

Business Planning for Group of Livestock Breeders in Reaching 1,000 Cows and Independence of Breeder

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ABSTRACT

Indonesia has always been importing beef because the increase in beef production is not in line with the increase in beef consumption. SPR – Sentra Peternakan Rakyat is one of the programs launched by the Ministry of Animal Husbandry in collaboration with the Bogor Agricultural Institute (IPB) aiming to raise livestock in groups with a target of producing 1,000 cows per group. The mission of SPR is that livestock groups can control production and selling prices. To achieve the target of 1,000 cows is not easy, one reason is the traditional farming pattern. This research aims at developing SPR business planning and individual breeders to get an idea of when the target of 1,000 cows can be achieved and an idea of when is the right time for farmers to sell their cows. The results showed that each SPR will reach the target of 1,000 cows in the 10th year and the right time for farmers to sell their cows is in the 6th year with the indicators being BEP, IRR, BCR, and NPV. Every breeder must carry out other business during the period of 6 years of breeding.

Keywords: SPR, Business Planning, Group of Breeder, Individual Breeder.

1. BACKGROUND

1.1 Overview of Beef Production vs. Demand for Beef in Indonesia

Indonesia is an agrarian country which is indicated by the large number of the workforce working in agriculture, forestry, and fisheries, which is around 29% (appendix 1 of the Indonesian population above 15 years of age who works according to employment). This means that the size of the field can be managed. This condition provides a great advantage for Indonesia because it can meet its own needs. The total population of Indonesia, which reached 270.20 million people in 2020 and will continue to increase in the following year, is a large number to ensure that food availability can be supported.

The ability to ensure food availability for the population is a challenge for the government during decreasing agricultural/livestock land, farmer regeneration, namely the reduced interest of the younger generation in agriculture and animal husbandry, the use of new technology and other things. Efforts have been made by the government to get there in the form of the application of modern technology, fertilizer subsidies, ease of obtaining seeds, ongoing research to get superior variants and many other things. However, this effort is still not maximally carried out and can be seen with the import of commodities produced by Indonesian farmers/breeders.

One example is in terms of fulfilling beef for the community. Based on BPS data for 2017 – 2019 the number of beef production continues to increase (appendix 2) as shown in the graph below:

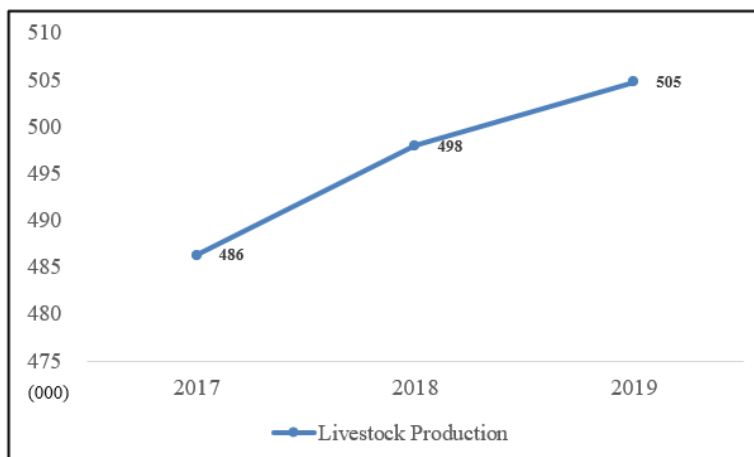


Figure 1 Indonesian Beef Production 2017 - 2019

This increase in beef production is not followed by an increase in beef consumption by the public and this is illustrated in the following 2017 – 2019 beef consumption graph:

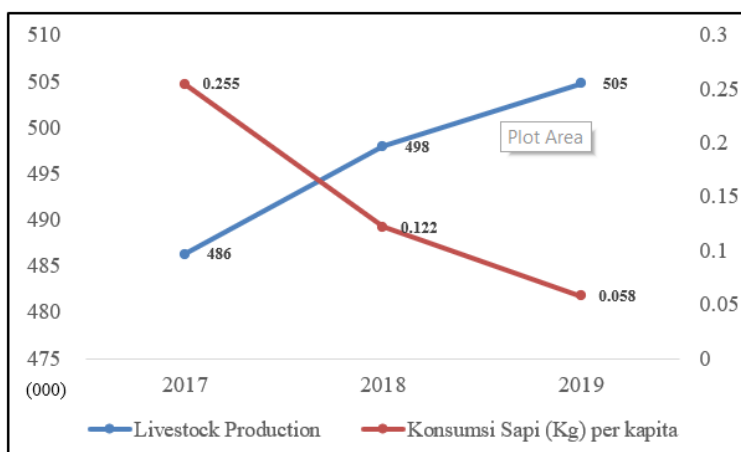


Figure 2 Beef Production vs Indonesian Beef Consumption 2017 – 2019

Economists argue that the declining level of consumption is influenced by the increasing price of beef so that people's purchasing power decreases as shown in the following graph:

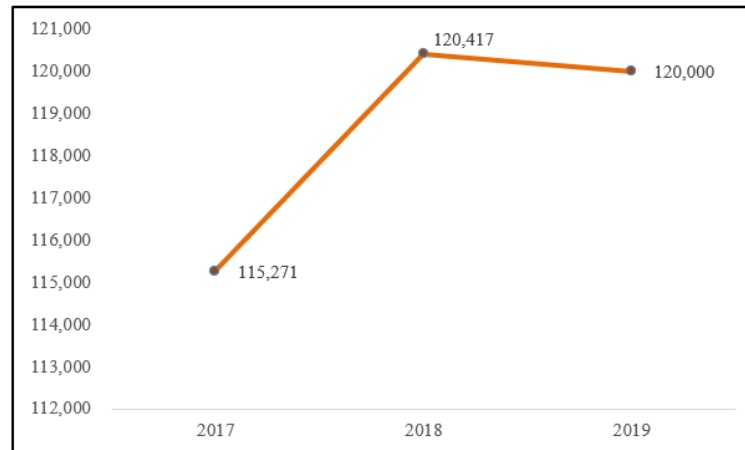


Figure 3 Beef Price Trend 2017 - 2019

The decrease in consumption of meat (animal protein) is a sign of the threat of protein fulfillment for the community which in turn has an impact on the threat of producing the next generation of the nation that is healthy and nutritious.

From the three data displayed, although beef production continues to increase, beef prices also continue to increase, one of which is caused by the inability of cattle farmers to control prices.

1.2 Cattle Farm Management

The People's Animal Husbandry School – Sekolah Peternakan Rakyat (SPR) is a program created by the Bogor Agricultural University (IPB) which was formed with the intention of educating small-scale farmers (hereinafter referred to as community breeders) through participatory learning for a maximum of four years so that they can be independent & sovereign in running a collective business in congregation or mutual business. SPR can be formed based on 1 livestock group consisting of several breeders in 1 village or for example 1 sub-district. The SPR program is known as 1111, which means that in 1 group there are at least 1000 brooders, 100 males, 10 strategy programs and 1 vision of independent and sovereign breeders.

With the educational background of farmers who are generally still low (junior high school and below, including uneducated), the intellectual level of the majority is below average and the association of breeders which is only limited to between breeders makes the knowledge of farmers limited. This factor is a challenge to realize independent and sovereign breeders.

For this reason, SPR has the main objective of its program, namely building human resource capacity rather than only providing facilities and infrastructure (which the government has often done). The capacity of breeders who are filled with knowledge about various technical and non-technical aspects will be able to increase the awareness of smallholder farmers to take actions that are oriented towards developing the competence of farmers themselves.

Since 2012 the program has been running, the type of cattle breeding business has not been running as expected. The target of 1000 brood stock has not been achieved even the number is slowly decreasing. Based on interviews with several breeders whose type of

business is breeding, the cause of failure to achieve the target of 1000 brood stock is because it is still difficult for farmers to change the mindset of traditional farming. On average, breeders breed their livestock in the yard with 2-3 cows. Their target in raising livestock is to be able to be sold in the next 2-3 years when farmers will send their children to school or marry. There is no long-term plan that has become a target for livestock breeding. Things like this are common in some breeders.

Seeing this, the authors conclude that farmers do not yet understand changing their business-oriented livestock system. Business orientation means that farmers have short-, medium- and long-term targets for their livestock breeding.

For this reason, the author tries to make a business plan for the livestock group so that it has a future picture of the target of 1000 cows which can be achieved in what year and what benefits will be obtained if 1000 cows is achieved. The livestock group that became the object of the research was named Berkarya. The research method used was interviews with the head of the livestock group. The Berkarya Group was established in 2011 consisting of 120 farmers with a total of 300 Bali cattle at the beginning. On average, each farmer keeps 2-3 cows. Looking at the development of the Berkarya group, until 2020 the number of cattle that have been successfully developed is 532 heads. The results of interviews with group leaders, so far, cattle breeding methods are still separate, even though they have joined the livestock group, but the unity of purpose has not been seen. Another thing is, breeders are still aiming for the short term, namely the next 2-3 years according to the needs of life.

2. ANALYSIS

To see the condition of the Berkarya group, the author conducted a study of the value of Natural Increase (NI), Reproduction Efficiency (ER), Net Replacement Rate (NRR) dan Population Dynamics.

2.1 Natural Increase (NI)

Is a unit of calculation of natural growth obtained by subtracting the birth rate with the death rate in a certain area and time. To calculate the natural increase, the initial population, final population, mean population, parent population, birth rates and mortality rates are obtained. Based on these figures, the following calculations are obtained:

Table 1 Calculation of Increase in Cattle Production

NATURAL INCREASE - NI	
Variable	Total
Initial Population (heads)/ Populasi Awal (ekor)	513
Final Population (heads)/ Populasi Akhir (ekor)	532
Everage Population (heads)/ Populasi Rerata (ekor)	522.5
Dam Population (heads)/ Populasi Induk (ekor)	425.6
Populasi Induk terhadap populasi rerata	81%
Male Calving Heads/ Kelahiran Jantan	
On Dam Population (%)/ Terhadap Induk (%)	28%
On Everage Population (%)/ Terhadap populasi rerata (%)	23%
Female Calving Heads/ Kelahiran Betina	
On Dam Population (%)/ Terhadap Induk (%)	42%
On Everage Population (%)/ Terhadap populasi rerata (%)	34%
Calving Rate/ Tingkat Kelahiran	
On Dam Population (%)/ Terhadap Induk (%)	70%
On Everage Population (%)/ Terhadap populasi rerata (%)	57%
Mortality/ Kematian	
Mortality on Population (heads)/ Kematian terhadap populasi (ekor)	2
Mortality on Population (%)/ Kematian terhadap populasi (%)	0.38%
Natural Increase - NI	56.6%
Natural Increase Male/ Natural Increase Jantan (%)	22.3%
Natural Increase Female/ Natural Increase Betina (%)	33.6%
Natural Increase 2 years Old Male/ NI Jantan Umur 2 Th (%)	21.89%
Natural Increase 2 years Old Female/ NI Betina Umur 2 Th (%)	33.22%

Determination of the NI category is done by looking at the percentage of the parent population to the population, from that percentage then divided by three for high, medium and low categorization. The highest NI value was obtained if all the broods in the population were calf and there were no calf deaths. The NI categories in the Work group are 0 – 27% (low), 28 – 55% (medium) and 56 – 82% (high). The NI obtained in the Work group in the past year is 56.6%, which means it is in the high category (lower limit). This shows that maintenance management is good, namely the birth rate is higher than the death rate.

2.2 Reproduction Efficiency (ER)

Production efficiency is calculated to find out whether the cow's reproductive process is considered effective by comparing the calving distance and the number of children with the number of parents giving birth for the first time minus the age of the mother at first mating plus the distance from calving minus the length of pregnancy.

Based on the calculation formula, it was found that the reproductive efficiency of Bali cattle in the Berkarya group was 97%.

Table 2 Production Efficiency Calculation

REPRODUCTION EFFICIENCY- ER	
Parturition interval/ Jarak Beranak	14.17
Number of calf/ Jumlah Anak	1
First Partus Age (months)/ Induk 1 Beranak	32.46
First Mating Age (months)/ Induk 1 Kawin	23.06
Partusition Period	9
EFFICIENCY REPRODUCTION (ER)	97%

ER 97% is low (below 100%). This is because the age of the first calf is too long and the interval for calving again is quite long.

2.3 Net Replacement Rate (NRR)

NRR is used to determine the ability of an area to provide replacement livestock needs within a period. To calculate the NRR, a comparison of the number of prospective replacement young cows is made with the need for replacement in a year. Based on the calculation, the NRR value for the Berkarya group is 137% for bulls and 77% for female cows.

Table 3 Number of Substitute Livestock Needs

NET REPLACEMENT RATE - NRR	
Male (Jantan)	
Replacement Stock Necessary/ Kebutuhan Pengganti (%)	9.23%
Availability/ Ketersediaan (%)	21.89%
NRR (%)	237%
Female (Betina)	
Replacement Stock Necessary/ Kebutuhan Pengganti (%)	18.74%
Availability/ Ketersediaan (%)	33.22%
NRR (%)	177%

With a surplus (positive) NRR value, it means that the Berkarya group has the ability to replace the cows that must be replaced. Cattle that must be replaced can be due to death or being sold. The NRR value of the female is 50% less than that of the male.

2.4 Population Dynamics

In an effort to achieve the target of 1000 cows, the Berkarya group continues to make improvements in its management, namely improving the way of feeding and others. Based on production figures from 2011, cattle production continues to increase.

Table 4 Bali Cattle Population 2011 - 2020

POPULATION DYNAMICS 2011 - 2020			
Year	Population (Heads)	Growth	
		Heads	%
2011	300		
2012	330	30	10%
2013	372	42	13%
2014	402	30	8%
2015	432	30	7%
2016	450	18	4%
2017	477	27	6%
2018	495	18	4%
2019	513	18	4%
2020	532	19	4%
Average	430.3	26	7%

However, production since 2018 has experienced an average growth of 4%. Based on the increase in the mean and the regression equation $Y=aX + b$ from the results of time series data analysis for 2011 – 2020, the equation $Y = 25,618X + 430.3$ is then used to estimate the cattle population from 2021 to the year 1000 cows are achieved.

Table 5 Cattle Population Prediction in Achieving 1000 Cows

POPULATION DYNAMICS - PREDICTION 2021 - 2039			
Year	Population (Heads)	Growth	
		Heads	%
2021	558	26	5%
2022	584	26	5%
2023	610	26	4%
2024	635	26	4%
2025	661	26	4%
2026	686	26	4%
2027	712	26	4%
2028	738	26	4%
2029	763	26	3%
2030	789	26	3%
2031	815	26	3%
2032	840	26	3%
2033	866	26	3%
2034	891	26	3%
2035	917	26	3%
2036	943	26	3%
2037	968	26	3%
2038	994	26	3%
2039	1020	26	3%

Based on the regression equation, it is found that the prediction of the achievement of 1000 new cows will be obtained in 2039.

By knowing the operational conditions of the Berkarya group's production above and looking at the targets to be achieved, the improvements that the Berkarya group needs to do refer to the strategy implemented by the porang farmers in East Java. Among the strategies that will be implemented are “managing the production system effectively and efficiently, maintaining business sustainability, accelerating the improvement and

growth of human resources, as well as collaboration with other industries” (Santoso, 2015).

3. CONCLUSION

Based on the analysis of Bali cattle production in the Berkarya group from 2011 – 2020, it was understood that:

- a. The population of Bali cattle continues to increase from year to year, namely at the beginning of the formation of the group the number of cows was 300 cows and in 2020 there were 532 cows.
- b. The natural increase growth of the Work group is included in the high category, namely 56.6%, which means that the number of births is higher than deaths.
- c. The 97% Efficiency Rate is relatively low, where the age of the cow for the first time is calving and the calving interval is still inefficient (more than 2 years).
- d. The Net Replacement Rate of bulls is higher than that of female cows. This illustrates that there is a challenge for the group to catch up with production if the number of births of female cattle is lower than that of males. On the other hand, the birth of bulls provides an opportunity for the group to earn income from the sale of cows.
- e. The estimated achievement of the target of 1000 cows of cattle will only be achieved in 2039, meaning that it will take the next 18 years to achieve this target.

This picture is certainly not very encouraging because it takes a long time for the state to realize self-sufficiency in cattle and for farmers to control cattle prices.

4. SUGGESTION

- a. For short-term planning (1-3 years), farmers must look for other sources of income besides raising cattle such as farming, selling processed cattle products (compost fertilizer, etc.).
- b. For medium-term planning (3-7 years), farmers can sell bulls by considering the high Net Replacement Rate. Sales planning is based on the value of the NRR.
- c. For long-term planning (more than 10 years), farmers must take corrective steps related to increasing the capacity of farmer resources in terms of identifying the fertile period, shortening the distance between births and subsequent pregnancies, improving food, treatment to reduce mortality.

APPENDIX

Appendix 1: Residents 15 Years Old and Over who Work by Main Occupation

No.	Lapangan Pekerjaan Utama	2017		2018		2019		2020	
		Februari	Agustus	Februari	Agustus	Februari	Agustus	Februari	Agustus
A	Pertanian, Kehutanan dan Perikanan	39,683,855	35,924,541	39,770,287	36,577,980	39,135,917	35,450,291	38,956,801	38,224,371
B	Pertambangan dan Penggalian	1,357,863	1,386,900	1,394,242	1,466,215	1,379,054	1,428,556	1,342,568	1,352,236
C	Industri Pengolahan	17,084,305	17,558,632	18,182,039	18,535,303	18,467,747	19,197,915	18,709,441	17,482,849
D	Pengadaan Listrik, Gas, Uap/Air Panas dan Udara Dingin	300,324	302,385	349,885	344,124	317,938	363,635	343,830	303,551
E	Pengadaan Air, Pengelolaan Sampah dan Daur Ulang, Pembuangan dan	362,241	414,627	445,929	479,422	418,510	502,283	463,359	490,984
F	Konstruksi	7,162,968	8,136,636	7,196,235	8,457,293	7,763,292	8,675,449	8,116,426	8,066,497
G	Perdagangan Besar Dan Eceran, Reparasi dan Perawatan Mobil dan Sepeda	23,249,255	22,477,345	23,906,748	23,460,412	24,825,952	24,163,931	24,773,768	24,702,695
H	Transportasi dan Pergudangan	4,936,126	5,064,247	5,181,080	5,491,679	5,290,506	5,656,314	5,509,153	5,591,941
I	Penyediaan Akomodasi dan Penyediaan Makan Minum	7,082,086	6,904,745	8,195,757	7,766,077	8,894,194	8,562,226	9,059,188	8,543,794
J	Informasi dan Komunikasi	848,882	819,210	1,008,953	904,536	951,756	921,191	962,935	933,273
K	Jasa Keuangan dan Asuransi	1,792,228	1,724,544	1,713,872	1,819,837	1,810,255	1,775,289	1,819,735	1,557,927
L	Real Estat	333,252	305,066	270,013	393,758	340,585	403,906	426,483	393,665
MN	Jasa Perusahaan	1,446,841	1,663,893	1,603,695	1,684,852	1,708,268	1,943,089	1,824,899	1,796,755
O	Administrasi Pemerintahan, Pertahanan dan Jaminan Sosial Wajib	5,024,461	4,581,690	5,452,858	4,766,102	5,239,129	4,947,873	5,435,306	4,569,946
P	Jasa Pendidikan	6,390,920	5,978,228	6,415,102	6,167,853	6,715,049	6,416,322	7,110,557	6,028,610
Q	Jasa Kesehatan dan Kegiatan Sosial	1,843,371	1,781,975	2,047,495	1,879,729	2,016,514	1,982,709	2,219,080	2,005,522
RST	Jasa Lainnya	5,639,871	5,997,759	6,345,351	6,087,014	6,419,926	6,364,292	6,219,537	6,409,568
	Total	124,538,849	121,022,423	129,479,541	126,282,186	131,692,692	128,765,271	133,292,866	128,454,184

Appendix 2: Indonesian Beef Production 2017 - 2019

Provinsi	Produksi Daging Sapi menurut Provinsi (Ton)		
	2017	2018	2019
ACEH	8550.28	11524.28	10416.20
SUMATERA UTARA	26297.65	15240.33	14153.16
SUMATERA BARAT	20206.48	20298.94	21589.63
RIAU	7700.43	9792.53	8379.10
JAMBI	4085.1	4540.06	5026.46
SUMATERA SELATAN	12666.1	11261.05	11455.31
BENGKULU	2587.24	2471.91	2587.44
LAMPUNG	12998.57	13332.35	14326.19
KEP. BANGKA BELITUNG	2601.43	3065.93	3212.58
KEP. RIAU	1470.16	1164.33	1384.08
DKI JAKARTA	15611.43	15867.13	19194.53
JAWA BARAT	72499.52	81625.91	79481.14
JAWA TENGAH	59902.61	64755.61	66681.14
DI YOGYAKARTA	8046.93	9272.92	7835.21
JAWA TIMUR	96917.01	96727.91	103291.79
BANTEN	30277.11	34946.23	37328.57
BALI	7215.34	7431.38	8255.84
NUSA TENGGARA BARAT	9472.32	9551.84	10202.83
NUSA TENGGARA TIMUR	12285.36	11761.40	10851.00
KALIMANTAN BARAT	5123.9	5447.37	5350.23
KALIMANTAN TENGAH	4488.31	3822.07	3786.73
KALIMANTAN SELATAN	7263.31	7237.91	6219.69
KALIMANTAN TIMUR	8241.26	7944.06	7653.63
KALIMANTAN UTARA	639.49	639.02	583.07
SULAWESI UTARA	3496.61	3518.33	3693.68
SULAWESI TENGAH	4541.63	4693.39	4790.41
SULAWESI SELATAN	19876.27	19696.50	17926.13
SULAWESI TENGGARA	5103.79	6474.83	4437.75
GORONTALO	3707.86	4250.17	3830.06
SULAWESI BARAT	2854.43	2266.15	2115.86
MALUKU	2185.98	2122.73	2201.00
MALUKU UTARA	1560.58	939.89	959.56
PAPUA BARAT	2700.74	1914.77	1941.93
PAPUA	3144.42	2372.50	3660.38
INDONESIA	486319.65	497971.70	504802.29

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