

Jurnal Peternakan Integratif Vol.8, No. 2, 2020



Jurnal Peternakan Integratif



Analysis of the Potential Development of Beef Cattle in Deli Serdang Regency of North Sumatra

N R Batubara^{1*}, Hamdan¹, R Simanjuntak²

¹Animal Production Program Study, University of Sumatera Utara, Padang Bulan, Medan 20155, Indonesia

²Head of Deli Serdang District Animal Husbandry Department

* Correspondent Author: rahmibatubara@gmail.com

Abstract. Deli Serdang Regency is one of the largest beef cattle producing areas in north Sumatra. Analysis of the potential development of beef cattle in the area needs to be carried out in order to achieve various objectives. This study aims to identify resources, base, non-base and beef cattle capacity and find the right strategy for the development of beef cattle business in Deli Serdang Regency. The method used in this research is *stratification method (stratified sampling)* in all subdistricts in Deli Serdang regency and *purposive sampling method* in three sub-districts namely STM Hilir, Patumbak, and Hampan Perak as a method of determining the area. Interviews were conducted to explore information related to beef cattle farms in the area. Data analysis is carried out with Descriptive Analysis, *Location Quotion (LQ)*, Livestock Density, Feed Concentration Index (IKP) Analysis, Waste Analysis, Agricultural and Plantation Waste SupportIng Capacity Index (IDDLP) and Ruminant Livestock Population Increase Capacity Analysis (KPPTR). The results showed that the livestock resources in Deli Serdang Regency have the potential to develop beef cattle farming business. There are 10 sub-districts that are the base area of STM Hulu, Kutalimbaru, Namo Rambe, STM Hilir, Bangun Purba, Galang, Patumbak, Hampan Perak, Percut Sei Tuan and Pagar Merbau with a capacity of 155,209 ST. The beef cattle development strategy is divided into four regions based on the value of LQ and its KPPTR.

Keywords: beef cattle, deli serdang, potential development, strategy

Received [14 November 2020] Revised [21 November 2020] Accepted [30 November 2020]

1. Introduction

Beef cattle have an important role as a producer of meat to meet the nutritional needs of livestock origin, the need for meat demand nationally is increasing in line with the rate of economic growth that is getting better. Currently, the fulfillment of national beef needs is still dependent on imports. One of the causes is the imbalance between the rate of beef production and the rate of consumption [1].

In addition, the construction of farms so far has not focused on locations that have potential and are not integrated in their development. The location of livestock development is scattered throughout the region so that the scale portion of the business is small and difficult to get support from various components both for infrastructure, human resources, institutional and other technical components that support activities both upstream and downstream. Beef cattle farming business in Deli Serdang

regency is generally still dominated by people's farms related to other farming businesses. Raising cows is done only as a part-time effort by most people in addition to farming. But some communities also make livestock activities as the main business. [2] It is also stated that raising beef cattle has a role and religion, customs, family savings and as an honor or social status in society.

Deli Serdang Regency also has a harvest area of 86,014.80 ha with a production of 501,208.24 tons in rice fields, a harvest area of 20,202.40 ha in maize with a production of 117,517.36 tons, a harvest area of 2,633 ha in cassava with a production of 8,431 tons. Meanwhile, the area of oil palm reached 13,374.99 ha with a production of 38,731.83 tons. This indicates that beef cattle in Deli Serdang district have the potential to be developed [3].

2. Materials and Methods

Population of This Research is the breeders in Kabupaten Deli Serdang. Sampling is done gradually, namely:

1. The first stage of stratified sampling of *sub-districts* in Deli Serdang Regency, which is divided into three sub-district groups with high beef cattle population, medium beef cattle population, low cut cow population.
2. The second stage took deliberately (*purposive sampling*) *three sub-districts* from the sub-districts with the highest population, namely Hamparan Perak Sub-District, Sinembah Tanjung Muda Hilir Sub-District, and Patumbak Sub-District which is the center for the development of beef cattle in Deli Serdang Regency.
3. The third stage takes deliberately (*purposive sampling*) 10 farmers from each selected sub-district. The selection of breeders based on skill level in breeding beef cattle. Farmers selected as a sample of respondent data can represent all farmers in Deli Serdang Regency.
4. Design: This research is designed as a research with survey method that is with direct observation to the field to know the resources owned by Deli Serdang Regency can be used as a development area for beef cattle.

2.1. Data Collection Methods

The data obtained in this study consists of:

1. Primary data is obtained directly from respondents' monitoring of cattle business activities through interviews and questionnaires.
2. Secondary data is obtained from various relevant agencies such as government agencies related to agriculture and livestock.

2.2. Descriptive Analysis

The descriptive analysis in this study was used to describe the state of the cattle ranch resources that exist in the Deli Serdang region.

LQ Analysis (Location Quotation)

$$LQ = (v_i/v_t)/(V_i/V_t)$$

Description:

v_i = Sub-District Beef Cattle Population

v_t = Number of Heads of Sub-District Families

V_i = District Beef Cattle Population

V_t = Number of District Family Heads

1. If the LQ of a sector is worth more than or equal to 1 (≥ 1), it means that the sub-district has the potential to develop cattle cattle compared to the average cattle population of beef cattle at the sub-district level.
2. If the LQ of a sector is worth less than 1 (< 1), it means that kecamatan does not have the potential to develop cattle cattle compared to the average cattle cattle population at the sub-district level.

2.3. Beef Cattle Density Analysis

The Analysis method used to calculate the density of livestock is distinguished into three kinds [4] namely :

1. Economic density can be calculated by means, the total population of cows is divided by population and multiplied by a thousand by very dense category > 300 , solid 100 - 300, medium 50 -100, and rarely < 50 .
2. The density of farming can be calculated by means of the total population of cows divided by the area of farmland (ha) with very dense category > 2 , solid 1 - 2, medium 0.25 - 1, and rarely < 0.25 .
3. The density of the area can be calculated by means of the total number of cowpopulations divided by the area of the whole area (km^2) with very dense category > 50 , solid 20 - 50, medium 10 - 20, and rarely < 10 .

2.4. Agricultural Waste Production Analysis

Analysis method used to calculate agricultural waste production is distinguished into four kinds [5] namely total fresh production, total dry material production, total production of Coarse Protein and total production

total digestible nutrient with the following formula:

$$\text{Total Fresh Production} = \text{Fresh Production (Ton/Ha)} \times \text{harvest area (ha)}$$

$$\text{Total Bk Production} = \text{Fresh Material Production} \times \text{BK Content (\%)}$$

$$\text{Total PK Production} = \text{Dry Material Production} \times \text{PK Content (\%)}$$

$$\text{Total TDN Production} = \text{Dry Material Production} \times \text{TDN Content (\%)}$$

2.5. Agricultural Waste Feed Concentration Index

Analysis method used to calculate and know the comparison of feed from agricultural waste between sub-districts, it is necessary to calculate the feed concentration index [5] Feed concentration index is the production of dry materials of each village against the average production of dry materials of the region. Feed concentration index can be known by means of: Dry material production per sub-district is divided by the average total of dry materials per District by the category of feed concentration index > 1 is high, medium feed concentration index is 0.5 - 1, and feed concentration index is low < 1.

2.6. Agricultural Waste Support Capacity Analysis

Analysis method used to calculate and know the carrying capacity of agricultural waste of a region to meet the needs of cattle daily can be divided into three kinds [5] namely DDLP Dry Materials, DDLP Coarse Protein, and DDLP Total Digestible Nutrient with the following formula:

$$\text{DDLP (BK/PK/TDN)} = \frac{\text{Production (BK/PK/TDN) / ST}}{\text{Needs (BK/PK/TDN) / ST}}$$

2.7. Agricultural Waste Feed Support Capacity Index (IDDP)

$$\text{IDDP (BK/PK/TDN)} = \frac{\text{Production (BK/PK/TDN) (ton/year)}}{\text{Livestock Population (ST) x Needs (BK/PK/TDN) 1ST(ton/th)}}$$

Based on the average value of IDDP can be grouped by three categories index, namely:

1. The low carrying capacity category is less than the average IDDP value (< 1).
2. The medium carrying capacity category is the IDDP value that is in the range between the average values of IDDP (1-2).
3. The category of high carrying capacity is more than the average value of IDDP (≥3).

Feed support index (IDDP) is the ratio between the production of available feed and the number of needs of a number of ruminansia livestock populations in the region. Livestock populations are calculated based on the standard unit of cattle (ST). IDDP is calculated based on the above formula [5].

2.8. Ruminansia Livestock Population Increase Capacity (KPPTR)

Ruminansia Livestock Population Building Capacity (KPPTR) method is an approach to demonstrate the ability or capacity of the region in the provision of livestock food. The [6] method is a direct method that takes into account forage sources. In this method the forage used is forage derived from permanent pastures, ricepaddies, dry land/ moors, plantations and forests.

$KPPTR(L) = KTTR - \text{Rill Population}$

Real Population = Livestock that really existed back then

$$KTTR = \frac{(\sum k \cdot Le \cdot 15 \text{ tons BK/ha/year}) + \sum j \cdot Li \text{ (ST)}}{2,3}$$

$KPPTR(KK) = \text{Number of Family Heads (KK)} \times 3ST/KK$

$KPPTR(E) = KPPTR(KK)$

$= KPPTR(KK) < KPPTR(L)$

$KPPTR(E) = KPPTR(L)$

$= KPPTR(L) < KPPTR(KK)$

Description:

k : coefficient of grass-producing land availability

Le : grass-producing land (ha)

j : HMT production coefficient

Li : Agricultural Wasteland (HHSP)

15 tons BK/ha/year: average pasture production in Indonesia

2.3 : every ST per year requires 2.3 tons of BK

$KPPTR(L)$: $KPPTR$ based on forage availability

3 ST/KK : each KK is able to maintain 3 ST

$KPPTR(KK)$: $KPPTR$ based on kerja energy

3. Results and Discussion

The geographical location of Deli Serdang regency is one of the districts located in the East Coast area of North Sumatra. Geographically Deli Serdang regency is located at 2°57' North Latitude to 3°16' North Latitude and 98°33' East Longitude to 99°27' East Longitude with an altitude of 0-500 m above sea level and known only two seasons, namely dry season and rain [3]. According to [7], to ensure the certainty of livestock and animal health, it is necessary to provide land that meets the technical requirements of livestock and animal health. In table 4 total grass producing land in Deli Serdang Regency area of 114,140.20 Ha. Agricultural waste-producing land comes from rice with an

area of 86,708.30 Ha, corn 20,202.70 Ha, Cassava 2,633 Ha, Sweet Potato 54 Ha, Peanuts 64 Ha, Soybeans 401.70 Ha and Green Beans 300.60 Ha. The potential land area for food crops in Deli Serdang Regency is as follows:

Table 1. Area of agricultural waste-producing land in Deli Serdang

Forage Producing Land	Land Area (Ha)
Rice fields	86. 708,30
Heavy Land	17. 341,66
Rice Field Yard	2. 167,71
Plantation	1. 515,84
Forest State	4. 004,18
People's Forest	2. 402,51

Source: [4]

Human resources play an important role in management and improving the business of beef cattle farming, one of which is farmers. According to [8] The farmer not only acts as a production factor but also acts as a leader (manager) in his farm that regulates the overall production organization. Karateristic breeders who need to be observed in this study include breeding experience, age, main occupation, number of livestock ownership, maintenance system and breeding purposes.

3.1. Cattle Base Area of Beef Cattle

Wilayah base means that the cattle farm in Deli Serdang regency can still be developed judging by the needs of the people and the number of livestock. In the table mshows that Tanjung Muda Hilir sub-district has a greaterLQ value than other sub-districts which is 7.55 thus it can be said that Sinembah Tanjung Muda Hilir sub-district has a relatively large number of beef cattle population compared to other sub-districts and sub-districts which are non-base areas in Deli Serdang district as many as 12 sub-districts. This is in accordance with [9] which states that $LQ > 1$ means that a region already has a comparative advantage, where the population exceeds the needs of its area so that it is biased to be sold or exported outside the territory. In non-base areas with lq value < 1 means livestock in a region cannot meet its own needs needing supply from outside the region.

3.2. Beef Cattle Population Density

The density of the cattle population can be known in several ways such as economic density, agricultural density, and the density of the cow population density area is very influential to the livelihood of the surrounding community. Effective management of livestock will accelerate the process of development and growth of livestock. With the basic knowledge of the community about the utilization of crop waste, it will have an impact on the use of feed materials derived from agricultural waste to meet the needs of cattle. in addition, there needs to be optimal utilization of

agricultural waste so that the needs of cattle are met.

According to [5] it states that densely populated areas give an indication of the possibility of competition between livestock and the population in terms of food supply. Districts that fall into the category of rare, still possible addition of ruminansia livestock population support area is still large and give an indication that in this area the potential of pasture or grazing for livestock maintenance is still available. In the opinion [10] states that the balance between the livestock population and the number of inhabitants and land in a sub-district is one of the considerations / indicators to establish the development of livestock.

Table 2. LQ Value in Deli Serdang Regency

No	District	Beef Population/subdistrict (vi)	Number of hosehold /subdistrict (vt)	Population of cow/regency (Vi)	Number of household/regency (Vt)	vi/vt	Vi/Vt	LQ
1	Gunung Meriah	39,00	897,00	94.533,00	504.955,00	0,04	0,19	0,23
2	STM Hulu	902,00	3.867,00	94.533,00	504.955,00	0,23	0,19	1,25
3	Sibolangit	797,00	6.512,00	94.533,00	504.955,00	0,12	0,19	0,65
4	Kutalimbaru	7.459,00	10.522,00	94.533,00	504.955,00	0,71	0,19	3,79
5	Pancur Batu	4.589,00	25.038,00	94.533,00	504.955,00	0,18	0,19	0,98
6	Namo Rambe	5.399,00	10.879,00	94.533,00	504.955,00	0,50	0,19	2,65
7	Biru-biru	358,00	10.221,00	94.533,00	504.955,00	0,04	0,19	0,19
8	STM Hilir	13.229,00	9.354,00	94.533,00	504.955,00	1,41	0,19	7,55
9	Bangun Purba	5.133,00	6.380,00	94.533,00	504.955,00	0,80	0,19	4,30
10	Galang	4.229,00	18.054,00	94.533,00	504.955,00	0,23	0,19	1,25
11	Tanjung Morawa	3.261,00	53.651,00	94.533,00	504.955,00	0,06	0,19	0,32
12	Patumbak	9.130,00	24.982,00	94.533,00	504.955,00	0,37	0,19	1,95
13	Deli Tua	414,00	16.477,00	94.533,00	504.955,00	0,03	0,19	0,13
14	Sunggal	3.339,00	67.601,00	94.533,00	504.955,00	0,05	0,19	0,26
15	Hamparan Perak	19.184,00	43.165,00	94.533,00	504.955,00	0,44	0,19	2,37
16	Labuhan Deli	610,00	16.788,00	94.533,00	504.955,00	0,04	0,19	0,19
17	Percut Sei Tuan	6.634,00	105.446,00	94.533,00	504.955,00	0,06	0,19	0,34
18	Batang Kuis	2.934,00	15.576,00	94.533,00	504.955,00	0,19	0,19	1,01
19	Pantai Labu	1.244,00	11.927,00	94.533,00	504.955,00	0,10	0,19	0,56
20	Beringin	1.865,00	14.572,00	94.533,00	504.955,00	0,13	0,19	0,68
21	Lubuk Pakam	477,00	22.477,00	94.533,00	504.955,00	0,02	0,19	0,11
22	Pagar Merbau	3.307,00	10.569,00	94.533,00	504.955,00	0,31	0,19	1,67

Source: [4]

Table 3. Economic Density, Regional Density and Farm Density on Deli Serdang Regency

No	District	Economic Density	Regional Density	Farm Density
1	Gunung Meriah	12,27	0,51	0,03
2	Sinembah Tanjung Muda Hulu	59,34	4,04	0,65
3	Sibolangit	32,46	4,43	0,44
4	Kutalimbaru	169,00	42,64	2,58
5	Pancur Batu	44,00	37,45	3,42
6	Namo Rambe	120,53	86,66	2,63
7	Biru-biru	8,54	3,99	0,16
8	Sinembah Tanjung Muda Hilir	350,23	69,44	5,01
9	Bangun Purba	192,52	39,50	42,74
10	Galang	55,64	28,14	2,20
11	Tanjung Morawa	13,84	24,75	0,54
12	Patumbak	84,35	195,13	13,36
13	Deli Tua	5,58	44,23	10,51
14	Sunggal	11,19	36,09	0,60
15	Hamparan Perak	104,20	83,35	1,55
16	Labuhan Deli	8,27	4,79	0,07
17	Percut Sei Tuan	14,07	34,77	0,55
18	Batang Kuis	42,57	72,73	1,47
19	Pantai Labu	23,50	15,20	0,15
20	Beringin	28,88	35,40	0,33
21	Lubuk Pakam	4,77	15,29	0,14
22	Pagar Merbau	73,18	52,58	0,76
Deli Serdang		1.458,95	931,13	89,90

- Economic Density : very dense > 300, dense > 100 - 300, medium 50 - 100 and rarely < 50

- Regional Density : very dense >50 solid >20-50, medium 10-20 and rarely < 10

- Farm Density : very dense >2, dense >1-2, medium 0.25-1 and rarely < 0.25

Source: [4]

3.3. Agricultural and Plantation Waste Production

Local resources that have the potential to feed efficiently either as supplements, concentrate components or basic feed. Local feed can be crop residues, follow-up or side products or agroindustry waste (*agroindustry byproducts*) [11]. Agricultural waste has considerable potential as a source of animal feed, especially beef cattle. Nutrition of agricultural waste is sufficient and in accordance with the needs of livestock can be used as a source of energy and protein, while agricultural waste nutrients that have a low content can also be used as a source of fiber. According to [12], medium and high-scale livestock development should take into account the availability of cheap local feed sources, not compete with human needs, are easy to obtain, and are available continuously. Such feed resources can be met from the plantation industry. Fresh production of agricultural and plantation waste in Deli Serdang regency is highest in Percut Sei Tuan sub-district which is 103,349.59 tons/year while the smallest waste is

located in the old Deli sub-district which is 338.81 tons/year, the total amount of potential agricultural waste and plantations in Deli Serdang district is 678,365.95 tons/year. This gives an indication that in Percut Sei Tuan sub-district can raise a large number of cows and can also be a producer of forage waste for other sub-districts.

Table 4. Agricultural and Plantation Waste Production

No	District	Agricultural and Plantation Waste Production		
		DM Dry matter	CP Crude Protein	TDN Total Digestible Nutrient
1	Gunung Meriah	1.860,44	110,47	680,16
2	Sinembah Tanjung Muda Hulu	4.142,82	212,98	2.015,40
3	Sibolangit	3.240,82	202,97	1.283,65
4	Kutalimbaru	13.132,91	867,24	6.570,61
5	Pancur Batu	5.401,63	395,29	2.728,19
6	Namo Rambe	3.550,01	205,31	1.455,67
7	Biru-biru	4.920,44	302,91	2.183,74
8	Sinembah Tanjung Muda Hilir	7.539,70	405,32	3.602,79
9	Bangun Purba	1.157,43	48,77	635,33
10	Galang	3.550,18	242,62	1.546,59
11	Tanjung Morawa	10.160,29	647,05	4.185,88
12	Patumbak	3.082,58	241,36	1.587,35
13	Deli Tua	82,02	5,52	36,3
14	Sunggal	9.487,07	579,19	3.890,67
15	Hampan Perak	18.807,25	1065,45	7.379,12
16	Labuhan Deli	13.249,31	788,06	5.194,66
17	Percut Sei Tuan	25.258,92	1599,55	11.111,13
18	Batang Kuis	4.174,75	261,56	1.828,33
19	Pantai Labu	11.519,85	661,04	4.359,59
20	Beringin	7.715,22	448,87	2.872,87
21	Lubuk Pakam	4.512,80	261,4	1.659,94
22	Pagar Merbau	6.380,96	397,5	2.449,52
Deli Serdang		162.927,40	9.950,43	69.257,49

Source: [4]

3.4. Feed Concentration Index

The use of agricultural waste as alternative feed is one solution to address ruminansia animal feed shortages. The higher the production of land-wide unity waste, the higher the ability to house a certain number of livestock at any given time. In "Table 4" Feed Concentration Index is the availability of feed in a region in the utilization of agricultural waste as a source of feed based on the production of dry material waste. Highly categorized sub-districts mean to have considerable potential in the

utilization of agricultural and plantation waste as well as vice versa.. To know the comparison of agricultural waste production between sub-districts in Deli Serdang regency, it is necessary to calculate the feed concentration index of each sub-district in Deli Serdang Regency. According to [13] that increased intensification of food crops resulted in increased production of food waste as well. The supporting capacity of agricultural waste and sub-district plantations in Deli Serdang regency is able to accommodate and provide feed for the needs of the cattle population based on the needs of dry materials / year with the number of 71,459 cows, the need for crude protein / year with the number of 41,460 cows and the needs of TDN / year with the number of 44,113 cows. According to [14] it states that feed support is an area's ability to produce feed in the form of crop waste that can accommodate the needs of a number of livestock populations without going through processing. From the data, it can be said that the supporting capacity of agricultural waste in Deli Serdang Regency has great potential in the development of cattle breeding cattle.

Table 5. Feed Production (Dry Matter)

No	District	Dry Material Production (Tons)	IKP	Category
1	Gunung Meriah	1.860,44	0,25	Low
2	Sinembah Tanjung Muda Hulu	4.142,82	0,56	Moderate
3	Sibolangit	3.240,82	0,44	Low
4	Kutalimbaru	13.132,91	1,77	High
5	Pancur Batu	5.401,63	0,73	Moderate
6	Namo Rambe	3.550,01	0,48	Low
7	Biru-biru	4.920,44	0,66	Moderate
8	Sinembah Tanjung Muda Hilir	7.539,70	1,02	High
9	Bangun Purba	1.157,43	0,16	Low
10	Galang	3.550,18	0,48	Low
11	Tanjung Morawa	10.160,29	1,37	High
12	Patumbak	3.082,58	0,42	Low
13	Deli Tua	82,02	0,01	Low
14	Sunggal	9.487,07	1,28	High
15	Hampan Perak	18.807,25	2,54	High
16	Labuhan Deli	13.249,31	1,79	High
17	Percut Sei Tuan	25.258,92	3,41	High
18	Batang Kuis	4.174,75	0,56	Moderate
19	Pantai Labu	11.519,85	1,56	High
20	Beringin	7.715,22	1,04	High
21	Lubuk Pakam	4.512,80	0,61	Moderate
22	Pagar Merbau	6.380,96	0,86	Moderate
	Amount	162.927,40		
	Average	7.405,79		

- IKP > 1 Categorized High

- IKP = 0.5-1 categorized Medium

- IKP < 0.5 categorized low

Source: [4]

3.5. Supporting Capacity of Agricultural and Plantation Waste

Table 6. Carrying Capacity

No	District	Carrying Capacity (ST)		
		Dry Material	Crude Protein	TDN
1	Gunung Meriah	815,98	460,29	433,22
2	Sinembah Tanjung Muda Hulu	1.817,03	887,42	1.283,69
3	Sibolangit	1.421,41	845,71	817,61
4	Kutalimbaru	5.760,05	3.613,50	4.185,10
5	Pancur Batu	2.369,14	1.647,04	1.737,70
6	Namo Rambe	1.557,02	855,46	927,18
7	Biru-biru	2.158,09	1.262,13	1.390,92
8	Sinembah Tanjung Muda Hilir	3.306,89	1.688,83	2.294,77
9	Bangun Purba	507,64	203,21	404,67
10	Galang	1.557,10	1.010,92	985,09
11	Tanjung Morawa	4.456,27	2.696,04	2.666,17
12	Patumbak	1.352,01	1.005,67	1.011,05
13	Deli Tua	35,97	23,00	23,12
14	Sunggal	4.161,00	2.413,29	2.478,13
15	Hamparan Perak	8.248,79	4.439,38	4.700,08
16	Labuhan Deli	5.811,10	3.283,58	3.308,70
17	Percut Sei Tuan	11.078,47	6.664,79	7.077,15
18	Batang Kuis	1.831,03	1.089,83	1.164,54
19	Pantai Labu	5.052,57	2.754,33	2.776,81
20	Beringin	3.383,87	1.870,29	1.829,85
21	Lubuk Pakam	1.979,30	1.089,17	1.057,29
22	Pagar Merbau	2.798,67	1.656,25	1.560,20
Deli Serdang		71.459,39	41.460,13	44.113,05

Source: [4]

3.6. Agricultural and Plantation Waste Feed SupportIng Capacity Index

Ratio is between the production of available feed and the number of needs of a number of ruminansia livestock populations in the region. The ratio value is categorized into three categories which is a low category which means the area has a relatively low feed support capacity and the area can no longer increase the number of livestock, the medium category means the area can still increase the number of cattle raised in the region, and the high category means the area has a high feed support capacity and the area is highly recommended to increase the number of livestock to be maintained.

In the table above can be seen iddlpp value of dry materials high category there are 5 sub-districts namely Gunung Meriah Sub-District, Blue - Blue, Labuhan Deli, Labu Beach and Lubuk Pakam which means that the sub-district has a high waste support capacity and can be recommended to increase the number of livestock maintained. IDDLPP category is currently there are 6 sub-

districts namely Sinembah Tanjung Muda Hulu Sub-District, Sibolangit, Tanjung Morawa, Sunggal, Percut Sei Tuan and Beringin which means this area can still be developed the number of livestock to be raised. IDDLP low category there are 11 sub-districts namely Kecamatan Kutalimbaru, Pancur Batu, Namo Rambe, Sinembah Tanjung Muda Hilir, Bangun Purba, Galang, Patumbak, Deli Tua, Hamparan Perak, Batang Kuis and Pagar Merbau in the sub-district has relatively low waste feed power in the district suggested not to increase the number of livestock, if it wants to increase the number of livestock then the sub-district should feed it plus other alternatives such as concentrates.

Table 7. Agricultural and Plantation Waste Feed Supporting Capacity Index

No	District	DM		CP		TDN	
		Index	Category	Index	Category	Index	Category
1	Gunung Meriah	20,92	3	11,80	3	11,11	3
2	STM Hulu	2,01	2	0,98	1	1,42	2
3	Sibolangit	1,78	2	1,06	2	1,03	2
4	Kutalimbaru	0,77	1	0,48	1	0,56	1
5	Pancur Batu	0,52	1	0,36	1	0,38	1
6	Namo Rambe	0,29	1	0,16	1	0,17	1
7	Biru-biru	6,03	3	3,53	3	3,89	3
8	STM Hilir	0,25	1	0,13	1	0,17	1
9	Bangun Purba	0,10	1	0,04	1	0,08	1
10	Galang	0,37	1	0,24	1	0,23	1
11	Tanjung Morawa	1,37	2	0,83	1	0,82	1
12	Patumbak	0,15	1	0,11	1	0,11	1
13	Deli Tua	0,09	1	0,06	1	0,06	1
14	Sunggal	1,25	2	0,72	1	0,74	1
15	Hamparan Perak	0,43	1	0,23	1	0,24	1
16	Labuhan Deli	9,53	3	5,38	3	5,42	3
17	Percut Sei Tuan	1,67	2	1,00	2	1,07	2
18	Batang Kuis	0,62	1	0,37	1	0,40	1
19	Pantai Labu	4,06	3	2,21	2	2,23	2
20	Beringin	1,81	2	1,00	2	0,98	1
21	Lubuk Pakam	4,15	3	2,28	2	2,22	2
22	Pagar Merbau	0,85	1	0,50	1	0,47	1

Source: [4]

3.7. Ruminansia Livestock Population Increase Capacity (KPPTR)

Table 8. KPPTR Value in Deli Serdang Regency

No	District	KPPTR Value (E)
1	Percut Sei Tuan	24.328,32
2	Labuhan Deli	19.930,15
3	Pantai Labu	17.975,25
4	Sinembah Tanjung Muda Hulu	12.516,45
5	Hampan Perak	10.839,67
6	Sibolangit	10.690,13
7	Tanjung Morawa	10.094,05
8	Beringin	9.852,10
9	Biru-biru	9.194,11
10	Sunggal	9.085,69
11	Kutalimbaru	8.194,32
12	Lubuk Pakam	6.447,78
13	Pagar Merbau	5.987,15
14	Gunung Meriah	5.297,73
15	Batang Kuis	1.882,59
16	Galang	947,90
17	Sinembah Tanjung Muda Hilir	913,10
18	Pancur Batu	35,66
19	Namo Rambe	-2,95
20	Deli Tua	-316,36
21	Bangun Purba	-1.922,72
22	Patumbak	-6.761,41
Total		155.208,70

Source: [4]

The effective mortgage value (KPPTR(E)) of Deli Serdang Regency is 155,209 ST. This indicates that Deli Serdang Regency still has great potential for the addition of ruminansia cattle as big as the value of the KPPTR. Namun in its implementation in the field should be considered several factors such as technical, socio-cultural as well as the skills of farmers in managing the implementation pattern of the maintenance of cattle. The distribution of KPPTR value in each sub-district varies greatly, the highest mortgage value in Percut Sei Tuan sub-district is 24,328.32 ST. According to [14] it states that the positive value of increasing the capacity of ruminansia livestock populations means that the availability of feed crop waste as a source of ruminansia animal feed is sufficient and can be increased by a number of populations – ruminansia livestock populations.

Sub-districts that have a positive KPPTR value have the potential to be able to increase their beef cattle population by the value of each sub-district and can be used as a center for beef cattle production. For areas of negative mortgage value although it cannot be increased population due to overpopulation of that value, the area still has the potential to fatten beef cattle.

3.8. Beef Cattle Development Area

Table 9. Beef Cattle Development Area

Region	Criteria	District
I	KPPTR (E) Positive and $LQ > 1$	Sinembah Tanjung Muda Hulu
		Kutalimbaru
		Galang
		Sinembah Tanjung Muda Hilir
		Hampan Perak
		Batang Kuis
II	KPPTR (E) Positive and $LQ < 1$	Pagar Merbau
		Gunung Meriah
		Sibolangit
		Pancur Batu
		Biru – biru
		Tanjung Morawa
		Sunggal
		Labuhan Deli
		Percut Sei Tuan
		Pantai Labu
Beringin		
Lubuk Pakam		
III	Negative mortgage (E) and $LQ > 1$	Namo Rambe
		Patumbak
		Bangun Purba
IV	KpPPTTR (E) Negative and $LQ < 1$	Deli Tua

Source : [4]

The value of LQ and KPPTR in each sub-district shows that deli serdang regency still has the potential to be developed as a center for the development of cattle production.

4. Conclusion

Livestock resources in Deli Serdang Regency have the potential to develop cattle farming businesses based on superior livestock genetic resources, natural resources and waste from agriculture and plantations that can be utilized as animal feed, human resources, capital and technology utilization. According to the calculation of LQ (*Location Quotation*) in Deli Serdang Regency there are 10 sub-districts that still have the potential in the development of livestock with a capacity of 155,209 ST and The Strategy of Development of Beef Cattle for the area I of the nursery center and bakalan, providing capital loans, educating farmers and feed preservation technology. Region II forms livestock groups, lending capital assistance, educating farmers and unproductive livestock turnover. Area III centers of fattening of beef cattle, management of animal feed, forming cooperatives and animal health centers, the turnover of unproductive livestock. Area IV centers of livestock education services, feed processing, forming cooperatives and animal health care centers

and unproductive turnover of livestock. The four regions are divided into LQ and KPPTTR calculation.

REFERENCES

- [1] Daryanto, A. 2011. ImportEd Stylist For Beef Self-Sufficiency. Trobos March 2011 issue. http://www.trobos.com/show_article.php?rid=22&aid=2781. Retrieved January 4, 2014.
- [2] Directorate General of PKH (Directorate General of Animal Husbandry and Health.. Guidelines for The Development of Sapid and Buffalo Areas.Jakarta (ID): Directorate General of Animal Husbandry and HealthMinistry of Agriculture. 2012.
- [3] Williamson, G. and W. J. A. Payne. Introduction to Animal Husbandry in the Region Tropical (Translated by S.G.N.D. Darmadja). 1st edition.Gadjah Mada University Press. Yogyakarta. 1993.
- [4] BPS Agriculture Deli Serdang Regency. 2019. Deli Serdang RegencyIn Figures 2019.
- [5] Ashari S. Horticultural Aspects of Cultivation.Buku. Publisher University of Indonesia.Jakarta. pp 141--146. 1995.
- [6] Syamsu, J. Food Crop Waste as a Source of FeedRuminant Potential Supporting Capacity in Makassar. Emulsion Foundationand Livestock Service Office, South Sulawesi. 2006.
- [7] Nell, A. J. And Rollinson. The Requirement an Avaliability ofLivestock Feed in English. UNDP project INS/72/009. 1974.
- [8] Animal Husbandry and Health Act. Farm Law and Animal Health. 2009.
- [9] Mubyarto. Village Development Strategy. First aid. Yogyakarta. 1989.
- [10] Hendayana, R. Location Quotien Method (LQ) Application InDetermination of National Leading Commodities. Agricultural Informatics.Volume 12 : 658-675. 2003.
- [11] Tanuwiria, U.H., Mushawwir, A and Yulianti, A. Feed PotentialFiber And Its Carrying Capacity To Livestock PopulationRuminants In Garut Regency. Journal of Livestock Sciences.Vol. 7 No. 2, 117 – 127. 2007.
- [12] Wiryawan, G.K. Feed Science and Technology Laboratory Team. Knowledge of livestock foodstuffs. Faculty of Animal Husbandry. IPB.Bogor. 2012.
- [13] Mathius, I.W.,D and A.P. Sinurat. Utilization of feed materialsinconvesional for livestock. Wartazoa 11(2):20-31. 2008.
- [14] Syamsu, J.A. Repositioning the Paradigm of Livestock DevelopmentPublic Thought, Ideas and Enlightenment. Absolut Media, Yogyakarta. 2011.
- [15] Dwyanto, K., S. Bahri and E. Masbulan. "Availability andTechnology, Livestock and Veterinary Needs in EffortsImproving Food Security". Proceedings of the National

SeminarFarms and Veterinary. Livestock Research Center. Bogor. 2009.