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Original Article**Improved varieties of swine suitable for Indian climate**

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Abstract:

Rearing of pigs is a common practice in rural India and can improve food security and the economic status of poor farmers. Most of the pigs reared belongs to native breeds with production of just 35–40 kg of meat per pig and the relatively small litter size of 4-6 piglets. The opportunity for rural farmers and women to generate additional income for their families is made possible by the rising demand for pig meat products and the minimal investment in the pig industry. However, issues with desi pig's low weight gain and fewer piglets each litter are among of the production challenges that must be overcome by introducing superior varieties of pigs with higher performance levels. So, improved pig breeds can readily increase pig production and guarantee superior meat yield.

Key words: AICRP, Crossbreeding, Genetic Diversity, Litter Size, Superior Germplasm

Introduction:

Pig farming is popular among rural farmers, particularly among India's tribal populations. According to the 20th livestock census, there are 9.06 million pigs in the country, and their number is now declining. Farmers in India preferred crossbred pigs more than native pigs since they outgrew them in terms of growth performance, litter size, mortality rate, and back fat thickness (Shyam et al. 2017). The government of India has made an attempt to boost up the commercial pig farming by developing crossbred varieties of pigs with superior production and reproduction traits when compared to the indigenous breeds (Annual Report, ICAR-NRC on Pig, 2017). The majority of pigs in India are of native breeds, which are smaller in size with modest growth rates. This is a result of the lack of a superior, high-performing pig breed. There is an urgent need for the creation of superior swine germplasm via effective breeding intervention for the commercial pork sector as well as for backyard farming.

In order to achieve this, AICRP on pig was launched during fourth five-year plan (1970-1971) with the main objective of studying the performance of purebred exotic pigs under existing managerial conditions. Due to their abundance and significant economic value to the rural population, it was evident by the end of the fifth five-year plans that there was an urgent need to develop indigenous pigs. Therefore, at the start of the sixth five-year plan, the technical programme of the AICRP on pig was completely redesigned to provide a multidisciplinary approach to pig production. First, research on indigenous pigs was conducted, and then research on the crossbreeding of indigenous females with suitable exotic breeds followed. The following are some of crossbred pig varieties that were developed through this project in India.

1. Rani:

This pig variety was developed by Indian Council of Agricultural Research (ICAR) - National Research Centre (NRC) on Pig, Guwahati, Assam by cross breeding exotic Hampshire and indigenous Ghungroo breeds of pig. For six generations of continuous crossbreeding, the breed characteristics of the "Rani" crossbred have been stabilized. The exotic and indigenous inheritance were 50% and 50%, respectively. These two breeds were selected because Ghungroo can generate more offspring and Hampshire has a faster rate of growth. This pig gains almost 75 kg body weight at slaughter age of 8 months with 1.98 cm of backfat thickness. At the time of slaughter *i.e.*, 8 months, this pig gained over 75 kg of body weight and 1.98 cm of backfat thickness (Annual report, ICAR-NRC on Pig, 2017).



2. Asha:

Another exotic genotype called Duroc was crossed with "Rani" to create the triple cross "Asha", which inherited 25% Ghungroo, 25% Hampshire, and 50% Duroc. At the age of 8 months for slaughter, "Asha" can produce 80 kg of lean pork with a 1.75 cm back fat thickness (Annual report, ICAR-NRC on Pig, 2017). The developed variety is climatically tolerant and has a promising growth rate.



"Asha" Crossbred pig

3. Lumsniang:

Lumsniang variety of pig was developed by All India Coordinated Research Project on Pig at ICAR-Research Complex for NEH Region, Barapani by crossing Niang Megha local pig of Meghalaya and Hampshire as exotic breed. The variety has better adaptability in hill ecosystem with promising growth rate and feed conservation efficiency, good mothering ability with higher litter size at the time of birth and weaning, good carcass quality and consumer preference in the region. Another key feature of the pig variety is suitable to low input tribal production/backyard pig production system. The pig variety attained higher body weight of 65-75 kg at 8 months of age and 90-100 kg at 12 months of age, with litter size of 8-9 piglets at birth and higher litter size at weaning as compared to local non-descriptive pigs (8.56 ± 0.77 vs 5.23 ± 0.54) in the low input tribal production system.



4. HD-K75:

The HD-K75 variety was created by systemic crossbreeding and stabilized through 16 generations of inter-se mating with the genetic makeup of 75% Hampshire inheritance and 25% indigenous inheritance of local pigs of Assam. It was developed by the All India Coordinated Research Project on Pig at Khanapara, Guwahati. At birth, there are 8-9 piglets in the litter and at the time of slaughter,

which is 8 months old, the breed can gain close to 74–80 kg of body weight and 1.72–2.58 cm of back fat thickness. The produced variety was discovered to be adaptable to Assam's and the surrounding region's various agro-climatic conditions.



5. Jharsuk (T & D):

This pig variety has 50 % Tamworth (exotic breed) and 50 % local pigs of Jharkhand inheritances and was developed under All India Coordinated Research Project on Pig at Ranchi Veterinary College, Birsa Agricultural University, Ranchi in 1989 by inter-se-mating and by continuous selection for several generations on the basis of black color, faster growth and better reproductive performances and gradually spread within the Jharkhand, adjoining and north eastern states. This breed of pig matures to a body weight of about 80 kg between 8 and 10 months before slaughter. It can give birth to 8–12 piglets with each of its two farrowing's per year. The 'T&D' pig has faster growth rate, better reproductive performance, higher disease resistance and better adaptability at farmer's door.



6. Mannuthy White:

At the Kerala Veterinary and Animal Sciences University in Mannuthy, Kerala, as part of the All India Coordinated Research Project on Pigs, the Mannuthy White variety was created by breeding pure lines of Large White Yorkshire males with half-bred Large White Yorkshire x Desi females. For LWY and Desi, the inheritance level has been maintained at 75:25 percent. The litter size of sow at birth ranges from 9-10 piglets. Weight at 8 months of age is around 75-80 kg and at 10 months of age for slaughter, the breed can gain 94 kg of body weight and 2.10 cm of back fat thickness. Mannuthy White is highly suited to Kerala's low input raising system and humid tropical agro-climatic conditions. The developed variety is useful for mitigating demand of improved pig germplasm of the state of Kerala and adjoining areas.



7. TANUVAS KPM Gold:

The crossbred pig variety "TANUVAS KPM Gold" was developed by AICRP on Pig at PGRIAS, Kattupakkam. The crossbred pig variety was devolved by crossing exotic Large White Yorkshire (75%) with Desi pig (25%) of Tamil Nadu. The developed variety is adapted to local climatic condition of the state with litter size at birth of 8-9 and average body weight of 72 kg at 8 months.



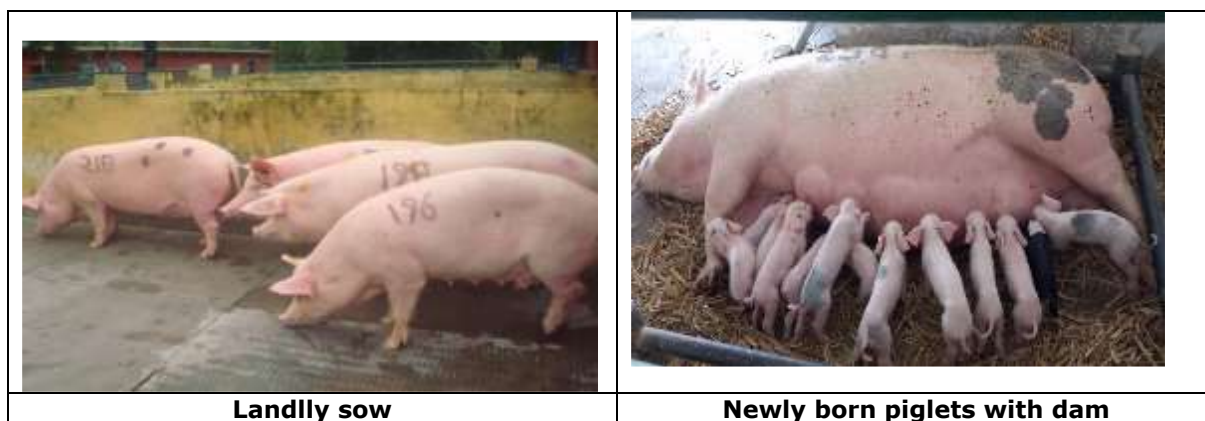
8. SVVU-T17:

This pig variety also called as "Tirupati Varaha" has 75 % Large White Yorkshire (exotic breed) and 25 % Desi pig of Andhra Pradesh inheritance and was developed at All India Coordinated Research Project (AICRP) on Pig centre of Sri Venkateswara Veterinary University (SVVU), Tirupati. This pig variety attains 85.48 kg body weight at slaughter age of 10 months with 8.1 litter size at birth. The average pork production was 60 kgs per pig and with a litter size of 8 – 12 piglets.



9. Landlly:

Landlly was developed at AICRP on Pig centre of ICAR-Indian Veterinary Research Institute (IVRI), Bareilly, Uttar Pradesh. This pig variety has 75 % Landrace (exotic) with 25 % Ghurrah -pig (local) inheritance. The litter size at birth is around piglets and it attains marketable weight of 75-80 kg at the age of 8 months. This variety of pig has performed well under farm and field conditions. The weight at marketable age of 8 months ranged between 73 to 90 kg. Also, Landlly can be reared successfully, with suitable replacement of concentrates, with kitchen waste, vegetable waste and agro-industrial by-products like sugarcane press mud etc.



Landlly sow

Newly born piglets with dam

Impact of success:

The developed crossbred pig varieties has made a sizable and meaningful impact among the rural farmers in terms of economic gain and livelihood security. They are more prolific in terms of litter size at birth and weaning as compared to local/indigenous pigs.

Economic analysis:

Litter size at birth of indigenous pigs: 5-6 nos.

Improved crossbred variety litter size: 9-10 nos.

Average body weight at 8 months of age of indigenous pigs: 40-50 kg

Average body weight at 8 months of age of crossbred pigs: 70-80 kg

Parameters	New improved variety	Local variety
Litter size at birth	9-10 piglets	5-6 piglets
Body weight at slaughter (8 months)	75 kg	45 kg
Income through sale of pigs @ Rs. 100/kg live weight	Rs. 70000.00 (9.5 X 75kg X Rs. 100)	Rs. 25000.00 (5.5 X 45kg X Rs. 100)

Improved variety increased farmers' income up to 2.8 times

Source: <https://aicrp.icar.gov.in/pig/success-stories/>

Conclusion:

Rural farmers may be employed by pigs in both direct and indirect ways, earning money directly from the sale of live pigs and pork as well as indirectly through the production of manure and fuel. Among small-scale farmers, crossbred varieties are becoming more and more popular in the recent century. In order to protect the farmers' interests, it is important to upgrade native breeds with exotic breeds. A large portion of the indigenous pig germplasm found in India has not yet been characterized, despite its abundance. These pigs are special in that they are well adapted to hot, humid weather and are more resilient to disease than other breeds, particularly foreign ones. Due to negligent crossbreeding techniques, many of the native pig breeds may already be in danger of extinction. Therefore, extreme caution must be used when breeding native pigs for genetic improvement based on farmer preference and suited for commercial piggery farming for the overall development of the industry. The systematic survey, documentation, characterization, and conservation of India's indigenous pigs are urgently needed at the same time. The production of native pigs is just 35-40 kg of meat per pig, and the litter size is also relatively small—4-6. However, improved pig breeds can readily increase pig production and guarantee superior meat yield.

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