

Population and Production Dynamic of Peranakan Ongole Cattle in The Breeding Source Area

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Abstract. The purpose of this research was to figure out the population structure and productivity of Peranakan Ongole cattle in the breeding source area. The research was conducted from September 2022 to August 2023 in the breeding source area for Peranakan Ongole cattle, Napis village, Tambakrejo sub-district, Bojonegoro district, East Java province. Data was obtained by recording for 1 year on 1,015 heads Peranakan Ongole cattle. Research variables include population structure and cattle productivity. The results of population structure research showed that the number of male calves was 10.34%, female calves 8.13%, bulls 17.61%, and cows 63.93%. Peranakan Ongole cattle calf crop was 55.01%, calf births to the population were 37.04% with the number of male calves born at 53.46% and the number of female calves born at 46.54%. The percentage of cows to the population was 63.94%. The percentage of mortality to the population was 2.27%. Total livestock income to the population was 12.12% and total livestock output to the population was 31.13%. The natural increase in Peranakan Ongole cattle was 34.78%. The research results showed that the Calf crop value is quite good. To increase the percentage of calf crops, it is necessary to limit and select the production of prospective and productive heifers and cows. Prospective heifers and cows who are productive and have good potential must be preserved to increase the number of births and produce good-quality calves.

1 Introduction

Peranakan Ongole cattle are a wealth of Indonesian local livestock genetic resources that need to be protected and preserved. Efforts to meet national meat consumption needs can be through increasing local beef cattle production which is also beneficial for the conservation of potential beef cattle. According to Fauziah et al [1], Peranakan Ongole (PO) cattle are one of the local cattle that are widely cultivated in Indonesia with the largest population in Java Island with the advantages of tropical cattle.

Productivity is one of the indicators to determine the success rate of beef cattle farming. The technical parameter of productivity from the aspect of cow production is the calf crop. According to Budiarto, et al [2], productivity includes aspects of controlling livestock

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mutations, and observing the value of natural increase and calf crop numbers. The productivity of PO cattle in an area can be seen from the livestock population structure. Population structure is the composition of the population which includes male and female species, as well as child, young, and adult age groups, livestock density, birth rate, and mortality rate. Population structure needs to be known as a parameter in regulating the breeding system, maintenance management, and population size in farmers. The potential increase in productivity of Peranakan Ongole cattle is determined by the number of available cows. The percentage of calf crops is very significant in a livestock business to determine the yield of calves in the PO cattle breeding business. The percentage of calf crops was affected by the number of cows that were able to produce calves and the ability of the cows to take care of the calves until they weaned.

A lack of understanding of good livestock management and selection can lead to unbalanced production of PO cattle. The productivity of PO cattle in the Napis Village Breeding Area, Tambakrejo Subdistrict, Bojonegoro Regency has not been observed. In order to support the breeding business in an area, it is essential to conduct periodic research. Based on the description above, research was conducted on the productivity of PO cattle in the breeding area of Napis Village, Tambakrejo District.

2 Materials and Methods

The research material used PO cattle in the PO cattle breeding source area in Napis village, Tambakrejo sub-district, Bojonegoro district, East Java province. The research was conducted in September 2022 - August 2023. Data were obtained by recording for 1 year on 1,015 PO cattle. Research variables covered population structure and cow productivity. Calf crop percentage was calculated by the number of calves weaned compared to the number of cows during the breeding season multiplied by one hundred percent. Natural increase (NI) was calculated as the percentage of births per year minus the percentage of mortalities per year [3].

3 Results and discussion

3.1 General Description of Farmers

The PO cattle breeding resource area of Napis village is located in the southwest corner of Tambakrejo sub-district, Bojonegoro district, East Java province. Geographically, Napis village is hilly because it is located along the Kendeng mountain range that runs from east to west. Cattle farmers in Napis village are mostly smallholder farmers with traditional livestock breeding methods. Livestock breeding is affected by several aspects, including farmer age, education, and breeding experience. Farmer identity data can be seen in Table 1 below:

Table 1. Identity of PO Cattle Farmers.

No	Description	Averages
1	Farmer's age (years)	51.33 ± 10.56
2	Length of Farming (years)	19.33 ± 8.97
3	Education (%) - Not graduated from Elementary School	16.55

	- Graduated Elementary School	69.31
	- Graduated Junior High School	9.89
	- Graduated Senior High School	3.05
	- Bachelor's Degree	1.20
4	Livestock Ownership (Heads)	2.79 ± 1.52

Based on Table 1, the average age of farmers is 51.33 ± 10.56 years. The average length of farming experience is 19.33 ± 8.97 years. Farmer education is still relatively low with the highest percentage of elementary school education (SD) at 69.31%, this is also the same as the census data from the Directorate General of Animal Husbandry and Animal Health in 2012-2016 which stated that the highest level of education in the livestock sub sector was elementary school graduates. The average livestock ownership is 2.79 ± 1.52 heads. This low level of education and small average livestock ownership is because the livestock sector in Indonesia, especially cattle, is still classified as livestock that is kept as savings and to be sold when needed, not yet as commercial livestock. According to Syukur et al [4], the success of a livestock business is closely related to the factors of age, education level, farmer experience, risk-taking courage, work time, number of family dependents, cattle ownership and availability of agricultural land for forage.

3.2 Population Structure and Livestock Productivity

The research data used 1,015 heads PO cattle. The structure of the livestock population can be seen in Figure 1 below:

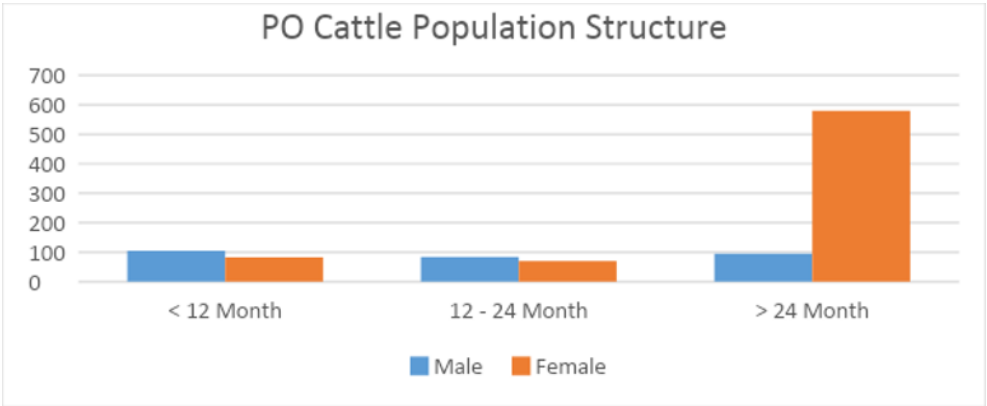


Fig. 1. PO Cattle Population Structure.

Based on Figure 1, the number of bulls aged < 12 months 10.34%, 12 - 24 months 8.25%, > 24 months 9.36% and cows aged < 12 months 8.13%, 12 - 24 months 6.89%, > 24 months 57.03%. The results showed that the ratio of bulls aged < 12 months and 12-24 months was more than the cows, different results were shown by the cows aged > 24 months more than the bulls. Calf births in Napis village in percentage terms are more male calves so the percentage of bulls aged < 12 months and 12-24 months is more than cows. Cows aged > 24 months are more in number compared to bulls because more bulls are sold and cows are retained by farmers to be used as breeding cows in order to reproduce calves.

Table 1. Identity of PO Cattle Farmers.

No	Indicator	Result (%)
1	Number of male calf births	53.46
2	Number of female calf births	46.54
3	Number of births to population	37.04
4	Number of cows to population	63.94
5	Number of cattle mortalities to population	2.27
6	Number of livestock intake to population	12.12
7	Number of livestock outputs to population	31.13
8	Calf crop	55.01
9	Natural increase	34.78

The success indicators of beef cattle production activity are calf crop, birth, and mortality rates. Observations showed that the percentage of weaned calves to cows (calf crop) was 55.01%. The percentage of calf crop to cows is 55.01% with 53.46% males and 46.54% females. The calf crop percentage is considered to be good because the number of cows to the population is 63.94%. The calf crop value in Table 2 is in accordance with national standards. The average national calf crop value is 50-60% [5]. Hartati et al [6] stated that the growth of pre-weaned calves is influenced by mothering ability. Good mothering ability will be able to produce a lot of milk and is good at protecting calves and a good calf breeding system by farmers so that the calf mortality rate at weaning is low. The lower value of calf crop obtained by Sonbait, Santosa, and Panjono [7] was 51.26% and the results of research by Wiyatna, Gunardi, and Mudikdjo [8] showed that the calf crop rate was 25%. The low value of calf crops is influenced by less than optimal reproductive management and a long calving interval (17.76 months). According to Kusuma et al [9], factors affecting calving interval are maintenance management, feeding, housing, inseminator expertise, and livestock ability.

Based on Table 2, it can be concluded that the mortality percentage of the population is 2.27%. This value is smaller than Peraturan Menteri Pertanian [10] which states that the breeding source area should reduce calf mortality by 5% to 10%. Mortality in the research location was caused by technical errors in rearing and bloat. Bloat was caused by feeding in wet conditions during the rainy season and difficulty giving birth due to the size of the fetus.

Based on Table 2, the intake of PO cattle during the research achieved 12.12%. The intake consisted of both male and female cattle. Based on the descriptive analysis, it can be seen that the herding system has the purpose of raising livestock as a breeding system. The purpose of breeding in the herding system is to increase the number of livestock owners which will then be shared between the breeder and the cattle owner. The output of PO cattle amounted to 31.13%. The amount of output is greater than the income due to the ownership used as savings and would sell the best cattle. According to Netshipale et al [11] the motivation for cattle ownership by breeders is only for side business and for savings if needed at any time for educational needs or ceremonies. The cows must be selected for breeding. If the cows have superior traits, they should be retained. In addition, the elimination of productive cows

causes a decrease in calf crop percentage because productive cows still have the potential to produce calves.

Based on Table 2, the Natural Increase of PO cattle in Napis village is 34.78%, this result is not too desirable and needs to be enhanced. Natural increase has a strong connection with population development because a high Natural increase signifies that there are a number of productive adult females in the area with adequate husbandry and management. The Natural increase value will be more significant if the high birth rate is equaled by the low mortality rate and the calculation is done annually [2].

4 Conclusion

The research results showed that the Calf crop value is adequate. It is important to limit and carefully determine the production of potential and productive heifers and cows in order to raise the percentage of calf crops. Prospective and productive heifers and cows that are well qualified and potential must be retained to increase the number of births and produce high-quality calves.

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