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# The production risk of broiler farm management at plasma breeders: Evidence from Indonesia

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# **ARTICLE INFO**

# ABSTRACT

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The broiler chicken business is essential to providing national meat consumption in Indonesia. However, the business also faces a very significant management risk. The purpose of this research is to study broiler farm management and the effect of its business management on the production and production risk. This research was conducted in Lamongan regency of East Java by interviewing broiler chicken farmers and using descriptive and multiple linear regression analysis. The results of the research show that the implementation of broiler farm management reached 73.48% of ideal situation, with planning reaching 67.64% ideal situation, 65.58% for ideal organizing, 84.18% for optimal direction, 74.43% for ideal coordination, and 77.58% for ideal control. Also, the management had a positive influence on the production of the broiler livestock business, with an elasticity of 0.700. The management had a negative effect on the risk of production of broiler livestock business with the elasticity of 0.237. Production risk was negatively affected by the number of chicks and the amount of feed. To provide support for breeders in their business, it is necessary to have a policy of low cost of broiler cultivation, especially the cost of chicks and feed, by setting DOC prices and cheap or cheaper feed. Besides, it is required to develop cooperation with companies using broiler primary products, as well as certain policies so that there will be businesses that use broiler primary products as their main ingredient.

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#### INTRODUCTION

Production management is a high concern in the broiler chicken business. It is necessary to pay attention to how to manage a broiler chicken business properly. Therefore, it is one of the most important indirect independent variables, and very much determines the success of a business (Suwarta & Darmaji, 2020). Good management can increase the productivity and profits of the poultry industry (Suwarta & Hanafie, 2018). Dun & Bradstreet concluded that 88% of all business failures were due

to ineffective management (<u>Suwarta & Hanafie,</u> 2018). According to <u>Ochieng et al. (2011)</u>, by adopting a full management intervention package, performance is more productive than modifying and selectively.

To support the growth of broiler chickens and provide maximum benefits, it needs to be managed properly by meeting the needs of broilers properly (<u>Suwarta & Darmaji, 2020</u>). The elements of managing the broiler chicken business (<u>Aviagen, 2018</u>), including day old chicks (DOC), feeding and water, health and biosecurity, housing and

neighborhoods, monitoring of live weight and uniform performance and pre-processing management. The management of broiler chicken farming includes waste, curtains, water, nutrition, pumps, heat, and other kinds of management.

Broiler chickens are part of the poultry industry. Broiler chicken has the greatest contribution to support the sufficiency of national meat, and is a good business commodity as a means of increasing income and community welfare (<u>Simatupang & Maulana</u>, <u>2010</u>). This statement is marked by the fact that broiler chicken is a good business commodity with a major role in improving the welfare of the poor. Broiler chickens can be used to meet the greatest national demand for meat, namely as much as 60% of the national demand (<u>Simatupang & Maulana</u>, <u>2010</u>).

The study by <u>Simatupang & Maulana (2010)</u> provided motivation to increase the production of broiler chicken farming. Broiler chicken production can be increased by managing the broiler chicken business in the best possible way. First, the management of broiler chicken maintenance, such as the needs for feed, water, vitamins, medicine/antibiotics, chemicals for sanitation, a good environment, should be improved. Second, broilers should be prevented from getting attacked by diseases and other factors that limit their growth.

According to <u>Suwarta, Irham, & Hartono (2012)</u>, broiler chicken production is influenced by number of chicks, amount of feed, age of workers, workers' level of education, farmers' experience, wage, size of cage, partnerships of plasma breeders and nucleus company, and economic scale of chicken population. Studies showed that the management factor plays a very large role in supporting the success of a broiler business. However, they generally did not involve management factors as an independent variable in the broiler production or business productivity model.

Suwarta et al. (2012) also stated that broiler chicken farming business has a high risk of failure. High risks in broiler chicken farming are related to erratic fluctuations in production prices, DOC price, production and feed price, and other factors. The risks affect the extent of the success of a business. The greater the risk of a business, the greater the opportunity for the business to achieve success. Risk and return has a direct or linear correlation. The higher the risk of a business, the higher the level of business acceptance (high risk high return), and vice versa. Broiler chicken farming with certain characteristics has a high risk. High profits in broiler chicken farming can be achieved by applying management theory.

Due to the above mentioned risk, it is very essential for broiler chicken breeders to pay attention seriously to keep the risk of broiler chicken farming appropriate. By maximizing the application of broiler chicken business management, the level of production and the expected level of profit or income can be achieved. Breeders should focus on how to fulfill a best practices of the management of broiler chickens.

With the background of the problems above, this study aims to take the production model and the risk model for the broiler chicken production business. It is expected that the model of production and the risk of production in the broiler chicken business can be used to increase production and reduce the risk of production in the said business. This study tries to develop a business management model where the production and production risks of the best broiler chickens will be achieved, associated with management factors that affect the broiler business.

The purpose of this study is to determine the effect of business management and breeder's social factors on the production and risk of broiler chicken production.

#### **RESEARCH METHOD**

The research was conducted in the broiler chicken farm in Jombang regency. Jombang, Malang and Lamongan are the main producers of broiler chicken in East Java. The broiler breeders were plasma farmers who partnered with companies as the nucleus. The number of plasma broiler breeders was 49 breeders selected randomly with minimum business volume of 500 chicks (day old chick). They were spread over the areas of Kedumping District (11 breeders), Sugiro District (9 breeders), Tikung District (2 breeders), Sarirejo District (2 breeders), Kembang Bahu District (3 breeders), and Muntup District (22 breeders). The interviews were carried out to obtain data variables including production of broiler chickens, direct production factors (number of chicks, amount of feed, amount of drug-vaccine-chemicals, labor, and cage area), indirect production factors (age breeders, experience, farmer education, main job), age of harvest, and feeding method.

The management of broiler chicken business was analyzed qualitatively using score value addressing the management function of planning, organizing, implementing, monitoring, controlling. The approach was measured in units of score and comparing an ideal management situation.

The production function and production risk were determined using the Cobb-Douglas production function, as follow.

 $Q = AX_1^{b1} X_2^{b2} \dots X_n^{bn} e^u$ .

Factors affecting production and production risk were formulated using the following model

$$\begin{array}{l} {\rm Ln}\; Y = {\rm Ln}\; b_0 + b_1 \, \ln X_1 + b_2 \, \ln X_2 + b_3 \, \ln X_3 + b_4 \, \ln \\ {\rm X}_4 + b_5 \, \ln X_5 + b_6 \, \ln X_6 + b_7 \, \ln X_7 \\ {\rm +}\; b_8 \, \ln X_8 \ {\rm +}\; b_9 \, D_1 + b_{10} \, D_2 + b_{11} \, D_3 + b_{12} \\ {\rm D}_4 \, + \, \varepsilon_1 \ (1) \end{array}$$

$$\begin{array}{l} {\rm Ln} \ \epsilon_1{}^2 = \ ln\beta_0 + \beta_1 \ lnX_1 + \beta_2 \ lnX_2 + \beta_3 \ lnX_3 + \beta_4 \ lnX_4 \\ + \ \beta_5 \ lnX_5 + \ \beta_6 \ lnX_6 + \ \beta_7 \ lnX_7 + \ \beta_8 \ lnX_8 + \\ \beta_9 D_1 + \ \beta_{10} \ D_2 + \ \beta_{11} \ D_3 + \ \beta_{12} \ D_4 + \ \varepsilon_2 \ \ (2) \end{array}$$

In which Y is production (kg) and  $\varepsilon 12$  is production risk. Those variables are affected by number of DOC (X1), amount of feed in kg (X2), age of harvest in day (X3), area of cage in m2 (X4), age of breeder (years) (X5), farmer education (years) (X6), farm experience (years) (X7), and business management in score (X8). Dummy variable, D1 = 1, business volume > average, D2 = 1, divided feeding, D3 = 1, harvest age < average, D4 = 1, raising broiler chickens as the main work. Meanwhile  $\varepsilon$  = error,  $\beta 0$  = constant,  $\beta 1$ -  $\beta 8$  = elasticity of the independent variable,  $\beta 9$  -  $\beta 12$  = parameter of the dummy variable.

Regression analysis tested heteroscedasticity models to determine the percentage of the influence of independent variables on the dependent variable used the statistical Likelihood Ratio.

#### **RESULT AND DISCUSSION**

#### **Business Management of Broiler**

Business management indicators that affect business concerning the organization functions are planning, organizing, implementing, supervision, evaluation, and control of the production process. Business management functions to direct and deliver the influencing factors for increased production, and to minimize or even eliminate a negative effect on production, so that the level of production is achieved (Suwarta & Darmaji, 2020).

The implementation of management functions in the broiler chicken business can be maximally achieved at the ideal number of 100%. Each breeder has different abilities in implementing broiler business management. The better the application of business management, the broiler chicken business will achieve the desired goals, through increasing production and reducing the risk of production in the broiler chicken business.

For planning function, the results of the analysis (Table 1) show that management in the production planning function achieved a score of 22.32 (67.64% ideal) from a maximum score of 33. The results of the analysis consisted of components of commodity selection with a score of 4.14 (82.8% ideal), site selection at 1.96 (49% ideal), determination of business scale at 1.98 (66% ideal), breed objectives reaching 1.88 (47% ideal), motivation to join the partnership reaching 2.60 (86.7% ideal), preservation period of 3.34 (66.8% ideal), and planning after harvest of 1.9 (63.33% ideal).

These results show that the implementation of management in the planning function is still below the ideal. It means that it is necessary to add instruments that are included in planning activities and have a positive effect to increase production and reduce production risk.

For organizing function, the results of the analysis (Table 2) show that the implementation of management in the organizing function reached a score of 12.48 (65.58% ideal) of a maximum score of 19. The results of the analysis (Table 2) consist of the components of total production at the score 2.12 (53% ideal), production technique as many as 2.58 (86% ideal), marketing at 2.20 (73.33% ideal), purchase of input and output at 1.40 (46.67% ideal), state of money for operational costs at 2.16 (72% ideal), and adapted state of labor at 2.02 (67.33% ideal). Overall, the implementation of management in the organizing function is still far from ideal. Therefore, it is necessary to expand or add instruments included in the organizing function.

For direction function, the analysis results (Table 3) show that the implementation of management in the direction function reached a score of 18.52 (84.18% ideal) of the maximum score 22. The results of the analysis consisted of the components of optimal resource allocation which reached the score of 2.50 (83.33% ideal), optimal production process planning with the score of 2.20 (73.33% ideal), optimal implementation at 1.98 (99% ideal), optimization of production resources as many as 2.46 (82% ideal), optimizing time with 1.78 (89% ideal), optimization of

labor at 2,64 (88% ideal), optimizing the use of tools at 2.9 (96.67% ideal), and directing function on optimizing product damage of 2.06 (68.67% ideal). With these results, it appears that the management implementation in the direction function is still far from ideal. It is necessary to expand or add instruments in the activities of the directive function to gain a positive effect, i.e. increased production and reduced production risk.

Table 1. Management Planning Function of The Broiler Chicken Business

Components	Score	Criteria
Commodity selection	4.14(5)	Easy, short cycle, and profitable
Site Selection	1.96(4)	Far from settlements, the core, or the center of agribusiness.
Business scale determination	1.98(3)	Many demands and competitive conditions
Determination of breeding goals	1.88(4)	To fill in spare time
Economic motives of the business	2.50(3)	To make ends meet and try his best
Production schedule	2.02(3)	The production period is good but the vacuum period is not good
Motivation to join the partnership	2.60(3)	There is no place, no other business, looking for profit
Preservation time	3.34(5)	Shorter maintenance time, standard weight
After harvesting	1.90(3)	To meet the needs of life and business development
Note: () = Maximum score		

Table 2. Management Organizing Function of The Broiler Chicken Business

Components	Score	Criteria
Production amount	2.12 (4)	Consider facilities and requests
Production technique	2.58 (3)	proper facilities, most of production facilities is appropriate
Marketing	2.20 (3)	demand increases, demand>supply, price>market price
Input and output	1.40 (3)	Input price = market price, output price < market price
Operational money	2.16 (3)	Not enough available
Labor	2.02 (3)	Skillful, but not optimal
Note: () = Maximum score		

## Table 3. Management Directing Function of The Broiler Chicken Business

Components	Score	Criteria
Optimal resource allocation	2.50 (3)	Right quantity and quality
Optimum production process	2.20 (3)	Planning is optimal, the allocation is not fully optimal
Optimal implementation	1.98 (2)	Most of the implementation according to plan
Resource optimization	2.46 (3)	46% recommendations is applied
Time optimization	1.78 (2)	78% sapronak administration is applied
Power Optimization	2.64 (3)	Doing obligations and getting rights, not all live in a cage.
Tool optimization	2.90 (3)	90% facilities needed are met.
Optimization of product damage	2.06 (3)	Pay attention to transportation division

Note: () = Maximum score

#### Table 4. Management Monitoring Function of The Broiler Chicken Business

Components	Score	Criteria
Budget's utilization	2.48 (3)	48% to the provisions
Production process	2.66 (3)	As per the procedure, 66% refers to experience
Use of inputs	2.32 (4)	Right amount, good quality, wrong time
Work schedule	3.10 (4)	The schedule in the beginning, implementation, a small portion of the end
Notor () - Maximum cooro		

Note: () = Maximum score

#### Table 5. Management Controlling Function of The Broiler Chicken Business

Components	Score	Criteria
Use of seeds	2.26 (3)	The right amount, 26% of good quality
Energy use	2.16 (3)	The right amount, 16% of skills are fulfilled
Use of a starter	2.26 (3)	Exact amount, 26% of tub quality
Use of a grower	2.52 (3)	The right amount, 52% of good quality
The use of finisher	2.44 (3)	The right amount, 44% of good quality
Vaccine use, disinfectants	3.10 (4)	Right amount, good quality, 10% right usage
Nata () Mandana and		

Note: () = Maximum score

For coordination function, the results of the analysis (Table 4) show that the implementation of management on the coordinate function reached the level of 10.56 (74.43% ideal). The analysis shows that the management function on coordination, including budgeting achieved the score of 2.48 (82.67% ideal), production process 2.66 (88.67% ideal), input consumption 1.74 (43, 5% ideal), and the coordination function of work schedules 3.1 (77.5% ideal). These results show that the implementation of management in the coordination function is still far from ideal. It is necessary to expand or add instruments in the activities of the coordination function to gain a positive effect i.e. increased production and reduced

For control function, the results of the analysis (Table 5) show that the implementation of management in the control function reached a score of 14.74 (77.58% ideal) from the maximum score of 19. The results of the analysis show that the control function component included the scores for seedlings at 2.26 (75.33% ideal), use of labor at 2.16 (72% ideal), use of starter feed at 2.26 (75.33% ideal), use of grower feed at 2.52 (84% ideal), use of finisher feed at 2.44 (81.33% ideal), and drug, vitamins and chemistry uses at 3.10 (77.5% ideal). With these results, it shows that the management implementation in the control function is still far from ideal. Therefore, it is necessary to expand or add the control function activities to increase production and reduce production risk. Sharma et al. (2021) stated disease control is crucial in the management of a broiler business. It becomes critical to learn about epidemiology, to design mitigation plans, and to underline the need for a one-health approach to protect public health.

The overall results showed that the implementation of broiler chicken business management reached a score of 78.62 (73.48% ideal) from a maximum score of 107. Business management of broiler chickens can be addressed by maximizing the management function and its components. Iheke & Igbelina (2016) said that training programs should be carried out for farmers on poultry technology and risk management.

#### **Production of Broiler**

The results of the analysis of the production function (Table 6) showed that the R2 value was 0.998 and F-value was 627.285 (p=0.01). It means that all independent variables in the model affected the

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production of broiler chicken farming. Meanwhile, the results of the partial analysis showed that the independent variables that influenced production were business management, the amount of feed, the age of harvest, and the number of chick.

Table 6.	Estimated	Variable	Affecting	Production	of
	Broiler Chi	cken Far	ming		

Variable	Coefficient	p-value
LnX1 (number of chick)	0,282	0,004
LnX2 (amount of feed)	0.760	0.000
LnX3 (harvest age)	-0.869	0.069
LnX4 (cage area)	-0.051	0.357
LnX5 (age of breeder)	0.035	0.349
LnX6 (education)	-0.047	0.577
LnX7 (experience)	0.023	0.536
LnX8 (management)	0.700	0.020
Dummy Variable		
D1 (volume> average)	-0.009	0.513
D2 (divided feed)	0.004	0.871
D3 (average harvest age)	0.019	0.335
D4 (main job raising)	-0.030	-0.128
Constant	-0.103	0.938

The number of chicks (X1) positively affected broiler production, with an elasticity of 0.2820 (p=0.01). The number of chicks cultivated was directly proportional to the amount of broiler production or had a positive effect on the production of broiler chicken farms. Todsadee et al. (2012) found that the number of chicks has a positive effect on production. Suwarta et al. (2012) found an elasticity of 0.42 and the productivity of broilers with an elasticity of 0.54. Likewise, other studies found that the elasticity was 0.3312 (Sunarno, Rahayu, & Purnomo, 2016), 0.0046 (Buntara et al., 2014), and 1.0578 (Wardhani & Waridin, 2012).

This research showed that the amount of feed had a positive effect on broiler production, with an elasticity of 0.760 (p=0.01). <u>Suwarta et al. (2012)</u> found an elasticity of 0.402. <u>Buntara et al. (2014)</u> also found an elasticity of 0.2407. <u>Aboki et al. (2013)</u> found that feed stimulates production and indicates capital formation, drugs or vaccines precaution, and innovations attention. <u>Sitompul, Sjofjan, & Djunaidi</u> (<u>2016</u>) said that difference in broiler feed types has an effect on the increase in body weight of chickens.

The results showed that the harvest age had a negative effect on the production of broiler chickens with an elasticity of 0.869 (p = 0.10). The best harvesting age is during optimal production in broiler growth, or during production phase II. Along with the growing period of broilers, the increasing age of the

production risk.

harvest results in smaller additional production. This explains why the age of harvest has a negative effect on production. This shows that the harvesting age at growth stage III is ineffective and inaccurate. Harvesting decisions are essential in business management, where decisions are influenced by the experience and knowledge of the breeders.

The amount of feed affected the production of broiler chicken farms with respect to the law of decreasing yields. This means that an additional increase in the amount of feed results in a decreased additional production. This concept forms an optimal and maximum production quantity associated with the amount of feed. Optimal production is the achievement of production at an optimal level of feed usage that results in maximum profit. Whereas, the maximum production is the highest level of production achieved, and after that the production will decrease with the addition of the amount of feed. Internal management factors, such as farmer's age, education, and experience have an effect on increasing broiler production.

The influence of business management on production serves to direct factors that have a positive effect on increasing production (Suwarta & Darmaji, 2020). The implementation of the management of the broiler business is directly proportional to the increase in production. In addition, it was found that breeders' age, education, and experience are able to support the internal management that affects production and production risks. Business management (X8) positively affected broiler production, with an elasticity of 0.700 (p=0.05). These results indicate that if the management of broiler chicken farms is increased by 1%, the production will increase by 0.7%. Suwarta & Darmaji (2020) found that broiler business management had an effect on broiler production with an elasticity of 1.68. Suwarta et al. (2012) found that business management had a positive effect on broiler farm productivity with the parameter 0.0658 and on the FCR with the parameter -0.08337.

Suwarta et al. (2012) found that the performance of plasma breeders is better than independent breeders, and plasma nucleus breeders are better than independent plasma breeders. Business management of plasma breeders has a more positive effect on broiler farm production than independent breeders, and management of post-factory core breeders has a more positive effect on production compared to independent plasma breeders. Todsadee et al. (2012) stated that increasing broiler production in Chiang Mai Province could be obtained by adopting good management practices. <u>Baliyan & Masuku (2017)</u> found that to increase the efficiency and productivity of broiler farming, small-scale broiler breeders must be adequately trained in management skills.

Other factors affecting production have been identified by several researchers. <u>Todsadee et al.</u> (2012) found that production affected by increasing operating costs and other costs in Chiang Mai Province. <u>Sunarno et al.</u> (2016) found that production is affected by additional vitamin and heater, and decreased mortality. Production is also enhanced by labor and energy (<u>Mehrjerdi et al.</u>, 2015), the cost of fuel, and electricity (<u>Wardhani & Waridin, 2012</u>).

Ngozi & Chinonso (2013) found that the problems faced in increasing the production of broiler chicken farming are lack of capital, inadequate resources of livestock production, disease, poor transportation network, and labor. Mbuza et al. (2017) stated that the increasing broiler production in Rwanda is done by established 62.2% feed processing industry, increase marketing facilities 35.1%, increase the availability of DOC, access credit 27%, and intensification of farmer training 16.2%. Limbergen et al. (2018; 2020) showed facility, housing size, and infrastructure had the highest condemnation affecting broiler management. Etuah et al. (2013) found that the main production constraints are high feed costs, lack of access to credit, competition from cheap poultry imports, and lack of government support. Other obstacles come from management, low-quality feed, poor access to extension services, lack of government support, lack of sufficient capital, and lack of farmers' technical knowledge (Hassan, 2017).

#### **Production Risk of Broiler**

The analysis (Table 7) shows the R2 of 0.996 and F value of 399.92 (p=0.01). This shows that all independent variables in the model affected the risk of production. The results of the partial analysis showed that the independent variables influencing the risk of broiler chicken production were management, amount of feed, harvest age, and number of seedlings. The independent variables with a significant effect on production, namely the number of chicks, feed and management (having a negative effect), and the age of harvest (having a positive effect).

Table 7.	Estimated	Variable	Affecting	Production	Risk
	of Broiler	Chicken F	arming		

Variable	Coefficient	p-value
LnX1 (number of chick)	-0.264	0.008
LnX2 (amount of feed)	-0.400	0.004
LnX3 (harvest age)	1.695	0.000
LnX4 (cage area)	-0.033	0.452
LnX5 (age of breeder)	-0.013	0.728
LnX6 (education)	0.092	0.256
LnX7 (experience)	0.037	0.505
LnX8 (management)	-0,237	0,015
Dummy Variable		
D1 (volume> average)	-0.237	0.015
D2 (divided feed)	-0.013	0.391
D3 (average harvest age)	0.022	0.333
D4 (main job raising)	-0.008	0.675
Constant	0.011	0.500

The number of produced chicks was inversely proportional to the risk of production in the broiler chicken business. The more the number of DOC that was maintained, the smaller the risk of broiler chicken business production was produced, and vice versa. This study showed that the number of chicks had a negative effect on the risk of broiler chicken production with an elasticity of -0.264 (p=0.01). Fajar & Heriyadi (2017) stated that the causes of the risk of broiler production include cage size, weather changes, pests and diseases. Pests presented the highest risk of 38% and climate change contributed the lowest risk of 12%.

This study revealed that the amount of feed had a negative effect on the risk of broiler production with elasticity - 0.400 (p=0.01). Essentially, the use of an efficient amount of feed will also have an impact to enhance to reduce the risk of broiler production. The amount of feed affects the risk of broiler farm production compared to the effect on production. The experience of breeders using the amount of feed is an important decision to reduce the risk of broiler production. This finding is in line with the study of Vinanda et al. (2015), where the amount of feed could reduce the risk of production in independent farmers. Production risks can also be reduced by the use of vaccines, the amount of husks and labor.

The results of this study showed that the harvest age (X4) had a positive effect on the risk of production with an elasticity of 1.695 (p=0.01). These results indicate that extending the harvest time is associated with high risk and indicates inefficient activity. Therefore, the harvest time implementation plan should be strictly implemented in order to prevent a decline in production.

The best harvest is in the second production phase (II), namely in the optimal production area. Harvest time beyond this phase will tend to be inefficient. Harvesting decision making is crucial in broiler business management, in which breeders always use their experience and knowledge to carry out these decisions.

The management of broiler chicken cultivation (X8) had a negative effect on the risk of production of broiler chicken with an elasticity of -0.237 (p=0.05). Business management had an inverse effect on the risk of broiler chicken farming. The better the application of business management, the more reduced the risk of broiler chicken farming will be. Business management is related to the experience and skills (education) of breeders as the provisions to optimize or increase the effect of business management in reducing the risk of broiler production. Habibi, Azizi & Shal (2017) found that the production is influenced by risk factors, including cleanliness, ventilation and temperature, nutrition, disease prevention, hatchability of chickens, and insurance. Van Limbergen et al. (2018) stated that better education of farmers helps to improve overall biosecurity on broiler management.

Besides, <u>Suwarta (2012)</u> stated that business patterns have an effect on the risk of broiler chicken business. In general, independent breeders face a greater risk than joining plasma, in terms of dealing with DOC prices, income earning and broiler product prices.

#### **Research Implication**

Ditjen PKH (2020) mentioned that national meat production in 2019 reached 4,888,800 tons, with the contribution of broiler chicken production as many as 3,495,100 tons (71.49%) of the total population of 3,169,805,000 broilers. <u>BPS (2020)</u> recorded a total supply of broiler chickens of 3,484,216 tons and a total demand of 3,442,558 tons with a surplus of 41,658 tons. Meanwhile, the total consumption of fresh meat was 7,299 kg per capita per year, derived from broiler chicken as many as 5,683 kg per capita per year or 77.86%.

<u>Rustam (2020)</u> said there are several strategic indicators that need serious attention from the government, including the increasing meat consumption from 13.2 kg/capita/year (baseline 2019 from prognosis results/estimates for 2019) to 14.6 kg/capita/year in 2024. The consumption of protein from livestock increases from 10.9 grams/capita/day (baseline 2019 from prognosis results/estimates for 2019) to 11 grams/capita/day in 2024, and the availability of animal protein from 2.4 million tons (2019 baseline) from the prognosis/estimation results in 2019) to 35.3 million tons in 2024. Furthermore, the livestock sector performance target that must be realized in the mid-term development of 2020-2024 is realizing an independent, advanced, just and prosperous Indonesian society.

The self-sufficiency of chicken meat that has been achieved in Indonesia must be maintained so that food stability is fulfilled. If the growth in consumption of broiler meat exceeds the growth in production, it will result in the end of chicken meat self-sufficiency in Indonesia. Therefore it is necessary to increase the production of broiler chicken farms.

Broiler chicken business requires a lot of capital. This can not be done by breeders who have limited capital. In fact, farmers can run a broiler business through a profit sharing scheme, for example by renting out agricultural land, a partnership scheme with capital owners, partnerships with companies that are positioned as the nucleus, and breeders who are positioned as plasma. The distribution of business results depends on the contract agreement at the beginning of the cooperation. The broiler chicken farming partnership business generates significant income and benefits (Suwarta, 2012; Illahi, Novita, & Masithoh, 2019). BPPP (2019) stated that the broiler breeding business is sufficient to provide good business opportunities, as long as maintenance management follows applicable procedures and regulations through various partnership patterns with a business scale of 15 thousand chicks. According to Rondhi et al. (2020), the farm management of the broiler is unstable due to the possibility of farm risk. Contract farming in a plasma-core relationship can reduce production risk. Contract farming participation should focus on young and educated farmers with large farm sizes.

Continuously increasing production is carried out by ensuring the broiler's business profits and reinvestment to increase production capacity. The strategy undertaken by independent breeder entrepreneurs is to look for DOC and feed prices that are more competitive than the manufacturer's price. Another approach is to manage the excess supply of broilers in the market and process them into frozen chicken products even though they require additional processing and treatment.

The indicator for the sustainability of the livestock business is seen from the exchange rate of farmers in the livestock subsector. Exchange rate data is also used as a proxy to measure the level of welfare of farmers. BPS's published data shows that the monthly exchange rate indicators throughout 2019 have increased and tend to improve from month to month.

Rusdiana & Talib (2020) stated that livestock policy has considered various aspects, including risks and market situations, in which cases affect the decisions of breeders and consumers. This will have an impact on national food security and the agricultural sector. The results of this study indicate that breeders' business decisions also support the availability of national meat. It is very important for farmers to implement business management by following and adapting to environmental and technological developments. Good business management will lead to increased production and farmer income. Experience in partnerships also helps the capital aspect and ensures a more profitable business venture.

Meanwhile, the impact of the COVID-19 pandemic has had a significant impact on broiler farms. The large-scale social restriction policy has had an impact on the distribution of feed, meat production and other means of production, affecting manufacturers, livestock entrepreneurs to retailers. According to <u>Armelia et al. (2020)</u> and <u>Harmen (2020)</u>, there has been a decline in feed prices and consumer purchasing power of broiler chickens. <u>Ilham & Haryanto (2020)</u> observed a decline in production during the pandemic.

In general, the pandemic has an impact on the reducing production of broilers, beef cattle, and goats or sheep. However, chicken farmers were more severely affected by the nature of the perishable product. The traders then speculate by lowering the price in the market. In this condition, the breeders' creativity emerged by selling directly from breeders to end consumers. In addition, breeders as producers also sell broilers in processed form, for example grilled or steamed chicken. This step succeeded in increasing added value of broiler, but the turnover for direct sales and processed products was very limited.

Armelia et al. (2020), stated that Covid-19 can have a positive and negative impact on broiler farms. The positive impacts include the prospect of developing frozen food for chicken meat, increasing the issue of Safe, Healthy, Whole and Halal (ASUH) food, and tax relief in the broiler sector. Meanwhile, the negative impact is disruption of the supply chain in the distribution of DOC, feed and medicines as well as operational activities, resulting in decreased productivity of broiler chicken farms and farmer income.

# **CONCLUSION AND SUGGESTION**

The application of management in the broiler business achieved on average 75% of ideal score. It was distributed in the components of planning 67.64%, organizing 65.58%, directing 84.18%, coordinating 74.43%, and controlling 77.58%.

Production was positively influenced by the number of chicks, amount of feed, and business management; and was negatively affected by the age of harvest. Production risk was negatively affected by the number of chicks, the amount of feed, and business management. Meanwhile, production risk was positively influenced by the age of harvest.

The broiler farming business by farmers requires the following policy and management support. In order to reduce the cost of cultivating broiler chickens, farmers need to be assisted by setting competitive prices for DOC and feed. Farmers can produce lowcost feed ingredients by using rice by-products such as bran, or other primary agricultural products, added with Black Seed. To determine the right harvest time, farmers need to plan and collaborate with markets, restaurants, processed chicken entrepreneurs or other food companies so that broiler chickens are immediately distributed to end consumers or other users.

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