Profitability Performance of Broiler Chicken Farming Partnership Pattern in North Minahasa Regency

Annatasiya Grace Ambat[1], Femi H. Elly[2] and Richard E.M.F. Osak[2*]

[1]Postgraduate Program Student of Sam Ratulangi University.
[2]Faculty of Animal Science, Sam Ratulangi University.
*Correspondent e-mail: richard.osak@unsrat.ac.id

Abstract— The study aims to analyze the influence of performance factors on the profitability of broiler chicken farming using partnership patterns in North Minahasa Regency. The method used is a survey method, using a purposive random sampling technique. Data collected through used the questionnaires. Data analysis used multiple linear regression analysis. The results showed that the profitability obtained by broiler chicken farmers using a partnership pattern was IDR 623,844,148 with an average per respondent of IDR 20,794,805. While the influence each independent variable have a very significant effect on the partnership pattern broiler farming profitability. The results of the regression coefficient analysis show that if the Performance Index (IP) increases by IDR 1, profitability will increase by IDR 2.29, these results indicate that farmers have succeeded in achieving the performance of lifeweight and efficiency of feed and medicine/vaccine use. However, Feed Conversion Ratio (FCR) increases by IDR 1, profitability will decrease by IDR 1.13, meaning it is necessary to improve maintenance management to increase feed conversion into additional bodyweight. Likewise, the Mortality rate increases by IDR 1, then profitability tends to decrease by IDR 0.68, which means the depletion or mortality rate needs to be reduced through more intensive maintenance management.

Keywords— Broiler, Chicken, Partnership Pattern, Performance, Profitability.

I. INTRODUCTION

The nutritious food program that will soon be implemented by the Indonesian government needs to be supported by a livestock production development program, to provide meat, milk, and eggs as part of an effort to increase the availability of animal protein in Indonesia (Ministry of Agriculture, 2024). Meat and eggs from chickens are sources of protein that are easy to find and have affordable prices (Prasetyo, 2018).

Chickens farmed for meat are called broilers. Globally, the billions broiler chickens are farmed each year to meet consumer demand. Broiler chickens as one source of animal protein from livestock are very popular among various levels of society. Chicken delivers vital, under-consumed nutrients of public health importance for all age groups. Chicken meat is a favorite meat because almost everyone, and the increasing public awareness of the importance of consuming nutritious food has caused the demand for chicken meat to continue to increase every year (Swamilaksita and Sukandar, 2022; and Tamaluddin, 2016).

The demand or need for broiler chicken meat is driven by several factors, including a fast lifestyle and changes in people's consumption patterns. People tend to choose foods that are quick to process and have the right taste, such as chicken meat as the main choice of food ingredients for the community. Broiler chicken meat has become a favoured choice among consumers due to its high content of nutritions as proteins and minerals, and its affordable price. Processed chicken meat is also easy to find in various outlets, from restaurants to food shops, also playing an important role in increasing demand (Sattyananda, 2024).

On the other hand, the supply of broiler chickens are influenced by various factors, including chicken farming management to increase production efficiency, where the management technology that has been applied, especially for broiler chicken farming businesses, is the partnership pattern.

Partnership in livestock business is cooperation between livestock businesses based on the principles of mutual need, strengthening, benefit, respect, responsibility, and dependence, where the partnership agreement is made in the form of a written agreement (Ministry of Agriculture, 2017). Partner farmers (plasma actors) are generally evaluated for their performance by partner companies (core actors) by looking at the performance of achieving body weight, production age, feed conversion ratio, mortality rate, and performance index (Pandey et al., 2022 and Ministry of Agriculture, 2017).

In North Sulawesi, Indonesia, broiler chicken farming has developed since the 1978 Bimas (Community Guidance) Program for broiler chickens, and has implemented a broiler partnership pattern since the 1990s through partner companies, namely PT Charoen Pokphand Indonesia (Animal Feedmill) and PT Java Pelletizing Factory Ltd (PT Japfa Comfeed), each of which later developed with several subsidiaries as partner companies. Partner companies PT Ciomas Adisatwa and PT Bintang Sejahtera Bersama (BSB) as the core companies of partner farmers studied in North Minahasa Regency.

The partner company (core) evaluates the performance of partner farmers (plasma) of broiler chickens expressed in the performance or appearance of broiler chicken production which can be measured through three indicators, namely the index of performance (IP), feed conversion ratio (FCR), and mortality rate. The performance of the three performance indicators at the partner farmer level (plasma) is appreciated by the partner company (core) through the provision of performance index (IP) incentives, feed conversion ratio (FCR) incentives, and mortality rate incentives. For this reason, it is necessary to know the influence of each of the three indicators on business profitability, so that it will be known which performance indicators need to be maintained or improved.

II.   RESEARCH METHODS

The study was conducted in North Minahasa Regency in the sub-districts that have the most partnership broiler farmers, namely Dimembe Sub-district and Talawaan Sub-district. The method used was a survey method with a purposive random sampling technique for determining respondent samples with research criteria, namely a

minimum of 3 years of experience in partnership broiler farming and using conventional cage construction (open house).

Data were collected through direct observation and interviews with broiler farmers using a partnership pattern using a questionnaire. This study only selected 30 partner farmers as a minimum number, where according to Sugiyono (2019) the sample size should be 30 to 500 samples.

Data analysis used a multiple linear regression analysis model, to test the effect of independent variables, namely performance index incentives (X1), feed conversion ratio incentives (X2), and mortality incentives (X3) on the dependent variable of broiler business profitability (Y). The variables were analyzed using multiple regression using the formula according to Basuki (2015) and Sugiyono (2014):

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + e$$

Definition of variables and coefficients of this study, namely:

Y is the profitability or profit level of broiler chicken farming

X_1 is the amount of performance index (IP) incentives for broiler chicken farming

X_2 is the amount of feed conversion ratio (FCR) incentives for broiler chicken farming

X_3 is the mortality (depletion) incentive for broiler chicken farming

a is the constant coefficient

b_1 is the regression coefficient of the performance index (IP) incentive variable

b_2 is the regression coefficient of the feed conversion ratio (FCR) incentive variable

b_3 is the regression coefficient of the mortality (depletion) incentive variable

e is the standard error coefficient.

Through multiple linear regression analysis, regression coefficient (R) and determination coefficient (R2) analysis were carried out to determine the level of relationship and percentage of influence of all independent variables with the profitability variable of the broiler business. Then the F test was carried out to test the multiple linear regression model of the influence of independent variables (Xi) simultaneously on the profitability of the broiler farming. Furthermore, the t test was used to determine the partial influence of each independent variable (Xi) on the profitability of the broiler business. Then the results of the regression coefficient analysis were interpreted according

to the regression coefficient value of each variable, namely the performance index incentive (X_1), feed conversion ratio incentive (X_2), and low mortality incentive (X_3) on the profitability variable or profit of the broiler chicken business (Y) of partner farmers. The analysis used the SPSS 23 application.

III.   RESULTS AND DISCUSSION

Revenue of broiler farming with a partnership pattern in North Minahasa Regency is obtained from total broiler sales, partner company incentives, namely IP (Index on Performance) incentives, FCR (Feed Conversion Ratio) incentives, and LM (Low Mortality) incentives. The higher the IP (Index of Performance) value, the better the performance (Suwianggadana, et al., 2013). FCR (Feed Conversion Ratio) is a measure of feed use, the lower the FCR value, the more efficient it is (Siregar et al. 2017). While the mortality value as a percentage is calculated by dividing the number of dead chickens by the chicken population during maintenance and then multiplying it by 100 percent (Zulfan and Zulfikar, 2020).

Table 1. Revenue, costs and profits of sample farmers per period

No	Description	Amount (IDR/Period)	Average (IDR/Period)
(1)	**Revenue:**		
	a) Chicken Sales	10,626,702,600	354.223.420
	b) Performance Incentives/Bonuses from Core Company:		
	▫ Index of Performance (IP) Incentive	50,049,847	1,668,328
	▫ Feed Conversion Ratio (FCR) Incentive	47,838,302	1,594,610
	▫ Low Mortality (LM) Incentives	49,982,299	1,666,077
	Total Revenue	**10,774,573,048**	**359,152,435**
(2)	**Cost:**		
	▪ Purchase of Inputs (chicks/DOC, feed and medical chemical vaccines (MCV)	9,635,378,900	321,179,297
	▪ Electricity and water/PDAM bills	187,250,000	6,241,667
	▪ Labor Wages	282,500,000	9,416,667
	▪ Taxes (land and building tax, levies)	45,600,000	1,520,000
	Total Cost	**10,150,728,900**	**338,357,630**
(3)	**Profit = (1) – (2)**	**623,844,148**	**20,794,805**

Table 1 shows that the total income obtained by partner farmers in one period was IDR 10,774,573,048 with an average per period of IDR 359,152,435 for each partner farmer. While the total cost for one period was IDR 10,150,728,900 with an average of IDR 338,357,630 per period for each partner farmer. So the profit obtained by partner farmers per period was IDR 623,844,148 with an average of IDR 20,794,805 for each partner farmer. Factors that influence the amount of profit obtained are the allocation of production costs, besides the factor of how to regulate the use of farm production factors (Murti, et al., 2020).

Table 2. Results of correlation and determination coefficient tests

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.931	.867	.852	.12139

R is the correlation coefficient

R Square or R2 is the determination coefficient

Data processed, 2024

Table 2 shows the results of the correlation coefficient test of 0.931, which means that there is a very close relationship between the dependent variable of profitability or profit level (Y) with the independent

variables of the amount of performance index incentives/bonuses (X1), the amount of feed conversion ratio incentives/bonuses (X2) and mortality incentives/bonuses (X3). Likewise, the results of the determination coefficient test obtained an adjusted R square value of 0.867, this means that the influence given by the performance index incentive variables, feed conversion ratio incentives and mortality incentives on profitability performance is 86.7%; while 13.3% is influenced by other variables. The determination coefficient (R2) is useful for measuring the level of accuracy which is the proportion or percentage of Xi's contribution to the variation in the rise and fall of Y (Mubarak, 2021 and Sahir, 2021). This determination coefficient test is carried out with the aim of measuring the model's ability to explain how much the independent variables simultaneously influence the dependent variable, which can be indicated by the adjusted R-Square value (Ghozali, 2016).

Table 3. F test results

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.507	3	.836	56.719	.000**
	Residual	.383	26	.015		
	Total	2.890	29			

a. Superscript **) indicates a significant level of p<0.01 or very significant

b. Data processed, 2024

Based on the results of the F test in Table 3, the independent variables simultaneously, namely performance index incentives (X$_1$), feed conversion ratio incentives (X$_2$), and mortality incentives (X$_3$) have a very significant effect (p <0.01) on the dependent variable of broiler business profitability (Y) of broiler chicken farming for farmers with a partnership pattern. These results indicate that the three performance variables most influence the level of profit, so partner farmers must pay attention to these three factors. In improving production performance and profits, broiler plasma farmers are expected to improve maintenance management (Mahardika, et al., 2020). Analysis of the influence of each independent variable, namely the amount of performance index incentives/bonuses (X$_1$), the amount of feed conversion ratio incentives/bonuses (X$_2$) and mortality incentives/bonuses (X$_3$) on the dependent variable of broiler chicken farming profitability (Y), is presented in **Table 4**.

Table 4. T-test results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
a (Constant)	-.316	2.085		-.152	.881
X$_1$	2.924	.230	1.524	12.728	.000**
X$_2$	-1.135	.282	-.772	-4.027	.000**
X$_3$	-.617	.218	-.471	-2.837	.009**

Dependent Variable:

   Y = profitability or level of profit of broiler chicken business

Predictors:

   a is a constant

   X1 is the amount of performance index (IP) incentives for broiler chicken businesses

   X2 is the amount of feed conversion ratio (FCR) incentives for broiler chicken businesses

   X3 is the low mortality (depletion) incentive for broiler chicken businesses

*Superscript **) indicates a significant level of p<0.01 or very significant*

Data processed, 2024

Table 4 shows the results of the partial influence test or each independent variable also has a very significant influence ($p < 0.01$) on the dependent variable of broiler business profitability (Y) of broiler chicken farming for farmers with a partnership pattern, so that partner farmers must pay attention to these three factors, especially variables that show negative regression coefficients, namely feed conversion ratio (X2) and mortality rate (X3). Based on Table 4, the multiple linear regression equation is obtained:

$$Y = -0{,}316 + 2{,}924\,X_1 - 1{,}135\,X_2 - 0{,}617\,X_3$$

The results of the regression coefficient analysis in the equation show that if the Performance Index (IP) increases by IDR 1, profitability will increase by IDR 2.29, this result means that farmers have succeeded in achieving the performance of lifeweight and efficiency of feed and drug/vaccine use. Variations in the production index indicate fluctuations in production efficiency that require improvement to increase profit margins (Bahari, et al., 2024).

However, if the Feed Conversion Ratio (FCR) increases by IDR 1, profitability will actually decrease by IDR 1.13, meaning that it is necessary to improve maintenance management to increase the conversion of feed into additional livestock weight. Feed Conversion Ratio (FCR) is a comparison between the amount of feed used and the amount of chicken weight that can be produced. The smaller the FCR value indicates better business conditions (other factors being equal). This shows that the addition of a certain amount of feed can result in an increase in chicken weight with a greater proportion. As with the addition of feed, for the addition of other inputs, the addition of the input in question is said to have a good effect on FCR if the addition of certain inputs with a certain proportion causes broiler chickens to transfer a certain amount of feed to increase chicken weight with a greater proportion (Suwarta, 2012). Ridwan et al. (2019) reported that the profits obtained by plasma farmers each period are fluctuating, where there is an influence of the Feed Conversion Ratio (FCR) on the profits of broiler chicken farmers in the partnership pattern. The effect is inversely proportional, if the Feed Conversion Ratio (FCR) is smaller, the profit of broiler farmers will be greater, and vice versa.

Likewise, the Mortality rate increases by IDR 1, then profitability tends to decrease by 0.68 rupiah, which means that the mortality rate or depletion (including livestock that died/was removed due to poor growth) needs to be reduced through more intensive and effective maintenance management. It is also necessary to mitigate extreme weather events that often occur, which greatly affect the level of feed consumption and increase the mortality rate of broiler chickens. The results of the study showed a very significant effect on the level of profit, so it needs to be given serious attention. This result is different from the results of the study by Ratnasari et al. (2015) that the effect of mortality on income levels was not significant because mortality did not have a real effect on the income level of broiler chicken farmers due to the level of cage density.

IV.   CONCLUSION

The profitability obtained by broiler chicken farmers in partnership pattern in North Minahasa Regency is IDR 623,844,148 per period with an average per respondent of IDR 20,794,805 per period.

Each of the performance variables of Performance Index (IP) and Feed Conversion Ratio (FCR) needs to be improved, while the level of depletion or mortality needs to be reduced through more intensive and effective maintenance management.

REFERENCES

[1] BPS. (2024). Livestock in Figures 2023. Manado: Central Bureau of Statistics of North Sulawesi.

[2] Bahari, A.S., Setianto, N. A. & Wakhidati, Y. N. (2024). Productivity of Broiler Chicken Business Case Study at PT GSU in Serang Regency. Proceedings of the XI National Seminar on Livestock Technology and Agribusiness, 17-18 July 2024: "Synergistic Livestock: Real Steps to Face Climate Change and Integration of Digital Technology for Food Independence" (pp. 107-113). Purwokerto, Faculty of Animal Husbandry, Jenderal Soedirman University.

[3] Ghozali, I. (2016). Application of Multivariate Analysis with IBM SPSS 23 Program. 8th Edition. Semarang: Diponegoro University Publishing Agency.

[4] Kalangi, J. (2024). Profit From Chicken Livestock Agribusiness (The Type Of Layers That Were Cultivated As Broiler). Jambura Journal of Animal Science 6(2): 115-120.

[5] Kalangi, L. S., Lombogia, S. O. B., Pandey, J. & Fadwiwati, A. Y. (2022(. Analysis of technical efficiency and determining factors of the broiler business in North Sulawesi. Livestock and Animal Research 20(1):101-109.

[6] Ministry of Agriculture (2017). Regulation of the Minister of Agriculture Number 13/Permentan/PK.240/5/2017 of 2017 concerning Livestock Business Partnerships. Jakarta: Ministry of Agriculture.

[7] Ministry of Agriculture (2024). Ministry of Agriculture Designs Roadmap to Meet Meat, Milk, and Egg Needs. Retrieved September 22, 2024, from: https://ditjenpkh.pertanian.go.id /berita/2001-kementan-

rancang-peta-jalan-penuhi-kebutuhan-daging-susu-dan-telur#!

[8] LIPI (2018). Summary of Recommendations for the National Food and Nutrition XI. Jakarta: Indonesian Institute of Sciences (LIPI).

[9] Lumenta, I. D. R., Osak, R. E. M. F., Rambulangi, V., & Pangemanan, S. P. (2022). Analysis of Income of Egg-Laying Chicken Farming Business "Golden Paniki PS". Jambura Journal of Animal Science 4(2):117-125.

[10] Mahardika, C. B. D. P., Pello, W.Y., & Pallo, M. (2020). Performance of Broiler Chicken Partnership Business. Partner 25(1):1270-1281.

[11] Mubarak, R. (2021). Introduction to Econometrics. Pamekasan: Duta Media Publishing.

[12] Murti, A. T., Suroto, K. S., & Karamina, H. (2020). Analysis of Profit of Independent Broiler Chicken Farming Business in Malang Regency (Case Study in Karangploso District, Malang Regency). SOCA: Journal of Socio-Economics of Agriculture, 14(1):40–54.

[13] Pandey, J., Osak, R. E. M. F., & Pangemanan, S. P. (2022). Feasibility Analysis of Broiler Chicken Business Partnership Pattern (Case Study in Pinaras Village, South Tomohon. Tomohon City). EMBA Journal 10(2):1211-1222.

[14] Prasetyo R. M. (2018). Analysis of Egg-Laying Chicken Business and Farmer Income in Pulau Harapan Village, Sembawa District, Banyuasin Regency. Palembang: Sriwijawa University.

[15] Ratnasari, R. Sarengat, W., & Setiadi, A. (2015). Analysis of Broiler Chicken Farmer Income in Partnership System in Gunung Pati District, Semarang City. Animal Agriculture Journal 4(1):47-53.

[16] Ridwan, I., Widodo, A., & Mukti, M. (2020). The Influence of Partnership Patterns on Broiler Farmers' Profits (FCR Study in Partnership Patterns at CV. Taat Mitra Bersinar Tangerang). The Asia Pacific Journal of Management 7(2): 105-114.

[17] Sahir, S. H. (2021). Research Methods. Bojonegoro: KBM Indonesia Publisher.

[18] Sattyananda, D. (2024). Supply Demand for Broiler Chickens. Poultry Indonesia Magazine. (e-magazine). Retrieved September 22, 2024 from: https://www.poultryindonesia. com/id/supply-demand-ayam-ras-pedaging/

[19] Siregar, J., Jatikusumah, A. & Komalasari, R. (2017). Practical Guide to Broiler Chicken Management. (Translation of Broiler Signals written by Maarten de Gussem, Edward Mailyan, Koos van Middelkoop, Kristof van Mullem, Ellen van 't Veer). Poultry Signals. Roodbont Publisher B.V. The Netherland.

[20] Sugiyono (2014). Quantitative, Qualitative and R&D Research Methods. Bandung: Alfabeta.

[21] Suryanti, R. (2019). Sustainability of Broiler Farming on Partnership Pattern. Food Journal, 28(3):213-226.

[22] Suwarta. (2012). Feed Conversion Ratio (FCR) of Broiler Chicken Farming Business in Sleman Regency. Agrika 6(1):65-85.

[23] Suwianggadana, I., Suciani, PA, & Sariani, NP (2013). Financial Analysis of Broiler Chicken Business with Partnership Pattern. E-Journal of Tropical Animal Husbandry 1(2):58-68.

[24] Swamilaksita, P. D., & Sukandar, D., 2022. Projection of Broiler Meat Production to Meet the Protein Needs of the Population in Indonesia. J. Dietetic Nutrition, 1(3):196-203.

[25] Tamaluddin, F. (2016). Complete Broiler Chicken Guide. Penebar Swadaya Jakarta.

[26] Ulfa, D., Suyatno, A. & Dewi, Y.S.K. (2021). Partnership Patterns and Performance in Broiler Chicken Farming Businesses in Kubu Raya Regency, West Kalimantan. Agricultural Policy Analysis 19(1):19-32.

[27] Zulfan & Zulfikar. (2020). Evaluation of Performance and Income Over Feed & Chick Cost (IOFCC) of Three Broiler Chicken Strains Circulating in Aceh. Agripet Journal 20(2):136-142..

ISSN: 2456-1878 (Int. J. Environ. Agric. Biotech.)

https://dx.doi.org/10.22161/ijeab.101.4   *33*