Influencing factors of madura cattle farmers' courage to face risks of breeding

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Abstract. Traditional Madurese cattle farmers experience many difficulties in carrying out cattle breeding. Madurese cattle farmers do not have genetic data on the cows they raise, making it difficult for breeders to produce superior calves. Cattle breeding is often considered high risk because it is biologically susceptible to disease and death. In addition, the low selling price of local cattle breeds is not comparable to the care performed by farmers. So, it is crucial to analyse the factors that influence the ability of Madura cattle farmers to face the risk of breeding. This research was conducted in Pamengkasan Madura with 100 respondents. The selected respondents are Madura cattle farmers who do business in the Madura cattle breeding. Data analysis was carried out using ordinal regression analysis method. Based on the results of data processing, it was found that Self Confidence and Optimism had a significant effect on the ability of Madura cattle farmers to face risks. At a 10% confidence level, Self Confidence and Optimism has a significant impact on the power of Madura cattle farmers to face risks with a P-value of 0.087.

1. Introduction
Indonesia has a number of cattle types including Peranakan Ongole cattle, Bali cattle, Pesisir cattle, Aceh cattle, and Madura cattle. Cow diversity is spread across nearly every area of Indonesia. Seeing the variety of livestock this can undoubtedly be used to meet Indonesia's demand for meat, given that the need for meat, particularly beef, still depends on imports. The centre of the largest population of cattle is East Java Province which reaches 4.5 million heads. Madura cattle are the most raised cattle in eastern Java province. Madura cattle are found mainly in the Archipelago of Madura, with 950 thousand in total. The largest population on Madura Island is in the district of Pamengkasan, with a total population of 164 thousand.

Apart from cultivating Madura cattle fattening, farmers also do the preservation of cattle reproduction. The preservation is the Madura cattle breeding process which is currently being developed by the government. Madura cattle have the advantage that they have better reproductive performance than Bos Taurus cattle; they are more resistant to heat and tick disease [1]. The pattern of breeding livestock is carried out by breeders at first for a savings business but eventually for commercial business. The nursery technique is carried out with the injection mating system (Artificial Insemination-IB), and some are done with the natural mating system (KA). The success of cows' pregnancy is usually achieved with a frequency of injections of 2-3 times, even up to 4 times [2].
Cattle breeding business has a higher risk than cow fattening business [3]. Cattle fattening business has a faster turnover and return on capital than breeding business [4]. Traditional Madurese cattle farmers experience many difficulties in carrying out cattle breeding. Madurese cattle farmers do not have genetic data on the cows they raise, making it difficult for breeders to produce superior calves. Cattle breeding is often considered high risk because it is biologically susceptible to disease and death. In addition, the low selling price of local cattle breeds is not comparable to the care performed by farmers.

Farmers are the main actors who can overcome the business risks they suffer. Farmers are involved in various risk management practices to reduce losses due to livestock morbidity and mortality. The ability of Madura cattle breeding farmers is essential in this regard. So, it is crucial to analyse the factors that influence the ability of Madura cattle farmers to face the risk of breeding.

2. Methodology
This research was conducted in Pamengkasan Madura with 100 respondents. The selected respondents are Madura cattle farmers who do business in the Madura cattle breeding with purposive method. The data used has a secondary type of data taken from the Indonesian Central Statistics Agency. Data analysis was carried out using ordinal regression analysis method. This is because the dependent variable required is a type of ordinal scale.

2.1. Hypothesis testing
H1. Vision have a significant effect on Taking risk
H2. Self-Confident & Optimist have a significant effect on Taking risk
H3. Managerial Skill have a significant effect on Taking risk
H4. Knowledge have a significant effect on Taking risk

2.2. Data analysis
Data analysis was performed using ordinal regression because the data processed was data with an ordinal scale type. Ordinal regression is used to model the relationship between the ordinal scale response variables and their explanatory variables [5].

\[
\pi(x) = \frac{e^{E(x)}}{1 + e^{E(x)}}
\]

If it is assumed that there is a related variable Y on an ordinal scale with categories J and that \(x = (x_1, x_2, ..., x_p)\) is the explanatory variable vector, then the likelihood of the response variable of the category J on a given explanatory variable X can be represented by \(P(Y_{ij}) = \pi_j(x)\) and the cumulative odds are described in equation 2.

\[
P(Y \leq j | x) = \pi_j(x)\pi_j(x) = \frac{\exp(\alpha_j + \sum \beta_k x_{ik})}{1 + \exp(\alpha_j + \sum \beta_k x_{ik})} \]

Cumulative logit models are obtained by comparing the cumulative likelihood, i.e. the likelihood that the predictor variable represented in the vector \(x_i\) will be less than or equal to the response category "j" on "p" Equation 3 indicates the formula for the models with cumulative logits.

\[
\text{Logit } P(Y \leq j | x) = \log \left( \frac{P(Y \leq j | x)}{P(Y > j | x)} \right)
\]
\[ \phi_1(x) = \frac{e^{g_1(x)}}{1 + e^{g_1(x)}} \]  
\[ \phi_2(x) = \frac{e^{g_2(x)} - e^{g_1(x)}}{(1 + e^{g_2(x)})(1 + e^{g_1(x)})} \]  
\[ \phi_0(x) = 1 - \phi_1(x) - \phi_2(x) = \frac{1}{1 + e^{g_2(x)}} \]

2.3. Variable description

| Variable Description | Symbol |
|----------------------|--------|
| Vision               | X1     |
| Self-Confident & Optimist | X2     |
| Managerial Skill     | X3     |
| Knowledge            | X4     |
| Taking Risk          | Y      |

3. Results and discussion

3.1. Model fit test

The Model Fitting Information -2log Likelihood states that it has a value of 104.448 without including the independent variable (intercept only) and is relevant at the real level of 10 per cent (sig.0.090).

| Model                | -2 Log Likelihood | Chi-Square | Df  | Sig.   |
|----------------------|-------------------|------------|-----|--------|
| Intercept Only       | 104.448           |            |     |        |
| Final                | 88.105            | 16.342     | 10  | .090   |

3.2. Goodness of fit

Goodness of Fit indicates the model's suitability test with the used data and that the model is match.

| Chi-Square | df | Sig.  |
|------------|----|-------|
| Pearson    | 111.509 | 71    | 0.002 |
| Deviance   | 64.555  | 71    | 0.692 |

3.3. Model determination coefficient

The Cox and Snell value of 0.763 indicates that variable X can explain variable Y by 76.3%. Meanwhile, the other 23.7% was explained by other variables outside the model.

| Pseudo R-square |  |
|-----------------|-----|
| Cox and Snell   | .763|
| Link function: Logit. | |
3.4. Partial hypothesis test results
Based on the partial test results, the variable that has a significant effect on the ability of Madura cattle farmers to face risks is X2. Where Self Confidence and Optimism have a significant impact on the power of Madura cattle farmers to face risks (Table 5).

| Table 5. Partial test results |
|-----------------------------|
|                           | Estimate | Std. Error | Wald | Sig.  |
| Threshold                  |          |            |      |       |
| [Y = 2]                    | -4.425   | 2.511      | 3.104| 0.078 |
| [Y = 3]                    | 1.004    | 2.492      | 0.162| 0.687 |
| [Y = 4]                    | 4.131    | 2.525      | 2.676| 0.102 |
| Location                   |          |            |      |       |
| [X1=2]                     | -1.047   | 1.308      | 0.641| 0.423 |
| [X1=3]                     | -0.505   | 0.518      | 0.950| 0.330 |
| [X1=4]                     | 0\(^a\)  |            |      |       |
| [X2=2]                     | 1.952    | 1.479      | 1.743| 0.087 |
| [X2=3]                     | -0.132   | 0.533      | 0.061| 0.805 |
| [X2=4]                     | 0\(^a\)  |            |      |       |
| [X3=2]                     | 0.250    | 2.341      | 0.011| 0.915 |
| [X3=3]                     | 1.944    | 2.245      | 0.750| 0.387 |
| [X3=4]                     | 1.724    | 2.252      | 0.586| 0.444 |
| [X3=5]                     | 0\(^a\)  |            |      |       |
| [X4=1]                     | -1.431   | 1.465      | 0.954| 0.329 |
| [X4=2]                     | -1.074   | 0.982      | 1.196| 0.274 |
| [X4=3]                     | -0.129   | 0.954      | 0.018| 0.892 |
| [X4=4]                     | 0\(^a\)  |            |      |       |

Link function: Logit.

- This parameter is set to zero because it is redundant.
- \( \alpha = 10\% \)

3.5. Factors influencing madura cattle farmers' courage to face risks of breeding
Based on the results of data processing, it was found that Self Confidence and Optimism had a significant effect on the ability of Madura cattle farmers to face risks. At a 10% confidence level, Self Confidence and Optimistic has a significant impact on the power of Madura cattle farmers to face risks with a P-value of 0.087.

Self-confidence is self-confidence obtained from life experiences. Self-confidence is one of the aspects of personality which is a belief in one's ability so that it is not influenced by other people and can act according to their wishes, is happy, optimistic, tolerant and responsible enough. Self-confidence is related to the ability to do something good. Confident people usually have initiative, are creative, and optimistic about the future, can realize their weaknesses and strengths, think positively, think that all problems must have a solution. Self-confidence is a positive attitude of an individual which enables him to develop a positive assessment of himself and his environment or situation.

In doing the Madura cattle breeding business, self-confidence is necessary so that confidence in overcoming the risks of cow breeding can be overcome. The importance of self-confidence for farmers to face risks is closely related to the ability of farmers to work enthusiastically and never give up. Mental self-confidence can accept reality, can develop self-awareness, think positively, have independence, and have the ability to achieve success in the Madura cattle breeding business.
Self-confidence is a positive attitude that can genuinely face risks [6]. According to [7], the independence of cattle farmers in rural community empowerment efforts is influenced by the attitude of self-confidence. The development of a community mindset to move forward and be confident in facing all risks reflects the independence of farmers. An optimistic attitude so that future risks can be minimized to a minimum, especially in the long term risk, which certainly threatens the welfare of farmers and the economic community [8].

Courage to take risks shows the courage of farmers in facing the natural phenomena that attack them [9]. Disease attacks that attack Madura cattle breeders cause significant losses. It can even cause the death of Madura cows. The death of Madura cows is a considerable loss. This is because the broodstock price is relatively expensive. The health of the broodstock must be fought for optimistically by Madura cattle farmers. Optimistic in care so that you avoid disease. Based on observations, many Madura cows are still engaged in natural mating [10]. So that the spread of the disease is not controlled, therefore Madura cattle farmers must be optimistic about incubating cows and artificial insemination to support the success of their business.

Apart from production risks, market risks are also faced by Madura cattle breeding farmers. Where the selling price of feeder Madura cattle is considered very low. The low feeder price of Madura cattle causes losses in production. Where the production costs are higher than the sales revenue received, this condition must be addressed optimistically by Madura cattle breeding farmers. Optimistic that there will be a time when the price of feeder cattle tends to increase, namely a few months before Eid al-Adha. This is an essential reference for Madura cattle breeding farmers in facing market risks.

4. Conclusions

Based on the results of data processing, it was found that Self Confidence and Optimism had a significant effect on the ability of Madura cattle farmers to face risks. At a 10% confidence level, Self Confidence and Optimism has a significant impact on the power of Madura cattle farmers to face risks with a P-value of 0.087.

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