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Growth Rate of Beef Cattle to Supporting Livestock Agribusiness in South Sulawesi

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ABSTRACT

Developing beef cattle in Indonesia has great potential to meet the demand for beef, improve farmers' welfare, and positively contribute to the national economy. This study aims to identify development areas and analyze the growth rate of beef cattle in South Sulawesi Province. The sampling of areas was done purposively. The data analysis includes the Location Quotient (LQ) and the Growth Ratio Model (GRM). The study results indicate that Bulukumba, Sinjai, Maros, Bone, Barru, Wajo, and Enrekang Regencies are the leading (base) areas for beef cattle development in South Sulawesi Province. The growth rate of beef cattle that falls into classification I includes Selayar Islands, Bulukumba, Takalar, Gowa, Sinjai, Bone, Wajo, Pinrang, Tana Toraja, North Luwu, and East Luwu Regencies. Meanwhile, Bantaeng, Jeneponto, Maros, Pangkajene and Islands, Barru, Soppeng, Enrekang, and Luwu Regencies, as well as the cities of Makassar, Parepare, and Palopo, are included in classification II. This information on the growth rate of beef cattle serves as a basis for local governments to determine appropriate policies for sustainable beef cattle development in these areas. The growth of beef cattle to support livestock agribusiness can be achieved through the development of digital-based technology. This can significantly contribute to developing livestock agribusiness that is more efficient, sustainable, and profitable.

Keywords: *Beef Cattle, Cattle Growth, Location Quotient, Supporting Agribusiness*

INTRODUCTION

Cattle farming plays a vital role in providing food to meet human nutritional needs, creating economic opportunities for communities, and contributing to a country's food self-sufficiency. A country can reduce dependence on local production for food imports, especially in small- and medium-scale farming. Local and small-scale agriculture can help create food security within a community or country (Basyar, 2015). In situations where external food supplies are disrupted, local farms can be an important support in ensuring that communities continue to have access to sufficient food sources. The development of cattle farming in Indonesia faces several challenges in improving the quality and productivity of the livestock. This is due to inefficient management, resilience to livestock diseases, and farmers' lack of knowledge and skills regarding more modern cattle management practices. The application of modern technologies such as farm management systems, digital livestock health monitoring, and livestock waste processing technologies still needs to be enhanced to improve efficiency and productivity.

The livestock management system helps farmers optimize the management of livestock feed, milk production, livestock growth, and environmental conditions. With IoT-based (Internet of Things) devices, farmers can enhance productivity through data-driven decision-making (Ramadani, 2023). Additionally, real-time livestock health monitoring through sensors, wearable devices (smart collars), or cameras connected to software can provide information such as body temperature, heart rate, livestock movement, and feeding patterns. Through digital monitoring, farmers can quickly detect illness, stress, or injuries in livestock, reducing the risk of losses (Herlin *et al.*, 2021). Livestock waste, such as manure, is a significant challenge that must be managed to prevent environmental pollution. Modern waste processing technologies include biogas digesters to produce renewable

energy from manure and composting technology to process waste into organic fertilizers. Implementing these three technologies still needs to be improved, both in terms of adoption by farmers, the availability of supporting infrastructure, and human resource (HR) training. These improvements will help livestock farming become more efficient, productive, and sustainable, as well as contribute to meeting global food demands and mitigating environmental impacts.

The cattle population in Indonesia continues to increase along with the rising demand for cattle products such as meat and milk. However, this population growth does not always align with increased productivity or livestock quality. Nearly all meat production comes from local farms (78%), with the remainder sourced from imports, approximately 5% in beef, and 17% in live cattle (Zakiah *et al.*, 2017).

The prospects for cattle farming in Indonesia remain quite promising despite several challenges. The demand for cattle products such as meat and milk continued to grow along with population growth and changing consumption patterns that are on the rise. This increase is driven by greater nutritional awareness and a lifestyle shift towards protein-rich foods. This creates significant opportunities for the livestock industry to meet market demands, but it also requires improvements in production capacity and efficiency to address the challenges of growing demand.

South Sulawesi has potential in the development of beef cattle farming. Socio-culturally, the community has inherited cattle-rearing traditions passed down through generations, supported by local resources, including feed raw materials from agricultural waste, livestock facilities such as slaughterhouses, livestock markets, veterinary clinics, supporting infrastructure like road access, transportation, inter-island seaports, and a strategic geographical position for livestock commodity trade in Eastern Indonesia (Paly, 2013).

The Central Bureau of Statistics reported in 2022 that the average beef consumption in South Sulawesi Province in 2021 was 2.11 kg per capita per year, which aligns with its population of 9,022,300 people, significantly affecting the demand for livestock products. Therefore, livestock farming plays a vital role in rural communities, providing income sources through raising livestock for meat, milk, eggs, and others. Figure 1 below presents the distribution of beef production in South Sulawesi in 2021.

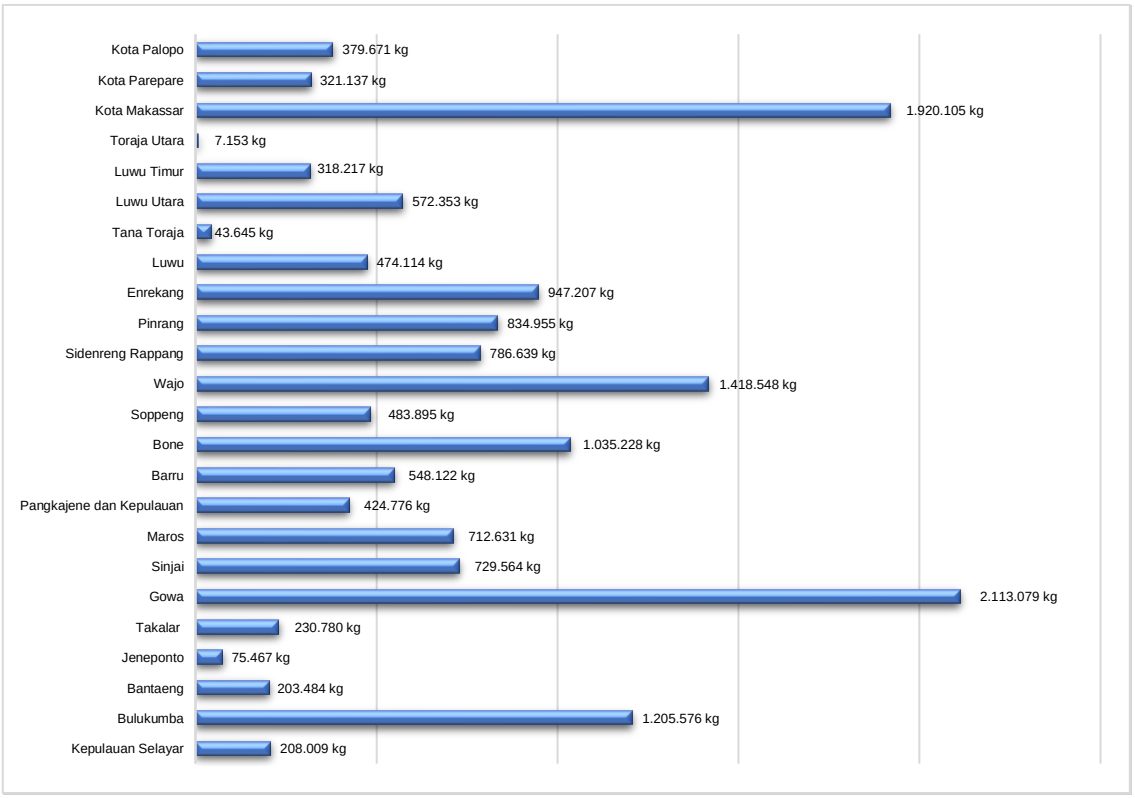

Figure1. Beef Production in South Sulawesi in 2021.
Source: South Sulawesi in Figures, 2022.

Figure 1 shows that beef production in South Sulawesi in 2021 totaled 15,994,355 kg. South Sulawesi Province has significant potential for further development. The economy of South Sulawesi is supported by the agricultural, livestock, fisheries, trade, and industrial sectors. Agriculture in this area includes the production of

rice, cocoa, coffee, and other commodities. Additionally, the livestock and fisheries sectors serve as a backbone of the community's economy, making important contributions to economic growth in the province. The cumulative economy of South Sulawesi in 2022 grew by 5.09 percent compared to 2021 (BPS Sulsel, 2023). The consumption patterns of livestock products in South Sulawesi tend to reflect the habits and preferences of the community in consuming products derived from the livestock sector, which drives the increase in demand for high-nutrition animal protein such as meat, milk, and eggs. Based on this, the availability of these livestock products must continue to be improved.

The results of previous research by Anggraini and Putra (2017) show that the Sijunjung District in Sijunjung Regency is a safe area for beef cattle development, as indicated by the Feed Support Index (IDD) value in Sijunjung District, which is 8.23, meaning IDD > 2. The area's capacity to accommodate ruminant livestock is 24,816.248 heads. Currently, the livestock population is 6,030.68 heads, allowing for an increase of 18,785.568 heads. For beef cattle, an additional 3,615.54 heads can be accommodated. Habsari and Irwani (2021), The development of ruminant livestock in Selagai Lingga District, Central Lampung Regency, can be carried out by analyzing livestock density, which includes economic density analysis, farming density, regional density, and population density. Sengkey *et al.* (2017) state that the availability of natural resources, human resources, and agricultural and plantation resources supports the development of beef cattle in Tompaso Barat District.

The government has designated beef as one of the commodities expected to achieve self-sufficiency to support national food security. However, domestic beef production has not yet been able to meet national demand, so the deficit still needs to be covered through imports of beef or live cattle. South Sulawesi Province plays a strategic role in the national livestock industry, as evidenced by its achievement in being recognized as a livestock hub for cattle. With the ability to supply breeding and beef cattle to various other regions, South Sulawesi demonstrates significant potential as a center for cattle production and distribution in Indonesia. This reflects the region's excellence in livestock management, supporting national needs.

The beef cattle farming business in South Sulawesi Province is essential for developing the agricultural sector. Livestock resources, particularly beef cattle in South Sulawesi, are sufficiently developed to be directed towards processed production in support of downstream industry commitments. This serves as the foundation for the development of beef cattle farming areas. In general, based on data from the Central Statistics Agency (BPS), the total beef cattle population in South Sulawesi in 2022 reached 1.48 million heads. This figure makes South Sulawesi the province with Indonesia's third-largest beef cattle population, after East Java and Central Java. Developing beef cattle in South Sulawesi Province is competitive, enabling it to meet national beef demand. Based on this, this study aims to examine the growth rate of beef cattle in various regencies/cities in South Sulawesi Province.

RESEARCH METHODS

Location of the Research

This research was conducted in South Sulawesi Province, one of Indonesia's beef cattle development centers. South Sulawesi has 21 regencies, namely Kepulauan Selayar, Bulukumba, Bantaeng, Jeneponto, Takalar, Gowa, Sinjai, Maros, Pangkajene and Kepulauan, Barru, Bone, Soppeng, Wajo, Sidenreng Rappang, Pinrang, Enrekang, Luwu, Tana Toraja, North Luwu, East Luwu, and Toraja Urara, as well as three cities, namely Makassar, Parepare, and Palopo. The research location was chosen purposively, considering South Sulawesi Province has Indonesia's largest beef cattle population.

Data Collection

This study uses secondary data from time series data obtained from the Central Bureau of Statistics (BPS) and the Department of Animal Husbandry and Animal Health of South Sulawesi Province. The data evaluated includes:

1. The population data of beef cattle in the regencies/cities of South Sulawesi Province for the period 2017-2021.
2. The population data of South Sulawesi Province for the period 2017-2021.
3. The data on the population of large livestock in the regencies/cities of South Sulawesi Province for the period 2017-2021

Data Analysis

The Location Quotient (LQ) analysis is used to identify sectors or economic activities with a competitive advantage or specialization in a particular region compared to other regions. *Location Quotient* (LQ) or regional condition analysis (basic or non-basic sector) is used to calculate the comparison between Si and Ni. Si is the

specific livestock population ratio per regency/city to the population in the same area. At the same time, Ni is the ratio of the specific livestock population to the total population in South Sulawesi Province. Based on this explanation, the following equation is formulated:

$$LQ = \frac{Si/S}{Ni/N}$$

Where:
Si = Population of commodity type I at the district/ city level
S = Population at the district/ city level
Ni = Population of commodity type I at the South Sulawesi Province level
N = The population at the provincial level of South Sulawesi

The results of the LQ calculation, with three criteria, are:
LQ>1 = Basis means that the production of commodity I in the regency/city area has a comparative advantage.
LQ=1 = Non-basis means that the production of commodity I in the regency/city area does not have a comparative advantage and is only sufficient to meet the needs within that area.
LQ<1 = Non-basis also means that the production of commodity I in the regency/city area does not have a comparative advantage, and the production of commodity I in that area cannot meet local needs and must be supplied from outside the area.

Analysis of the Growth Ratio Model by comparing the growth of an activity in the reference area with the study area. The Growth Ratio Model. The growth ratio model is divided into two parts, namely the growth ratio of the reference area (RPr) of South Sulawesi Province and the growth ratio of the study area (RPs) of regencies/ cities in South Sulawesi Province.

1. Reference Area Growth Ratio (RPr)

The growth ratio of the reference area by comparing the growth of each sector within the context of the reference area (South Sulawesi Province) with the growth of sector I within the context of the reference area (South Sulawesi Province). The equation for RPr is:

$$RPr = \frac{\Delta Eir/Eir}{\Delta Er/Er} \quad \text{..... (1)}$$

Where:
ΔEir = The growth of the cattle population in the reference area at the beginning and end of the research year
Eir = The population of beef cattle in the reference area at the beginning of the research year
ΔEr = The growth of the large livestock population in the reference area at the beginning and end of the research year
Er = The large livestock population in the reference area at the end of the research year

Suppose RPr is greater than 1, denoted by (+). In that case, it means that the growth of the beef cattle population in South Sulawesi Province is more significant than that in the regencies/cities of South Sulawesi Province. Suppose RPr is less than 1, denoted by (-). In that case, it indicates that the growth of the beef cattle population in South Sulawesi Province is less than that in the regencies/cities of South Sulawesi Province.

2. Study Area Growth Ratio (RPs)

The Study Area Growth Ratio (RPs) compares the growth of the beef cattle population in each study area (regency/city) in South Sulawesi Province with the growth of the beef cattle population. The formula for RPs is as follows:

$$RPs = \frac{\Delta Eij/Eij}{\Delta Eir/Eir} \quad \text{..... (2)}$$

Where:

ΔEij = The growth of the beef cattle population in the study area at the beginning and end of the research year

Eij = The beef cattle population in the study area at the beginning of the research year

ΔEir = The growth of the beef cattle population in the reference area at the beginning and end of the research year

Eir = The beef cattle population in the reference area at the beginning of the research year

If the value of RPs is more significant than one, denoted by (+), it indicates that the beef cattle population in the study area is increasing rapidly. Conversely, if RPs decrease, it will be denoted by (-). The MRP analysis will yield accurate and nominal values, and the combination of both will provide an overview of the potential beef cattle population to be developed in a regency/city in South Sulawesi Province. In this case, the potential population of beef cattle to be developed in a regency/municipality in South Sulawesi Province will be analyzed and divided into four categories or segments based on specific criteria:

Classification I = RPr (+) and RPs (+) mean that the commodity has dominant growth in both the reference area (regency/city) and the study area (province)

Classification II = RPr (+) and RPs (-) mean that the commodity has prominent growth in the reference area (regency/city) but not in the study area (province).

Classification III = RPr (-) and RPs (+) mean that the commodity does not have prominent growth in the reference area (regency/city) but has potential for development in the study area (province)

Classification IV = RPr (-) and RPs (-) mean that the commodity shows no growth in either the reference area (regency/city) or the study area (province)

RESULTS AND DISCUSSION

Location Quotient (LQ) Analysis of Beef Cattle

Beef cattle farming is an important part of the agricultural industry that involves the maintenance and breeding of cattle to produce meat (Widiati, 2014). This beef cattle farming significantly impacts food, the economy, and the environment. Therefore, due to the increasing population, sustainable management and development in South Sulawesi Province are needed to meet the growing demand for beef. This necessitates regional mapping using LQ analysis, which relates the number of beef cattle to the population in each regency/city and province. The results of the LQ analysis for beef cattle development are presented in Table 1 below.

Table 1. LQ Analysis of Beef Cattle Development in South Sulawesi Province.

Regency/ City	Location Quotient					Average LQ
	2017	2018	2019	2020	2021	
Selayar Islands	0,87	0,94	1,04	1,10	1,11	1,01
Bulukumba	1,09	1,22	1,17	1,13	1,13	1,15
Bantaeng	0,95	0,89	0,57	0,56	0,56	0,71
Jeneponto	0,55	0,48	0,48	0,45	0,45	0,48
Takalar	0,68	1,00	0,73	0,73	0,73	0,77
Gowa	0,90	0,94	0,96	0,97	1,99	1,15
Sinjai	2,69	2,36	3,02	3,00	3,01	2,81
Maros	1,48	1,41	1,37	1,27	1,27	1,36
Pangkajene and Islands	1,00	0,83	0,83	0,81	0,82	0,86
Barru	2,55	2,42	2,28	2,15	2,17	2,31
Bone	3,42	3,74	3,61	3,51	3,52	3,56
Soppeng	1,33	0,98	0,97	0,97	0,98	1,05
Wajo	1,80	1,55	2,03	2,27	2,29	1,99
Sidenreng Rappang	1,34	0,81	0,83	0,72	0,72	0,88
Pinrang	0,44	0,50	0,49	0,47	0,47	0,47
Enrekang	1,47	1,78	1,37	1,28	1,28	1,44
Luwu	0,31	0,37	0,31	0,30	0,31	0,32
Tana Toraja	0,19	0,23	0,20	0,17	0,71	0,30
Luwu Utara	0,58	0,60	0,69	0,66	0,66	0,64
Luwu Timur	0,33	9	0,48	0,44	0,44	0,42
Toraja Utara	0,01	0,01	0,02	0,01	0,01	0,01
Makassar City	0,01	0,02	0,01	0,01	0,01	0,01
Parepare City	0,25	0,23	0,24	0,21	0,21	0,23
Palopo City	0,13	0,12	0,11	0,11	0,11	0,12

Source: Seconder Data Processed, 2022.

Table 1 shows that Bone Regency is one of the key areas for beef cattle development in South Sulawesi Province, with an LQ value of 3.56. This is supported by the size of Bone Regency, which covers 4,559 km², and the beef cattle population of 452,347 head in 2022. The beef cattle population in Bone Regency has continued to grow from 2017 to the present. Additionally, Bone Regency is one of the national corn centers, producing 291,000 tons in 2021, which can be used as a feed source (concentrate) for beef cattle, indicating significant feed support from this crop. Moreover, feed support is also obtained from rice with a harvested area of 168,603.73 ha and a production of 817,823.30 tons, where the by-product of rice straw can be used as feed for beef cattle. Hajirin *et al*. (2020) state that the aspects to be considered in developing beef cattle involve assessing existing resources, such as natural, human, and sustainable livestock feed resources. Also, cultivation aspects, including seeds, technology, and the strategic environment, must be taken into account, as all of these factors can directly or indirectly influence the success of beef cattle development.

Table 1 also shows that Sinjai Regency (LQ= 2.81), Barru (LQ= 2.31), and Wajo (LQ= 1.99) are key areas for beef cattle development in South Sulawesi Province, aside from Bone Regency. The development of beef cattle in these regions is supported by agricultural waste from food crops such as rice and corn and horticultural crops like vegetables. Mayulu *et al*. (2010), to ensure the sustainability of the business, it is necessary to design beef cattle development policies that facilitate gathering information regarding new growth areas in feed centers, taking into account land availability and livestock population.

Other potential key areas for beef cattle development include Enrekang Regency (LQ= 1.44), Maros (LQ= 1.36), and Bulukumba (LQ= 1.15). The capacity of green feed resources and government support significantly influences the growth of the beef cattle population in these regions. Rusdiana and Praharani (2019) state that government support and policies can increase farmers' population and economic value. In addition to technical aspects, institutional support and communication are necessary to achieve the sustainability of beef cattle farming. The potential for developing the livestock subsector in the highlands of South Sulawesi lies in the advantages of available green feed and climate (Rahim & Fatimah, 2019).

The results of the LQ analysis of the 24 regencies/cities in South Sulawesi Province (Table 1) indicate that there are eight regions with potential (basis) for beef cattle development. Based on the beef cattle population in the regencies/cities of South Sulawesi Province in 2021 (Figure 2), Bone Regency has a beef cattle population of 454,600 head, followed by Wajo Regency with 138,881 head and Sinjai Regency with 125,929 head.

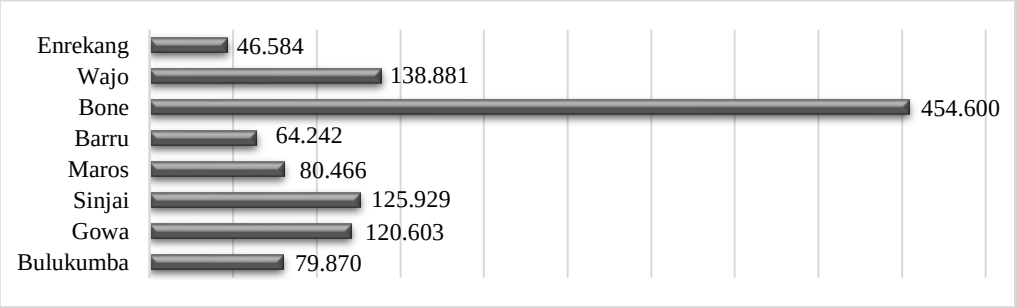

Figure 2. Beef Cattle Population in Regency/ City of South Sulawesi Province

Beef cattle farming in South Sulawesi Province is spread across all regencies/cities; however, the South Sulawesi Provincial Government has mapped three regencies as regional livestock development centers. One of these is the Bone Regency, which serves as a center for developing cattle (large livestock). Bone Regency is the largest beef cattle producer in South Sulawesi (Figure 2) and ranks fourth nationally. Bone Regency is an area in South Sulawesi with promising agricultural potential for economic development. The local potential in Bone Regency within the agricultural sector includes using and developing rice, corn, peanuts, soybeans, mung beans, cassava, and sweet potatoes. Rosada and Haris (2023) state that the potential of crops to support the development of beef cattle in the Bone Regency can be realized by using alternative feed made from agricultural and horticultural waste. This potential can be optimized through the enhancement of human resource quality, the development of product innovations, the expansion of capital access to increase production, closer collaboration with farmers to obtain raw materials for alternative feed, market expansion to increase beef demand, the development of efficient marketing systems, and the improvement of beef quality.

Analysis of the Livestock Growth Ratio Model (MRP) for Beef Cattle in South Sulawesi Province.

The Livestock Growth Ratio Model (MRP) analysis was conducted to examine the description of economic activities, particularly the economic structure of South Sulawesi Province, emphasizing growth criteria both externally (provincially) and internally (within the study area). The results of the MRP analysis for beef cattle in South Sulawesi Province are presented in Table 3.

Table 3. Value of RPr and RPs for Beef Cattle in South Sulawesi Province

Regency/ City	RPr	Nominal	RPs	Nominal
Selayar Islands	1,46	+	9,87	+
Bulukumba	1,46	+	2,79	+
Bantaeng	1,46	+	-12,70	-
Jeneponto	1,46	+	-3,27	-
Takalar	1,46		3,21	+
Gowa	1,46	+	3,36	+
Sinjai	1,46	+	6,39	+
Maros	1,46	+	-1,37	-
Pangkajene and Islands	1,46	+	-5,21	-
Barru	1,46	+	-3,54	-
Bone	1,46	+	2,77	+
Soppeng	1,46	+	-8,42	-
Wajo	1,46	+	6,42	+
Sidenreng Rappang	1,46	+	-14,09	-
Pinrang	1,46	+	5,35	+
Enrekang	1,46	+	-1,42	-
Luwu	1,46	+	-0,23	-
Tana Toraja	1,46	+	3,10	+
Luwu Utara	1,46	+	5,59	+
Luwu Timur	1,46	+	12,34	+
Toraja Utara	1,46	+	-18,79	-
Makassar City	1,46	+	-2,39	-
Parepare City	1,46	+	-3,38	-
Palopo City	1,46	+	-4,19	-

Source: Seconder Data Processed, 2022.

The results of the MRP analysis in Table 3 show that the population of beef cattle has grown well in both the reference area (province) and the study area (regency/municipality), namely the Selayar Islands, Bulukumba, Takalar, Gowa, Sinjai, Bone, Wajo, Pinrang, Tana Toraja, North Luwu, and East Luwu. According to Mayulu and Daru (2019), the livestock sector development requires synergy between the government, the private sector, and small-scale farmers. The government plays a role in establishing regulations, organizing management, providing guidance, and controlling and supervising products. Meanwhile, the private sector and the community contribute to achieving livestock product sufficiency, carrying out production activities, and managing the trade and distribution of products. In this regard, the government plays a strategic role in supporting the development of the livestock sector through various policies and regulations aimed at creating a conducive ecosystem for all industry stakeholders. This role includes the formulation of regulations governing production standards, safety, and the quality of livestock products to meet health requirements and market demands, both domestic and international. In addition, the government is also responsible for developing policies related to resource management, such as feed management, land use, and other supporting infrastructures. To ensure the sustainability of this sector, the government actively provides technical guidance to farmers through training programs, mentoring, and counseling on modern livestock technology and sustainable livestock practices.

In addition to regulations and guidance, the government controls and supervises the quality of livestock products circulating in the market (Sidauruk, 2013). This is done by implementing strict quality standards and certifications, including monitoring animal health, production processes, and final distribution to consumers. This oversight aims to ensure that livestock products are safe, halal, and high-quality while maintaining product competitiveness in the global market (Istiqlal, 2023). On the other hand, the private sector plays an important role in driving production growth through investments in the livestock sector. This sector contributes to providing business capital, technology, and innovation needed to increase production efficiency. Through collaboration with farmers and research institutions, the private sector can also promote the development of new high-value-added products. Moreover, the private sector's role in managing trade and the distribution of livestock products is significant in ensuring product availability in various regions, minimizing supply gaps, and maintaining price stability in the market.

Meanwhile, farmers and micro, small, and medium enterprises (MSMEs) actively participate in daily production activities. They are the frontline in producing quality livestock products through effective livestock management. With support from the government and the private sector, the community has the opportunity to enhance their capacity and competitiveness. Additionally, consumer awareness is vital in shaping a healthy market by choosing quality and sustainable products.

Good collaboration between the government, the private sector, and the community will create a synergy that promotes the achievement of national livestock product sufficiency, improves farmer welfare, and drives economic growth in the livestock sector. Thus, the role of each party is key to realizing food security and the sustainability of the livestock industry in the future.

Table 3 also shows that the growth of beef cattle population is dominant in the reference area (province) but not dominant in the study area (regency/municipality), such as Bantaeng, Jeneponto, Pangkajene Kepulauan, Barru, Soppeng, Enrekang, Luwu, North Toraja, Makassar City, Parepare City, and Palopo City. This can be explained by the fact that although the beef cattle population is growing rapidly or is more significant at the provincial level as a whole, this is not reflected at the regency or city level, which is the focus of the study. In other words, while the province has a significant growth in beef cattle population, the growth in the study area (regency/city) is not as substantial or may even be less developed compared to the overall province.

The statement above can be explained by several factors that influence the differences between the provincial and regency/municipality levels in the growth of the beef cattle population. These factors include resources such as land, feed, and capital, which are often more concentrated at the provincial level or in certain areas with better infrastructure. In contrast, these resources may be more limited at the regency or municipality level, resulting in slower growth than the overall provincial level. Furthermore, beef cattle farming at the provincial level is often carried out on a larger scale and is well-organized. The demand for livestock products, such as beef, may be higher, which supports the growth of the beef cattle population. Meanwhile, small or traditional farms may dominate at the regency or municipality level, leading to slower population growth. At the same time, the purchasing power of the community and local market capacity can limit the expansion of the beef cattle population.

The differences between provincial and regency/municipal levels in the growth of the beef cattle population are caused by the complexity of various factors, including resource availability, production scale, market demand, government policies, human resource quality, and supporting infrastructure (Maskur *et al*., 2023). Therefore, efforts to increase the beef cattle population at the regency/municipal level require a holistic approach that involves infrastructure improvement, human resource capacity development, sustainable policy support, and synergy between the government, the private sector, and the community (Romadhon *et al*., 2022). In this way, the growth of the beef cattle population can be equitable and sustainable across all regions.

CONCLUSION

Based on the research conducted, it can be concluded that the results of the LQ analysis in regencies/cities in South Sulawesi Province that are included in the potential development area for beef cattle are Bulukumba, Sinjai, Maros, Bone, Barru, Wajo, and Enrekang Regencies. The results of the MRP analysis show that the dominant growth potential for beef cattle in both the reference area and the study area (Classification I) is in Selayar Islands, Bulukumba, Takalar, Gowa, Sinjai, Bone, Wajo, Pinrang, Tana Toraja, North Luwu, and East Luwu Regencies. At the same time, the regions classified as Classification II are Bantaeng, Jeneponto, Pangkajene Islands, Barru, Soppeng, Enrekang, Luwu, North Toraja, Makassar City, Parepare City, and Palopo City. Information regarding the growth rate of beef cattle can serve as a basis for local governments to formulate appropriate policies for beef cattle development in the region. The research can significantly contribute to the development of livestock agribusiness that is more efficient, sustainable profit.

REFERENCES

.

Anggraini, N., & Putra, R.A. (2017). Analysis of Regional Potential for Beef Cattle Farming Development in Sijunjung District, Sijunjung Regency. Agrifo: Journal of Agribusiness, Malikussaleh University 2 (2): 82. https://doi.org/10.29103/ag.v2i2.380

Basyar, B. (2015). Regional Government Policy Strategy in Optimizing Bakorluh of West Sumatra as the Vanguard of Farmer Empowerment in Facing the Challenges of the ASEAN Economic Community. Proceedings of the National Seminar on Livestock Technology and Agribusiness (Series III): Development of Livestock Based on Local Resources to Face the ASEAN Economic Community (AEC). Faculty of Animal Science, Jenderal Soedirman University, Purwokerto, September 2015. ISBN 978-602-1004-09-8.

Habsari, I. K., & Irwani, D.N. (2021). Regional Potential Analysis for Ruminant Livestock Development in Central Lampung Regency. Journal of Applied Animal Husbandry (PETERPAN) 3 (1): 20–27. https://jurnal.polinela.ac.id/index.php/PETERPAN/index

Hajirin, Hubies, M., & Suryahadi. (2020). Beef Cattle Development Strategy in the Bali Cattle Development Area of Barru Regency. Journal of Management for Small and Medium Industry Development 15 (1): 48–61

Herlin, A., Brunberg, E., Hultgren, J., Högberg, N., Rydberg, A., & Skarin, A. (2021). Animal welfare implications of digital tools for monitoring and managing cattle and sheep on pasture. *Animals*, *11*(3), 1–20. https://doi.org/10.3390/ani11030829

Istiqlal, F. (2023). Building Indonesia's Global Halal Hub: Strategies and Opportunities to Achieve Competitiveness in the Global Market. Halal Research Journal, *3*(2), 72–85. https://doi.org/10.12962/j22759970.v3i2.614

Maskur, C. A., Afikasari, D., Ervandi, M. (2023). Critical Review Of Beef Cattle Breast Cattle Problems In Probolinggo District. *Jurnal Sains Ternak Tropis*, *1*(2), 54–64.

Mayulu, Sunarso, H., Sutrisno, C.I., & Sumarsono. (2010). Beef Cattle Farming Development Policy in Indonesia. Agricultural Research Journal 29 (1): 34–41

Mayulu, H., & Daru, P.T. (2019). Region-Based Animal Husbandry Development Policy: A Case Study in East Kalimantan. Journal of Tropical AgriFood 1 (2): 49–60

Paly, B. (2013). "Gross and Net Population Growth of Cattle in South Sulawesi." Biogenesis: Scientific Journal of Biology 1 (1): 33–40. https://doi.org/10.24252/bio.v1i1.445

Rahim & Fatimah, A.R. (2019). Development of Bali Cattle Farming Business through the Application of Agribusiness Systems in Gowa Regency. 8: 107–25

Ramadani, R. (2023). The Potential of the Internet of Things (IoT) as a Source of Official Statistics for Agriculture National Seminar on Official Statistics, 2023(1), 161–166. https://doi.org/10.34123/semnasoffstat.v2023i1.1900

Romadhon, R, Amam, Romadhona, & Rusdiana, S. (2022). The Influence of Beef Cattle Human Resources on Sustainable Livestock Development. Journal of Animal Science, *25*(3), 147–153. http://dx.doi.org/10.24843/mip.2022.v25.i03.p05%0Ahttps://ojs.unud.ac.id/index.php/mip/article/download/97199/48072

Rosada, I., & Haris, A. (2023). Agricultural Superior Commodity Development Strategy in Bone Regency, South Sulawesi Province. 4 (2): 277–88. https://jurnal.fp.umi.ac.id/index.php/agrotekmas/article/view/346/288

Rusdiana, S., & Praharani, L. (2019). Development of Smallholder Beef Cattle Farming: Self-Sufficiency Policy on Beef and Business Feasibility. Agro-Economic Research Forum 36 (2): 97. https://doi.org/10.21082/fae.v36n2.2018.97-116

Sidauruk, R. (2013). Building Indonesia's Global Halal Hub: Strategies and Opportunities to Achieve Competitiveness in the Global Market. *Jurnal Bina Praja*, *05*(03), 141–158. https://doi.org/10.21787/jbp.05.2013.141-158

Widiati, R. (2014). Building the Smallholder Beef Cattle Industry to Support Beef Sufficiency. WARTAZOA Vol. 24 No. 4 Th. 2014 Hlm. 191-200 DOI: http://dx.doi.org/10.14334/wartazoa.v24i4.1090

Sengkey, N.M., A H.S., & Salendu, A.H.S., E., Wantasen, E., & Waleleng, P.O.V. (2017). Potential for Beef Cattle Development in West Tompaso District. Zootec 37 (2): 350. https://doi.org/10.35792/zot.37.2.2017.16155

Zakiah., Saleh, A., & Matindas, K. (2017). Leadership Style and GPPT Communication Behavior with Institutional Capacity of Community Livestock School in Muara Enim Regency. Journal of Extension 13 (2): 133. https://doi.org/10.25015/penyuluhan.v13i2.14977.

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