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Proceedings of 3rd International Wildlife Symposium

October 18-20, 2016

"Conserving Sumatran Wildlife Heritage for Sustainable Livelihood"

Institute for Research and Community Service
University of Lampung

LEMBAR HASIL PENILAIAN
SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : PROSIDING DAN MAKALAH YANG DIPRESENTASIKAN

Judul Makalah (Paper) : Social Behavior of Spotted Deer (Axis axis) in Gunung Madu Plantations Inc. Sanctuary Lampung Tengah District Lampung
Jumlah Penulis : 3 Orang
Nama-nama Penulis : Rita Gusmalinda, **Baisah Sari Dewi**, dan Niskan Walid Masruri
Status Penulis : Penulis Pertama/ **Penulis ke Dua**/ Penulis Korespondensi **)

Identitas Prosiding
- a. Judul Prosiding : Proceeding of 3rd International Wildlife Symposium (Oktober 2016)
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Kategori Publikasi Makalah (*beri tanda V pada kategori yang tepat*)

- [V] Prosiding Forum Ilmiah Internasional (Dipresentasikan secara Oral Dimuat dalam Prosiding)
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SEJAWAT SEBIDANG ATAU PEER REVIEW
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LEMBAR PENGESAHAN

Judul Poster	:	*Social Behavior Of Spotted Deer (Axis axis) In Gunung Madu Plantations Inc Sanctuary Lampung Tengah District Lampung Province Indonesia*
Penulis	:	Gusmalinda, Rita, **Bainah Sari Dewi**, dan Masruri, Niskan Walid
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Instansi	:	Jurusan Kehutanan, Fakultas Pertanian, Universitas Lampung
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Lokasi	:	Bandar Lampung. , 18 - 19 Oktober 2016,
Penyelenggara	:	*International Wildlife Symposium*

Bandar Lampung, 06 Juli 2020

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INTERNATIONAL WILDLIFE SYMPOSIUM

Sekretariat: Kantor Puslitbang Lingkungan Hidup
Lembaga Penelitian dan Pengabdian kepada Masyarakat Universitas Lampung
Gedung Rektorat Unila Lt. 5Jl. Sumantri Brojonegoro No.1 Bandar Lampung 35145

Bandar Lampung, September 22, 2016

Subject: Notification of Acceptance

Dear Madame/Sir,
Rita Gusmalinda *et al.*

We are happy to inform you that your paper entitled **"Social Behavior Of Spotted Deer (Axis axis) In Gunung Madu Plantations Inc. Sanctuary Lampung Tengah Lampung Province Indonesia"** is accepted to be presented in the International Wildlife Symposium "Conserving sumatran wildlife heritage for sustainable livelihood", that will be held in University of Lampung, October 18-20, 2016. Your paper will be in the section of Applied conservation.

For your reminder, the International Wildlife Symposium program will be:

October 18, 2016
Keynote Speakers: Dr. Ir. Siti Nurbaya Bakar, M.Sc. (Minister of Environment and Forestry), Dr. Ashley Brooks (WWF Tigers Alive Initiative), Dr. Barney Long (Global Wildlife Conservation), Dr. Jatna Supriatna (University of Indonesia), and Dr. Siti Nur Hidayati (Middle Tennessee State University).
Workshop: "The Future of Sumatran Wildlife Conservation Program" (by Dr. Sunarto_WWF Indonesia).

October 19, 2016: Paper presentation
October 20, 2016: Fieldtrip

We are looking forward to seeing you soon. If there is any question, please feel free to contact us.

Sincerely yours,
Chairman of the committee

Dr. Erdi Suroso, S.T.P., M.T.A.

Regards,

Dr. Endang Nurcahyani, M.Si.

ISBN: 978-602-0860-13-8

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SOCIAL BEHAVIOR OF SPOTTED DEER *(Axis axis)* IN GUNUNG MADU PLANTATIONS INC. SANCTUARY LAMPUNG TENGAH LAMPUNG PROVINCE INDONESIA

Rita Gusmalinda [1], Bainah Sari Dewi[2,3], Niskan Walid Masruri[2,3]

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ABSTRACT

Deer holds important role to the ecosystem equilibrium due to its level in food chain as consumerg herbivore. Conservation effort through the species and habitat preservation has to be concern in terms of prevention through its extinction. The research in to social behavior of spotted deer (Axis axis) in Gunung Madu Plantations Inc.Sanctuary, Lampung Tengah, Lampung Province Indonesia, in January 2016. Adlibitum sampling and scan sampling method was used in the research. The results shown that rubbing antlers behavior mostly done by stag K (41,59%), grooming behavior mostly done by doe N (98,32%), grazing behavior mostly done by stag Q (11,46%) while interacting with human behavior was done by stag K about (31,25%). Furthermore, avoiding human behavior mostly done doe O and Q about (12,82%).

Key words : Spoted Deer, Social Behavior, GMP, Adlibitum Sampling, Scan Sampling.

PRELIMINARY

The wildlife is a component of the ecosystem that ensure the sustainability of the energy cycle. Obliteration of a species (flora / fauna) will affect the balance of the ecosystem, which in turn will affect other components of the ecosystem, because the elements forming the system constantly interacts with its environment. Various efforts have been made to protect the wildlife and at the same time use it wisely. Furthermore, spoted deer *(Axis axis)* is potential to be utilized, especially its meat, horns, and skin (Garsetiasih and Herlina, 2005).

Captive cage PT. Gunung Madu Plantations, Lampung Tengah, subdistrict Lampung Privince Indonesia is a sanctuary is a realization of *ek-situ* conservation efforts to maintained and breed the spotted deer *(Axis axis)* in order to establish and develop new habitats as a of protection and nature conservation. Aside from being a conservation area *ek-situ* captive deer in PT. GMP also as a hobby of the owner of PT. GMP. Unfotunately, inapropri habitat for spotted deer caused the change of its structural patterns and social activities. The condition of captive cage under the area of 0.08 ha constructed a social structure when *grazing, grooming,* interaction with humans and rubbing antlers.

Spotted deer have reddish brown skin, filled with large white spots. There is a dark line that runs along the back. Abdomen and legs are white. On the neck there is a section of white, dark colored snout when compared to other parts of the face. Its tail is larger than the deer species in general.

Stag has antler horn as a desense property. Spotted deer antler has three branches as well as other tropical deer, which didn't tall out in certain season. The body of spotted deer (from nose to base of tail) is about 110 - 140 cm, tail length 20 - 30 cm, height 97 cm and 75- weight ranged between 75 - 100 kg. Life span spotted deer ranged between 8-30 years. Characteristic of spotted deer has a chest circumference of 75-79 cm, has a long tail of 20-30 cm, shoulder height 110-40 cm, and weighs 75-100 kg of (Fajri, 2000).

Breeding habitat is different from the natural habitat. Based on the characteristics of their habitat, the breeding habitats are improved nutrition, and intraspecific competition for food, reduced predation by natural predators, parasites and disease and increased contact with humans (Dewi and Wulandari, 2011). Spotted deer *(Axis axis)* is not an endemic

species that originated from Indonesia but developed by many the breeding attempts. The original habitat of these animals come from Nepal, Bangladesh, India, Bhutan, Sri Lanka and Pakistan. *Ex-situ* conservation is an important part of an integrated conservation strategy to protect endangered species and supporting approach (Robinshon, 1987).

The introduction of spotted deer (*Axis axis)* in Bogor, West Java occurred in 1814, when it was brought by Sir Thomas Stamford Raffles who import these kind of deer from Nepal and India. The initial purpose in doing this was to for hunting sport that often played by the English nobility. Until now, the population of spotted deer (Axis axis) contained in Bogor Palace ranged between 600-800 taol. In addition, exclude the Bogor palace area there is also a wildlife breeding for spotted deer *(Axis axis)* in various places, one the that is PT. Gunung Madu Plantations (GMP) Lampung Tengah which has ten spotted deer.

Research on the social behavior of spotted deer need to be done because the nature of the deer whotend to live in groups. If the social behavior of spotted deer can be managed goodly, the breeding success can be appraised by the increase of spoted deer population.

RESEARCH METHODS

Location and Time Research

The research was conducted in January 2016 covering the preparatory phase of the data and proceed with the processing and analysis of data. The location of research is done in a breeding cage PT. GMP Lampung Tengah with an area of 0.08 ha (Figure 1).

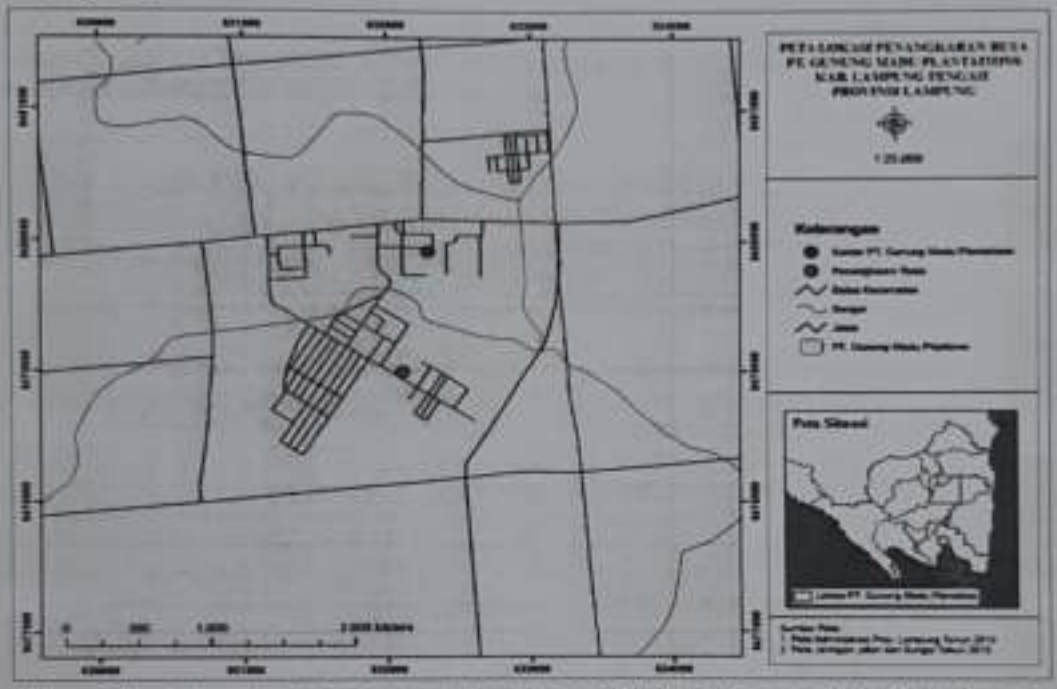

Figure 1. Map of the study spotted deer *(Axis axis)* location social behavior Gunung Madu Plantations Inc. Sanctuary (Setiawan, 2015).

Data on the social behavior of spotted deer *(Axis axis)* contained in captivity PT. GMP using *Ad libitum sampling* methods that record the behavior of certain of wildlife for example communication between two individual or more (Sionora, 2010). All spesific gestures on communication or behavior which often done by deer was colected, such as grooming behavior, rubbing antlers and interaction with humans. The observations described descriptively through tabulation of data and graphs. Behavior data about collected by grazing using *scan sampling* method (Altman, 1978; Subagyo, Arfan, Siburian, 2008; Putra, 2016). Observations were made directly and recorded at intervals of 60 minutes (Subagyo *et all,* 2008). The results of the observations will obtain a frequency behavior of each individual adjacent.

Tools and materials

The tools used in this research are: digital cameras, binoculars, digital watches, stationery, tally sheet, Ms. Office and laptop. The object of research is ten spotted deer *(Axis axis)* contained in captivity Inc. GMP.

Analysis method

The collected data was analyzed using *adlibitum Sampling* through three behavior rubbing antlers and head (especially males), licking the body (*gromming*), and interacting with humans. While, *Scan Sampling* methods used to observe *grazing* behavioral. Furthermore, the data were analyzed descriptively to determine the percentage of frequency. Calculation of percentage for each individual study conted by formula (Martin and Batcson, 1988; Putra, 2016):

$$\text{Percentage behavior frequency} = \frac{A}{B} \times 100\%$$

Information :

A = frequency of daily Behaviour

B = total number of times per day throughout the Behavior

THE RESULTS AND EXPLANATION

A. Identivication of Spoted Deer

Conservation efforts made in the management of wildlife species that require protection and preservation (Johnson., *et all*,2007). There are 10 spotted deer (*Axis axis*) is divided by the composition of the six male and four female. The division of the composition of individual deer was named with characterized by using a sequence Alphabet H-Q because deer are in a breeding cage. PT.GMP not have a name that used initials during the study. Initials are used to using the information described in Figure 1 follows:

H

I

J

K

L

STRUCTURE INDIVIDUALS OF SPOTTED DEER *(AXIS AXIS)* IN GUNUNG MADU PLANTATIONS INC. SANCTUARY LAMPUNG TENGAH, LAMPUNG PROVINCE INDONESIA

Deer's	Gender	Structure Age	Characteristics
H	Stag	*Adult*	There is a lump in the abdomen
I	Stag	*Adult*	Colored light brown body
J	Stag	*Adult*	body colored dark brown
K	Stag	*Sub Adult*	Antler size small
L	Stag	*Juvenill*	Larger body size compared to stag M
M	Stag	*Juvenill*	The body size is smaller than the stag L
N	Doe	*Adult*	Mother deer's greatest
O	Doe	*Adult*	The body size is smaller than the doe N
P	Doe	*Juvenill*	Larger body size than the doe Q
Q	Doe	*Juvenill*	The body size is smaller than the doe P

M

N

O

P

Q

Keterangan: (1) Stag H; (2) Stag I ; (3) Stag J; (4) Stag K; (5) Stag L; (6) Stag M; (7) Doe N; (8) Doe O; (9) Doe P; (10) Doe Q

Figure 1. Compositional Structure Of Spotted Deer *(Axis Axis)* In Gunung Madu Plantations Inc. Sanctuary Lampung Tengah Lampung Province Indonesia.

B. Conduct Licking Fure Behavior *(grooming)*

Grooming behavior is a manifestation of affection shown from one individual to another individual animals, it is usually performed by the parent to the child or to a neighbor one species (Sionora, 2010). In deer fur, licking behavior patterns of interaction *(grooming)* is usually done by the parent to the child or to the couple. Grooming behavior patterns during the 13-day time study at PT. GMP ten spotted deer can be seen clearly in the following graph:

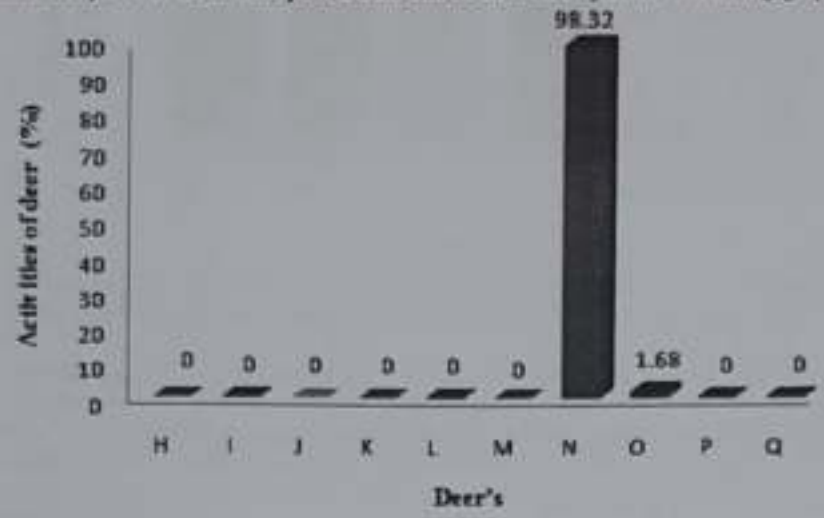

Figure 2. Graph of the deers total interactions licking fur (grooming), 10 spotted deer in the study of social behavior of spotted deer *(Axis axis)* in the GMP Inc. Sanctuary by January 2016.

Graph one explain that the fur licking behavior (grooming) is most performed by a doe spotted N by 98,32% to doe spotted O who is the son of a doe spotted N. The difference in behavior due to the doe spotted N that was the mother spotted deer, the greatest and most dominant in the cage. The doe spotted N have offspring that the doe spotted O (F1), a doe spotted P (F1) and a doe spotted Q (F1). While tendency in grooming, activitiy mostly from doe O, (F1). Those behavior was a behavior that caused by the affectionate relationship between the parent with a child or commonly referred to family reletionships. Those interaction was the earliest evidence of affection toward the mother deer against children and against the opposite sex who mate a doe during mating season (Sionora, 2010).

C. Rubbing Antler Behavior (Particulary Stag)

Antler is one of the character display of secondary sexual characteristic on a stag after reaching puberty, except for two species of deer are deer chinese water *(Hydropotes inermis)* and deer musk *(Moschus chrysogaster)*, both stag and females have antler. The stag's antler has specific character *(phenotype performance)* because it is closely related to the active reproductive period (Handarini, 2006). According to (Semiadi, Wirdateti, and Brahmantiyo, 2008) (Antler) is part of a limb deer mostly basic material is calcium which grew out of the body, on the head, passing through a growth phase and fall in a sustain cycle.

Rubbing antlers iteration is an activity performed by a stag against the other. This is usually done for power, for females or fight over food. Swipe behavior performed by a stag antler to attract doe attention is they matted during the next breeding season, or this behavior is often done because the stag's antler for change want to release the new antler (Suttie and Simpson, 1985). Behavior rubbing antlers found in a breeding cage PT. GMP is performed only by stag the one has antler. There are six doe *(Axis axis)* are presented in the following three graphs:

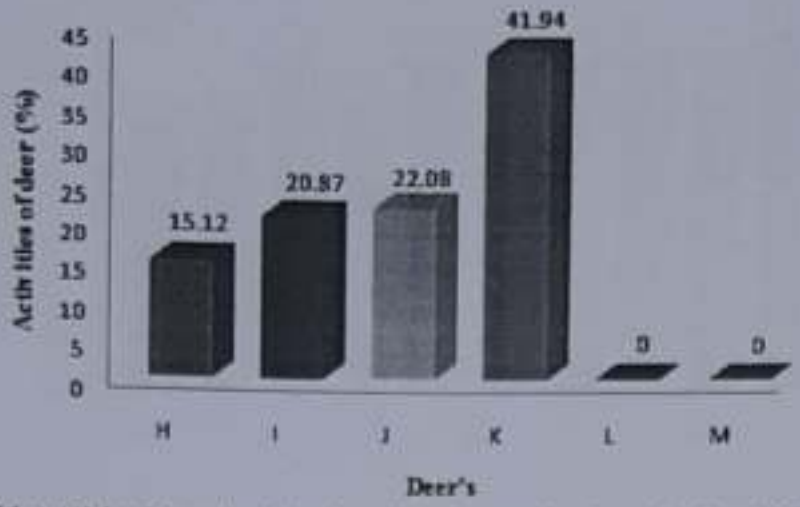

Figure 3. Graph of the total deer interactions in antler rubbing observed by the study of social behavior spotted deer *(Axis axis)* in the Gunung Madu Plantations Lampung Inc. Sanctuary on January 2016.

Stag often conducting rubbing antlers are deer K about 41,94%. Stag spotted deer youngest K is contained in a breeding cage PT. GMP presence in new breeding cage 4 months. Individuals deer K was not a descendant of the individual stag and doe from breeding cage, so its presence often stilling spotlight stags. Individuals stag spotted K often approached, stag spotted J (males blackish brown spots), the cause of frequent interaction of rub antlers was a fight over territory of the area where a sources of grass to consumed. Antler rub longest time lasted for 56 seconds and after that the deer automatically seperated apart back.

Spotted deer H, spotted deer I, spotted deer J, often visited by stag spotted K which often come into the territorial groups of spotted deer (H, I, J), which first became residents in the breeding cage. Spotted deer K, is a doe which has a juvenile antler, while the stag L and M was non shown rubbing antlers behavior beacause it have no horns. Antler rubbing behavior was not always done by the opponent or partner, it might rub the trees or the ground. Behavior rubbing antlers included into *agonistic* behavior which is divided into two categories. The first category, which means that the behavior aggressive threatening or offensive behavior, the second category, which means that the submassive behavior indicated strength and power.

C. The social behavior of grazing

According to Gartesiasih (2007) deer *ex-situ* conservation, the primary requirements to fuldiled was its habitat which stived just like its natural habitat. Because habitat is a place where the life of an organism in a wildlife must grow breed. Grazing is one of the behaviors shown by deer in the daytime both living in the wild or in a breeding cage. Grazing was frequently done in the deer because the deer in the breeding cage PT. GMP was only given feed (drop in) once a day, causing lack of food intake obtained by each individual deer. Deer are herbivorous species that can take various types of forage. According to (Tirtayasa, Ichwan, and Wijaya, 2011) apart from the grass and foliage, deer feed complementary can be concentrates, vegetables, leaves, tubers or other agricultural wastes. Giving pellet contained concentrate was also given to the spotted deers.

The social behavior of grazing GMP Inc. Sanctuary was done by 10 spotted deer *(Axis axis)* which presented in the following graph:

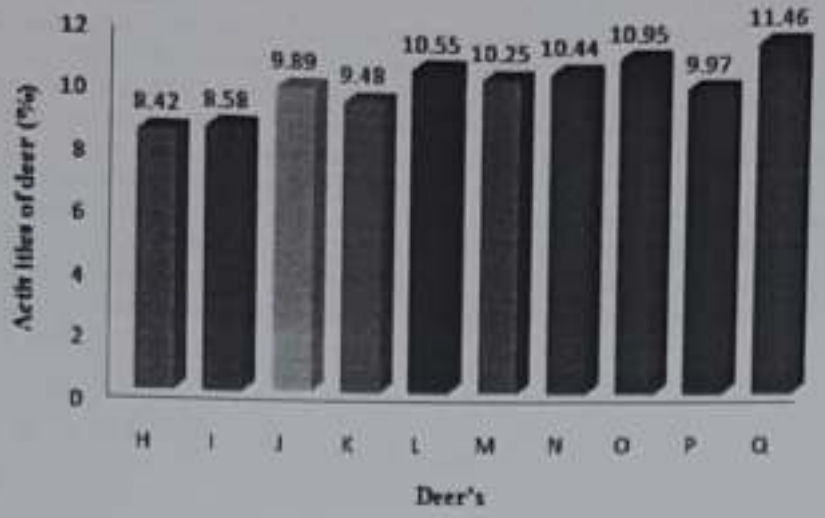

Figure 4. Graph of total interaction on grazing activities on the study of social behavior spotted deer *(Axis axis)* GMP Inc. Sanctuary Lampung Tengah January 2016.

Eating (grazing) is observation was conducted at 7:00 to 17:00 pm in the breeding cage there was a reservoirs of grass as a drop in media feeding that has been provided by the manager of the enclosure GMP Inc. Sanctuary. The graph above explains that the grazing behavior was mostly performed by a doe spotted Q. The difference of behavior pattern level just shown slight diffrent because the spotted deer was seperated into two groups : doe and stag.

Doe shown dominant of the area that growed by natural grass feed within the breeding cage. Doe N, O and Q was frequently has grazing activities in areas surrounding the captivity without having to scramble with the other doe.

D. Social Interaction with Humans

Gunung Madu Plantations Inc.sanctuary Lampung Tengah has a deer guard named Ismoyo that took handle in oversees and provides feed and checking condition. In the natural conditions the animals tend to live in groups and deer will be active at night (nocturnal). Ambient changging for spotted deer *(Axis axis)* caused its structural patterns and social activities undertaken. Spotted deer *(Axis axis)* was taken, and maintained at a certain place with conditions that resemble their natural habitat. *Ex-situ* conservation is done as an effort to management of wildlife species that require protection and preservation of the impact on changing patterns of social behavior. The negative impact of *ek-situ* conservation frequent of direct contact with humans that could affect changes in its primitive of behavior. The social behavior of grazing in a GMP Inc. Sanctuary done by 10 spotted deer *(Axis axis)* which presented in the following charts:

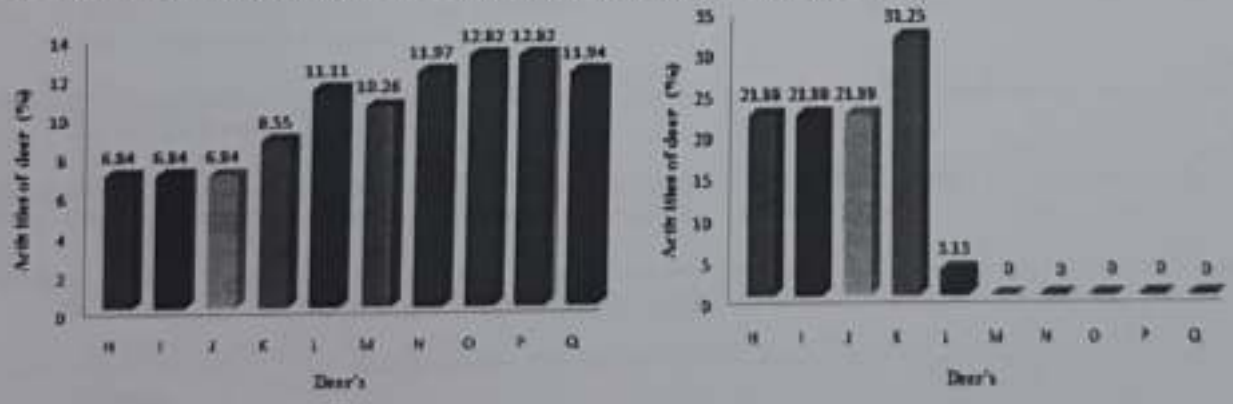

Figure 5. Graph of the deers total interactions with humans (right) and avoid interaction with humans (left) on the study of social behavior of spotted deer *(Axis axis)* GMP Inc. Sanctuary Lampung Tengah January 2016.

Interaction with human activities are in captivity, was usually interaction with the handler or keeper or manager or with visitors. Wildlife behavior is the expression of an animal raised by all the factors that influence it, the movement of individual animals is a strategy of the individual and of wildlife populations to adapt and utilize state of the environment in order to live and reproduce normally (Alikodra, 2002). The conditions when deer interacted human usually upon the guards at the of morning ehen he checked the condition of the deer. Spotted deer which often approaching the human were stag K about to 31,25%, while the doe more often away from humans because its higt sensitify to the state of the environment. The doe should protect children so it was more alert to the threat.

Investigative behavior is suspicious guard interference, its characterized by upholding head silently and looked straight in one direction that considered dangerous. Deer found in PT. GMP still have its primitive behavior, If compared with the deer breeding deer in University Of Lampung Sanctuary. Deer in University of Lampung no longer has a wild nature or original properties, when visitors come, the deer will approach and immediately took the feeds offered or given from visitors (Sionora, 2010).

CONCLUSION

Based on the research conducted in the cage captive deer PT. Gunung Madu Plantations Lampung Tengah, it could be concluded that the percentage of the number of social activities licking fur (grooming) was highest in the doe spotted N (98.32%). Percentage of the higest number grazing social activities was doe spotted Q (11,46%). Percentage of social activities number about rubbing antler was stag spotted K (41,94%). The highest Percentage of the number of interact with human social activities was stag spotted K (31,25%) and the highest percentage of the number of social activities, avoid human interaction was female doe P, O about (12,82%). Breeding habitat that different from the natural habitat caused a lot of changes in physiological and daily behavior patterns of animals.

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