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A Comparative On-Farm Evaluation of Growth Performance and Feed Efficiency in the TANUVAS Namakkal Gold versus a Standard Japanese Quail (*Coturnix japonica*)

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Abstract

This study evaluated the production performance of the newly developed "TANUVAS Namakkal Gold" quail strain in comparison to a standard Japanese quail control within the rural farming systems of Karur District, Tamil Nadu, India. A total of 300-day-old chicks (150 per strain) were distributed to selected farmers under a Front-Line Demonstration program. Production traits including body weight, weight gain, feed intake, and feed conversion ratio (FCR) were meticulously recorded over an 8-week period. Results indicated that Namakkal Gold quails exhibited superior growth, starting with a significantly higher day-old weight (8.45±0.34g vs. 7.83±0.19g) and culminating in an 18.4% higher final body weight at six weeks (326.17±8.81g vs. 275.57±5.42g). While Namakkal Gold quails consumed more cumulative feed (635.6±45.5g vs. 574.0±37.8g), they demonstrated a significantly better overall FCR (2.70 vs. 2.96), indicating superior feed efficiency. The growth pattern differed, with Namakkal Gold achieving peak weight gain later (weeks 3–4) compared to the control (weeks 2–3). The authors conclude that the Namakkal Gold quail strain presents a genetically superior alternative for commercial quail farming, offering significantly enhanced growth rates and better feed conversion efficiency, making it a highly suitable and profitable venture for rural farmers.

Keywords: Namakkal Gold Quail; Japanese Quail; Production Performance; Body Weight; Feed Conversion Ratio; Rural Farming; Front-Line Demonstration; Growth Trait

Introduction:

Japanese quail (*Coturnix japonica*) farming is an emerging and commercially significant component of the Indian poultry sector, ranking as the third most populous avian species after chickens and ducks. Its popularity stems from attributes favourable to farmers, including low capital investment, minimal space and labour requirements, short generation intervals, and a quick return on investment [1]. Meat and eggs are also in high demand due to their nutritional profile, such as lower cholesterol [2]. Following the introduction and improvement of germplasm in India [3]. ongoing genetic selection has aimed to enhance economically vital traits like body weight and feed efficiency [4]. This effort has led to the development of new strains, including the "TANUVAS Namakkal Gold" quail, engineered through a five-way cross at the Tamil Nadu Veterinary and Animal Sciences University. Preliminary reports indicate its potential for superior growth performance and efficiency compared to existing varieties. To substantiate these claims under

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practical conditions, this study was conducted to evaluate the production performance of the Namakkal Gold quail in comparison to a standard Japanese quail strain within rural farming systems of Karur District.

Material and Methods

Farmer Selection and Training

The study was implemented as a Front-Line Demonstration (FLD) by the ICAR-Krishi Vigyan Kendra (KVK), Karur district, Tamil Nadu, to evaluate the on-farm production performance of the Namakkal Gold quail strain. Participating farmers were selected based on predefined criteria, including willingness to adopt scientific practices, availability of basic infrastructure, and prior livestock-rearing experience. Prior to commencement, selected farmers underwent a structured training program on standardized quail rearing protocols, encompassing brooding management, nutrition, health care, and record-keeping. A total of 300-day-old Namakkal Gold chicks, alongside age-specific formulated feed rations and essential supplements, were distributed to the participants to ensure uniformity in the initial stock and nutritional inputs.

Method demonstration

Next day, the chicks, feed bags, brooding equipment's were distributed to the selected farmers from Karur district. A total of each 100 chicks of Namakkal gold quail were supplied to the selected quail farmers. Feed bags of various age group formulated rations were purchased from Feed formulation unit at VCRI, Namakkal and supplied to farmers. Brooding arrangements are made in advance in a thoroughly cleaned and disinfected room, to receive the chicks on the anticipated date. Brooding continued out for a period of 10 days using electric bulbs as sources of heat and illumination at farmer's field. Chicks were supplied with good quality food, water, and light (35°C) were provided for 24 hours during brooding to avoid early chick mortality. Seasonal deworming also practiced with selected need-based anthelminthic. Chick starter ration was provided to the chicks up to 6 weeks of age. Subsequently, the grower ration during growing periods and formulated layer ration for the layers are also provided throughout the study. Feeding patterns are monitored regularly to measure the amount of feed consumed by qualifiers. Normally, 2-3 times per day feed occurs on quail farms. The demonstrated fields were regularly visited for technical service, supply of inputs and education. The production traits (up to 8 weeks) of day-old weight, body weight, weight gain, feed intake and feed conversion ratio were recorded as per standard procedure. Routine observations on production performances were documented.

Statistical analysis

Data for body weight, weight gain, feed intake, and feed conversion ratio were analyzed using descriptive statistics to calculate means and standard deviations. A one-way analysis of variance (ANOVA) was conducted to compare the means between the Namakkal Gold and Japanese control groups at each time point, with significance set at $p < 0.05$. Where significant differences were found, post-hoc tests were applied. A two-way ANOVA was used to examine the interaction effects between breed and time (week) on weekly weight gain. All statistical analyses were performed using standard statistical software.

Results

The mean values of day-old body weight of Japanese quail and Namakkal gold quail was 7.83 ± 0.19 and 8.45 ± 0.34. Cumulative parameters body weight of Namakkal quail and Namakkal gold quail given at [Table-1]. Finding shows that the body weight of Namakkal gold quail slightly higher than that of Japanese quail variety.

Body weight

Table 1: Body Weight (g) Comparison between Namakkal Gold and Japanese Quails across Seven Time Points.

Time Point	Namakkal Gold (Mean ± SD)	Japanese Control (Mean ± SD)	Mean Difference (Gold Quail- Japanese quail)	p-value	Significance	% Difference
Day 0	8.45 ± 0.34	7.83 ± 0.19	0.62	<0.001	***	7.90%
Week 1	41.82 ± 1.35	39.63 ± 0.61	2.18	0.021	*	5.50%
Week 2	86.10 ± 2.20	80.28 ± 1.42	5.82	<0.001	***	7.30%
Week 3	131.40 ± 6.13	139.18 ± 2.15	-7.78	0.045	*	-5.60%
Week 4	217.37 ± 7.50 g	192.53 ± 3.42	24.83	<0.001	***	12.90%
Week 5	267.90 ± 4.55	238.49 ± 2.42	29.41	<0.001	***	12.30%
Week 6	326.17 ± 8.81	275.57 ± 5.42	50.6	<0.001	***	18.40%

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Table 2: Body Weight gain (g) of Namakkal Gold and Japanese Control Quails across Six Weeks (n=6 per breed).

Time Point	Namakkal Gold (Mean ± SD)	Japanese Control (Mean ± SD)	p-value (Weeks)	p-value (Breed×Weeks)	Interpretation
Week 1	33.37 ± 1.53 g	31.80 ± 0.78 g	-	-	Initial similar weights (p>.05)
Week 2	44.28 ± 2.77 g	40.65 ± 1.42 g	<0.001*	<0.001*	Gold shows higher early growth
Week 3	61.18 ± 6.18 g	68.82 ± 2.80 g	<0.001*	<0.001*	Cross-over point: Japanese exceeds Gold
Week 4	85.97 ± 7.69 g	53.36 ± 5.22 g	<0.001*	<0.001*	Major divergence: Gold peaks, Japanese declines
Week 5	50.53 ± 2.79 g	45.96 ± 5.45 g	0.039*	<0.001*	Both decline; Gold maintains advantage
Week 6	58.27 ± 8.81 g	37.08 ± 6.23 g	0.76	<0.001*	Gold recovers, Japanese continues decline

Feed intake

Feeder and water are more important than the floor space for growth of chicks. Inadequate feed intake will result in poor growth and enhanced morality. Cumulative parameters of feed intake of Namakkal quail and Namakkal gold quail given at [Table-2]. In present study the average feed intake of Namakkal Gold quail and Japanese quail and was 47.6 ± 3.5 and 43.4 ± 2.8. At 6 wks of age average feed consumption of Namakkal gold quail and Japanese quail was 109.2 ± 7.7 and 99.4 ± 6.3.

The Namakkal Gold birds showed a consistently superior growth performance compared to the Japanese control group. They started with a higher initial body weight (8.45 ± 0.34 g) than the Japanese birds (7.83 ± 0.19 g), indicating an early growth advantage. Peak growth in Namakkal Gold occurred later, during weeks 3–4, whereas the Japanese control reached peak growth earlier in weeks 2–3, reflecting differences in maturation timing. The maximum weekly weight gain was substantially higher in Namakkal Gold (85.97 g during weeks 3–4) compared to the Japanese control (58.90 g during weeks 2–3), representing a 46.0% increase. By the end of the trial, Namakkal Gold achieved a significantly higher final body weight (326.17 ± 8.81 g) than the Japanese control (275.57 ± 5.42 g), with an overall total weight gain advantage of about 18.7%. Growth patterns also differed, with Namakkal Gold exhibiting late-peaking growth and the Japanese control showing early-peaking growth, suggesting differences in genetic growth programming. However, uniformity at week 6 was better in the Japanese control, which had a lower coefficient of variation (1.97%) compared to Namakkal Gold (2.70%), indicating more consistent body weights within the group.

Table 3: Cumulative Feed Consumption (g/bird) Over Six Weeks.

Breed	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Total
Namakkal Gold	47.6 ± 3.5	78.4 ± 5.6	115.5 ± 8.4	156.8 ± 11.2	128.1 ± 9.1	109.2 ± 7.7	635.6 ± 45.5
Japanese (Control)	43.4 ± 2.8	68.6 ± 4.2	107.1 ± 7.0	137.9 ± 9.8	117.6 ± 7.7	99.4 ± 6.3	574.0 ± 37.8
p-value	0.021*	0.003**	0.045*	0.001**	0.032*	0.015*	<0.001*

Table 4: Feed Consumption (g/bird/day) of Namakkal Gold and Japanese Control Quails across Six Weeks (n=6 per breed).

Week	Namakkal Gold (Mean ± SD)	Japanese Control (Mean ± SD)	p-value (Breed Effect)	Feed Conversion Ratio (FCR)* Gold	FCR* Japanese
Week 1	6.8 ± 0.5	6.2 ± 0.4	0.021*	2.04	1.95
Week 2	11.2 ± 0.8	9.8 ± 0.6	0.003**	2.53	2.41
Week 3	16.5 ± 1.2	15.3 ± 1.0	0.045*	2.7	2.22
Week 4	22.4 ± 1.6	19.7 ± 1.4	0.001**	2.61	3.69
Week 5	18.3 ± 1.3	16.8 ± 1.1	0.032*	3.62	3.65
Week 6	15.6 ± 1.1	14.2 ± 0.9	0.015*	2.68	3.83
Overall	15.1 ± 5.8	13.7 ± 4.9	<0.001*	2.7	2.96

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Table 5: Growth Pattern Comparison between Breeds.

Parameter	Namakkal Gold	Japanese Control	Difference	Biological Significance
Initial Weight	8.45 ± 0.34	7.83 ± 0.19	7.90%	Gold starts heavier
Peak Growth Week	Week 3-4	Week 2-3	1 week later	Different maturation timing
Max Weekly Gain	85.97 (W3-4)	58.90 (W2-3)	46.00%	Gold has higher peak growth
Final Weight	326.17 ± 8.81	275.57 ± 5.42	18.40%	Gold significantly heavier
Total Gain	317.72 ± 4.90g	267.74 ± 5.32	18.70%	Gold superior overall
Growth Pattern	Late peaking	Early peaking	Different curves	Genetic programming differs
Uniformity (CV at W6)	2.70%	1.97%	-	Japanese more uniform

Discussion

Body weight

This result gives differences of [1], reported comparatively less body weight in Namakkal gold quail. Day old body weight of Namakkal quail in present finding is higher than the study conducted by [5]. The variation among the body weight includes number of factors. Mostly, storage of eggs, incubation time, temperature and environmental factors plays vital role for the standard quality of chick body weight. The average sixth week body weight of Japanese quail and Namakkal gold quail is 275.57 ± 5.42 g and 326.17 ± 8.81 g. The present study on Namakkal quail body weight agrees with the study of [6]. were reported similar sixth week body weight. In contrary to the current study on Namakkal quail, [7]. reported slightly higher body weight in Namakkal quail, where they reported male and female Namakkal quail weight 289.50 ± 4.97g at sixth week of age. In contrary to the current study, [8]. reported slightly higher body weight in Namakkal quail, where they reported male and female Namakkal quail weigh 254.33±8.45g and 289.50±4.97g respectively at 6th week of age The body weight of Namakkal gold quail at sixth weeks of age reported in this present study is higher with the results reported by [9]. Average daily weight gain for 2-3, 3-4, 4-5- and 5-6-weeks periods are slightly higher with the findings of [6]. from Namakkal quail and [10]. The observed variation might be due to non-genetic factors applied in this study area. The differences in body weight could be due to geographical location of the study area. Drastic variation in the temperature considered here could be an important factor in the quail body weight.

Feed intake

Feed intake of Namakkal quail slightly higher than gold quail. According to [11] the average daily feed consumption quails at six weeks of age is 21.61g, which is lower than the present report and lower than reported by [5,10]. On the other hand, [12] observed a lower cumulative feed consumption of 563.12g at six weeks of age. Variation in cumulative feed intake might be due to variation in the genetic groups. The changes in the feeding pattern might be the important factors for the differences in the consumption. Feed conversion ratio (FCR) of Namakkal quail and gold quail is **2.96 and 2.70.** This is comparable with in the variety Namakkal quail reported slightly better FCR than gold variety. At sixth week body weight, gold quail revealed better growth compared to Namakkal quail. This result shows gold quail required more energy to attain that body weight. These values are agreement with the results of [6,10] reported lower FCR in gold quail [5] reported higher FCR in Namakkal quail [13].

Conclusion

This on-farm evaluation conclusively demonstrates that the TANUVAS Namakkal Gold quail strain exhibits genetically superior production traits compared to a standard Japanese quail control. The strain achieved significantly higher final body weight (+18.4%) and total weight gain (+18.7%) over a six-week period, driven by a distinct late-speaking growth pattern with a substantially higher peak weekly gain. Crucially, despite greater cumulative feed intake, the Namakkal Gold quails demonstrated significantly better overall feed conversion efficiency (FCR 2.70 vs. 2.96), translating to more economical meat production. These findings validate the success of the selective breeding program and confirm that the Namakkal Gold strain is a highly suitable and profitable genotype for adoption in rural and small-scale quail farming systems, offering enhanced productivity and improved economic returns for farmers.

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