# The Influence of Livestock Groups and Knowledge of Alternative Feed on Farmers' Welfare (Case Study of the Damarwulan Cattle Group, Umbulrejo)

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**Abstract**

The existence of cattle groups in Indonesia, especially in Umbulrejo village, Umulsari sub district, Jember district, is one of the important strategies in improving the economic welfare of farmers. The Damarwulan cattle group in this village is a clear example of how farmer organizations can function as a means of collaboration and knowledge exchange. In this context, the cattle group not only plays a role in social aspects, but also in economic aspects that have a direct impact on the welfare of its members. This research method uses a quantitative approach with the type of survey research using 100 respondents. data analysis using SPSS analysis software. The results of this study indicate that the livestock group variable has a significant effect on the economic welfare of breeders. In addition, researchers also showed that knowledge of alternative animal feed has a significant effect on the economic welfare of farmers. Based on the results of the research conducted, it can be concluded that the existence of livestock groups and farmers' knowledge of alternative animal feed have a positive and significant influence on improving the economic welfare of farmers.

Keywords**:** *Livestock Groups, Alternative Livestock Feed, Economic Welfare of Livestock Farme*

## 1. Introduction

Umbulrejo Village, located in Umbulsari Sub-district, Jember Regency, is the smallest village in the area and is divided into two hamlets: Sidomulyo and Krajan. The majority of the population works as farmers and livestock breeders, primarily focusing on goat and cattle farming. In this village, there are two main livestock groups, namely Tombo Ati (goat farmers) and Damarwulan (cattle farmers). The Damarwulan cattle group serves as a clear example of how farmer organizations can function as a means of collaboration and knowledge exchange, which directly impacts the economic welfare of its members.

The economic welfare of livestock farmers is a crucial aspect in the development of a sustainable livestock sector. This study, entitled "The Influence of the Existence of Livestock Groups and Knowledge of Alternative Animal Feed on Farmers' Welfare (Case Study of the Damarwulan Umbulrejo Cattle Group)," aims to explore how these two factors affect the economic welfare of farmers. Previous studies have shown that the presence of livestock groups improves farmers' access to information, resources, and social networks, which can enhance productivity and income (Putra et al., 2017) .However, there remains a lack of understanding regarding the contribution of knowledge about alternative animal feed in this context. Based on an interview with Mr. Ikhwan Prayogo, the head of the Damarwulan livestock group, before joining the group, farmers faced limitations in information, technology, and market access, resulting in production activities being carried out independently without support. After joining the group, they received technical training, access to feed innovations, and economic opportunities from selling alternative animal feeds, which increased their income. Knowledge

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of alternative feeds such as silage and fermented straw has helped farmers reduce production costs, especially during the dry season (Syaiful et al., 2020).

A literature analysis shows that although many studies highlight the positive impact of livestock groups on welfare, few have examined the role of knowledge about alternative feeds. This knowledge is important as it helps farmers select more efficient and affordable feeds, thereby increasing livestock productivity. Therefore, this study aims to fill this gap by analyzing the interaction between the existence of livestock groups and knowledge of alternative feeds on farmers' economic welfare. The selection of the Damarwulan livestock group as the study object is based on its relatively recent establishment (about one year ago) and its high level of activity compared to other livestock groups in nearby villages. Previous research indicates that new, active livestock groups have great potential to enhance farmers' socio-economic capacity through institutional synergy and access to innovation (Hasan et al., 2022).

The main problem addressed in this study is: How do the existence of livestock groups and knowledge of alternative feeds affect farmers' economic welfare? The hypothesis proposed is that the existence of livestock groups and knowledge of alternative feeds significantly and positively influence the economic welfare of farmers. This hypothesis is based on the assumption that social support from groups and increased knowledge create a conducive environment for welfare improvement.

To address these issues, this study will propose training and socialization programs aimed at increasing farmers' knowledge of alternative animal feeds and strengthening the existence of livestock groups (Fanani, 2023) These programs are expected to provide relevant and practical information for farmers, enabling them to apply better and more efficient husbandry techniques. The programs aim to enhance farmers' capacity to utilize local resources as alternative feeds, which directly impacts cost efficiency and livestock productivity (Widiarti et al., 2024). I Strengthening livestock groups through managerial and technical training is also believed to increase solidarity, role sharing, and the sustainability of collective livestock businesses.

Previous research by Hadi on the "Sapiku" Livestock Group in Blado Hamlet, Gunungkidul Regency, shows that livestock groups play an important role in empowering cattle farmers, resulting in increased economic income and social cooperation. Livestock groups allow farmers to access wider markets and improve bargaining power through collective marketing, thereby reducing the risk of losses due to market price fluctuations (Fanani, 2023). The primary objective of this study is to examine the influence of the existence of livestock groups and knowledge of alternative animal feeds on the economic welfare of Damarwulan farmers in Umbulrejo Village. The research findings are expected to provide practical recommendations for stakeholders to improve farmers' welfare through strengthening livestock groups and alternative feed counseling, while also contributing academically and practically to the field (Nugroho et al., 2022).

## 2. Literature Review

Livestock Group

According to Johnson and Johnson (1997) in (Saleh, 2015) groups are defined as Two or more individuals who interact face-to-face, each aware of their membership in the group, aware of the existence of other members, have positive interdependence in achieving common goals, and appreciate the possibility of mutual benefit. According to (Mutmainah & ., 2015), the definition of a farmer group or livestock group is an institution at the farmer level formed to organize farmers in farming. This group functions as a forum for learning, cooperation, and production units to increase the knowledge, skills, and independence of members in managing farming or livestock businesses (Wulanjari & Setiani, 2016)

Group Dynamics Theory according to Kurt Lewin, a group is not just a group of individuals, but is a complete unit with interactions that influence each other (AM, 2009). This

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concept emerged in the 1940s and was influenced by force-field theory, which explains that the behavior of individuals in groups is influenced by various forces around them. The indicators to measure livestock group variables according to (Andarwati et al., 2017) (1) group goals, (2) group structure, (3) group task function, (4) group development, (5) group cohesiveness, (6) group atmosphere, (7) group pressure and (8) group effectiveness.

Alternative Animal Feed Knowledge

Feed is a major component in animal husbandry, and its availability is often a challenge, especially during the dry season. To overcome this, farmers have begun to utilize local ingredients as alternative feed, such as agricultural waste and crop by-products (Fajar et al., 2023) Alternative animal feed knowledge refers to farmers' understanding of the types, sources, processing, and benefits of non-conventional feed ingredients that can be used to meet livestock nutritional needs. These alternative feed ingredients usually come from local sources that are easily obtained and are not the main feed ingredients such as corn or rice bran.

The Innovation Adoption Theory proposed by Everett M. Rogers (2003) explains how and why an innovation is accepted or rejected by individuals or groups in society. According to Rogers, innovation adoption is a mental process that a person goes through from the time he first finds out about an innovation to finally deciding to adopt or reject it. This process involves changes in the knowledge, attitudes, and behavior of individuals towards these innovations (Adianto et al., 2020) , The indicators to measure the variable knowledge of alternative animal feed according to (Yesi Chwenta Sari & Syafri Nanda, 2020) are Knowledge of Alternative Feed Sources, Understanding of Nutrient Content, Knowledge of Feed Processing Techniques, Skills in Making and Storing Feed, Understanding of Economic Benefits.

Economic Welfare Of Breeders

Suharto (2006) in (*PERAN PEKERJA SOSIAL DALAM SISTEM USAHA KESEJAHTERAAN SOSIAL DI ERA MILLENNIUM Oleh: Purwowibowo*, 2011) states that social welfare is a process or planned effort carried out by individuals, social institutions, communities, and government agencies to improve the quality of life through the provision of social services and social benefits, while the economic welfare of farmers refers to conditions in which farmers have adequate access to the resources, knowledge, and support needed to increase their productivity and income. This includes aspects of animal health, business sustainability, and the social and economic welfare of farmers.

According to Amartya Sen's Social Welfare theory in, (Marisa, 2021) Social Welfare theory, known as the Capability Approach, is an important contribution to welfare economics and moral philosophy. This approach emphasizes that individual welfare is not only measured by income or utility, but by a person's real ability to live the life they value and choose. The indicators to measure alternative animal feed knowledge variables according to Hartoyo's research (2017) in (Penerapan & Fifo, 2023) are Livestock Business Income, Access to Markets and Capital, Health and Education, Participation in Institutions, Life Satisfaction, Use of Natural Resources.

## 3. Research Methods

This research method uses a quantitative approach with survey research as a data collection technique, because it offers various advantages, ranging from cost efficiency to its ability to produce reliable quantitative data. By considering the research objectives and characteristics to obtain the relevant population, surveys become a very effective method to obtain the required information. This technique allows data collection from both large and small populations by distributing questionnaires to respondents. The population studied in this study were cattle farmers in Umbulrejo Village with a total population of 100 people. This study used a non-probability sampling technique with the Purposive Sampling method, in

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which the researcher selected respondents based on certain criteria that were relevant to the research objectives. This approach provides an opportunity for researchers to obtain information from individuals who have specialized knowledge or experience. To determine the sample size, researchers used the Slovin formula, which is applied in quantitative research with a known population.

$$n = \frac{N}{1+Ne^2}$$

Where : n = number of samples

N = total population =100

e = margin of error =5% (0.05)

$$n = \frac{N}{1+Nd^2} = \frac{100}{1+100(05)^2} = \frac{100}{1+10000025} = \frac{100}{1+025} = \frac{100}{025} = 80$$

This data collection technique uses a questionnaire questionnaire statement, with a scale of 1 5. This research data analysis uses SPSS analysis software.

## 4. Result and Discussion

First Discussion

Validity and Reliability Test

The validity test is used to determine whether the data obtained from the questionnaire or questionnaire that has been distributed is valid or not. Determination of whether or not the data is valid can be seen from R count and R table. If R count > R table with a = 0.05 or 5%, the data is declared valid. Reliability test is a survey research method that serves as an indicator of variables or constructs. If the Cronbach alpha value is > 0.60, the statement items in the questionnaire can be declared reliable. (Ghozali, 2021)

Table 1. Validity and Reliability Test Results

| Variables | Item | R Count | R Table | Description | Cronbach's Alpha | Description |
|-----------|------|---------|---------|-------------|------------------|-------------|
| Livestock Group (X1) | X1.1 | 0,548 | 0,2172 | Valid | 0.915 | Reliable |
| | X1.2 | 0,644 | 0,2172 | | | |
| | X1.3 | 0,640 | 0,2172 | | | |
| | X1.4 | 0,576 | 0,2172 | | | |
| | X1.5 | 0,673 | 0,2172 | | | |
| | X1.6 | 0,675 | 0,2172 | | | |
| | X1.7 | 0,472 | 0,2172 | | | |
| | X1.8 | 0,634 | 0,2172 | | | |
| Knowledge Alternative Animal Feed (X2) | X2.1 | 0,524 | 0,2172 | Valid | 0.798 | Reliable |
| | X2.2 | 0,648 | 0,2172 | | | |
| | X2.3 | 0,643 | 0,2172 | | | |
| | X2.4 | 0,496 | 0,2172 | | | |
| | X2.5 | 0,467 | 0,2172 | | | |
| Farmers' economic welfare (Y) | Y1 | 0,585 | 0,2172 | Valid | 0.882 | Reliable |
| | Y2 | 0,573 | 0,2172 | | | |
| | Y3 | 0,577 | 0,2172 | | | |
| | Y4 | 0,730 | 0,2172 | | | |
| | Y5 | 0,580 | 0,2172 | | | |
| | Y6 | 0,511 | 0,2172 | | | |

Source: Primary Data, processed by SPSS 2025

Based on the table above, it can be seen that all statement items in the Livestock Group variable (X1), the Alternative Animal Feed Knowledge variable (X2), and the Farmers' Welfare

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variable (Y) have an R-count value greater than the R-table value. This indicates that all statement items of each variable are valid, and all variable items have a Cronbach's alpha value greater than 0.60, meaning that all questionnaire items can be used for the research purposes.

Classic Assumption Test
Normality Test

The normality test aims to test whether the dependent variable regression model and the independent variable have a normal distribution (Ghozali, 2021) Normally distributed data based on plot diagrams is if the results of data testing or obtained points spread along the diagonal line. (Dwi Kurnia PS, Miftahul Munir, Suhartono, 2023)
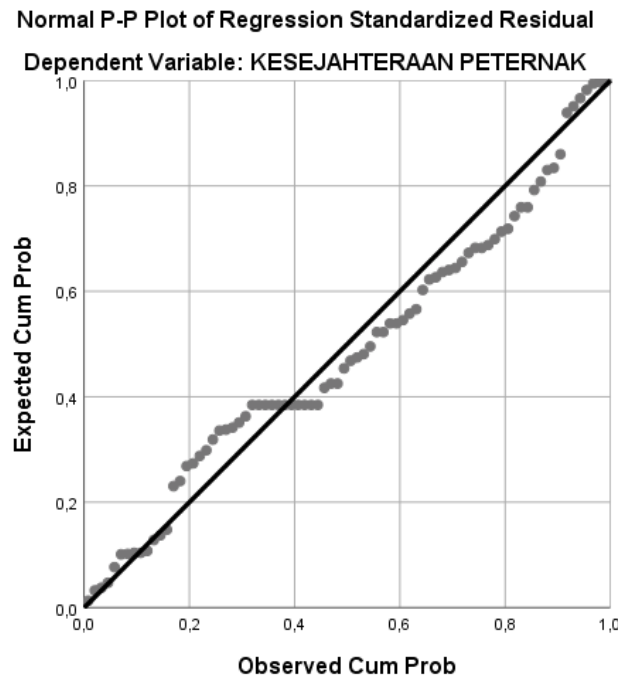


Source: Primary Data, processed by SPSS 2025
*Figure 4. Normality Test Results*

In the plot diagram above shows no skewness in the distribution of data, it can be concluded that the data on perceptions of respondents in livestock groups, knowledge of alternative animal feed, economic welfare of farmers are normally distributed.

Multicollinearity Test

Multicollinearity is a high level of correlation that occurs between one independent variable and another. The multicollinearity test aims to test whether the regression model found a correlation between the independent variables. A good regression model should not have a correlation between the independent variables. (Ghozali, 2021)Tolerance value> 0.10 and VIF value < 10, then it can be said that there is miltikolinearity between the independent variables in the regression model. (Riyanto, Slamet & Andhita, 2020)

Table 2. Multicollinearity Test Results

| Collinierity Statistics | | | |
|---|---|---|---|
| Variables | Tolerance | VIF | Description |
| Livestock Group (X1) | 0.542 | 1.845 | No multicollinearity |
| Knowledge of Alternative Animal Feed (X2) | 0.542 | 1.845 | No multicollinearity |

Source: Primary Data, processed by SPSS 2025

Based on the table above, it shows that the tolerance value of the Livestock Group variable (X1) and the Alternative Animal Feed Knowledge variable (X2) which are independent variables is 0.542 and the VIF value is 1.845. These results prove that there is no multicollinearity because the tolerance value > 0.10 and the VIF value < 10.

Heteroscedasticity Test

The heteroscedasticity test aims to test whether in a multiple regression model there is an inequality of variance from the residuals of one observation to another. (Ghozali, 2021) The heteroscedasticity test on this data is carried out based on the results of the scatter plot test if it is found that the points spread randomly and do not form a pattern, it is concluded that there is no inequality in the residual variance from one observation to another or the regression model does not occur heteroscedasticity. (Riyanto, Slamet & Andhita, 2020)

**Scatterplot**
**Dependent Variable: KESEJAHTERAAN PETERNAK**
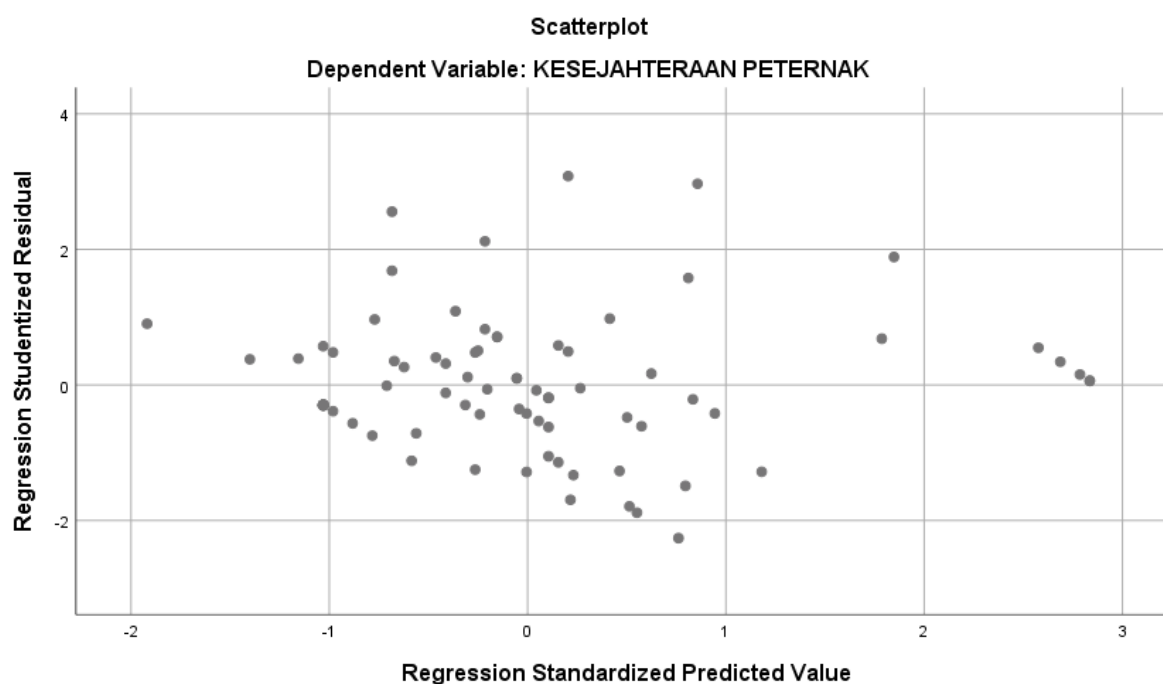


Source: Primary Data, processed by SPSS 2025
*Figure 5. Normality Test Results*

Based on the table above, it can be seen that the points spread randomly, do not form a certain clear pattern, and are spread both above and below the number 0 on the Y axis. This means that there is no heteroscedasticity in the regression model.

Multiple Linear Regression Test

Multiple linear regression analysis is used to determine how much influence the independent variable has on the dependent variable. (Sudariana, 2021)

Table 3. Multiple Linear Regression Test Results

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 3,954 | 4,353 | | 908 | .367 |
| | Livestock Group | 207 | .053 | 295 | 3,948 | .000 |
| | Knowledge of Alternative Livestock Feeds | 878 | .101 | 649 | 8694 | .000 |

a. Dependent Variable: Farmer's economic welfare

Source: Primary Data, processed by SPSS 2025

Based on the table above, the multiple linear regression equation can be written as follows:

**Y = 3.954 + 0.207X$_1$ + 0.878X$_2$**

Explanation:

1) The constant value shows that if the Livestock Group variable (X1) and Alternative Animal Feed Knowledge (X2) are zero, then the value of the variable Economic welfare of farmers (Y) is 3,954.

2) The regression coefficient value of the variable livestock group (X1), which is 0.207, is negative and shows a unidirectional relationship to the variable Economic welfare of breeders (Y), where each one unit increase in the variable livestock group (X1) will cause an increase in the variable Economic welfare of breeders 0.207.

3) The regression coefficient value of the alternative animal feed knowledge variable (X2) which is 0.878 is positive and shows a unidirectional relationship to the variable Economic welfare of farmers (Y), where each one unit increase in the alternative animal feed knowledge variable (X2) will cause an increase in the variable Economic welfare of farmers (Y) by 0.878.

F Test Results (Simultaneous Test)

The F test or simultaneous test aims to test the joint influence between the existence of livestock groups and knowledge of alternative livestock feed on the welfare of farmers. (Ghozali, 2021)

Table 4. F Test Results

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 1384,307 | 2 | 692,154 | 126,988 | .000$^b$ |
| | Residual | 419,693 | 77 | 5,451 | | |
| | Total | 1804,000 | 79 | | | |

a. Dependent Variable: Farmer's economic welfare

b. Predictors: (Constant), Livestock Group, Alternative Animal Feed Knowledge variables

Source: Primary Data, processed by SPSS 2025

The results of the analysis in the table above show that the calculated F value is 126.988 > F table of 3.960 and sig value. 0.000 < 0.05, it can be concluded that there is a simultaneous significant influence between Livestock Groups (XI) and Alternative Animal Feed Knowledge (X2) on the economic welfare of farmers (Y).

T Test (Partial Test)

T test or partial test to show how much influence the independent variable has on the dependent variable. (Ghozali, 2021)

Table 5. T-test Results

| Variable | T count | T table | Sig. | Information |
|---|---|---|---|---|
| Livestock Group | 3,948 | 1.990 | .000 | Significant |
| Alternative Animal Feed Knowledge | 8,694 | 1.990 | .000 | Significant |

Source: Primary Data, processed by SPSS 2025

1) Based on the table above that the Livestock Group (X1) obtained t table of 3.948 < t table 1.990 and sig value. 0.000 < 0.05 which can be concluded that there is a significant influence on the economic welfare of breeders (Y) then H1 (accepted).
2) Based on the table above that Knowledge of Alternative Animal Feed (X2) obtained T count of 8.694 T table 1.990 and sig value. 0.000 < 0.05 which can be concluded that there is a significant influence on the economic welfare of farmers (Y) then H2 (accepted).

Test Coefficient of Determination (R2)

The coefficient of determination (R2) test shows how well the regression model explains the dependent variables. A higher coefficient of determination indicates that the model is better able to influence the independent variables in explaining the behavior of the dependent variable.

Table 6. Test Results of the Coefficient of Determination

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .876a | .767 | .761 | 2,33464 |

Source: Primary Data, processed by SPSS 2025

Based on the table above shows that the coefficient of determination is 0.761 which means that this regression can explain 76% of the variable Economic welfare of breeders and the remaining 24% is influenced by other variables not examined in this study.

The Influence of Livestock Groups on The Economic Welfare of Farmers

Based on the results of the study, it is known that the t count is 3.948 < t table of 1.990 and a significance value of 0.000 < 0.05. This indicates that the variable livestock group has a significant effect on the economic welfare of farmers. These results indicate that there is a positive and significant relationship between the existence of livestock groups and the level of economic welfare of farmers. This finding indicates that the participation of livestock farmers in livestock groups can make a real contribution to improving their welfare, both in terms of economic, social, by joining livestock groups farmers as well as gaining access to market access, Information quickly on how to deal with animal diseases. Thus, the hypothesis that can be formulated in this study is that livestock groups have a positive and significant effect on the economic welfare of farmers.

Livestock groups have a significant effect on the economic welfare of user farmers. The results of this study are in line with Nashor's research (2025) that livestock groups have a significant effect on the economic welfare of farmers. Based on various consistent research results, the existence of livestock groups has a significant influence on improving the economic welfare of breeders. According to elyani et al in. (Potong, n.d.)found that beef cattle group development programs such as "Suko Tani were able to increase productivity through the application of reproductive techniques and production, records, which then had a positive impact on the economic welfare of farmers. Meanwhile, according to (Adolph, 2016) emphasizes that livestock groups also play an Important role in educating farmers regarding livestock technology, so that their contribution is not only economic but also educational. According to (ZAFIRA, 2020) This mechanism directly contributes to increasing income, production cost efficiency, and economic stability of farmer households.

Effect Of Alternative Animal Feed Knowledge On Farmers Economic Welfare

Based on the results of the study, it is known that the t count is 8.694 < t table of 1.990 and a significance value of 0.000 < 0.05. This indicates that the variable Knowledge of alternative animal feed has a significant effect on the economic welfare of farmers. These results

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indicate that farmers' knowledge of alternative animal feed has a positive and significant influence on their welfare. This indicates that the higher the level of knowledge of farmers about alternative feed, the more likely they are to improve the efficiency and productivity of livestock businesses, which in turn has an impact on improving welfare. Thus, the hypothesis that can be formulated in this study is that knowledge of alternative animal feed has a positive and significant effect on the economic welfare of farmers. Therefore, increasing access to information and training on alternative animal feed can be an effective strategy in efforts to empower and improve the economic welfare of farmers in a sustainable manner.

Knowledge of alternative animal feed has a significant effect on the economic welfare of user farmers. The results of this study are in line with Nashor's research (2025) that livestock groups have a significant effect on the economic welfare of farmers. According to (Syaiful et al., 2020) shows that the use of ammoniated straw as beef cattle feed in South Solok reduces feed costs and increases business efficiency, which has a direct impact on farmers' income, Research by (Theo Mahiseta Syahniar et al., 2021) in Jember also confirmed that training on alternative feed ingredients based on the principle of zero waste increased milk production and business resilience of dairy farms, Research (Pudjawati et al., 2024) proved that silage making training helped farmers maintain the availability of forage throughout the year and increased their economic stability.

## 5. Conclusion

Based on the research findings, it can be concluded that the existence of livestock groups and knowledge of alternative animal feed have a positive and significant effect on the economic welfare of farmers in the Damarwulan Cattle Group, Umbulrejo Village. The presence of livestock groups strengthens social networks, improves access to information, training, and innovation, thereby increasing farmers' productivity and income. Meanwhile, knowledge of alternative feed enables farmers to adopt more efficient and economical feeding technologies, reducing dependence on conventional feed, especially during the dry season.

Theoretically, this research expands the application of Group Dynamics Theory and Innovation Adoption Theory in the context of rural livestock farming. Practically, these findings can serve as a reference for policy formulation and empowerment programs based on livestock groups, as well as for the development of alternative feed training.

## 6. Suggestion

a. For Local Government and Relevant Agencies

It is recommended to strengthen the role of livestock groups through continuous managerial, technical, and alternative feed innovation training programs. The government should also provide support in the form of subsidies for alternative feed materials and facilitate market access for farmers' products.

b. For Livestock Groups and Farmers

Livestock groups are encouraged to continuously enhance solidarity, collaboration, and knowledge sharing among members, and to actively seek and implement alternative feed innovations suited to local potential.

c. For Future Researchers

Further research should expand the scope of the study and variables, and examine the long-term impact of alternative feed innovation adoption on the sustainability of livestock businesses and farmers' welfare.

d. For Educational Institutions and Extension Workers

There is a need to develop training modules based on local needs and to enhance the capacity of extension workers as facilitators of innovation and institutional strengthening in livestock groups.

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