

THE KATJANG GOAT: DISTRIBUTION, CHARACTERISTICS AND CONSERVATION DEVELOPMENT

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ABSTRACT

Katjang goat is an indigenous breed of goat in Malaysia. It is also known as *Kambing Kacang*, *Kambing Katchang*, *Kambing Licin* and Pea Goat. It also said to be the indigenous goat breed in Indonesia, Thailand, Philippines, Taiwan and the southwest islands of Japan. This breed also bears resemblance to the South China goat and the Black Bengal goat. It is found in small herds in several parts of Malaysia and considered to be at risk. From a survey done by the Department of Veterinary Services Malaysia, the breed is found to be scattered in small numbers in Peninsular Malaysia, with the highest density being in Kuala Pilah, Negeri Sembilan. They are mostly reared by small or traditional farmers. There are cases of inbreeding, where the breed becomes smaller and has lower resistance to heat and ticks. Most of the pure breed has been crossed with other breeds, mainly Boer, British Alpine and Jamnapari. Conservation activities are currently being undertaken at the National Institute of Veterinary Biodiversity (NIVB), Jerantut, Pahang using a semi-intensive management system. Sixteen acres of paddock area consisting of Guinea grass (*Panicum maximum*), Israel grass (*Foeniculum vulgare*), Sambau grass, (*Eleusine indica*), Kerbau grass (*Paspalum conjugatum*) dan *Balik Angin* (*Mallothus biaceae*) has been planted. Morphologically pure Katjang breed with the total number of 100 individuals has been brought in from few places in Peninsular Malaysia and is currently being bred. The bucks are being trained for semen collection and their semen will be kept in the semen bank at NIVB.

INTRODUCTION

In Malaysia, the production of goat and sheep meat in 2010 was 2,386.5 metric tons while the demand for this meat was 22.549 metric tons. The self sufficiency for goat and meat in Malaysia in 2010 was 10.58% (Department of Veterinary Services, 2011). The Ministry of Agriculture and Agro-based Industry (2011) through the National Agri-Food Policy of Malaysia has planned a few strategies to increase meat production from 2011 to 2020. Referring to the above, conservation and sustainable utilization of indigenous breed resources need to be done and genetic diversity should be understood and quantified. Adapted to the local environment, the indigenous breeds represent unique genetic resources for the farmer. However, the need for increased economic gains has led to crossbreeding these indigenous breeds with imported exotic breeds or directly replacing the indigenous genotypes.

As an indigenous goat breed, Katjang is best known for their prolificacy in Malaysia (Devendra 1989). It possesses the natural characteristics of heat and tick tolerance under the local climate. Although their production may be relatively low compared to other goat breeds in Malaysia that results in declining economic interest, indigenous breeds often have unique adaptive qualities (FAO 1992). It is a meat type and possesses morphological characteristics of thin black coloured coat, sometimes with white patches on the belly and feet (Devendra

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1966) (Figure 1). Coat colour with dark chocolate and black (without white patches) has also been reported (Department of Veterinary Services 2006) (Figure 2). Average birth weight is 1.5 kg with mature weight of 25 kg for males and 20 kg for females. Average daily weight gain of Katjang goat is 55 gm/day (Devendra & McLeroy 1982). Katjang goats, due to their small size, also have good potential of meeting local market demand and religious purposes (such as korban and aqiqah).



Figure 1: Adult Katjang goat with black coat colouration with occasionally white patches



Figure 2: Adult Katjang goat with black and brown coat colouration (without white patches)

MATERIALS AND METHODS

Study Site for Breed Distribution

A random survey has been done in Peninsular Malaysia. Department of Veterinary Services' personnel from ten (10) states of Peninsular Malaysia were appointed to lead the survey for their state. Distribution of morphologically pure goat as described in Figure 1 and Figure 2, were plotted on the map based on their GPS location. Questionnaires based on Katjang goat breed were prepared and the Katjang farmers were interviewed.

In-situ Conservation

The *in-situ* conservation design is as described by Ernie-Muneerah et al., (2010). *In-situ* conservation facilities have been established at the National Institute of Veterinary Biodiversity (NIVB) at Jerantut, Pahang. Land clearance for a grazing paddock has been undertaken and a Katjang yard with an area of 110 sq. meters has been built (Figure 3). For genetic variability, the animals were procured from throughout Peninsular Malaysia. All animals were screened for Brucellosis, Caseous Lymphadenitis, Melioidosis, Salmonellosis, Johne's disease, Leptosprosis and Foot and Mouth Disease (FMD) before being brought in. Once they arrived at NIVB, the animals were quarantined and screened for the second time. During the quarantine period, all the animals were tagged and Guinea grass (*Panicum maximum*), were given by cut and carry technique.

Management

A semi-intensive management system has been applied. Goats were released from the yard in the morning to graze in the day at the paddock and stalled in the evenings. The lands for grazing paddock total 18 acres, consisting of three 5-acres paddocks and a 3-acres paddock (Figure 4).

Feeding

All the goats are allowed to graze in Guinea grass (*Panicum maximum*) plots. *Israel* grass (*Foeniculum vulgare*), *Sambau* grass, (*Eleusine indica*), *Kerbau* grass (*Paspalum conjugatum*) dan *Balik Angin* (*Mallothus biaceae*) is also available at the plots. Napier was given by cut

and carry technique whenever needed. Goat pellet was given weekly at the yard in the evenings.

Herd Health

Continuous monitoring of health status was carried out on all the animals. Screening for Brucellosis, Caseous Lymphadenitis, Melioidosis, Salmonellosis, Johne's disease, Leptosprosis and Foot and Mouth Disease (FMD) are done twice a year. FMD vaccination is applied every 6 months. Deworming and deticking is also done once every 3 months.



Figure 3. Katjang yard with an area of 110 sq. meters at NIVB, Jerantut, Pahang.



Figure 4. Grazing paddock at NIVB, Jerantut, Pahang.

Ex-situ conservation

Selected males from animals under *in-situ* conservation were trained for semen collection and processed semen is to be kept in the semen bank at NIVB, Jerantut, Pahang for conservation purposes.

Breed Evaluation

All the animals under *in-situ* conservation were monitored for breed evaluation. Body weight, body length, height at withers and heart girth were measured, recorded and analysed using Statistical Package for Social Science (Ver. 17.0).

RESULTS AND DISCUSSION

Katjang Distribution in Peninsular Malaysia.

Figure 5 below shows the distribution of morphologically pure goat based on a random survey conducted by Department of Veterinary Services personnel. From the survey, it showed that the breed still can be found scattered in rural areas of Peninsular Malaysia in small numbers with the total population for each herd being not more than 20 heads. They are mainly bred by small and traditional farmers and being reared either under semi-intensive or extensive management systems. Based on the survey, the small farmers prefers the small build since it is easier to market and the cost of feeding for Katjang is also low as compared to other goat breeds. On the other hand, the commercial farmers prefer to breed larger goat breeds such as Boer and Jamnapari and some use Katjang goat as a foundation goat breed to capitalize on the disease tolerance characteristics. Higher density of morphologically pure Katjang goat was found in Kuala Pilah, Negeri Sembilan. There are also cases of inbreeding at most places since most of the Katjang farmers use the same male for a few generations.



Figure 5. Distribution of morphologically pure Katjang goat in Peninsular Malaysia (map by Google Maps, 2011)

Conservation Development

A hundred (100) animals have been procured from four (4) states of Peninsular Malaysia (Table 1) and have been kept at NIVB, Jerantut, Pahang. The total numbers of males are 35 heads and females are 65 heads (Table 2).

Table 1. Procurement of Katjang goat breeds from Peninsular Malaysia.

| State | Total head count | Percentage (%) |
|-----------------|------------------|----------------|
| Pahang | 68 | 68 |
| Kelantan | 10 | 10 |
| Negeri Sembilan | 5 | 5 |
| Kedah | 17 | 17 |

Table 2. Numbers of male and female under *in-situ* conservation at NIVB, Jerantut, Pahang.

| Sex | Total head count | Percentage (%) |
|--------|------------------|----------------|
| Total | 100 | 100 |
| Male | 35 | 35 |
| Female | 65 | 65 |

To date, up to 60% heads have difficulties to thrive under *in-situ* conservation and eventually died especially during quarantine period. According to lab reports, most of the cases were due to infectious diseases, environmental change, stress and immunity status where all the factors will eventually contribute to opportunistic secunder bacterial infection to the animals. Table 3 summarised the laboratory diagnosis on post-mortem samples.

Table 3. Laboratory diagnosis on post-mortem samples of Katjang goat breed.

| Laboratory Dianogsis | Percentage of Cases % |
|-------------------------------|-----------------------|
| Acute hepatitis | 81.81 |
| Pulmonary edema | 36.36 |
| Suppurative bronchopneumonia | 36.36 |
| Interstitial pneumonia | 36.36 |
| Bronchointerstitial pneumonia | 18.18 |
| Pulmonary congestion | 18.18 |

| | |
|--------------------------------------|-------|
| Hepatic congestion | 18.18 |
| Proliferative glomerulonephritis | 18.18 |
| Myocarditis | 18.18 |
| Pulmonary fibrosis | 18.18 |
| Hepatic lipidosis | 9.09 |
| Tubulointerstitial nephritis | 9.09 |
| Acute renal tubular necrosis | 9.09 |
| Generalized fatty liver degeneration | 9.09 |
| Renal congestion | 9.09 |
| Glomerulitis | 9.09 |
| Splenic hemisiderosis | 9.09 |

Breed Evaluation

The Katjang breed under *in-situ* conservation at NIVB, Jerantut were evaluated for body weight, body length, height at withers and heart girth measurements. The results were as shown in Table 4.

Table 4. Body measurements Katjang breed under in-situ conservation at NIVB, Jerantut

| | N | Minimum | Maximum | Mean | | Std. Deviation |
|------------------------|-----------|-----------|-----------|-----------|------------|----------------|
| | Statistic | Statistic | Statistic | Statistic | Std. Error | Statistic |
| Male | | | | | | |
| Body Weight (kg) | 14 | 10.00 | 29.00 | 17.1743 | 1.61074 | 6.02683 |
| Body Length (cm) | 14 | 58.00 | 85.00 | 73.0000 | 2.11938 | 7.92998 |
| Height at withers (cm) | 14 | 43.00 | 60.00 | 52.1429 | 1.55435 | 5.81586 |
| Heart girth (cm) | 14 | 54.00 | 72.50 | 62.1071 | 1.61567 | 6.04527 |
| Female | | | | | | |
| Body Weight (kg) | 20 | 8.75 | 21.75 | 14.5010 | .80644 | 3.60651 |
| Body Length (cm) | 20 | 29.00 | 88.00 | 56.4585 | 3.43136 | 15.34549 |
| Height at withers (cm) | 20 | 17.50 | 55.00 | 40.4300 | 2.59041 | 11.58466 |
| Heart girth (cm) | 20 | 50.00 | 70.00 | 60.1690 | 1.16466 | 5.20851 |

Overall body measurements for male are slightly higher than the female. The body weight for both male and female was found to be lower than as reported by Devendra & McLeroy (1982), which is 25 kg for male and 20 kg for female. This might be due to the stress which occurred during quarantine period. During the quarantine period, the animals were kept under intensive management system, and the stress occurred has resulted in the decrease of the body weight. At the farmer's farm, they were previously reared under semi-intensive or extensive management system, and the difference in feeding regime also might contribute to this factor. Body length for male is higher than reported by Abd Rahman (1980), which is 65 cm-70 cm for male and lower for female which is 60 cm-65 cm. Height at withers is also lower which is 60 cm-65 cm for male and 55 cm-60 cm for female. Heart girth

for male is also lower than reported by Abd Rahman (1980), which is 70 cm -75 cm for male and higher for female which is 65 cm-70 cm.

CONCLUSION

Further work needs to be done to improve the body weight genetically to meet the market demand for a particular size at a specific age. Evaluation of this indigenous breed under different management systems should be applied. Measurement of genetic diversity in comparison with other popular goat breeds in Malaysia through molecular technique should be carried out to further understand this indigenous breed.

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