

Factors Influencing Population of Beef Cattle in Ciamis Regency, West Java Province, Indonesia

Agus Yuniawan Isyanto^{1*} Iwan Sugiarto²

1. Department of Socio Economic, Faculty of Agriculture, University of Galuh, Indonesia

2. Latifah Mubarakiyah Institute of Economic Science, Indonesia

Abstract

The research was conducted in Ciamis as one of the centers of beef cattle in West Java Province. This study was conducted to identify factors influencing beef cattle population in Ciamis Regency. Farm level survey data from 100 beef cattle farmers were obtained using well structured questionnaire. The parameters were estimated by using multiple linear regression. Result reveal that beef cattle population in Ciamis more determined by the number of beef cattle inflow compared with outflow and beef cattle slaughtered. Variables beef cattle inflow, beef cattle outflow, pasturage, grass land, forest, the number of beef cattle ownership, human population and beef price significant influence on beef cattle population. While number of farmers no significant effect on beef cattle population.

Keywords: factors, population, beef cattle

1. Introduction

Consumption of beef in Indonesia tends to increase over time in line with population growth, increasing income, changes in public taste (Kusriatmi, et al., 2014), better development of education, and the growing awareness of the importance of nutrients from livestock (Ariningsih, 2014). Increased of beef demand not be offset by the availability of local beef production (Marhendra, et al., 2014), thus partially met through import (Winarso and Basuno, 2013; Elly, et al., 2013; Ashari, et al, 2012).

The imbalance between the supply and demand of animal protein consumption in Indonesia has always been a classic problem that is never resolved even today. Livestock population is unable to meet the needs of the population, not only due to the high rate of population growth, but also because of the low growth in livestock populations (Syafrizal, 2011).

Beef cattle production is an important branch of livestock production sector as it occupies a special place in countries economy with its employment rate and values of products produced (Elfadl, et al, 2015). Beef cattle have a strategic role in strengthening food security efforts. The most fundamental issue is how do we ensure that the food animal production is comparable to current needs (Paly, 2013).

National meat production is affected by population and the quality of the beef cattle. Quality of beef cattle depending on body weight and carcass percentage. Increased the quality of beef cattle do with increased productivity. The greater the population and the higher productivity will increase the national beef supply capacity (Atmakusuma, et al, 2014). This study estimates the factors influencing population of beef cattle.

2. Theoretical Framework

The potential of beef cattle in a certain area is the number of beef cattle that can be exported or cut from a certain area without disrupting the continuity of the beef cattle population (Hardjosubroto, 1987 in Samberi, et al., 2010). There are three main things that need to be considered in the development of animal husbandry in the region, namely livestock, human and land resources (Gunardi, 1992 in Fariani, et al., 2014).

Some factors that could potentially reduce the beef cattle population is declining competitiveness, high price disparities and the quota system (Saptana and Ilham, 2015). Beef production growth rate faster than the rate of population growth. If this goes on or no significant effort to increase beef cattle population, then the beef cattle population will continue to decline (Nuhung, 2015).

Improvement cattle population to do with the revitalization of artificial insemination through improved management and skills inseminator, provision of cheap cement packages, and improved maintenance management. Integrated policy of gradual removal of quotas that complemented with seed policy, technology, investment, and prices have positive influence on the beef cattle population. Beef cattle investment policy through lower interest rates, increased realization of farming credit, physical infrastructure revitalizing and marketing institution can influence the development of beef cattle population (Rusastra, 2014). Development of an integrated system of crop-livestock farming can increase the carrying capacity of feed, so as to increase the population (Saptana and Ilham, 2015)

Gross population is the sum of the existing livestock population with the birth and livestock inflow in the same period. It said gross population because it has not reduced by the number of livestock sold, cut, and dead. Net population is the result of a reduction in gross population by the number of livestock sold, cut, and dead. In other words, the net population is the sum of the actual livestock population plus the number of births and inflow,

and reduced by the number of livestock sold, cut, and dead (Dirjennak, 2013 in Paly, 2013). Social and economic factors can affecting the livestock number and composition (Sherpa and Kayastha, 2009).

3. Research Methodology

The study was carried out in Ciamis Regency by using mainly primary data and were obtain from 100 beef cattle farmers were randomly selected.

The study utilizing multiple linear regression, and the following multiple linear regression model was employed to estimate factors influencing population of beef cattle. The model is defined by:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + u_i$$

where: Y = beef cattle population (head), X₁ = number of beef cattle inflow (head), X₂ = number of beef cattle outflow (head), X₃ = pasturage (hectare), X₄ = grass land (hectare) (kg), X₅ = forest (hectare), X₆ = Number of farmer (people), X₇ = number of beef cattle ownership (head), X₈ = population (people), X₉ = beef price (Rupiah), β = coefficient of regression.

4. Results and Discussion

4.1. Growth of Population of Beef Cattle in Ciamis Regency

Beef cattle population in Ciamis influenced by the amount of beef cattle inflow, outflow and slaughtering. During the period 2002-2012, the average increase in beef cattle population amounted to 5.77% per year, the average increase in beef cattle inflow per year 31.80%, the average increase in beef cattle outflow per year 0,52 %, and the average increase in beef cattle slaughtered per year 1,47%. This indicates that the increase in beef cattle population in Ciamis more determined by beef cattle inflow. While beef cattle out flow and beef cattle slaughtering have a little effect on beef cattle population. Growth of beef cattle population, inflow, outflow and slaughtered can be visually seen in Figure 1.

Figure 1 shows that the beef cattle population in Ciamis increased in 2012 compared with 2002. The increase of the population is determined more by beef cattle inflow compared to outflow and slaughtering. This condition shows the dependence of Ciamis Regency on cattle supply from other regions.

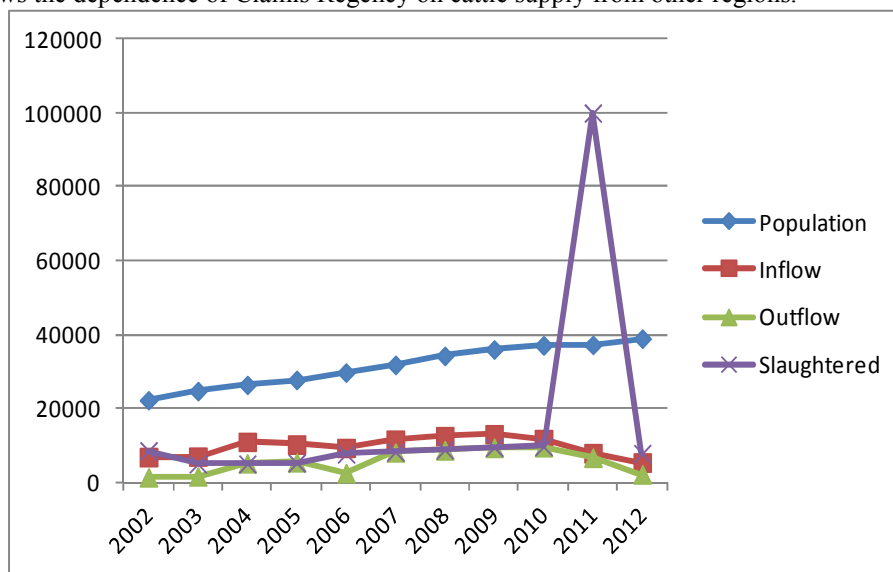


Figure 1. Growth of Population, Inflow, Outflow and Slaughtered

4.2. Factors Influencing Population of Beef Cattle in Ciamis Regency

The results of the analysis of the factors influencing the beef cattle population in Ciamis Regency is presented in Table 1.

Table 1. Multiple linear regression estimate of factors influencing population of beef cattle

Variable	Coefficient	Standard Error	t-ratio	Sig.
Constant	-3.084	3.443	-0.896	0.387
Beef cattle inflow	0.654	0.214	3.061	0.009**
Beef cattle outflow	-1.581	0.487	-3.249	0.006**
Pasturage	-0.188	0.083	-2.273	0.041**
Grass land	0.909	0.108	8.385	0.000***
Forest	-0.343	0.188	-1.826	0.091*
Number of farmers	0.580	0.440	1.317	0.211
Number of livestock ownership	5.734	2.143	2.675	0.019**
Population	1.336	0.483	2.767	0.016**
Beef prices	-0.351	0.174	-2.019	0.065*
R ² value	= 0.956			
Adjusted R ² value	= 0.926			
F-ratio	= 32.605***			

(***) significant at 1%, (**) significant at 5%, (*) significant at 10%

Table 1 shows that simultaneously, the variables included in the model significantly influence the beef cattle population in the district of Ciamis. R² value of 0.956 indicates that the variation of the change of the independent variables included in the model can explain the variation in the dependent variable changes amounted to 95.60%; while the remaining 4.40% is influenced by other variables not included in the model. Simultaneous analysis shows that all variables have significant influence on beef cattle population.

Partial analysis shows that the variable beef cattle inflow, beef cattle outflow, pasturage, grass land, forest, the number of livestock ownership, population and beef price had significant effect on the beef cattle population. Variable number of farmers no significant effect on beef cattle population.

Beef cattle inflow variable has significant and positive influence on the beef cattle population. Increase of beef cattle inflow would increase beef cattle population. These conditions indicate the existence of Ciamis District dependence on the supply of beef cattle from other areas that may threaten self-sufficiency of beef cattle in Ciamis Regency. Need to be efforts to increase the population of beef cattle originating from the Ciamis Regency itself through an increasing number of farmers, the number of livestock ownership, the number of beef cattle births and a decrease of beef cattle outflow and death of beef cattle.

Beef cattle outflow has significant and negative effect on beef cattle population. Increase of beef cattle outflow will reduce the population of beef cattle. Attempts to increase beef cattle population is the increase in beef cattle population in the Ciamis Regency itself through an increasing number of farmers, number of livestock ownership, birth of beef cattle; as well as the decline in beef cattle deaths. According to Elly (2007), beef cattle outflow reduce the population of beef cattle. According to Priyanti, et al (2012), beef cattle outflow from West Java had significant effect on beef cattle population.

Pasturage has significant and negative effect on the beef cattle population. Increase of pasturage will declining beef cattle population. Pasturage is not owned by farmers, so it can not be used by farmers as feed for beef cattle. This pasturage expansion will reduce the land for other farming resulting in decreased agricultural waste which has been used by farmers as beef cattle feed. According Adinata, et al (2014), the ability of the environment to provide livestock feed includes the production of forage and agricultural wastes.

Grass land has significant and positive influence on the beef cattle population. Increasing the grass land will increasing population of beef cattle. Grass land is a common land so that farmers can take advantage of the grass as a source of beef cattle feed. Increased grass land will increase the production of grass so as to increase the population of beef cattle. According Matondang and Rusdiana (2013), the death of the calves reaches 20-40% caused by lack of feed and water during the dry season. According to Elly, et al (2013), an increase in the cattle population must be supported by the availability of forage throughout the year, both quantity and quality. The ability of farmers in the supply of feed will determine the number of livestock that can handled by farmers.

Forest has significant and negative effect on beef cattle population. Increase of forest will declining beef cattle population. Forest land has not been used for the cultivation of grass as feed for beef cattle. Increase of forest will reduce the area for cultivation of grass resulting in production decreasing of grasses that can reduce the population of beef cattle. According Delima, et al (2015), the availability of land suitable for growing forage is something that is important to increase livestock numbers.

Number of farmers no significant effect on beef cattle population. Positive sign of regression coefficient shows that increase of number of farmers will increasing beef cattle population. The increase in the number of farmers is one of the efforts to improve the beef cattle population. however, an increasing number of farmers must be accompanied by increased technical and management skills in order to achieve high productivity of beef cattle. According to Tatipikalawan (2012), labor productivity is affected by the number of livestock ownership.

The number of beef cattle ownership has significant and positive influence on the beef cattle population.

The more the number of beef cattle ownership will increase the population of beef cattle. Farmers have an average of two cows, so they potentially can be increased the number of beef cattle ownership. Success of Beef cattle business can be seen among others from the growing number of beef cattle ownership (Hoddi, et al., 2011). According Suwito (2000) in Trigestianto, et al. (2013), ideally farmers had at least 4 cows to maintain profit from livestock business.

Population has significant and positive influence on the beef cattle population. Increase of the number of population will increasing population of beef cattle. Increase of population will increase the demand for beef which influence on the increasing the beef cattle population to meet the needs of beef. According to the Son and Rustariyuni (2015) and Harmini, et al. (2011), increase in the population will increase the demand for beef.

Beef prices has significant and negative influence on beef cattle population. Increase of beef prices will declining beef cattle population. Increase of beef price will increase the supply of beef. Increase of the supply of beef was done through increased of beef cattle slaughtering so that will reduce the population of beef cattle. According Rusastra (2014), high disparity of beef prices will lead to smuggling that could potentially reduce the population of beef cattle

5. Conclusion

Beef cattle population in Ciamis more determined by the number of beef cattle inflow compared with outflow and beef cattle slaughtered. Variables beef cattle inflow, beef cattle outflow, pasturage, grass land, forest, the number of beef cattle ownership, human population and beef price have significant influence on beef cattle population. While number of farmers no significant effect on beef cattle population.

6. Recommendation

Efforts to increase the beef cattle population in Ciamis could be achieved through outflow reduction of beef cattle to other regions, increased the number of beef cattle ownership, and increased grass land area. Increased the number of livestock ownership is done in order to increase beef cattle population without depending on the inflow of beef cattle from other region.

7. Acknowledgement

Writers say thank you to Directorate of Research and Community Service, Directorate General of Strengthening Research and Development, Ministry of Research Technology and Higher Education, Republic of Indonesia, for funding this research through a scheme of research grant competition of the fiscal year 2016.

References

- Adinata, Y., Pamungkas, D., Krishna, N.H., and Aryogi. (2014). Estimasi Dinamika Populasi Sapi Potong yang Dipelihara di Areal Perkebunan Kelapa Sawit di Kalimantan Selatan, *J. Sains Dasar*, 3(2), 183-189.
- Ariningsih, E. (2014). Kinerja Kebijakan Swasembada Daging Sapi Nasional. *Forum Penelitian Agro Ekonomi*, 32(2), 137-156.
- Ashari, Ilham, N., and Nuryanti, S. (2012). Dinamika Program Swasembada Daging Sapi: Reorientasi Konsepsi dan Implementasi. *Analisis Kebijakan Pertanian*, 10(2), 181-198.
- Atmakusuma, J., Harmini, and Winandi, R. (2014). Mungkinkah Swasembada Daging Terwujud? *Risalah Kebijakan Pertanian dan Lingkungan*, 1(2), 105-109.
- Delima, M., Karim, A., and Yunus, M. (2015). Kajian Potensi Produksi Hijauan Pakan pada Lahan Eksisting dan Potensial untuk Meningkatkan Populasi Ternak Ruminansia di Kabupaten Aceh Besar. *Agripet*, 15(1), 33-40.
- Elfadl, E.A.A., Fardos, A.M., and Radwan, H.A.A.. (2015). Quantitative Methods to Determine Factors Affecting Productivity and Profitability of Beef Fattening Enterprises in Egypt. *Global Veterinaria*, 14(1), 77-82.
- Elly, F.H. (2007). Sistem Pemasaran Ternak Sapi di Kabupaten Minahasa dan Peran Pemerintah. *Jurnal Zootek*, 25, 214-226.
- Elly, F.H., Waleleng, P.O.V., Lumenta, I.D.R., and Oroh, F.N.S. (2013). Introduksi Hijauan Makanan Ternak Sapi di Minahasa Selatan. *Pastura*, 3(1), 5-8.
- Fariani, A., Susantina, S., and Muhakka. (2014). Pengembangan Populasi Ternak Ruminansia Berdasarkan Ketersediaan Lahan Hijauan dan Tenaga Kerja di Kabupaten Ogan Komering Ulu Timur Sumatera Selatan. *Jurnal Peternakan Sriwijaya*, 3(1), 37-46.
- Harmini, Asmarantaka, R.W., and Atmakusuma, J. (2011). Model Dinamis Sistem Ketersediaan Daging Sapi Nasional. *Jurnal Ekonomi Pembangunan*, 12(1), 128-146.
- Hoddi, A.H., Rombe, M.B., and Fahrul. (2011). Analisis Pendapatan Peternakan Sapi Potong di Kecamatan Tanete Rilau, Kabupaten Barru. *Jurnal Agribisnis*, X(3), 98-109.
- Kusriatmi, Oktaviani, R., Syaikat, Y., and Said, A. (2014). Peranan Teknologi Inseminasi Buatan (IB) pada Produksi Sapi Potong di Indonesia. *Jurnal Agro Ekonomi*, 32(1), 57-74.
- Marhendra, A.V.M., Arifin, Z., and Abdillah, Y. (2014). Analisis Dampak Kebijakan Pembatasan Kuota Impor

- Sapi Terhadap Kinerja Perusahaan (Studi Kasus Pada Pt Great Giant Livestock (GGLC), Lampung Tengah-Lampung). *Jurnal Administrasi Bisnis*, 13(1), 1-8.
- Matondang, R.H., and Rusdiana, S. (2013). Langkah-Langkah Strategis Dalam Mencapai Swasembada Daging Sapi/Kerbau 2014. *J. Litbang Pert.*, 32(3), 131-139.
- Nuhung, I.A. (2015). Kinerja, Kendala, dan Strategi Pencapaian Swasembada Daging Sapi. *Forum Penelitian Agro Ekonomi*, 33(1), 63-80.
- Paly, B. (2013). Pertumbuhan Gross dan Net Populasi Ternak Sapi di Sulawesi Selatan. *Biogenesis*, 1(1), 33-40.
- Priyanti, A., Mahendri, I.G.A.P., and Kusnadi, U. (2012). Dinamika Produksi Daging Sapi di Wilayah Sentra Usaha Sapi Potong di Indonesia. Prosiding Seminar Nasional “Petani dan Pembangunan Pertanian”, Pusat Sosial Ekonomi dan Kebijakan Pertanian, Badan Penelitian dan Pengembangan Pertanian, Kementerian Pertanian, 573-589.
- Putra, A.A.B.S.O.P., and Rustariyuni, S.D. (2015). Pengaruh Kurs Dollar Amerika Serikat, Harga Impor, Harga Domestik, Jumlah Produksi Terhadap Volume Impor Daging Sapi di Indonesia Tahun 1998- 2013. *E-Jurnal EP Unud*, 4(9), 1048-1062.
- Rusastra, I.W. (2014). Perdagangan Ternak dan Daging Sapi: Rekonsiliasi Kebijakan Impor dan Revitalisasi Pemasaran Domestik. *Forum Penelitian Agro Ekonomi*, 32(1), 59-71.
- Samberi, K.Y. Ngadiyono, N., and Sumadi. (2010). Estimasi Dinamika Populasi dan Produktivitas Sapi Bali Di Kabupaten Kepulauan Yapen, Propinsi Papua. *Buletin Peternakan*, 34(3), 169-177.
- Saptana and Ilham, N. (2015). Pengembangan Sistem Integrasi Tanaman Tebu-Sapi Potong di Jawa Timur. *Analisis Kebijakan Pertanian*, 13(2), 147-165.
- Sherpa, Y.D., and Kayastha, R.B. (2009). A Study of Livestock Management Patterns in Sagarmatha National Park, Khumbu Region: Trends as Affected by Socio-Economic Factors and Climate Change. *Kathmandu University Journal of Science, Engineering and Technology*, 5(II), 110- 120.
- Syafrizal. (2011). Keragaman Genetik Sapi Persilangan Simmental di Sumatera Barat. *Jur. Embrio*, 4(1), 48-58.
- Tatipikalawan, J.M. (2012). Analisis Produktivitas Tenaga Kerja Keluarga pada Usaha Peternakan Kerbau di Pulau Moa Kabupaten Maluku Baratdaya. *Jurnal Agroforestri*, VII(1), 8-15.
- Trigestianto, M., Nur, S., and Sugiarto, M. (2013). Analisis Tingkat Kesejahteraan Peternak Sapi Potong di Kabupaten Purbalingga. *Jurnal Ilmiah Peternakan*, 1(3), 1158-1164.
- Winarso, B., and Basuno, E. (2013). Pengembangan Pola Integrasi Tanaman-Ternak Merupakan Bagian Upaya Mendukung Usaha Pembibitan Sapi Potong Dalam Negeri. *Forum Penelitian Agro Ekonomi*, 31(2), 151-169.