

Distribution of population and production estimate of some cattle breeds at Yogyakarta Province, Indonesia

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ABSTRACT: This research was conducted from January 1st to March 31st, 2009 to study the distribution of cattle population and to estimate production (output) some cattle breeds. Census methods were used for the area of Sentolo Sub district (Kulonprogo Regency), Prambanan Sub district (Sleman Regency), Kasihan Sub district (Bantul Regency), Special Province of Yogyakarta, Indonesia. Objects of this research were 5,724 respondents of cattle farmers. The variables observed were number cattle of each breed, age, sex, period of time used as breeder, mortality, and birth, for further calculation of natural increase (NI) and cattle production (output). It is indicated that there were three cattle breeds (Ongole Grade, Simpo, and Limpo) distributed at many villages in the area. Number of cattle owned by farmer was low; however, the area still is able to produce cattle (output). It could be concluded that Special Province of Yogyakarta was considered as beef cattle resource.

Key words: population distribution, output, PO, Simpo, Limpo

INTRODUCTION

Cattle were reared by most rural farmers in Special Province of Yogyakarta, especially in Sentolo Sub district (Kulonprogo Regency), Prambanan Sub district (Sleman Regency), Kasihan Sub district (Bantul Regency). The cattle were for sale when cash money was needed. Ongole Grade cattle or *Peranakan Ongole* (PO) were raised by most farmers at the region. Introduction of new cattle breeds through artificial insemination resulted in crossbred cattle. Simmental \times PO cross (Simpo) and Limmousin \times PO cross (Limpo) were the examples of crossbred cattle found in the region making changes in number and proportion of cattle breed.

Better performance of Simpo and Limpo makes farmers like the crossbred. Hardjosubroto (1994) stated that the growth, production, and reproduction performance of *Bos Taurus* cattle were higher than that of *Bos Indicus* cattle. *Bos Indicus* cattle had good resistance to hot weather and to parasites and had good mothering ability.

The PO cattle had high adaptation, primarily to feed residue from agricultural waste-product. However, very limited information available on cattle population, production and reproduction performance, and the changes of proportion of population each breed in the region. The information is important for decision making in the formulation of development program. This research was conducted to study the capability of Yogyakarta Province in producing cattle (output).

MATERIALS AND METHODS

This research was conducted from January 1st to March 31st, , 2009, in the areas of Sentolo Sub district (Kulonprogo Regency), Prambanan Sub district (Sleman Regency), Kasihan Sub district (Bantul Regency), Yogyakarta Province to study the distribution of cattle population and to estimate cattle production (output). Census methods were used participated by 5,724 respondents. Variables observed were number of cattle each breed, number of cattle owned by each farmer, number of birth and mortality, period of using cattle as breeder, cattle population from 2004 to. Number of cattle owned by each farmer was calculated in animal unit (AU) as follows: 1 adult cattle =1.00 AU, 1 young cattle = 0.67 AU, 1 calf =0.25 AU according to Reksohadiprodjo (1984). Data were analyzed to calculate natural increase (NI) and number of cattle production. Population distribution was

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calculated based on the number of each breed. NI was calculated by formula recommended by Hardjosubroto (1994):

$$NI, \% = CR, \% - MR \%, \text{ where } CI=\text{calving rate, } MR=\text{mortality rate.}$$

Number of cattle production (output) was calculated by formula recommended by Hardjosubroto (1994):

$$\text{Output, \%} = NI, \% - RCN, \%, \text{ where } NI=\text{natural increase, } RCN =\text{replacement cattle needed, \%}.$$

Furthermore, data of cattle production were analyzed to estimate cattle production begin 2008 up to 2013 by time series with least square method (Supranto, 1993) using formula:

$$\hat{Y} = a + bx, \text{ where } \hat{Y} = \text{production, } x=\text{period or time, yr, } a=\text{the constant, } b=\text{coefficient}$$

RESULTS AND DISCUSSION

Proportion of Cattle Breeds and Number of Cattles Owned Each Every Farmer

Data at Table 1 showed number and proportion each cattle breed at research location.

Table 1. Number and proportion of breeds at 3 locations

Breed	Location							
	Sentolo		Prambanan		Kasihlan		Average	
	heads	%	heads	%	heads	%	heads	%
PO	1,047	31.74	698	17.22	505	28.30	2,250	25.76
Simpo	1,353	41.01	2,633	64.95	913	51.17	4,899	52.38
Limpo	899	27.75	723	17.83	366	20.52	1,988	21.87
Total	3,299	100.00	4,054	100.00	1,784	100.00	9,137	100.00

Table 1 showed that percentage of Simpo cattle at three location was the highest because the price of Simpo cattle were highest than that of PO and Limpo. Despite, at the region, frozen semen of Simpo sire was the only frozen semen always available. The condition was similar with the condition at Sewon and Banguntapan Sub districts, Bantul Regency. Hasbullah (2003) reported that most of farmers at the region raised Simpo cattle because Simpo cattle grew faster than that of Limpo and PO cattle. Simpo cattle need 166.7 d to reach body weight of 100 kg and average daily gain (ADG) was 0.60 kg. PO cattle need 277.8 d having ADG of 0.36 kg. Feed cost per gain of PO cattle was Rp11,780.00 per animal, which was lower than that of Simpo cattle (Rp12,483.00 per animal).

Percentage of PO cattle was the lowest, which could be considered that PO price was lower than those of Simpo and Limpo. The condition was similar with the condition of Banjarnegara Regency, Central Java. Hasbullah (2003) reported that percentage of PO, Simpo, and Limpo cattle at Yogyakarta Province were 25.75, 52.38, and 21.87%, respectively. Sumadi et al. (2009) reported that number of PO, Simpo, and Limpo at Banjarnegara regency, Central Java Province were 630, 1,442, and 20 heads, respectively. The condition indicated that there were decreasing PO population at Java Island (Sumadi, 2009).

Structure of Cattle Population

Table 2 showed indicated that percentage of PO, Simpo, and Limpo dams were higher than those of respective sire, so that the area can be said as beef cattle resource because population can increase easily. The condition was similar with some region as reported by Sumadi et al. (2004), where percentage of dams was 51.54 % at East Java Province, 48.88 % at East Nusa Tenggara Province, 29.64 % at Southeast Sulawesi Province, 42.83 % at Sulawesi Selatan Province. According to Sumadi et al. (2009), 65,06 % of population at Banjarnegara regency, Central Java Province, was male. High

Table 2. Population structure of 3 breeds

Item	Breed							
	PO		Simp0		Limpo		Average	
	heads	%	heads	%	heads	%	heads	%
Adult cattle								
Sire	73	3.98	149	3.04	62	3.10	285	3.12
Dam	789	47.14	1,566	31.96	485	24.40	2,823	30.89
Total	862	51.12	1,715	35.00	547	27.50	3,108	34.02
Young cattle								
Male	124	7.12	363	7.42	584	29.39	1,137	12.45
Female	314	23.75	1,015	21.44	355	17.87	1,692	18.51
Total	438	30.87	1,414	28.88	939	47.26	2,829	30.96
Calve								
Male	238	7.13	667	13.61	163	8.21	1,044	11.43
Female	712	10.88	1,103	22.52	339	17.03	2,157	23.60
Total	950	18.01	1,770	34.13	502	25.24	3,201	35.03
Total number								
Male	436	18.23	1,179	24.07	809	40.70	2,466	26.99
Female	1,814	81.77	3,720	75.93	1,179	59.30	6,671	73.01
Total	2,250	100.00	4,899	100.00	1,988	100.00	9,137	100.00

Number of Cattle Owned by Each Farmer

Number of cattle owned by each farmer was presented Table 3.

Table 3. Number of cattle owned by each farmer

Breed	Population			Number of respondents	Number owned per farmer	
	heads	%	AU		head	AU
PO	2,250	25.75	1,995.06	1,622	1.39	1.23
Simp0	4,899	52.36	3,035.69	2,551	1.92	1.19
Limpo	1,988	21.87	1,519.98	1,551	1.28	0.98
Total	9,137	100.00	6,550.73	5,724	1.53	1.13

percentage of dam and low percentage of sire at some region was caused by the use of frozen semen to mate dam by artificial insemination.

Table 3 showed that numbers of cattle owned by each farmer were low, i.e. 1.53 heads (1.13 AU); in another word, each farmer just had one adult cattle. The number of cattle owned by each farmer was low because the farmer in that location raised cattle just as additional job, their main job was as crop farmer. Sumadi et al. (2004) stated that number of cattle owned by each farmer at East Java Province (1.87 AU) were lower than that of West Nusa Tenggara, East Nusa Tenggara, Southeast Sulawesi, and South Sulawesi Province (7.03, 15.08, 5.04, 3.67, respectively). The condition in East Java was caused by limitation of land, employment, and capital (small scale).

Cattle Production (Output)

Table 4 showed that the observed region still could produce cattle consisting of male and female replacement stock residual and cattle culled. Male and female replacement stock residual could be sent to the other region as breeders. Percentage of female cattle culled was higher in the region because farmers did not have any male cattle, as the female cattle were always mated by artificial insemination. The output at Yogyakarta Province was high enough (average of 25.35 %). Sumadi et al. (2003) stated that output estimate (cattle production) of 20% were considered to be high. A high output was affected by high calving rate and low mortality percentage.

Table 4. Cattle production (output)

Variables	Regency			Average
	Kulonprogo	Sleman	Bantul	
Replacement stock residual, %				
Male	8.61	7.11	7.45	7.72
Female	12.02	13.17	11.40	12.19
Cattle culled, %				
Male	1.34	0.53	0.33	0.73
Female	5.72	3.70	4.73	4.71
Total, %	27.69	24.51	23.91	25.35

Output estimate (cattle production) from 2009 to 2013 based on census data is presented in Table 5, which shows that Yogyakarta Province had capability as beef cattle resource. The region could produce cattle until the year of 2013. There was increasing production every year.

Table 5. Output estimate (cattle production) begin 2009 up to 2013 based on census data

Item	Year				
	2009	2010	2011	2012	2013
Replacement stock residual					
Male (heads)	10,897	11,163	11,430	11,696	11,963
Female (heads)	17,207	17,628	18,153	18,469	18,890
Cattle culled					
Male (heads)	1,030	1,056	1,081	1,106	1,131
Female (heads)	6,647	6,811	6,974	7,136	7,299
Total	7,677	7,867	8,055	8,242	8,430

CONCLUSIONS

Based on result and discussion, it could be concluded that Yogyakarta Province were stated as beef cattle resource and there was decreasing of PO population.

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