SWINE TECHNOLOGY

INNOVATIONS IN PORK PRODUCTION

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From the Editor's Desk

Navigating a Shifting Global Herd

The global pork and swine industry is standing at a fascinating crossroads. Valued at approximately $235.9 billion and projected to grow at a 5.5% CAGR through 2030, our sector proves its resilience even as overall meat consumption rises. Yet, beneath these strong baseline numbers lies a complex matrix of challenges. Producers today are navigating a volatile terrain defined by fluctuating pork prices, shifting international trade flows, and steadily rising production costs.

Looking across the globe, we see a starkly divided regional landscape. In the Americas, the US enjoys robust domestic and international demand, with cash index prices stabilising around the $92-$96 range. Meanwhile, Europe battles structural headwinds, where skyrocketing feed and energy costs are tightening profit margins and forcing a hard look at international competitiveness.

To survive these pressures, the global industry is leaning heavily into innovation and using precision swine farming and focusing on strategic feeding with advanced biosecurity measures.

Perhaps the most compelling story of rapid evolution is happening in India. While China remains the central driver of the Asia-Pacific region, India is emerging as a major wildcard, registering the highest growth rate in the pig genetics and breeding sector.

Historically, the Indian pig market has been highly fragmented, localised, and largely unorganised, with consumption heavily concentrated in Goa and the Northeastern states like Assam, Nagaland, and Mizoram. Today, it is undergoing a profound structural shift from traditional backyard rearing to commercial setups.

However, this transition is not without growing pains, including price volatility and socio-cultural dynamics. Roughly 75% of the country's herd consists of low-quality indigenous breeds, compounded by a lack of specialised commercial feed pan-India.

Despite these hurdles, the horizon is bright. A bifurcated consumer base is driving modernisation. While rural and tribal markets rely on traditional wet markets for fresh pork, a rising urban elite and expatriate demographic are supercharging demand for premium, processed products like bacon, ham, and sausages. To meet this premium demand, both government and private entities are aggressively promoting high-yielding crossbred varieties like Large White, Landrace, and Duroc to vastly improve lean meat percentages and growth rates.

Whether managing AI-driven feeders in the West or upgrading genetic stock in the valleys of Northeast India, the mandate for the modern swine producer remains identical: adapt, automate, and biosecure. The future belongs to those who view these market disruptions not as a crisis, but as an invitation to modernise.

ARTICLE'S INDEX

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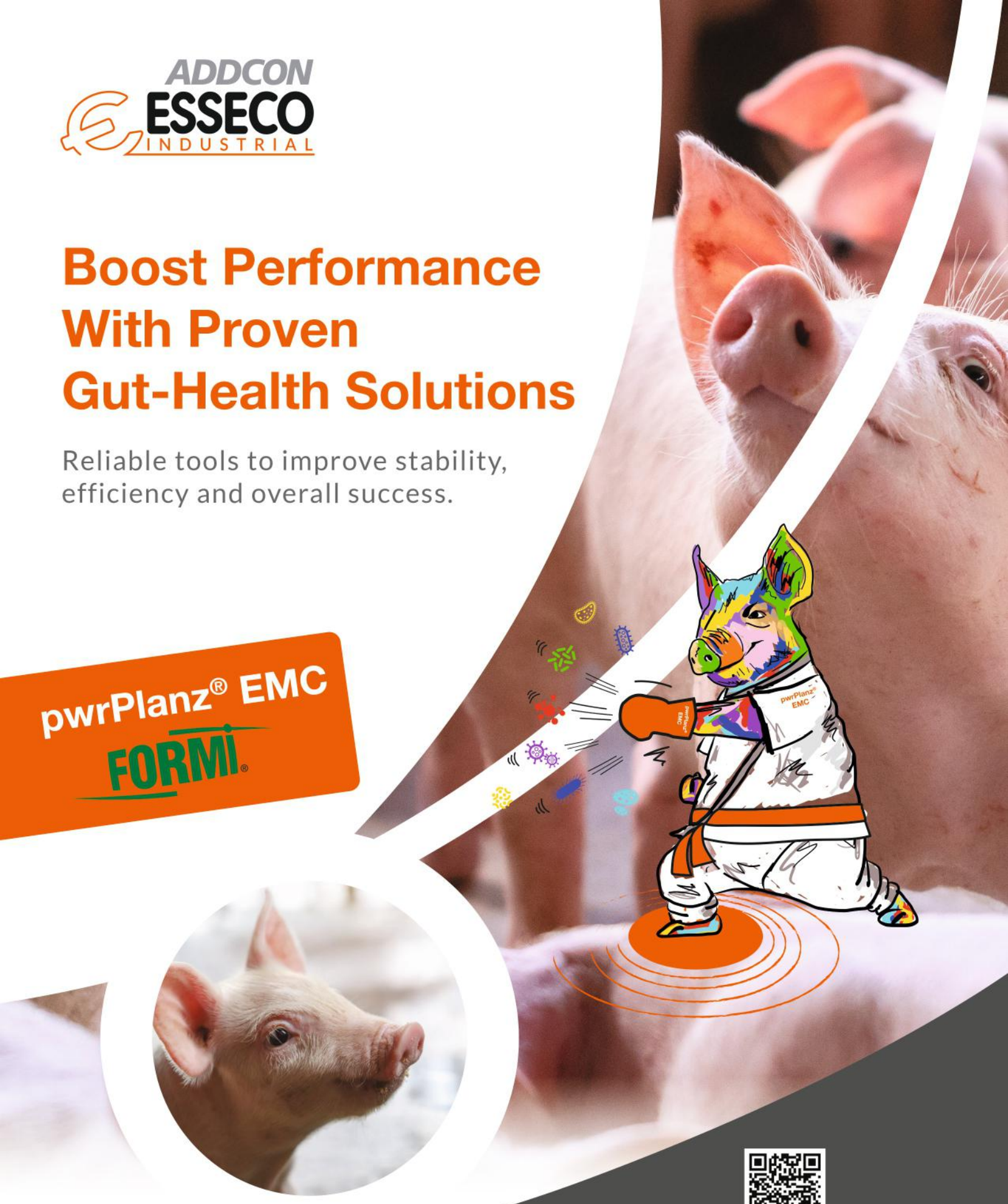

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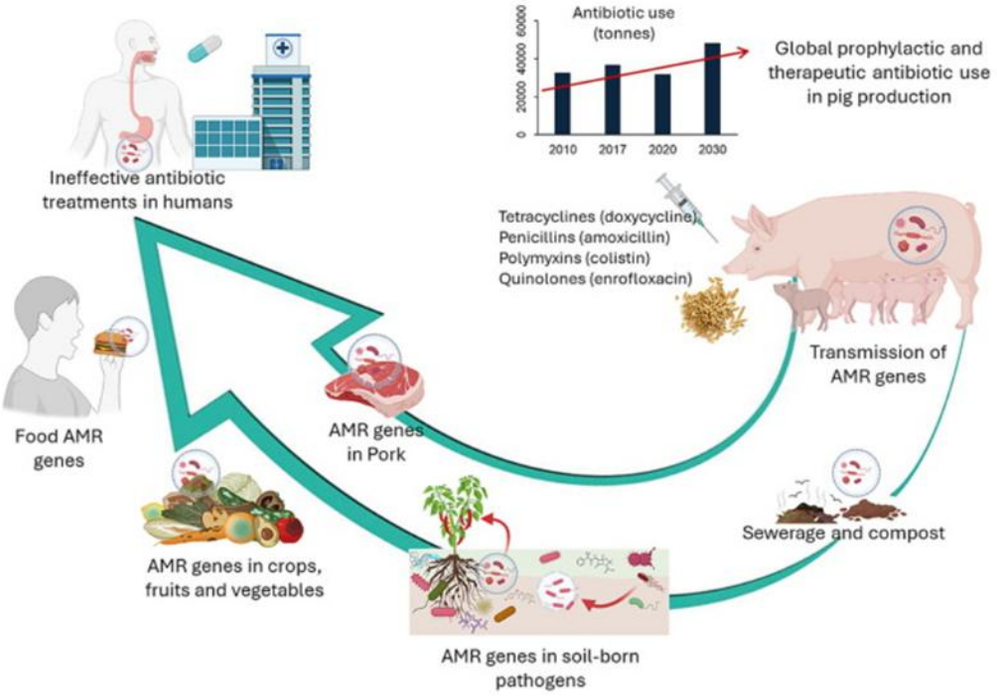
Nutritional Strategy to Reduce

Environmental Pollution from Pig Farms

Dr. Shivangi Singh

Introduction

The production of pigs is essential to supplying the world's need for animal protein. However, large volumes of manure, nitrogen (N), phosphorous (P), greenhouse gases, and chemicals that cause odours are produced by intensive swine production methods, which may contribute to environmental contamination. Pig farms' excessive nutrient excretion can contaminate the air, water, and soil, causing eutrophication, ammonia emissions, and concerns about climate change.To meet the global need for animal protein, pig production is crucial. However, intensive swine production methods produce huge amounts of manure, nitrogen (N), phosphorous (P), greenhouse gases, and odor-producing compounds that may contribute to environmental damage. Excessive nitrogen excretion from pig farms can contaminate the land, water, and air, resulting in ammonia emissions, eutrophication, and climate change problems.



Environmental Challanges Associated with Pig Farming-

1. Pollution from nitrogen

Pigs expel excess food protein in their urine and faeces. Air and water pollution can result from the conversion of nitrogen from manure into ammonia, nitrate, and nitrous oxide.

2. Pollution from Phosphorus

Manure contains undigested phosphorus, which can infiltrate rivers and lakes and cause eutrophication and dangerous algal blooms.

3. Emissions of Greenhouse Gases

Methane (CH_4), carbon dioxide (CO_2), and nitrous oxide (N2O) are released by pig dung and contribute to global warming.

4. Emissions of Odours

Ammonia and sulfur-containing chemicals cause unpleasant odours when manure ferments.

Nutritional Strategies for Reduce Pollution Reduction-

1. Precision Feeding

Supplying nutrients in accordance with the precise needs of pigs at various stages of growth is known as precision feeding.

Advantages

lowers the consumption of extra nutrients.

increases the efficiency of feed conversion.

reduces the excretion of phosphate and nitrogen.

reduces the amount of feed waste.

Precision feeding techniques that are frequently employed include phase feeding and customised feeding systems.

2. Amino Acid Supplements for Low-Protein Diets

Pig diets have historically included extra crude protein to guarantee a sufficient supply of amino acids. On the other hand, nitrogen excretion is increased by excess protein.

Approach

Lower the amount of crude protein while adding necessary amino acids like:

Lysine

Methionine

Threonine

Benefits of Tryptophan Valine-20-40% less nitrogen is excreted,reduces emissions of ammonia,keeps up growth performance.

3. Utilising Feed Enzymes

Feed enzymes decrease nutrient losses and increase nutrient digestibility.

Phytase

Phytate-bound phosphorus found in grains and oilseed meals is broken down by phytase.

Advantages

- increases the availability of phosphorus.
- reduces the excretion of phosphorus by as much as 50%.
- reduces the cost of feed.

Protease

Protease decreases nitrogen excretion and enhances protein digestion.

Enzymes that Carbohydrate-These enzymes enhance the utilisation of nutrients and the digestion of fibre.

4. Optimising Phosphorus in Diet

Phosphorus is included in many plant-based feed ingredients in forms that pigs do not use well.

Methods

Make use of easily accessible phosphorous sources., Add the phytase enzyme, Instead of focusing on total phosphorus, create diets based on digestible phosphorus.

Results

Less contamination from phosphorus.,increased use of minerals.

5. Dietary Fibre Incorporation

Moderate amounts of fermentable fibre can change nitrogen excretion patterns and enhance gut health.

References-bran made from wheat, Pulp from sugar beets, Hulls of soybeans, Grain distillers

Advantages for the Environment-transfers the excretion of nitrogen from urine to faeces., lessens the volatilisation of ammonia.,improves the quality of manure.

6. Utilising Probiotics as Feed Additives

Digestion and nutrient absorption are enhanced by beneficial bacteria.

For instance-Lactobacillus species, Bacillus species, Prebiotics elements in non-digestible diet that support good gut flora.

For instance-Oligosaccharides of mannan, Organic Acids and Fructooligosaccharides

Reduce harmful microorganisms and increase nutrient digestibility.

Benifits-Better feed efficiency ,Reduced nutrient losses, Lower odor production.

7. Improving Feed Digestibility- Highly digestible diets reduce nutrient excretion.

Methods include-Fine grinding of feed ingredients, Heat processing, Pelleting, Selection of high-quality feedstuffs.Improved digestibility means more nutrients are utilized by pigs rather than excreted.

8. Alternative Protein Sources- Innovative protein components can enhance sustainability.

For instance - Meal for insects, Proteins found in a single cell, Proteins derived from algae, Ingredients for fermented feed Compared to traditional protein sources, these substitutes frequently have smaller environmental impacts.

9. Liquid Feeding System- Feed waste is decreased and nutrient utilisation is enhanced by liquid feeding.

Advantages-improved digestion., increased consumption of feed.,decreased excretion of nutrients.

10. Nutritional Approaches to reduce Green house gas emission- Among the tactics are-

- Increasing the effectiveness of feed.
- Reducing the amount of crude protein.
- Using additives and enzymes.
- Improving the digestibility of nutrients.

Methane and nitrous oxide emissions are reduced when manure production is decreased.

Economic Benefits of Nutritional Strategies - In addition to safeguarding ecosystems, environmental nutrition increases profitability by-

- lower feed expenses.
- Increased ratio of feed conversion.
- Improved growth performance.
- Less need for fertiliser.
- Increased sustainability on farms.

Therefore, eco-friendly feeding can boost agricultural productivity and profitability at the same time.

Conclusion and Future Perspective- It is anticipated that new technologies like artificial intelligence, real-time nutrition monitoring, precision feeding systems, and precision livestock husbandry would transform sustainable pig production. Farmers will be able to supply nutrients more precisely thanks to these improvements, which will cut down on waste and lessen their negative effects on the environment. One of the main issues with sustainable livestock production is environmental pollution from pig farms. Nutrient excretion and greenhouse gas emissions can be significantly decreased by using nutritional techniques such precision feeding, low-protein diets supplemented with amino acids, enzyme supplementation, optimised phosphorus nutrition, dietary fibre inclusion, and increased feed digestibility. Pig farmers can increase productivity while preserving the environment by combining these dietary strategies with efficient manure management techniques. In order to ensure the swine industry's continued expansion while preserving ecological balance, sustainable feeding will be essential.

Dr. Shivangi Singh

Assistant Professor Animal Nutrition, Abhilashi Univesity Chail Chowk District Mandi H.P.

Pig Farming: A Sustainable and Profitable Livestock Enterprise

Swarup Debroy[1], Uma Kant Verma[2] and Narendra Kumar[3]

Introduction

Pig farming is considered an economically viable livestock enterprise due to its rapid growth rate and high feed conversion efficiency. A significant proportion of the initial investment can be recovered within 1.5-2 years of farm establishment, making it a profitable venture for small and marginal farmers. Generally, pigs should achieve a monthly body weight gain of more than 10 kg when fed balanced concentrate diets, agricultural by-products, or processed food industry wastes. This makes pig farming a highly profitable enterprise, with small-scale piggery units often yielding profit margins exceeding 60%.

Benefits of Pig Farming

1. Pigs are highly prolific animals with a short generation interval. A sow can attain breeding age at 8-9 months and is capable of farrowing twice a year. Under normal management conditions, each farrowing may produce 6-12 piglets, contributing to rapid herd expansion and increased profitability.
2. Pig farming requires relatively low investment in housing, buildings, and equipment compared to many other livestock enterprises.
3. Pigs are well recognized for their high meat-producing ability, with a dressing percentage ranging from 65% to 80%, which is considerably higher than that of most other livestock species, whose dressing percentage generally does not exceed 65%.
4. Pigs possess excellent feed conversion efficiency, enabling them to convert feed into body weight more effectively than most meat-producing livestock species, second only to broiler chickens.
5. Pigs are capable of utilizing a wide range of feed resources, including cereal grains, forages, agricultural by-products, damaged feed stuffs and food waste, efficiently converting them into high-quality and nutritious meat. However, the use of poor-quality feed ingredients or nutritionally unbalanced diets may adversely affect feed conversion efficiency and overall animal performance.
6. Pig manure is a valuable organic fertilizer that is widely utilized in agricultural fields and aquaculture systems to improve soil fertility and enhance productivity.
7. Pigs have a high capacity for fat deposition and the fat obtained from pigs is utilized in various industries, including poultry feed manufacturing, soap production, paint manufacturing and other chemical industries.
8. Pig farming offers rapid economic returns, as pigs can attain marketable body weight within 6-8 months under proper management and feeding practices.

Pig Feeding Practices and Management

Feed is a critical component of profitable pig production, accounting for approximately 70-75% of the total production cost. The growth performance, reproductive efficiency and overall health of pigs are largely influenced by the quality and quantity of feed provided. Proper nutrition not only enhances productivity but also improves carcass quality, which directly affects market value and farm profitability. Therefore, pigs should be supplied with a well-balanced diet containing adequate amounts of energy sources, proteins, fats, minerals, and vitamins, along with continuous access to clean and fresh drinking water. Common feed ingredients used in pig diets include maize, wheat bran, rice polish, broken rice, groundnut cake, fish meal, mineral mixture, and common salt.

To reduce feeding costs, locally available non-conventional feed resources such as processed colocasia (up to 30%), cabbage (up to 10%), and water hyacinth (up to 30%) may be incorporated into the ration. In addition, vegetable residues, kitchen waste, and food leftovers obtained from hotels and other sources can be utilized as supplementary feed resources alongside concentrate diets, thereby improving the economic efficiency of pig production.

Table 1 Feeding details of different rations

Type of	RationRecommended Feeding Period
Creep Ration	Offered to piglets from 7-10 days of age until weaning (approximately 21 days of age).
Starter Ration	Fed from 22 days to 60 days of age to support early growth and development.
Grower Ration	Provided from 2 to 5 months of age to promote rapid body weight gain.
Finisher Ration	Fed from 5 to 8 months of age until pigs attain market weight.

Table 2 Recommended Daily Feed Allowance for Growing Pigs

Age Group (Months)	Average Body Weight (kg)	Daily Feed Requirement per Pig (kg)
1-2	12	0.50
2-3	18	1.00
3-4	26	1.25
4-5	36	1.50
5-6	48	2.00

Table 3 Daily Water Requirements of Pigs at Different Growth and Physiological Stages

Category of Pig	Daily Water Requirement (Liters /Day)
Piglets (8 - 12 weeks of age)	3.5
Growing pigs (13 - 18 weeks of age)	6.0
Growing pigs (19 - 24 weeks of age)	7.5
Finishing pigs (25 weeks and above)	8.0
Pregnant gilts (during the last 3 months of gestation)	16-20
Lactating (nursing) sows	20-25
Boars	20-25

Management of Breeding Stock in Pig Farming

Breeding in pigs primarily aim to improve both reproductive and productive traits. Reproductive performance is commonly assessed by parameters such as litter size and the number of piglets born per farrowing. Productive performance, on the other hand, is evaluated based on traits associated with meat production efficiency, including growth rate, feed conversion efficiency, and carcass characteristics. Improvement of these traits contributes significantly to the overall profitability and sustainability of pig farming.

Heat Detection and Mating in Pigs

Indigenous pigs generally reach sexual maturity at around 9 months of age, whereas crossbred pigs attain puberty earlier, usually between 7.5 and 8.5 months of age. The normal estrous cycle in pigs averages 21 days, although it may range from 18 to 24 days. Accurate detection of estrus is essential for achieving successful breeding and optimum reproductive performance.

During the oestrus, the female shows

1. Frequent urination, reduced appetite, erect ears, and restlessness are common signs of heat in female pigs.
2. Females in heat often produce distinctive grunting sounds or vocalizations.
3. Swelling and reddening of the vulva, along with mounting behavior toward pen mates, are common signs of estrus in pigs.
4. Vulvar discharge and immobility (standing reflex) when pressure is applied to the back are reliable indicators of estrus in female pigs.
5. For optimum reproductive performance, gilts are generally bred during their second or third estrous cycle.
6. The estrus period usually lasts for 2-3 days, and the most suitable time for mating is during the latter half of the first day and throughout the second day of heat.
7. To improve conception rates, females are often mated twice at an interval of 10-12 hours. After mating, the boar should be removed from the sow's pen. The mating process generally lasts between 3 and 7 minutes.
8. The average gestation period in pigs is approximately 114 days (3 months, 3 weeks, and 3 days). Sows can usually be rebred about one month after weaning their piglets.
9. Breeding boars may be maintained for reproductive purposes up to about 18 months of age, whereas sows are commonly replaced after their fourth farrowing to maintain optimal reproductive efficiency and herd productivity.

Housing Management in Pig Farming

1. Pig sheds should be constructed on elevated, well-drained land to prevent water accumulation and maintain a dry environment.
2. Areas prone to water logging, marshy conditions, or excessive rainfall should be avoided for pig housing.
3. Side walls should be approximately 1.2-1.5 m (4-5 ft) high, with the remaining height fitted with suitable materials such as GI pipes, wire mesh, or wooden posts to ensure adequate ventilation.
4. Walls should be properly plastered to prevent moisture penetration and facilitate easy cleaning.
5. The roof should have a minimum height of 2.5-3.0 m (8-10 ft) to provide sufficient air circulation and thermal comfort.
6. Pig houses should be well ventilated to maintain a healthy environment and reduce heat stress.
7. Floors should be made of durable, non-slippery, and impermeable materials with a gentle slope (approximately 3 cm per meter) to facilitate efficient drainage and cleanliness.

8. Adequate feeder space, ranging from 15-30 cm (6-12 inches) per pig, should be provided to ensure proper feed access.
9. Feed troughs, drains, and wall corners should be rounded to simplify cleaning and improve hygiene.
10. Sufficient open exercise area should be provided, preferably at least twice the covered floor area.
11. During hot weather, animals should be provided with adequate shade and continuous access to cool, clean drinking water.
12. Proper disposal of manure and urine is essential to maintain sanitation and minimize disease risks.
13. Separate pens should be provided for breeding boars and lactating sows to facilitate better management.
14. Dry sows and growing or finishing pigs can be maintained in group housing systems.
15. Adequate floor space should be allotted according to the age, size, and physiological status of the animals to ensure their comfort, health, and productivity.

Conclusion

Pig farming is a highly profitable and sustainable livestock enterprise owing to its rapid growth rate, high reproductive efficiency, superior feed conversion ability, and relatively low investment requirements. The ability of pigs to efficiently utilize a wide range of feed resources and attain market weight within a short period makes pig production an attractive option for both small-scale and commercial farmers. Successful pig farming depends on the adoption of scientific management practices, including balanced nutrition, adequate water supply, efficient breeding programmes, proper housing, and effective health care. With appropriate management and the use of improved breeds, pig farming can significantly enhance farmers' income, generate employment opportunities, and contribute to food security and rural economic development.

Swarup Debroy[1], Uma Kant Verma[2] and Narendra Kumar[3]

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EVENT CALENDER

SIAVS–2026
4–6 AUGUST, 2026
Venue : Anhembi District - São Paulo - Brazil - Av. Olavo Fontoura, 1209
Phone : +55 (11) 3095-3120
E-mail : siavs@abpa-br.org
Web : www.siavs.com.br

VIV SELECT CHINA 2026
19–21 AUGUST, 2026
Venue : Shanghai, China.
Website : https://china.viv.net

ILDEX-INDONESIA
16 –18 SEPTEMBER, 2026
Venue : Hall 5 & 6, Indonesia Convention Exhibition (ICE) BSD City, Tangerang
Website : https://www.ildex-indonesia.com/

SPACE
15–17 SEPTEMBER , 2026
Location : Parc Expo, Rennes, France.
Website : https://www.space.fr/en/

ALLEN D. LEMAN SWINE CONFERENCE 2026
19–22 SEPTEMBER, 2026
Venue : St Paul Minnesota, USA.
Website : https://lemanconference.umn.edu

EXPOMEAT–2026
22–24 SEPTEMBER 2026
Venue : Sao Paulo, Brazil.
Website : https://www.expomeat.com.br/

INTERNATIONAL PRRS SYMPOSIUM–2026
6–8 OCTOBER, 2026
Venue : Barcelona, Spain.
Website : https://iprrs2026.or

PORK EXPO MEXICO–2026
21–23 OCTOBER 2026
Venue : Aguascalientes, Mexico.
Website : http://pork-expo.org/

15TH WORLD SWINE INDUSTRY EXPO–2026
22–24 OCTOBER, 2026 | Changsha, China
Venue : Changsha International Convention & Exhibition Centre
Website : https://www.lemanchina.com/

EUROTIER–2026
10–13 NOVEMBER, 2026 | Hanover, Germany
Venue : Hanover Exhibition Centre
Website : https://www.eurotier.com/en/

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Route7
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Route8
Industry Summit
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Terminologies used in Pig Farming

Prof. R.N.S.Gowda*

Piggery (also spelled piggary) is the practice of breeding and raising domestic pigs as livestock, primarily for meat production (pork). It is a significant branch of animal husbandry that offers high growth potential due to several agricultural advantages. It is better to know the different terms used in pig farming management.

Pigs are often called as Swine, porcine, hog etc. "Pig" and "swine" both refer to animals in the Suidae family, often used interchangeably, but "pig" typically describes domesticated animals of any size, whereas "swine" is a broader, more formal, or technical term for pigs, hogs, and wild boars. "Pig" often implies a younger or smaller animal, while "swine" covers all ages, including adults.

In pig management, specialized terminology is used to describe animals by their age, sex, and reproductive status, as well as various husbandry practices.

Classification by Age and Sex

- **Piglet:** A young pig from birth until it is weaned.
- **Boar:** An intact adult male pig, typically over 6 months of age, used for breeding.
- **Sow:** An adult female pig that has given birth to at least one litter.
- **Gilt:** A young female pig that has not yet farrowed (given birth).
- **Barrow:** A male pig castrated before reaching sexual maturity, usually raised for meat.
- **Stag:** A male pig castrated after reaching sexual maturity.
- **Shoat (or Shote):** A young, unweaned, or immature pig, often weighing around 60kg.

Reproduction and Life Stages

- **Farrowing:** The act of a sow giving birth to a litter of piglets.
- **Gestation:** The pregnancy period, which lasts approximately 114 days (often remembered as 3 months, 3 weeks, and 3 days).
- **Estrus (Heat):** The period when a female is sexually receptive and ready to mate.
- **Litter:** A group of piglets born to a single sow at one farrowing.
- **Weaner:** A piglet that has been permanently separated from its mother and is eating solid food (typically around 4-10 weeks old).
- **Grower:** A pig between the weaning and finishing stages, typically weighing between 30-60 kg.
- **Finisher:** A pig nearing market weight, generally over 60-70 kg.
- **Summary Table:**

Term	Context	Primary Usage
Pig	General/Common	Young or Domesticated
Swine	Technical/Formal	All ages, often mature
Hog	Commercial	Mature/Large, meant for market
Boar	Wild/Breeding	Uncastrated Male

- **Management and Husbandry Practices**
- **Creep Feeding:** Providing highly palatable supplemental feed to nursing piglets in an area (the "creep") inaccessible to the sow.
- **Biosecurity:** Procedures designed to prevent the introduction and spread of diseases on a farm.
- **Farrowing Crate:** A specialized pen designed to protect piglets from being crushed by the sow while allowing her to nurse.
- **Rooting:** A natural behavior where pigs use their snouts to dig in the ground for food.
- **Wallowing:** Rolling in mud or water to regulate body temperature and protect skin from the sun.
- **Feed Conversion Ratio (FCR):** A measure of efficiency, calculated as the amount of feed consumed divided by the weight gained.
- **Backfat:** The depth of fat over a pig's loin, used as a benchmark for carcass quality.

Market Classification

- **sPorker:** A pig raised to a weight suitable for fresh pork, typically around 60kg.
- **Baconer:** A heavier pig raised specifically for bacon production, usually weighing between 80-100kg.
- **Cutter:** A pig whose weight falls between a porker and a baconer, often used for larger meat joints.
- All pigs are swine, but not all swine are considered pigs in casual conversation.
- "Swine" is often used to describe the entire species in a professional or scientific setting HowStuffWorks.
- "Piglet" is the modern term for a baby pig

Various Terms to Mention Pork-derivative containing Products

The term pork is not just ham or pork. There are many terms that are usually used in the list of food ingredients listed on the packaging or menu labels in restaurants. Sometimes, some eateries or packaging bear a sign that the food contains pork. But some do not include the naming of pork and replace it with the term. Thus, it is essential to know the term processed pork so as not to be fooled and accidentally eat pork.

1. Pig: a young pig, weighing less than 50kg.
2. Pork: pork in cooking.
3. Swine: the term for the whole assemblage of pig species.
4. Hog: adult pig, weighing more than 50kg.
5. Boar: wild boar/boar/wild boar
6. Lard: lard to make cooking oil and soap.
7. Bacon: sliced animal meat, especially pork.
8. Ham: meat on the pork thigh.
9. Sow: adult sow.
10. Sow milk: pig's milk
11. Porcine: something related to or derived from pigs, found in many medicines.
12. Zhūròu/Zhū : pork in Chinese.
13. Char Syu: roast pork (barbeque).
14. Cu Nyuk: pork in Khek/Hakka.
15. Dwaeji: Pork in Korean.
16. Tonkatsu: sliced pork in Japanese cuisine.
17. Tonkotsu: ramen topped with pork.
18. Yakibuta: roast pork in Japanese.
19. Nuraniku: pork in Japanese.
20. Nibuta: Japanese pork shoulder dish.
21. B2: food made from pork in Indonesia.
22. Khinzir: pig in Arabic and Malay.

Benefits of Piggery farming

- **High Feed Conversion:** Pigs are efficient at converting feed into body mass, second only to broilers.
- **Rapid Growth:** They reach market weight quickly, allowing farmers to see a return on investment in a relatively short timeframe.
- **Prolific Breeding:** Pigs have high reproductive rates, meaning a small initial herd can grow rapidly.
- **Low Space Requirements:** Piggeries can be managed on smaller plots of land compared to other livestock like cattle.
- **Diverse Income:** Profit can be generated through meat sales, selling piglets for breeding, or selling manure as organic fertilizer.

In conclusion, Pig farming involves breeding and raising pigs for meat and skin, offering high feed conversion efficiency and quick turnover, with pigs reaching market weight (50-100 kg) in 6-7 months. Success requires hygienic, well-ventilated housing, balanced nutrition, and good genetic selection to manage diseases and ensure profitability. It is essential to know and understand the various terms practically used in farming systems.

(*Former and Founder VC, KVAFSU, Bidar. Former Director IAH&VB, Bangalore, Former Prof and University head, Dept. of pathology, Veterinary College UAS Bangalore)

ARTICLE

Prevention and Control of Swine Pests

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Hog Lice (Haematopinus suis)

The hog louse is the largest bloodsucking louse infesting domestic animals. In the adult stage it is nearly 1/4 inch long. Hog lice are parasitic on swine only and will attack hogs of any age or condition. However, more prevalent in hogs living in an unthrifty condition which increases its susceptibilty for attack. This results in itching and discomfort caused during lice piercing the skin of hog to suck blood it causes animals to scratch their skin with their feet and can also to rub against feeders, posts, or any stationary objects. This ultimately causes skin to become thick, cracked, tender, and sore. Infested animals are restless, less profitable, and more susceptible to disease. A heavy infestation of lice causes a condition on the skin similar to measles. The hair cannot be removed without skinning, so hide loss and a discounted carcass can result. In addition, it is claimed that the hog louse can transmits swine pox virus among pigs, and may be a potential transmitter of other diseases such as hog cholera and eperythrozoonosis. Hog lice is obligated parasite which pass their entire life cycle on the host. Female lice attach their eggs directly to the bristles of the hog, close to the skin. Total up to 90 eggs will be laid during a 25-30-day period. The eggs hatch within 12-20 days, while the young lice or nymphs mature in another 10-12 days. The entire life cycle takes about 25 to 30 days. Hog lice are of a slate blue colour and are often overlooked because they may resemble the skin of the hog. They feed mainly on the tender areas of the skin, and are first noticed in small clumps inside the ear, or in folds of skin around the neck. They also favour areas around the upper inside surface of the legs and around the tail. These lice are most common in the winter, but can be found on animals the entire year.

MANGE

Common mange of hogs is caused by tiny mites who burrow through the skin, making thread-like tunnels up to 1 inch long. Within these tunnels, the females lay their eggs. Eggs hatch in 3-10 days and a generation can be completed in 2 weeks. These mange mites, also called sarcoptes or itch mites, are too small to be readily seen with the naked eye, but are visible through a hand lens(microscope). These mites cause severe itching, and infested animals rub vigorously. Sarcoptic mange is highly contagious and may spread rapidly through a herd of hogs by direct contact between the animals. Lesions may start on any part of the pig's body, but usually appear first on the head-around the eyes, nose, or ears. The mites are often present inside the ears and may be overlooked when the hogs are examined or treated for mange. Since infested swine scratch the first lesions with their hind feet, the next appearance of the disease is often on the hind legs. The lesions grow gradually and may spread over the whole body. The skin about the eyes, ears, and along the top of the neck and back becomes scurfy, inflamed, scabby, and eventually raw and cracked. The bristles also become stiff and stand upright, giving the animals a rough, unkempt appearance. In addition, a secondary bacterial infection may occur where the mites have burrowed; advanced lesions may attract flies to further complicate the condition. Demodectic mange mites are small, elongated mites about half the size of sarcoptic mange mites, but they are not as commonly found on hogs. When infestations do occur, they penetrate hair follicles or oil glands and cause small, hard nodules or pimples. These nodules may increase in size to about 1 inch in diameter, and often rupture, releasing a creamy-white, cheesy material. The complete life cycle is not known, but the mites require about 3 weeks to develop through three immature stages to the adult. Adults will live for 1-2 months. Initial infection begins around the nose and eyelids, then moves to the abdomen and inner thigh areas. Neither serious pruritus (itching) nor other clinical problem is usually involved with this parasite. Occasionally, the pimples become infected and an abscess develops.

Control measures for hog lice and mange

Good management practices are a must to control lice and mange population to stop disease transmission. These parasites are introduced onto a farm during introduction of new animals. Any external parasite program should start with good bio-security. All new animals brought into a herd should be quarantine ie isolated in a separate building until they can be treated for internal and external parasites as well as other disease problems. The initiation of a total herd control program can be very effective when followed strictly and continually. Such a program is composed of an initial treatment followed by a maintenance schedule. Initially, all animals in the herd should be properly treated.

If sprays are applied, a second treatment should be made 5 to 21 days following the first treatment. Also, treat all floors, walls, and equipment surfaces which come in contact with the animals with suitable disinfectant. Before treatment, be sure to remove or empty all feeders and waterers from pens if animals are to be sprayed there. After initial treatments, all sows should be routinely treated prior to farrowing. Treat piglets at weaning time and Treat boars in every 3 months. Isolate any new additions to the herd and treat before they are co-mingled with the rest of the herd. Choose suitable external parasite control product for treatment. Sarcoptic mange is generally more difficult to control and there are fewer compounds registered. Choose a product and application method that addresses your existing problem and production system. If sprays or dips are used, apply them to ensure 100% coverage of the animals. During severely cold weather, injectable, pour-on treatments or dust applications may be the best to use. Withdrawal periods, as specified on the labels, must be carefully observed because of the residue-producing potentials of these chemicals. Read the label information on withdrawal times, proper product usage and application rates. Do not over treat animals with any compound.

FLIES

Several species of flies may be present around swine facilities. House flies are the most common but the stable fly, little house fly, and mosquitos may also be present. House flies are pests primarily because of their general annoyance to swine and other animals. The stable fly, equipped with bayonet-like mouthparts for sucking blood, has an irritating bite, and several of these flies can severely hamper animal performance. Mosquitoes, which breed in standing water around hog lots and in lagoons, can also cause great annoyance to animals by their biting activities. Besides the importance of mosquitoes in disease transmission, house flies and stable flies have been implicated in the transmission of hog cholera and other human and animal diseases. Sanitation: House flies, little house flies and stable flies develop in moist manure and wet decaying organic matter of all kinds found around animal premises. No insecticide can be expected to control flies as long as breeding sites exist. A thorough sanitation program is a must to hold down fly populations in and around swine facilities. All manure, spilled feed, wet straw, and decaying plant material should be removed twice a week to break the breeding cycle of house flies and stable flies. These flies can complete a generation from eggs to adults in as few as 10 days. This can be done by spreading manure and other waste material to dry or by placing it in pits or lagoons to become liquefied. If you use a liquid manure pit, do not allow accumulations of manure above the water line, either floating or sticking to the sides, since this is ideal for fly production. For treating hogs with the listed insecticides, read and follow label directions for proper use of formulations and product chosen. Residual premise sprays should give control up to 4 weeks. Knockdown sprays, with no residual action, should be applied when flies first appear in the spring. Fly baits are most useful as a supplement to sprays. They alone cannot be expected to control fly populations. Larvicides can be applied directly on manure and other fly breeding sources; but their use should be reserved for treatment of fly breeding spots not eliminated by normal sanitation practices.

Drugs used against Lice and mitesfound on Swine

S. No.	Name of drugs	Methods
1	Amitraz	Spray
2	Coumaphos	Dust, Spray
3	Ivermectin	Injectable, Pour on, feed additive
4	Lindane	Spray
5	Malathion	Dust, Spray
6	Methoxychlor	Spray
7	Permethrin	Dust, Spray

Different insecticide used against fly on swine and their premises

S. No.	Name of drugs	Methods
1	Permethrin, Cyfluthrin	Spray (Residual)
2	Synergized pyrethrins	Sprays (Knockdown)
3	Methomyl and Imidacloprid	Baits
4	Tetrachlorvinphos and Dichlorvos	Larvicides (Treating Manure)

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Production Cycle of SWINE

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Introduction

Pork is the most widely consumed meat in the world. In the United States, approximately 50 pounds of pork are consumed per person per year. Pork production is an important component of American agriculture, with production concentrated in Corn Belt states (such as Nebraska, Iowa, Minnesota, Missouri, Indiana and Illinois) and North Carolina. Modern pork production is mostly done in enclosed buildings to protect animals from the weather, from predators, and from the spread of diseases. Over the past 50 years low prices have resulted in larger, more efficient operations with many smaller farms finding it hard to produce pigs profitably.

Wild boars domesticated in Northern Europe around 1500 B.C. mixed with smaller Asian species domesticated in China around 3000 B.C. are believed to be the ancestors of modern domesticated hogs. Hogs came to the Americas with Columbus on his second voyage in 1493, but may have also been brought to the Hawaiian Islands even earlier by Polynesians.

Swine Terminology

There are a number of terms that are unique to the swine industry and warrant definition here.

Barrow

Castrated male pigs intended for slaughter. Usually castrations are performed at a very young age (a few days old).

Farrowing

The process of giving birth to a litter of piglets.

Finishing Pigs

Barrows and gilts from approximately 120 to 150 lbs (55 to 68 kg) to market weight for slaughter.

Gilts

Female pigs intended for slaughter or breeding purposes that have not yet farrowed a litter.

Growing Pigs

Barrows and gilts from approximately 50 to 60 lbs (23 to 27 kg) to 120 to 150 lb (55 to 68 kg).

Market Pigs

Pigs that are marketed and slaughtered for pork production. Typically these pigs are slaughtered at 5.5 to 6 months of age at 200 to 300 lbs (91 to 135 kg).

Nursing

Pigs Pigs from birth until weaning and still nursing.

Piglet

A newborn pig until it is weaned from a diet of milk to an all solid-feed ration.

Replacement Gilt

Breeding female pigs that have not yet farrowed a litter; usually weigh 220 to 300 lbs (100 to 135 kg).

Roaster Pigs

Pigs of both sexes and any age marketed with the carcass unsplit and with the head intact.

Sow

A female pig that has had at least one litter of piglets.

Stags

Male pigs that are castrated at any age after reaching sexual maturity. Sexual maturity is reached at five to six months of age.

Starter or Nursery Pigs

Boars, barrows, and gilts from approximately two to four weeks of age and approximately 50 to 60 lbs (23 to 27 kg).

Breeds

More than 70 recognized or "official" breeds of pigs exist in the world. In the United States, most hogs bred for consumption are the combination of a dark breed boar bred to a white breed sow. Dark breed boars enhance the meat quality of their offspring, while white breed females are used for their ability to produce many piglets and have good maternal instincts. Some of the most common breeds are presented here.

DUROC

There is considerable color variation within the Duroc breed, ranging from a very light golden, to a very dark red that approaches mahogany. The ears should be droopy. Quick growth and maturity and heavy muscling make this a good breed for meat production.

HAMPSHIRE

The Hampshire breed was developed in the United States and is now one of the world's most important breeds. Black with a white belt over the shoulders. Hampshires are a heavily muscled, lean meat breed that are regarded by many as the best terminal sire breed for all purposes.

LANDRACE

Landrace pigs are white in color with droopy ears. They are known for having and raising large litters of piglets. Landrace are known for their long body, high percentage of carcass weight in the ham and loin, and ideal amount of fat. Landrace are prolific mothers and are exceptionally heavy milkers.

YORKSHIRE

Yorkshire pigs are also white in color, but have erect ears. They are the most common breed of swine in the United States and Canada. This is a very durable and muscular breed with a high proportion of lean meat and low back fat.

Swine Operations

Before the 1960's, most pork in the U.S. was raised in outside lots or on pasture systems. The development of slotted floors and liquid manure handling equipment, allowed producers to more easily care for large numbers of animals, and protect them from the weather in an enclosed building.

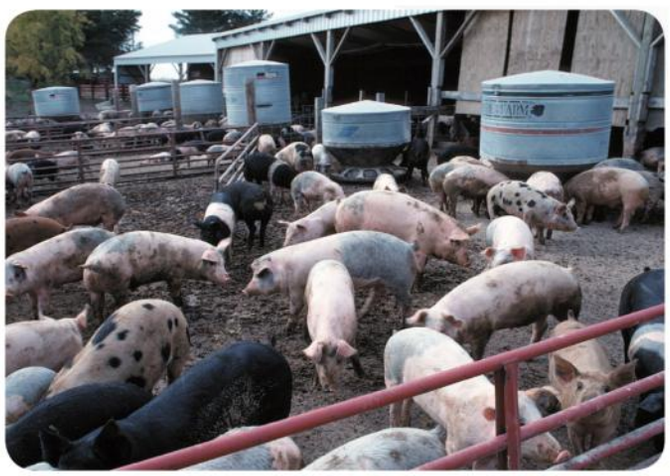
Almost all large swine operations now are total confinement operations, and these produce the majority of market hogs in the United States. The buildings have a controlled environment provided by fans for ventilation and heaters for warmth. Many of the buildings have flexible curtains on the side walls that can be opened and closed to allow for natural ventilation. In this type of system, feed intake and animal health is more easily monitored. Also, there is reduced risk of disease since there is less contact with wildlife, and between different age groups of pigs.

Outdoor rearing systems generally require less capital input, however there is lower productivity in terms of product output when compared to a confinement system. Pigs are especially susceptible to heat stress, making it necessary to provide shade structures in warm climates if rearing pigs outdoors. Farrowing huts, bedded with straw, are often used for the gestation and farrowing phases in outdoor swine production systems.

Hoop-type buildings can be used for gestating and finishing pigs. These buildings have wooden or concrete sidewalls 3-4 feet high upon which are mounted hoops that support covers. The ends of the building are left open during warmer weather.

Feeding Swine

Swine are classified as having a monogastric digestive system, characterized by a simple, glandular stomach. Humans and carnivores are also monogastrics.



In swine diets a variety of feedstuffs such as corn, barley, milo, or oats are used to provide energy, while oilseed meals (primarily soybean meal) are the major source of protein. Vitamins and minerals are also added to the feed to optimize health and growth at each stage of life. The ration is normally changed to provide more energy and less protein as the pig grows. Pig rations are usually ground or partially ground prior to mixing.

Feed can be delivered to pigs by a variety of methods and the one chosen will depend on the type of housing, availability of labor, management preference, and feedstuffs being used. In automated delivery systems, feed is delivered to pigs via feed lines and drawn from a feed bin using an auger.

This system requires a power source to get feed from the bin to the pen. Hand delivery is more labor intensive, and is usually used in outdoor rearing systems and farrowing rooms. With this method, workers monitor feed intake and delivery on an individual basis.

Identification

Ear notching is widely used in the swine industry, and involves removing V-shaped notches from the pig's ear that correspond to a specific litter number and also an individual pig number from that litter. Ear notching is used when the pig needs to be recognized separately from other pigs, such as breeding stock and exhibition animals.

Ear tags are often used in conjunction with ear notches in a breeding herd. These are typically plastic tags with numbers printed on them to identify individuals.

Slap tattoos (a temporary tattoo, usually on the shoulder of the animal) may be used when hogs are sent for slaughter. This allows the transporters and slaughter facilities to readily identify ownership of the shipment.

Record Keeping

Large confinement swine operations will utilize commercial computer software to keep track of sows and growing pig production. These software programs can generate a variety of reports that allow the manager to track individual, as well as group performance. Culling and feeding decisions are often based on performance records.

Smaller farms and outdoor swine producers will also maintain records. Written paper records are commonly observed in these situations. Breeding records and drug usage records are the information most commonly kept by producers.

Life Cycle of a Pig from Birth to Death

Over 100,000,000 swine are slaughtered annually in the United States, with the vast majority being market hogs. About 3% of the total number of pigs slaughtered consist of other classes, including roaster pigs, boars, and sows.

In large, integrated hog farms, a group of pigs will move together through the system from birth to laughter. That is, a group of sows will farrow at the same time, the piglets will be weaned at the same time, and those pigs will then move through the nursery and finishing units together. This “all-in, all-out” (AIAO) approach helps maximize production and limits disease transmission. Each room or building is completely emptied and sanitized between groups of pigs, therefore new groups of pigs enter freshly disinfected environments. The facility has a separate room or building for each group of pigs weaned. AIAO animals in each room are of a uniform age and size, and are isolated to the extent possible, to decrease the possibility of diseases spreading from older animal groups to younger ones.

Swine production is generally classified into four production phases (on large farms, each phase occurs in a separate barn, and often a separate physical location):

BREEDING/GESTATION

Historically, sows have been bred by placing a number of sows in a pen with one or more boars. Now, boars are often rotated between sow pens to make sure that all sows are bred while they are in heat. Sows come into estrous three to five days after their piglets are weaned, and are bred at this time. If the sow is not bred, she will return to estrous about 21 days later. After breeding, the sow has a gestation period of about 115 days (three months, three weeks, and three days). The goal of most pork producers is to have, on average, greater than two litters per sow per year

FARROWING

Just prior to farrowing, pregnant animals are moved to individual pens or stalls in the farrowing barn. Sows typically farrow eight to twelve piglets. A group of piglets are called a “litter.” Most confinement operations place the sow in a farrowing pen or crate which restricts her movement to protect the baby pigs. Farrowing and lactation occur in the same facilities until the baby pigs are weaned. An average sow will raise three to five litters of pigs in her lifetime.

Pigs are born with sharp teeth and curly tails. The tips of the teeth are clipped at birth to prevent injury to the sows udder and other piglets, and the tail is shortened to prevent tail biting. Piglets are weaned anywhere from five days to four weeks, with most operations weaning at two to three weeks.

NURSERY

Weaned pigs are moved to either a nursery facility or a wean-to-finish building. In either case, both weaned types of facilities may be on a separate site from the farrowing facility.

In confinement barns, the floors will be constructed from plastic or plastic covered steel, with slots to allow manure to fall through. The temperature is closely controlled, as pigs can suffer from heat and cold stress. Pigs are normally removed from the nursery at about six to ten weeks of age and placed in the finishing building.

GROW-FINISHING

Pigs are fed in the grow-finishing facility until they reach market weight of 250 to 275 pounds. The grower stage takes starter pigs from about 35 to 60 pounds to 120 to 150 pounds body weight while the finishing stage takes pigs from about 120 to 150 pounds up to 230 to 270 pounds body weight. During these stages pigs are fed specialized diets to maximize growth and achieve a target of 230 pounds body weight by 175 days of age. Marketing typically occurs at five to six months of age. At this time, gilts may be selected to become replacement sows and be moved to a breeding/gestation facility. The remainder of the market weight pigs are sent to slaughter.

LEAVING THE HERD

Market pigs are sent to slaughter at about 6 months of age, weighing 200 to 300 pounds of live weight. This represents the most common reason for leaving the herd. Sows and boars are culled from the herd due to old age, reproductive failure, poor performance (small litter size, high preweaning mortality, low birth weight), illness or injury. About one in five, to one in four, breeding age females are culled or die every year. Those that are culled are usually sold to livestock auctions or sent directly to slaughter.

Common Swine Diseases and Treatments

AIAO production in confinement barns has helped many swine farms greatly reduce the incidence of disease in their herds. There continues to be several significant infectious and non-infectious diseases that affect swine production, and a few of the more important ones are presented below.

RESPIRATORY DISEASE

Market hogs are susceptible to a variety of microbial agents that can cause respiratory infections and pneumonia including viruses, bacteria, and some parasites. Often, disease transmission is exacerbated if less than ideal environmental conditions (poor ventilation, high humidity) exist in the swine units. The most common type of treatment for respiratory infections is antibiotic therapy. Drugs used to treat bacterial pneumonia in pigs include oxytetracycline, ceftiofur, florfenicol, sulfamethazine, tulathromycin, lincomycin, and tylosin. Some of these drugs are supplied in the form of medicated feeds, injectable formulations, or both.

GASTROINTESTINAL PROBLEMS

Ileitis, bloody diarrhea, and gastric ulcers are common in market hogs. Antibiotics are used in the U.S. to help treat some of the causes of these conditions. In some cases medications are provided through feed to help control and/or treat these diseases in large groups of pigs. Drugs provided through the feed include chlortetracycline, tiamulin, tylosin, and lincomycin.

In outdoor rearing systems, internal and external parasites are more commonly encountered than in confinement barns. Parasite treatments include ivermectin, hygromycin B, levamisole, and fenbendazole. Roundworms are often seen in sows and boars, especially in those reared outdoors. Fenbendazole is an antiparasitic drug that can be administered in the feed to control infestations with roundworms.

LAMENESS

Lameness is a common reason for sows and boars to be culled from a breeding herd. While there are potentially many causes of lameness, producers may not establish a definitive diagnosis, and often will administer antibiotics such as penicillin procaine G, in the hopes that the causative agent is a bacteria that is susceptible to the drug.

PORCINE EPIDEMIC DIARRHEA VIRUS (PEDV) AND PORCINE DELTA CORONAVIRUS (PDCOV)

Recently, two new viral infections of swine have been identified in the U.S. swine population: porcine epidemic diarrhea virus (PEDV) and porcine delta coronavirus (PDCoV). Together these viruses are responsible for a condition described as novel swine enteric coronavirus disease (SECD). In suckling piglets, PEDV causes a severe disease characterized by acute watery diarrhea, vomiting, loss of appetite, and dehydration; are fatal in 50 to 80% of affected piglets. PDCoV is believed to cause a similar disease in suckling piglets. Both viruses are only known to affect swine and are not threats to public health. Efforts to develop vaccines to protect pigs against these diseases are ongoing.

Tissue Residues and Swine

Tissue residues are possible when drugs are administered in ways that are not specified on the manufacturer's label. For example, procaine penicillin G, an over the counter drug that is readily available at feed stores, is often administered at doses that far exceed those listed on the label. If a producer has not consulted with a veterinarian with whom they have a valid Veterinarian-Client-Patient Relationship, such use would constitute extra-label-druguse (ELDU) and would be illegal. Such use can result in a producer not observing an appropriate withdrawal period for the drug prior to sending an animal to slaughter, and could result in violative tissue residues of a drug being detected at slaughter. Inadequate record keeping or lack of individual animal identification may lead to an animal being sent to slaughter prior to the end of an adequate withdrawal period.

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From Backyard to Business:
Scaling Up Pig Farming Profitably

Dr. R.Selvakkumar., Ph.D.

Pig farming is becoming a promising livestock venture in India, providing both income opportunities and nutritional security. Pigs are remarkably efficient meat producers due to their high reproductive rates, early maturity, and excellent feed conversion efficiency (3:1), making them well-suited for commercial farming systems.

In recent years, the sector has experienced consistent growth fuelled by increasing demand for animal protein. India's pork consumption surpassed 317 thousand metric tons in 2024, indicating a gradual rise in market demand, especially in urban and institutional sectors like hotels and restaurants. However, despite this potential, the piggery sector in India remains predominantly unorganized and is largely characterized by smallholder backyard systems, with over 70% of pigs raised under low-input traditional practices. This reveals a significant disparity between current production methods and the escalating market demand.

Simultaneously, pig farming plays a vital socio-economic role by supporting rural livelihoods, particularly among economically disadvantaged communities, due to its low initial investment and rapid returns.

Converting backyard piggery into scientifically managed, commercial-scale enterprises can helping in

- Close the demand-supply gap
- Boost productivity
- Increase farmers' income

Potential of Pig Farming

Pig farming is recognized as one of the most biologically efficient and economically viable livestock systems. The scientific potential of piggery lies in its unique combination of reproductive efficiency, growth performance, and feed utilization capacity.

- **Reproductive efficiency:** Pigs are polytocous animals, meaning they produce multiple offspring in a single farrowing. Under proper management, a sow can produce 8-12 piglets per litter and up to 16-24 piglets annually with two farrowing per year.
- **Growth performance:** Pigs exhibit rapid weight gain and early maturity. Improved and cross bred pigs can attain a market weight of 90-100 kg within 6-8 months, depending on feeding and management. This is supported by their superior feed conversion ratio (FCR), typically ranging between 2.5:1 and 3.5:1, and this efficiency is a key scientific advantage contributing to profitability.
- **Feeding behaviour:** Pig's ability as an omnivorous and digestive-efficient animal, make nthem to utilize a wide range of feed resources, including agro-industrial by-products, kitchen waste, and crop residues, converting low-value materials into high-quality animal protein.
- **Carcass characteristics:** pigs have a high dressing percentage (65-80%), indicating a greater proportion of usable meat. Pork is also a rich source of high-quality protein, essential amino acids, B-complex vitamins, and minerals, making it valuable from a nutritional standpoint.

Transitioning from Backyard to Commercial Farming

Backyard pig farming generally consists of a small number of animals raised with limited resources. Although this method demands a low initial investment, it frequently leads to reduced productivity and unpredictable income. To expand pig farming successfully, a structured, scientific, and gradual strategy is essential. Rushing the process without adequate systems can result in losses, thus each phase should be based on the prior one.

Baseline Assessment of Existing System (To identify gaps in productivity& management)

Begin by evaluating your current backyard unit like

- Number and type of pigs
- Available housing and land
- Feed resources (kitchen waste, farm by-products)
- Access to veterinary support and markets

- **Define the Scale and Business Strategy** (Scientific planning to reduce the financial uncertainty)
  - **Decide your target:** Small commercial (10-20 pigs)/ Medium (20-50 pigs)/Large (>50 pigs)
  - **Prepare a basic business plan:** Investment (housing, animals, feed)/ Expected returns /Risk factors

Breed Upgradation (For better growth rate, higher litter size, and uniform production)

Breed upgradation in pigs means improving the genetic quality of local or non-descript pigs by introducing superior breeds (usually through crossbreeding or selective breeding).

- **Higher growth rate and body weight:** Improved breeds like Large White Yorkshire or Landrace grow faster and reach market weight earlier compared to indigenous pigs. This reduces rearing time and increases turnover.
- **Better feed conversion efficiency (FCR):** Upgraded pigs convert feed into meat more efficiently, meaning less feed is needed per kg of weight gain → lower production cost.
- **Increased litter size and reproductive performance:** Exotic and crossbred pigs generally produce more piglets per litter and have better mothering ability, improving overall productivity.
- **Superior carcass quality:** Improved breeds having higher dressing percentage, better lean meat content, less fat (preferred in commercial markets)
- **Disease resistance with adaptability (in crossbreeds):** When compared with exotic breeds crossbred pigs are having hardiness of indigenous pigs and productivity of exotic breeds.
- **Higher income and profitability:** All the above factors (growth, reproduction, meat quality) directly increase farmer income and make pig farming more commercially viable.

Scientific Housing Development

Scaling up piggery farming without upgrading housing will leads difficulties in farm routines, disease outbreaks, poor growth, and economic losses. Scientific housing management becomes the backbone of a successful transition from small-scale to commercial pig production. Hence, upgrading the housing is essential for

- Efficient space utilization
- Better feed conversion efficiency
- Reduced disease transmission
- Ease of labour and waste management
- Improved growth and reproductive performance
- **Site Selection and Layout Planning:** Space Requirements (Scientific Stocking Density): Overcrowding is a major mistake in scaling up. Hence it is important to get scientific advice from the expertise to get a clear idea about the space requirement for various categories if pigs.
- **Housing Design and Construction:** Housing design and construction including flooring, wall and roofing will always suitable to the prevailing climatic condition, geographical factors of the surrounding area as well as the stocking density.
- **Ventilation and Temperature Control:** Pigs are highly sensitive to heat stress. Hence, we should provide Natural ventilation (open-sided sheds), cooling systems (sprinklers, wallowing tanks) and fans in intensive units.
- Increasing the scale significantly raises the manure load. Proper drainage channels will effectively facilitate its removal. Additionally, the construction of biogas units and compost pits is also beneficial for managing waste efficiently.

Feeding and Watering Systems:

considering the potential for disease transmission through feeding and watering in large scale farming, it is essential to exercise the highest level of care in managing Feeding and Watering. This can be achieved by utilizing group feeders or automatic feeders, ensuring that clean drinking water is available at all times, employing nipple drinkers to minimize water wastage, and designing feeding areas to prevent competition.

Biosecurity Measures:

As the size of the farm expands, it is essential to adhere closely to biosecurity protocols by limiting visitor access, installing footbaths at entry points, utilizing distinct equipment for each unit, and quarantining new animals for a period of 2 to 3 weeks.

Specialized Housing Units:

Due to the higher stocking density, it is essential to create the special structures like farrowing pens(Protect piglets from crushing), weaner pens(Warm and draft-free),boar pens (Strong and secure) and isolation pens(For sick animals)

Labour Efficiency and Automation:

As farm size increases, we should mechanize feeding and cleaning wherever possible and design the pens in such a way for easy movement and handling of pigs

Environmental and Welfare Considerations:

Avoid overcrowding and poor ventilation, provide enrichment (chains, toys) to reduce stress and ensure humane handling and housing

Feeding System Improvement

Improving the feeding system is where many piggery farms unlock hidden profits—feed alone accounts for 60-75% of total production cost, so even small efficiency gains make a big difference. When scaling up, feeding must shift from "routine feeding" to a scientifically managed, precision-based system.

- **Phase Feeding (Stage-wise Nutrition):** Instead of one common feed, divide feeding based on growth stage of the pigs (Starter, Grower and Finishers feed)

- **Balanced Ration Formulation:** Use locally available ingredients (maize, bran, oil cakes) to prepare a nutritionally balanced ration.

- Selection of Breeding Stock (Boar & sow selection): selected Boar should be healthy, active, having good libido free from hereditary defects and also

Health Care & Biosecurity

Health care and biosecurity are where large pig farms either stay profitable—or collapse under disease pressure. As herd size increases, even a small lapse can spread infection rapidly. A scientific, preventive approach is essential.

Establish a preventive health system by strictly adhere the below steps

- Vaccination schedule
- Regular deworming
- Ectoparasite Control
- Isolation pen for sick animals
- Disinfection at entry points
- Routine Health Monitoring
- Sanitation and Disinfection

- **Reproductive & Breeding Management**

Reproductive and breeding management is the engine that drives profitability in piggery—because the number of piglets weaned per sow per year ultimately decides farm output. When scaling up, this has to move from casual mating to a planned, data-driven system.

having a good growth rate and body conformation. Selected Sow/Gilt is at least having 8-12 well-developed teats ,good mothering ability and is having proper body condition (not too fat or thin).

- **Age and Weight at First Breeding:** Gilts should be bred at the age of 7-8 months with a weight of 100-120 kg.
- **Pregnancy (Gestation) Management:** Gestation length of pig is 114 days. During this period, we should provide balanced nutrition and stress-free environment to prevent farrowing related problems.
- **Farrowing Management:** Shift sow to farrowing pen one week before expected date of farrowing in to the farrowing pen. This should be clean and having a non-slippery floor. Continuous monitoring is must to and give assistance whenever needed.
- **Piglet Care (Neonatal Management):** Provide warmth (30-32°C) to prevent the early piglet mortality. Instal farrowing crate to prevent crushing of piglets by sow. (use farrowing crate) and administration of Iron supplementation (3-5 days old) to prevent piglet anaemia and do tail docking & teeth clipping (if required).

- **Weaning Management:** Weaning age at 28-42 days is normally practised and early weaning helps in reduce sow stress and increase number of litters/year.
- **Record Keeping:** Helps in selecting high-performing animals and culling poor ones.
- **Culling Strategy:** Remove animals with poor fertility, small litter size and animals with frequent health issues.

Record Keeping System(Performance analysis and decision-making):

A record keeping system is the backbone of scientific pig farming. It helps farmers monitor performance, control costs, improve decision-making, and ultimately increase profitability. Without proper records, it becomes difficult to identify problems such as poor growth, low reproduction, or financial losses.Maintain scientific records on Feed intake, growth and weight gain, breeding and farrowing details , Expenses and income are essential for a scientific piggery farming.

Conclusion

Scaling up pig farming from a backyard activity to a commercial enterprise is not merely an increase in numbers—it is a transformation in approach. Success in this transition depends on adopting scientific management practices, strategic planning, and continuous monitoring. By focusing on improved breeds, balanced nutrition, proper housing, strict biosecurity, and efficient reproductive management, farmers can significantly enhance productivity and reduce risks.

The growing demand for pork in India presents a clear opportunity for organized piggery development. Bridging the gap between traditional practices and market needs can unlock higher income potential and ensure sustainable livelihoods, especially for rural communities. Moreover, integrating waste management and resource-efficient feeding systems further strengthens the economic and environmental viability of pig farming.

Ultimately, profitable pig farming is driven by knowledge, discipline, and adaptability. Farmers who embrace modern techniques, maintain accurate records, and respond to market trends will be better positioned to build resilient and scalable enterprises. With the right approach, piggery farming can evolve from a subsistence activity into a thriving agribusiness contributing to food security, employment, and rural development.

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Indigenous Pig Breeds of India:
Distribution, Breed Characteristics and Socio-Economic Importance

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Introduction

India possesses a rich genetic diversity in its livestock, including a varied population of pigs. These native pig breeds are primarily reared by tribal, rural, and marginal farming communities and play a significant role in livelihood security, nutritional support, and socio-cultural traditions. Fifteen indigenous pig breeds have been identified and officially recognized, with ongoing efforts to characterize the substantial population of nondescript pigs. The major population of indigenous pigs is contributed by nondescript pigs which need to be characterized. Apart from the nondescript pigs, there are 15 distinct pig breeds which have been registered as breed in the national database. These indigenous pigs of India are identified as a distinct group due to gradual domestication of wild pigs. These pigs differ in their characteristics from region to region depending on the climatic conditions and topography.

S. No.	Pig Breeds	Pig Images	State / Breeding Tract
1	Ghoongroo		West Bengal
2	Niang Megha		Meghalaya
3	Agonda Goan		Goa
4	**Tenyi Vo**		Nagaland
5	Nicobari		Andaman & Nicobar Islands
6	Doom		Assam
7	Zovawk		Mizoram
8	Ghurrah		Uttar Pradesh
9	Mali		Tripura
10	Purnea		Bihar and Jharkhand
11	Banda		Jharkhand
12	Manipuri Black		Manipur
13	Wak Chambil		Meghalaya
14	Andamani		Andaman & Nicobar Islands
15	Karkambi		Maharashtra

Indigenous Pig Breeds of India

Characteristic of indigenous Pig breeds:

1. Ghoongroo: Ghoongroo is the first recognized pig breed of India and characterized by a ompact body, folded "bulldog-like" face with an upward-curved snout and large drooping ears. These pigs are predominantly black, occasionally displaying white hooves and metapodials.

It is renowned for its exceptional reproductive performance, producing large litters averaging 11-12 piglets and sometimes up to 18 piglets per farrowing.

2. Niang Megha: A small-sized indigenous pig breed, typically black in color with erect ears, a potbelly, and occasionally a white star-shaped mark on the forehead. The Snout is medium tapering partially white at nostril, Bristle is long on midline. It is well adapted to scavenging systems and local feed resources, producing moderate litter sizes of about 5-6 piglets per farrowing.

3. Agonda Goan: A small to medium-sized indigenous pig breed, characterized by a animals are small, featuring short ears, a short snout, a pot belly, and a wild nature with rough bristles. While the predominant colour is black, some animals exhibit white patches on their legs and face. It is highly active and hardy, known for excellent maternal ability and producing lean, high-quality pork preferred for traditional sausage preparation.

4. Tenyi Vo: These pigs are characterized by a long, strong, tapering snout, small erect ears, and bright, alert eyes. It is valued for its hardiness, disease resistance, early sexual maturity, and excellent mothering ability. The Tenyi Vo pig is raised mainly for pork production in Nagaland.

5. Nicobari: Nicobari pigs are mostly black and brown, with some pigs exhibiting creamy-white, reddish-brown, or mixed black and brown colours. They have a sturdy, short and long body, with a medium to short snout and short erect ears. The tail is notable for its lack of curling. Nicobari pigs are ferocious in nature and have an average adult body weight of 63 kg.

6. Doom: A small-sized indigenous pig breed with a predominantly black in colour and have a short, concave snout, large, flat-bellied body type, short erect ears, and a straight topline with long bristles extending to the thoraco-lumbar area; it thrives under low-input scavenging or backyard systems, is highly adaptable and prolific, produces good-quality meat, and reaches about 64 kg by 12 months.

7. Zovawk: A small, pot-bellied indigenous pig breed characterized by a predominantly black with a white spot on the forehead (star) and occasionally has white patches on the belly and white boots. They have distinctive erect ears, a concave snout, a pot belly, a concave top line, and long bristle along the mid-line. The average body weight is 32.27±0.87 kg at 8 month of age while adult weighs 50 Kg.

8. Ghurrah: Also known as Deshi or Bareilly Local, they produce a peculiar sound called "Ghur," which is why they are named Ghurrah. These pigs are primarily black, though some are greyish-black or brownish. They are medium-sized with flat bellies, angular bodies, and long straight snouts. Their legs below the hock joint are white, and a thick line of hair runs from the neck to the shoulders. Adult male Ghurrah pigs weigh about 46 kg, while females weigh about 48 kg.

9. Mali: A hardy, pot-bellied indigenous pig breed with a predominantly generally black with star-shaped white patches on their foreheads. They are medium-sized with pot bellies and medium to small bristles distributed throughout their bodies. it is early maturing, highly prolific (8-12 piglets per litter), well adapted to low-input backyard systems, and attains about 70-75 kg body weight by 1-1.5 years of age.

10. Purnea: A thick line of bristles runs along the top line from the neck to the shoulders, giving the pigs a wild appearance. These pigs are characterized by round faces, short conical and erect ears, and small, thick, slightly concave snouts. Their skin is thick, with neck folds in mature animals, and they have a ferocious nature. it has a hardy, semi-wild temperament and attains an average adult weight of about 44 kg in males and 42 kg in females.

11. Banda: A small indigenous pig breed with a Coat colour is mainly black or dark grey. Distinguishing features included body covered with thick hair, specially on poll and neck, small but elongated snout, small erect ears. it is well adapted to scavenging systems, produces 3-7 piglets per litter, and attains an average adult weight of about 28 kg in males and 27 kg in females.

12. Manipuri Black: These medium-sized pigs are predominantly black, although grayish-black body coats and white patches on the extremities can also be seen. They have a medium-sized, concave, dish-shaped head, a short slightly upward-curved snout, a well-built long body with short legs, and a prominent neck. Both males and females are covered with short hair. It is valued for its flavorful meat, produces 6-11 piglets per litter, and attains an average adult weight of about 96 kg in males and 93 kg in females.

13. Wak Chambil: These pigs are small, predominantly black and white in colour, and possess well-built, compact body structures with short limbs. They have small heads, small eyes, medium snouts, small erect ears, and small hooves that touch the ground less frequently. These pigs have a smaller body size, attains an adult weight of about 25-35 kg, an adequate growth rate and lower litter performance compared to other indigenous pigs of the northeastern region.

14. Andamani: They are sturdy, medium-sized pigs that are black or brownish in colour. They have short to medium snouts and short, upward-erected ears. The most commonly observed feature is a slight downward arch or curvature of the back. adult weights of 55-75 kg, and litter sizes ranging from 6 to 13 piglets.

15. Karkambi: A predominantly black-coated indigenous pig breed, well adapted to low-input rural farming systems and valued for its resilience and ability to thrive in tropical, humid environments.

Conclusion:

India's native pig breeds are a significant part of the nation's animal genetic diversity, showing adaptation over centuries to various environments and traditional farming methods. These breeds are known for their robustness, resistance to illness, effective use of local feed, and suitability for low-resource farming, thus playing a crucial role in the livelihoods of tribal, rural, and smallholder farming populations. The choice of pig breed should be based on local climate, feed availability, and market requirements. While commercial breeds are selected for fast growth and lean meat production, indigenous breeds are valued for their better disease resistance and ability to tolerate heat. The most effective approach usually combines local adaptability with exotic performance traits.

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