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Analysis of Strategy for Developing Beef Cattle Production on a Smallholder Farming Basis in Musi Banyuasin Regency South Sumatra

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ABSTRACT

The increased beef cattle production at traditional farms is a strategy to achieve meat self-sufficiency in 2026. This is accomplished through various parties, including the government, academics, researchers, the private sector, and farmers as the main actors. Therefore, this study aimed to determine and analyze criteria, performance criteria, strategies, and alternatives for sustainable beef cattle production in traditional farms based on the opinion of experts. The research location was School for Smallholder Community (SPR) Maju Bersama, Sungai Lilin Sub-District, Musi Banyuasin Regency, South Sumatra Province, Indonesia. Primary data were collected through FGD (focus group discussion) and interview with expert stakeholders, including farmers, policymakers, entrepreneurs, academics, and research analyst. They were analyzed using the Analytical Hierarchy Process (AHP) with R studio version 4.1.2. The result showed that Musi Banyuasin Regency has a natural resource potential for supporting beef cattle production with an institutional collaborative strategy. The interaction between the production factors showed that the feeding criteria were at the highest level, with 32.05%. Considering the performance criteria, business sustainability was essential at 35.70% and should be achieved by adopting a corporate strategy of 85.52%, implemented through alternative business management at 61.40%.

Keywords: Analytical hierarchy process, Production development, Smallholder beef cattle

Introduction

Population increase positively correlates with national meat demand (Fatmawati *et al.*, 2016). The increasing beef consumption is influenced by several factors, including income and consumer tastes (Priyanto, 2011). According to the Directorate General of Livestock and Animal Health projections, national beef consumption increased by an average of 5.97% annually between 2014 and 2023. This condition has not rendered Indonesia self-sufficient; despite being offset by a 2.32% rise in meat production. Domestic beef production has not fully met national demands because population growth remains low and needs to be optimized (Rohasti, 2017). Most beef cattle farmers are smallholders, hence, the development of traditional cattle farms is a primary objective (Harmini *et al.,* 2011). The various parties that have tried to increase meat productivity include the government, academics, research analysts, and the private sector. Furthermore, the institutional support from the government is also adequate in enhancing farmers' enthusiasm through the establishment of groups and assistance by extension workers and research analysts.

School for Smallholder Community is one of the programs of Lembaga Penelitian and Pengabdian Masyarakat (LPPM) IPB University. This was formed to change the mindset of farmers in cultivating and building a collective business to increase their productivity and income (Sari *et al.*, 2020). One of them is located at Sungai Lilin Sub-District, Musi Banyuasin Regency, South Sumatra Province. Musi Banyuasin Regency is one region with potential livestock development, especially beef cattle. This place was appointed as a livestock development location based on the Ministry of Agriculture Republic Indonesia decree 472 of 2018. In 2020, the population of beef cattle at this regency was 35.766, an increase of 3.78% (Wiadnyana *et al.*, 2021). Furthermore, establishing a focus group for the livestock

farming industry in Musi Banyuasin Regency in 2013 was one of the measures made by the regional government. SPR becomes a field laboratory for farmers and policymakers in implementing livestock sector programs. The strategy formulation to boost beef cattle production in traditional farms was accomplished through SPR's business experience. Therefore, this study aimed to determine and analyze criteria, performance criteria, strategies, and alternatives for sustainable beef cattle production in traditional farms based on the opinion of experts.

Materials and Methods

This study was conducted at SPR Maju Bersama, Sungai Lilin Sub-District, Musi Banyuasin Regency from March to September 2021. This location was selected because the group corporately runs the business. Data were collected through FGD and interviews with respondents selected through purposive sampling representing 5 sectors. These include farmers represented by the group leader and group secretary (2 informant), policymakers represented by the Head of Regency Planning Board; Head of Cooperatives and UMKM Office; Head of Horticultural Food Crops and Livestock Office; Head of Plantation Office; and Head of Village (5 informant), entrepreneurs represented by Telago Farm and Cooperative owners (1 informant), academics represented by a Professor from the Faculty of Animal Science at IPB University (1 informant) and research analysts from the South Sumatra Agricultural Technology Study Center (2 informant). The FGD was conducted through interviews with experts based on the hierarchies arranged. The collected data were analyzed using the Analytical Hierarchy Process (AHP) (Saaty, 1993). Table 1 shows the average expert opinion scores computed using a rating scale in Microsoft Excel before being processed in RStudio version 4.1.2. Therefore, it is necessary to ensure the inconsistency of scores resulting from the calculation of expert opinions before synthesizing the weighting matrix on AHP (Thomas L Saaty, 1993). Consistency Ratio (CR) is an index showing the consistency level of experts in answering AHP questions at each level. Furthermore, they are said to be consistent when the CR value is <10% or 0.1 (Saaty, 2013).

Table 1. Rating scale and definition in the weighting of components in the AHP method

Comparison (A versus B)	Definition
1	A is as essential as B
3	A is slightly more important than B
1/3	The opposite (B is slightly more important than A)
5	A is more important than B
1/5	The opposite (B is more important than A)
7	A is very clearly more critical than B
1/7	The opposite (B is very clearly more critical than A)
9	A is more important than B
1/9	The opposite (B is more important than A)
2, 4, 6, 8 (or 1/2, 1/4, 1/6, 1/8)	The slight difference with the benchmark above

Source: Saaty (1993).

Results and Discussion

Hierarchical structure of beef cattle production development strategy

The average CR value in most pairwise comparison tables was 0.096 or 9.6%. Therefore, it can be concluded that the experts consistently answered the questions at each level. Figure 2 shows the data analysis results for all levels.

Feed and capital criteria

Musi Banyuasin Regency has considerable natural resource potential for beef cattle production development with the availability of natural resources. Musi Banyuasin Regency is located between 1.30 – 4.00 latitude and 1030 – 1050 longitude, administratively covering 15 sub-districts with an area of 14,265.96 km² (Figure 1). The population of beef cattle was 8,280.75 ST in

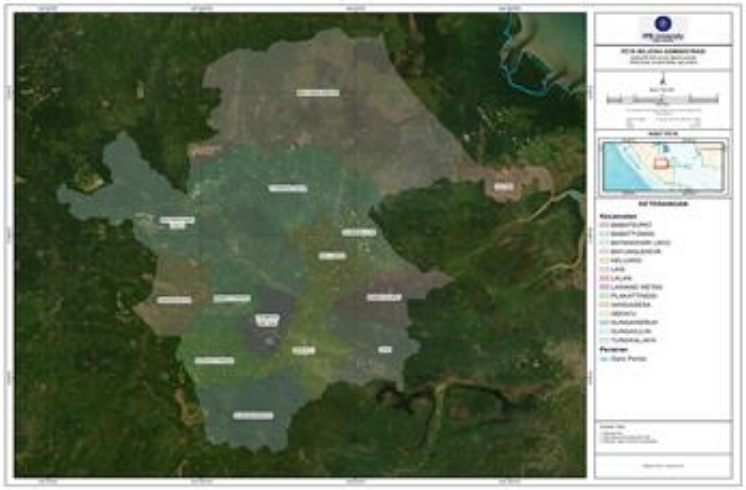

Figure 1. Map of Musi Banyuasin Regency.

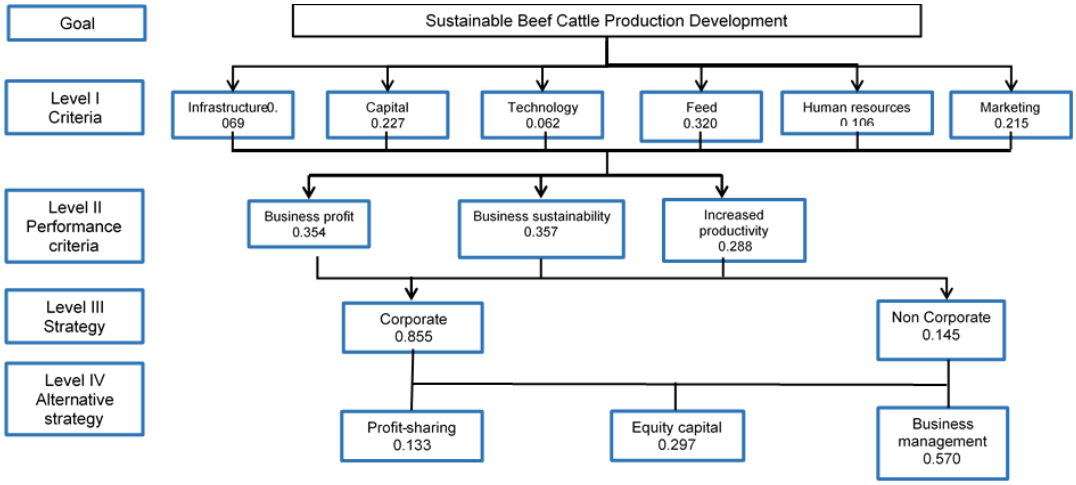

Figure 2. Hierarchy of sustainable beef cattle production development in Musi Banyuasin Regency.

2021 (Table 2), with an increase over the last five years of 3.78% (BPS Musi Banyuasin, 2021). The highest beef cattle population is in the Plakat Tinggi Sub-District of 1,083.29 ST, and the lowest is in the Jirak Jaya Sub-District of 167.53 ST. Area potential and feed potential in Musi Banyuasin Regency are shown in Tables 2 and 3.

The criteria analysis aims to determine the essential criteria for the sustainable development of beef cattle production in Musi Banyuasin Regency based on the priority weight of the AHP. According to the data analysis results in Table 3, the highest weight in the sustainable development of beef cattle production in Musi Banyuasin Regency was feed criteria of 32.05%, then capital of 22.68%. Feed is the most essential (Haryanto, 2012) and has the most significant portion, or approximately 70% of the total production cost (Rusdiana and Praharani, 2019). The primary problem of cost inefficiency will be resolved when its cost is reduced to a certain point. Furthermore, feed is the primary energy source for growth, sustaining life, producing, and maintaining body resistance and health. The food given to livestock should be of good quality and in sufficient quantities for them to grow well (Sandi *et al.*, 2019). However, the availability of forage is decreasing with the high rate of land conversion. These problems can be anticipated by increasing land capacity (Fatah *et al.*, 2012) and integrating crops and livestock (Yusdja *et al.*, 2003). According to the data in Table 4, in Musi Banyuasin Regency, the feed can be obtained from natural forage as well as agricultural and plantation waste. This location has the second-best animal food-carrying capacity. Additionally, the availability should be maintained by applying its processing technology (Haryanto, 2012).

The second priority after feeds is capital, where in business often called investment, an expenditure to buy production equipment to run a business. Business scale, production costs, working capital and management system are the factors that positively and significantly correlate to livestock farm income (Melandri *et al.*, 2022). The number of beef cattle ownership is positively correlated with income, which is highest on a relatively large scale of livestock ownership and the lowest on a relatively small scale of ownership (Dadang *et al.*, 2021). The average ownership in SPR Maju Bersama is 4.42±0.95 per farmer (Sari *et al.*, 2020). Therefore, its raising cannot be a primary source of income. According to the interviews, the main obstacle to improving business scale is limited capital and the collateral financial institutions can accept, hence,

Table 2. A potential area for beef cattle development in Musi Banyuasin Regency

Sub District	Beef cattle population (ST)	Cultivated land area (ha)	Area (km^2)
Sanga desa	409.91	11,473	317
Babat toman	327.19	23,926.13	1.291
Batanghari leko	228.94	21,008.55	2,107.79
Plakat tinggi	1,083.29	7,870.4	247
Lawang wetan	303.09	17,986	232
Sungai keruh	273.66	11,030.4	330.12
Jirak jaya	167.53	12,649.32	298.88
Sekayu	368.67	22,081	701.60
Lais	949.82	20,447	755.53
Sungai lilin	824.46	14,663	374.26
Keluang	725.28	9,373.02	400.57
Babat supat	785.07	20,694.68	511.02
Bayung Lencir	646.73	61,579.65	4,847
Lalan	453.71	72,563	1,031
Tungkal Jaya	733.39	15,254.75	821.19
Musi Banyuasin Regency	8,280.75	342,599.64	14,265.96

Primary data sources from the Musi Banyuasin Regency Agriculture Office 2021.

Table 3. Criteria weight in the development of sustainable beef cattle production in Musi Banyuasin Regency

	Weight
Feed	0.32047690
Capital	0.22684448
Marketing	0.21493038
Human resources	0.10590723
Infrastructure	0.06956437
Technology	0.06227663

Table 4. Potential of beef cattle feed in Musi Banyuasin Regency

Sub District	Natural forage production (tons/BK/Year)	Agricultural waste production (tons/BK/Year)	Total feed production (tons/BK/Year)
Sanga desa	6,537.15	8,606.10	15,143.25
Babat toman	14,908.79	1,143.90	16,052.69
Batanghari leko	144,652.36	286.50	144,938.86
Plakat tinggi	4,859.82	114.70	4,974.52
Lawang wetan	10,769.33	3,353.00	14,122.33
Sungai keruh	6,735.19	990.20	7,725.39
Jirak jaya	7,428.30	2,608.60	10,036.90
Sekayu	13,760.51	10,415.00	24,175.51
Lais	9,958.53	16,422.60	26,381.13
Sungai lilin	119,664.88	5,256.30	124,921.18
Keluang	119,681.51	91.50	119,773.01
Babat supat	62,941.48	6,562.90	69,504.38
Bayung Lencir	37,908.73	5,562.60	43.471,33
Lalan	24,942.17	229,009.00	253,951.17
Tungkal Jaya	9,518.19	695.40	10,213.59
Musi Banyuasin Regency	594,266.94	291,118.30	885,385.24

Primary data sources from the Musi Banyuasin Regency Agriculture Office 2021.

regulations are needed to stimulate farmers' enthusiasm for developing businesses (Sodiq *et al.*, 2017). This has an impact on improving the economy of rural communities (Rusdiana *et al.*, 2020). Cultivars need government regulations, such as simplifying banking procedures, reducing interest rates (maximum 5%), and providing subsidies to do business (Mayulu and Sutrisno, 2016).

Human resources, marketing, infrastructure, and technology are complementary for increasing beef cattle production in traditional farms. The increasing number of beef cattle should be balanced with clear marketing channels. One obstacle farmers face is the lack of a guaranteed market. Farmers do not have accurate information about market prices and how it is interpreted, hence, they sell at a value set by the seller. They get minimal profits and even suffer losses (Rusdiana *et al.*, 2020). The key to developing beef cattle farms is human resources, namely farmers and their companions. Farmers play an essential role in livestock's progress, sustainability, and development (Arifin and Riszqina, 2016). Extension workers and field officers build their capacity through training in the introduction of applied technology, including livestock health, feeding, mating systems, and other maintenance management. Health services and assistance help farmers in daily maintenance practices, which are expected to affect productivity and business efficiency (Sodiq *et al.*, 2019). The factors supporting the success of sustainable production are infrastructure and technology. Furthermore, the development of beef cattle in traditional farms cannot be separated from the role of the government. One of the services is infrastructure support, which begins with providing forage land, irrigation, and repairing production roads (Mayulu and Sutrisno, 2016). Poor infrastructure is one of the barriers to production; the introduction of technology is needed to increase farmers' production and income. This is applied when it corresponds to their capabilities, namely simple, economical, and following regional conditions (Rusdiana and Praharani, 2019; Rusdiana and Talib, 2019). Additionally, the application of technology is one of the levers to increase farmers' competitiveness (Sugiarto *et al.*, 2018) and improve the quality and quantity of business (Adawiyah, 2017).

Business sustainability performance and business profit

According to the analysis in Table 5, it can be seen that the priority weight is determined by (a) infrastructure and human resource criteria, (b) capital and marketing criteria, and (c) technology and feed criteria. Furthermore, the highest priority of these performance criteria is business continuity, profit, and increased productivity, respectively. Table 5 presents the overall weight of performance criteria in the sustainable development of beef cattle production in Musi Banyuasin Regency. According to the results, the highest weight was business

Table 5. Weight of performance criteria in the development of sustainable beef cattle production based on each performance criteria in Musi Banyuasin Regency

Performance Criteria	Infrastructure	Capital	Technology	Feed	Human recources	Marketing
Business profit	0.1119317	0.592246	0.1576351	0.109765	0.242301	0.659201
Business sustainability	0.6230477	0.269638	0.3252871	0.340799	0.653759	0.250425
Increased productivity	0.2650205	0.138116	0.5170778	0.549437	0.103940	0.090374

sustainability at 35.70%, followed by business profit at 35.48%. This shows that business sustainability and profits are equally essential in the sustainable development of beef cattle production in Musi Banyuasin Regency. According to regional stakeholders, the support for the development of the livestock farming sector was demonstrated by the government through infrastructure development and assistance (cages and equipment), assistance to field officers, and Kredit Usaha Rakyat (KUR)/business loan, hence, the beef cattle farming can continue to provide benefits. A business is said to be sustainable when it reaches ecological stability, thereby its supporting factors, such as natural resources, human resources, and capital, is consistently available (Suryanti, 2020).

Corporate strategy for business sustainability

Examining the comparison of the most critical strategies in the sustainable development of beef cattle production in Musi Banyuasin Regency according to each performance criteria presented in Table 6 is a prerequisite to analyzing the overall design. The highest priority is a corporate strategy based on the performance criteria of business profits, business continuity, and increased productivity. Table 7 shows the overall weight for sustainable development of beef cattle production in Musi Banyuasin Regency. The highest weight for strategy was the corporate strategy with 85.52%. Business can be sustained by revitalizing people's businesses into an advanced form. Farmers can be empowered through corporate farming, which combines capital to be jointly managed in one management (Musthofa and Kurnia, 2018). SPR IPB is one of the institutions transformed from livestock into a corporate livestock group. Corporations allow smallholding farmers to conduct participatory learning to improve livestock efficiency and productivity through collective business and collaboration with various parties. Business partnership assistance is provided for mutual benefit (Puspaningrum, 2019), hence, improving added value, competitiveness, as well ass developing advanced, independent and modern agriculture performance and is expected to increase income (Shodiq, 2022). This result is consistent with President Joko Widodo's report that the livestock farming sector is more efficient when managed corporately.

Table 6. Weight of performance criteria in the sustainable development of beef cattle production in Musi Banyuasin Regency

Performance criteria	Weight
Business sustainability	0.3570453
Business profit	0.3544720
Increased productivity	0.2884827

Table 7. Weight of strategy in the development of sustainable beef cattle production in Musi Banyuasin Regency

Strategy	Weight
Corporate	0.8552629
Non-Corporate	0.1447371

Alternative of business management strategy

According to the comparison of overall strategy alternatives, as shown in Table 8, the primary priority in implementing corporate strategy was business management of 56.90%, followed by capital participation of 29.71%. SPR Maju Bersama has partnered with financial institutions since 2020 and obtained beef cattle farming financing through the Corporate Social Responsibility (CSR) scheme. Farmers can maintain large amounts of beef cattle without capital difficulties, while management benefits from profit sharing. The group thrives as a learning institution and business unit managed by, from, and for farmers (Tinenta *et al.*, 2017).

Table 8. Weight of alternative in the development of sustainable beef cattle production in Musi Banyuasin Regency

Alternative	Weight
Business management	0.5699914
Equity capital	0.2971202
Profit-sharing	0.1328884

Conclusions

Increasing beef cattle production on traditional farms requires the involvement of various parties. Based on the FGD with experts and the AHP results, the formulation of criteria, performance criteria, strategies, and alternatives to increase sustainable beef cattle production in traditional farms were determined. The results showed that feed was the primary supporting criterion at 32.05%, while business sustainability was the performance criterion at 35.70%. Finally, business sustainability can be achieved through a corporate strategy of 85.52% implemented in business management of 56.90%.

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References

Adawiyah, C. R. 2017. Urgensi komunikasi dalam kelompok kecil untuk mempercepat proses adopsi teknologi pertanian. Forum Penelitian Agro Ekonomi 35: 59–74.

Arifin, M. Z. and Riszqina. 2016. Analisis potensi pengembangan ternak sapi potong di Kecamatan Galis Kabupaten Pamekasan. Maduranch 1: 1–12.

BPS Musi Banyuasin. 2021. Kabupaten Musi Banyuasin Dalam Angka 2021. CV Vika Jaya, Sekayu.

Dadang, S., Sutriyono, and Novan. 2021. Income of beef cattle breeders and outpouring of family labor based on livestock ownership scale in North Bengkulu regency. Buletin Peternakan Tropis 2: 118-124.

https://doi.10.31186/bpt.2.2.118-124

Fatah, W. M., E. Gurnadi, and K. Mudikdjo. 2012. Produktivitas sapi peranakan ongole pada peternakan rakyat di Kabupaten Sumedang. Jurnal Ilmu Ternak 12: 2–5.

Fatmawati, Rostin, and J. N. Baso. 2016. Faktor-faktor yang mempengaruhi permintaan daging sapi di indonesia. Jurnal Ekonomi 1: 128–134.

Harmini, H., R. W. Asmarantaka, and J. Atmakusuma. 2011. Model dinamis sistem ketersediaan daging sapi nasional. Jurnal Ekonomi Pembangunan 12: 128. https://doi.10.23917/jep.v12i1.211.

Haryanto, B. 2012. Perkembangan penelitian nutrisi ruminansia. Wartazoa 22: 169–177.

Melandri, D., A. Munandar and V. Meiriasari. 2022. Factor affecting chicken livestock business income in Lubuk Linggau City. IJCSE 3: 1-8.

Mayulu, H. and C. I. Sutrisno. 2016. Kebijakan pengembangan peternakan sapi potong di Indonesia. Jurnal Penelitian dan Pengembangan Pertanian 29: 124-352. https://doi.10.21082/jp3.v29n1.2010.p%p.

Musthofa, I. and G. Kurnia. 2018. Prospek penerapan sistem corporate farming. Jurnal AGRISEP 17: 11–22. https://doi.10.31186/jagrisep.17.1.11-22.

Priyanto, D. 2011. Strategi pengembangan usaha ternak sapi potong dalam mendukung program swasembada daging sapi dan kerbau tahun 2014. Jurnal Litbang Pertanian 30: 108 – 116. https://doi.10.21082/jp3.v30n3.2011.p108-116.

Puspaningrum, A. 2019. Factors affecting the development of small and medium industry business in Malang City. Journal of Applied Management 17: 328–335. https://doi.10.21776/ub.jam.2019.017.02.16.

Rohasti, E. 2017. Beef usage by padang restaurants in Bandar Lampung. JIIA 5: 312-319.

Rusdiana, S., A. B. L. Ishak, and T. R. Ferasyi. 2020. Development strategy of beef cattle business to increase farmers' economic value in Sukabumi Regency S. Int. J. Trop. Vet. Biomed. Res. 5: 13–28.

Rusdiana, S. and L. Praharani. 2019. Pengembangan peternakan rakyat sapi potong: kebijakan swasembada daging sapi dan kelayakan usaha ternak. Forum Penelitian Agro Ekonomi. https://doi.10.21082/fae.v36n2.2018.97-116.

Rusdiana, S. and C. Talib. 2019. Kebijakan pemerintah mendukung peningkatan usaha sapi potong di peternak. SOCA Jurnal Sosial Ekonomi Pertanian 13: 380. https://doi.10.24843/soca.2019.v13.i03.p08

Saaty, T. L. 1993. Pengambilan Keputusan: Bagi Para Pemimpin. Terjemahan Liana Setiono. LPPM dan Pustaka Binaman Pressindo, Jakarta Pusat.

Sandi, S., M. Desiarni, and Asmak. 2019. Manajemen pakan ternak sapi potong di peternakan rakyat di Desa Sejaro Sakti Kecamatan Indralaya Kabupaten Ogan Ilir. Jurnal Peternakan Sriwijaya. https://doi.10.33230/jps.7.1.2018.7080.

Sari, D. A. P., Muladno, and S. Said. 2020. Potensi dan performa reproduksi indukan sapi bali dalam mendukung usaha pembiakan di stasiun lapang Sekolah Peternakan Rakyat. Jurnal Ilmu Produksi dan Teknologi Hasil Peternakan 8: 80–85. https://doi.10.29244/jipthp.8.2.80-85.

Shodiq, W. M. 2022. Model of CVRV (Cost, Productivity, Risk and Value-Added) in improving Indonesia farmer's income. Jurnal Hexagro 6: 115-127. https://doi.10.36423/hexagro.v6i2.657

Sodiq, A., S. Suwarno, F. R. Fauziyah, Y. N. Wakhidati, and P. Yuwono. 2017. Sistem produksi peternakan sapi potong di pedesaan dan strategi pengembangannya. J. Agripet. 17: 60–66. https://doi.10.17969/agripet.v17i1.7643.

Sodiq, A., P. Yuwono, J. Sumarmono, S. A. Santosa, Y. N. Wakhidati, F. R. Fauziyah, M. Rayhan, A. H. Sidhi, and A. Maulianto. 2019. Improving beef cattle production system for sustainable rural development in Central Java. AIP Conf. Proc. 2094. https://doi.10.1063/1.5097497.

Sugiarto, M., Y. N. Wakhidati, A. Einstein, and K. Kherudin. 2018. The Competitiveness of beef cattle business on various agro-ecological zones in Tegal Regency. Anim. Prod. 19: 127. https://doi.10.20884/1.jap.2017.19.2.604.

Suryanti, R. 2020. Sustainability of broiler farming on partnership pattern. Jurnal Pangan 28. https://doi.10.33964/jp.v28i3.446.

Tinenta, S. G., S. O. Lombogia, F. S. Oley, and J. M. Tumewu. 2017. Peranan kelompok peternak terhadap usaha pengembangan ternak itik di Kecamatan Tondano Barat Kabupaten Minahasa. Zootec 37: 415. https://doi.10.35792/zot.37.2.2017.16267.

Wiadnyana, P., T. Saili, L. Ode, and A. Sani. 2021. Faktor pendukung dan penghambat pengembangan kawasan Sentra Peternakan Rakyat (SPR) sapi potong di Kabupaten Konawe. Jurnal Ilmiah Peternakan Halu Oleo 3: 258–264.

Yusdja, Y., N. Ilham, and W. K. Sejati. 2003. Profil dan permasalahan peternakan. Forum Penelitian Agro Ekonomi 21: 44–56. https://doi.10.21082/fae.v21n1.2003.44-56.