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A REVIEW ON THE ECONOMIC POTENTIAL, BREEDING PRACTICES, AND CHALLENGES IN PIG FARMING IN INDIA

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ABSTRACT

The farming of pigs in India has become an indispensable component of the agricultural environment, exhibiting significant development potential and making substantial contributions to the country's socioeconomic terrain. This review article underscores the economic potential and its economic impact in India, as well as the challenges associated with pig husbandry, including breeding practices and management. Lack of high-quality germplasm, the endemic character of porcine diseases and the swine agricultural associations lack a unified representation etc. We gathered the data for this paper from government libraries, reports, and published papers. Pig farming in India has the potential to increase the supply of animal protein, employment, and rural livelihoods, according to the findings of this paper. The diversified climate and biodiversity bolster regional agriculture, supporting both indigenous and foreign pig varieties. However, a variety of factors, such as inadequate veterinary care, inadequate infrastructure, socio-cultural obstacles, and exorbitant feed costs, impede expansion. To completely realize its potential, we require government measures, corporate sector involvement, and financial aid.

Keywords: - Pig farming, breeding, economic potential etc.

INTRODUCTION

Pig farming in India has seen a notable transition in recent decades, becoming a substantial component of the nation's agricultural sector. The pig farming sector, with a profound historical foundation in traditional techniques, has experienced significant modernization and technical progress, establishing itself as a profitable and sustainable industry. The diversified geographical topography and variable climatic conditions of India have enabled the proliferation of pig farming in several places, thereby enhancing the nation's agricultural portfolio. This emerging business is essential in meeting the increasing demand for pork and

its by-products, both nationally and globally. Pig farming, primarily viewed as a small-scale and backyard endeavour, has increasingly attracted commercial farmers, and the formation of modern pig farms utilizing advanced breeding methodologies and effective management strategies [1]. Furthermore, the sector's role in supporting rural lives, generating employment, and empowering underprivileged groups, especially women, underscores its socio-economic importance. As India investigates options for sustainable agriculture and food security, pig farming emerges as a viable sector with significant untapped potential for expansion and advancement.

Pig farming in India exhibits a varied geographical distribution, with notable concentrations in regions like Punjab, Haryana, Kerala, and the north-eastern area. Different pig breeds, such as local types like Ghungroo and Banmpudke, along with various crossbreeds, are raised in specific areas, each adapted to particular weather and farming methods. The sector has transitioned from traditional backyard operations to commercial pig raising, characterized by modern facilities and enhanced managerial techniques [2][3]. Furthermore, we can discuss the piggery farming and its economic potential, breeding practices along with challenges that are facing in piggery farming in India.

ECONOMIC POTENTIAL OF PIGGERY FARMING

Pig husbandry has made substantial strides in India since its introduction in the 20th century. The breeding and genetics of pigs, the formulation of high-protein and energy-balanced diets with modern technology, and the management of piggery units with environmental considerations and details have all improved significantly. There are around 13.30% of the entire population of the globe that is comprised of pigs, which are approximately 12.79 million according to the livestock census conducted in 1992 and 13.291 million according to the provisional result of the census conducted in 1997 from the states. Annexure I has a description of the pig population broken down by state. In 1995, the total amount of pork that was produced was 4.20 lakh tons [3][4]. In the years 2001-2002, it was projected that the output of pork and pork products was 612,550 metric tons, representing a growth rate of 3.03% over the previous decade. The percentage of piggery meat that India produced had a moderate growth from 0.53% in 1981 to 0.63% in 2002, indicating that it now accounts for

more than 38% of the entire world meat product [5]. Pig products account for 0.80% of the total livestock products and 4.32% of the meat and meat products. This means that pig products contribute 0.80% of the entire value of animal products. India's pig exports are minimal. Between 1995 and 1996, around 934 tons of pork and pig products were sent out of the country. On account of the entire value of meat and meat products shipped, the value of pork and pig products exported is Rs. 262 lakhs, while the total worth of meat and meat products exported is Rs. 61604 lakhs [6].

Pig farming is the means of subsistence for rural poor people who belong to the lowest socioeconomic strata. However, these individuals lack the resources necessary to engage in scientific pig farming, which would need enhanced foundation stock, appropriate housing, housing management, and management of the animals. Consequently, to modernize the Indian pig industry and to increase the productivity of small-sized rural pig farms, it is required to implement acceptable programs that will promote the scientific breeding of pigs and the raising of animals that produce meat. These programs should also include adequate financial considerations [7].

In light of the significance of pig farming in terms of its contribution to the rural poor and the potential for pig rearing in our nation, the Government of India has launched efforts to promote pig farming on scientific lines as part of its five-year plans. These actions reflect the importance of pig farming. The creation of eight bacon factories and the organization of pig production in rural regions that are connected to bacon manufacturers is the first step in the direction of this strategy. Each bacon manufacturer was given the responsibility of establishing regional pig breeding facilities in order to ensure that they had access to high-quality foundation stock [8]. As a continued expansion of pig breeding programs, 115 pig breeding farms were established around the country during the years 1992 and 1993.

BREEDING PRACTICES OF PIG FARMING

Breeding management is essential for the success of pig farming enterprises, as it guarantees the generation of high-quality piglets that fulfill market requirements. Given the rising demand for pig products in India, it is imperative for farmers to use appropriate breed management practices to optimize earnings and foster sustainable industry growth [9]. This

technical bulletin will address several facets of breed management, encompassing the selection of breeding stock, breeding methodologies, estrus detection, optimal time of mating, and genetic enhancement.

The selection of breed is a crucial task for farmers. The productivity of a farm relies on both foundational stock and managerial practices. The breeding stock must have a large litter size, robust strength and vigour of offspring, excellent maternal instincts, temperament, and efficiency in grain and feed use of the progeny.

A. Indigenous breeds of pigs

BREED	CHARACTERSTICS	References
Ghungroo	This breed of pigs is found in North Assam, Jalpaigui and Cooch Behar in West Bengal, and close to the Indo-Nepal border. Animals are mostly black in color and have a bulldog face shape. The local people like this species because of its outstanding prolificacy, good mother instincts, mild temperament, and ability to survive on minimal resources.	[10]
Jovaka	This breed is found in Mizoram and Manipur. Animals exhibit a small, compact physique with lengthened limbs, reaching a weight of around 40 to 50 kg at maturity.	[11]
Ankamali	This breed is found in the states of Kerala, Karnataka, Maharashtra, and Tamil Nadu. This breed often has a coat color varying from black to brown, possesses a small physique with extended limbs, and attains a mature weight of 40 to 50 kg.	[12]
Desi	It is found in every state of India. Animals have a coat color varying from brown to black, feature a short, robust body with lengthened limbs, and reach a weight of between 40 and 80 kg upon maturity.	[13]

B. Exotic breeds of pigs

Various exotic pig breeds are present in India, including:

BREED	CHARACTERSTICS	References
The large white Yorkshire	It is the most frequently employed extraterrestrial species in India. This breed is distinguished by a white coat adorned with intermittent black dots, erect ears, a medium-length snout, and a concave facial configuration. The weight of an adult human body ranges from 300 to 500 kg.	[14]
Middle White Yorkshire	This breed stands out with its white coat, elongated muscular neck, and extended back. Its adult body weight ranges from 270 to 360 kg.	
Landrace	This breed of pigs is typically white with black skin spots. They have an elongated body, prominent drooping ears, and an elongated nose. The adult body weight ranges from 250 to 350 kg.	[15]
Berkshire	They are black entities, adorned with white patterns on their extremities, snout, and caudal appendages. The breed is characterized by a small head, a concave face shape, and a saucer-shaped body with flexible ribs. The weight of an adult body ranges from 280 to 350 kg.	[16]
Hampshire	The animals are black with a white pattern that extends from the forelegs to the shoulders. A petite and compact physique, as well as diminutive and vertical ears, is typical characteristics. Sows possess exceptional maternal instincts.	[16]

C. Crossbreds

Within the framework of the All India Coordinated Research Programme (AICRP) on Pigs, breeding programs were established to produce the subsequent genotypes/genetic groups:

- Enhanced indigenous swine
- Crossbreds exhibiting a 50:50 genetic contribution from Landrace and indigenous swine
- Large White Yorkshire crossbreeds possessing 50% indigenous lineage.
- Crossbreeds including 75% Large White and 25% indigenous lineage.
- Landrace crossbreeds with 25% indigenous ancestry.
- Hampshire crossbreeds with 25% and 50% indigenous genetic contribution.

Landrace and indigenous half-breeds resulting from reciprocal crossings Currently, AICRP centers on pigs adhering to a breeding strategy to sustain crossbred animals with 75% exotic heritage. The Mega Seed Project on Pig and the AICRP on Pig, executed by the National Research Centre on Pig, facilitate a consistent provision of high-quality pig germplasm and conduct location-specific research on pig nutrition and breeding across India [17].

Breeding management – North east India case study

The economics of piggery farming are significantly impacted by breeding, which is an essential element. The majority of farmers, which accounts for 84% of the total, raise crossbred pigs because crossbred pigs have superior growth and reproductive performance compared to native pigs. In Indian North east Districts with hilly and undulating topography, such as Dhalai (23%) and Tripura (north) (25%), have a higher percentage of indigenous pigs in their populations than districts with plain topography, such as Tripura (west) (6%) and Tripura (south) (12%). It is possible that the preference for indigenous pigs in regions with steep and undulating terrain is related to the fact that there is a lower supply of feed resources that are proportional to the relatively lower feed requirements of indigenous pigs. A majority of farmers, 75%, raise pigs for the goal of fattening them, whereas just 25% do so

for the purpose of breeding [18]. The vast majority of farmers, seventy percent, bred their pigs once they had reached the age of one year, all of them using natural service.

CHALLENGES IN PIGGERY FARMING

In India, Pig farming has obstacles like disease control, feed accessibility, and marketing limitations. Outbreaks of diseases such as swine fever and African swine fever have resulted in economic losses and affected the stability of the business. Challenges related to feed procurement and quality continue, requiring the implementation of sustainable methods and the utilization of locally obtained components. Deficiencies and escalating costs of vital feed components, such as maize and soybeans, are additional concerns. Government regulation and environmental issues are intensifying, leading to rising costs in global pig farming associated with waste management and ecological considerations.

Lack of high-quality germplasm: The majority of India's pig population is of the native variety, which has a slow rate of development and low productivity. It is important to remember, nonetheless, that these breeds are highly suited to the severe temperature, inadequate diet, and tropical illnesses [19]. Because of careless breeding and breed mixing, a sizable portion of the nation's pig population falls into the nondescript group. The underutilization of these native animals' genetic potential and the lack of emphasis on breeding animal selection are the reasons for their low output [20]. The frequent intermixing that occurs between these breeds may also be partly to blame for this.

The endemic nature of pig illnesses: Three main pig diseases, namely the foot-and-mouth (FMD) virus, PCV, and CSF, are prevalent in India. In the recent past, India has also documented incidences of two illnesses that require notification, namely ASF and PRRS [21]. The government gives the producers the FMD vaccination for free. Currently, there are no PRRS, PCV, or ASF vaccines in the country, and only a few CSF vaccines. Additionally, India has a very small number of semi-governmental and commercial animal vaccination producers [22].

Farm managers and assistant veterinarians frequently have low levels of appropriate training and competence (those with skills, experience, and education). Even on farms with

substantial development and investment, this is a significant issue. In a similar vein, relatively few state veterinary labs are able to provide pig farmers with services in the fundamental fields of epidemiology, microbiology, and pathology. The severity and length of disease outbreaks, as well as the general degree of knowledge and training that farmers have access to, are all impacted by this inadequate diagnostic capacity [23].

Lack of a unified representation for pig farming associations: This has several consequences. For example, there is no clear voice at the state or regional level on the need for suitable facilities for pig production, marketing, and veterinary laboratories, and only government administrators look at the typical figures for farm costs and requirements. Furthermore, separate, approved training programs centered on farm management and disease prevention strategies would be made easier by a single voice. Pig farming across the world is hampered by shortages and growing costs of these essential feed materials, as maize and soybeans are mostly used for human consumption or diverted to the manufacture of biofuel. On a global scale, pig farming is also impacted by increased government regulation, rising waste disposal costs, and potential environmental issues [24].

CONCLUSION

We conclude that the raising pigs in India offers a fantastic chance to meet the growing need for animal protein, boost rural areas' standards of living, and provide employment possibilities. The nation has been able to promote the development of both local and foreign pig breeds, each of which has made a unique contribution to the agricultural economy of the different areas due to its variable temperature and outstanding biodiversity. Moreover, exotic breeds promise faster development rates and greater productivity, so their inclusion in scientific breeding programs is rather crucial. Although exotic breeds ensure better development rates, local breeds offer adaptability and tolerance to disease. Notwithstanding enormous potential, the sector still faces several challenges, including limited access to veterinary care, a lack of knowledge among farmers, inadequate infrastructure, and socio-cultural barriers. Further elements hindering the company's growth are limited market links, high feed prices, and economic constraints. Nonetheless, there have been various initiatives to address these issues, including government actions, business sector increased interest, and the availability of financial aid

programs. To fully realize the economic potential of pig farming in India coordinated efforts in scientific breeding, disease control measures, feed quality, and robust market ties must be pursued. Not only would the empowerment of farmers via training and capacity-building activities, especially in the northeastern and tribal regions, aid in the rise of output, but it will also assist in constructing inclusive rural communities. With the right help, poultry farming might grow from a side industry into a major part of India's cattle market.

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