

## Postpartum productivity of Simmental-Ongole crossed cows of the first generation compared to Ongole crossed cows kept by farmers

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**ABSTRACT:** Many farmers, currently, prefer to keep crossbred cows between Simmental and *Peranakan Ongole* (PO) which called SimPO because of a large body size. Up to now there have not been much information available related to the cows productivity. The study was conducted to see the first generation of SimPO cow productivities compared to that of PO cows kept by the farmers. Seventeen SimPO cows and nineteen PO cows, at the second parity, aged about five years and seven mo pregnancy, at Bambanglipuro, Bantul District, *Daerah Istimewa Yogyakarta*, were used in this study. The observation of the study include the calving score, calf vigor score at birth, calf performances (birth weight, average daily gain and four mo old weight), the cow weight change since calving until four mo after it, and cow reproductive performances (post partum estrus, service per conception, and days open). The results showed that there was no difference between the SimPO and PO cows on calving score (1 vs. 1) and calf vigor score (1 vs. 1). However, the SimPO calf birth weight ( $37.47 \pm 5.03$  vs.  $32.17 \pm 4.08$  kg), the 4 month olds weight ( $153.97 \pm 25.28$  vs.  $109.15 \pm 19.93$  kg) and the average daily gain up to 4 mo old ( $1.04 \pm 0.30$  vs.  $0.72 \pm 0.15$  kg/h/d) were significantly ( $P < 0.01$ ) higher compared with PO calves. Although the SimPO cow weight loss was greater ( $-0.63 \pm 0.31$  vs.  $-0.35 \pm 0.21$  kg/h/d) ( $P < 0.01$ ), there was no difference between the two breeds in terms of cow reproductive performances (post-partum estrus, service per conception, and days open). It can be concluded that the productivity of SimPO cows at the first generation was better than the PO cows in terms of calf performances, while in terms of their reproductive performances there was no different.

**Keys words:** Simmental-*Peranakan Ongole* crossed cows, *Peranakan Ongole* cows, productivity

### INTRODUCTION

*Peranakan Ongole* (PO) cattle are one of local breed cattle that genetically have a high adaptability to the tropical environment such as temperature, humidity and feed (Wijono et al., 2003 cited Aryogi, 2006). Nowadays people are concern on the degradation of productivity because of decreasing the genetic quality of local cattle due to negative selection and inbreeding (Suryana, 2000 cited Aryogi, 2006). Furthermore stated that local cattle genetic have a large potential to be developed to produce superior beef production, reproductive efficiency, and ability to adapt to environmental conditions (Wijono et al., 2003). Efforts to improve the productivity of local cattle, which increases the rate of growth and reproductive efficiency, according to Wijono et al. (2003), could be done by improving the genetic quality through selection or cross breeding with imported cattle to take advantage of heterocyst. Therefore the government have program to improve the genetic quality of local cattle with artificial insemination using *Bos Taurus* cattle cement, including cement of Simmental cattle.

Currently, cross breeding program has been running for more than 20 years. Many farmers who at the beginning keep PO cows decided to keep Simmental-PO crossbred cattle due to the larger body size, as reported by Munfaati (2005) that the average SimPO cows weight around 4 to 5 year old was  $354.3 \pm 33.4$  kg, while the average weight of PO cows was  $234.7 \pm 48.1$  kg. Ariyanti (2010) reported that adult SimPO cows have a heart girth of  $170.75 \pm 1.90$  cm, height withers of  $128.68 \pm 1.00$  cm, body length of  $119.73 \pm 1.43$  cm, high hip of  $132.75 \pm 0.93$  cm, and wide hips of  $46.75 \pm 0.67$  cm, which were significantly higher than the PO cows that were  $156.52 \pm 2.16$  cm,  $121.57 \pm 1.03$  cm,  $105.26 \pm 1.21$  cm,  $127.31 \pm 0.93$  cm, and  $41.68 \pm 0.76$  cm, respectively. SimPO cows also have a calf with birth weight of 31.1 kg, greater than the PO calf that was 25.4 kg (Talib and Siregar, 1999), and the average daily gain up to age 6 mo was 643 g/h/d, higher than PO calf (516 g/h/d) (Bestari et al.,

1999). Wahyono cited Aryogi (2006) reported, on SimPO and PO cow performances in Central Java, East Java, and Yogyakarta, birth weight of PO female calf was  $21.80 \text{ kg} \pm 2.90 \text{ kg}$ , while for male was  $25.30 \pm 13.30 \text{ kg}$ , male calf weaning weight (205 days) was  $155.70 \pm 14.10 \text{ kg}$  and female was  $154.30 \pm 13.30 \text{ kg} \pm 14.10 \text{ kg}$ , adult weight (2.5 year old) for male was  $234.10 \pm 34.80 \text{ kg}$  and for female was  $206.10 \pm 34.80 \text{ kg}$ . SimPO male calf birth weight was  $41.10 \pm 3.90 \text{ kg}$  and  $35.50 \pm 6.70 \text{ kg}$  for female, male weaning weight (205 days) was  $170.10 \pm 6.50 \text{ kg}$  and female was  $167.70 \pm 8.70 \text{ kg}$ , adult (2.5 year old) male weight was  $289.60 \pm 14.90 \text{ kg}$  and female was  $263.20 \pm 9.30 \text{ kg}$ . Aryogi (2005) after did research in East Java reported that SimPO calf birth weight was  $30,80 \pm 0,48 \text{ kg}$ , PO calf was  $18,93 \pm 0,42 \text{ kg}$ , SimPO calf weaning weight (205 day old) was  $165,04 \pm 4,52 \text{ kg}$  and PO was  $127,72 \pm 2,07 \text{ kg}$ , ADG of SimPO calf was  $0,657 \pm 0,022 \text{ kg/h/d}$  and PO was  $0,507 \pm 0,018 \text{ kg/h/d}$ . Cow weight at calving for SimPO cows was  $333,68 \pm 28,21 \text{ kg}$  and  $298,88 \pm 0,65 \text{ kg}$  for PO; SimPO cow weight at 4 mo after calving was  $277,96 \pm 25,58 \text{ kg}$  and  $257,05 \pm 2,83 \text{ kg}$  for PO. These studies have shown that cows SimPO performances were greater than PO, it was caused by the fact that the original Simmental bull adult weight was 1150 kg, and adult female was 800 kg (Anonimus, 2002b). In terms of reproductive ability, there were no significant difference between two breeds in term of PPE. PPE of SimPO cows were  $119.34 \pm 0.12$  days, almost the same as PPE of PO cows ( $117.18, \pm 0.62$  days). The fact in the field indicates that the management of all cows at the farmer level was not different.

Theoretically, SimPO cow need better daily management, including feed. SimPO cow need more nutrients than the PO cow due to the bigger body size they have, but in fact, at the farmer management level, the farmers give same treatment. Research by Randel (1990) showed that lack of energy and protein in pre partum and post partum periods will cause a delay of first post partum estrus, reduced conception rate and reduced days open. Since the cow productivity of SimPO cows at the farmer management level has not been known yet, this research was carried out to explore the productivity of SimPO compared to PO cows at Bambanglipuro, Bantul, Yogyakarta.

## MATERIALS AND METHODS

The study used 17 SimPO cows and 19 PO cows, at the second parity, aged about 4-5 years, seven mo pregnancy, kept by the farmer at Bambanglipuro, Bantul District, Daerah Istimewa Yogyakarta. In addition to looking at the inseminator records, gestation period was also checked by rectal palpation. The experiment was conducted in June 2003 to June 2004. During the study, all the animals were kept by the owner, placed in a simple housing; every morning around at 1000 h. all the animals were brought outside of the housing for about 2-5 hours. Feed given to each animal was in accordance with given by the owners. Part of the feed given in house, while others was given when the cows were outside the house. Body weight was measured each month. Calving score and calf vigor score was done at calving (Wiley et al., 1991 cited Baliarti, 1998). Weighing of the cow and the calf were done each month until the calf reach 3 mo old. Feed consumed was calculated by weighing the feed during three days each month. Data collected were post partum estrus, service per conception, days open, calf birth weight, weight of calf aged 4 mo, ADG of the calf. T-test analysis was done to identify whether there was any difference in the productivity between two breeds or not, unless for conception rate which was analyzed using Chi-Square test (Steel and Torrie, 1991).

## RESULTS AND DISCUSSION

The result indicated that calves born from cows SimPO (proportion of blood Simmental 50% 50% PO) had significantly greater ( $P < 0.01$ ) birth weight, weaning weight, and weight gain pre-weaning calves SimPO (the proportion of 75 blood % Simmental 25% PO) than PO calves (100% PO) (Table 1). Table 1 showed that there is an increase of birth weight from 32.17 kg to 37.47 kg, the increase was approximately 16.5%, the weight age of four mo was increased from 109.15 to 153.97 kg, the increase was 44.82 kg or 41.06%, ADG was increased from 0.72 kg to 1.04 kg, the increase was 0.32 kg or 44.45%. Pre-weaning weight gain of calves was caused by the presence of genetic improvement, it was in line with the research by Aryogi (2005) and the increase was supported by the cows milk

production, unfortunately in this study, milk production data was not recorded. Milk production is influenced by genetics and feed. In terms of feed provided by farmers, the results showed that both the quantity and quality of feed given by farmers for SimPO and PO cows did not differ significantly, even the consumption of crude protein per unit weight tend to be higher in the PO cows. Calf weight gain was relatively high, this can be achieved because the quality of the parent and feed given to the cows was relatively good (Table 2).

Bodyweight of cows at calving up to 4 mo after calving, body weight of calves from birth up to 4 mo olds is presented in Table 1.

**Table 1.** Cows and calves bodyweight of SimPO and PO cattle

	SimPO	PO	Significance
Cows weight at calving, kg	463.70 ± 47.29	349.90 ± 63.34	**
1 mo after calving, kg	441.65 ± 45.21	334.63 ± 62.57	**
2 mo after calving, kg	419.27 ± 53.94	330.23 ± 59.07	**
3 mo after calving, kg	412.16 ± 54.83	317.94 ± 54.29	**
4 mo after calving, kg	405.05 ± 50.68	302.71 ± 38.84	**
Lost weight, kg/d	-0.63 ± 0.31	-0.35 ± 0.21	**
Pregnancy, days	284 ± 12	288 ± 15	ns
Postpartum an-estrus, days	56 ± 6	60 ± 8	ns
Calving interval, days	576 ± 201	683 ± 238	ns
Service per conception	1.75 ± 1.0	2.43 ± 1.40	ns
Conception rate, %	56.25	28.57	ns
Birth-weight, kg	37.47 ± 5.03	32.17 ± .08	**
% birth-weight	8.09 ± 0.85	9.40 ± 1.58	*
4 mo old, kg	153.97 ± 25.28	109.15 ± 19.93	**
ADG 4 mo old, kg	1.04 ± 0.30	0.72 ± 0.15	**

\*P<0.05

\*\*P<0.01

<sup>ns</sup>Non significant

Results of the study (Table 1) indicated that the bodyweight of SimPO cows after birth, significantly higher than bodyweight of PO cows (P<0.01) as well as bodyweight from one up to four mo after birth, however, there was a tendency that bodyweight of cows up to for mo after birth significantly decreased (P<0.01) compared to bodyweight at calving, the decrease was -0.63±0.31 and -0.35 ± 0.21 kg/head/day, respectively for SimPO and PO cows. The greater weight loss could be caused by the growth of SimPO calves significantly higher (1.04 ± 0.30 kg/head/ day) PO calves (0.72 ± 0.15 kg head/day), while the feed given to SimPO and PO cows was the same. Figure 1 showed that under feed was given as Table 2, the cows lost their weight, indicating that the feed is not sufficient to meet basic living needs of the cows at milking condition. Up to 4-month feeding period, weight loss trend was sharpened, so that if the calf is not weaned, it will soon decrease body conditions of the cows. The cows which has body condition score less than 3, will greatly interfere reproductive activities, due to the fact that body condition score has great effect on the occurrence of estrus, service per conception and pregnancy rate of the cows.

Birth weight and average daily gain of SimPO calves was significantly higher (P<0.01) than those of PO calves, as presented in Table 1. The same result was found on the bodyweight of calves at four mo olds. Each month, bodyweight of the calves increased significantly, mainly for SimPO calves, as presented in Figure 2. At four mo olds, bodyweight of SimPO calves was 153.97 ± 25.28 kg, while PO calves was 109.15 ± 19.93 kg. The higher bodyweight and average daily gain of SimPO calves was understandable, since the SimPO calves contains Simmental blood, this breed of cattle is well known as large body size and high performances cattle, mainly if it supplied by good quality and quantity of feed.

During the study, it was found that feed offered to the cows were consisted many types of roughages, this types of feed offered to the cows was not fixed, it was depended on the availability of those feed, each day, at least three or four types of those feed were offered to the cows. The types of feed given by the farmers were native grass, elephant grass, rice straw, maize straw, peanut straw,

leaves, sugarcane, cassava leaves, bean leaves, the heart of banana, banana stem, rice bran, cassava tofu by-product, soybean straw and soybean peel. The research was conducted during the rainy season, while milking periods of the cows was fall in the end of rainy season up to the dry season, it could be support why the cows loss their bodyweight and poor body condition score they have.

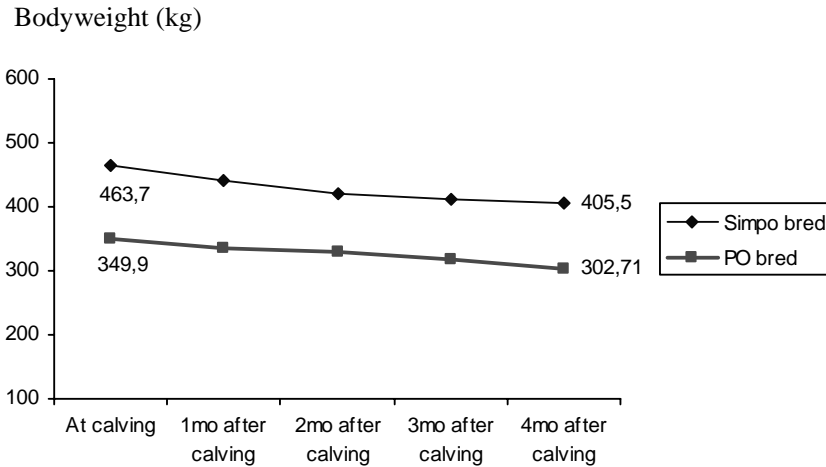


Figure 1. Cows bodyweight after calving

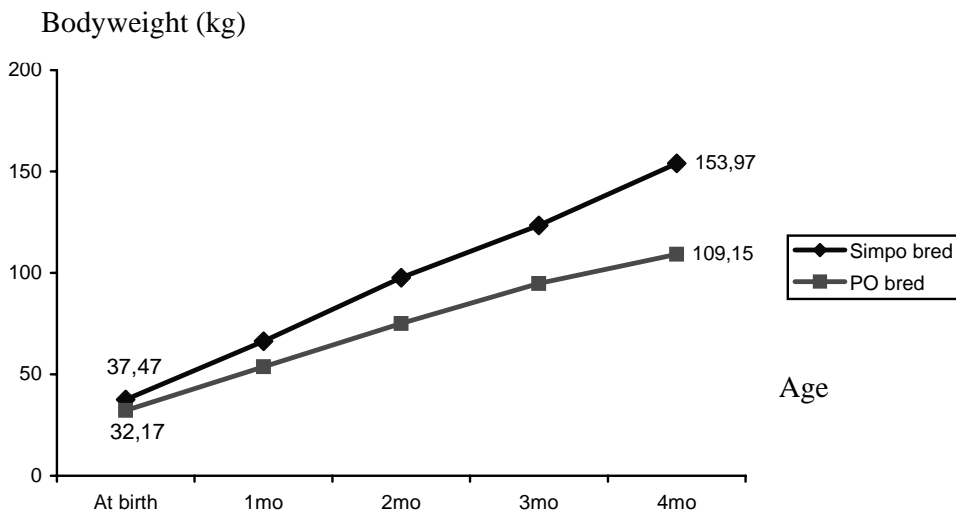


Figure 2. Calves bodyweight

Nutrient requirements and intakes of cows at the first, second and third month after calving is presented in Table 2. There is a tendency that PO cows consume more nutrients compared to SimPO cows, either for dry matter (DM), crude protein (CP) and total digestible nutrients (TDN) intakes. Except for TDN which the intake was less sufficient, nutrient intakes generally was found sufficient, the intakes was relatively higher than the requirements, for example, at the first month after calving, DM intakes of SimPO cows was  $26.68 \pm 8.15 \text{ g/kg}^{0.75}/\text{d}$ , whereas the requirement was  $22.00 \text{ g/kg}^{0.75}/\text{d}$ . However, TDN intakes of both cows breed was less than the requirement, therefore, the cows loss their bodyweight after calving. Apparently, sufficient intakes of DM and CP can not prevent the body weight lost of cows after calving.

In terms of reproductive performance, it was found that there was no significant different on postpartum an-estrus, calving interval, S/C, and conception rate between SimPO and PO cows. (Table 1). In this study, observations of the cows was initiated since the cow was in the third trimester of

gestation period in the mo of June, July and August, followed by the birth which occurred in the month of August, September, October (dry seasons). However, due to the location of the study include the relatively fertile agricultural area, the cows still have body condition score between 2.5 to 3.5 although the cows was in milking period and its reproduction performances (postpartum an-estrus, calving interval, S/C, and conception rate) remains in the normal condition.

**Tabel 2.** Feed intake of the cows (g/kg<sup>0.75</sup>/d)

1 <sup>st</sup> mo after calving	SimPO	PO
DM intake	26.68 ± 8.15	30.37 ± 15.14
DM requirement	22.00	22
CP intake	3.90 ± 1.73	5.12 ± 1.99
CP Requirement	2.33	2.33
TDN intake	12.35 ± 3.41	15.28 ± 5.65
TDN requirement	13.14	13.14
<b>2<sup>nd</sup> mo after calving</b>		
DM intake	33.03 ± 11.53	27.86 ± 8.89
DM requirement	22	22
PK intake	5.03 ± .80	6.22 ± 2.22
PK requirement	2.33	2.33
TDN intake	15.17 ± 5.58	12.47 ± 4.41
TDN requirement	13.14	13.14
<b>3<sup>rd</sup> mo after calving</b>		
DM intake	26.99 7.14	27.48 ± 5.37
DM requirement	22	22
PK intake	4.69 2.10	5.59 ± 1.80
DM requirement	2.33	2.33
TDN intake	13.84 4.22	12.18 ± 3.29
DM requirement	13.14	13.14

## CONCLUSIONS

From the study it can be concluded that first generation of SimPO cows with a relatively good feeding will produce better calves than PO cows, while reproduction aspects of both cows was remain the same.

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