

Profit Analysis of Timor Deer Utilization from Two to Four Years of Age

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ABSTRACT

This research aimed to analyze the profitability of Timor deer (*Rusa timorensis*) beyond sexual maturity from ages 2 to 4 years old. Parameters like carcass, viscera, skin, antler, and velvet from nine bucks were used. Edible meat, skin, antler and velvet were harvested and weighed. Economic profitability was compared for each age groups (2, 3 and 4 year) including the antler and velvet. Descriptive analysis used for comparing Timor deer at different ages were presented. The result of this research showed that the profitability of Timor deer at various ages were 2,236,138; 1,643,957 and 4,283,693 IDR for 2, 3 and 4 years, respectively inclusive of velvet. Inclusive of antler, the profitability Timor deer with varying ages were 2,986,138; 1,993,957 and 3,583,693 IDR for 2, 3 and 4 years, respectively. Based on economic profitability it is therefore most profitable for Timor deer to raise them until 4 years of age (twice the velvet and 0.33 more antler).

Keywords: profit analysis, Timor deer utilization, ages

INTRODUCTION

Venison consumption increased up to 42 kg in 2011 compared to 23 kg in 1961 (Kudrnáčová et al., 2018). The Increase in demand for meat, especially red meat, led to an increase in demand of venison deer. Venison commonly referred to meat from game animals in wild. Venison was preferred by consumer because of very low muscle fat contents consisting predominantly of structural lipid components (phospholipid and cholesterol) that have high proportions of polyunsaturated fatty acids (Hoffman & Wiklund, 2006). Venison has 944 to 1154 kcal per 100 g, crude protein 19 to 20%, low fat content (1.1% to 3.9 %) and 5 to 10

times more vitamins compare to beef (Okuskhanova et al., 2016).

Aside from meat, deer also have high value medicinal product from antler. Young antler is the source of medicinal ingredients. Young antler or commonly called velvet of swamp deer, axis deer and hog deer contain of calcium (22.05-23.44%), phosphorus (10.38-12.62%) and zinc (32.14-35.81 ppm) (Pathak et al., 2001). Red deer velvet contains calcium 34.5-35% and zinc 95-98 ppm (Estevez et al., 2009). Different methods of rearing will be affected by the composition of velvet mineral. Red Iberian deer with free-ranging rearing method will produce the velvet with higher mineral composition compared with farm rearing method

(Landete-Castillejos et al., 2012). In other research on fallow deer the velvet is composed 28.5% calcium, 10.9% phosphorus and 69.79 ppm Zinc (Steiner-Bogdaszewska et al., 2022). and the antler cornification is a source of craft products.

Nowadays, wild animal start to raise in captive breeding including deer. Some red deer captivity breeding was developed in Australia and some country in Europe (Kudrnáčová et al., 2018). Red deer (*Cervus elaphus*) and fallow deer (*Cervus dama*) are two of the most common deer species farmed in Europe (Hoffman & Wiklund, 2006). Whereas Timor deer is the common deer species farmed in Indonesia.

Timor deer is a deer endemic in Indonesia. It is among the protected animals included in Indonesian Government Regulation No. 7/1999 about Preservation Plant and Animal Species (Rasyidi, 2022). Timor deer is a potential deer in Indonesia with the following products such as meat, velvet, antler and skin (Safithri et al., 2018). The Timor deer is a medium sized deer with the range of body weight 40 to 80 kg (Purwaningsih et al., 2018). Timor deer are known to have high carcass percentage (60-70%) and considered as easy to breed and are adaptable to its environment (Makmun et al., 2017).

Nowadays, Timor deer in Indonesia are reared in captivity. The increasing population was reported to be 50% per year (Samsudewa et al., 2018). Timor deer are often traded alive or through its products, which include meat, antlers, velvet, viscera, and skin (Takandjandji & Setio, 2014). Given its wide range of products and uses, Timor deer can have a high economic value and prospective as breeding animal (Muchlis & Nurcholis, 2020).

Unfortunately, information about the most profitable age of Timor deer for product utilization is very limited. Hence, the objective of this research is to determine profitability of Timor deer utilization in at three different ages after

sexual maturity. The results of the study can provide relevant information to aid captive breeders the in deciding the most profitable age for Timor deer utilization

METHODS

1. Date & Time of Study.

This research was done from June to September 2020, at H. Yusuf Wartono Timor deer captivity, Margorejo village, Dawe district, Kudus regency.

2. Feeds & Feeding.

This captive breeding of Timor deer was already applied for business on venison, velvet, antler craft and live animal trading of Timor deer. In central java this place is one and only captive breeding of Timor deer that already applied complete usefulness of Timor deer. Carcass, viscera, skin, antler and velvet from twelve bucks of Timor deer ages 2, 3 and 4 years were used. Data gathering, recording and financial report were used. Profitability analysis includes profit value divided into two, i.e. with velvet and antler inclusion were presented in tables. Profit value was taken from the difference between total income and total costs (Takandjandji & Setio, 2014). Profit value with antler utilization and velvet utilization were compared between ages (2-, 3- and 4-year-old). The result with descriptive analysis were presented.

Net profit value was computed through this formula (Skonhoft et al., 2013):

$$\pi = TR - TC$$

$$\pi = \text{Profit}$$

$$TR = \text{Total Revenue}$$

$$TC = \text{Total Cost}$$

RESULT AND DISCUSSION

Operational cost is the total of variable cost and fixed cost. Profit analysis is computed from the net profit minus operational cost. Profit analysis of utilization of Timor deer with velvet (Table 1) and antler (Table 2) were shown below

Table 1.
Profit Analysis of Utilization of Timor Deer with Velvet Included.

Outcome	Unit Price	Unit	Ages		
			2	3	4
Variable Cost	... IDR IDR		
Feed					
a. Grass	160	Kg	460,800	691,200	921,600
b. Concentrate	3,000	Kg	1,080,000	1,620,000	2,160,000
Anesthesia	250,000	Hd	500,000	750,000	1,000,000
Vitamin	7,169	Head/Year	15,238	22,857	30,476
Dry Ice	150,000	Head/Year	300,000	450,000	600,000
Material Velvet	100,000	Head/Year	200,000	300,000	400,000
Fixed Cost					
Labor					
a. Keeper	17,143	Head/Month	411,429	617,143	822,857
b. Butcher	500,000	Head	500,000	500,000	500,000
c. Manager	23,810	Head/Month	571,429	857,143	1,142,857
d. Velvet Process	100,000	Head/Year	200,000	300,000	400,000
Depreciation	80,400	Year	160,800	241,200	321,600
Total			4,399,695	6,349,543	8,299,390
Revenue			6,635,833.33	7,993,500	12,583,083.33
Profit			2,236,138	1,643,957	4,283,693

Source : Primary data of H. Yusuf Wartono Timor deer captivity, 2020

Table 2
Profit Analysis of Utilization of Timor Deer with Antler Included

Outcome	Price	Unit	Ages		
			2	3	4
Variable Cost	... IDR IDR		
Feed					
a. Grass	160	Kg	460,800	691,200	921,600
b. Concentrate	3,000	Kg	1,080,000	1,620,000	2,160,000
Vitamin	7,169	Head/Year	15,238	22,857	30,476
Fixed Cost					
Labor					
a. Keeper	17,143	Head/Year	411,429	617,143	822,857
b. Butcher	500,000	Head	500,000	500,000	500,000
c. Manager	23,810	Head/Year	571,429	857,143	1,142,857
Depreciation	80,400	Year	160,800	241,200	321,600
Total			3,199,695	4,549,543	5,894,390
Revenue			6,185,833	6,543,500	9,483,083
Profit			2,986,138	1,993,957	3,583,693

Source : Primary data of H. Yusuf Wartono Timor deer captivity, 2020

The operational cost utilization of Timor deer velvet was higher than antler because of costly velvet harvesting and

extraction process, this cost increased the variable cost for production. Furthermore, velvet harvesting and extraction efficiency

must be cost-effective, to bring down operational cost to increase more revenue and profit.

The overall operational cost for the utilization of Timor deer with velvet was higher since velvet harvesting and extraction requires higher production cost. Overall efficiency in all the process of utilization and other production cost for Timor deer is directly needed to guarantee its increase revenue and profit, hence sustainability of captured Timor deer farm. To assure sustainability is needed to keep the operation simple, efficient, and economically viable. Now at varying ages of Timor deer considered, all remain economically viable.

Income source for Timor deer breeders usually come from selling edible and non-edible portion such as skin, viscera and velvet or antler. The market niche of Timor deer comes from the value of velvet. The velvet value improvement must be highly considered for its relevance in human medicine and as food supplement. The average of revenue from Timor deer were IDR 6,635,833; IDR 7,993,500; and IDR 12,583,083 for 2, 3 and 4 years inclusive of velvet harvest, respectively. Meanwhile, the average of revenue Timor deer with antler harvest were IDR 6,185,833; IDR 6,543,500; IDR 9,483,083 for 2, 3 and 4 years, respectively.

The result of profit analysis showed raising Timor deer is most profitable at 4 years old due to its heavier body weight or carcass yield (IDR 3,583,693 to IDR 4,283,693). Average body weight of Timor deer on 3 year old was 35.07 ± 1.91 kg, at 4 year old was 48.17 ± 2.02 kg. The body weight of male Timor deer was also affected by its dominance hierarchy (Krisna et al., 2020). Male Timor deer with the highest social level has a bigger neck circumference compared to those with lower social level (Samsudewa et al., 2017).

It is reported that higher body weight yielded to higher carcass weight (Santosa et al., 2012). The average percentage carcass of Timor deer is said

to be at 60%-70% (Makmun et al., 2017). Average revenue for raising Timor deer is IDR 8,237,472 with range IDR 6,185,833 to IDR 12,583,083. Average revenue of Timor deer slaughtered is higher compared with live animals. The price of live Timor deer at 2, 3 and 4 years is Rp 7,500,000 (Takandjandji & Setio, 2014). Utilization of Timor deer slaughtered is not only from carcass, but also from non-carcass part like velvet, antler, skin and others.

Timor deer velvets are also known as a good source of income. Velvet or young antler is used as a raw material of traditional medicine in China. Its extract capsule in the present research is priced at IDR 100,000/30 capsule. This price is the same with the estimated price of velvet extract of previous research in Dramaga, Bogor (Takandjandji et al., 2020). Velvet extract is highly beneficial for immune system, sexual hormone, and stamina (Yuliawati et al., 2019). As seen on the results, Timor deer raised for velvet production is most profitable at 4 years old while those age 2 and 3 years are more suited for antler utilization.

Product diversification is an important way to improve profitability (Huber et al., 2023). Venison has various health benefits which include low cholesterol, low fat, and high protein (Takandjandji & Setio, 2014). There also dishes that can be made from venison such as satay, curry, jerked meat. Meanwhile, the skin of Timor deer is also considered as luxury leather which can be used to manufacture wallet, shoes, and bags (Reznikova et al., 2017). These wide range of products from Timor deer can be further explored to increase its economic value.

CONCLUSION

The findings of the research suggest that raising Timor deer age 2 and 3 years old is less profitable for antler production, i.e. 2,986,138 and 1,993,957, respectively. While Timor deer at age 4 years is most profitable for velvet production (12,583,083,33). The rearing of Timor deer in captive breeding needs to be

diversified with consideration for antler, velvet and skin product to maximize income. The study also reiterates that products from carcass and non-carcass of Timor deer should further be explored and studied to increase its economic value.

DECLARATION OF INTEREST

The authors declare no conflict of interest in this study.

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