ISSN: 0852-3681
E-ISSN: 2443-0765

Jurnal Ilmu-Ilmu Peternakan 31(3): 192 – 200
Available online at http://jiip.ub.ac.id

Study of vulnerability aspects of beef cattle farming business

Amam*[1)], Bambang Hidayat Setyawan[1)], Mohammad Wildan Jadmiko[1)], Pradiptya Ayu Harsita[1)], Supardi Rusdiana[2)] and Muchamad Luthfi[3)]

[1)] Department of Animal Husbandry, Faculty of Agriculture, Universitas Jember
Jl. Diponegoro, Curahdami, Bondowoso District, East Java 68251, Indonesia
[2)]Animal Research Center – Bogor, PO Box 221, Bogor District, West Java, Indonesia
[3)] Beef Cattle Research Station
Jl. Pahlawan No. 2 Bebekan Lor, Grati, Pasuruan Distrcit, East Java 67184, Indonesia

Submitted: 12 March 2020, Accepted: 21 May 2021

ABSTRACT: Farmer accessibility to resources plays an essential role in developing livestock farming businesses, but the vulnerability aspect is one of the obstacles for farmers' accessibility to resources. This research aims to examine aspects of the vulnerability of beef cattle farming businesses and analyze their effects on the accessibility of farmers to resources. The research was conducted from May to September 2019 in Purnama Village, Bondowoso District. Purnama Village is one of the villages developed by the University of Jember to develop a beef cattle farming business in the Bondowoso District. Respondents were all 201 beef cattle farmers in Purnama Village. The research variables consist of aspects of the vulnerability of the beef cattle farming business (X), financial resources (Y_1), technological resources (Y_2), and physical resources (Y_3). Data were obtained using the FGD (Focus Group Discussion), observation, and survey methods. The survey was conducted using interviews and questionnaires. Data were analyzed using the PLS (Partial Least Square) method. The results showed that the vulnerability of the beef cattle farming business had a negative and significant effect on the accessibility of farmers to financial and physical resources and a negative but not significant effect on technological resources. The conclusion of the research shows that the vulnerability of the beef cattle farming business had a negative impact on the livestock farming business resources, so it needs to get special attention from stakeholders.

Keywords: Resources; Financial; Technological; Physical; Assisted village

*Corresponding Author: amam.faperta@unej.ac.id

INTRODUCTION

Beef cattle commodity is one of the commodities that has received special attention from the government (Harsita and Amam, 2019). Various attempts have been made to develop the beef cattle business in Indonesia. These efforts are prioritized for the improvements in the upstream to the downstream sector. It was done solely to support food self-sufficiency for beef (Amam and Haryono, 2021). The beef self-sufficiency program, closely related to food issues, is one of the priorities set out in the National Medium-Term Development Plan (RPJMN) following Presidential Regulation No.2 of 2015.

One of the concrete steps to support and actualize the beef self-sufficiency program is to develop a household-scale beef cattle business (Amam *et al*., 2020). The household-scale beef cattle business is the most significant contributor to the total beef cattle population in Indonesia and contributes 6.8% to the total household income of breeders (Setiawan *et al*., 2014). Ironically, Sunarto *et al*. (2015) argued that the household scale beef cattle business was not entirely of a business nature. Still, only a side business and not oriented towards profitability, beef cattle raised were only on a small scale. Qinayah *et al*. (2017) stated that the higher the scale of the beef cattle business, the higher the breeder's income per head. Zulfikri *et al*. (2014) mentioned that when the beef cattle farming business contributes> 30% to the household income of the breeder, the beef cattle farming business is included in the typology of the main business branch, not as a sideline. The variables that have significant effects on the income of beef cattle breeders are livestock business costs, the amount of livestock ownership, and the cattle rearing system. In contrast, the variable of farming experience and education level have no significant effect (Indrayani and Andri, 2018). Resources play an important role in the development of livestock businesses (Amam *et al*., 2019). These resources include financial resources, technological resources, and physical resources. The number of resources that farmers can access will not be optimal if the vulnerability of the livestock business is high. Amam and Soetriono (2019) revealed that livestock business development has a negative effect on business risk aspects.

The aspects of business risk include the aspect of vulnerability which has a positive effect on the HR (Human Resources) of farmers if managed properly and correctly (Amam and Harsita, 2019; 2021). According to Amam and Soetriono (2020), human resources have a positive influence on livestock business development. This study aims to study the vulnerability of the beef cattle farming business and analyze its effect on the accessibility of breeders to the resources using the Partial Least Square (PLS) method. The resources in question are financial, technological, and physical resources (Amam *et al*., 2019). This research was conducted in Purnama Village, Curahdami District, Bondowoso Regency. Purnama Village is one of the villages assisted by Jember University for the development of the beef cattle farming business.

MATERIALS AND METHODS

This research was conducted using an ex post facto research approach. The data were collected from May to August 2019 in Purnama Village, Curahdami District, Bondowoso Regency. Purnama Village is one of the villages assisted by Jember University for the development of beef cattle so that the research location was determined using purposive sampling. The research data consisted of primary and secondary data. The primary data was obtained directly from respondents (informants) who are beef cattle breeders. The secondary data were obtained from the Animal Husbandry and Animal Health Service of Bondowoso Regency and Statistics Indonesia. The research data were

obtained using the FGD (Focus Group Discussion), observation, and survey. The survey methods used were interviews and questionnaires. The questionnaire used is on a Likert scale +1 to +5. The respondents were beef cattle breeders in Purnama Village, Curahdami District, Bondowoso Regency. The number of beef cattle breeders was 201 people. All beef cattle breeders were used as the sample in this study (total sampling). This study consisted of four main variables, namely the vulnerability of the beef cattle farming business (X) and financial resources (Y_1), technology resources (Y_2), and physical resources (Y_3). The indicators of each variable are described in detail in Table 1.

Table 1. Research Variables and Indicators

Variables	Indicators	Notation
Vulnerability Aspects of Beef Cattle Farming Business (X)	it is difficult to find animal feed during the dry season	$X_{1.1}$
	the water availability is not evenly distributed	$X_{1.2}$
	the selling price of live cows is unstable	$X_{1.3}$
	the lack of attention of government and related departments	$X_{1.4}$
	the lack of understanding of good cattle raising management	$X_{1.5}$
	the livestock health	$X_{1.6}$
	the cows are difficult to get pregnant	$X_{1.7}$
	the utilization of cow dung	$X_{1.8}$
	the manure handling	$X_{1.9}$
	the difficulty in handling cows during calving	$X_{1.10}$
	the cows often miscarry	$X_{1.11}$
Financial resources (Y_1)	the main income	$Y_{1.1}$
	the income from dairy cattle farming business	$Y_{1.2}$
	the income from businesses other than livestock	$Y_{1.3}$
	the income from other livestock businesses	$Y_{1.4}$
	the total income for the daily needs	$Y_{1.5}$
	the amount of savings	$Y_{1.6}$
	the amount of debt	$Y_{1.7}$
	the repayment of debt	$Y_{1.8}$
	the ownership of calves	$Y_{1.9}$
	the ownership of heifers	$Y_{1.10}$
	the ownership of pregnant cows	$Y_{1.11}$
	the ownership of production cows	$Y_{1.12}$
	the ownership of a dry period cow	$Y_{1.13}$
	the number of cattle population that are reared	$Y_{1.14}$
Technological resources (Y_2)	the selection of cow broodstock (breeds)	$Y_{2.1}$
	feed technology	$Y_{2.2}$
	the livestock health	$Y_{2.3}$
	housing	$Y_{2.4}$
	marketing of milk	$Y_{2.5}$
	the technology to increase milk production	$Y_{2.6}$
Physical resources (Y_3)	the residential house	$Y_{3.1}$
	the cowshed	$Y_{3.2}$
	the means of transportation	$Y_{3.3}$
	the means of communication	$Y_{3.4}$
	the means of information	$Y_{3.5}$
	the electricity usage	$Y_{3.6}$
	the land tenure	$Y_{3.7}$
	the land use	$Y_{3.8}$
	the availability of water sources	$Y_{3.9}$
	the availability of feed sources	$Y_{3.10}$

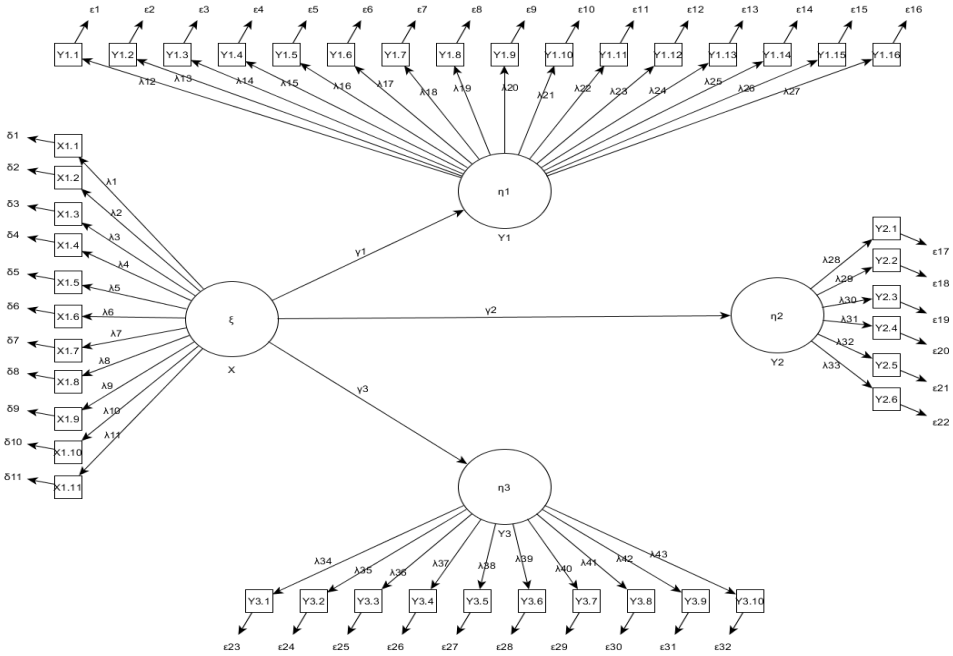

Figure 1. Variable Relationship Model

Table 2. Outer Loading Score

Notation	X	Y_1	Y_2	Y_3	Information
$X_{1.1}$	0.946				valid
$X_{1.2}$	0.915				valid
$X_{1.3}$	0.877				valid
$X_{1.4}$	0812				valid
$X_{1.5}$	0.789				valid
$X_{1.6}$	0.654				valid
$X_{1.7}$	0.623				valid
$X_{1.8}$	0.549				valid
$Y_{1.2}$		0.983			valid
$Y_{1.4}$		0.524			valid
$Y_{1.5}$		0.679			valid
$Y_{1.6}$		0.736			valid
$Y_{1.7}$		0.561			valid
$Y_{1.8}$		0.511			valid
$Y_{1.13}$		0.667			valid
$Y_{1.14}$		0.573			valid
$Y_{1.16}$		0.825			valid
$Y_{2.1}$			0.817		valid
$Y_{2.2}$			0852		valid
$Y_{2.3}$			0.534		valid
$Y_{2.5}$			0.914		valid
$Y_{2.6}$			0.656		valid
$Y_{3.2}$				0.506	valid
$Y_{3.7}$				0.645	valid
$Y_{3.9}$				0720	valid
$Y_{3.10}$				0.923	valid

Description: outer loading score after eliminating invalid indicators

Based on the descriptions and the indicators of variables in Table 1, the relationship between variables in this study is shown in Figure 1.

The data were analyzed using the PLS (Partial Least Square) method. The application used in the PLS method is SmartPLS 2.0. The PLS method is a form of SEM (Structural Equation Model). Wiyono (2011) stated that one of the benefits of using the PLS method is testing or strengthening weak theories and finding new theories.

RESULT AND DISCUSSION

Outer Model Test

Modelling with the PLS method (Partial Least Square) begins with an indicator test. The value of the indicator test result is called outer loading. Outer loading value is considered valid if it is >0.500 so that the indicator is feasible to be accepted and meets the requirements. The results of the indicator test using the PLS method are shown in Table 2.

The next step after testing the indicator is testing the outer model. Some of the criteria in the PLS method (Partial Least Square) is the AVE value (Average Variance Extracted), CR value (Composite Reliability), CA value (Cronbach's Alpha), and value Composite Reliability (CR). The test results are shown in Table 3.

Inner Model Test

The structural test on the effect test after the indicator test consists of the coefficient of determination, the t-statistic value, and the value of the parameter coefficient. The structural test results are shown in Table 4.

Table 3. The Outer Model test results

Variable	Notation	AVE	CA	CR
Vulnerability Aspects	X	0.877	0.926	0.914
Financial resources	Y_1	0.845	0.887	0.878
Technology resources	Y_2	0.631	0.792	0812
Physical resources	Y_3	0.769	0.869	0.889

Table 4. Inner Model

Testing	Score	Information
Determination Coefficient (R^2)		
a. Financial resources	0.556	
b. Technology resources	0.218	
c. Physical resources	0.395	
t-statistic		
a. $X \rightarrow Y_1$	4.788	significant
b. $X \rightarrow Y_2$	1.615	insignificant
c. $X \rightarrow Y_3$	3.124	significant
Parameter coefficient		
a. $X \rightarrow Y_1$	-0.421	negative effect
b. $X \rightarrow Y_2$	-0.158	negative effect
c. $X \rightarrow Y_3$	-0.359	negative effect

t table: 1.653

The Influence of Vulnerability Aspects on Financial Resources

The financial resources were negatively and significantly affected by the vulnerability of the beef cattle business of -0.421 with a significance value of 4.788. The condition in the research location shows that the higher the vulnerability of the beef cattle farming business, the lower the farmer's access to financial resources. The

aspects of this vulnerability include the difficulty of finding cow feed during the dry season, the uneven share of water availability, the unstable selling price of live cows, the lack of attention from the government and related departments, the lack of understanding of good cow rearing management, the livestock health problems, cows that are difficult to get pregnant, and the utilization of cow manure that have not been done. Amam and Harsita (2019) revealed that livestock business vulnerability could affect the development of livestock businesses.

The farmers' access to the financial resources in the research location which was influenced by the vulnerability aspect is the income from beef cattle business, the income from other livestock businesses, the total income for family living needs, the total savings, the total debt, the total debt repayment, the ownership of adult male cows, the ownership of adult female cow, and the number of cow ownership. These financial resources can directly influence the livestock business development (Amam *et al*., 2019). Riszqina *et al*. (2014); Amam and Rusdiana (2021) added that business scale greatly affects livestock productivity, and Asmara *et al*. (2017) the productivity and profitability of large-scale livestock businesses are higher when compared to small-scale livestock businesses.

The Influence of Vulnerability Aspects to Technological Resources

The technological resources were affected negatively but not significantly by the vulnerability aspect of the beef cattle business of -0.158. The aspects of this vulnerability include the difficulty of finding cow feed during the dry season, the uneven share of water availability, the unstable selling price of live cows, the lack of attention from the government and related departments, the lack of understanding of good cow rearing management, the livestock health problems, cows that are difficult to get pregnant, and the utilization of cow manure that have not been done. Farmers' access to financial resources at the research location was influenced by vulnerability, namely the selection of breeds, the feed technology, the livestock health, the fattening management and the marketing management. These financial resources can directly influence the livestock business development (Amam *et al*., 2019). Technology adoption at a low level causes an increase in productivity. This condition occurs in organizations or companies with abundant resources (Ellitan, 2003), which may have an impact on decreasing the quality of human resources of cattle breeders when technology adoption is carried out at a high level. Soetriono *et al*. (2019) explained that one of the efforts to increase breeders' competitiveness and bargaining power began with improving the quality of human resources. HR can also increase farmers' access to resources (Soetriono and Amam, 2020).

The Influence of Vulnerability Aspects on Physical Resources

The physical resources were negatively and significantly affected by the vulnerability of the beef cattle farming business of -0.359 with a significance value of 3.124. This condition in the research location shows that the higher the vulnerability of the beef cattle farming business, the lower the farmer's access to financial resources (Harsita and Amam, 2021). The condition in the research location shows that the higher the vulnerability of the beef cattle farming business, the lower the farmer's access to financial resources. The aspects of this vulnerability include the difficulty of finding cow feed during the dry season, the uneven share of water availability, the unstable selling price of live cows, the lack of attention from the government and related departments, the lack of understanding of good cow rearing management, the livestock health problems, cows that are difficult to get pregnant, and the utilization of cow manure that have not been done. Farmers' access to financial resources in the research location, which is influenced by the vulnerability aspect, is ownership of cattle sheds, land ownership,

water availability, and availability of animal feed. The development of livestock business must be supported by various means of production or resources, one of which is the availability of animal feed (Diwyanto *et al*., 2007). This shows that farmers' access to resources and means of production is very supportive of livestock business development (Amam *et al*., 2021). The lack of feed and availability throughout the year are the main limiting factors for low livestock productivity (Mansyur *et al*., 2012). One possible effort is to carry out a crop-cattle integrated farming system, ammonia production, and silage (fermentation technology) (Hidayat and Amam, 2021). Beef cattle feed fermentation technology can also be done with banana stalks and peels because feed is one of the critical success factors in the beef cattle business (Labatar, 2018).

CONCLUSIONS

The vulnerability aspect of the beef cattle farming business has a negative and significant effect on the accessibility of farmers to financial and physical resources, but not significant to technological resources.

The vulnerability aspects of the beef cattle business include the difficulty of finding feed during the dry season, the uneven share of water availability, the unstable selling price of live cows, the lack of attention from the government and related agencies, the lack of understanding of good management of cattle rearing, the livestock health, cows that are difficult to get pregnant, and the utilization of cow manure.

REFERENCES

Amam`, A., & Haryono, H. (2021). Pertambahan bobot badan sapi impor Brahman Cross heifers dan steers pada bobot kedatangan yang berbeda. *Jurnal Ilmu Peternakan Terapan*, *4*(2), 104–109. https://doi.org/10.25047/jipt.v4i2.2357

Amam. (2021a). Pembangunan peternakan berkelanjutan dalam perspektif standar kompetensi lulusan program studi sarjana peternakan di Indonesia. *JAMI: Jurnal Ahli Muda Indonesia*, *2*(1), 21–35. https://doi.org/10.46510/jami.v2i1.56

Amam, A. (2021b). Gaduhan: sistem kemitraan usaha peternakan sapi potong rakyat di pulau Jawa. *Jurnal Peternakan Sriwijaya*, *10*(1), 16–28. https://doi.org/10.33230/JPS.10.1.2021.13030

Amam, A., Fanani, Z., Hartono, B., & Nugroho, B. A. (2019a). Pengembangan usaha ternak ayam pedaging sistem kemitraan bagi hasil berdasarkan aksesibilitas peternak terhadap sumber daya. *Jurnal Ilmu Dan Teknologi Peternakan Tropis*, *6*(2), 146–153. https://doi.org/10.33772/jitro.v6i2.5578

Amam, A., Fanani, Z., Hartono, B., & Nugroho, B. A. (2019b). Usaha ternak ayam pedaging sistem kemitraan pola dagang umum : pemetaan sumber daya dan model pengembangan. *Sains Peternakan*, *17*(2), 5–11. https://doi.org/10.20961/sainspet.v17i2.26892

Amam, A., & Harsita, P. A. (2019a). Efek domino performa kelembagaan, aspek risiko, dan pengembangan usaha terhadap SDM peternak sapi perah. *Sains Peternakan*, *17*(1), 5–11. https://doi.org/10.20961/sainspet.v17i1.24266

Amam, A., & Harsita, P. A. (2019b). Aspek kerentanan usaha ternak sapi perah di Kabupaten Malang. *AGRIMOR*, *4*(2), 26–28. https://doi.org/10.32938/ag.v4i2.663

Amam, A., & Harsita, P. A. (2019c). Pengembangan usaha ternak sapi perah : evaluasi konteks kerentanan dan dinamika kelompok. *Jurnal Ilmiah Ilmu-Ilmu Peternakan*, *22*(1), 23–34. https://doi.org/10.22437/jiiip.v22i1.7831

Amam, A., Harsita, P. A., Jadmiko, M. W., & Romadhona, S. (2021). Aksesibilitas sumber daya pada usaha

peternakan sapi potong rakyat. *Jurnal Peternakan*, *18*(1), 31–40. https://doi.org/10.24014/jupet.v18i1.10923

Amam, A., & Haryono, H. (2021). Quality of imported beef in Indonesia. *Jurnal Sain Peternakan Indonesia*, *16*(3), 277–282. https://doi.org/10.31186/jspi.id.16.3.277-282

Amam, A., Jadmiko, M. W., Harsita, P. A., & Yulianto, R. (2020). Internal resources of dairy cattle farming business and their effects on institutional performance and business development. *Animal Production*, *21*(3), 157. https://doi.org/10.20884/1.jap.2019.21.3.740

Amam, A., & Soetriono, S. (2019). Evaluasi performa kelembagaan peternak sapi perah berdasarkan aspek risiko bisnis dan pengembangan usaha. *Jurnal Ilmu Dan Teknologi Peternakan Tropis*, *6*(1), 8–13. https://doi.org/10.33772/jitro.v6i1.5391

Amam, A., & Soetriono, S. (2020). Peranan sumber daya terhadap SDM peternak dan pengembangan usaha ternak sapi perah di kawasan peternakan sapi perah nasional (KPSPN). *Jurnal Peternakan Indonesia (Indonesian Journal of Animal Science)*, *22*(1), 1–10. https://doi.org/10.25077/jpi.22.1.1-10.2020

Amam, A., & Solikin, N. (2020). The effect of resources on institutional performance and vulnerability aspects of dairy cattle businesses. *Proceedings of the Proceedings of the 2nd International Conference on Economics, Business, and Government Challenges, EBGC 2019, 3 October, UPN "Veteran" East Java, Surabaya, Indonesia*. https://doi.org/10.4108/eai.3-10-2019.2291919

Amam, A., Yulianto, R., Widodo, N., & Romadhona, S. (2020). Pengaruh aspek kerentanan terhadap aksesibilitas sumber daya usaha ternak sapi potong. *Livestock and Animal Research*, *18*(2), 97–107. https://doi.org/10.20961/lar.v18i2.42955

Amam, Fanani, Z., Hartono, B., & Nugroho, B. A. (2019c). The power of resources in independent livestock farming business in Malang district, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *372*(1), 1–10. https://doi.org/10.1088/1755-1315/372/1/012055

Amam, & Harsita, P. (2021). Profil usaha peternakan sapi potong rakyat. *JAMI: Jurnal Ahli Muda Indonesia*, *2*(1), 1–12. https://doi.org/10.46510/jami.v2i1.53

Amam, & Rusdiana, S. (2021). Pertanian Indonesia dalam menghadapi persaingan pasar bebas. *Jurnal Agriovet*, *4*(1), 37–68.

Amam, Setyawan, H. B., Jadmiko, M. W., Harsita, P. A., Rusdiana, S., & Luthfi, M. (2021). Pengaruh sumber daya manusia terhadap aksesibilitas sumber daya usaha ternak sapi potong rakyat. *Jurnal Ilmu Dan Teknologi Peternakan Tropis*, *8*(1), 57–65. https://doi.org/10.33772/JITRO.V8I1.14118

Asmara, A., Purnamadewi, Y. L., & Lubis, D. (2017). The relationship analysis between service performances of milk producer cooperative with the dairy farm performance of members. *Media Peternakan*, *40*(2), 143–150. https://doi.org/10.5398/medpet.2017.40.2.143

Harsita, P., & Amam. (2019). Permasalahan utama usaha ternak sapi potong di tingkat peternak dengan pendekatan vilfredo pareto analysis. *Prosiding Seminar Nasional Teknologi Peternakan Dan Veteriner 2019*, 241–250. https://doi.org/10.14334/Pros.Semnas.TPV-2019-p.241-250

Indrayani, I., & Andri, A. (2018). Faktor-faktor yang Mempengaruhi Pendapatan Usaha Ternak Sapi potong di Kecamatan Sitiung, Kabupaten Dharmasraya. *Jurnal Peternakan Indonesia (Indonesian Journal of Animal Science)*, *20*(3), 151–159.

https://doi.org/10.25077/jpi.20.3.151-159.2018

Kusumo, D., Priyanti, A., & Saptati, R. A. (2017). Prospek pengembangan usaha peternakan pola integrasi. *Sains Peternakan*, *5*(2), 26–33. https://doi.org/10.20961/sainspet.v5i2.4924

Labatar, S. C. (2018). Pengaruh pemberian batang dan kulit pisang sebagai pakan fermentasi untuk ternak sapi potong. *Jurnal Triton*, *9*(1), 31–37.

Mansyur, Dhalika, T., & Islami, R. (2012). Implementasi strategi dan teknologi kecukupan pakan sepanjang tahun untuk penyembangan peternakan sapi perah di Desa Sukawargi dan Cidatar Kecamatan Cisurupan Kabupaten Garut. *Dharmakarya*, *1*(2), 64–73. https://doi.org/10.24198/DHARMAKARYA.V1I2.8198

Martha, A. D., Haryono, D., & Marlina, L. (2020). Analisis pendapatan dan tingkat kesejahteraan rumah tangga peternak sapi potong kelompok ternak limousin Desa Astomulyo Kecamatan Punggur Kabupaten Lampung Tengah. *Jurnal Ilmiah Peternakan Terpadu*, *8*(2), 77–82. https://doi.org/10.23960/jipt.v8i2.p77-82

Riszqina, R., Isbandi, I., Rianto, E., & Santoso, S. I. (2014). The analysis of factors affecting the performance and benefit of karapan (racing) cattle business in Madura Island, East Java, Indonesia. *Journal of the Indonesian Tropical Animal Agriculture*, *39*(1), 65–72. https://doi.org/10.14710/jitaa.39.1.65-72

Setiawan, H., Hartono, B., & Utami, H. (2014). Kontribusi Pendapatan Usaha Ternak Sapi Potong terhadap Rumah Tangga Peternak. *Jurnal Fakultas Peternakan Universitas Brawijaya*.

Soetriono, S., & Amam, A. (2020). The performance of institutional of dairy cattle farmers and their effects on financial, technological, and physical resources. *Jurnal Ilmu-Ilmu Peternakan*, *30*(2), 128–137. https://doi.org/10.21776/ub.jiip.2020.030.02.05

Soetriono, S., Soejono, D., Zahrosa, D. B., Maharani, A. D., & Amam, A. (2019). Strategi pengembangan dan diversifikasi sapi potong di Jawa Timur. *Jurnal Ilmu Dan Teknologi Peternakan Tropis*, *6*(2), 138–145. https://doi.org/10.33772/jitro.v6i2.5571

Sunarto, E., Nono, O. H., Lole, U. R., & Henuk, Y. L. (2016). Kondisi ekonomi rumah tangga peternak penggemukan sapi potong pada peternakan rakyat di Kabupaten Kupang. *Jurnal Peternakan Indonesia (Indonesian Journal of Animal Science)*, *18*(1), 21–28. https://doi.org/10.25077/jpi.18.1.21-28.2016

Wiyono, G. (2011). *Merancang Penelitian Bisnis dengan Alat Analisis SPSS 17.0 dan SmartPLS 2.0*. Unit Penerbit dan Percatakan STIM YKPN Yogyakarta.

Zulfikri, Doloroso, E., & Komariyati. (2014). Analisis kontribusi usaha ternak sapi potong terhadap pendapatan rumah tangga petani di Kecamatan Tebas Kabupaten Sambas. *Vokasi*, *10*(1), 54–67.