

Factor Affecting Shortage of Broiler Meat in Selangor, Malaysia

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ABSTRACT

Malaysia has become one of the world's largest consumers of poultry meat, with per capita consumption rising from 13.8 kilograms in 2015 to 50 kilograms in 2022. However, recurrent chicken shortages have emerged as a pressing issue, posing risks to food security, trade and economic stability. Despite substantial research on broiler meat production and market dynamics, empirical evidence on the determinants of broiler meat shortages at the subnational level remains scarce. This study fills this gap by analyzing the key factors driving broiler meat shortages in Selangor. Primary data were collected from 101 broiler farmers and industry stakeholders using structured questionnaires. Descriptive statistics, Pearson's correlation and multiple regression analysis were employed to examine the relationships among key explanatory variables. The results indicate significant positive associations between input difficulties, disease outbreaks, production costs and government intervention. The correlation coefficients ranged from 0.655 to 0.717, with input constraints and escalating production costs emerging as the most critical determinants of broiler meat shortages. The findings highlight the sector's heavy reliance on imported feed materials and exposure to price volatility. Strengthening local feed resources, enhancing institutional support, and accelerating technological adoption are essential to improve sectoral resilience and reduce import dependence. Such measures are critical to ensuring sustainable broiler production and safeguarding long-term national food security. This study contributes to the literature by providing empirical insights into the structural and operational vulnerabilities of Malaysia's broiler meat industry.

Keywords: Broiler meat, Food security, Import dependence, Production cost and Shortage

INTRODUCTION

The majority of Malaysians consume poultry meat as one of the main sources of protein. In 2023, the United States remained the world's leading poultry meat producer with approximately 21.3 million tonnes, followed by Brazil at 14.9 million tonnes and China at 14.3 million tonnes (Attia et al., 2024). Malaysia ranked 16th globally in poultry meat production contributing approximately 1.58 million metric tonnes which represents about 1.5% of total world output (FAO, 2024). Broiler meat output has grown faster than other major protein sources (Daghir et al., 2021). The consumption of broiler chicken in Malaysia has exhibited a consistent upward trajectory over recent years with per capita intake ranging from 50 kg to 60 kg annually (Zamani & Debbra, 2022). This trend underscores the growing role of poultry meat as a primary source of animal protein in the Malaysian diet and reflects shifting consumer preferences towards more affordable and accessible protein sources. Malaysia's poultry meat sector contributed around 52.2% of total livestock production in 2023 (Kementerian Pertanian dan Keterjaminan Makanan Malaysia, 2024), reflecting its dominant role within the national livestock industry. Despite this substantial output, the sector's self-sufficiency ratio (SSR) stood at 90.2% in 2023, while the Import Dependency Ratio (IDR) reached 13.7%. It indicates that domestic production alone is insufficient to fully satisfy national consumption demand (DOSM, 2023). Malaysia primarily imports poultry meat from Thailand, the leading poultry exporter in ASEAN (Paramayudha et al., 2024). This reliance on imports particularly for specific cuts required by the food-processing sector. Shortage occur when the quantity demanded is higher than the quantity supplied at the market price causing unfulfilled demand have created greater awareness for food security in Malaysia. Therefore, it underscores the strategic importance of international trade in maintaining supply stability and meeting the evolving demands of the Malaysian broiler meat market.

Identifying the key factors influencing broiler meat shortages is crucial for strengthening Malaysia's food production system and reducing supply vulnerability. Existing studies largely concentrate on production efficiency, feed cost volatility, biosecurity, and general supply chain performance, but they do not sufficiently address the localized mechanisms that trigger shortage issues. For example, Dagher et al., (2021) discussed global production growth and technological advancements without examining domestic market imbalances that may result in supply shortfalls. Zamani & Debra (2022) analyzed Malaysian consumption patterns but did not link demand and supply mismatches to state-level shortages. Research on import dependency by Paramayudha et al., (2024) highlights reliance on external suppliers, yet these works focus on trade flows rather than determinants of local availability. Likewise, study on national-level assessments conducted by Attia et al., (2024) overlook inter-state differences in market structure, distribution networks, regulatory compliance, and retailer behavior. Crucially, these studies do not explicitly address the local mechanisms that create supply shortages. In particular, the interplay of operational, logistical and market-related factors influencing availability in high-demand regions such as Selangor remains underexplored. Addressing these gaps is essential to strengthen the resilience of Malaysia's poultry sector and to provide evidence-based guidance for policy interventions aimed at safeguarding national food security.

This study aims to investigate the demographic characteristics of chicken producers, to examine the relationship between selected factors and to determine the most significant factors influencing the shortage of broiler meat di Selangor. The focus on Selangor is particularly relevant given its high population density, rapid urbanization and strong consumer demand. A deeper understanding of how these factors interact will enable policy makers and industry players to develop more targeted and sustainable strategies. This study contributes new insights by integrating key economic and production-related factors to explain broiler shortages in Malaysia. Overall, the findings provide a clearer understanding of the structural challenges affecting supply performance and support strategies to enhance efficiency and food security.

LITERATURE REVIEW

One major factor contributing to broiler meat shortages in Malaysia is the vulnerability of production systems to disruptions in feed supply. The Russia–Ukraine war has severely affected global maize and wheat markets. Malaysia's reliance on imported grain maize makes the poultry sector highly susceptible to external shocks (Amjath-Babu et al., 2020). Additional disruptions arise from geopolitical tensions, shipping bottlenecks, and commodity price volatility that constraining the availability of maize and soybean meal (FAMA, 2023; Mat Isa, 2022). Empirical evidence indicates that such supply-side shocks propagate rapidly through feed mills, hatcheries and broiler farms. These disruptions lead to production instability and episodic shortages of broiler meat and eggs in Malaysia (Amjath-Babu et al., 2020). Studies by Jamaludin et al. (2023) and Che Rose and Sapar (2024) further highlighted that feed import dependency not only increased vulnerability to supply shocks but also amplified price volatility in the domestic broiler sector. Collectively, these findings underscore the critical need for interventions that enhance feed self-sufficiency and strengthen the resilience of Malaysia's poultry supply chain.

Second major factor reducing chicken production is disease outbreak, particularly highly pathogenic avian influenza (HPAI). Avian influenza or known as bird flu is caused by influenza A viruses. It spreads through contact with infected birds or contaminated environments leading to high mortality and mass culling. HPAI outbreaks had caused prolonged production losses due to biological and logistical lags before restocking (Ayuti et al., 2024; Ukita et al., 2025). Zubaidah et al. (2018) documented a major H5N1 outbreak in 2017 in Kelantan caused significant mortality and culling. Complementing this, Syamsiah et al., (2019) characterized H9N2 low-pathogenic avian influenza (LPAI) strains circulating in Malaysian chickens between 2015 and 2018. These strains had been found to be endemic and had caused economic losses through reduced growth rates and increased mortality. Collectively, these findings suggest that both HPAI and LPAI strains contribute to systemic vulnerabilities with HPAI triggering acute supply shocks and LPAI causing chronic production inefficiencies.

Rising input costs, particularly feed prices, constitute another key factor affecting production and supply. Feed typically accounts for 60 percent to 75 percent of the variable costs in broiler production (Ferlito, 2020). Global increases in maize and soybean prices due to conflicts, climate shocks, or trade disruptions translate

directly into higher domestic feed costs. Wong & Khazali (2023) reported that global shocks including COVID-19 and the Russia–Ukraine war has increased soybean and maize prices. This decline in profitability often forces smaller producers to reduce flock sizes or exit production entirely (Amjath-Babu et al., 2020). Price hikes for key feed ingredients can increase feed costs by up to 30 percent, directly affecting farm-gate chicken prices (FAMA, 2023; Mat Isa, 2022). Using a structural time-series model, Che Rose and Sapar (2024) demonstrated a strong association between imported feed prices (corn and soybean) and ex-farm broiler prices in Malaysia. The findings highlighted that macroeconomic factors, particularly feed price volatility were critical determinants of production costs and market price fluctuations within the broiler sector. Beyond feed, rising energy, packaging, and labor costs have further compounded financial pressures on producers (Wongtangtintharn et al., 2025). Factors related to rising input prices tend to exacerbate market shortages and contribute to price instability for consumers.

Government interventions play a dual role in the broiler sector. Policy measures aim to stabilize supply and protect consumers, but can also create distortions that weaken producer incentives and obscure market signals. Malaysia had implemented temporary export bans, price ceilings, and subsidy programs during acute shortages and feed-price inflation. Benalywa et al. (2018) applied a Policy Analysis Matrix to evaluate policy effectiveness and found that existing support had been insufficient, particularly for non-contract farms, leaving producers financially exposed and reducing incentives to maintain output. Samsuddin and Ismail (2023) reported that fiscal incentives, such as Pioneer Status and Capital Allowance had improved financial viability for small and medium farms, yet the smallest and most resource-constrained producers remained vulnerable to cost shocks. In contrast, Nurshuhada et al. (2021) demonstrated that the National Agrofood Policy 2.0 had successfully enhanced poultry self-sufficiency and reduced reliance on imports, illustrating how well-designed interventions could strengthen domestic production capacity and contribute to supply security.

Despite the substantial literature on feed supply disruptions, disease outbreaks, rising input costs, and policy interventions, existing studies largely examine these factors in isolation or at a national level. Few studies have simultaneously considered the interplay part of all these determinants. Moreover, state-level analyses remain scarce even though regions such as Selangor, the most urbanized and densely populated state in Malaysia. This gap highlights the need for an integrated study that examines how multiple factors influence broiler meat shortages in a high demand region. Based on this rationale, a conceptual framework was developed to guide the present study. Broiler meat shortage serves as the dependent variable, while independent variables include input supply disruptions, disease outbreaks, input costs and government interventions (Figure 1). These factors inform the development of survey questions and regression models to explain the determinants of broiler meat shortages in Selangor, Malaysia.

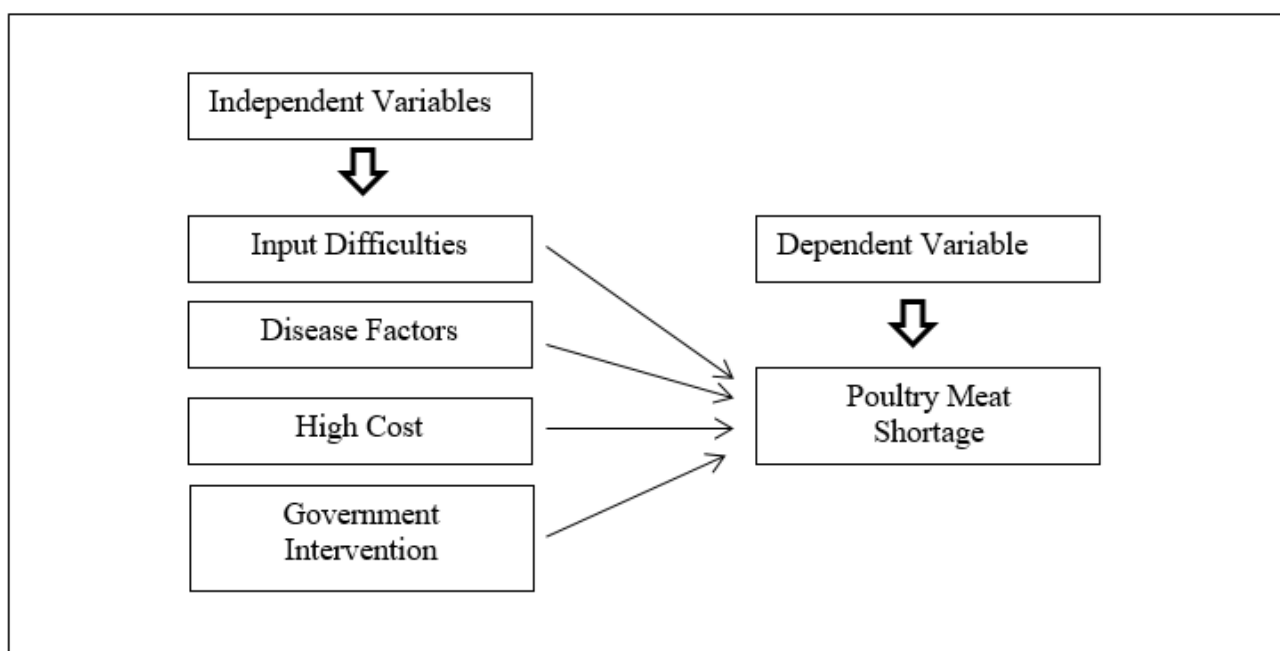


Figure 1. The conceptual model of the study

METHOD

Methodology was designed to systematically investigate the factors influencing shortage of broiler meat in Selangor. A quantitative research approach was employed as it allowed for empirical data collection, objective measurement and statistical analysis to ensure reliable and generalizable findings.

The questionnaire comprised a combination of multiple-choice items, closed-ended questions, and Likert-scale statements were designed to capture both factual and perceptual data from respondents in a structured manner. The instrument was organized into two main sections. Section A collected demographic and farm-level characteristics, including age, experience, income and farm size. Section B focused on the key determinants contributing to broiler meat shortages, covering dimensions such as input constraints, disease challenges, cost pressures and policy-related factors. Basic random sampling was employed to choose a sample of the data since it is an equitable selection of a subset of the population with an equal chance of being selected (Lauren, 2020). The required sample size was determined using the sample size computation guideline proposed by Daniel (1999), which specifies that for a known population. The minimum sample can be estimated using $n = N / (1 + N(e^2))$, where N is the population size and e is the acceptable margin of error. Applying this formula to the population of 270 broiler meat farmers in Selangor with a 5% margin of error has yielded a minimum sample of 159 respondents.

Although Daniel's (1999) formula indicated a minimum of 159 respondents, the achieved final sample of 110 broiler meat farmers were considered adequate for the study's analytical needs. Power analysis for multiple regression has been conducted to validate the sample size. The result showed a power level of 0.86 meeting the standard threshold recommended by Cohen (1988) and widely accepted in social science research. Similar agricultural studies have also used comparable sample sizes when statistical power was deemed sufficient (Jabbar et al., 2021; Rahman & Chima, 2020).

Descriptive analysis was used to summarize the demographic characteristics of the respondents, facilitating a clearer understanding of their profiles. Pearson's correlation was employed to examine the relationships between variables that precisely assessing the degree of interaction between any two variables. The relationships among the factors influencing broiler meat shortages were analyzed to achieve the study's objectives. Multiple regression analysis is one of the most effective statistical methods for predicting a continuous dependent variable from a set of independent variable. The multiple regression equation for this study was expressed as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon_i$$

Where: Y = Broiler meat shortage, X_1 = Input difficulties, X_2 = Disease factor, X_3 = High cost, and X_4 = Government intervention.

The questionnaire underwent pre-testing with a small group similar to the target population to establish content validity and refine item clarity and relevance. Internal consistency was assessed with Cronbach's alpha, with $\alpha \geq 0.70$ taken as acceptable. A pilot test ($n = 20$) was performed to verify the questionnaire's robustness and reliability. The results revealed a Cronbach's Alpha of 0.861 across all constructs, indicating excellent internal consistency and measurement stability which exceeding the 0.70 threshold recommended by Nunnally and Bernstein (1994). Consequently, the instrument was considered reliable and appropriate for use in the main study ($n = 110$).

RESULTS AND DISCUSSION

The key findings derived from the survey of farmers that involve in broiler meat in Selangor are shown in this section.

Demographic Profile of Respondents

Ten items related to the characteristics of broiler meat farmers were included in the questionnaire's demographic section. According to Table I, 84.2% of farmers who involved in poultry meat are men, and only 15.8% are women. Twenty respondents (19.8%) were between the ages of 31 and 35, while the majority of respondents (44.6%) were between the ages of 36 and 40. Malay farmers were found to have conquered

chicken production with a percentage of 69.3%, while Chinese respondents made up 30.7% of the total. In terms of education, about half of respondents (45.5%) had a secondary education, followed by a higher education level of a diploma (29.7%) and a degree (17.8%). Most of the respondents had an average monthly income of RM4,850-RM 10,959 with 52.5%, while just 17.8% had an income of RM10,960 or above. There were 44.6% married respondents and 41.6% single respondents. Regarding the breeding period, 28 respondents (27.7%) worked for 11-15 years, followed by those with a minimum of five years of experience (25.7%) and 10.9% involved in chicken breeding for more than 21 years. A large percentage of respondents received government assistance to help them sustain their business with over 2 acres of poultry farm.

Table I Respondents' Demographic Profile

Variable(S)	Frequency	Percentage (%)
Gender		
Female	16	15.8
Male	85	84.2
Age		
21 –25	15	14.9
26 –30	9	8.9
31 –35	20	19.8
36 –40	45	44.6
40 and above	12	11.9
Race		
Chinese	31	30.7
Malay	70	69.3
Nationality	101	100
Educational level		
Secondary	46	45.
Diploma	30	29.7
Degree	18	17.8
Master&PhD	7	6.9
Monthly income		
B40 = RM2,500-RM4,849	30	29.7
M40 = RM4,850- RM10,959	53	52.5
T20 = RM10,960	18	17.8
Marital status		
Married	45	44.6
Single	42	41.6
Widow/ widower	14	13.9
Period breeding chicken		
1-5 years	26	25.7
6-10 years	19	18.8
11-15years	28	27.7
16-20 years	17	16.8
Acres of chicken farm		
<1.0 acres	19	19
<1.0 acres	19	19
1.2 -1.4acres	19	18.8
1.5 -1.7acres	12	11.9
1.8-2.0 acres	23	22.8
>2.0 acres	28	27.8
Incentive from government agency		
No	28	27.7
Yes	73	72.3

Correlation Coefficient Result

As indicated in Table II, Pearson's correlation was used to determine the link between four variables. According to Wong & Hiew (2007), the correlation coefficient (r) is considered as poor between 0.10 and 0.29, medium between 0.30 and 0.49 and strong between 0.50 and 1.0. All four factors leading to Selangor's lack of chicken production were found to be statistically significant, with P-Values less than 0.05. The correlation coefficient between input difficulties and poultry meat shortages was 0.717, indicating a strong positive correlation. It demonstrates that when input difficulties increase, it also impacts the supply of poultry meat. The correlation coefficients for disease factors, production costs, and government intervention were 0.680, 0.676, and 0.655, respectively, reflecting moderate positive relationships. These results indicated that increases in disease incidence, higher production costs, and greater government intervention were associated with reductions in broiler meat production in Selangor.

Table II Pearson Correlation Matrix

		Poultry meat shortage	Input difficulties	Disease factor	High cost	Government intervention
	Pearson Corr. Sig. (2-tailed)	1 -	.717** .000	.680** .000	.676** .000	.655** .000
Input difficulties	Pearson Corr. Sig. (2-tailed)	.717** .000	1 -	.753** .000	.615** .000	.660** .000
Disease factor	Pearson Corr. Sig. (2-tailed)	.680** .000	.753** .000	1 -	.704** .000	.792** .000
High cost	Pearson Corr. Sig. (2-tailed)	.676** .000	.615** .000	.704** .000	1 -	.766** .000
Government intervention	Pearson Corr. Sig. (2-tailed)	.655** .000	.660** .000	.792** .000	.766** .000	1 -

** Correlation is significant at the 0.01 level (2-tailed)

Multiple Regression Results

Multiple regression analysis is a statistical approach investigates the relationship between numerous independent variables and one dependent variable. The ANOVA results in Table III show a significant p-value (<0.05) and an F-value of 37.875 (p = 0.000), indicating a statistically significant relationship between the independent variables and the dependent variable. The significance of the regression coefficients was estimated using t-statistics, and the regression's goodness-of-fit was assessed using the coefficient of determination (R²) and adjusted coefficient of determination (adjusted R²). According to the model summary in Table IV, the R² value of 0.612 demonstrated that the input difficulties, disease issues, high cost and government intervention explained 61.2% of the factors influencing the shortage of broiler meat, while the remaining 38.8% was attributed to other external variables. The standard error of the estimate, valued at 0.323, showed that the regression model demonstrated good predictive accuracy, as prediction improved when standard errors decreased. The Durbin–Watson statistic of 1.826, which exceeded the upperbound value (dU = 1.78), suggested that no significant positive autocorrelation existed among the residuals. Thus, the model was considered reliable and statistically valid.

Table III Anova Results

Model	Sum of Squares	Df	Mean Square	F test	Sig.
Regression	15.808	4	3.952	37.875	.000 ^b
Residual	10.017	96	.104		
Total	25.826	100			

a. Dependent Variable: Broiler Meat Shortage

b. Predictors: (Constant), Input Difficulties, Disease Factor, High Cost, Government Intervention

Table IV Coefficient Of Determination Result

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin Watson
1	.782	0.612	.596	.32303	1.826

Input difficulties and high cost variables showed a positive relationship with the shortage of broiler meat and were statistically significant at 1% level as presented in Table V. The coefficient value of 0.406 for input difficulties indicated that greater challenges in obtaining key inputs such as feed supplies contributed to an increase in broiler meat shortages by 0.406 units. This result aligned with earlier empirical investigations that identified feed supply instability as a critical vulnerability in Malaysia’s poultry sector. For instance, Jamaludin et al. (2023) highlighted that the industry was heavily reliant on imported feed materials and that external supply shocks posed a serious threat to domestic production. Similarly, Bathmanathan & Wong (2024) demonstrated that global fluctuations in corn and soybean prices significantly affected broiler production costs, which in turn influenced supply stability. In addition, the rising cost of imported feed ingredients driven by the depreciation of the Malaysian Ringgit against the US Dollar, further increased production expenses and financial constraints for broiler farmers (Tan et al., 2023). Collectively, these findings underscored that input supply challenges were not peripheral but central determinants of shortage risk, reinforcing the need for policy interventions aimed at enhancing feed self-sufficiency and strengthening the resilience of Malaysia’s poultry supply chain.

The coefficient value of 0.289 for input cost indicated that increases in input expenses reduced broiler meat production by 0.289 units. The cost of broiler feed was largely determined by the availability and cost of maize and soy bean meal. In order to satisfy consumer demand, the broiler meat industry required a steady supply of high-quality feed ingredients (Thirumalaisamy et al., 2016). This finding was consistent with earlier research. Bathmanathan and Wong (2024) reported that escalating feed costs, particularly for imported corn and soybean meal directly depressed broiler production margins. Likewise, Tey et al. (2018) showed that cost inflation within the broiler value chain had a cascading effect on supply consistency and retail price volatility. Collectively, these studies supported the present results, highlighting that cost pressures represented one of the most persistent structural constraints in Malaysia’s broiler sector.

Table V Result Of Regression Coefficient

Variable	Coefficient	t-stat	Sig.
Constant	0.479	1.450	.150
Input difficulties	0.406**	4.115	.000
Disease factor	0.105	.865	.389
High cost	0.289**	2.808	.006
Government Intervention	0.083	.693	.490

** Correlation is significant at the 0.01 level (2-tailed)

The remaining variables, namely disease factors and government intervention were found to be statistically insignificant in explaining broiler meat shortages in Selangor. Although the regression results showed that disease factors did not significantly influence the current shortage ($p > 0.05$), this finding was not entirely inconsistent with existing literature. Several studies suggested that the impact of poultry diseases varied depending on outbreak severity, epidemiological cycles, and the robustness of biosecurity measures. For example, Ariff et al. (2020) noted that strengthened biosecurity and vaccination programs in Malaysia had substantially reduced production losses historically associated with avian influenza and Newcastle disease. Similarly, Abu Hassan et al. (2021) found that commercial broiler farms with strong preventive management practices experienced minimal supply disruptions despite periodic disease presence. Therefore, although diseases remained an important long-term production risk, their limited statistical influence in this study likely reflected the effectiveness of disease control mechanisms within the sampled farms.

Government intervention showed a non-significant relationship with broiler meat shortage in this study. Previous literature presented mixed findings regarding its effectiveness. Some studies argued that price

ceilings, subsidies, and market regulations could stabilize supply under normal conditions. However, their impact was often delayed or insufficient during periods of cost escalation or global supply shocks. Ahmad & Noh (2022) found that government price-control policies in Malaysia sometimes failed to incentivise producers, particularly when production costs exceeded the regulated selling price. Similarly, Fatimah et al. (2021) observed that certain policy interventions unintentionally distorted market signals and limiting farmers' ability to respond efficiently to changing demand and input-cost pressures. Therefore, the absence of significance in this study likely reflected ongoing challenges in policy responsiveness rather than the irrelevance of government intervention itself.

CONCLUSION

This study investigated the key determinants of broiler meat shortages in Selangor using descriptive, correlation and regression analyses. Descriptive results indicated that most producers were experienced male farmers operating medium-sized farms and had received government support to sustain production. Correlation analysis showed that all four factors, namely input difficulties, disease issues, high production costs, and government intervention were significantly associated with broiler meat shortages, with input difficulties emerging as the strongest contributor. The regression findings further refine this understanding by identifying input difficulties and high production costs as the only significant predictors of broiler meat shortages. These two factors directly reduce production capacity, elevate financial risks, and weaken supply stability. Disease factors and government intervention were statistically insignificant in the regression model. This suggests that improved biosecurity practices may be mitigating disease impacts, while existing government interventions may not be sufficiently responsive to market conditions or cost pressures.

The findings underline the urgent need for targeted policy measures that priorities feed supply security and stabilize production costs through more adaptive support mechanisms. Strengthening supply chain resilience particularly in feed sourcing and price management will be essential to reducing Malaysia's exposure to global shocks. Future research should extend by incorporating additional determinants such as market concentration, contract farming structures and logistics bottlenecks. Since this study was limited to Selangor, future research should extend the analysis to other regions for broader representativeness. Expanding the model to include longitudinal or time-series data may also help capture dynamic changes in production conditions and policy impacts over time. Overall, this study contributes a holistic empirical assessment of broiler meat shortages demonstrating that multifaceted structural constraints particularly feed-related challenges and rising input costs remain the primary threats to supply stability in Malaysia's broiler sector.

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