

# **PROFITABILITY OF BROILER CONTRACT FARMING: A CASE STUDY IN JOHOR AND SABAH**

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## **ABSTRACT**

The study evaluated the profitability of small scale broiler production in Sabah and Johor with emphasis on contract farming. Cost benefit analysis and financial appraisal were carried out and the net return, value of input and output indicated broiler contract farming in Johor was more viable and profitable compared to Sabah. There were two obstacles limiting sustainable broiler contract farming in Sabah: 1) higher feed cost, and 2) low profit due to low gross margin between production cost and the ex-farm selling price. Therefore, in this study, the financial performance was evaluated, and sensitivity analysis was performed to assess the effect of changes in feed cost and selling price. The results concluded that Sabah broiler contract farming was more sensitive to changes in feed cost and selling price while the implementation of a zero tax incentive to small scale broiler contract farmers especially in Sabah would help the industry remained sustainable.

**Keywords:** Broiler contract farming; Profitability; Cost benefit analysis; Zero tax incentive

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## **1. INTRODUCTION**

Poultry industry is the most important livestock subsector in Malaysia. There are four common poultry farming established for meat and eggs supply, namely, chicken, duck, ostrich and quail. Chicken farming is the major subsector that recorded 662 establishments (Kei, 2017). One of the major reasons that lead to the fast expansion of chicken farming in Malaysia is its cheap source of protein that is socially acceptable by multi-ethnic community in Malaysia. Poultry meat in Malaysia had achieved self-sufficiency level of about 128% since 1970 (Idrus, 2016). However, few problems are prohibiting sustainable broiler chicken meat production, accessibility of low cost production inputs and non-optimal resources used.

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The Malaysia's National Agro-food Policy, 2011-2020 had provided specific strategies in ensuring adequate domestic supply of poultry meat and eggs (MOA, 2010). The government of Malaysia tend to promote vertical integration and stimulate efficiency gains among small scale farmers (Sugumar, 2006). Vertically integrated system in poultry industry consists of integrator that offers contract farming scheme to the small farmers. Integrator is a major commercial player in the production of poultry meat and eggs, which contribute about 75% of total output in Malaysia with the help of broiler contract farmers (Majid & Hassan, 2014; Loh, 2006).

Broiler meat is crucial sources of animal protein in Malaysia, with estimated per capita consumption about 40kg in 2011 (Elsedig, Mohd & Fatimah., 2015). However, the question on how to ensure the industry to remain sustainable to fulfil the domestic demand and at the same time maximizing profits to industry players is still unresolved. Since, farmers tend to gain less profit, due to small gross margin between the revenue and total cost of production per bird, the industry may experience lower participation, and this will limit the number of investors entering broiler chicken production. The government must not let this happen because poultry meat and eggs are vital for food security.

The low gross margin was attributed to mainly by high price imported broiler feed ingredients. Most researchers admit that high feed cost affects the performance of broiler chicken meat industry, since it solely depends on the price trend of imported feed ingredients. The research conducted by Elsedig et al., (2015) and Pattamarakha & Chanjula, (2002) did acknowledged that the feed cost is a major problem in broiler chicken production together with other problems such as lack of knowledge on disease prevention, breeding process and disease outbreak.

Peninsular Malaysia is the largest producer of broiler chicken meat in Malaysia compared to East Malaysia. According to the Department of Veterinary Services (DVS) Malaysia, Johor recorded the highest total number of productions for broiler chicken while Sabah has the least total number of productions compared to Sarawak (Table 1), even though Sabah had achieved almost full self-sufficiency level in chicken meat production estimated about 95 percent since year 2005 (Inus, 2016). Besides, the study conducted by Assis et al., 2015 show that, the chicken meat had been the most preferred source of protein among Sabahan in Kota Kinabalu due to its cheaper price compared to beef and mutton. All broiler contracts farming in Sabah had been managed by the Rural Development Corporation (KPD), and in this research, the focus was on the broiler contract farming in Sabah due to the collaboration with KPD on the enhancement of their broiler contract farming activities. Therefore, this study aims to assess the performance of broiler contract farmers in Sabah and Johor in order for the small scale broiler production to remain sustainable.

## **2. CONCEPTUAL FRAMEWORK**

This section briefly describes the pathway on measuring the profitability of broiler contract farming in Johor and Sabah. The broiler contract farming established in Malaysia as a private sector since 1980. Recently, the public sector builds an interest in contract farming by focusing on rural development. Therefore, specific planned interventions and programmes had been established in improving the socio-economic status of rural population. Apart from rural development, broiler contract farming also aimed at ensuring sustainable broiler chicken production in Malaysia.

Previous study conducted by Sulaiman, 2001 showed that contract farmers produce 55% of broiler output in 2001 and the remaining 45% from independent farmers. This means, contract farming is able to improve sustainable food security for future domestic consumption.

In order to remain sustainable, the industry must be consistently profitable. If the industry is making a loss, then many firms will exit the industry. When this happen, the industry will be controlled by few large firms and this is not good for the food industry because they may collude and set high price for one of the most important sources of protein. The broiler meat will not be the cheapest source of protein anymore when there are no small scale producers. Thus, the Malaysian government needs to ensure these small farms exist to enhance cheaper food availability and accessibility.

Normally, cost benefit analysis (CBA) was used to measure profitability of any enterprise. The CBA will show the tendency of broiler contract farming to effectively sustain the industry. There are three indicators of CBA that was measured in this research known as operational expenditures, net return and input and output ratios. Capital budgeting analysis also being carried out for this research in order to measure the performance of broiler contract farmers.

This research will investigate the current cost benefit structure of broiler chicken production in Sabah and Johor and provide suggestions in improving the performance of broiler chicken meat production. In general, feed cost dominated about 60% to 70% of the total cost of production. This is due to the high cost of imports of those ingredients used in the feed formulation for broiler chicken. The fluctuation of imported price of these ingredients might affect the feed selling price locally, and hence, influenced the profit margin.

**Table 1:** The Total Production of Poultry Meat (Mt) in Malaysia (2016)

State	Chicken	Duck	Ostrich	Quail
Perlis	1,408,985	12,131	n/a	3,978
Kedah	60,041,255	830,629	51	493,149
Pulau Pinang	13,018,266	497,153	n/a	143,214
Perak	38,740,037	7,486,010	33	76,830
Selangor	20,400,381	7,444	281	75,482
Negeri Sembilan	19,894,661	61,252	109	308,602
Melaka	22,447,234	153,314	22	91,699
Johor	69,460,978	1,192,806	308	1,312,044
Pahang	13,121,732	16,808	9	216,750
Terengganu	5,870,455	24,139	n/a	98,578
Kelantan	1,845,918	54,905	n/a	31,347
W. Persekutuan	n/a	n/a	n/a	n/a
Sabah <sup>P</sup>	5,816,200	46,934	n/a	n/a
Sarawak <sup>P</sup>	32,992,104	272,401	n/a	243,586
<b>TOTAL</b>	<b>305,058,206</b>	<b>10,655,926</b>	<b>813</b>	<b>3,095,259</b>

*Sources:* Department of Veterinary Services Malaysia, (2016)

Therefore, based on the issues presented, higher feed cost and low gross margin need serious attention to sustain the broiler industry for enhancing food security. In addition, this research offers in depth study on the effect of changes in feed and selling prices on profit by the broiler contract farming in Sabah and Johor. First, the financial analysis was carried out to identify the profitability of broiler contract farmers in Sabah and Johor. Then, further analysis (sensitivity analysis) was carried out by changing the feed price and the ex-farm price from 5% to 15%. Last, the study performed further analysis on how the government can intervene the industry to enhance profitability.

### 3. METHODOLOGY

The scope of the study only focused on broiler contract farmers in Sabah and Johor. The sources of data for this research were based on primary data gathered through face to face interviews with a set of questionnaires as a research instrument. The questionnaire had been tested and validated through a pilot study and confirmed by expert panel before actual data collection was conducted.

#### 3.1. Sampling Methods

Purposive sampling technique was used in this study by selecting one sample each from Peninsular (Johor) and East Malaysia (Sabah), respectively. According to expert judgement, the number of respondents should be small contract farmers rearing less than 30,000 birds per cycle. Since researcher depends on the expert judgement, hence the sample size (Sabah: 35 and Johor: 29) of this study is adequate.

#### 3.2. Analytical Techniques

There are four methods of analysis involved in this study; 1) descriptive, 2) economic assessment, 3) financial appraisal and 4) simulation. The descriptive analysis of this study involved the socio demographic factors such as age, education background, experience and job commitment summarized into mean, maximum, minimum and standard deviation among a sample of broiler producers in Sabah and Johor.

Economic assessment for this research had been carried out through the comparison of operational expenditures per kg and the comparison of net return to broiler production for both states. The feed conversion ratio (FCR) involves calculation as shown below:

Next, the financial appraisal analysis was carried out. Only one financial indicator involves in this study as shown below:

$$FCR = \frac{\text{Total Feed (kg)}}{\text{Total Weight (kg)}} \quad (1)$$

Net Present Value (NPV):

- The difference between the present value of cash inflows and the present value of cash outflows over the period of time.

$$NPV = \sum_{t=1}^T \frac{C_t}{(1+r)^t} - C_0 \quad (2)$$

Where,

$C_t$  = the cash inflow during the period  $t$

$C_0$  = the total initial investment cost

$r$  = discount rate

$t$  = time period

Then, the sensitivity analysis was conducted to show the effect of increase in ex-farm price per kg and feed cost per kg on the feasibility of broiler contract farming in Sabah and Johor.

## 4. RESULTS AND DISCUSSION

### 4.1. Descriptive Analysis

Demographic characteristics are necessary information to describe farms profile in Sabah and Johor. There are six categories involved in the descriptive analysis for this study, namely age, education level, working experience, job mode, scale of production and source of credit. The results indicated most of the broiler contract farmers for Sabah (40%) and Johor (38%) come from the age class of 51 years and above. Meanwhile, the involvement of young farmers in broiler contract farming industry is estimated about 14.3% and 10.3% for Sabah and Johor respectively. The involvement of young farmers is limited due to high capital requirement in broiler contract farming. For education level, majority of farmers from both Sabah (65.7%) and Johor (62.1%) completed secondary education while 5.7 % of farmers in Sabah and 6.9% of farmers in Johor obtained primary certificate. Meanwhile, the remaining 27.8% of farmers in Sabah and 31% in Johor had finished higher education. In terms of farming experience, farmers with range 5 to 10 years' experience is dominant in Sabah, estimated about 48.6%, slightly lower than Johor where the majority of farmers' experienced more than ten years (55.2%). Majority of farmers in Sabah (62.9%) and Johor (69%) operated broiler contract farming full time. The production for broiler contract farming industry in Sabah and Johor is more focus on small scale. Credit is crucial to ensure adequate working capital. Credit can be obtained through loans from credit institutions or family savings. In this study, most of the farmers in Sabah (62.9%) and Johor (86.2%) highly dependent on their own credit (loan from family members and friends) compared to the loans from credit institutions. This may be due to the collateral requirements by financial institutions. Meanwhile, in Sabah, it was estimated about 28.6% farmers depend on their own credit and loans from credit institutions.

**Table 2:** Descriptive Analysis of Demographic Characteristics of Broiler Farmers

<i>Categories</i>	<i>Sabah (n=35)</i>	<i>Percentage</i>	<i>Johor (n=29)</i>	<i>Percentage</i>
<i>Age of farmers</i>				
1=20-30	5	14.3%	3	10.3%
2=31-40	8	22.9%	6	20.7%
3=41-50	8	22.9%	9	31%
4=51 and above	14	40%	11	38%
<i>Education level</i>				
1=Primary School	2	5.7%	2	6.9%
2=Secondary School	23	65.7%	18	62.1%

<i>Categories</i>	<i>Sabah (n=35)</i>	<i>Percentage</i>	<i>Johor (n=29)</i>	<i>Percentage</i>
<i>3=Higher Education</i>	10	27.8%	9	31%
<i>Experience</i>				
<i>1=&lt;5 years</i>	5	14.3%	1	3.4%
<i>2=5-10 years</i>	17	48.6%	12	41.4%
<i>3=&gt;10 years</i>	13	37.1%	16	55.2%
<i>Job</i>				
<i>1=Full time</i>	22	62.9%	20	69%
<i>2=Part time</i>	13	37.1%	9	31%
<i>Scale of Production</i>				
<i>1=&lt;30,000</i>	31	88.6%	24	82.8%
<i>2=30,0000-125,000</i>	4	11.4%	4	13.8%
<i>3=&gt;125,000</i>			1	3.4%
<i>Sources of Credit</i>				
<i>1=Owner/ shareholder</i>	22	62.9%	25	86.2%
<i>2=Loan from other institutional credit</i>	3	8.6%	4	13.8%
<i>3= Owner + Loan</i>	10	28.6%		

Source: Primary Survey Data, 2017

#### 4.2. Broiler Production Per Cycle

The results indicated there are differences in the total number of broiler production between Sabah and Johor. Johor recorded a large number of broiler production each cycle compared to Sabah (Table 3). This is not surprising since almost 90% of broiler production come from Peninsular Malaysia and Johor is the largest (Orrisa, 2017). The price of DOC is slightly different as recorded in Johor (RM1.60) which is cheaper than the price of DOC in Sabah (RM1.90) may be reflecting transportation cost from Peninsular to Kota Kinabalu. The mortality rate recorded for Sabah is slightly higher (9%) with average weight 2.4 kg per bird, meanwhile for Johor the mortality rate is lower (5%) with average weight 2.2kg per bird. The ex-farms price for Sabah is a bit higher compared to Johor about RM 5.30 and RM 4.20 respectively. The FCR recorded for both states is lower which indicates efficient feed conversion among the broiler population. The FCR calculation is crucial because a small change in FCR at any given feed price will provide great impacts towards financial margins (Arbor, 2011).

**Table 3:** Descriptive Statistic of Broiler Production Per Cycle

<b>Items</b>	<b>Sabah (n=36)</b>	<b>Johor (n=29)</b>
Mortality Rate (%)	8.72(2.580)	5.49(2.10)
Price/ DOC(RM)	1.90(.000)	1.60(.000)
Weight (kg)	2.42(.185)	2.19(.196)
Price/ kg	5.30(.000)	4.20(.000)
Feed Conversion Rate	1.74 (.587)	1.90(.580)

Notes: Mean value are shown with standard deviation in parentheses

Source: Primary Survey Data, 2017

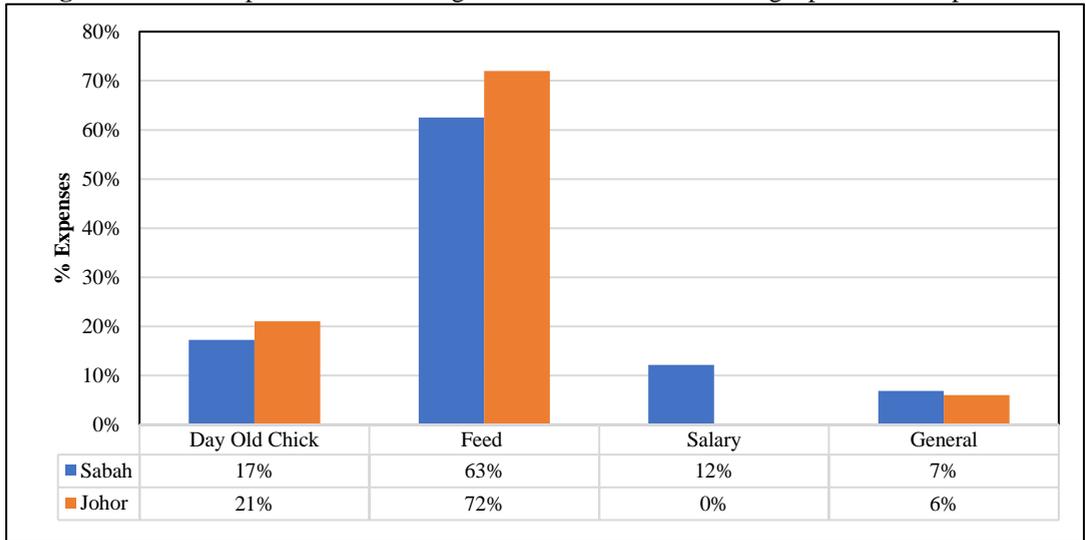
### 4.3. Operational Expenditures

Operational expenditures are expenditures incurred through normal business operations. There are eight components of operational expenditures involves in broiler chicken production known as cost for DOC, feed, manpower, utility, veterinary, maintenance, transport and others. As mentioned above, the feed cost apparently dominated about 60% until 70% of the total operational expenditures (Jahan et al., 2006; Bhatta et al., 2008 and Skinner and Waldroup, 1992). The results of this study also indicated that, feed cost is the main source of operational expenditures for broiler production in Sabah and Johor, estimated about 63% and 72% from the total operational expenditures respectively (Table 4 and Figure 1). The second highest cost component of operational expenditures is the DOC cost which are 17% and 21%, for Johor and Sabah respectively, which is similar to (Abdurofi, Ismail, Kamal & Gabdo, et al., 2017). There are differences between the manpower cost in Sabah and Johor, which is slightly higher for Sabah (12% of the overall total operational expenditures, see Figure 1). Most of Johor broiler contract farmers manage their farms by themselves, therefore less expenses recorded for manpower. The total operational expenditures per bird for Sabah is slightly higher compared to Johor (Table 4).

**Table 4** : Operational Expenditures Per Kg of Broiler Production, 2017

<b>Operational Expenditures Per Unit</b>	<b>Sabah (RM)</b>	<b>Johor (RM)</b>
Day Old Chicks (DOC)	0.88	0.77
Feed cost	3.19	2.67
Manpower	0.68	0.06
Utility	0.08	0.02
Veterinary	0.18	0.14
Maintenance	0.05	0.03
Transport	0.02	0.02
Others	0.01	0.01
<b>Total Cost Per kg</b>	<b>5.10</b>	<b>3.72</b>

*Source:* Primary Survey Data, 2017

**Figure 1:** The Comparison of Percentage in Broiler Contract Farming Operational Expenses

#### 4.4. Net Returns To Broiler Producers

Based on Table 5, the net returns of broiler productions in Johor is higher than Sabah. This may be due to lower operational cost in Johor. The total operational expenditures of broiler production in Johor and Sabah might vary based on certain socioeconomic factors. In terms of broiler sold, Sabah recorded lowest compared to Johor. This situation might exist due to strong import demand for broiler chicken meat by Singaporean which consumed about 40,000 live birds daily (DVS, 2016). The cost per kg for Sabah is slightly higher (RM 5.20/kg) compared to Johor (RM 4.20/kg) due to higher operational costs the higher cost may force the poultry firm in Sabah to be unsustainable in the long run. Meanwhile, the data showed that poultry firms in Johor can manage their cash flow better than Sabah.

**Table 5:** Net Return to Broiler Production in Sabah and Johor

Item	Sabah	Johor
Quantity sold/kg	36,743	59,589
Price/kg	5.30	4.20
Total Revenue	1,168,140.78	1,501,649.37
Total Cost	819,096.43	626,076.85
Net Returns	349,044.36	875,572.51

Source: Primary Survey Data, 2017

#### 4.5. Value Input-Output Ratio

The return on investment and efficiency evaluation of poultry firm can be measure using the input-output ratios. The input output ratios had been calculated by dividing the output cost (revenue) with the input cost (total production cost). The result of return on investment: Johor obtained

highest (1:2.39) compared to Sabah (1:1.43). The ratio indicated that each ringgit invested in broiler production in Johor will return 2.39 ringgit. The result obtain for this study is slightly difference from the previous study conducted by (Abdurofi, Ismail, Kamal & Gabdo, et al., 2017; Khair and Razzaq, 2002; Ahmad et al.,2008). On the whole, the results indicate the broiler production in Johor is more sustainable and highly profitable than Sabah (Table 6).

**Table 6** : Value of Input - Output (Returns) in Broiler Production for Sabah and Johor

Item	Sabah	Johor
Input cost (RM)	819,096.43	626,076.85
Output/ Revenue (RM)	1,168,140.78	1,501,649.37
Ratio	1: 1.43	1: 2.39

*Source:* Primary Survey Data, 2017

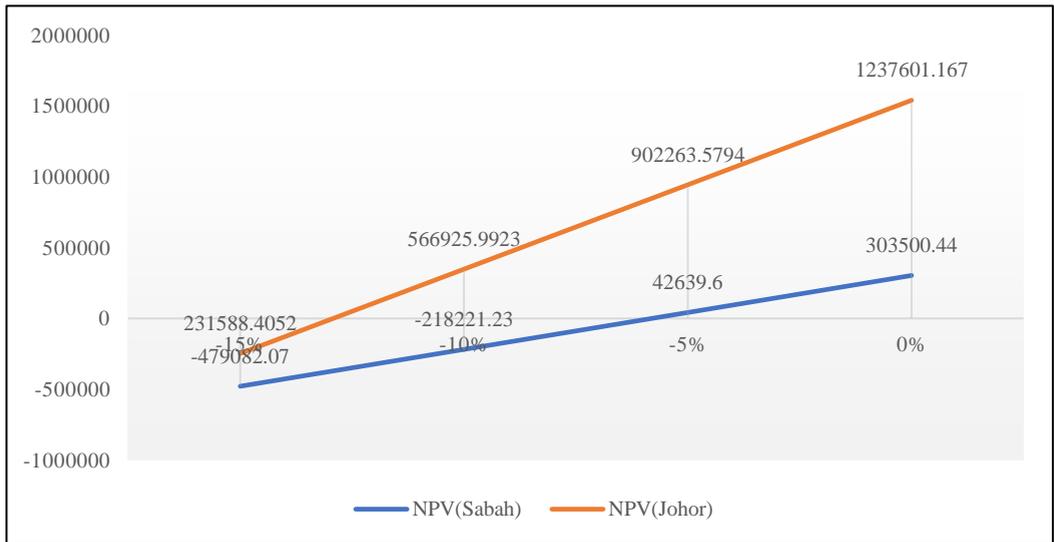
#### 4.6. Sensitivity Analysis

Sensitivity analysis or simulation analysis are necessary to predict the outcome of a decision given certain range of variables. Three simulations were conducted in order to predict the effect of changes on feed price, selling price and tax implementation towards the Net Present Value (NPV). The results for feed price in Figure 2 showed that, there are changes in NPV if the feed price increase from 5 % to 15% for broiler chicken production in both states. However, the NPV for Johor still positive while, the NPV for Sabah turned negative when the feed price increase by 15% (- RM 101,202.85).

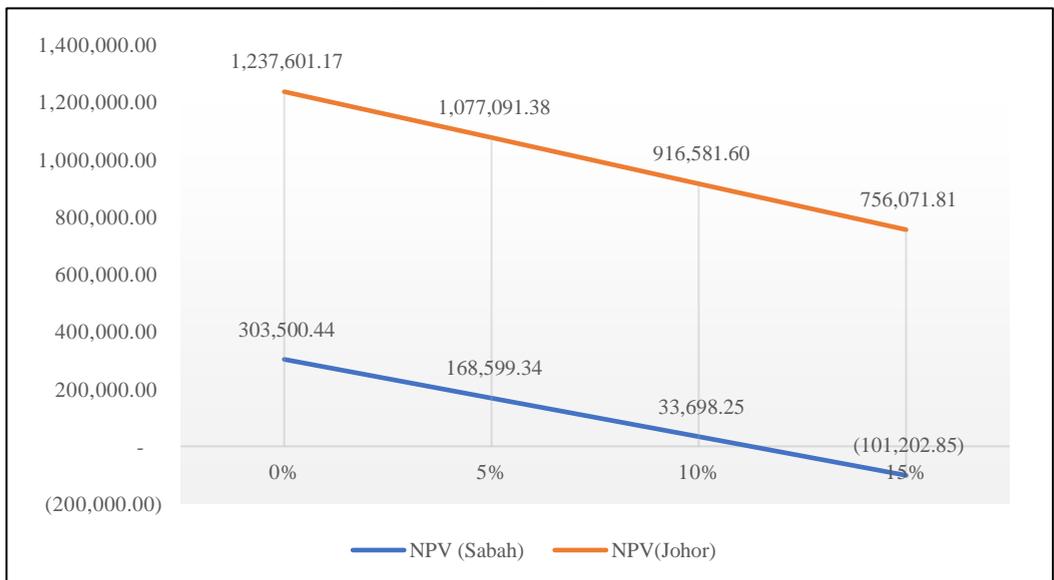
Similar results obtain for changes in selling price on NPV, the NPV declined slightly for both Sabah and Johor broiler production. The NPV for Johor broiler production remain positive but the NPV for Sabah turned negative when the selling price decreased by 10 % to 15 %. The results implied that the changes on selling price seriously affected the NPV for broiler chicken production in Sabah.

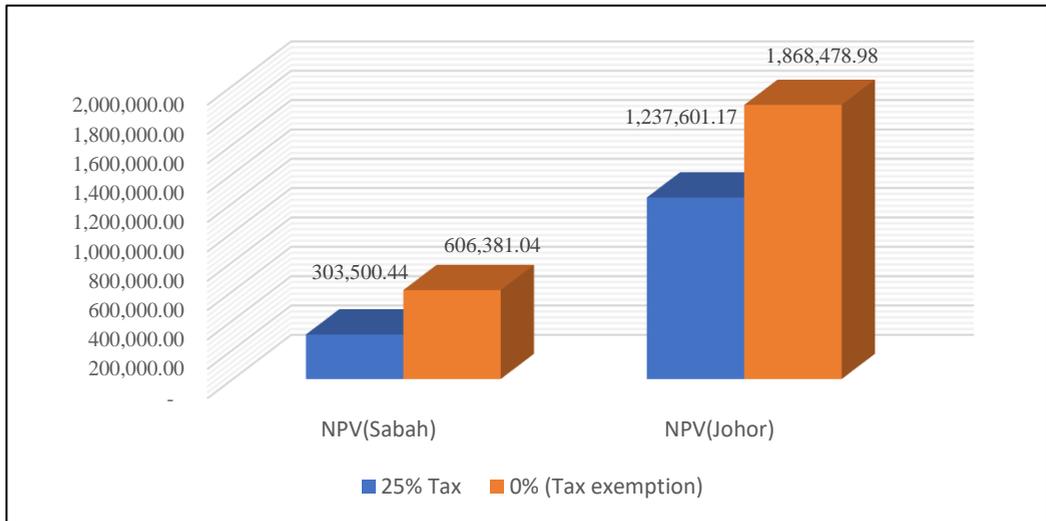
In terms of corporate tax, the 25 % government tax affects poultry firm profit. Therefore, in order to ensure the poultry farms, remain sustainable, tax incentives should be implemented. Thus, the following section will discuss this sensitivity analysis conducted on tax exemption towards NPV. The results indicated 50 % increase in NPV, if zero tax incentive implemented in broiler chicken production. Meanwhile, for the broiler chicken production in Johor, only 34 % increase in NPV if the zero tax incentives were implemented (Figure 4). This incentive for 5 years is applied to promote the broiler industry.

**Figure 2: Changes on Feed Price Towards NPV, 2017**



**Figure 3: Changes on Selling Price Towards NPV, 2017**



**Figure 4: Tax and Tax Exemption, 2017**

## 5. CONCLUSION

The study showed that involvement of senior farmers aged 51 and above is impressive compared to the young farmers due to credit accessibility. Senior farmers are economically stable, and they have a lot of experience in broiler contract farming. Majority of broiler contract farmers are fulltime. The broiler contract farming in Johor and Sabah mainly consist of small-scale operation. The results of this study showed that broiler contract farming in Johor and Sabah were profitable. However, serious attention needs to be given to the broiler contract farming in Sabah since the net return is not promising and significantly affected by the changes in feed cost and selling price. Hence, the industry is risky and hard to sustain in the long run. To mitigate the problem, the study suggested a zero tax incentive need to be implemented in Sabah to increase the profit by at least 50%. In addition, the state government and KPD in Sabah should find an alternative source of feed derives from local raw material that might reduce dependent on imported feed in the long term. In conclusion, the study showed broiler industry could remain sustainable even in times of high feed cost and low gross margin if the government provides the necessary incentives.

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