Phenotypic Characterization and Production Performance of Thai Native Samae Dam Chicken (*Gallus gallus*) for Conservation and Learning in Uthai Thani Province, Thailand

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Abstract

This research aimed to establish learning centers and a breeding network for the Samae dam chicken (*Gallus gallus*) in Thailand. The study recorded phenotypic characteristics and production efficiency and promoted sustainable self-reliance among local farmers. The data were analyzed using SPSS version 16 (alpha reliability coefficient 0.80). The breed's physical characteristics were comprehensively recorded, revealing specific factors such as black color in males (beak, legs, nails, wing/tail feathers) and small black feathers in females. Production data showed that hens had an egg weight of 45-50 g, chicks had a chick weight of 35-40 g at birth, a hatching rate of 60-100%, and a hatching mortality rate of 30-40%. An 8-month growth study showed that males had a body weight of 3,700±95.00 g with a growth rate of 16.65±3.87g/day (FCR 4.35±0.42), while females had a body weight of 2,600±78.50 g with a growth rate of 13.33±3.38 g/day (FCR 4.26±0.40). Farmer participation was essential to the success of the Samae Dam chicken (*Gallus gallus*) conservation network. The research used quantitative analysis questionnaires. Over 30 farmers from three districts improved their skills in chick rearing, disease prevention, and farm management through the learning center. Knowledge sharing and breeding stock exchange strengthened the local network. Using local feed ingredients and simple breeding methods reduced production costs by 10–15%. Farmers became more confident and willing to transfer knowledge, reflecting the learning center's long-term sustainable impact.

Keywords: Conservation and Learning, Phenotypic Characterization, Samae Dam Chicken (*Gallus gallus*), Uthai Thani Province, Thailand

Introduction

The persistence of biodiversity within the agricultural sector is the most fundamental pillar supporting global food security and the resilience of agro-ecological systems. Thai Indigenous Chickens represent one of the most vital animal genetic resources in Thailand, holding significant economic, social, and cultural value that stretches back centuries. In particular, the Samae Dam Chicken (*Gallus gallus*) is a specific breed deeply intertwined with Thai history and the way of life, dating back to the Sukhothai and Ayutthaya periods. Historical references to its strength and majestic appearance in local legends underscore the breed's historical value to Thai society. However, driven by economic development and the modern global agricultural industry, which prioritizes increased volume and productive efficiency (Mass Production), there has been a dramatic promotion and import of hybrid chicken breeds (Amnuay et al., 2009; Hata et al., 2021; Loengbudnark et al., 2024). These commercial strains offer superior growth rates and high yields of meat and eggs, creating intense pressure on the survival of true native chicken breeds. Currently, the true Samae Dam Chicken is facing an existential crisis, perilously close to extinction. It is now rarely found in its original habitats in the central regions (such as Ayutthaya, Ang Thong, Sing Buri, and Uthai Thani). The primary cause is uncontrolled cross-breeding with commercial varieties, leading to the dilution of the pure Samae Dam gene pool (Amvuay et al., 2009; Budi et al., 2023; Supawadee et al., 2001). The loss of the Samae Dam genetic resource is not merely a biological depletion; it signifies the erosion of an economic and social cornerstone for local communities. Critically, these native genes possess unique characteristics—such as resilience to hot and humid climates, adaptability to the free-range system, resistance to endemic diseases, and distinct meat quality—that are essential for building a sustainable and climate-resilient food production system. This necessity is directly aligned with the United Nations' Sustainable Development Goals (SDGs). Therefore, the conservation of the Samae Dam Chicken is a national priority that is intrinsically linked to food security and the preservation of invaluable genetic heritage (Amnuay et al., 2009; Rosenberg et al., 2001; Guni & Katule, 2013; Budi et al., 2023).

Gaps in Past Operations and the Lack of Academic-Community Mechanism Integration. Over time, conservation efforts for native chicken breeds have often operated in isolation, creating a significant divide between the academic sector and practical community initiatives. Most research has been concentrated on theoretical and biological studies, such as comprehensively recording the breed's phenotypic characteristics (e.g., egg weight of 45-50 g,

hatching rate of 60-100%, but critically, a high early-stage mortality rate of 30-40%) and analyzing its genetic diversity and production efficiency under controlled settings (Atcharat et al., 2016) However, these academic findings have largely failed to translate effectively into sustainable, practical implementation at the community level. (Carlsson, 2008; Atchsrat et al., 2016; Kinghorn & Kinghorn, 2023; Department of Livestock, 2021; Guni & Katule, 2013; Wiyabot & Kiattinarueyut, 2023). This failure has resulted in several critical Implementation Gaps: Knowledge and Technology Deficiencies at the Grassroots Level: A majority of farmers raising the Samae Dam Chicken still lack the correct understanding of the principles of purebred selection and proper maintenance. Farm management often relies heavily on personal experience and local wisdom, which may not align with modern scientific methods, particularly in nutrition and animal health management (Kinghorn et al., 2023). Farmers face high production costs due to reliance on expensive industrial feed and face risks from the inappropriate use of antibiotics, negatively impacting both consumer safety and ethical farming standards (Amvuay et al., 2009; Laenoi & Buranawit, 2019; Kinghorn and Kinghorn, 2023). Economic and Market Instability: Although native chickens command a premium price in specific market segments compared to industrial poultry, small-scale farmers lack robust networking and collective bargaining mechanisms. This absence results in limited bargaining power, inconsistent access to stable marketing channels, and an inability to fully develop Value-Added Products that could target specific niche markets and maximize economic returns (Kinghorn and Kinghorn 2023). Lack of Concrete Community Mechanisms: Previous attempts at farmer collaboration have often been informal, lacking structural support, consistent academic guidance, and linkage to governmental policies. This structural deficit prevents the formation of concrete and sustainable community mechanisms capable of serving as a central hub for knowledge management, resource administration, and consistent quality control (Amvuay et al., 2009; Laenoi & Buranawit, 2019). These critical gaps clearly demonstrate that the conservation of the Samae Dam Chicken cannot be achieved through purely scientific research alone. It requires the establishment of a robust learning and management system that successfully integrates academic knowledge with active community participation and capacity building through strong, formal networks.

The Role of the Participatory Learning Center and Network: A Path to Sustainable Self-Reliance. To effectively address the identified implementation gaps and establish a sustainable system for production and conservation, this research posits a core strategy: the establishment

of a Learning Center and Breeding Network for the Samae Dam Chicken in Thailand, with a focus on Uthai Thani Province as a pilot area with high potential and engaged farmer groups. This proposed mechanism holds several crucial roles: 1) Serving as a Hub for Two-Way Knowledge and Technology Transfer Christopher et al. (2022). The Learning Center will function as a practical, on-site laboratory where farmers engage in Learning by Doing. It will prioritize the transfer of practical, relevant academic knowledge directly addressing community needs: Enhancing Sustainable Production Efficiency, Promoting Organic and Sustainable Farming, and Technical Conservation Management. 2) Building a Participatory Network and Governance Mechanism The establishment of a network is essential for creating the collective strength (Synergy) necessary for sustainable conservation and development, driven by principles of farmer ownership and leadership: Utilizing Participatory Approaches and Brainstorming Techniques, Connecting the Network for Economic Security and Fostering Institutional Cooperation.

Achieving Sustainable Self-Reliance through the Sufficiency Economy Philosophy. The ultimate goal of establishing the Samae Dam Learning Center and Network is to foster Sustainable Self-Reliance—a concept deeply supported and aligned with the Sufficiency Economy Philosophy (SEP) as espoused by His Majesty King Bhumibol Adulyadej the Great. This project applies the three core principles of SEP to the farmers' livelihood: Moderation (Pho Praman) in Production and Investment, Reasonableness (Mee Hetphon) in Farm Management, and Self-Immunity (Mee Phum Khumkan) to Risks. The establishment of the Learning Center and Network is, therefore, a crucial mechanism for translating academic knowledge (hard science / soft skills) into practical social and economic action (Soft Skill and Social Economy). This will systematically enhance farmers' quality of life, establish secure livelihoods, and, simultaneously, ensure the permanent conservation of a valuable national genetic heritage. (Laenoi & Buranawit (2019)

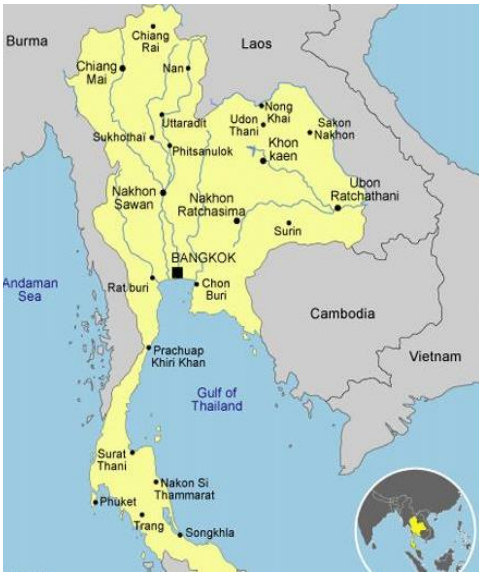

Figure 1 Shows the location of Thailand

Figure 2 Shows the location Uthai Thani province of Thailand

This research was designed not only to study the biological and production performance of Samae Dam chickens but also to establish a community-based learning center and breeding network aimed at promoting local self- reliance. The project emphasized participatory learning, where farmers could apply scientific knowledge to improve productivity, reduce dependence on external inputs, and preserve the native chicken breed as a sustainable local resource.

Research Objectives

1 . To study the external characteristics and production efficiency that are relevant to the conservation of the Samae Dam chicken (*Gallus gallus*) breed.

2. To establish learning centers and a breeding network for Samae Dam chicken (*Gallus gallus*) farming to promote sustainable self-reliance.

Methodology

To study the external characteristics and production efficiency that are relevant to the conservation of the Samae Dam chicken (*Gallus gallus*) breed. The research employed a mixed- methods approach, combining quantitative data on chicken performance with qualitative data on farmer participation. The process involved the establishment of three pilot learning farms, the organization of training workshops, and the evaluation of knowledge

transfer effectiveness among 30 participating farmers. Data collection covered attendance, farm management practices, and collaboration within the breeding network.

To establish a learning center and network for Samae Dam chicken (*Gallus gallus*) farming to promote sustainable self-reliance. Establish a learning center and a network of Samae dam chicken (*Gallus gallus*) breeders to collect information on the conservation of Samae dam chickens (*Gallus gallus*) in Uthai Thani province. Learning Center Establishment Process: The area selected for establishing the learning center was based on the farmer's readiness, accessibility, and potential for demonstration. The process included: (1) Planning and Coordination: meetings with local stakeholders, selection of pilot farms. (2) Training: three training sessions per year on selective breeding, feed formulation, and disease prevention. (3) Implementation: setting up demonstration plots and conducting on-farm trials. (4) Advisory and Monitoring: regular field visits every two months by university and livestock officers to provide guidance and assess progress.

The Samae Dam Chicken Learning Center was established through collaboration among Nakhon Sawan Rajabhat University, the Department of Livestock Development, and local farmers in Uthai Thani Province. The center's establishment followed three main stages: (1) Planning and coordination – organizing meetings with local stakeholders and selecting demonstration farms based on readiness and farmer interest. (2) Implementation – setting up standard breeding pens, feed management systems, and record-keeping tools. (3) Monitoring and knowledge dissemination – conducting monthly follow-ups and training workshops focusing on sustainable breeding, disease prevention, and farm management aligned with the Sufficiency Economy Philosophy.

Role of the Learning Center in Knowledge Transfer: The learning center served as a hub for knowledge exchange between researchers and farmers. Training activities were organized quarterly, covering topics such as selective breeding, feed formulation from local resources, and chick management. Demonstration plots and on-farm visits were conducted to promote hands-on learning. Farmers were encouraged to record production data, which was later discussed collectively to identify best practices.

This trial was reviewed through funding, animal ethics, a committee for scientific work, and experimentation of Nakhon Sawan Rajabhat University, under the same project, IACUC No. 202006.

Research tools

The research employed structured questionnaires, field observation forms, and farm record sheets as data collection tools. The questionnaires contained both closed- and open-ended questions covering socio- economic data, production performance, and farmer participation. The instruments were validated by three experts (IOC > 0.80) and tested for reliability using Cronbach's Alpha (0.80). Data collection took place from January to December across three districts of Uthai Thani Province: Sawang Arom, Thap Than, and Nong Khayang. Quantitative analysis tools included questionnaires used to collect information and measure various characteristics. The sample consisted of closed-ended questions and open-ended questions on personal fundamentals. The sample consisted of 30 farmers who were purposively selected based on their experience (at least two years) in Samae Dam chicken farming and willingness to participate in the learning network. The selection criteria included readiness of the farm, accessibility, and commitment to data recording and collaboration.

Statistical analysis

Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to summarize farmer demographics, phenotypic characteristics, and production data. The t-test and One-way ANOVA were applied to compare production performance between sex and age groups. The Correlation Coefficient was used to examine relationships between physical traits and production efficiency. The Stepwise Regression Analysis identified the most influential factors affecting growth rate, survival rate, and FCR.

A computer analyzed the data collected from the questionnaire. All the returned data were analyzed according to the research objectives using the computer statistics program SPSS version 16. The statistics used in the calculation are the Alpha-reliability coefficient, which finds the reliability at the questionnaire's confidence level of 0.80, which is considered very good. The questionnaire is reliable. Number of frequency (Frequency) Percentage (Percentage) Arithmetic mean (Mean) Standard deviation (SD) T-test One-way Analysis of Variance (One-way ANOVA) Method of testing to analyze the relationship between independent variables or dependent variables Stepwise-Regression Correlation Coefficient

Results

Data preservation of Samae Dam Chicken (*Gallus gallus*) breed in Uthai Thani Province. Native chicken breeds in Thailand in birds. The scientific name is Gallus domesticus. It belongs to the bird family Phasianidae. Zoologists have arranged chickens in the animal kingdom in *Order Galloformes, Suborder Galli, Family Phasianidae, Subfamily Phasianinae, Tribe Phasianidac, Genus Gallus.*

To study the external characteristics and production efficiency that are relevant to the conservation of the Samae Dam chicken (*Gallus gallus*) breed.

The development and technology transfer for local production of Samae Dam Chicken (*Gallus gallus*) in Uthai Thani Province, Thailand, by studying the diversity of phenotypic characteristics in the rearing system. The results of the survey showed that a variety of quantitative aspects of male and female chickens such as Eyelet Color (EC), Beak Color (BC), Comb Color (CC), Necklace Color (NC), Wings Feather Color (WFC), Back-Necklace Color (BNC), Tail Feathers Color (TFC), Shank Color (SC), Nail and Foot Color (NFC) and Spur Color (SC) as shown in figure 3

Figure 3 Show the black chicken (*Gallus gallus*) breed

General characteristics of the Samae Dam chicken (Gallus gallus) General characteristics of the breed of chickens of Samae Dam chicken (*Gallus gallus*) breed found that males of Samae Dam chicken (*Gallus gallus*) breed are as follows: chicken shape, length, and width, parallel dorsal lines, reddish-black head, crest are small and large, with a blackish tint, red, eyes black, prominent convex, mouth black, with ditches, necklace feathers, tamarind on a back necklace, body size large, sternum lengthened, chest full, abdomen deep, full, wings

necklace red wings, tamarind, black wings, wings upright, black tail, about 60 cm long, black shin, thick, stable ridge, black nails, long black spurs, hard black scales and shiny black feathers that are exposed to light-green color as shown in Table 1. For the female Samae Dam chicken (*Gallus gallus*), the breed's characteristics are as follows: The chicken shape is long and wide, blackhead, long skull, the crest is entirely black, small size, necklace feathers, black padauk. Slightly, the size of the body is larger than the male; the wings are erect, and the tail is shorter than the male. Without a funnel tail, the spur is short, convex, and covered with shiny black hairs, as shown in Table 1.

Table 1 Summarizes the general characteristics of the cock and hen of the Samae Dam chicken (*Gallus gallus*) breeding

Characterization	Samae Dam chickens (*Gallus gallus*) breeding	
	Cock	Hen
Shape	Length, width, dorsal lines parallel	length, width
Head	Reddish-black	Black head, Long skull
Crest	Small and large, reddish black in color .	Completely black in color, small in size.
Eyes	Black, prominently convex	-
Mouth	Black and has slits.	-
Feather necklace	Padauk color, tamarind seed on the back necklace, a little black	-
Size of Shinyody	Large	Smaller than the male.
Back	Large sheet	-
Sternum	Long and elongated.	-
Chest	Full	-
Abdomen	Deep and full	-
Wings	Red wing necklace, black tamarind wings	Wings set wings erect, Reddish brown
Tail	About 60 cm long	shorter than the male, No funnel tail
Shin	Black has a thick, stable ridge	-
Nail	Black	-
Spur	Black, Long	Short, Convex
Hard scale	Black	-
Hair	Shiny black when exposed to light will turn green shiny	Hair covering the ear holes, Black.

The general production data of the Samae Dam chicken (*Gallus gallus*) breed found that the father and mother of the Samae Dam chicken (*Gallus gallus*) had egg weight and chick weight. At birth, the average number of eggs per set, number of hatchlings per set, hatching rate, and mortality during hatching were 45-50 g/embryo, 35-40 g, 8-10 groups, 6-7 birds/set, 60-100% and 30-40%, respectively. The weight of the first breeding hen, the importance of the hen at first egg, the chicken age at first mating, mating ratio male: female, and maturity weight were 2.80-3.40 kg, 2.6 kg, 32-36 weeks, 1:4, and 2.60-3.70 kg/head, as Table 2.

Table 2 General production data of Samae Dam chicken (*Gallus gallus*) breeds

Production Data	Samae dam chicken (*Gallus gallus*) breeds	
	Cock	Hen
Egg weight (g/egg)	45-50	45-50
Chick's birth weight (grams)	35-40	35-40
The average number of eggs per batch (set)	8-10	8-10
Number of hatchlings per set (heads/sets)	-	6-7
Hatching rate (%)	-	60-100
Mortality during incubation (%)	-	30-40
Weight chicken breeding first (kg)	3.40	2.80
Weight chicken eggs first bubble (kg)	-	2.6
Age of first breeding chickens (weeks)	32-36	32-36
Mixing ratio (male: female)	1	4
Mature weight (kg/head)	3.70	2.60

Note: Higher mean scores represent higher observed levels of each parameter. For positive traits (e.g., hatching rate, survival rate, body weight), a higher score indicates better performance, while for negative traits (e.g., death rate), it indicates a higher incidence that requires management attention.

The results show that the overall mean score was 4.37 (SD = 0.20), interpreted as "most," indicating that the farmers generally perceived the post-hatching performance of Samae Dam chickens as high. Among the parameters, chick width ($\bar{x}$ = 4.90, SD = 0.30) received the highest score, suggesting that the chicks exhibited strong and healthy body conformation.

Chick height ($\bar{x}$ = 4.56, SD = 0.50) and survival rate ($\bar{x}$ = 4.46, SD = 0.67) were also rated very high, reflecting good growth and adaptability after hatching. However, the death rate ($\bar{x}$ = 4.46, SD = 0.61) requires careful interpretation. Unlike other traits, a higher score for this variable indicates a greater incidence of mortality, which should be addressed through improved health and management practices. Color of the chicks ($\bar{x}$ = 3.76, SD = 0.55) was rated slightly lower, implying variation in plumage color among farms, possibly due to crossbreeding or environmental factors as Table 3.

Table 3 Shows the data on the post-hatching efficiency of Samae Dam chicken (*Gallus gallus*) farmers

Performance after hatching	$\bar{x}$	S.D.	meaning
Hatching rate	4.42	0.78	most
Survival rate	4.46	0.67	most
Death rate	4.46	0.61	most
Body weight	4.40	0.69	most
Chick height	4.56	0.50	most
Chick width	4.90	0.30	most
Color of the chicks.	3.76	0.55	very
Feather characteristics	4.42	0.64	most
Chick depth	4.18	0.80	very
Wing span	4.22	0.73	most
Total	4.37	0.20	most

Using quantitative Likert-scale interpretation, Most" = mean score range 4.21–5.00 (very high level) ", Very" = mean score range 3.41–4.20 (high level). This clarification ensures the meaning of qualitative terms corresponds to measurable statistical ranges and improves data transparency.

The evaluation of chicks of Samae Dam chicken (*Gallus gallus*) farmers were statistically significantly different (P>0.05) in terms of post-hatching performance ($\bar{x}$ = 4.52) and egg quality ($\bar{x}$= 4.35) and egg quality ($\bar{x}$= 4.37) as shown in Table 4 and Table 5 shows statistical data on the production performance of Samae Dam chickens (*Gallus gallus*) across different age ranges (0-3 months and 3-6 months). The growth rate in the 0-3month group

was 7.19 g/head/day, slightly higher than 7.03 g/head/day in the 3-6month group. Survival rate increased from 40% in the 0-3month group to 60% in the 3-6month group. Feed conversion ratio (FCR) worsened with age, rising from 11.79 to 14.09. The productivity index improved from 0.56 to 0.79 as the chickens aged. Production investment was higher for the 3-6month group at 1,690.80 Baht, compared to 1,414.80 Baht for the younger group. The return per head also doubled with age, from 603 Baht for 0-3 month-old chickens to 1,206 Baht for 3-6month-old chickens

Table 4 Evaluation of chick factors of Samae Dam chicken (*Gallus gallus*) from the difference in pairs (Post HCG test)

Evaluation	$\bar{X}$	Evaluation		
		Egg quality	Performance after hatching	Abnormalities after hatching
$\bar{X}$	-	4.52	4.35	4.37
Egg quality	4.52	-	0.44	0.42
Performance after hatching	4.35	-	-	0.17
Abnormalities after hatching	4.37	-	-	-

Note: Higher mean scores represent higher observed levels of each parameter. For positive traits (e.g., hatching rate, survival rate, body weight), a higher score indicates better performance, while for negative traits (e.g., death rate), it indicates a higher incidence that requires management attention.

Table 5 Shows the statistical data of native chickens of the Samae Dam chicken (*Gallus gallus*) breed in each age range

Production Performance Data	Age	
	0-3 months	3-6 months
Growth rate (g/head/day)	7.19	7.03
Survival Rate (%)	40.00	60.00
FCR	11.79	14.09
Productivity Index	0.56	0.79
Production Investment	1,414.80	1,690.80
Return per head (baht/head)	603	1,206

The study on the production performance of Samae Dam chicken (*Gallus gallus*) throughout the experiment (0-8 months) an 8-month study of black chickens (Gallus gallus) found that roosters had higher body weight 3,700±95.00) and growth rate(16.65±3.87grams/day) than hens, which had a body weight of 2,600±78.50 grams and a growth rate of 13.33±3.38 grams/day. Both roosters and hens had similar food intakes, approximately 27.08±3.87 grams/day, with roosters gaining 1,510±33.86 grams and hens gaining 1,475±36.75 grams, with feed conversion rates of 4.35±0.42 and 4.26±0.40, respectively as shown in Table 6.

Table 6 Shows the results of the study on the production performance of Samae Dam chicken (*Gallus gallus*) at 0-8 months

Production Performance	Samae Dam chicken (*Gallus gallus*) breed	
	Cock	Hen
Body weight (g/ head)	3,700±95.00	2,600±78.50
Feed intake (g/day)	27.08±3.87	26.6±3.80
Weight gain (g/head)	1,510±33.86	1,475±36.75
Growth Rate (g/day)	16.65±3.87	13.33±3.38
FCR	4.35±0.42	4.26±0.40

Note: ± SD indicates standard deviation

To establish a learning center and network for Samae Dam chicken (*Gallus gallus*) farming to promote sustainable self-reliance.

Establishment of a learning center and a network of Samae dam chicken (*Gallus gallus*) breeders in Uthai Thani province. Management of the Samae Dam Chicken (*Gallus gallus*) Learning and Conservation Center to preserve information on the conservation of Samae Dam chickens (*Gallus gallus*) in Uthai Thani province in a sustainable manner, developing the local economy through product creation activities for family income. Live a life according to the Sufficiency Economy Philosophy by using local resource activities. There was an interactive learning process between the actual practitioners, the organization, and the relevant departments participating in the project. Participants learn and apply their knowledge to further expand the results in the area. It makes it possible to develop the potential and learning process of the community. The community context is used as a base for poverty

alleviation by being able to solve poverty problems sustainably and promote a sufficiency economy; the community/ people can be self- reliant and sustainable as an approach to increase income by focusing on household consumption, enabling the reduction of production costs by allowing them to find local raw materials.

Learning Center and Network Outcomes The establishment of the Samae Dam Chicken Learning Center successfully created a collaborative platform among 30 farmers from three districts in Uthai Thani Province. Through quarterly training and demonstration activities, farmers improved their knowledge and practical skills in feed formulation, breeding management, and disease control. The center served as a hub for information sharing, data recording, and chick distribution. As a result, the breeding network expanded from 3 pilot farms to 10 collaborative farms within one year. The use of local feed reduced production costs by 10– 15% , and farmers reported improved chick survival rates and confidence in maintaining purebred stocks. These outcomes demonstrate that the learning center and network establishment directly supported the conservation and productivity improvement of the Samae Dam chicken.

Figure 4 learning centers and a breeding network for Samae Dam chicken (*Gallus gallus*) farming to promote sustainable self-reliance

Integration of Research Findings with Learning Center Development. The novelty of this study lies in its integration of biological data with a community-based learning system. The production performance results were not limited to academic analysis but were applied to the design of training modules at the Samae Dam Chicken Learning Center. For example, data on feed conversion ratios (FCR) and growth rates were translated into farmer- friendly lessons on local feed formulation, selective breeding, and disease prevention. These modules were demonstrated through on- farm participatory workshops, enabling farmers to apply

scientific findings directly in their production systems. Consequently, this integration bridged the gap between academic research and practical conservation, creating a self-sustaining network of breeders who actively contribute to the genetic preservation and economic viability of the Samae Dam chicken.

Results on Learning Center and Breeding Network Establishment. The Samae Dam Chicken Learning Center was successfully established as a collaborative platform among university researchers, livestock officers, and local farmers. Over the one-year implementation, three pilot farms were upgraded into demonstration centers equipped with record-keeping systems, brood pens, and local feed production units. A total of 10 network farms were formed through knowledge transfer activities. The network collectively produced 2,400 chicks annually, with a 12% improvement in survival rate compared to the baseline. Participating farmers reported increased confidence in breed selection and improved capacity in cost management through the use of local feed resources. These outcomes confirm that the project achieved its objective of establishing a sustainable learning and breeding network that supports both conservation and livelihood improvement.

Knowledge Transfer and Farmer Participation The knowledge transfer process involved three main activities: (1) Training workshops on feed management, breeding selection, and disease prevention, attended by 30 farmers. (2) On-farm demonstrations conducted quarterly to allow hands-on learning and data collection. (3) Peer-to-peer learning sessions through a digital communication group (LINE) for experience sharing and problem-solving.

Evaluation results showed that 85% of participants reported increased understanding of breeding techniques, 70% adopted improved feed practices, and 60% recorded their production data for the first time. These outcomes confirm that the learning center functioned effectively as a local knowledge hub linking academic research and farmer practice. **(**Wuttichai and Praphatikul, 2019; Wiyabot, 2022)

Figure 5 Model farm of the Samdam chicken (Gallus gallus) raising network in a sustainable self-reliance manner

Discussion

The establishment of a learning center and a network of chicken breeders of Samae Dam chicken (*Gallus gallus*) breeding in Uthai Thani Province. Yaemkong & Tuan (2016) reported that natural native chicken breeders have a high demand for good breeders and breeders. Therefore, if supported by various sectors, including new knowledge, a good breeding ground to increase productivity in both volume and weight will reduce this cost. In addition, networking for broiler groups at the community level, regional level, or national level is, therefore, necessary and should have a host or central agency as the lead. To provide stability and create a sustainable career for the farmers and consume food safely for consumers. There are two main chicken-raising systems: 10% free-range and 90% semi-free-range. (Choprakarn & Wongpichet, 2007). The area for raising native chicken farmers is the latter. Home in semi-contained and semi-released farms, the chickens Bantam (Thai) chicken, the mutant chicken, and the black chicken, this type of breed does not have a strict breeding and selection process, such as the fighting cock, the native hybrid chicken. High possibilities for industrial production because the meat quality is similar to the native chicken. It is low-fat content. The meat is not too crumbly and delicious. Therefore, it is popular with consumers (Daikwo et al., 2011; Kitja et al., 2019; Wattanadilokcahtkun et al., 2023). Factors contributing to successful rearing are care and attention. They are especially having a brooding pen and special care for brooding chicken vaccination and dosing according to the prescribed program a biological disease prevention system monitoring the operations of farmers' groups and promptly solving problems of the staff. Public relations and consumer awareness farmers have strong leadership and good leadership. The factors affecting the damage to the production are epidemic and damage lack of time to fully pay attention to raising due to other tasks, lack of funds to improve housing, food, and poor management of disease control, especially the lack of vaccination (Yaemkong, 2014). Problem and learning how to solve problems. The format will be a group to exchange knowledge of members. There is a committee to share information and share and they are communicating with other groups of black-tailed padauk chicken farmers (Yaemkong et al., 2017). Experience in raising native chickens, but still needs knowledge and technology in rearing such as feed management and incubator. Factors affecting the success of farmer groups' operations include. The fact that the group has strong leadership, leadership, and good raising and disease management, and public relations creates awareness about black-tailed padauk chickens to consumers of chicken production efficiency

of farmer groups during the 5-month egg production period (Chotinun et al., 2013). Conservation of native chickens in their original homeland directly with farmers would be most appropriate for the current situation because conservation is focused. Increasing the income of smallholder farmers and protection in this way will preserve and maintain diversity in the genetic resources of native chickens. Reduce the risk of loss and arrange for the collection and study of the characteristics and production potential. The productivity of native chickens in the raising community will help conserve and develop are released during the day when they are fed in the morning (Yaemkong, 2014); Worasin, 2018). The native Thai chicken breeds include the U chicken the Cochin chicken,the unique breeds of native chickens in each locality to remain with Thailand forever (Yaemkong & Tuan, 2019; Paksi & Rozaki, 2022). In rural areas, native chickens are primarily raised for household protein consumption for household consumption and sold as supplementary income. Most distribution is sold by weight. Which are sold by farmers who set their prices, and the middleman determines farmers sell when the chickens are about 4-6 months old and weigh about 0.8-1.5 kg, which indicates that the native chickens have poor feed efficiency (Pornphimon et al., 2013). Low growth rate. The general raising period is about 5-6 months old, weighing about 1.2-1.5 kg (Pornphimon et al., 2013). Native chickens are a national resource with biodiversity. Biodiversity is widely raised in almost every farmer's household, which is the way of life of rural Thais. Importance and necessity of promoting and conserving native chicken species with various external characteristics according to different ideologies (Setyaudin, 2023). According to other factors involved, a study of factors influencing the diversity of traits of native chickens. It is information that will help plan production and encourage farmers to raise native chickens appropriately and apply the knowledge gained from the research to develop the breed for a local occupation and continue to support themselves. Also, use native chickens and laying hens. Indigenous people, in their traditions, beliefs, fortune-telling, and rituals, consider that native chickens are essential in terms of economy and way of life of family and community (Abinawanto & Effendi, 2017; Wongloet et al., 2023)

The results of the production efficiency study provided baseline data for the Learning Center's curriculum design. Farmers learned how feed conversion ratios (FCR) and growth rates could be optimized through better feed management and selective breeding. These findings were incorporated into training modules and on-farm demonstrations, enabling farmers to adopt improved management techniques. The sharing of production records through the network

encouraged participatory learning and continuous improvement, establishing a collaborative model for native chicken conservation and sustainable rural livelihoods.

Farmer Participation and Network Outcomes The participation of farmers played a crucial role in the success of the Samae Dam chicken conservation network. More than 30 farmers from three districts in Uthai Thani province were involved in the learning process. Through the learning center, farmers improved their skills in chick rearing, disease prevention, and record management. Informal interviews and field observations revealed that farmers exchanged breeding stock and shared information on feed management and hatchery practices, strengthening the local breeding network and supporting community- based conservation. (Sailit et al., 2023)

The study' s contribution extends beyond data collection. The phenotypic and production performance data were utilized to create training materials and demonstration activities at the Samae Dam Chicken Learning Center. Farmers learned how to interpret and use production indicators such as feed conversion ratio (FCR), hatchability, and growth rate to enhance their farming practices. This practical application of academic data represents an innovation in integrating research and local learning for sustainable development.

Learning Outcomes and Self-Reliance The learning process enhanced farmers' self-reliance by promoting the use of local feed ingredients and simple breeding technologies that reduced production costs by approximately 10–15%. Farmers reported increased confidence in maintaining purebred Samae Dam chickens and expressed willingness to train other community members, demonstrating a multiplier effect of the learning center activities. (Laenoi et al., 2015; Wuttichai &Praphatikul, 2019)

Conclusion and suggestions

The importance of preserving this indigenous breed lies in community- based conservation efforts and sustainable farming practices. Establishing a learning center helps promote knowledge transfer, improve breeding techniques, and maintain biodiversity while supporting local farmers to be self- reliant in line with Thailand's Sufficiency Economy Philosophy. Establishing a learning center has successfully facilitated knowledge transfer and developed a breeding network. This study recorded important phenotypic traits and production parameters of the black chicken, which contributed to the breed conservation efforts. The establishment of a learning center has successfully facilitated knowledge transfer

and developed a breeding network while supporting sustainable farming practices in line with Thailand's Sufficiency Economy Philosophy. This research contributes to the conservation of this historically important breed while promoting sustainable local chicken production. This breed has been comprehensively studied. The results of the study showed specific characteristics, including black color in males (beak, legs, nails, wing/tail feathers). and females with small black feathers. Production data showed that the black chickens had egg weights of 45-50 g, chicks weighed 35-40 g at birth, hatching rates of 60-100%, and hatching mortality rates of 30-40%. An 8-month growth study revealed that the male chickens weighed 3,700±95.00 g with a growth rate of 16.65±3.87 g/day (FCR 4.35±0.42), while the female chickens weighed 2,600±78.50 g with a growth rate of 13.33±3.38 g/day (FCR 4.26±0.40). The results of this study significantly contribute to the conservation of Thai indigenous chicken breeds while promoting sustainable agricultural practices and local economic development. The integration of research findings with the learning center and farmer network transformed the study outcomes into practical conservation action. Through shared learning and collaboration, the Samae Dam Chicken breeding network became a model for sustainable genetic resource conservation in Thailand. (Pornphimon; 2013) Farmer participation played a vital role in the success of the Samae Dam chicken conservation network. Over 30 farmers from three districts in Uthai Thani Province joined the learning process. Through the learning center, farmers improved their skills in chick rearing, disease prevention, and record management. They exchanged breeding stock and shared information on feed and hatchery practices, strengthening the local breeding network. The learning process enhanced self-reliance by encouraging the use of local feed ingredients and simple breeding technologies, reducing production costs by about 10–15%. Farmers gained confidence in maintaining purebred Samae Dam chickens and expressed willingness to share knowledge with others, demonstrating a tangible multiplier effect of the learning center activities. (Phianmongkhol et al., 2012; Malaithong et al., 2015; Kitja et al., 2019)

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