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Dairy Goat Feeding Characteristics in Malang District East Java, Indonesia

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Introduction

Most farmers in the upland areas choose to rear dairy goats because goats can be cared easily by the women and children and milk can be fed to children. In addition, the investment cost for goat rearing is lower and the price of goat milk is higher than that of cow milk. However, there are several constraints in goat milk production one of them is the low availability of local forages for use as feed especially in the dry seasons. The objective of this study was to assess how locally available forages are used as feed for dairy goats by the rural farmers.

Materials and Methods

The study was conducted in the uplands and slopy (20–60°) areas of the Malang district to determine the potential of rearing dairy goats in these areas. A survey was carried out to obtain primary and secondary data. The secondary data was obtained from agencies such as the district offices. The social data was extracted from 64 dairy goat households which were selected from the six regions on the basis of dairy goat populations. The primary data was obtained by a questionnaires and interviews. Through stratified sampling, 22 households were chosen to determine characteristics of feed (feed composition, feed consumption) and milk production. Data were collected over 6 months (3 months each in dry and wet seasons).

Annual measurement. Characteristics of feed and milk production were measured 3 times during the wet and dry seasons with an interval of 7 days between each measurement. The fodder given to the animals was separated into legume trees, grass, non-legumes trees, crop wastes and concentrates or byproducts and these were weighed. Milk production was measured at the time of milking in the morning after the animals were given concentrate or additional feed. Goat milk produced per colony per day was measured using 1000 mL measuring cups.

Chemical analyses. Samples of feed were analysed for proximate composition (AOAC, 1990). To determine total digestible nutrient (TDN), the samples were analysed using the Moores *in vitro* modification technique (Tilley and Terry, 1963) and converted to TDN based on Ibrahim (1986) equations.

Statistical analyses: Social data were tabulated and analysed by description. Data on feed characteristic were calculated in the mean value and subjected to statistical analyses using the paired *t*-test design models (Minitab 14.0 for windows statistical software, 1995).

Results and Discussion

Social condition of households. The social condition of household and characteristics of dairy goat feed are shown in Tables 1 and 2, respectively.

Table 1. Social condition of households

Variable			
Ages (%)	20–33 years 25.71	34–48 years 54.29	48–61 years 20.00
Education level (%)	Elementary (40.63)	Junior high school (28.13)	Senior high school (15.63)
Dairy goats keeps (%)	1–8 heads (51.44)	9–16 heads (25.71)	>16 heads (22.85)
Landholding (m ²)	Sawah (224.5 ± 224.5)	Tegalan (1700 ± 886.1)	Pekarangan (292.22 ± 171.82)
Farming experiences (%)	1–5 years (34.28)	6–10 years (45.72)	>10 years (20.00)

Table 2. Characteristics of dairy goat feed, composition and milk production

Variable	Wet season	Dry season
Feed composition of dairy goat feed (%)		
a. Legume tree	79.75 ^a ± 4.58	40.23 ^b ± 6.16
b. Grass	36.61 ^a ± 1.98	47.97 ^b ± 19.55
c. Non-legume tree	48.29 ^a ± 5.92	63.77 ^b ± 16.12
d. Crop wastes	1.37 ^a ± 5.92	14.04 ^b ± 9.55
e. Byproduct/concentrate	18.54 ± 5.92	18.74 ± 0.89
Consumption of nutrient and milk production		
a. DM intake (g/h/d)	1396.3 ^a ± 393.3	1341.6 ^b ± 147.1
b. CP intake (g/h/d)	234.9 ^a ± 131.0	143.1 ^b ± 37.62
c. TDN intake (g/h/d)	1061.4 ^a ± 330.0	824.9 ^b ± 471.3
d. Milk Production (l/h/d)	0.8159 ^b ± 0.125	0.7942 ^b ± 0.159

^{a, b} values with different superscripts in the same row indicate significant differences at $P < 0.05$

The main problem in goat production is the limited grazing land particularly in the intensive cropping area during the wet seasons (Phengsavanh, 2003). In addition, native grass, shrubs and fodder trees become dry in the dry seasons which lead to decline in feed quality and availability. Use of crop wastes and concentrates as the energy sources were lesser than of forages especially in the wet seasons. These conditions affect the milk production which is quite similar between the two seasons. If concentrates and forage are used at the optimum ratio, this will increase the milk quality especially the milk fat (Van Raust et al., 2009) and it will have an impact on the milk price. The different seasons, level of farmers' education, land

ownership and farming experiences all play important roles in dairy goat production which rely heavily on forage utilisation.

Conclusions

Type of dairy goats and feeds found in the upland areas is dependent on season, level of farmer education, land ownership and farming experience. The use of forages was dominantly legume tree in the wet and tree leaf in the dry seasons. The use of crop wastes in the dry seasons is higher than in the wet seasons, and it has an impact on the milk production.

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