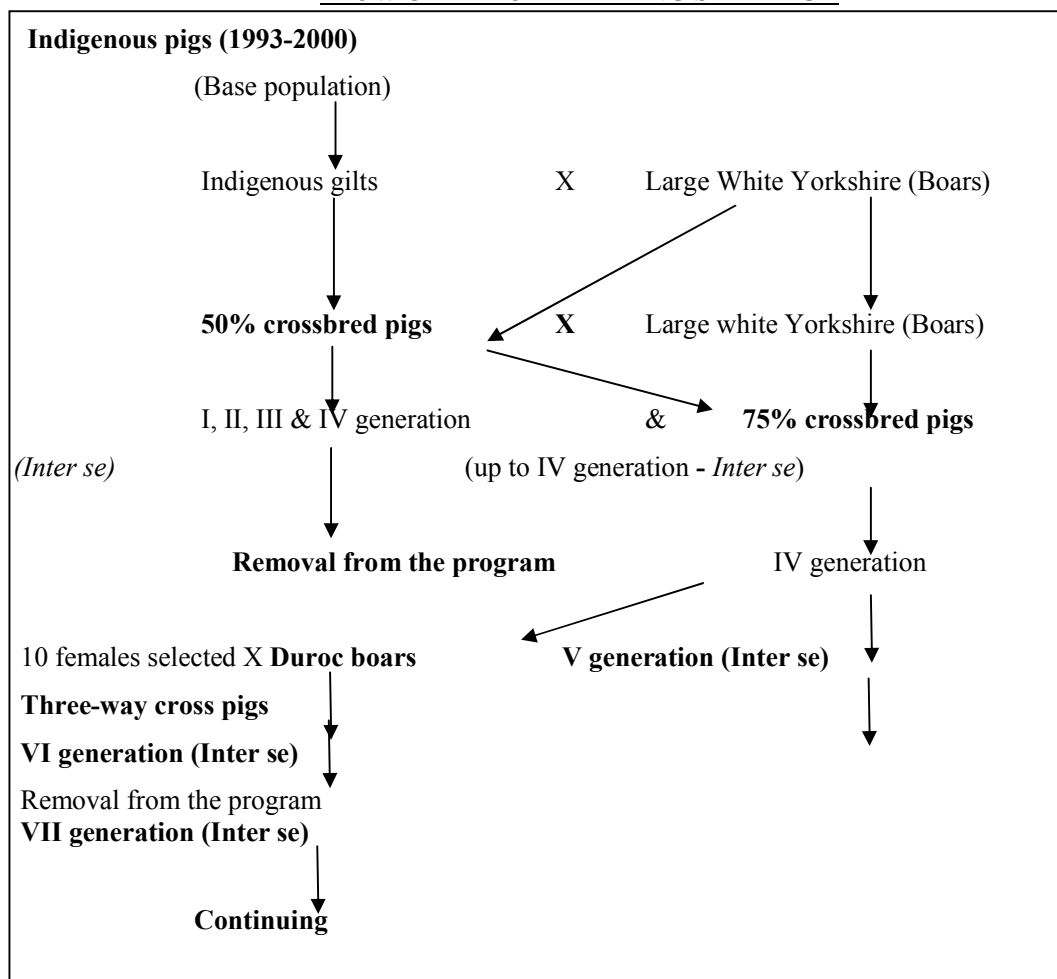
1) Herd dynamics

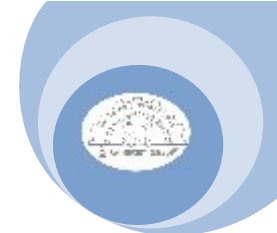
17) Herd dynamics

Particulars	75 % CROSSBRED PIGS						Total
	Adult		Grower		Suckling		
	Male	Female	Male	Female	Male	Female	
Opening balance on 01.04.2012	2	37	28	45	0	0	112
Birth	-	-	-	-	210	183	393
Internal transfer	15	38	195	174	0	0	422
Purchase (Desi pig)	4	14	-	-	-	-	18
Total addition	19	52	195	174	210	183	833
Opening balance + Total addition	21	89	223	219	210	183	945
Death	-	-	5	2	12	5	24
Breeding sale	-	-	128	108	-	-	236
Slaughter sale	8	39	36	22	-	-	105
Internal Transfer	-	-	15	38	195	174	422
External Transfer	-	-	-	-	-	-	-
Total deletion	8	39	184	170	207	179	787
Closing balance on 31.03.2014	13	50	39	49	3	4	158

2) 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.

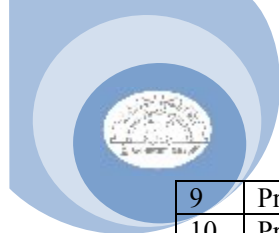
- (i) Sex ratio : 1: 3
- (ii) No. of breedable pigs
75% crossbred : 10: 30
- (iii) Selection procedure : Sequential selection
- (iv) Traits considered : 1. Litter size at birth
2. Litter size at weaning
3. Litter weight at birth
4. Litter weight at weaning
5. Birth weight
6. Weaning weight
7. Fifth month weight
8. Eighth month weight.

3) (i) Performance of animals – VII GENERATION II CROP

Sl. No.	Traits / Characters	Mean \pm SE (No. of observations)		
		Male	Female	Total / overall
1	Litter size at birth (No.)	4.65 \pm 0.32 (23)	3.74 \pm 0.36 (23)	7.95 \pm 0.47 (23)
2	Litter weight at birth (kg)	5.98 \pm 0.47 (23)	4.51 \pm 0.42 (23)	10.0 \pm 0.48 (23)
3	Litter size at weaning (No.)	4.03 \pm 0.33 (23)	3.65 \pm 0.37 (23)	7.87 \pm 0.72 (23)
4	Litter weight at weaning (kg)	32.63 \pm 3.08 (22)	25.8 \pm 3.11 (22)	67.41 \pm 6.42 (23)
5	Individual weight at birth (kg)	1.28 \pm 0.05 (107)	1.22 \pm 0.05 (86)	1.25 \pm 0.03 (193)
6	Weight at 21 day (kg)	5.34 \pm 0.18 (105)	5.27 \pm 0.19 (80)	5.01 \pm 0.15 (185)
7	Individual weight at weaning - 42 days (kg)	8.8 \pm 0.33 (99)	8.19 \pm 0.32 (84)	8.36 \pm 0.37 (183)
8	Number of days for weaning	42 days of age		
9	Pre weaning mortality rate (%)	7.47	2.32	5.18
10	Pre-weaning growth rate (g/day)	181.81 \pm 0.19 (99)	170.0 \pm 0.21 (84)	176.82 \pm 0.42 (183)
11	Post-weaning mortality rate (%)	4.04	1.19	2.73
12	Post-weaning growth rate (g/day) (up to 8 month)	365.60 \pm 1.7 (21)	355.7 \pm 1.62 (30)	347.9 \pm 0.42 (51)
13	Body weight (kg)			
	6-Month	47.88 \pm 1.33 (21)	5.065 \pm 1.11 (30)	49.36 \pm 0.86 (51)
	7-Month	57.4 \pm 1.12 (21)	58.31 \pm 0.88 (30)	58.04 \pm 0.68 (51)
	8-Month	76.43 \pm 1.72 (21)	70.20 \pm 1.05 (30)	72.78 \pm 1.03 (51)
	9-Month	80.04 \pm 1.52 (21)	74.22 \pm 1.04 (30)	76.32 \pm 1.01 (51)
	10-Month	84.04 \pm 1.52 (21)	78.11 \pm 1.05 (30)	81.08 \pm 1.42 (51)
	11-Month	90.09 \pm 1.04 (18)	87.11 \pm 1.05 (30)	90.05 \pm 1.02 (48)
	12-Month	95.09 \pm 1.04 (15)	97.11 \pm 1.05 (30)	96.05 \pm 1.02 (45)

(ii) Performance of animals – VIII GENERATION I CROP

Sl. No.	Traits / Characters	Mean \pm SE (No. of observations)		
		Male	Female	Total / overall
1	Litter size at birth (No.)	4.0 \pm 0.37 (25)	3.56 \pm 0.37 (25)	6.93 \pm 0.05 (25)
2	Litter weight at birth (kg)	5.02 \pm 0.45 (25)	4.29 \pm 0.43 (25)	8.45 \pm 0.21 (25)
3	Litter size at weaning (No.)	3.83 \pm 0.34 (25)	3.48 \pm 0.37 (25)	6.78 \pm 0.3 (25)
4	Litter weight at weaning (kg)	30.05 \pm 2.95 (25)	26.37 \pm 2.86 (25)	53.09 \pm 2.36 (25)
5	Individual weight at birth (kg)	1.24 \pm 0.02 (100)	1.22 \pm 0.02 (93)	1.24 \pm 0.02 (193)
6	Weight at 21 day (kg)	5.21 \pm 0.15 (65)	5.19 \pm 0.15 (64)	4.83 \pm 0.09 (176)
7	Individual weight at weaning 42 days (kg)	8.08 \pm 0.28 (67)	8.36 \pm 0.31 (64)	8.62 \pm 0.38 (193)
8	Number of days for weaning	42 days of age		



9	Pre weaning mortality rate (%)	4.0	4.30	4.14
10	Pre-weaning growth rate (g/day)	154.0 ± 0.18 (96)	146.0 ± 0.17 (89)	150.0 ± 0.12 (185)
11	Post-weaning mortality rate (%)	1.04	1.11	1.07
12	Post-weaning growth rate (g/day) (up to 5 month)	281.0 ± 1.91 (16)	316.0 ± 0.82 (34)	301 ± 0.78 (50)
13	Body weight (kg) VIII GENERATION I CROP			
	1-month	6.78 ± 0.25 (97)	6.85 ± 0.21 (91)	6.73 ± 0.14 (188)
	2-month	10.26 ± 0.62 (96)	11.03 ± 0.48 (90)	10.82 ± 0.36 (186)
	3-month	17.18 ± 0.74 (62)	15.66 ± 0.41(43)	16.25 ± 0.39 (105)
	4-month	28.96 ± 0.63 (41)	28.96 ± 1.15 (49)	28.55 ± 0.58 (90)
	5-month	39.8 ± 0.54 (21)	37.28 ± 0.84 (49)	38.65 ± 0.69 (88)

(iii) Performance of animals - VIII GENERATION II CROP

Sl.No.	Particulars	75% Large White Yorkshire
1.	No. of farrowing	1
2.	Litter size at birth (No.)	7 (1)
3.	Litter weight at birth (kg)	8.89 (1)
4.	Birth weight (kg)	1.27 ± 0.03 (7)
	Male	1.28 ± 0.04 (3)
	Female	1.26 ± 0.05 (4)

4) Specific managemental practices

(a) Identification: The newborn 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 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.

5) Mortality parameters

(i) Genetic group-wise mortality rate - 75 per cent crossbred from 01.04.2013 to 31.03.2014

VII Generation II Crop

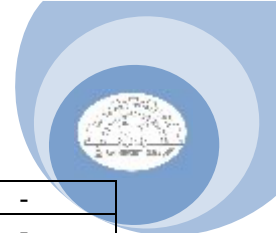
	Pre-weaning(1 days to 42 days)			Post-weaning(42 days to 1 year)		
	M	F	T	M	F	T
Animals at risk	107	86	193	99	84	183
Animals died	8	2	10	4	1	5
Mortality (%)	7.47	2.32	5.18	4.04	1.19	2.73

VIII Generation I Crop (Pre- 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	100	93	193	96	89	185
Animals died	4	4	8	1	1	2
Mortality (%)	4.0	4.30	4.14	1.04	1.11	1.07

Causes of mortality (2013-14)

Sl. No.	Causes	75% crossbred (<i>inter se</i>)			
		Pre-weaning		Post-weaning	
		M	F	M	F
1.	Crushing	2	2	-	-
2.	Enteritis	4	2	1	-
3.	Debility	-	-	-	2



4.	Pneumonia	-	1	1	-
5	Heat stress	-	-	2	-
6	Weak piglet	4	-	-	-
7	Carcass decomposed	2	-	1	-
	Total	12	5	5	2

(iv) Measures taken to minimize mortality Health problems such as anorexia, lameness, maggot wound, metritis, mastitis, enteritis, etc. were treated with appropriate medicines and efforts were taken to minimize mortality through prophylactic measures. All the pigs were dewormed periodically using Albendazole and Ivermectin suspension and / or Fenbendazole and Praziquantel suspension @ 1ml per 3 kg body weight to prevent the reinfection because of intensive rearing. Routine health cover measures viz., iron, vitamin and oral calcium supplementation, disinfecting the pig sties and premises, etc. were also carried out. Strict supervision and summer managerial practices like sprinkling of water and allowing the pigs for wallowing were followed. Growth promoters like mixtures of yeast extract, nicotinic acid, cyanocobalamin and amino acids or combination of calcium, phosphorus and vitamin D₃ and vitamin B₁₂ were given to the weak or runt piglets, pregnant pigs and lactating sows to boost up their growth and health. During 2013-14, all the pigs were dewormed periodically using Albendazole and Ivermectin combination @ 1 ml per 3 kg body weight.

(a) Managerial measures

Particulars	01-04-2013 to 31-03-2014
No. of pigs treated	476
No. of pigs dewormed	369
No. of growers castrated	75
No. of pigs sold for breeding	236
No. of new field units established	5
No. of pigs sold for slaughter	105
Revenue generated (Rs. in lakhs)	14.93
Farm advisory services	529 farmers

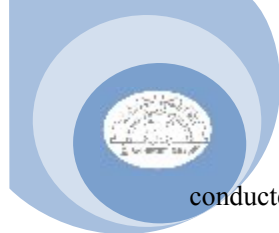
(b) Prophylactic measures

- The piggery premises were disinfected with sodium carbonate (10%) solution
- Animal sheds were disinfected with potassium permanganate solution/kohrsolin.
- Water sanitizer viz. sokrena was used routinely for water purification.
- All staffs working in pig breeding unit followed the self precautionary measures
- Field units were advised appropriately
- No. of animals vaccinated against Swine Fever: 104 (August, 2013)
- No. of animals vaccinated against Foot and Mouth Disease: 65 (2013-14)

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

6) Nutritional experimentation

i) A trial on “Multi-enzyme supplementation to study the growth rate in crossbred pigs” was



conducted for six months duration to study the growth rate and economics of enzyme supplementation. The details of the trial are given below:

Months	Group I (Control) without Alzyme)	Group II (Alzyme 200g/ton of feed)	Group III (Alzyme 300g/ton of feed)
Weight at IV month of Trial (Kg)	53.16 ± 1.62	57.83 ± 1.35	62.50 ± 4.54
Weight at V month of Trial (Kg)	64.5 ± 2.18	70.25 ± 1.76	76.25 ± 4.62
Weight at VI month of Trial (Kg)	69.83 ± 1.25	75.83 ± 2.48	82.33 ± 5.06

ii) A trial on “Effect of fibrolytic enzymes on growth performance in crossbred pigs” is going on. Three experimental rations formulated by adding 0,100 and 200 g NSP enzymes/ton of feed. The details of the trial are given below:

Particulars	Group I (Control) Concentrate without NSP enzymes	Group II (Concentrate with NSP enzymes - 100g/ton)	Group III (Concentrate with NSP enzymes -200g/ton)
Weight at the start of the Trial (Kg)	17.6±1.21	17.50±0.81	17.10±0.6
Weight at I month of Trial (Kg)	26.60±1.57	29.00±1.70	28.20±0.73
Weight at II month of Trial (Kg)	32.80±2.93	37.80±2.06	37.30±1.23
Weight at III month of Trial (Kg)	51.80±1.69	56.00±2.59	55.80±2.08

iii) A trial on “Effect of protease enzymes on growth performance in crossbred pigs” is going on.

Three experimental rations formulated by adding 0,100 and 200 g protease enzymes/ton of feed. The details of the trial are given below:

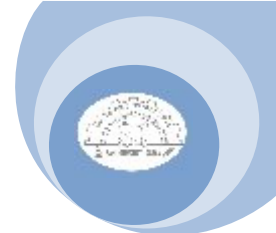
Particulars	Group I (Control) Concentrate without protease enzymes	Group II (Concentrate + protease enzymes - 100g/ton)	Group III (Concentrate + protease enzymes -200g/ton)
Weight at the start of the Trial (Kg)	17.6±1.21	17.40±0.83	17.30±0.90
Weight at I Month of Trial (Kg)	26.60±1.57	28.00±1.34	28.80±0.86
Weight at II Month of Trial (Kg)	32.80±2.93	38.80±1.66	39.50±0.52
Weight at III Month of Trial (Kg)	51.80±1.69	56.60±2.66	57.80±0.58

7) **Survey on market of pork production:** Pork marketing area have been identified and survey will be taken up in this year

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

9) Production economics

- | | | |
|-------|--|-------------------|
| (i) | Total variable cost | : Rs. 19.77 lakhs |
| (ii) | Total receipts (sale of pigs) | : Rs 14.93 lakhs |
| (iii) | Cost of production / kg of live body weight (Total variable cost / total body weight produced during the year) | : Rs. 131.06 |
| (iv) | Net farm income per adult unit | : Rs. 31,104 /- |
| (v) | Cost of production of a piglet at Weaning | : Rs.2709.84 /- |



10) Extension programme with success story

i) At the institute:

Training conducted

- Farm Manager Training (skill development course)-6
- White Pig Rearing Self Employment Course-2

ii) Participated in Science City

Exhibited live specimens of Large White Yorkshire, Duroc and Three-way synthetic pigs and explained to school students and visitors about importance of pig rearing in Science City Festival at Science City, Chennai held between 29.01.2014 and 01.02.2014.

iii) Guest lecture delivered

Title	Subject Matter Specialist	Date and Place
General management practices in white pig rearing	Dr.M.Murugan Associate Professor	(01.09.2013) Tamilnadu white pig growers association meet held at salem
General management practices followed in pig farming	Dr.M.Murugan Associate Professor	(04.12.2013) Krishi Vigyan Kendra Karur, Tamilnadu
Pig farming	Dr.M.Murugan Associate Professor	(23.11.2013) All India Radio, Chennai
General management practices followed in pig farming (Farmers)	Dr.M.Murugan Associate Professor	(20.03.2014) Jointly organized by PGRIAS, Kattupakkam and Science City, Dept. of Higher Education, Govt. of Tamilnadu

(i) At the farmers field: Five field units were visited and collected feedback from the farmers and photos are enclosed in Part-C.

11) Scientific publications:

M. Murugan, M. Muthulakshmi, H. Gopi, R. Ilavarasi and G. Margaret Salomi. Prewaning performance of seventh generation 75 % large white yorkshire x 25 % desi crossbred pigs” has been accepted for presentation in ISAPM National Seminar on “New Dimensional Approaches for Livestock Productivity and Profitability Enhancement under Era of Climate Change” was held during 28 – 30 January, 2014 at Anand.

M. Murugan, M. Muthulakshmi, H. Gopi, R. Ilavarasi and G. Margaret Salomi. Performance of 75 % Large White Yorkshire pigs under different feeding system has been accepted for presentation in ISAPM National Seminar on “New Dimensional Approaches for Livestock Productivity and Profitability Enhancement under Era of Climate Change” was held during 28 – 30 January, 2014 at Anand.

12) Distinguished visitors:

Date	Name of Visitor	Designation
22.07.2013	Dr. Elankumaran Subbaiah	Associate Professor, Virginia Tech, USA
25.07.2013	K. Sugitama	Deputy consultant General of japan
20.08.2013	Riev DE Keuser	Rothamsted Research UK
27.08.2013	Prof. Scheercinck	Associate Dean , Faculty of veterinary science
30.08.2013	T.N. Sekar	GM, Apollo
28.09.2013	M.K. Ashok	Board Member of TANUVAS , Member of legislation Assemblt Govt. of Tamilnadu



13.11.2013	Sebastien Deville	South Asia Business Development Manager
02.12.2013	Dr. P.H. Tank	Professor of Surgery ,Gujarat
02.12.2013	Dr. B.H. Gohie	Director of A.H, Gujarat
12.03.2014	Dr.Abhijeet Kumar	CPDO & TI, Hessargahatta , Bangalore



Field Unit - 1

Thiru. Ganesaraja, Kandanpalayam, Namakkal Dt. Tamilnadu.(Grower pigs – 30+14)



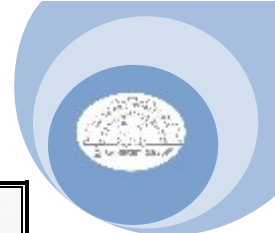
Field Unit - II

Thiru. Kirubakaran, Arakkonam, Thiruvallur Dt. Tamilnadu. (Grower pigs – 10+2)



Field Unit - III

Mr. Muruganantham, Sethiathope, Cuddalore dt. Tamilnadu (Adult pigs -5 and Grower pigs – 22)



Field Unit - IV
Nellai Church Community, Tirunelveli dt. Tamilnadu (Grower pigs – 20 + 4)



Field Unit-V
Mr. Muruganantham, Sethiathope, Cuddalore dt. Tamilnadu (Adult pigs -5 and Grower pigs-22)



Hygienic slaughtering of pigs demonstrated to students of Food Science, Pondicherry Central University

**INDIAN VETERINARY RESEARCH INSTITUTE, IZATNAGAR, BAREILLY**

IVRI Centre of All India Coordinated Research Project on Pigs 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 initiate research works on indigenous and crossbred genotypes with Landrace blood of 75% and 50%. As there was no significant difference between the two genetic groups of crossbred pigs, they were merged as per the recommendations of Scientists' Meet (1994) 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. After merging the two crossbred genotypes, the crossbred was further crossed with purebred Landrace in the year 2006 due to gradual deterioration of the performance, as per the recommendation made at the Scientists' Meet (2001-02). The present crossbred stock (81.25% L x 18.75% D), produced was maintained and evaluated for their performance in the light of the recommendations made at the Scientists' Meet (2010). However afterwards it was felt and decided at AICRP meet (2011) to replace the crossbred stock (81.25% L x 18.75% D) with crossbred (75 % L x 25 % D). In order to produce stock of 75% exotic blood line, efforts were made to breed pure landrace with desi. Hence, at present this farm has crossbred pig of 146 numbers (comprising of 50 %LR 30 numbers and 75 %LR 116 numbers). Further, Out of 116 of 75% crossbred, 23 are gilts and 44 female piglets.

1. Herd dynamics**Herd strength of Crossbred (C.B) Pigs as on 1.4.2013**

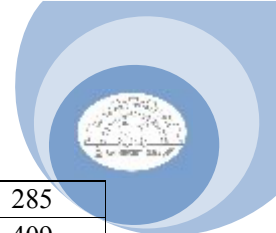
Age (months)	CB 50%			CB 75%			CB 81.25			Grand Total
	M	F	Total	M	F	Total	M	F	Total	
Piglet	17	17	34	11	17	28	11	7	18	80
Grower	8	11	19	-	-	-	4	1	5	24
Finisher	-	-	-	-	-	-	-	-	-	-
>8 months	-	13	13	-	-	-	1	6	7	20
Total	25	41	66	11	17	28	16	14	30	124

Herd strength of Crossbred (C.B) Pigs as on 31.03.2014

Age (months)	CB 50%			CB 75%			Grand Total
	M	F	Total	M	F	Total	
Piglet	-	-	-	38	44	82	82
Grower	-	-	-	-	-	-	-
Finisher	-	-	-	8	8	16	16
>8 months	7	23	30	3	15	18	48
Total	7	23	30	49	67	116	146

Herd dynamics of Crossbred (C.B) Pigs

Details	CB 50%			CB 75%			CB 81.25%			Grand total
	M	F	Total	M	F	Total	M	F	Total	
Balance as on 1.4.2013	25	41	66	11	17	28	16	14	30	124



Born during the period	17	21	38	123	116	239	3	5	8	285
Total	42	62	104	134	133	267	19	19	38	409
Disposal due to										
1. Sale	30	32	62	56	50	106	16	17	33	201
2. Mortality	2	2	4	28	16	44	1	1	2	50
3. Slaughter	2	6	8	1	0	1	2	1	3	12
4 Transfer	0	0	0	0	0	0	0	0	0	0
Total disposal	34	40	74	85	66	151	19	19	38	263
Balance as on 31.03.2014	7	23	30	49	67	116	-	-	-	146

Herd strength of Pure Landrace (LR) and Desi (D) as on 1.4.2013

Age (months)	Landrace			Desi			Grand Total
	M	F	Total	M	F	Total	
Piglet	8	4	12	-	-	-	12
Grower	1	3	4	-	-	-	4
Finisher	-	-	-	-	-	-	-
>8 months	6	9	15	3	6	9	24
Total	15	16	31	3	6	9	40

Herd strength Landrace (LR) and Desi (D) Pigs as on 31.03.2014

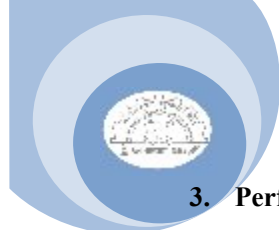
Age (months)	Landrace			Desi			Grand Total
	M	F	Total	M	F	Total	
Piglet	2	2	4	-	-	-	4
Grower	8	7	15	4	8	12	27
Finisher	14	4	18	-	-	-	18
8 and above	6	12	18	-	-	-	18
Total	30	25	55	4	8	12	67

Herd dynamics of Landrace (LR) and Desi (D) Pigs in the reported period

Details	Landrace			Desi			Grand total
	Male	Female	Total	Male	Female	Total	
Balance as on 1.4.2013	15	16	31	3	6	9	40
Born during the period	52	34	86	24	22	46	132
Total	67	50	117	27	28	55	172
Disposal due to							
1. Sale	20	17	37	20	15	35	72
2. Mortality	16	5	21	3	5	8	29
3. Slaughter	1	3	4	0	0	0	4
4. Transfer	0	0	0	0	0	0	0
Total disposal	37	25	62	23	20	43	105
Balance as on 1.03.2014	30	25	55	4	8	12	67

2. Breeding strategy of the Farm as approved

In order to establish 75% exotic blood line crossbred, pure Landrace & desi are mated to produce 50% stock, which were further backcrossed with LR pure bred pigs to get 75%LR. During this year a total of 239 CB (75%) animal were born. Further, there will be selection of animal based on their performance for the future breeding also. The established 75% exotic inheritance will be maintained by inter-se- mating. As per the recommendation of AICRP annual meet (2013) a minimum of 30 breedable sows unit will be maintained with a sex ratio of 1:3 along with 10 sires.



3. Performance of animals

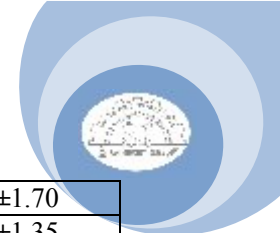
Various production parameters in Crossbred pigs with 75% exotic bloodline

Sl. No.	Traits/characters	CB75%		
		M	F	Total
1.	Litter size at birth (no.)	3.81±0.58 (42)	3.90±0.67 (43)	7.72±0.76 (85)
2.	Litter weight at birth (kg)	4.59±0.76 (42)	4.76±0.98 (43)	9.35±1.31 (85)
3.	Litter size at weaning (no.)	-	-	-
4.	Litter weight at weaning (kg)	-	-	-
5.	Individual weight at birth (kg)	1.08±0.20 (123)	1.06±0.04 (116)	1.07±0.04 (239)
6.	Individual weight at weaning (kg)	8.04±0.25 (39)	8.07±0.27 (41)	8.06±0.42 (80)
7.	Number of days for weaning (d)	42	42	42
8.	Pre weaning mortality rate (%)	21.95%	11.20%	16.73 %
9.	Pre weaning growth rate (gm/d)	210.93±0.00(67)	207.05±0.00(87)	208.67±0.0(154)
10.	Post weaning mortality rate (%)	5.12%	-	5.12%
11.	Post weaning growth rate (gm/d) (up to 24 weeks)	552.10±0.01 (7)	498.83±0.00(26)	510.13±0.00(33)
12.	Body weight (kg)			
	1 Month	5.89±0.15 (70)	6.10±0.15 (72)	6.00±0.10 (142)
	2 Month	11.28±0.29 (65)	12.95±1.52 (58)	12.07±0.68(123)
	3 Month	22.34±0.52 (47)	22.42±0.46 (50)	22.38±0.35 (97)
	4 Month	37.25±0.81 (31)	36.56±1.02 (31)	36.90±0.63 (62)
	5 Month	52.11±1.05 (21)	54.50±1.04 (29)	53.50±0.72 (50)
	6 Month	78.94±0.42 (7)	72.10±1.32 (20)	73.87±0.76 (27)
	7 Month	91.83±0.62 (3)	91.65±0.90 (8)	91.7±0.52 (11)
	8 Month	NA	NA	NA

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

Mean±SE of various production parameters in Crossbred pigs with CB50%

Sl. No.	Traits/characters	CB50%		
		M	F	Total
1.	Litter size at birth (no.)	4.76±0.52 (81)	4.29±0.47 (73)	9.05±0.40 (154)
2.	Litter weight at birth(kg)	4.70±0.53 (81)	4.39±0.60 (73)	9.10±0.50 (154)
3.	Litter size at weaning (no.)	4.21±0.52 (59)	4.00±0.44 (56)	8.21±0.43 (115)
4.	Litter weight at weaning (kg)	34.21±4.07 (59)	32.67±3.27 (56)	66.89±3.38(115)
5.	Avg. individual weight at birth(kg)	1.02±0.08 (17)	1.05±0.08 (21)	1.03±0.07 (38)
6.	Individual weight at weaning (kg)	8.42±0.60 (16)	8.08±0.35 (20)	8.23±0.41 (36)
7.	Number of days for weaning (d)	42	42	42
8.	Pre weaning mortality rate (%)	5.82%	9.52%	7.89%
9.	Pre weaning growth rate (gm/d)	204.61±0.00(16)	193.45±0.00(20)	198.04.47±0.00(36)
10.	Post weaning mortality rate (%)	7.14	-	7.14%
11.	Post weaning growth rate (gm/d) (upto 24 weeks)	447.05±0.01 (4)	467.70±0.02 (7)	469.36±0.01 (11)
12.	Body weight (kg)			
	1 Month	5.06±0.25 (16)	5.43±0.28 (20)	5.51±0.20 (36)
	2 Month	10.81±0.05 (16)	11.18±0.71 (20)	11.02±0.47 (36)
	3 Month	23.68±1.62 (15)	23.25±1.29 (11)	23.50±1.10 (26)
	4 Month	38.24±2.34 (7)	38.24±1.54 (9)	38.80±1.42 (16)
	5 Month	56.80±1.60 (5)	54.66±1.40 (8)	55.48±1.15 (13)
	6 Month	66.82±1.53 (4)	66.94±1.58 (7)	66.90±1.17 (11)
	7 Month	75.90±0.37 (2)	88.90±0.65 (2)	82.40±1.26 (4)
13.	Age at slaughter (d)	195-225 days	NA	NA



14.	Weight at slaughter (kg)	81.96±1.70	NA	81.96±1.70
15.	Dressing percentage (%)	74.95±1.35	NA	74.95±1.35
16.	Carcass length (cm)	72.25±3.59	NA	72.25±3.59
17.	Back fat thickness (mm)	2.61±0.29	NA	2.61±0.29
18.	Loin eye area (sq cm)	34.26±1.17	NA	34.26±1.17
19.	Feed :Grain			
	Weaner	2.36±0.14	NA	2.36±0.14
	Grower	3.20±0.15	NA	3.20±0.15
	Finisher	4.26±0.19	NA	4.26±0.19

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

Mean±SE of various production parameters of Desi pigs

Sl. No.	Traits/ Characters	Desi		
		M	F	Total
1	Litter size at birth (no.)	4.55±0.72 (41)	4.33±0.42 (43)	8.40±0.85 (84)
2.	Litter weight at birth (kg)	3.97±.61 (41)	3.72±0.56 (43)	7.20±1.00 (84)
3.	Litter size at weaning (no.)	4.11±0.72 (37)	3.90±0.41 (39)	7.60±0.90 (76)
4.	Litter weight at weaning (kg)	26.60±4.99 (37)	26.05±4.06 (39)	52.56±7.69 (76)
5.	Individual weight at birth (kg)	0.89±0.05 (24)	0.79±0.07 (22)	0.85±0.06 (46)
6.	Individual weight at weaning (kg)	7.15±0.52 (22)	6.49±0.58 (19)	6.63±0.59 (41)
7.	Number of days for weaning (d)	42	42	42
8.	Pre weaning mortality rate (%)	8.33%	13.63%	10.86%
9.	Pre weaning growth rate (gm/d)	145.35±0.00 (21)	122.55±0.01 (19)	134.52±0.0 (40)
10.	Post weaning mortality rate (%)	4.54%	10.52%	7.31%
11.	Body weight (kg)			
	1 Month	4.33±0.25 (22)	3.47±0.30 (24)	3.90±0.20 (46)
	2 Month	7.78±0.33 (21)	6.45±0.45 (19)	7.15±0.29 (40)
	3 Month	12.11±0.55 (21)	10.23±0.58 (17)	11.27±0.41 (38)
	4 Month	17.40±0.85 (21)	15.67±0.91(15)	16.68±0.62 (36)
	5 Month	24.75±0.89 (14)	22.81±1.09 (10)	23.43±1.08 (24)
	6 Month	NA	36.7±0.00 (1)	36.7±0.00 (1)

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

Mean±SE of various production parameters of Landrace pigs

Sl. No.	Traits/ Characters	Landrace		
		M	F	Total
1	Litter size at birth (no.)	4.33±0.59 (52)	2.83±0.42 (34)	7.16±0.76 (86)
2.	Litter weight at birth (kg)	4.35±0.56 (52)	3.04±0.53 (34)	7.34±0.83 (86)
3.	Litter size at weaning (no.)	3.72±0.51 (41)	2.63±0.40 (29)	6.36±0.71 (70)
4.	Litter weight at weaning (kg)	30.17±5.24 (41)	22.48±3.46 (29)	52.65±7.33 (70)
5.	Individual weight at birth (kg)	1.03±0.06 (52)	1.05±0.04 (34)	1.05±0.05 (86)
6.	Individual weight at weaning(kg)	7.40±0.49 (41)	7.84±0.43(29)	8.21±0.53 (70)
7	Number of days for weaning (d)	42	42	42
8.	Pre weaning mortality rate (%)	17.30%	8.82%	13.95%
9.	Pre weaning growth rate (gm/d)	211.23±0.00 (48)	215.84±0.01(32)	213.08±0.00(80)
10.	Post weaning mortality rate (%)	14.63%	10.34%	12.85%
11.	Post weaning growth rate (gm/d) (up to 24 weeks)	448.37±0.05 (7)	535.59±0.02 (11)	501.68±0.01(18)
12.	Body weight (kg)			
	1 Month	5.76±0.17 (49)	6.08±0.39 (33)	5.89±0.14 (82)
	2 Month	11.81±0.35 (44)	11.88±0.72 (30)	11.84±0.26 (74)



	3 Month	22.15±0.59 (43)	22.02±1.34 (30)	22.10±0.46 (73)
	4 Month	36.39±1.04 (36)	36.48±2.18 (26)	36.43±0.79 (62)
	5 Month	53.17±1.24(19)	54.26±2.85 (19)	53.71±0.93 (38)
	6 Month	66.34±2.13 (7)	76.09±3.78 (11)	72.30±1.41 (18)
	7 Month	85.76±3.04 (3)	91.76±5.23 (11)	88.76±1.91 (14)

N.B: Figures in the parenthesis are number of observations; the parameters for which data is yet to be recorded are blank.

4. Lifetime production traits

S. no	Landrace									
	Sow no.	Total Furrow-wing	Total Litter size at Birth	Average Litter size at Birth	Total Litter Weight at Birth	Average Litter Weight at Birth	Total Litter size at Weaning	Average Litter size at Weaning	Total Litter Weight at Weaning	Average Litter Weight at Weaning
1	532	4	35	8.75	38.10	9.52	21	5.20	187.15	46.78
2	470	4	37	9.20	37.90	9.40	31	7.70	288.30	72.07
3	531	4	24	6.00	27.45	6.86	19	4.75	177.4	44.35
4	492	3	18	6.00	21.60	5.40	7	3.50	75.10	25.03
5	645	2	13	6.50	15.25	7.62	13	6.50	106.50	53.25
6	671	2	18	9.00	20.90	10.45	14	7.00	131.90	65.95
7	544	4	20	5.00	19.10	4.77	19	4.75	160.25	40.06
8	706	2	13	6.50	12.30	6.15	10	5.0	84.90	42.45
9	774	1	4	4.00	4.50	4.50	NA	NA	NA	NA
	Mean ±SE		20.22±3.51	6.77±0.61	21.90±3.72	7.18±0.73	16.75±2.49	5.55±0.46	151.43±23.03	48.74±4.97

Data includes from 1.4.13 to 31.4.14

S. no	CB 75%									
	Sow no.	Total Furrow-wing	Total Litter size at Birth	Average Litter size at Birth	Total Litter Weight at Birth	Average Litter Weight at Birth	Total Litter size at Weaning	Average Litter size at Weaning	Total Litter Weight at Weaning	Average Litter Weight at Weaning
1	7	1	6	6.00	5.60	5.60	NA	NA	NA	NA
2	16	1	12	12.00	16.90	16.90	NA	NA	NA	NA
3	65	1	7	7.00	8.20	8.20	NA	NA	NA	NA
4	27	1	9	9.00	12.90	12.90	NA	NA	NA	NA
5	38	1	9	9.00	10.70	10.70	NA	NA	NA	NA
6	57	1	8	8.00	9.00	9.00	NA	NA	NA	NA
7	15	1	12	12.00	16.30	16.30	NA	NA	NA	NA
8	49	1	6	6.00	6.50	6.50	NA	NA	NA	NA
9	28	1	6	6.00	7.20	7.20	NA	NA	NA	NA
10	58	1	5	5.00	5.70	5.70	NA	NA	NA	NA
11	20	1	5	5.00	3.90	3.90	NA	NA	NA	NA
	Mean ±SE		7.72±0.76	7.72±0.76	9.35±1.32	9.35±1.32	NA	NA	NA	NA

Data includes from 1.4.13 to 31.4.14

5. Specific managemental practice:

- Identification method: Four percent Silver nitrate solution is used for marking on body with numerical in white pigs. The black piglets as well as in adults pigs are identified by plastic/brass tags.
- Age: Age in pigs is determined by recording the date of birth and duration of their stay at Farm.



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

6. Mortality parameter

i) Causes of mortality (2013-2014):

Sl. No.	Causes of mortality	Category of pigs				Total
		CB50%	CB 75%	Landrace	Desi	
1	Pneumonia	2	2	6	1	11
2	Septicemia	-	1	1	1	3
3	Autolysis/ NSD	-	-	1	-	1
4	Enteritis	1	9	6	3	19
5	Hemorrhagic colifas	-	-	-	1	1
6	Trauma Asphyxia	-	4	3	-	7
7	Still birth*	-	6	-	-	6
8	Hepatitis	-	-	-	1	1
9	Pulmonary edema	-	1	2	-	3
10	Weakling	-	2	-	-	2
	Total	3	18	19	7	54

*includes still births and available reports

ii) 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 injection were given regularly at 4th and 14th as well as at 5th and 15th day of age, respectively, in all piglets is given regularly. Besides, the vaccination of FMD and Swine Fever is regularly done in all the stock of the Farm. During the year, 112 animals were vaccinated against FMD and 357 animals were vaccinated against Swine Fever. The deworming (386 animals) and disinfection are accomplished. Treatment of ailing cases is also regularly done.

Health care management of practices at SPF during 2013-2014

Sl. No.	Symptoms/ Ailments	Number of cases
1.	Lameness	74
2.	Digestive problem/ Diarrhea	267
3.	Skin lesions/ Dermatitis/ Pox like lesions	136
4.	Fever	4
5.	Weakness/ Dullness	71
6.	Hernia	8
7.	Furrowing difficulty	1
8.	Hemorrhage	2
9.	Anemia	2
10	Conjunctivitis	2
11	MMA	3
12	Total:	570

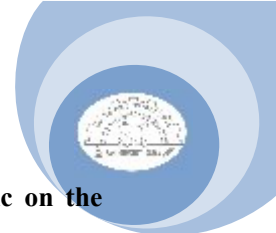
- iii) Disposal of diseased carcass: Usually sent to PM Section where incineration is done after the PM examination.



7. Nutritional experimentation:

Performance of crossbred (landrace x *desi*) pigs on feeding sugarcane press mud

To study the chemical composition, drying process of sugarcane press mud (SPM) and its effect on the performance of growing pigs, samples were collected from different batches of sugarcane processing plant nearby Bareilly. Chemical analysis of SPM was done as per standard procedure. Drying experiment was done by spreading 1" and 2" thickness under the sun and under shed and 2 times and 4 times mulching were performed under each thickness. Thereafter, feeding trial was conducted on twenty eight experimental animals which were randomly divided into four groups viz. T0 (0% SPM), T1 (5% SPM) T2 (10% SPM) and T3 (15% SPM) maintaining equal male: female ratio. The iso-nitrogenous and iso-caloric concentrate mixture were prepared for the animals in weaner (10 to 20 kg), grower (20-50 kg) and finisher (50-80 kg) stages. Digestive trial was conducted during the grower stage. Blood samples were collected at 0 day, end of weaner, grower and finisher stages. Immunological study was performed on pigs after 90 days of experimental period. Four animals from each group were slaughtered at about 80 kg of BW to study carcass traits. The SPM contained CP, CF, EE and TA 18.01 ± 0.57 , 12.38 ± 0.33 , 6.38 ± 0.71 and 17.73 ± 0.36 % on DM basis, respectively. Mean gross energy value of SPM was 4294.51 ± 79.64 kcal/kg DM. Micro mineral contents of SPM revealed it as a good source for Fe, Co, Cu, Zn and Mn, while SPM did not contain the fatty acids capric acid, caproic acid and caprylic acids; however linoleic acid as % of EE was 34.85. Drying experiment revealed that 1" thickness with two times mulching under sun or shed could be ideal for farmers for all practical purposes. During grower and finisher stage ADG, FCR and feed cost (Rs./kg BW gain) were comparable among all the groups. Intake and digestibility of all nutrients during digestive trial were comparable among the treatments, but intake and absorption as % of intake for calcium were significantly higher ($P < 0.05$) for T3 than T0, T1 and T2 group. Hematology showed that there was no significant difference among the treatment groups except PCV (%) during finisher stage. For T2 and T3, PCV (42.43 ± 0.96 and 42.33 ± 1.97 , respectively) was significantly lower as compared to T1 (45.86 ± 1.57) and control (47.63 ± 0.82). The mean plasma glucose, protein, albumin, globulin level, A:G, cholesterol, P, Na and K were comparable among all the treatment groups. However, plasma calcium level (g/dl) was significantly higher ($P < 0.05$) in T3 (13.32 ± 1.13) as compared to T0 (8.15 ± 0.63) in grower stage, while during finisher stage significant increase ($P < 0.01$) in calcium value in T3 (12.84 ± 0.74 mg/dl) was found as compared to T0 (8.15 ± 0.63), T1 (9.61 ± 0.91), and T2 (10.42 ± 0.67) group. No significant variation observed between the treatments for CMI response, but the maximum dermal in duration was noticed on 24th hour of PHA-p injection in all the groups. None of the carcass parameters were influenced by SPM. There was a comparative savings of Rs. 5.25 for T3 for each kg gain in BW as compared to control group. Thus, it can be concluded that SPM can be dried (90% DM) by spreading one inch thickness along with double mulching either in shed or sun. The dried samples can be included in the ration upto 15% by replacing mostly maize followed by wheat bran. Inclusion of SPM has potential to reduce the cost of pig.



Comparative evaluation of *Lactobacillus acidophilus* NCDC 15 and curd as probiotic on the performance of early weaned piglets (Ongoing)

8. 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.

9. Extension programme with success story:

i) At Institute:

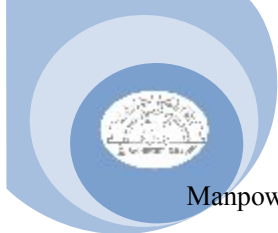
- i) Scientists delivered lectures on various aspects of swine production technology during Farmers' training (theory and practical classes) organized at Krishi Vigyan Kendra during the year. During these programmes, many farmers, either interested or practicing, were provided with the technical know-how.
- ii) Farmers from nearby areas were provided the information on pig production on their visit to the Swine Production Farm. The direct consultancy in the form of farmers-scientists interaction also became an effective mode of transfer of technology during the period.
- iii) Required information relating to pig/ livestock health management were directly provided to the farmers through Kisan Call Centre (at ATIC, IVRI) as well as through mobile telephony.
- iv) Scientists took part in development of programme on improvement of swine farming in rural areas, which was broadcasted by Doordarshan Kendra, Bareilly and dissemination of technical know-how was also accomplished through Radio talks (AIR, Bareilly; AIR, Rampur).
- v) Talks were also given to farmers under different trainings in KVK on the following topics-
 - a) Management of swine farm & Visit – LPR (Pig) on 14.06.2013
 - b) Sukar Boaro ki Banavat avam Rakhrkhav on 11.06.2013
 - c) Vagyanic suker paaln & perbandhan kaise kare, on 29-10-13.
 - d) Lecture – Management of Swine Farm & Visit on 22.11.2013
 - e) National training for vet. Off. Himachal Pradesh, Dated 16-23 Jan 2014(recent advanced in health management of pigs, Dated 17.1.14)
 - f) Suker prajnan vayvastha (Animal Genetics Division) , date- 11.6.13 & 26.11.13
 - g) Suker Prjatiyaa (Animal Genetics Division) date- 11.6.13 & 26.11.13
- ii) **At the Farmer's field:** Advisory services were given.

10. Scientific publications

- i) In peer-reviewed journals: 3
- ii) Others: 5

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

MVSc: Comparative manpower requirement in different categories of pigs for various management activities at farm



Manpower is the most critical source which influences the profitability of pig farm. So a time –motion study was conducted at Swine Production Farm of IVRI, Izatnagar, to assess the existing manpower utilization in new born management activities for litters belonging to three different breeds, viz., Desi, Landrace and Crossbred dams. Three litters consisting of 7 piglets each were utilized to record the time and labour used in different management activities in each breed. The total manpower used in cleaning of farrowing pen after the farrowing, was found 1370.5 ± 23.76 Man – seconds per litter for Desi and for Landrace and Crossbred it was 1101 ± 25.76 and 1100 ± 16.44 , respectively. Manpower used in cleaning of Desi dam pen was significantly higher ($p < 0.05$) than the Landrace and Crossbred dams, Cleaning operations also had some sub-operations out of which, except collection of piglets activity, manpower used in other activities did not differ significantly ($p < 0.05$) among the breeds. Man power required for collection of Desi piglets was significantly higher ($p < 0.05$) among the breeds. Manpower required for collection of Desi piglets was significantly higher ($p < 0.05$) than others. Similarly, next operation was attending the new born and it was again divided into sub activities such as needle tooth cutting, naval cord cutting and temporary tattooing. Total man-seconds required for this operation were found 279.14 ± 7.15 , 251.43 ± 9.12 and 289.24 ± 6.89 man-seconds, respectively for Desi, Landrace and Crossbred piglets. Time spent in attending new born activities was also significantly higher ($p < 0.05$) for Desi dam than the Landrace and Crossbred dams. Manpower required for iron injections were also estimated in three different breeds and again it was significantly higher for Desi breeds. This study generates the data about manpower required in new born litter management for three different breeds at an organized swine production farm. This data may be used to formulate or generalize the economics regarding manpower utilization for a large scale farming system.

17. Distinguished visitors:

- Dr. Dilip Kumar Sharma, Director, NRC on Pigs (ICAR), Rani, Guwahati and PI/Co-PI of all centers visited Swine Production Farm during this year.
- Dr. Mohammad Dawood Shirzed, Dr.Ahmad Hussain Rasikh, Dr.Noor Mohammad Nair, Dr.Mahmoodullah Rasikh, (Afghan Trainers),



Inaugural session of Annual AICRP meet held at IVRI on 30-31st October 2013



Group photo of the participants of Annual AICRP Scientists' meet 2013



Visit of Dr Goy, Bangkok, Thailand and Dr G.Bhalla, VO, Uttarakhand



Iron Injection to piglet for prevention of anemia



Heat detection by farm staffs



Weighing of piglets at weekly interval



Male pig distributed to the farmers of Chandan chowki, Palia kalan, Lakhimpur kheri



Sow with piglets in the farmers house of Chandan chowki, Palia kalan

**ICAR RESEARCH COMPLEX FOR GOA, OLD GOA**

Goa is under the influence of two global biomes - the marine biome of the Arabian Sea and the terrestrial forest biome of the Western Ghats. Being continental tourist destination as well as non-vegetarian food habits of the state population there is good demand for meat and meat products. In Goa State amongst livestock, pigs are the most important, and most of pork eating families rear pigs as a backyard venture due to availability of kitchen/hotel waste. Agonda Goan a local pig breed of the state traditionally known as “Gavthi Dukor (Village pig)”, is preferred due to its suitability in acclimatization, less feed requirement and capacity to utilize unconventional locally available fibrous feeds. This has attracted its conservation and use in crossbred production. Females are good mothers. Crossbreeding of this pig with exotic Large White Yorkshire has improved the performance.

1. Herd dynamics:

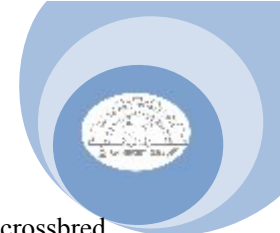
Month	Large White Yorkshire					Agonda Goan				
	M (Adult)	F (Adult)	M (Piglet)	F (Piglet)	Total	M (Adult)	F (Adult)	M (Piglet)	F (Piglet)	Total
Mar'13	7	7	3	0	17	19	27	17	11	74
Apr'13	9	7	9	8	33	27	33	12	12	84
May'13	4	7	8	8	27	26	32	18	13	89
Jun'13	4	7	8	11	30	23	32	13	8	76
Jul'13	4	7	6	9	26	22	30	17	8	77
Aug'13	4	6	6	6	22	30	31	6	5	72
Sep'13	10	12	4	5	31	30	31	7	4	72
Oct'13	9	11	2	1	23	22	29	5	3	59
Nov'13	9	11	1	0	21	18	27	12	14	71
Dec'13	9	10	1	0	20	12	24	6	4	46
Jan'14	9	10	4	2	25	12	24	1	1	38
Feb'14	9	10	4	2	25	12	24	0	1	37

Month	AG* LWY 75%					AGX LWY 50%				
	M (Adult)	F (Adult)	M (Piglet)	F (Piglet)	Total	M (Adult)	F (Adult)	M (Piglet)	F (Piglet)	Total
Mar'13	3	7	0	0	10	3	6	0	0	9
Apr'13	3	6	10	11	30	3	6	15	7	31
May'13	3	4	13	11	31	3	6	22	16	47
Jun'13	3	4	6	6	19	3	6	30	18	57
Jul'13	3	4	6	6	19	3	6	22	10	41
Aug'13	2	4	6	6	18	3	6	15	8	32
Sep'13	8	10	0	0	18	13	12	3	2	30
Oct'13	7	10	6	1	24	12	12	0	0	24
Nov'13	7	10	2	0	19	10	12	1	3	26
Dec'13	7	10	6	5	28	9	12	6	5	32
Jan'14	7	10	4	5	26	9	11	0	0	20
Feb'14	7	10	4	5	26	9	11	0	0	20

2. Breeding strategy of the farm as approved ;

At the institute pig unit four breed are maintained

- Agonda Goan (Local)
- Large White Yorkshire
- Crossbred 50% (Agonda Goan X Large White Yorkshire)



- D) Crossbred 75fd % (Agonda Goan X Large White Yorkshire)
 E) Breeding stock of all above breeds are maintained. For production of 50% crossbred semen of Large White Yorkshire is used to cross Agonda Goan sows and even *inter-se* mating of these animals is undertaken. Mostly AI is being used for the breeding.

3. Performance of animals:

Breed		Litter size at birth		Litter size at weaning	
Agonda Goan(Local) n=23		6.78±0.68		4.95± 0.67	
Large White York Shire n=9		7.66±1.11		4.55±0.55	
Crossbred 50%(Agonda Goan(X LWY) n=7		7.85±1.58		5.42±1.44	
Crossbred 75% n=10		8.60±0.77		8.00±0.66	
Breed	Litter weight at birth (g)		Litter weight at weaning (g)		
	Male	Female	Male	Female	
Agonda Goan	518.93±17.50	471.96±20.56	1513.14±276.26	3266.65±361.14	
LWY	1100.41±43.35	1128.78±30.50	8585.71±465.89	7800.11±562.10	
50% (AG X LWY)	803.82±30.33	716.34±37.60	4742.22±526.81	4891.66±433.12	
Crossbred 75%	1068.70±32.01	940.08±36.26	6767.50±339.31	6040.00±386.99	
Breed	Pre weaning growth in grams				
	Male	Female	Total		
Agonda Goan	62.19	69.65	65.58		
Large White York Shire	177.37	167.61	177.23		
50%(AGX LWY)	98.16	104.03	100.74		
Crossbred 75%	168.28	127.49	143.47		
	Post weaning growth in grams from weaning to 90days				
Breed	Male	Female	Total		
Agonda Goan(Local)	62.56	95.23	74.49		
Large White York Shire	139.29	256.66	180.18		
50%(AGX LWY)	131.74	238.59	180.03		
Crossbred 75%	184.2	352.20	364.34		
	Post weaning growth in grams from 90 days to 180				
Breed	Male	Female	Total		
Agonda Goan(Local)	135.16	230.46	220.15		
Large White York Shire	353.77	322.55	344.12		
Crossbred 50%(Agonda GoanX LWY)	358.74	117.35	241.00		
Crossbred 75%	426.00	379.25	406.72		
	Post weaning growth in grams from 180 days to 270days				
Breed	Male	Female	Total		
Large White York Shire	321.29	317.25	320.92		
Crossbred 50%(Agonda GoanX LWY)	317.40	386.85	302.12		
Crossbred 75%	349.62	248.88	299.25		
Body weights of 75% crossbred		Male	Female	Total	
Body weight (kg)					
2 month		6977.27±537	6733.33±962	6891.17±478	
3 month		17010.0±2438	23650.0±380	19961.11±2423	
4 month		29683.33±1544	35200.00±3695	32411.60±2090	
5 month		41916.66±2946	46600.00±4106	44258.33±2510	
6 month		55350.00±3167	57783.33±4046	56566.67±2477	
7 month		67066.66±3885	66916.66±5177	66991.66±3086	
8 month		76333.33±4292	70766.67±6920	73550.00±3972	
9 month		86816.66±5891	30183.33±6624	83500.00±4254	
10 month (if available)		95200.00±5761	86500.00±6858	90850.00±4467	



4. **Specific managerial practice:** Electronic chip (Microchip) identification is followed for breeding and experimental pigs, Castration of the male stock is undertaken from 60-90 days age and it is under local anaesthesia and open wound method.

5. **Mortality parameter:**

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

Pre weaning mortality

SN	Breed	Mortality %
1	Agonda Goan(Local)	24
2	Large White Yorkshire	40
3	Crossbred 50%(Agonda Goan(X Large White York Shire)	32
4	Crossbred 75%	18.64

Post weaning Mortality

Month	Large White Yorkshire				Agonda Goan			
	Less than 6 months		More than 6 months		Less than 6 months		More than 6 months	
	M	F	M	F	M	F	M	F
March 13	0	0	0	0	0	0	0	1.35
April 13	0	0	0	0	0	0	0	
May 13	0	0	0	0	0	0	0	1.12
June 13	0	0	0	0	1.31	0	0	0
July 13	0	3.84	0	0	0	0	0	0
August 13	0	0	0	0	1.38	1.38		
September .13	0	0	0	0	0	0	0	0
October 13	0	0	0	0		1.69	0	0
November 13	0	0	0	0	1.69	1.69	0	0
December 13	0	0	0	0	7.14	5.52	5.52	0
January14	0	0	0	0	0	5.52	0	0
February14	0	0	0	0	2.70		0	0

Month	Crossbred 50%				Crossbred 75%			
	Less than 6 months		More than 6 months		Less than 6 months		More than 6 months	
	M	F	M	F	M	F	M	F
March 13	0	0	0	0	0	0	0	0
April 13	0	0	0	0	0	0	0	0
May 13	0	0	0	0	3.22	0	0	3.22
June 13	7.07	5.27	3.50	0	0	0	0	0
July 13	9.75	4.78	2.49	0	0	0	0	0
August 13	3.15	0	0	0	0	0	5.5	0
September .13	0	0	0	0	0	0	0	0
October 13	0	0	4.16	0	0	0	0	0
November 13	0	0	0	0	10.52	5.26	0	0
December 13	0	0	0	5.0	0	0	0	0
January14	0	0	0	0	0	0	0	0
February14	0	0	0	0	0	0	0	0

ii. **Causes of mortality:** In case of young ones cause of mortality was diarrhea. In case of adult male cause of mortality was accidental fighting among the breeding boars mostly during night hours. This has happened during repair of unit. Adult females died due to weakness during lactation whenever there was good litter size.



iii. Measures to taken minimize mortality:

- i. **Managemental measures:** Regular culture and sensitivity of bacteria during piglet diarrhea as well as deworming was regularly undertaken and deworming drug was changed.
- ii. **Prophylactic measures:** Periodical disinfection Cleaning a of pigpens is followed to control diseases.
- iii. **Disposal of diseased carcass:** Every diseased carcass is disposed by burial.

6. Adoption of integrated farming systems:

Although maintenance of backyard garden is undertaken at AICRP centre integration of pig with fishpond is initiated at farmers field (Mr. Menezes) at Goavelha. Pig unit of 15 pigs on the bank of a fish pond with local fishes and muscle culture is initiated. Results of muscle and pig in terms of economics are awaited.

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

Biogas is established in 2011 and waste is collected in slurry tank from where it is utilized for the institute plantation.

8. Production economics:

- i. **Cost of production/pig up to slaughter age:** Group of six 75% crossbred pigs was studied for feed offered and feed consumed. Total of 1124.25 kg of feed was consumed by this group of six animals and cost of feed was Rs.28780/- for total weight of 368.1 kg weight *i.e.* average Rs.78.18/ kg live weight.
- ii. **Cost of production/ kg pork** As dressing percent is 78 the cost of pork production is Rs.100.23/kg

9. Extension programme with success story:

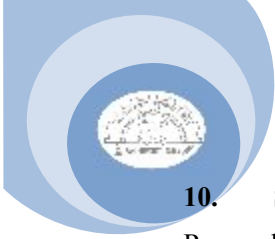
At the institute:

i) Training program was organized for “Scientific Pig Farming” on 21st December 2013. Beneficiaries (18) who have purchased piglets from the unit have attended the training. Lectures and practices in field of Management, reproduction, nutrition, health management were delivered by experts have conducted the theory and practical classes.

ii) Training on “Artificial Insemination in pigs” was organized on 24th February 2014. Pig growers (44) from Goa, Maharashtra and Karnataka have participated actively in the training. All the participants were having 5-200 pigs. They all following natural breeding. Training has imparted knowledge regarding advantages of AI technology and made them aware of importance of selective breeding. Farmers were exposed to identification of estrous, semen collection evaluation and AI.

At the farmers’ field

Twenty-seven Farmers in personal visit at institute and in farmer’s field were provided information on scientific pig rearing, feeding etc. In farmers field (eight units) AI in 29 pigs was undertaken 8 pigs were pregnant and tow pigs delivered till date.



10. Scientific publications:

Research Paper presented at National Symposium On “Frontier Reproductive Biotechnologies For Enhancing Animal Fertility and Fecundity : Global Perspective” January 8-10, 2014 ,XXIX Annual Convention of The Indian Society for Study of Animal Reproduction , Organized by Department of Animal Reproduction, Gynaecology and Obstetrics, Nagpur Veterinary College, Nagpur. Maharashtra Animal and Fishery Sciences University, Nagpur

11. Distinguish visitors:

- Dr. Alok Kumar Sikka, DDG (NRM) v on 19-09-2013
- Dr. K.M.L. Pathak, DDG (Animal Sciences)

12. Success story:

Under transfer of technology established pig units in farmer’s field and. Although pig rearing is part of back yard of some farmers the training on “scientific pig rearing” conducted has added in the improvement of may pig growers. Mr. Joseph Lobo, opposite to Police Station Ph no. 9226243346 one of the participants could establish the successful pig unit where he purchased crossbred pigs from AICRP Goa centre and trying to use scientific practices. He appreciated knowledge gain from his visit to ICAR; RC Goa. Two of his female pigs are pregnant with AI. Mr. Joseph Lobo is sure to get good returns from his pig unit.

13. Other information:

AI and ultrasonography pregnancy diagnosis at 40days is a part of regular management practice in Goa centre.



Flock of Agonda Goan (Local) pig Applied for Registration



AI in farmer's field



Piglets born through AI at Farmers unit



Training on AI in pigs



Hon'ble DDG (NRM), Dr. Alok Kumar Sikka, visited the pig unit of ICAR Research Complex for Goa on 19-09-2013



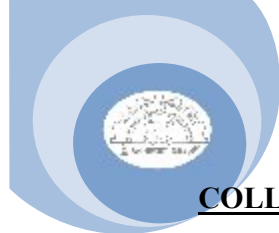
Dr. K.M.L. Pathak, DDG Animal Sciences visited Pig unit and discussed about ongoing work of Agonda Goan pig



Dr. K.M.L. Pathak, DDG Animal Sciences Inaugurated repair and modification of Pig unit



Dr. K.M.L. Pathak, DDG Animal Sciences Visited Pig Unit of farmer



**COLLEGE OF VETERINARY SCIENCES & ANIMAL HUSBANDRY, 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 267361 as per 18th Quinquennial Livestock Census, 2007 and shows the highest percentage of growth in its population. The cross bred population make up for 90% of the total population, the rest 10 % 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., Selesih, Mizoram during XIth Five Year Plan *w.e.f.* 1.10.2008. The basic principle of the project is to start a comprehensive study at institutional level to develop a farmer's friendly package of practices creating more assets and better opportunities for cash-starved populace. Initially, researches are being considered to conserve of local indigenous pigs for preserving the indigenous gene pool and promote low input animals for rural and areas.

1. Herd Dynamics:

Herd Strength of Zovawk as on 31.03.2014

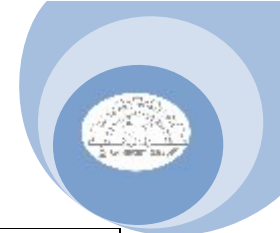
Sl. No	Categories	Opening balance	Additions			Disposals		Closing	
			Birth	Transfer	Death	Transfer	Sold	M	F
1	Piglet (upto 42 d)	3	28		2			-	-
2	Grower (42 d-5m)	5	-		1	5	10	-	1
3	Finisher (5-8 m)	14	-	8	1		1	6	6
4	Breeding female	12	-				5		16
5	Boar	2	-				4		14
	Grant total	36	28	8	4	5	20		43

Herd Strength of 50% Crossbred as on 31.03.2014

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing balance	
			Birth	Transfer	Death	Transfer	Sold	M	F
1	Piglet (upto 42 days)	2	47	-	1	-	-	6	8
2	Grower (42 d-5m)	8	-	-	2	-	3	-	2
3	Finisher (5-8 m)	8	-	-	-	-		14	13
4	Breeding female	-	-	-	-	-	1	6	
5	Boar	-	-	-	-	-	5	4	
	Grant total	18	47	-	3	-	9	53	

Herd Strength of 75% Crossbred as on 31.03.2014

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing	
			Birth	Transfer	Death	Transfer	Sold	M	F
1	Piglet (upto 42 d)	-	36		1	-	-	-	-
2	Grower (42 d-5m)	-	-	-	-	-	-	16	19
3	Finisher (5-8m)	-	-	-	-	-		-	-
4	Breeding female	-	-	-	-	-	-		-
5	Boar	-	-			-	-		-
	Grant total	-	36	-	1	-	-		35



Herd Strength of Large White Yorkshire as on 31.03.2014

Sl. No.	Categories	Opening balance	Addition			Disposal		Closing balance	
			Birth	Transfer	Death	Transfer	Sold	M	F
1	Piglet (upto 42d)	Nil	52	-	2	-	1	16	9
2	Grower (42d-5m)	7	-	-	-	-	1	10	8
3	Finisher (5-8 m)	2	-	8	-	-	2	6	9
4	Breeding female	3	-	6	-	-	2	7	
5	Boar	5	-	-	-	-	-	10	
	Grant total	17	52	14	-	-	-	75	

2. Breeding Strategy of the Farm:

Reproduction: Crossing of Zovawk and Large White Yorkshire for the production of cross -bred pigs (50% LWY x 50% Zovawk) is under way and production of cross-bred pigs (75% LWY x 25% Zovawk) had been initiated. In the stock, an effort has been made to maintain an overall litter index of 2 or more. A sow will be bred up to 3-4 farrowings based on its performance. Boars will be used for maximum 3 years for breeding. Regular heat detection has been done with teaser and/or by visual observation. Natural mating has been followed as per the mating plan. A boar has been used for 2-3 services in a week.

Breeding Performance of Zovawk

Numbers of gilts/sows put to boars	15
Numbers of boar used	9
Numbers of services given	30
Av. Services/ female	2
Conception rate (%)	93.33

Breeding Performance of Crossbred (50% LWY x 50% Zovawk)

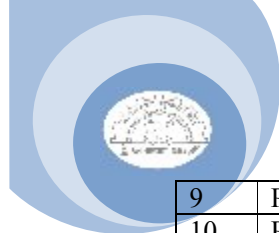
Numbers of gilts/sows put to boars	6
Numbers of boar used	5
Numbers of services given	12
Av. Services/ female	2
Conception rate (%)	100

Breeding Performance of Large White Yorkshire

Numbers of gilts/sows put to boars	7
Numbers of boar used	7
Numbers of services given	14
Av. Services/ female	2
Conception rate (%)	92.47

3. Performance of Animals: Zovawk

SL. NO.	TRAITS/CHARACTERS	ZOVAWK		
		Male	Female	Total/Average
1	Litter size at birth (no.)	3.0 ± 0.83	2.6 ± 0.92	5.6 ± 0.92
2	Litter weight at birth (Kg)	1.69 ± 0.46	1.45 ± 0.51	3.14 ± 0.52
3	Litter size at weaning (no.)	3.0 ± 0.83	2.2 ± 0.58	5.2 ± 0.73
4	Litter weight at weaning (Kg)	9.30 ± 3.5	6.98 ± 1.96	17.74 ± 3.5
5	Avg. Individual weight at birth (Kg)	0.59 ± 0.02	0.55 ± 0.02	0.57 ± 0.01
6	Avg. Individual weight at weaning (Kg)	3.12 ± 0.17	3.10 ± 0.16	3.11 ± 0.12
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%)	-	7.14	7.14



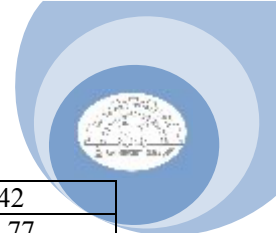
9	Pre weaning growth rate (g/day)	60.86 ± 3.63	60.41± 4.22	60.59± 2.87
10	Post weaning mortality rate (%)	3.57	3.70	7.27
11	Post weaning growth rate (g/day)	114.17 ±0.24	114.29±0.16	114.22 ±0.20
12	Overall growth rate (upto 9 m) (g/d)	105.81 ±0.42	105.96 ±0.14	105.89 ±0.17
13	Body weight (Kg) (Average)			
	1 month	2.7±0.3	2.71±0.12	2.7±0.1
	2 month	4.03±0.25	4.15±0.28	4.08±0.18
	3 month	8.43±1.15	8.49±2.04	8.46±2.4
	4 month	10.44±0.24	10.54±2.07	10.49±2.45
	5 month	14.46±1.11	14.54±1.13	14.5±1.17
	6 month	16.13±0.09	16.24±0.41	16.18±0.49
	7 month	17.81±0.17	17.93±0.94	17.87±0.82
	8 month	23.46±0.2	23.59±1.02	23.51±1.25
	9 month	29.1±2.41	29.22±3.13	29.16±4.37

Performance of Animals: 50% Crossbred

Sl. No.	TRAITS/CHARACTERS	½ LWY x ½ ZOFAWK		
		Male	Female	Total/Average
1	Litter size at birth (no.)	3.5 ± 0.67	3.3 ± 0.61	6.8 ± 0.87
2	Litter weight at birth (Kg)	2.67 ± 0.52	2.72 ± 0.48	5.4 ± 0.85
3	Litter size at weaning (no.)	3.2 ± 0.73	3.3 ± 0.61	6.66 ± 0.88
4	Litter weight at weaning (Kg)	13.77 ± 3.46	13.08 ± 2.4	26.86 ± 2.25
5	Avg. Individual weight at birth (Kg)	0.84 ± 0.03	0.77 ± 0.02	0.80 ± 0.02
6	Avg. Individual weight at weaning (Kg)	4.23 ± 0.32	4.02 ± 0.35	4.13 ± 0.23
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%)	2.43		2.43
9	Pre weaning growth rate (g/day)	94.85 ± 6.15	97.96 ± 7.17	96.28 ± 4.64
10	Post weaning mortality rate (%)	6.66	-	6.66
11	Post weaning growth rate (g/day)	262.02 ± 0.50	254.07 ±00.39	258.04 ± 1.80
12	Overall growth rate (upto 9 m) (g/d)	231.54 ± 0.40	229.97 ± 0.57	230.72 ± 1.40
13	Body weight (Kg) (Average)			
	1 month	4.15±0.09	4.26±0.20	4.2±0.18
	2 month	8.17±1.04	8.29±0.46	8.22±0.81
	3 month	11.27±0.87	11.19±1.03	11.23±1.96
	4 month	13.79±1.01	12.99±0.74	13.39±0.87
	5 month	25.42±0.99	24.36±1.55	24.89±1.97
	6 month	32.99±1.59	31.73±1.14	32.36±2.54
	7 month	51.25±2.16	49.21±1.08	50.23±2.85
	8 month	58.97±2.07	57.44±1.87	58.2±2.8
	9 month	64.28±0.44	63.22±0.28	63.75±0.38
14	Age at slaughter (d)	-	365	365
15	Weight at slaughter (Kg)	-	94.33 ± 2.33	94.33 ± 2.33
16	Dressing percentage (%)	-	73.00 ± 2.9	73.00 ± 2.9
17	Carcass length (cm)	-	101.67 ± 0.88	101.67 ± 0.88
18	Back fat thickness (mm)	-	24.52±1.46	24.52±1.46

Performance of Animals: 75 % Crossbred

Sl. No.	TRAITS/CHARACTERS	¾ LWY x ¼ ZOFAWK		
		Male	Female	Total/Average
1	Litter size at birth (no.)	4.25 ± 1.25	4.75 ± 1.43	9.00 ± 0.57
2	Litter weight at birth (Kg)	4.2 ± 1.27	4.3 ± 1.12	8.54 ± 0.56
3	Litter size at weaning (no.)	4.00 ± 1.08	4.75 ± 1.43	8.75 ± 0.47
4	Litter weight at weaning (Kg)	20.18 ± 3.57	20.59 ± 1.78	46.55 ± 2.57
5	Avg. Individual weight at birth (Kg)	0.99 ± 0.03	0.90 ± 0.03	0.94 ± 0.02
6	Avg. Individual weight at weaning (Kg)	5.57 ± 0.37	6.17 ± 0.24	5.80 ± 0.24



7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%)	2.77	-	2.77
9	Pre weaning growth rate (g/day)	107.45 ± 8.69	124.14 ± 5.69	114.40 ± 5.76
10	Post weaning mortality rate (%)	-	-	-
11	Post weaning growth rate (g/day)	152.56 ± 1.50	125.25 ± 1.27	144.35 ± 1.45
12	Overall growth rate (upto 9 m) (g/d)	137.08 ± 0.54	125.33 ± 0.51	134.33 ± 0.89
13	Body weight (Kg) (Average)			
	1 month			5.10 ± 0.11
	2 month			7.74 ± 0.61
	3 month			11.34 ± 0.19
	4 month			17.06 ± 1.94

Performance of Animals: LWY

Sl. no.	TRAITS/CHARACTERS	LWY		
		Male	Female	Total/Average
1	Litter size at birth (no.)	5.0 ± 0.44	3.5 ± 0.34	8.6 ± 0.49
2	Litter weight at birth (Kg)	7.03 ± 0.86	4.88 ± 0.51	11.91 ± 0.97
3	Litter size at weaning (no.)	4.6 ± 0.66	3.66 ± 0.33	8.3 ± 0.55
4	Litter weight at weaning (Kg)	32.54 ± 6.46	26.91 ± 0.26	29.72 ± 3.1
5	Avg. Individual weight at birth (Kg)	1.40 ± 0.05	1.39 ± 0.05	1.40 ± 0.03
6	Avg. Individual weight at weaning (Kg)	6.9 ± 0.36	6.7 ± 0.32	6.8 ± 0.24
7	Number of days for weaning (d)	42	42	42
8	Pre weaning mortality rate (%)	-	4.65	4.65
9	Pre weaning growth rate (g/day)	133.91 ± 7.55	128.02 ± 7.50	131.19 ± 5.26
10	Post weaning mortality rate (%)	-	-	-
11	Post weaning growth rate (g/day)	326.87 ± 1.44	326.87 ± 1.61	327.37 ± 1.07
12	Overall growth rate (upto 9 m) (g/d)	296.64 ± 0.20	296.69 ± 0.18	296.67 ± 4.8
13	Body weight (Kg) (Average)			
	1 month	5.74 ± 0.47	5.82 ± 0.09	5.78 ± 0.20
	2 month	9.31 ± 0.78	9.15 ± 0.06	9.24 ± 0.46
	3 month	13.24 ± 1.35	12.98 ± 1.10	13.11 ± 1.24
	4 month	25.59 ± 0.87	24.82 ± 0.45	25.2 ± 0.92
	5 month	38.94 ± 0.95	37.12 ± 1.10	38.03 ± 1.02
	6 month	48.75 ± 1.24	47.35 ± 1.86	48.05 ± 1.64
	7 month	61.83 ± 2.43	60.39 ± 2.8	61.10 ± 2.6
	8 month	72.76 ± 1.25	71.9 ± 1.72	72.33 ± 1.45
	9 month	82.1 ± 1.28	80.93 ± 1.40	81.5 ± 1.32
14	Age at slaughter (d)	-	-	365
15	Weight at slaughter (Kg)	-	-	104.33 ± 6.35
16	Dressing percentage (%)	-	-	73.77 ± 0.39
17	Carcass length (cm)	-	-	109.33 ± 3.38
18	Back fat thickness (mm)	-	-	19.2 ± 0.85

4. Lifetime Production Traits:

- Average litter size at birth per sow was 7.5 ± 0.29 , 8.66 ± 0.66 and 9.7 ± 0.37 in Zovawk, 50% crossbred and LWY respectively.
- Average litter weight (Kg) at birth per sow was 4.29 ± 0.17 , 8.51 ± 0.8 and 13.36 ± 0.66 in Zovawk, 50% crossbred and LWY respectively.
- Average litter size at weaning per sow was 6.3 ± 0.21 , 8.0 ± 0.57 and 8.5 ± 0.36 in Zovawk, 50% crossbred and LWY respectively.



- Average litter weight (Kg) at weaning per sow was 27.34 ± 1.37 , 56.04 ± 5.67 and 75.17 ± 2.96 in Zovawk, 50% crossbred and LWY respectively.

5. 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.

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

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

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

6. Mortality Parameter

- Group Wise and Sex Wise Mortality Rate (Pre and Post Weaning):**
Pre- and Post-weaning Mortality Rate (%)

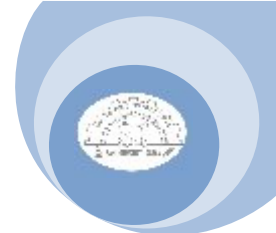
Age (Month)	MIZO LOCAL			50% CROSSBRED			75% CROSSBRED			LWY		
	M (%)	F (%)	Total (%)	M (%)	F (%)	Total (%)	M (%)	F (%)	Total (%)	M (%)	F (%)	Total (%)
0-2	-	7.14	7.14	2.43	-	2.43	2.77	-	2.77	-	4.65	4.65
2-6	3.57	3.70	7.27	6.66	-	6.66				-	-	-
6-12	-	-	-	-	-	-				-	-	-
12 & >	-	-	-							-	-	-
Total	3.57	10.84	14.41	9.09	-	9.09	2.77		2.77	-	4.65	4.65

(As on 31.03.2014)

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

Sl. N.	CAUSES	Zovawk			50% Crossbred			75% Crossbred			LWY		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
1	Pneumonia	1	3	4	1	-	1	1	-	1	-	2	2
2	Enteritis	-	-	-	1	-	1	-	-	-	-	-	-
3	Lymphadenitis	-	-	-	-	-	-	-	-	-	-	-	-
4	Accident	-	-	-	-	-	-	-	-	-	-	-	-
5	Dehydration	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1	3	4	2	-	2	1	-	1	-	2	2

(As on 31.03.2014)



iii) Measures Taken to Minimize Mortality:

1) Managemental Measures:

- All the sheds were disinfected twice weekly with disinfectants (Phenol or Clinar)
- Use of water sanitizer (Sokrena - WS)
- Use of foot dip (KMnO₄) at all the entrance of pig shed
- Restriction of entry of outsiders

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

Sl. No.	Prophylactic Measures	Zovawk			50% Crossbred			75% crossbred			LWY		
		M	F	Total	M	F	Total	M	F	Total	M	F	Total
1	Vaccination against Swine Fever	44	28	72	41	36	77	16	19	35	34	23	57
2	Deworming (Ivermectin /Albendazole)	30	21	51	54	49	103	16	19	35	38	30	68
3	Iron Injection (on 4 th & 14 th day of birth)	19	9	28	25	16	41	17	19	36	31	21	52
4	Vitamin B-complex Injection (on 5 th & 15 th day of birth)	19	9	28	25	16	41	17	19	36	31	21	52

iv) 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.

7. Nutritional Experimentation:

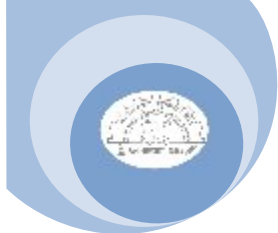
There are two ongoing nutritional trials under this project.

- The nutritional trial is on the study of performance of local growing pig (Zovawk) fed on maize- replaced wheat bran and rice bran based diet. The main objectives of this research work are to study the effect of feeding maize- replaced wheat bran and rice bran based diet on growth and nutrient utilization in local pig and to study the effect of feeding of wheat bran and rice bran based diet on blood biochemical profile of local pig.
- The nutritional trial is on the study of growth rate of Mizo local pigs (grower) by replacing concentrate feed with locally available feeds such as banana stem, colocasia leaves and kitchen waste. (Compilation of the data is in process)

8. 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.

9. Extension programme with success story:

- Supply of Piglets to the farmers at subsidized rate.
- Supply of Piglets to Non Government Organization (NGO) at subsidized rate.
- At the Institute: As resource persons in the trainings conducted by the parent organization on following aspects-



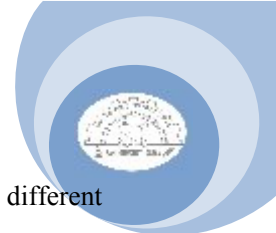
- a) Scientific Management on Pig Farms by Dr. L Hmar, Dr. Prasanta Saikia and Dr. Zosangpuui
- b) Pig Farming and Value Added Meat Products by Dr. L. Hmar, Dr. Prasanta Saikia and Dr. Zosangpuui. Lectures were given to the farmers on the following topics
 - 1. Pre-requisites for establishment of Pig production unit by Dr. L.Hmar
 - 2. Equipments and apparatus required in Pig production units by Dr. P. Saikia
 - 3. Site selection/location for profitable Pig production unit by Dr. Zosangpuui
 - 4. Care of Boar, Dry and Pregnant Sow by Dr.P. Saikia
 - 5. Hygiene and sanitation measures to be followed in a Pig farm by Dr. L. Hmar
 - 6. Care at the time of farrowing and lactation by Dr. Zosangpuui
 - 7. Care of Piglets by Dr. Zosangpuui
- iv) At the Farmers' Field: Nil

10. Scientific publications:

- i) In Peer-reviewed Journals:
 - a) T.C. Tolengkomba, P. Saikia, L. Hmar, Lalthazuali, Prava M. and N. Shyamsana Singh 'Principal component analysis of body measurements in Mizo local pigs' Indian J. Vet. Res. 22 No.1 (2013):26-31.
 - b) Two papers on the topic of "Effect of parity, sex and season on growth in indigenous pigs (Zovawk) during pre-weaning stage under intensive housing system" and "The effect of parity, sex and season on mortality pattern and the causes of mortality in indigenous pigs (Zovawk) during pre-weaning stage under intensive housing system" were submitted to Indian Journal of Animal Science for publication.
- ii) **Others:**
 - a) Lalnuntluangi Hmar, Zosangpuui, P. Saikia, G. Kalita and H. Lalliankimi "Improving the productivity of mizo local pig (zovawk) through upgradation in relation with growth, mortality and reproductive traits under climatic condition of Mizoram", National Seminar on "New Dimensional Approaches for Livestock Productivity and Profitability Enhancement under Era of Climate Change" & XXI Annual Convention of Indian Society of Animal Production and Management, January 28-30, 2014
 - b) Zosangpuui, L. Hmar, H. Lalliankimi, P. Saikia, G. Kalita and Elizabeth L. Leihang "The Effect Of Parity On Productivity And Mortality In Indigenous Pigs (Zovawk) Under Moderate Climatic Condition" "National Seminar on "New Dimensional Approaches for Livestock Productivity and Profitability Enhancement under Era of Climate Change" & XXI Annual Convention of Indian Society of Animal Production and Management, January 28-30, 2014.

11. Project work of students:

- 1. To study the characteristics and preservation of boar semen in Mizo local pig (Zovawk). The main objectives are to study the characteristics of Mizo local boar, to study the effect of



extender for preservation of liquid boar semen at 18°C and to study the effect of different packaging material on quality of preserved boar semen at 18°C.

2. Cryopreservation of Mizo Local Boar semen. The main objectives are to study the effect of extenders on frozen semen, to study the effect of glycerol levels on frozen semen and to study the effect of holding times on frozen semen of Mizo local boar.
3. Dynamics of mitogen stimulated cytokine gene expression in peripheral blood mononuclear cells of local and exotic breeds of pigs reared in Mizoram. The main objectives of this research work are estimation of proliferation index (P.I.) of mitogen stimulated peripheral blood mononuclear cell and expression analysis of cytokine transcripts by real time PCR.
4. Performance of local growing pig (Zovawk) fed on maize- replaced wheat bran and rice bran based diet. The main objectives are to study the effect of feeding maize- replaced wheat bran and rice bran based diet on growth and nutrient utilization in local pig and to study the effect of feeding of wheat bran and rice bran based diet on blood biochemical profile of local pig.
5. Performance of early weaned pigs under cage system of rearing. The main objectives are to study the growth performance of early weaned pigs under cage system, to study the health status of early weaned pigs under cage system, to study the behaviour of early weaned pigs under cage system and to study the economics of pig production under cage system of rearing (on the verge of completion).

12. Distinguished visitors:

- (i) Dr. D. K. Sarma, Director, NRC (Pig) on 12.11.2013
- (ii) Shri Charan Das Mahant, Union Minister of State for Agriculture & Food Processing Industry on 10.01.2014
- (iii) Pu Ngunlianchung, Minister of Animal Husbandry & A.H., Mizoram on 10.01.2014
- (iv) Dr. Gaj Raj Singh, Ex-Dean, College of Veterinary Sciences & A.H. Selesih, Aizawl on 21.02.2014



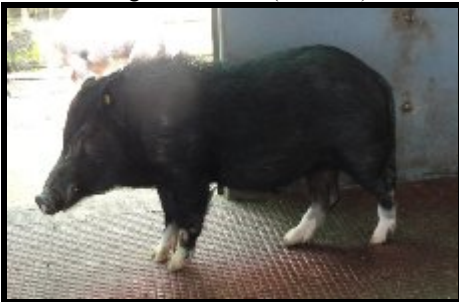
Weaned Piglets (50% Zovawk x 50% LWY)



Growers (LWY)



Pregnant Female (Zovawk)



Breeder Male (Zovawk)



Dr. D.K. Sarma, Director, NRC(Pig) visiting AICRP farm



Weaned Piglets (25% Zovawk x 75% LWY)



Crossbred Growers (50%Zovawk x 50% LWY)



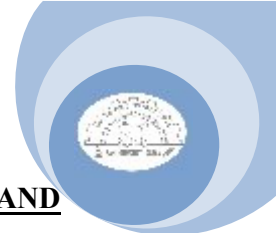
Breeder Male (50% Zovawk x 50%LWY)



Lactating Sow (LWY)



Charan Das Mahant, Union Minister of State for Agri. & FPI, Ngunlianchung, Minister of A.H. & Vety, Mizoram and S.N.Puri, Vice Chancellor, CAU, Imphal, visiting AICRP farm



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

AICRP on Pig Nagaland Centre started the project maintaining Local Indigenous pig (Tenyi Vo). The body coat is predominantly black with white markings on the sides, rump, neck and legs. The pig has a comparatively large head with long tapering snout, small erect ears and smart eyes. The belly is usually pendulous, low and almost touching the ground. The legs are short with pointed hooves and straight pasterns. The sow has remarkable mothering ability and is very protective when with litters at feet. The male piglets usually impregnated the sow before they are weaned, which is another remarkable character

Up-graded Tenyi Vo (50%) have medium erect ear dominantly black in colour with a large white belt in the shoulder region (85%), fully black body coat (10%) and the rest (5%) with black coat and white markings on the head and body parts.

1. Herd dynamics :

a) As on 01.04.2013

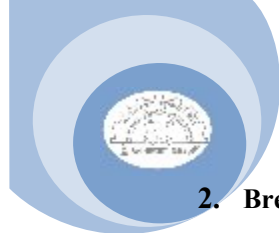
Genetic group/variety	Sex	Age in days			Sub-total(3+4+5)	Grand total
		0-42	43-180	>181		
1	2	3	4	5	6	7
Tenyi vo Nagaland Indigenous	Male			1	1	
	Female		3	12	15	
	Sub-total		3	13		16
Upgraded	Male	9	1		10	
	Female	9	3		12	
	Sub-total	18	4			22
Hampshire	Male	5		1	6	
	Female	3	6	3	12	
	Sub-total	8	6	4		18
Total					-	56

N.B. i) Number of piglets produced (2013-14) = 206 ii) Number of piglets sold out to Farmers=186

iii) Number of fattened pig sold & adult culled=10

As on 31.03.2014

Genetic group/variety	Sex	Age in days			Sub-total(3+4+5)	Grand total
		0-42	43-180	>181		
1	2	3	4	5	6	7
Tenyi vo Nagaland Indigenous	Male					
	Female		1	3	4	
	Sub-total		1	3	4	4
Upgraded	Male	14			14	
	Female	9	6	5	20	
	Sub-total				34	34
Hampshire	Male		3	1	4	
	Female		10	3	13	
	Sub-total		13	4	17	17
Total						55



2. Breeding strategy of the farm as approved:

Naga Indigenous gilts (Tenyi Vo) X Hampshire boar

Upgraded Tenyi vo (50%) X Hampshire boar

3. Performance of pigs: Upgraded Variety (50%).

Sl. No.	Trait/Characters	Mean \pm SE (no of observation)		
		Male	Female	Total
1	Litter size at birth (no)	3.00 \pm 1.50(16)	3.37 \pm 1.78(16)	6.37 \pm 3.28(32)
2	Litter weight at birth (kg)	2.12 \pm 0.23(48)	2.01 \pm 0.39(54)	4.13 \pm 0.62(102)
3	Litter size at weaning (no)	2.60 \pm 1.17(10)	3.41 \pm 1.83(12)	6.01 \pm 3.0(22)
4	Litter weight at weaning (Kg)	13.13 \pm 0.52(26)	10.97 \pm 0.89(41)	24.1 \pm 1.41(67)
5	Avg. Individual weight at birth (Kg)	0.71 \pm 0.13(13)	0.73 \pm 0.19(67)	1.44 \pm 0.32(115)
6	Avg. Individual weight at weaning (kg)	4.83 \pm 1.70(26)	4.78 \pm 1.72(41)	9.61 \pm 3.42(67)
7	No of days for weaning	42	42	
8	Pre weaning mortality rate (%)	5.1	6.48	5.8
9	Pre weaning growth (gm/d)	300	242	271
10	Post weaning mortality rate (%)	Nil	Nil	Nil
11	Post weaning growth rate (gm/d)	219	201	210
12	Overall growth rate (upto 9 m) (gm/d)	166	154	160
13	Body weight (Kg)			
	1 month	3.53 \pm 1.21(56)	3.60 \pm 1.31(65)	3.48 \pm 1.26(121)
	2 month	9.26 \pm 0.63(20)	8.85 \pm 0.91(39)	9.06 \pm 0.77(59)
	3 month	14.34 \pm 0.57(7)	13.57 \pm 0.68(18)	13.96 \pm 0.63(25)
	4 month	19.07 \pm 0.67(7)	18.53 \pm 1.07(14)	18.80 \pm 0.87(21)
	5 month	25.5 \pm 0.70(2)	23.33 \pm 1.03(9)	24.42 \pm 0.87(11)
	6 month	30.30 \pm 2.88(7)	27.84 \pm 4.38(8)	29.07 \pm 3.79(15)
	10 month	50.70 \pm 3.52(6)	47.04 \pm 3.05(6)	48.87 \pm 3.25(12)
14	Age at slaughter (month)		10	
15	Weight at slaughter (Kg)		58	
16	Dressing percentage (%)		70	
17	Carcass length (cm)		87.5 cm	
18	Back fat thickness (cm)		4	
19	Amount of pork produced per sow (Kg)		(58)	
20	Feed conversion efficiency (ratio)		4.42:1	

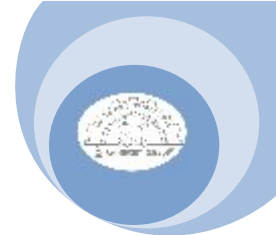
4) Specific management practices:

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

5) Mortality parameter:

i) Pre-weaning mortality

Sl. No.	Genetic group	Pre-weaning		
		male	female	Causes of mortality
1	Nagaland Indigenous (Tenyi vo)	-	-	-
2	Upgraded pigs	3	7	Asphyxia, iron toxicity
3	Hampshire pigs	2	2	Asphyxia



ii). Post-weaning mortality: Nil

iii) Measures taken to minimize mortality:

a) Management measures :

- First week after farrowing providing warm bedding and hundred-watt electrical bulb in the creep area during cold winter season
- Second week provide creep ration
- Helping the weak piglets to suckle mother's milk or bottle feedings
- Toning up weak animals with vitamins and mineral supplements
- Daily cleaning the pig pens morning and evening, use of disinfectants twice a week

b) Prophylactic measures:

- Iron injection first and second dose on the 7th & 14th day post farrowing
- De-worming done at 21-25 days old piglets, de-worming of adult pig at six month interval
- Segregation of sick animal for symptomatic treatment
- Vaccination against swine fever to all 3 months old pigs repeat after 6 months, vaccination of adult pig at 6 months interval.

iv) Disposal of diseased carcass: Dead carcass of any kind, under-ground burial with lime application at a depth of 3 feet in the farm burial ground.

7. Nutritional experimentation: The Naga pig farmers still cooked and fed pig using kitchen waste and coarse grains. The burning of fire wood and labour involve in cooking of feed make the practice expensive and not environment friendly. As per estimate 12 million trees are fell annually in Nagaland due to cooking of pig feed (NEPED-2012).

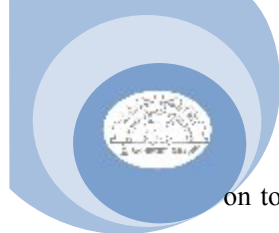
In order to develop an alternative feeding practice without cooking, a feeding trial using sweet potato based ensilage is carried out with 3 levels of supplemental feeding using sweet potato ensilage. It was found that concentrate feed can supplemented up to 30% with sweet potato ensilage without affecting the growth rate.

8. Adoption of integrated farming system: Integrate pig farming with fishery and fodder production using pig manure.

a) Cultivation of *Ficus hoorkeri*, *Pavill indicus* locally grown in the wild, sweet potato and tapioca using pig manure gave a rich harvest of fodder during July –September and sufficient quantity round the year. The leaves and vines ensilaged fodder incorporated successfully for economic ration, replacing 25% to 30% concentrate feed.

b) Catfish fingerlings introduced in the fishery pond during the month of July and harvested in the month of November, a pig based integrated-farming system, a demonstration model for pig farmers to enhance rural economy.

9. Disposal pattern of farm waste, pig excreta etc: The farm washing and excreta is directed 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.

10. Production economics

Assumption

a. No of sows	:	14
b. No of piglets farrowed in 12 months	:	147
c. Cost of feed @Rs.25 per kg x 15,330	:	Rs. 383250/-
d. Wages 1 person @Rs.150/-p day x 365 d	:	Rs. 54750/-
e. Power surcharge @Rs 280/month x 12m	:	Rs. 3360/-
f. Medicine @Rs. 150/sow/month x 12m	:	Rs. 25200/-
Sub-total	:	Rs. 466560/-

Production Cost of 1 piglet (Rs. 466560/147) : Rs. 3174/-

11. Extension program with success story:

Farmers outreach program 10 approved villages, six villages covered successfully. Seven community outreach programme conducted in the campus. Women Piggery Self Help Group (SHG) organised in two Villages namely Mezoma and Khonoma Village of Kohima district. The SHG is timely advice for de-worming, vaccination and other health care of the backyard piggery.

In collaboration with ICAR Jharnapani the trained SHGs were gifted with 20 numbers of cross breed of large black, rabbit cages, domestic fodder chaff cutters, rabbits and young Vanaraja chicks as seed animals. This was under Tribal Sub-Plan program lead by Jt. Director Dr. B.C. Deka ICAR-Jharnapani and his team, organizing the programs, preventive animal health measures, vaccination and monitoring in the field by the staffs of AICRP-Pig Nagaland Centre.

The Village Health Workers/Animal Health Workers (VHW/AHW) working with Nagaland Empowerment of People through Economic Development ((NEPED) implementing rural livelihood activities of backyard piggery were train on animal health care and management, diseases prevention and control. The trained persons render their service to the rural farmers at their doorstep with first aid, de-worming and vaccination of the livestock.

Coordinating with the Nagaland State Department of Veterinary and Animal Husbandry, vaccination of the pigs and other livestock of the rural farmers against swine fever, FMD, Black Quarter, Haemorrhagic Septicaemia etc. are some of the highlights of the year round programs. Vaccines and other medicines supply received from the State Veterinary & Animal Husbandry.

Institutional:

Date/Month	Village/Ward /Institution	Program/Activities	Participant
23.05.2013 & 24.05.2013	NU-SASRD	Training of farmers on pigs health Management	12 Animal health workers from 12 villages of Dimapur district(NEPED Animal Health Workers)
03.06.2013 & 04.06.2013	NU, SASRD	Training of farmers on pigs health Management	Farmers selected from 15 villages of Kohima district (NEPED Animal Health Workers)
24.07.2013	NU, SASRD	Awareness Program on Swine fever	Pig Farmers from in and around Medziphema & NU campus



13.12.2013	Dept. of APM, NU SASRD	Awareness on the classical swine fever cum vaccination program (126 no. of rural pig vaccinated)	Farmers from Medziphema town & village
05.02.2014	ICAR RC, Jharnapani	Awareness on creation of rural economy through livestock & Poultry Farming	Farmers from Dimapur and Kohima District
06.03.2014	ICAR RC, Jharnapani	Awareness on creation of rural economy through livestock & Poultry Farming	Farmers from Dimapur and Kohima District
14.03.2014	AICRP-Pig, NU-SASRD	Hands on training on health care of pigs	B.Sc. (Ag) Students and Progressive farmers

13. Distinguish visitors:

- a. Dr. Dilip Kumar Sarma, Director NRC on Pig, Rani Guwahati
- b. Prof. B. K. Konwar, Vice Chancellor, Nagaland University, HQ Lumami
- c. Prof. Glenn T. Thong, Dean, Research, Development & Consultancy, NU, Lumami.
- d. Prof. M. Aleminla Ao, Dean, NU-SASRD, Medziphema Campus
- e. H. E. Mr. Chalit Manityakul, Ambassador of Thailand to India with his 12 other dignities.
- i. Progressive farmers more than 300 plus.

14. Other information:

The Upgraded Tenyi Vo 50% and 75% produced under the AICRP on Pig, Nagaland Centre, supplied to farmer at reasonable price of Rs.1800/- to Rs. 2500/- per piglet to Rural Farmers, and demand is higher for 75% Up-Graded as compared to 50% group of Up-Graded Tenyi Vo.

The staffs and livestock attendants of APM & AICRP-Pig NU-SASRD extended free swine fever vaccination program in and around the campus during October 2013 to January 2014. There is no report of swine fever cases in the farm & in the campus during the reporting current year 2013-14.

Three days Farmers' Fare as "Naga Kheti Mela" under the theme "Towards Sustainable Agriculture" held in the campus from 17th-19th October 2013, organised by SASRD, Nagaland University. AICRP-Pig staffs participated show casing the Up-graded Tenyi Vo pigs, invited Veterinary Pharmaceuticals with the products suitable for rural livestock, free medicine samples provided to the farmers during the three days farmers' fare. A documentary film on Indigenous pig system (Tenyi Vo-2006) re-edited 2013 version played for the farmers and participant on the 18th October 2013, has rekindle the value of preservation of Naga Indigenous Pig.

Participated in 'Mithun Festival cum Interface Meet' held at National Research Centre on Mithun, ICAR Jharnapani, show casing AICRP initiatives under the aegis of SASRD, Nagaland University. Flexi banners, Posters, Photographs were displayed, interacted with the scientists, rural farmers and participants on 27th March 2014.



Graded piglets with Tenyi Vo sow



Graded Tenyi Vo growers



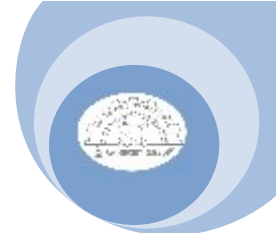
Graded Pregnant Gilt



Training of NEPED's Animal Health workers



Training of Young Pig Entrepreneurs on pig Husbandry

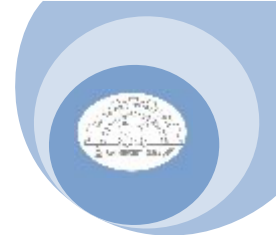


FUTURE PROGRAMME IDENTIFYING THE ACTIVITIES/TARGET

Sl. No.	Centre	Programme	Activities/Target
1.	All centers of AICRP on Pig	i) Maintenance of 75% upgraded animals	<ul style="list-style-type: none"> Maintained as per technical programme/breeding plan fixed for each centre
		ii) Conservation and characterization of indigenous pigs	<ul style="list-style-type: none"> All the centre shall maintain indigenous pig available in the respective state with a minimum breedable population of 20 (4 breedable male and 16 breedable female) Phenotypic characterization is to be done at farmers' field as well as institute farm. Molecular characterization may be done in collaboration with NRC on Pig/NBAGR. Documentation of indigenous germplasm available in the centre.
		ii) Adoption of integrated farming systems	<ul style="list-style-type: none"> Adoption of integrated farming system at farmers' field by incorporation of fisheries and agriculture with piggeries. Development of integrated farming system demonstration unit at the centre.
		iii) Survey and market value system linkage	<ul style="list-style-type: none"> Survey of local market and market value system linkage should be done
		iv) Housing and management	<ul style="list-style-type: none"> Individual centre should develop model housing and management strategies for climate resilient pig production
		v) Artificial Insemination	<ul style="list-style-type: none"> Propagation of AI at institute farm and farmers' field need to be carried out
		vi) Disposal of diseased carcass	<ul style="list-style-type: none"> Scientific method of disposal of carcass needs to be initiated.
		vii) Establishment of biogas plant	<ul style="list-style-type: none"> Biogas plant for utilization of pig manure needs to be initiated.
		viii) Extension activities	<ul style="list-style-type: none"> Awareness programme on improved pig production to be initiate in nearby area. Various on-campus and off-campus training on improved pig production to be done at AICRP. Provision of consultancy service to the farmers

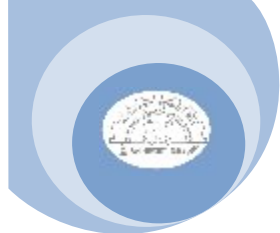


Mega-Seed Project on Pig



NAME OF THE CENTRE AND PRINCIPAL INCHARGE

Mega-seed Project on Pig	Name of Incharge
College of Veterinary Science, Assam Agricultural University Khanapara, Guwahati, Assam-781022	Dr. Dhireswar Kalita
College of Veterinary Science, Birsa Agricultural University, Kanke, Ranchi, Jharkand -834006	Dr. L. B. Singh
ICAR-RC for NEH region Jharnapani, Medziphema, Dimapur, Nagaland 797 106	Dr. Manas Kumar Patra
A.H. & Vety. Farm Complex, Veterinary Department, Govt of Mizoram Selesih, Aizawl, Mizoram – 796014	Dr. K. Lalrohlua



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

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

2. Objectives:

- Production of 900 piglets in each state to target production of quality pig covering 300 farm families per annum.
- Capacity building in institutes to produce above number of quality piglets
- Initiating gender friendly pro-poor growth through improved pig husbandry

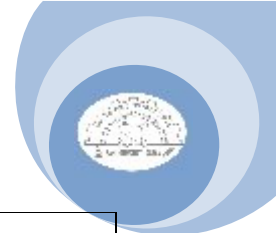
3. Target Fixed:

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

4. Action point discussed in Review Meet of ‘All India Coordinated Research Project on Pig’ and “Mega Seed Project on Pig” held Indian Veterinary Research Institute, Bareilly in 2013

AAU, Khanapara

Targets	Action Taken
<ul style="list-style-type: none">• Production of 900 quality piglets in each center for covering about 200 farm families/annum.• Capacity building in the centers to produce above no. of quality piglets.	<ul style="list-style-type: none">• The breeding stock of 50% Hampshire genetic group is proposed to increase from 35 to 70/75 to achieve the target of 1000 piglets. 13-15 numbers of gilt/sows /month are placed in breeding for regular production of piglets. With a view to produce 1000 number of 50%H piglets, regular replacement stock is maintained for maintaining the herd size. The herd size of T&D genetic group is reduced for increase production of 50%H piglets.• The revenue of sale proceed should be recycled as per the ICAR norms. The matter was informed to the University authority for consideration. In this regard, Rs.9.26 lakhs was estimated for repairing of Pigsties/office room and construction of water reservoir with filtration system

**BAU, Ranchi**

Targets	Action Taken
<ul style="list-style-type: none"> The centre will maintain TxD crosses with a targeted production of 1000 piglets during the period 2014-15 	<p>The centre is maintaining T&D crosses. The centre targeted 1000 piglet production during the year 2014-15. They are looking forward to achieve it. The major constraint is less number of pens.</p>

ICAR RC for NEH, Nagaland Centre, Medziphema

Targets	Action Taken
<ul style="list-style-type: none"> The centre will maintain only one crossbred (Ghungroo X Hampshire 50% exotic inheritance) with a targeted production of 1000 piglets during the period 2014-15. 	<ul style="list-style-type: none"> The centre has already procured breeding stock of Ghungroo and Hampshire cross (50%) from NRC on Pig during 2013-14. The existing stock of Large Black pig will be disposed gradually during the current year. The centre has produced 1062 piglets during 2013-14 and expected to produce 1000 piglets during current year.

Veterinary Department, Government of Mizoram, Aizawl

Targets	Action Taken
<ul style="list-style-type: none"> Necessary steps need to be taken up to achieve a production of 900 piglets/annum of Large White Yorkshire (2014-15) The house agreed to continue with Large White Yorkshire breed of pig for the centre. 	<p>The stock strength of Mega Seed Farm as on 1.4.2013 was 222 numbers including 50 sows, 2 boars, 4 gilts and 166 piglets. Due to the outbreak of PRRS, 3 sows and 107 piglets died and altogether 29 adult pigs were culled due to serum positive PRRS antibodies leaving behind only 86 pigs (23 sows, 4 gilt, and 59 piglets). Soon after confirmation of the serum PRRS antibodies were obtained, regeneration of farm stock from the negatively tested PRRS antibody sows, unaffected gilts and piglets were undertaken. Regeneration from the farm stock was done due to unavailability of good quality Large White Yorkshire in the neighbouring state Mizoram and transportation problems of pig from the central and remote part of India. Seven nos of Large White Yorkshire piglets were inducted from the other district of the state for breeding purpose and 8 piglets born out of LWY frozen semen from Canada are also reserved for breeding purposes. The breeding stock strength at present in the farm is 74 in numbers comprising of 29 sows, 14 gilt, 25 female weaned piglets, 1 young boar, and 5 weaned male piglets. From the above point of view, the center is not in a position to actually achieve the assigned target of production of 900 quality piglets during 2014-2015. In spite of all the problems the centre is trying to achieve production of maximum numbers of quality piglets.</p>

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 and 2851 nos of improved variety of piglets were produced for distribution in 2010-11, 2011-12, 2012-13 and 2013-14 respectively.



ASSAM AGRICULTURAL UNIVERSITY, KHANAPARA, GUWAHATI

The Indian Council of Agricultural Research, Govt. of India has sanctioned Mega Seed Project on Pig to the Assam Agricultural University, Khanapara. Accordingly, the activity of the project was started initially with four breeding boars and 13 Sows of 50%H genetic group of pigs purchased from the AICRP on Pig as one of the breeding / foundation stock under the Mega Seed Project during 2008. The three genetic groups viz. 50%Hampshire, Ghungroo 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.

2) Herd dynamics:

Herd Strength: Year 1.4.2013 - 31.3.2014

Genetic Group	Opening balance as on 1.4.2013 of the financial year under report						Total	Closing balance as on 31.03.2014 of the financial year under report						Total
	Male			Female				Male			Female			
	0 - 6 wk	6 wk - 8 m	over 8 months	0 - 6 wk	6 wk- 8 m	over 8 months		0 - 6 wk	6 wk - 8 m	over 8 months	0 - 6 wk	6 wk - 8 m	over 8 months	
50%H	24	19	-	47	26	27	143	90	-	16	86	-	46	238
Ghungroo cross	-	-	-	-	-	4	4	-	-	-	-	-	-	-
T&D	3	19	22	24	36	30	134	14	9	3	12	6	22	66
Total	27	38	22	71	62	61	281	104	9	19	98	6	68	304

Stock continuity details: 01.04.13 - 31.03.2014

Deletion

Genetic Group	Sale		Died		Slaughter		Destroyed*		Total		Stock as on 31.03.2014		Grand Total
	7		8		9		10		11(7+8+9+10)		12 (5 - 11)		
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
50%H	175	212	14	16	-	1	4	7	193	236	106	132	238
Ghungroo Cross	16	28	-	-	-	-	-	-	16	28	-	-	-
T&D	180	218	20	20	-	-	2	7	202	245	26	40	66
Total	371	458	34	36	-	1	6	14	411	509	132	172	304

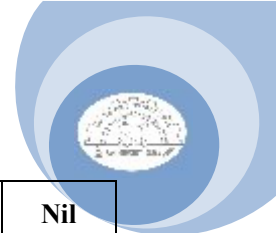
* The piglets were destroyed due to debility and poor health

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	64	4.00±0.19	4.05±0.19	8.05±0.20	3.88±0.21	3.92±0.22	7.80±0.22
Ghungroo Cross	4	4.00±0.71	6.00±0.71	10.00±0.71	4.00±0.71	6.00±0.71	10.00±0.71
T&D	47	3.91±0.22	4.15±0.20	8.06±0.22	3.72±0.24	4.02±0.19	7.74±0.20

Pre weaning and Post weaning mortality:

Genetic Group	Pre weaning mortality (%) (0-42 days)			Post weaning Mortality (%) * (42-5 months)			Adult Mortality (%) (over 5 months)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
50%H	3.13 (8)	3.08 (8)	3.11 (16)	4.44 (11)	5.18 (13)	4.81 (24)	Nil	0.42 (1)	0.21 (1)



Ghungroo Cross	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
T&D	4.89 (9)	3.08 (6)	3.96 (15)	7.43 (13)	10.58 (20)	9.07 (33)	Nil	0.59 (1)	0.30 (1)
Overall	3.73 (17)	2.93 (14)	3.32 (31)	5.43 (24)	7.11 (33)	6.31 (57)	Nil	0.46 (2)	0.24 (2)

Within parenthesis are the number of died animal

* Mortality due to Swine Fever and destroyed (debility and poor health) piglets were included.

3) Number of piglets produced during the reporting period: April 2013-March'2014

	Total no. of piglets born			Total no. of piglets died			No. of live piglets produced		
	M	F	T	M	F	T	M	F	T
1st quarter	66	76	142	1	2	3	65	74	139
2nd quarter	141	161	302	8	6	14	133	155	288
3rd quarter	94	88	182	19	19	38	75	69	144
4th quarter	155	153	308	13	22	35	142	131	273
Annual	456	478	934	41	49	90	415	429	844

4) Number of piglets sold during the reporting period:

	No. of live piglets Produced			No. of piglets Sold			Amount realized (Rupees)
	M	F	T	M	F	T	
1 st quarter	65	74	139	82	112	194	Rs. 2186390/-
2 nd quarter	133	155	288	88	84	172	
3 rd quarter	75	69	144	65	88	153	
4 th quarter	142	131	273	115	109	224	
Annual	415	429	844	350	393	743	

* Total receipt include from piglets and adults



50% Hampshire sow with piglets



50% Hampshire gilt



T&D sow with piglets



T&D gilts



Distribution of Piglets under TSP,
Regional Research Station, AAU, Lakhimpur



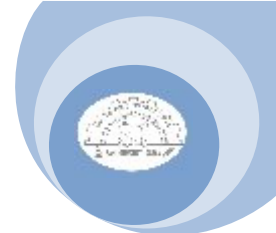
Distribution of Piglets under TSP, Boko, Kamrup



Private Farmer - Madhurjya Sarm, Teok, Jorhat



Private Farmer – Bipul Kalita, Mirza, Kamrup



BIRSA AGRICULTURAL UNIVERSITY, RANCHI, JHARKHAND

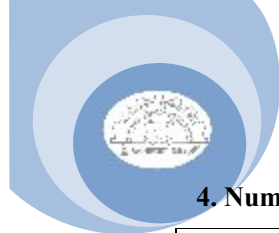
Jharkhand is one of the leading states in the country where piggery has been accepted by rural people as remunerative enterprises. The farmers have accepted the NATP Mission mode on pigs in past with great enthusiasm which provided tremendous employment opportunity to local people through integrated 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 the centre is not able to fulfill the 100% demand of piglets in Jharkhand. Presently, approx 60% population of pig in Jharkhand are of indigenous/local type. But gradually the centre will be able to replace local pig with improved variety. Success of piggery development programmes in target districts depends on regular supply of "T&D" pigs to farmers because desi pigs of the area can safely be replaced by identical colour "T&D" pigs with significant increase in growth rate and reproductive performances. Demands for "T&D" pigs are increasing day by day. In Jharkhand, pig production has assumed greatest importance even among extremely low resource poor farmers.

2. Herd dynamics:

Sl. No.	Categories	Opening balance	Additions			Disposals		Closing balance
			Births	Transfers	Deaths	Transfers	Sold	
1.	Piglet (up to 42 d)	153	697		34	-	-	181
2.	Grower (42d-5 m)	74	-	816	38	-	615	23
3.	Finisher (5m-8 m)	20	-	237	8	-	11	12
4.	Breeding Female	73	-	238	9	-	17	60
5.	Boar	16	-	285	-	-	9	16
Grand total		336	-	-	89	-	652	292

3. Number of piglets produced during the reporting period

	No. of piglets born			No. of piglets died			No. of piglets produced		
	M	F	T	M	F	T	M	F	T
1 st quarter	76	79	155	14	22	36	62	57	119
2 nd quarter	81	74	155	12	12	24	69	62	131
3 rd quarter	80	78	158	8	1	9	72	77	149
4 th quarter	111	118	229	11	9	20	100	109	209
Annual	348	349	697	45	44	89	303	305	608

**4. Number of piglets sold during the reporting period:**

	No. of piglets produced			No. of piglets sold			Amount realized (Rupees)
	M	F	T	M	F	T	
1 st quarter	62	57	119	105	83	188	367810.00
2 nd quarter	69	62	131	93	56	149	294375.00
3 rd quarter	72	77	149	101	74	175	325050.00
4 th quarter	100	109	209	83	57	140	394841.00
Annual	303	305	608	382	270	652	1382076.00

5) Success Story:**Success story of Chotanagpur Piggery Farm, Dohakatu, Ramgarh, Jharkhand**

Name of pig breeder - Sri Jai Prakash Mahto

Year of establishment of farm- May, 2005

Back history: Sri Jai Prakash Mahto belongs to a farmer's family. He was helping his father in agriculture work. After taking training on pig breeding and management for 10 days duration at AICRP on pig unit, Ranchi Veterinary College, he took loan of Rs. 1.50 lakh from Bank, for starting the pig farm. After that he started piggery farm on scientific lines with technical guidance of Scientists of Ranchi Veterinary College. His farm named "Chotanagpur Pig Breeding Farm" was inaugurated on September, 2005. His piggery farm having 01 acre land with 13 pig sheds is well protected by boundary wall. In the beginning, he purchased 10 piglets of "T&D" variety from Pig Breeding Farm of Ranchi Veterinary College, one boar and 12 growing female piglets from private Piggery Farm, Ranchi. In this way, he started his own piggery farm with 22 pigs of different ages at initial stage. He has also purchased one auto rickshaw to collect kitchen and vegetable wastes from different places to feed the pigs. He is utilizing the auto rickshaw to carry farm products and vegetable produced through agriculture to hotels and return back with kitchen and vegetable wastes from hotels to his farm from the same auto rickshaw. He produced about 100 piglets within 12 months and started selling of piglets without any problem. He has returned back Rs. 2.0 lakh bank loan within two year besides he is maintaining his family expenditure. Presently, he has one auto rickshaw, one tractor, one motor cycle and about 300 pigs of various age groups.

Starting cost of shed	60,000/-
Starting cost of Animal	50,000/-
Type of farm:	Breeding-cum-fattening farm
Starting herd strength	40 piglets
Annual herd strength	300 pigs including 50 adults
Annual income	4.5 to 6 lacs per year



Animal of Mahto



Pig of Mahto



Jai prakash shed



Visit to Mahto's shed

**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 fatterer farmers. Therefore, the need of the hour is to facilitate a shift in production pattern by way of introducing quality pig germplasm with superior genetic merit and production potential.

Keeping this fact in view, an attempt has been made to propagate quality pig germplasm under “Mega Seed Project on Pig” at the centre *w.e.f* November, 2008. In last three years, the Mega Seed Project has produced a total of 1976 no. of piglets, of which 1251 no. of distributed for promotion of breeding. Many entrepreneurs have come forward to take up pig breeding program and have generated self employment and additional income. Under the Mega seed program, ICAR Research Complex has conducted awareness campaign, training cum demonstration for promotion of quality germplasm and scientific rearing practices of pig for better income and sustainable production.

1. Herd dynamics:

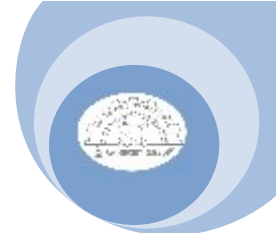
Sl. No.	Categories	Opening Balance	Additions			Disposal		Closing balance
			Birth	Transfer	Death	Transfer	Sold	
1	Piglets (upto 42 d)	Nil	1062	Nil	156	9	628	269
2	Grower (42d – 5m)	Nil	X	Nil	Nil	Nil	Nil	Nil
3	Finisher (5m- 8m)	Nil	X	Nil	Nil	Nil	Nil	Nil
4	Breeding female	69	X	24	3	Nil	19	71
5	Boar	13	X	6	2	Nil	7	10
Grand Total		82	1062	30	161	9	654	350

2. Number of piglets produced during the reporting period:

	Total no. of piglets born			No. of piglets died			No. of piglets produced		
	M	F	T	M	F	T	M	F	T
1 st quarter	124	102	226	19	20	39	105	82	187
2 nd quarter	133	109	242	31	32	63	102	77	179
3 rd quarter	140	133	273	11	7	18	129	126	255
4 th quarter	158	163	321	22	14	36	136	149	285
annual	555	507	1062	83	73	156	472	434	906

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

	No. of piglets produced			No. of piglets sold.			No. of adult sold			Amount realized (Rs)
	M	F	T	M	F	T	M	F	T	
1 st quarter	105	82	187	61	46	107	3	6	9	297215
2 nd quarter	102	77	179	79	74	153	1	1	2	372600
3 rd quarter	129	126	255	65	64	129	1	5	6	381700
4 th quarter	136	149	285	120	119	238	2	7	8	663900
Annual	472	434	906	325	303	628	7	19	26	17,15,415

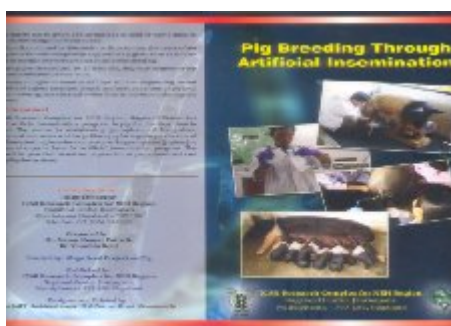


4. Other information:

Artificial insemination in pig is initiated for the first time in Nagaland to enhance the production of piglets from superior breeding stock. Five males of were trained to donate semen and about 130 ejaculates were collected, processed and preserved for insemination. Altogether 85 animals were served in farm and nearby villages of Dimapur district. The conception rate was recorded more than 75% in farm condition following double insemination with litter size ranges from 8-11. Several capacity building programs were undertaken to popularize the improved pig breed for establishment of pig breeding unit and to popularize artificial insemination technique in Nagaland. Five training programs both short and long duration, exposure visits and interactive meet were organized both off and on campus covering 304 beneficiaries from all the districts in Nagaland.

Artificial insemination record during 2013-14

No. boar trained	No. of collection	No. of insemination	Conception rate	Litter size
5 (LB-1; H-1; Gh-1; HG cross -2)	130	Farm – 60 Field – 25	70-75%	Average 9.26 (8 - 11)



Leaflet published for promotion of AI



Piglets kept for distribution under TSP



Piglet distributed program conducted under TSP in collaboration with Nagaland Pig Farmers' Association on December 07, 2013 at Hotel Saramati, Dimapur



Training on pig breeding conducted at ICAR Complex, Jharnapani during December 4-6, 2013



Training program on “Promotion of Pig Breeding for Sustainable Production and Marketing”



Hon’ble DDG (Ext.) Dr. K.D. Kokate visited the Mega Seed Project unit on September 09, 2013



Hon’ble DDG (AS) Dr. K.M. L. Pathak visited the Mega Seed Project unit on March 27, 2014



Training on “Pig and poultry production for livelihood improvement” funded by North East Rural Livelihood Program, (Jan 03-19, 2014)



Demonstration of semen collection technique using indigenous dummy



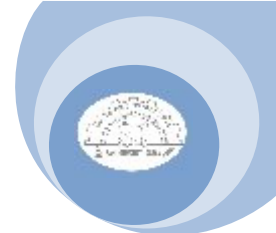
Demonstration of semen evaluation and processing



Demonstration of artificial insemination



News report published



VETERINARY DEPARTMENT, GOVT. OF MIZORAM, AIZWAL

Pork is the most favourable meat for the people of Mizoram which is signified by the latest report on integrated sample survey in Mizoram for the year 2012 - 2013. According to the sample survey report, 6892 tones of pork were produced during 2012 - 2013 out of the total meat production of 12037 tones. Pork accounts for 57.25% of the total meat production. This data also clearly showed that pig farming has a big potential and a huge economic importance in Mizoram.

The Mega Seed Project on Pig, Mizoram Centre was sanctioned on the 24th November, 2008 by the National Research Centre on Pig, ICAR, Guwahati and was practically commenced *w.e.f* the 29th March, 2009 by inducting 3 young boars and 27 young gilts from Kolkata after reconstructing, repairing and renovating the existing Departmental Farm building at A.H & Vety. Farm Complex, Selesih, Aizawl. Since its inception, the Mega Seed Farm produced 1320 nos. of piglets and sold 1117 nos. of good quality Large White Yorkshire piglets to the pig farmers till the end of the reporting period.

1. Herd Dynamic :

SL. No	Categories	Opening Balance	Addition			Disposal		Closing Balance
			Birth	Transfer	Death	Transfer	Sold	
1.	Piglet (upto 42d)	132	158	6	146*	19	96	35
2.	Grower (42d-5m)	34	-	19	5	10	-	38
3.	Finisher (5m-8m)	4	-	10	1	4	-	9
4.	Breeding Female	50	-	3	24	-	-	29
5.	Boar	2	-	1	2	-	-	1
Grand Total		222	158	39	178	33	96	112

* Out of 146 death piglets, 117 died from the previous years' balance and 29 nos. died from the piglet born during the reporting period.

2. Numbers of Piglets produced during the reporting period :

Sl. No.		No. of piglet born			No. of piglet died			No. of piglet produced		
		M	F	T	M	F	T	M	F	T
1.	1 st quarter	-	-	-	-	-	-	-	-	-
2.	2 nd quarter	14	11	25	4	4	8	10	7	17
3.	3 rd quarter	22	28	50	1	-	1	21	28	49
4.	4 th quarter	40	43	83	7	13	20	33	30	63
Annual		76	82	158	12	17	29	64	65	129

3. Numbers of Piglets sold during the reporting period :

Sl. No.		No. of piglet produced			No. of piglet sold			Amount realized (Rs.)
		M	F	T	M	F	T	
1.	1 st quarter	-	-	-	7	11	18	45,300.00
2.	2 nd quarter	10	7	17	10	10	20	51,500.00
3.	3 rd quarter	21	28	49	14	26	40	1,02,500.00
4.	4 th quarter	33	30	63	12	6	18	45,000.00
Annual		64	65	129	43	53	96	2,44,300.00

N.B.

- 1) No. of piglets from previous year balance = 166 nos.



- 2) Total no. of piglets born during the reporting year = 158 nos.
- 3) Total no. of piglets inducted from other farm = 6 nos.
- 4) Total no. of piglets = $(166 + 158 + 6) = 330$ nos.
- 5) Total no. of piglets died = 146 nos. (due to PRRS = 107, other reasons = 39)
- 6) 3 adult female pigs died due to PRRS and 27 adult female and 2 boars were culled due to PRRS sero-positive antibodies.
- 7) Total no. of piglets balance at the end of the reporting year = 88 nos. (33 nos. From reporting period and 55 nos. from the previous years' balance) the out of which 35 nos. of weaned piglets were retained for farm stock and from the remaining 53 nos. Un-weaned piglets some female piglets should be selected and retained in the farm for breeding purposes and rest should be sold to public.
- 8) Amount submitted to Director, NRCP during the reporting period = Rs. 61075.00

6. Constrains faced:

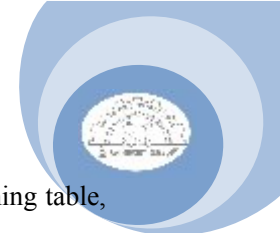
- (i) Outbreak of PRRS in the Mega Seed Farm: Incidence of outbreak of PRRS in Mizoram occurs *w.e.f* March, 2013 affecting six districts out of the eight districts in Mizoram. PRRS attacked Mega Seed Farm, Selesih during April, 2013 affecting all the 222 Pigs of which 3 Sows and 107 Piglets died initially and subsequently 2 Boars and 27 Sows were culled out due to serum tested and confirmed PRRS antibodies. Out of the affected pregnant sows exhibited still-births or abortion and few of them carried full term but farrowed weak and debilitated piglets and majority of them died soon after birth.
- (ii) In order to maintain the required stock strength of parental stocks for production of 900 piglets per annum, high cost of feed remains one of the biggest problems being faced by the farm.
- (iii) Management problems due to severe cold winter season accompanied by constant availability of viral piglet diarrhoea remain a big obstacle faced by the farm. Besides, high cost of feed accompanied by inadequate feed quality for optimum production affected the breeding performances of the female breeders in terms of milk production, timely estrus cycle, etc.

7. Success story:

Due to outbreak of PRRS in Mizoram during the early part of 2013, many beneficiaries of the Mega Seed Farm loses their pigs due to PRRS attack and many breedable pigs were culled due to presence of PRRS antibodies in their serum. Only few success stories could be obtained for this annual report.

Success stories were collected from ten (10) farmers as under:

- (i) Mr. Lalenauva, Durtlang, Aizawl District: Mr. Lalenauva had started rearing sows by purchasing 5 piglets from Mega Seed Farm in 2010. He had been very successful and sold over 100 piglets in recent years. At present, he had extended his farm to 13 sows unit.
- (ii) Mrs. Lalveni, Aizawl District: Mrs. Lalveni also started rearing pigs for breeding by purchasing 2 female piglets from Mega Seed Farm in 2011. She had earned thousands of rupees by selling her piglets and now she had extended her sows unit to 5 and her 2 sows farrowed on February and



- April 2014. She had informed us that she purchased most of her house holdings like dining table, television, etc. from the money she had earned from selling of her piglets.
- (iii) Mrs. Lalbiaknii, Chhiahtlang Village: Mrs. Lalbiaknii who is also a widow earns her daily live-hood by doing hard labour to support her one mentally ill son. She had purchased 2 piglets from Mega Seed Farm in June, 2011. One for fattener and another for breeding Sow. She had been successful and from her earnings she had purchased another 3 female piglets in 2012 for breeding and now she earns her daily live-hood by rearing her pigs and she is now self employed.
- (iv) Rozama, Mamit: Mr. Rozama is a regular breeder of local or indigenous pigs in his region. But after introducing him about the advantages of rearing a good quality exotic breed like Large White Yorkshire, he purchased 2 male piglets from the farm. At present he is making a good profit from his boar service charge and spread the boar-line of a good quality exotic breed in his region. He also avoids the incident of inbreeding among the local indigenous pigs.
- (v) Mrs. R. Lalnunmawii: Mrs. R. Lalnunmawii is a Superintendent in Protective Home, Social Welfare Department, Govt. of Mizoram. Her institution purchased 4 female piglets for breeding sows on October, 2013 and ordered more piglets for their next project. Her institution looks after those underprivileged persons like children from broken families, juvenile criminals, *etc.* Those interested persons in the institution are taught various kinds of farming and piggery farming is one of them and they have a huge hope of success.
- (vi) Mr Malsawma, Zawngin Village: Mr. Malsawma purchased 2 Large White Yorkshire male piglets for breeder on March, 2012 and another 2 male piglets on February, 2014. Since pig farmers in and nearby his village do not get a regular A.I for their pigs, he is very helpful to the pig farmers. His boars have mated around 38 sows in the last 3 to 5 months and earned more than Rs. 30,000/- from his boar service charges.
- (vii) Mr. L.T Ropuia, Lunglei: Mr. Ropuia had purchased four piglets for fattener and another 3 female piglets for breeding purpose from Mega Seed Farm earlier in 2011. At present he could extend his pig farm to 20 sows unit and 15 fatteners.
- (viii) Mrs. Zomuani, Aizawl: Mrs. Zomuani regularly purchases piglets from Mega Seed Farm. She had purchased over 80 piglets from the farm since 2009. She had raised piglets for fattener purpose and slaughter them between 8 to 9 months and she could sell each pigs between Rs.15000/- and Rs.26000/-.
- (ix) Mr. Ramlawma, Lungdai: Mr. Ramlawma took bank loan to start piggery farms. He purchases 10 female piglets for breeding purpose. And recently on February, 2014, three of his sows farrowed in total 26 piglets. At present local market, one piglet cost Rs.4500/- – Rs.5000/-.
- (x) Mr. Thuama, Rawpuichhip: Mr. Thuama purchased 2 male piglets from Mega Seed Farm for breeder. He earns a good profit from his boar service charges in and nearby his village where A.I in pig is not practiced.



Other information:

- 1) The stock strength of the Mega Seed Farm as on 1.4.2013 was 222 numbers including 50 Sows, 2 Boars, 4 Gilts and 166 Piglets. Due to outbreak of PRRS, 3 Sows and 107 Piglets died and altogether 29 adult pigs were culled due to serum-positive PRRS antibodies leaving behind only 86 pigs (23 sows, 4 gilts and 59 piglets). Soon after confirmation of the serum PRRS antibodies were obtained, regeneration of the farm stock from the negatively tested PRRS antibody Sows, unaffected Gilts and Piglets was undertaken. Regeneration from the farm stock was done due to un-availabilities of good quality Large White Yorkshire in the neighbouring states of Mizoram and transportation problems of pigs from the central and other remote parts of India. Seven nos. Large White Yorkshire piglets were inducted from the other district of the state for breeding purposes and 8 piglets born out of Large White Yorkshire frozen semen from Canada are also reserved for breeding purposes. The breeding stock strength at present in the farm is 74 in numbers comprising of 29 Sows, 14 Gilts 25 female weaned piglets, 1 young boar and 5 male weaned piglets. From the above points in view, the centre is not in a position to actually achieve the assigned target of production of 900 quality piglets during 2014 – 2015. In spite of all the problems, the centre is trying level best to achieve production of maximum numbers of quality piglets for the needy poor farmers of the state.
- 2) Some of the managerial practices being adopted in the Mega Seed Farm :
 - (a) Vegetables like Pumpkin, Chow Chow (squash) and Maize are grown in the farm premises and fed to the farm pigs as green feed supplement.
 - (b) Creep feeding of un-weaned piglets from the 2nd week till weaning was practiced.
 - (c) Un-weaned piglets provided with brooding facilities in cold winter and on cold rainy days.
 - (d) De-worming of pigs done at 3 months intervals.
 - (e) Weaning done at 42 days.
 - (f) Needle teeth cut at birth.
 - (g) Iron injection given at 4th and 14th days of birth.
 - (h) Sows were supplemented with Galactagogue during gestation and lactation period.
 - (i) Breeding done by A.I only.
 - (j) All the pigs were supplemented with mineral mixture as per requirements.
 - (k) Swine Fever Vaccination done at the time of weaning and at six months interval.
 - (l) Disposal of farm waste/ excreta done through two nos. slurry tanks for production of bio-gas.
- 3) **Distinguish Visitors :**
 - (a) Dr. D.K Sarma, Director, National Research Centre on Pig on the 12th November, 2013.
 - (b) Dr. Peter Kenmore, FAO representative in India and his team accompanied by Mr. P.L Thanga, I.A.S (rtd.), Vice Chairman, NLUP Implementing Board, Govt. of Mizoram visited the farm on the 11th October, 2013.



- (c) Mr. S. Rana, Joint Secretary, Livestock Health, Govt. of India and Dr. R.G Banbal, Asst. Commissioner, Govt. of India visited the farm on the 12th July, 2013.
- (d) Dr. D. Biswas, Regional Quarantine Officer (E.R.), Central Observer DADF, Govt. of India accompanied by Dr. Padam Chhetri, Dy. Director, Disease Investigation, A.H & Vety. Department, Govt. of Mizoram and his team visited the farm on the 8th August, 2013.



Private farms/beneficiaries of Mega Seed Project on pig, Mizoram center



हर कदम, हर उगर
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भारतीय कृषि अनुसंधान परिषद

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