

Research Article



The Development Priorities and Competitiveness of Leading Livestock Commodities in West Sumatera, Indonesia

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Abstract | The aim of this research is to identify them which are competitive and prioritized for development in West Sumatera. Data usages are secondary data and primary data. The secondary data obtained from Statistics Central Bureau of West Sumatera. The primary data obtained through interviews, filling out questionnaires and Focus Group Discussions with stakeholders and experts involved in livestock development, such as breeders, government, private sector, academics and relationship institutions. The obtaining of data was analyzed using Analytical Hierarchy Process (AHP) method. This research shows the leading commodities are competitiveness and priority to be developed in West Sumatera, especially such as the beef cattle, goats and also buffalo, laying hens, broilers, local chickens and ducks. The data obtained were analyzed using the Analytical Hierarchy Process (AHP) method. This research produces the leading commodities competitively and becomes the priority to be developed in West Sumatera, such as the beef cattle, goats and also buffalos, broilers, local chickens and ducks. Based on competitiveness concept, the first important priority which must be noticed in the development of leading livestock commodities are the labors availability in West Sumatera, then the second important priority is the availability of raw materials, financial resources, technologies, both the feed and seed technology are as the availability of marketing technologies, facilities and infrastructures, markets, raw material suppliers, business developments strategy, government rules and technological tools development. The number of laborers in the livestock sectors should be a major concern at this time.

Keywords | Competitiveness, Commodity, Leading, Livestock

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INTRODUCTION

A very dynamic globalization era claims a high competitiveness in all development sectors including agriculture and animal husbandry. In the future, the livestock industry in Indonesia will face fierce competition increasingly (Scarlat *et al.*, 2015; Amam and Rusdiana, 2021). In the country itself, land-based livestock business is increasingly difficult to develop because it competes with non-livestock agricultural businesses and non-agricultural sectors (Rusdiana and Praharani, 2019). On the other side, the Indonesian livestock products also compete with

similar products from abroad, especially the meat and milk. When viewed the terms of market opportunities, the development of livestock agribusiness which have some good prospects, especially to fulfill a demand of the domestic markets where get continuously to accelerate along with economic growth, increasing the numbers of population and urbanization (Rusdiana and Soeharsono, 2019).

Livestock development in Indonesia faces many challenges both now and in the future. The era of industrial revolution 4.0 and 5.0 adds various new problems in the livestock sub-sector. The challenges faced are quite serious in the future

development of livestock in Indonesia. There is still a long way to go in developing livestock in Indonesia because the problems are so many and complicated. Currently, livestock farming in Indonesia is still small scale, especially beef cattle, dairy cattle, buffalo and goat farming. The aim of raising livestock is still mostly as a side business or as savings and not as a main business. National demand for beef and buffalo still relies on imports from abroad. High feed costs and livestock costs in Indonesia result in high domestic meat and livestock prices (Jamaluddin, 2020).

In West Sumatera, the livestock sub-sector has an action role and contributes to the Product Domestic Regional Bruto. The livestock sub-sector only gives a contribution of 1.9 percent (West Sumatera in Numbers, 2023). This illustrated an average growth on the production of livestock commodities in West Sumatera in the last five years, such as the beef cattle 0.18 percent, buffalos 0.02 percent, horses 0.45 percent, goats 0.01 percent, and sheep 0.04 percent. This production growth rate was considered very small. The same was true for the development of poultry commodity production in West Sumatera, however it was smaller. The average growth rate of poultry commodities in West Sumatera for native chicken was 0.004 percent, broiler 0.04 percent, laying hens 0.02 percent, and ducks 0.02 percent. The cows and buffalos milk production have also decreased.

However, on the consumption side, the livestock products in West Sumatera has increased every year (West Sumatera in Numbers, 2023). This side indicates that the livestock commodity market opportunity is still wide opened. The highest mean meat consumption is found in households in urban areas (Ermanda *et al.*, 2020). The recommended protein adequacy rate for Indonesian people according to Indonesian Minister of Health Regulation No. 28 of 2019 is 62 grams/day/capita. According to the research results, West Sumatera has not met Widya Food and Nutrition standard yet (Ermanda *et al.*, 2019). This condition is very concerning when viewed from the nutritional adequacy of the community. This is a challenge for livestock development in West Sumatera. When viewed from a potential perspective, West Sumatera has considerable strength for livestock development. The great potential was the availability of land, geographical location, livestock center areas, farmer motivation and formal and non-formal institutional support. However, the current condition of livestock farming still has weaknesses, including small business scale, as a side business, breeder knowledge and skills are still low, production not yet optimal, limited cooperation network and inadequate livestock marketing (Juanda *et al.*, 2023). Technology adoption was still low, the quality of livestock human resources was low, the availability of livestock facilities and infrastructure is inadequate, access to capital and motivation for livestock

farmers as a main business was still low. All of this was a weakness and leads to problems for livestock development in West Sumatera (Yulia *et al.*, 2015).

Therefore, Increasing and accelerating the growth of livestock commodities production as the protein food sources producers for West Sumatera's people are something very urgent to do. Accelerating and increasing the production of livestock commodities can be done by focusing on the leading livestock products if they can produce the livestock commodities that have the demand and the competitiveness. The competitive livestock development is very crucial and should be improved immediately. The acts of leading sectors are competitively becoming an important thing as fundamental for the development planning, where regions have the opportunities and authorities to make suitable policies in accordance with the regional potentials to accelerate the regional economy development (Sjafrizal, 2008). In order to achieve the regional development goals, one of the important policies for the implantation is to notice and prioritize each potential region by selecting the leading commodities or sectors. It is a main leading according to Tarigan (2007), After being the regional autonomy, each of regions has a freedom in determining the sectors or commodities which are prioritized for the development. The ability of local governments to notice what they have advantages or weaknesses in their areas are more important. Those sectors that have the advantages and good prospects to be developed and hoped to encourage the other sectors. According to Dumairy (1996), broadly speaking, economic commodities in Indonesia are divided into two sectors, such as oil and gas and non-oil, non-gas. So far, their developments have always been a priority in supporting the development of a region. However, that history proves that dependence on the oil and gas sectors, especially the export of oil and gas commodities for the region in the long run, is one thing that is not profitable for continuity of the regional economic development.

The oil and gas sectors are not leading sectors in West Sumatera. But they are the leading economic sectors in West Sumatera Province where there are wholesale trades and retails and repairs of cars and motorcycles sectors, also education services. And then transportation and warehousing sectors, government administration sectors, defense, and compulsory social security, health services and social activities sectors. proceed through the information and communication sectors. And part of Agriculture is, Forestry and Fisheries sectors which geographically cannot be separated from the regional conditions are still seen as the strategic economic sectors (Irza, 2021). The agricultural sector in rural areas, especially for districts in West Sumatera, is still a leading sector (Rosa, 2019). The livestock sub-sector as part of the agricultural sector is still supporting commodities in the rural economy in

West Sumatera (Indrayani *et al.*, 2022). Even though the livestock sub-sector in West Sumatera is not a leading sub-sector, it must be a major concern for the development of West Sumatera in the future (Suresti *et al.*, 2021). The livestock commodities are food commodities that have high nutritional values and are also classified as high-priced foods. What else for a country is developing thus requesting for the livestock products will rise up along with increasing in population (Ariani *et al.*, 2018).

Therefore, this study aims to identify the leading livestock commodities which are prioritized and developed based on competitiveness criteria in West Sumatera. The most important thing in measuring this competitiveness is the productivity of industry in producing goods and services. Porter's diamond models have four components that must be considered by corporate organizations in gaining the market shares from the products that they produce. The first is firm strategy, structure, and rivalry. The second is the factor conditions, namely the company's internal conditions with a source-power that they have into an effort to produce low-cost products. The third is the demand conditions where the providing products will find some potential buyers. The fourth is the supporting industries where the companies producing the goods and services can maintain the availability of raw materials through a supplier network. Indirectly the competitiveness of companies are also influenced by the role of government and opportunity (Cho and Moon, 2003).

MATERIALS AND METHODS

This research was conducted to determine the leading livestock commodities in West Sumatra province, Indonesia. Determining superior livestock commodities by considering the concept of competitiveness from porter's diamond. The collected data in this study are primary and secondary data as supporting data. The primary data are obtained from interviews, filling out questionnaires and focused group discussions with relevant experts and stakeholders, such as academics, government, private sector (producers and suppliers), and breeders. All experts are people who understand problems regarding the condition of livestock in West Sumatera.

The data collected was pairwise comparison data on two alternative criteria from the competitiveness concept proposed by porter's diamond. There was six criteria for the concept of competitiveness, namely firm strategy, structure and rivalry, factor conditions demand and conditions supporting industries as well as the role of government and the role of opportunity. The indicators for these six criteria are availability of labor, availability of raw materials, availability of technology, availability of financial resources,

availability of facilities and infrastructure, availability of markets, availability of raw material suppliers, business development strategy, role of government (policies, technical and financial assistance) and development of technological tools. The livestock commodities studied to determine leading livestock commodities are beef cattle, dairy cattle, goats, buffalo, horses, laying hens, broiler chickens, lokal chickens and ducks.

Data is collected based on the results of expert assessments of each pairwise comparison of each competitiveness criterion based on expert experience and knowledge. Expert assessment in the form of a number that is the choice. This number is in the range 1 to 9. To assist experts in providing an assessment according to the level of importance which is described from 1-9, it can be used Table 1.

The technique of data analysis is used as the Analytical Hierarchy Process (AHP) method. The AHP method is used to determine the leading commodity in the livestock sub-sector to be developed in West Sumatera. The AHP method is used in this research because to determine whether a commodity is superior, it must be analyzed from various aspects and competitiveness criteria. The AHP method has the ability to solve multi-criteria problems. In this research, leading livestock commodities are determined from six competitiveness criteria so that the AHP method is very suitable to use. It was developed by Prof. Thomas Lorie Saaty from Wharton Business School in the early 1970s, which is used to get the ranking or order of priorities from various alternatives for solving a problem. In daily life, a person is always faced with making choices from the various alternatives. In a prioritization, it is necessary to test the consistency of choices that have been made.

Some steps are taken to perform the data analysis using the AHP method, such as: (1) problem decomposition; (2) Assessment or weighting; (3) Consistency test; (4) Synthesis (matrix iteration); (5) Priority weight on alternatives and (6) the best alternative determination (Permadi, 1992). In this research, which is the goal as the first hierarchy like the livestock commodity will be developed. The second hierarchy is the criteria of leading livestock commodities and the third hierarchy is the alternative types of livestock, such as the beef cattle, the native goats, the horses, the buffaloes, the pigs, the laying hens and broilers, the native chickens, the manila ducks. Basically, the problem decomposition above, a hierarchical chart can be arranged in Figure 1.

The second hierarchy, such as the hierarchy of criteria, is evaluated by experts who have been selected or considered, such as the academics, government and breeder associations. The consistency ratio test is used to ensure

that expert judgment regarding pairwise comparisons of competitiveness criteria to determine superior commodities is valid. The consistency ratio value must be a maximum of 10 percent. The definition of competitiveness criteria indicators can be said to be consistent if the consistency ratio test is smaller than 0.10. To find out and check the parameters used whether the pairwise comparisons have been carried out consistently or not by the expert, the Consistency Index is used as follows: $CI = (\lambda_{max} - n) / (n - 1)$.

Test the consistency of each paired matrix with the formula for each paired matrix element multiplied by the priority value of the criteria. The results for each row are added up, then the results with each criterion priority value are $\lambda_1, \lambda_2, \lambda_3, \dots, \lambda_n$. Calculate the maximum lambda value with the formula: $\lambda_{max} = \Sigma \lambda / n$. Calculating the Consistency Ratio, with the formula $CR = CI / RI$. If $CR < 0.1$, then the pairwise comparison value in the given criterion matrix is consistent. If $CR \geq 0.1$, then the pairwise comparison values in the given criterion matrix are inconsistent. If the CR value is high enough, namely more than 0.1, look for the Road Mean Square and revise the expert's opinion on the line with the largest value.

After setting priorities in hierarchy II, then setting priorities or choosing alternatives. For the iteration process on this stage, the alternative livestock commodity iterations will be carried out for each criterion. The principle is for each commodity alternatives will be assessed for its characteristic or importance levels based on predetermined criteria. The last step is to determine the best alternative by combining the weighting results on the criteria and alternative weighting based on the criteria.

RESULTS AND DISCUSSION

The study results found that the results of pairwise comparisons given by the respondent have a Consistency

Ratio value which is smaller than 0.1 as the maximum limit for it. Meaning that the estimation results are consistent whereas the results of geometric calculations combined with the respondent data are quite consistent. Based on the results of analytical hierarchy process are using helps of expert choice software, the results of the leading livestock commodities in West Sumatera basically the concepts of competitiveness are:

Table 2 shows that the leading livestock commodity in West Sumatera which has the main priority to be developed based on the concept of competitiveness is the beef cattle. Fitriawati *et al.* (2021) found the same results as this research where beef cattle have become a leading commodity in almost all districts and cities in West Sumatera. They used the Klassen Typology method based on LQ and shif share values. Indrayani *et al.* (2022) from them research found that beef cattle commodities have good competitiveness in 10 districts in West Sumatera, namely West Pasaman, Pesisir Selatan, Limapuluh Kota, Solok, Payakumbuh, Solok, Padang Panjang, South Solok, Dharmasraya and Mentawai Islands. Overall, there is no beef cattle commodity yet good competitiveness in West Sumatera. However, beef cattle is a commodity in the livestock sub-sector that has slow growth.

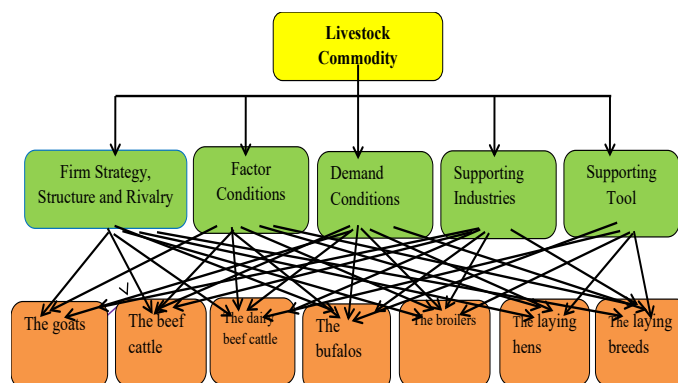


Figure 1: Hierarchical chart of livestock commodity.

Table 1: Table of criteria and value weights.

Value	Description	Explanation
1	Both elements are equally important	Two elements have the same influence on goals
3	One element is slightly more important than the other elements	Experience and judgment slightly favor one element over the other
5	One element is more important than on other elements	Experience and judgment strongly favor one element over another
7	One element is clearly more important than the other elements	One element that is strongly supported and dominant is seen in practice
9	One element is clearly absolutely more important than the other elements	Evidence that supports one element over another has a level of confirmation the highest that strengthens
2, 4, 6, 8	Values between two adjacent consideration values	Points are awarded when there are two compromises between two options
Invers	If activity i gets one number compared to activity I then i has the opposite (inverse) value compared to i	

Table 2: The leading livestock commodities in west Sumatera.

No.	Livestock commodity	Value	Percentage	Priority
1.	The Beef cattle	0.295	29.5	1
2.	The Dairy cattle	0.212	21.2	2
3.	The Goat	0.148	14.8	3
4.	The Buffalo	0.119	11.9	4
5.	The Horse	0.075	7.5	5
6.	The Laying hens	0.056	5.6	6
7.	The Broiler chickens	0.040	4.0	7
8.	The Local Chicken	0.032	3.2	8
9.	The Duck	0.023	2.3	9

This was because the majority of the people of West Sumatera work as farmers and livestock breeders. In West Sumatera, the smallholder farm majority are like the beef cattle, the buffaloes and the goat, they are raised by using the agrosilvopastoral model. This was very supported because West Sumatera has a natural resource potential where it has a bigger production forest is 587,903 Ha, a wide agricultural land where there are also 230,098.6 Ha paddy fields, 346 368.90 Ha plantations and 514,180.20 Ha field plantations 141 ,668.00 Ha. rice production 2,810,477.69 tons as much as, corn 985 847 tons, peanuts 4 313 tons, green beans 286 tons, cassava 209.115 tons and sweet potatoes 112.919 tons. It has also quite some agricultural productions and increases productions continuously, namely the crops 7,676.96 tons and fruits 584 234.9 tons. The forest land and agricultural production waste support the farms community development in West Sumatra. This is evident the largest livestock population in it as the beef cattle, goats and buffalo population (Fitrimawati and Adnani, 2020). In 2023, the population of the beef cattle was 400,033 heads, dairy cattle 744 heads, goats 242,302 heads, horses 1,071 heads and the buffalo 79,564 heads (West Sumatera Central Statistics Agency, 2023). The production costs of livestock businesses are cheaper because they are obtained from the agricultural waste, they have such as rice straw, corn and other agricultural waste including green field grass which is abundant around the agricultural land, plantations and forests they own. The results of research (Fitrimawati

and Adnani, 2020) found that economic and social aspects significantly influence their livestock production.

The leading livestock commodity and which the second priority is suitable to be developed in West Sumatera with the concept criteria consideration of competitiveness is dairy cattle. Furthermore, leading livestock commodities are based on the concept of competitiveness and in sequence are goats, buffalo, horses, laying hens, broilers, local chickens and ducks. The following are the results of priority competitiveness criteria for the development of leading commodities.

BEEF CATTLE

Tables 2 and 3 show that beef cattle were a leading commodity in West Sumatera and was a top priority for development when viewed from the concept of competitiveness. This was because it has a lot of raw materials such as feed and beef cattle seeds. The availability of raw materials gets a high percentage of 31.2 percent. Then it is followed by the availability of facilities and infrastructure 31.1 percent, the availability of labor 30.5 percent, the business development strategy 30.2 percent, the availability of markets and the availability of raw material suppliers 30.2 percent, the role of the government 30.0 percent, the availability of financial resources 28.1 percent and the development of technological tools 26.9 percent, and the availability of technology 24.6 percent.

DAIRY CATTLE

The second priority livestock commodity to be developed in West Sumatera is dairy cattle (Tables 3 and 4). The dairy cattle commodity is a leading commodity that can compete if it pays attention to the competitiveness criteria with the following priorities: (1) having the availability of financial resources (FL); (2) the role of the government (AT); (3) business development strategy (ST); (4) The availability of technology (TI); (5) availability of labor (TK); (6) availability of facilities and infrastructure (PS); (7) availability of raw materials (BB); (8) market availability (PR); and (9) the availability of markets (PR); (10) role of government (policy, technical and financial assistance) (GV).

Table 3: The leading livestock commodities basically the concepts of competitiveness in West Sumatera.

Livestock commodity	Value									
	BB	TK	TI	FL	PS	PR	SP	ST	GV	AT
The Beef Cattle	0.312	0.305	0.246	0.281	0.311	0.302	0.302	0.304	0.300	0.269
The Dairy Cattle	0.202	0.213	0.218	0.227	0.209	0.196	0.213	0.224	0.192	0.219
The Goat	0.130	0.145	0.168	0.152	0.142	0.164	0.165	0.150	0.160	0.147
The Buffalo	0.115	0.115	0.140	0.126	0.120	0.120	0.110	0.101	0.098	0.109
The Horse	0.083	0.078	0.073	0.064	0.071	0.069	0.062	0.069	0.081	0.090
The Laying Hens	0.055	0.052	0.058	0.056	0.056	0.063	0.060	0.060	0.066	0.070
The Broiler Chickens	0.045	0.038	0.040	0.039	0.035	0.037	0.038	0.040	0.045	0.039
The Local Chicken	0.034	0.033	0.033	0.032	0.035	0.027	0.029	0.028	0.032	0.031
The Duck	0.024	0.023	0.024	0.024	0.032	0.022	0.022	0.024	0.027	0.027

GOAT

If you look at the research results (Tables 3 and 4) based on the concept of competitiveness, the goat commodity in West Sumatera can become a leading commodity and can compete if you pay attention to the following priorities: (1) having the availability of technology (IT); (2) having availability of raw material suppliers (SP); (3) having market availability (PR); (4) government role (policy, technical and financial assistance) (GV); (5) availability of financial resources (FL); (6) having a business development strategy (ST); (7) developing technological tools (AT); (8) availability of labor (TK); (9) having availability of facilities and infrastructure (PS) and (10) having availability of raw materials (BB).

Table 4: Priority criteria for competitiveness of leading livestock commodities in West Sumatera.

Livestock commodity	Priority criteria for competitiveness									
	BB	TK	TI	FL	PS	PR	SP	ST	GV	AT
Beef cattle	1	3	10	8	2	5	6	4	7	9
Dairy cattle	8	5	4	1	7	9	6	3	10	2
Goat	10	8	1	5	9	3	2	6	4	7
Buffalo	5	6	1	2	3	4	7	9	10	8
Horse	2	4	5	8	6	7	10	9	3	1
Laying hens	9	10	6	7	8	3	5	4	2	1
Broiler Chickens	2	7	4	5	10	9	8	3	1	6
Local Chicken	2	3	4	6	1	10	8	9	5	7
Duck	4	8	7	5	1	9	10	6	3	2

Notes: BB = The availability of raw materials; TK = The availability of labor; TI= The availability of technology; FL= The availability of financial resources; PS= The availability of facilities and infrastructure; PR= The availability of markets; SP= The availability of raw material suppliers; ST= Business development strategy; GV= The role of the government; AT= The development of technological tools.

BUFFALO

Based on the concept of competitiveness, the buffalo commodity in West Sumatera can become a leading commodity and can compete if you pay attention to the following priorities: (1) having the availability of technology (IT); (2) having availability of financial resources (FL); (3) availability of facilities and infrastructure (PS); (4) market availability (PR); (5) availability of raw materials (BB); (6) availability of labor (TK); (7) availability of raw material suppliers (SP); (8) development of technological tools (AT); (9) having a business development strategy (ST) and (10) the role of government (policies, technical and financial assistance) (GV) .

HORSE

Horse commodities in West Sumatera can become leading commodities and can compete if they pay attention to

the following priorities: (1) development of technological tools (AT); (2) availability of raw materials (BB); (3) the role of government (policy, technical and financial assistance) (GV); (4) availability of labor (TK); (5) availability of technology (IT); (6) availability of facilities and infrastructure (PS); (7) market availability (PR); (8) having availability of financial resources (FL); (9) having a business development strategy (ST) and (10) availability of raw material suppliers (SP).

LAYING CHICKEN BREEDS

Table 2, it can be seen that poultry is ranked 6 to 10, namely laying chickens, broiler chickens, local chickens and ducks, respectively. In the poultry group, laying hens are leading in terms of the concept of competitiveness criteria. This was because the feed for laying hens in West Sumatera is feed that is formulated and mixed by breeders themselves from local agricultural products such as corn, bran and fish meal. The cost of feed from this farm can be reduced to be cheaper (Yuzaria *et al.*, 2023). If we look at the research results (Tables 3 and 4) based on the concept of competitiveness, the commodity of laying hens in West Sumatera can become a leading commodity and can compete if we pay attention to the following priorities: (1) development of technological equipment (AT); (2) the role of government (policy, technical and financial assistance) (GV); (3) market availability (PR); (4) having a business development strategy (ST); (5) availability of raw material suppliers (SP); (6) having technology availability (IT); (7) having availability of financial resources (FL); (8) availability of facilities and infrastructure (PS); (9) availability of raw materials (BB); and (10) availability of labor (TK).

BROILER CHICKENS

Based on the concept of competitiveness, the broiler chicken commodity in West Sumatra can become a leading commodity and can compete if you pay attention to the following priorities: (1) the role of government (policy, technical and financial assistance) (GV); (2) availability of raw materials (BB); (3) having a business development strategy (ST); (4) having availability of technology (TI); (5) having availability of financial resources (FL); (6) development of technological tools (AT); (7) availability of labor (TK); (8) availability of raw material suppliers (SP); (9) market availability (PR) and (10) availability of facilities and infrastructure (PS).

LOCAL CHICKEN

Local chicken commodities in West Sumatera can become leading commodities and can compete if you pay attention to the following priorities: (1) availability of facilities and infrastructure (PS); (2) availability of raw materials (BB); (3) availability of labor (TK), (4) having availability of

technology (IT); (5) role of government (policy, technical and financial assistance) (GV); (6) having availability of financial resources (FL); (7) development of technological tools (AT); (8) availability of raw material suppliers (SP); (9) having a business development strategy (ST) and (10) market availability (PR).

DUCKS

Duck commodities in West Sumatera can become a commodity and can compete if you pay attention to the following priorities: (1) availability of facilities and infrastructure (PS); (2) the development of technological tools; (3) role of government (policy, technical and financial assistance) (GV); (4) availability of raw materials (BB); (5) having availability of financial resources (FL); (6) having a business development strategy (ST); (7) having availability of technology (IT); (8) availability of labor (TK); (9) market availability (PR) and availability of raw material suppliers (SP).

Table 5: Competitiveness criteria priority of leading livestock commodities in West Sumatera.

Competitiveness concept criteria	Value	Percentage	Priority
The labor availability	0.270	27.0	1
The availability of raw materials	0.214	21.4	2
The technology availability	0.140	14.0	3
The availability of financial resources	0.112	11.2	4
The availability of facilities and infrastructure	0.086	8.6	5
The market availability	0.045	4.5	6
The availability of raw material suppliers	0.041	4.1	7
The business development strategy	0.037	3.7	8
The government role	0.034	3.4	9
The development of technological tools	0.021	2.1	10

Combinedly and overall, the development of leading commodities to be able to compete must pay attention to priority competitiveness criteria. In this research, priority criteria for competitiveness were obtained (Table 5) for developing superior commodities. The first priority of concern is the availability of labor in West Sumatera, the labor availability in the livestock sub-sector is very scarce. The community interest and motivation in raising livestock is still lacking. The farming for some people in West Sumatera is still a side job, especially in the mode of the beef cattle, buffalo and goats. 4 percent of the total respondents worked as breeders, 66 percent as farmers and 30 percent worked in the non-agricultural or livestock sector. Who work full time and low percentage are as the breeders caused by the fact of the businesses scale that the majority of people's livestock businesses are still small scale with 1-5 pieces for livestock (Almahmud, 2021). Suresti

et al. (2013) human resource capabilities of breeders are not yet adequate for develop their ness. This can be seen from education and devotion of working time to the beef cattle business. 62.9 percent of farmers did not complete it formal education. Knowledge technical is still low though already have farming experience average over 10 years

The availability of raw materials are the second important priority for the development of leading livestock commodities in West Sumatera in order to be competitive. The availability of seeds and feed as the raw materials in the livestock business must be of great concerns, especially for the large livestock. But a matter of fact that the aspect of feed for the large livestock gets a value of 50.00 percent. This value is in the less category based on the criteria what set by Directorate General of Animal Husbandry (1992). The conditions that cause low value about the technical aspects of feed are the low application of the quality aspect of forage as evidenced through the value of technical aspects (Yendraliza *et al.*, 2020). Whereas the quality of forage is one of the important factors in the livestock business. Romjali *et al.* (2007) explained that the livestock productivity is strongly influenced with the quality and quantity of feed. In this case, from the results of interviews conducted, are found generally results that the farmers give the forage with providing quality and use it where is available nearly their environments without regard to the forage quality given. Then what causes the low value of the technical aspects of feed are the low application of the technical aspects of processing and preserving forage. Feati (2011) explained that the smallholder farms are characterized with the feed problems, especially during dry season, where the breeders do not process and preserve the feed which causes a shortage of the feed stocks during the dry season. From the results of interviews in the fields it is known that farmers do not preserve or process feed because the knowledge of breeders how about to process and preserve feed are still minimal.

However, the availability of raw materials in the form of seeds, especially the seeds for large livestock such as the beef cattle, is still in good condition. It can be seen that the application of the technical aspects of breeding carried out in the maintenance of beef cattle obtained a total score percentage of 62.46 percent, based on the criteria set by the Directorate General of Animal Husbandry (1992). The thing as the problem is in the Calving interval or birth distance where the technical aspect gets a value of 19.25 percent (Almahmud, 2021). Even though the birth distancing aspect is an aspect quite influential on the livestock business. Ball and Peters (2004) explained that the ideal calving time interval is 12 months, namely 9 months of pregnancy and 3 months of breastfeeding. Reproductive efficiency is mentioned to be good if the cows

produce one calf in one year. Yuzaria *et al.* (2019) obtained the results of their research on analysis of agropolitan area sustainability of laying hens in Limapuluh Kota District. The dimensions of infrastructure and technology still lack support for the sustainability of the agropolitan region. The institutional dimension shows poor results. Attributes that affect the sustainability of the area that must be addressed are the lack of availability of upstream-to-downstream agribusiness facilities and infrastructure such as raw materials, agricultural machinery, marketing and road conditions, which are major obstacles in the process of regional development.

CONCLUSIONS AND RECOMMENDATIONS

The leading livestock commodity in West Sumatera which has the first priority to be developed based on the competitiveness concept is the beef cattle and the second priority are dairy cattle. The third priority are the goats. The labor availability based on the competitiveness concept is the top priority and it is important in the development of the leading livestock commodities. The availability of raw materials is the second priority. The third important priority in the development of leading livestock commodities in West Sumatera are the technology availability, the both of feed and seed technologies, even the marketing technology. These research suggestions are:

- The government of West Sumatera hoped to focus more on the development of the beef cattle and dairy cattle, and even more the other ruminant livestock such as the goats and buffalo as the leading livestock commodities in West Sumatera.
- The government needs to do propaganda for the community that the profession as a breeder is very promising if the problem of labor availability in the livestock sector is very increasing in West Sumatera.
- The Practical feed for ruminants livestock is very necessary for the development of business scale.
- The government is hoping to encourage its availability of the research results for commercialization for development of feed technology, seeds technology and marketing which have been produced in the high education institutions.

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NOVELTY STATEMENT

This study found leading commodities in the livestock sector

which were determined based on the concept of competitiveness. The research results obtained leading commodities and priority factors for attention in livestock development for each commodity based on competitiveness criteria.

AUTHOR'S CONTRIBUTION

All authors contributed to finding ideas and novelties, designing methods, collecting, and analyzed data, wrote and edited the manuscript.

CONFLICT OF INTEREST

All authors declare that there has no conflict of interest with any parties, individuals, organizations and companies in this study.

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