

# Observation of infant body weight and physiological conditions of Siamang (*Symphalangus syndactylus*) in ex situ conservation

Tetty Barunawati Siagian<sup>1,\*</sup>, Desi Qisti Mawada<sup>1,2</sup>, Aidell Fitri<sup>2</sup>

<sup>1</sup> Study Program of Veterinary Paramedic, School of Vocational, IPB University, Bogor

<sup>2</sup> Animal Sanctuary Trust Indonesia, Bogor

**ABSTRACT:** The purpose of this study was to describe the infant body weight and physiological parameters of a Siamang (*Symphalangus syndactylus*) treated at an ex situ conservation station. This study used an infant Siamang, which was estimated to be  $\pm 3$  months old. Body weight parameters were determined based on weekly weight gain for one month. The physiological parameters measured were the heart rate, pulse rate, respiration rate, and rectal temperature. Physiological parameters were measured in the morning and evening for 14 d. The results showed that the average heart rate of infant in the morning was  $202 \pm 11.5$  BPM and in the afternoon was  $184 \pm 14.9$  BPM, the average pulse rate in the morning was  $189 \pm 8.5$  BPM and in the afternoon was  $174 \pm 7.8$  BPM, the average respiration rate in the morning was  $58 \pm 6.8$  breaths per minutes and in the afternoon was  $60 \pm 6.3$  breaths per minutes, and the average rectal temperature in the morning was  $37.1^\circ\text{C}$  and  $37.6^\circ\text{C}$  in the afternoon. The body weight and physiology of the infant were good.

## Keywords:

body weight, physiology, infant, siamang, ex situ conservation

## INTRODUCTION

Siamang (*Symphalangus syndactylus*) is an endangered and protected endemic animal in Indonesia. Siamang occupies a tropical forest. Siamang female mothers care for their young together with wild males (Supriatna & Wahyono 2000). Siamang mothers are often hunted and traded. As a result, the siamang lost its mother and became an orphan. Infants require human intervention to survive outside their habitat (Lappan 2008). The infant is cared for, and its growth is monitored during ex situ conservation. Care and monitoring of infant growth includes feeding and physical examinations. Providing food for infant growth. A physical examination was performed to determine the physiological condition of the infant. Information regarding infant growth performance and physiological status of siamang is still minimal and usually uses the physiological status of human babies. Information on the physiological status can help determine the health status of infant siamangs. This study aimed to determine infant body weights and physiological conditions in the Animal Sanctuary Trust Indonesia (ASTI) in Bogor, West Java, Indonesia.

## MATERIALS AND METHODS

This study included a male infant, siamang, aged  $\pm 3$  months. The infant weighed  $\pm 950$  g. This research was conducted at the ASTI in Bogor, West Java, Indonesia. Weight monitoring was performed by weighing the infants once per week using an analogue scale. Examination of the physiological status of the infant was carried out twice a day, namely in the morning (AM) at 08.00-09.00 WIB and in the afternoon (PM) at

15.00-16.00 WIB. The examination was performed over a period of 14 days. The physiological data collected included heart rate, pulse rate, respiration rate, and rectal temperature. The heart rate was measured using a stethoscope. Pulse rate was measured using the thumb and forefinger placed on the medial area of the femur. The respiration rate was determined by observing the rise and fall of the infant's chest. The rectal temperature was measured at the anus using a digital thermometer. Body weight and physiological status data were analysed qualitatively and quantitatively.

## RESULTS AND DISCUSSION

The results of measuring the infant weight (Table 1) showed that there was an increase in body weight of 30 g per week, except that in the 4th week, there was a significant weight gain of 70 g. This increase in body weight correlates with infant growth.

Table 1. Infant weight gains of siamang per week at the Animal Sanctuary Trust Indonesia (ASTI) Ex situ Conservation Station in Bogor, West Java, Indonesia<sup>1</sup>

Week	Body weight (g)
1	1.020
2	1.050
3	1.080
4	1.150

The increase in body weight of the infant was due to routine feeding. Infant siamang are given 16 g of instant baby

Received: 29-10-2023 | Revised: 21-11-2023 | Accepted: 25-11-2023

© 2023 CC-BY-SA. This is an Open Access article distributed under the terms of the Creative Commons Attribution ShareAlike 4.0 International License (<https://creativecommons.org/licenses/by-sa/4.0/>).

porridge with a rate of 2 times a day, namely in the morning and afternoon. Formula milk or goat milk was given every 2-3 h at a rate of 5-7 times a day, 10 ml/g body weight (Yana 2015). Hard food can be consumed by infants at 12 weeks of age (Gage 2002).

As shown in Table 2, the average heart rate of the infants was 202 BPM, with a range of 184-220 BPM in the morning and 184 BPM, with a range of 172-208 BPM in the afternoon. The heart rate of infants is higher than that of long-tailed babies (163 BPM) (Nakayama *et al.* 2020). The average pulse rate in the morning was 189  $\times$ /min, with a range of 176-200  $\times$ /min and in the afternoon, 174  $\times$ /min, with a range of 160-192  $\times$ /min. The pulse rate was lower than the heart rate because it is a manifestation of the heart. The heart and pulse rates are higher in the morning than in the afternoon owing to the higher activity in the morning and the influence of environmental heat (Sari *et al.* 2016). The infant activity was higher in the afternoon than in the afternoon.

The average respiration rate of infants in the morning was 58  $\times$ /min, with a range of 44-60  $\times$ /min and in the afternoon, it was 60  $\times$ /min, with a range of 56-76  $\times$ /min. The respiration rate of infants is higher than that of *Macaca fascicularis* (30-54  $\times$ /min) (Mangkoewidjojo 1988), but when compared with human babies (45-60  $\times$ /min), it is still within the normal range (Fleisher *et al.* 2002). The respiration rate of infants was slightly higher in the afternoon owing to environmental humidity. Environmental humidity in the afternoon is higher than that during the day, resulting in increased respiration for sufficient oxygen uptake (Suprayogik *et al.* 2017).

Table 2. Daily physiological profile of an infant siamang at the Animal Sanctuary Trust Indonesia (ASTI) Ex situ Conservation Station in Bogor, West Java, Indonesia

Day	Heart rate (BPM)		Pulse rate (BPM)		Respiration rate (BPM)		Rectal temperature (°C)	
	AM	PM	AM	PM	AM	PM	AM	PM
1	200	192	176	168	44	68	37.1	37.5
2	220	180	200	176	56	56	37.8	37.4
3	204	208	192	192	52	64	37.7	37.5
4	200	196	188	180	52	64	37.1	37.6
5	216	200	188	180	72	76	37.1	n.a.
6	212	208	192	180	60	60	37.1	n.a.
7	216	188	200	160	68	56	36.6	n.a.
8	208	172	196	168	60	56	37.2	n.a.
9	200	172	196	172	56	56	36.7	n.a.
10	200	160	196	172	60	52	36.7	n.a.
11	192	172	184	168	56	56	37.1	n.a.
12	184	180	176	180	60	60	37.2	n.a.
13	192	176	180	172	60	56	37.1	n.a.
14	184	172	180	172	60	60	37.1	n.a.
Mean $\pm$	202 $\pm$	184 $\pm$	189 $\pm$	174 $\pm$	58 $\pm$	60 $\pm$	37.1 $\pm$	37.5 $\pm$
SD	11.5	14.9	8.5	7.8	6.8	6.3	0.3	0.1

Note: BPM=beats per minute, AM=ante meridiem, PM=post meridiem, SD=Standard Deviation.

The average rectal temperature of infants in the morning is 37.1°C, with a range of 36.6-37.8°C and in the afternoon, 37.5°C, with a range of 37.5-37.6°C. The body temperatures of the infants in the morning and evening were not significantly different. Rectal temperature checks in the afternoon were only carried out until the 4th day with the aim of minimizing stress on the infant. The body temperature of infants is higher than that of baby orangutans, namely 36.0-36.5°C (Dharmalingam 2015).

## CONCLUSION

Observations of an infant being cared for by humans in an ex situ conservation area showed an increase in body weight of 30 g/week. The physiological parameters of the gibbon baby were in good condition, with an average heart rate of 202 BPM in the morning and 184 BPM in the afternoon, pulse rate of 174 BPM in the morning and 189 BPM in the afternoon, respiratory rate of 58 BPM in the morning and 60 BPM in the afternoon, and rectal temperature of 37.1 in the morning and 37.5 °C in the afternoon.

## AUTHOR INFORMATION

### Author for Correspondence

\*TBS: tettyvirus@gmail.com

Study Program of Veterinary Paramedic, School of Vocational, IPB University. Jl. Kumbang No.14. RT.02/RW.06, Babakan, Kecamatan Bogor Tengah, Kota Bogor, 16128, West Java of INDONESIA.

## REFERENCES

- Dharmalingam S. 2015. Temperature management in infant orangutan (*Pongo pygmaeus*) at Orangutan Island, Bukit Merah, Perak, Malaysia. *Meerit Research Journal of Medicine and Medical Sciences*. 3(11):497-501
- Fleisher GR, Ludwig S, Silverman BK. 2002. *Synopsis of Pediatric Emergency Medicine*. 4th ed. Philadelphia (US): Lippincott Williams and Wilkins.
- Gage LJ. 2002. *Hand-Rearing Wild and Domestic Mammals*. Iowa (US): Blackwell Publishing.
- Lappan S. 2008. Male care of infants in a siamang (*Symphalangus syndactylus*) population including socially monogamous and polyandrous groups. *Behavioral Ecology and Sociobiology*. 62:1307-1317.
- Nakayama S, Koie H, Pai C, Fujishiro YI, Kanayama K, Sankai T, Yasutomi Y, Ageyama N. 2020. Echocardiographic evaluation of cardiac function in cynomolgus monkeys over a wide age range. *Experimental Animal*. 69(3):336-344.
- Sari SRPW, Suartha IN, Batan IW. 2016. Status praesen pedet sapi bali. *Buletin Veteriner Udayana*. 8(1):36-43.
- Suprayogik A, Alaydrussanu G, Ruhyana AY. 2017. Nilai hematologi, denyut jantung, frekuensi respirasi, dan suhu tubuh ternak sapi perah laktasi di Pangalengan. *Jurnal Ilmu Pertanian Indonesia (JIPI)*. 22(2):127-137.
- Supriatna J, Wahyono EH. 2000. *Panduan Lapangan Primata Indonesia*. Jakarta (ID): Yayasan Obor Indonesia.
- Yana Y. 2015. Pola makan bayi 0-12 bulan [Internet]. [Diakses 2023 Ags 1]. Tersedia pada: <https://hamil.co.id/bayi/makanan-bayi/pola-makanan-bayi>.