

Milk Production of Sahiwal x Holstein Crossbreed in Two Different System on Local Farm Kudat, Sabah-Malaysia

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ABSTRACT

In Sabah-Malaysia there is two dairy farming system, i.e. intensive and semi-intensive system. In intensive system, the animals kept on colony stable, meanwhile in semi-intensive system, the animals are reared on integrated oil palm plantation. The objective of this research was to compare the two different farming systems on nutrient intake and performance of dairy cattle in local farm Kudat, Sabah-Malaysia. In this research, 90 heads of Sahiwal-Holstein Crossbreed dairy cows from 4 farmers were observed for two month in September 2012. The parameters observed were feed consumption, milk production, body weight and body condition score (BCS). The data were analyzed using T-test. The results showed that daily dry matter intake on intensive system was higher than on semi-intensive system (15.87 and 10.16 kg head⁻¹ day⁻¹ respectively). The BCS of lactation cows of both system was no significantly different (3.08 vs 2.95). However, the average milk production on intensive and semi-intensive system showed significant differences, were 19.7 and 18.1 head⁻¹ day⁻¹ respectively. Cost of feed (MYR head·day⁻¹) in two different farming was significantly different (37.20 MYR on intensive system and 38.70 MYR on semi-intensive system). Base on income over feed cost (IOFC) in both systems, it is concluded that intensive system was more profitable than the semi-intensive system.

Keywords: dairy cattle, dairy farming system, milk production, Sahiwal x Holstein crossbreed.

Introduction

In Sabah-Malaysia, the dairy cattle development was started in Keningau and Tawau from 1981-1985. According to Salleh (1989), this project involved small land holders with the intention of forming the dairy industry and thereby increasing urban resident's income in conjunctions with the new economic foundation. Dairy industry in Sabah is growing forward to increase milk production to reached 10 million liter per year. Now, Sabah is a major producer of fresh milk for public school milk program.

Main breed of dairy cattle in Sabah is SxF crossbreed, which crossing from local Sahiwal dairy cattle with Australian and New Zealand Frisian Holstein (Sivarajasingam *et al.* 1983). SxF is best performance regarding to milk composition and quality (Talukder *et al.* 2013). In Sabah this crossbreed is called Sabah Sahiwal Friesian (SSF).

Dairy cattle farming management on local farm Kudat are intensive and semi-intensive system. In the intensive system, dairy cows kept in colony stable all day and fed according to nutrient requirement. While ion the semi-intensive system, cows grazing in the oil palm plantation or rubber plantation during the day and in the evening brought to the stable.

A problem in dairy cattle production in Sabah is limited land for grass production. Meanwhile, the oil palm and rubber plantations have the potential to supply forage. Forage

growing under the palm trees can be used as animal feed by cutting or used as a grazing area. However, the quality of forage under oil palm plantations is poor. Differences in production systems has an impact on the adequacy of nutrients supply to the dairy cows.

The objective of the study was to study the nutrient intake and performance of dairy cattle on two different production systems on local farm Kudat, Sabah-Malaysia.

Materials & Methods

Location

The study was carried out in Kudat, Sabah, Malaysia to evaluate the differences milk production and performance on intensive and semi-intensive dairy production systems.

Animals

In this study, 90 heads of crossbreed of Sahiwal x Friesian (SxF) dairy cattle from both intensive and semi-intensive farms were observed. The animals were belong to 4 farmers from different locations.

Feeding Management

On intensive dairy production system, the animals were kept in colony stable and fed with cut napier grass (*Pennisetum purpureum*), palm kernel cake (PKC) as concentrate source and mineral block as a feed supplement. Meanwhile, on semi-intensive system, the animals were kept on grazing area under oil palm plantation for 6-9 hours in a day and in the evening the animals were kept in stable and fed some napier grass and PKC. In both group farms, the dairy cows were milked using milking machine twice a day.

Methodology

This study was conducted by interview and observation directly at local dairy farmers. The variables measured were body weight of cows, body condition scoring (BCS), feed intake (grass and concentrate), milk production and income over feed cost.

Data were analyzed using T-test to compare the variables between two different farming system using the Statistical Package for the Social Sciences (SPSS).

Results & Discussion

Dry matter (DM) and nutrient intake of dairy cows on intensive and semi-intensive farming systems are shown in Table 1. The result showed that DM forage intake on intensive system was significantly higher than on semi-intensive system (7.31 vs 2.81 kg DM head⁻¹ day⁻¹). PKC intake of dairy cattle on intensive farming system was also higher than on semi-intensive farming system (9.24 vs 7.93 kg DM head⁻¹ day⁻¹). The use of PKC on both farming systems was more than 50% in the ration. According to Zahari & Farid (2011) in dairy cattle rations, PKC can be used as a source of energy and protein at the inclusion level of 30-50%.

The average of DMI of dairy cows in intensive systems was significantly higher than in the semi-intensive system (15.87 and 10.16 kg⁻¹ head⁻¹ day⁻¹ respectively). On intensive farming system percentage of DMI of body weight (BW) was sufficient (3.05% of BW), while on semi-intensive farming system was very low (2.03% of BW). This lower DMI in semi-intensive farming caused by lower total nutrient digestible (TDN) intake (6.14 kg⁻¹ head⁻¹

¹ day⁻¹). According to NRC (2000), daily DMI and percentage of DMI of BW for the dairy cattle is about 3.0% of BW.

Table 1. Dry matter and nutrient consumption of dairy cows on intensive and on semi-intensive farms in Sabah-Malaysia

Variables	Intensive System	Semi-intensive System	<i>P</i> -value
Forage intake (kg DM ⁻¹ head ⁻¹ day ⁻¹)	7.31±0.95	2.81±1.04	< 0.01
PKC intake (kg DM ⁻¹ head ⁻¹ day ⁻¹)	9.24±1.49	7.93±1.41	< 0.01
Total DM intake (kg DM ⁻¹ head ⁻¹ day ⁻¹)	15.87	10.16	-
CP intake (g ⁻¹ head ⁻¹ day ⁻¹)	2.21	1.15	-
CF intake (g ⁻¹ head ⁻¹ day ⁻¹)	3.12	1.33	-
TDN intake (kg ⁻¹ head ⁻¹ day ⁻¹)	10.35	6.14	-
Feed intake / body weight (%)	3.05	2.03	-

Table 2. Dairy cow performances and IOFC on intensive and on semi-intensive farms in Sabah-Malaysia

Variables	Intensive System	Semi-intensive System	<i>P</i> -value
Body weight (kg)	520±100	499±32	-
Body condition score (BCS)	3.1±0.28	2.9±0.21	-
Milk production (liter head ⁻¹ day ⁻¹)	19.7±1.1	18.1±0.5	< 0.01
Total Feed Cost (MYR head ⁻¹ day ⁻¹)	37.20	38.70	-
Income Over Feed Cost (MYR head ⁻¹ day ⁻¹)	12.10	8.02	-

The dairy cattle performance and IOFC is shown in Table 2. Body weight (BW) and body condition score (BCS) of dairy cattle on intensive system were relatively higher. This indicated that the animals kept on intensive system had better body condition than animals kept on semi-intensive system. Generally, cattle on pasture have lower BCS than cattle managed under a non-grazing environment (Lawrence, 2003).

The average of milk production of SxF dairy cattle on both farming systems was not much different, 19.71 kg⁻¹ head⁻¹ day⁻¹ on intensive farming system and 18.1 kg⁻¹ head⁻¹ day⁻¹ on semi-intensive farming system. This milk production was higher than reported by Boniface *et al.* (2007) that the average dairy cattle in Sabah was only 8.64 liters head⁻¹ day⁻¹.

Although DMI of dairy cows on a semi-intensive system was very much different with on semi-intensive farming system, however milk production on both systems was not much different. This is probably that dairy cattle that grazing on semi-intensive farming system was still get sufficient forage.

Total Feed Cost in semi-intensive farming system was slight higher than in intensive farming system (38.70 and 38.70 MYR head⁻¹ day⁻¹, respectively), This is because of cost of pasture management in semi-intensive system was high. Finally, income over feed cost (IOFC) on intensive system was higher than on semi intensive farming system.

Conclusions

Dry matter and nutrient intake of dairy cattle on intensive farming system in Sabah were more higher than on semi-intensive system, and then resulted more milk production. According to income over feed cost, dairy cattle on intensive farming system in Sabah was more profitable than semi-intensive system.

References

- Boniface, B., J.J. Silip & A.H. Ahmad. 2007. Dairy cattle management: survey on dairy cattle lactation trend in Sabah. Universiti Malaysia Sabah, Universiti Malaysia Sabah, Universiti Malaysia Sabah. MPRA Paper No. 23781.
- Lawrence, D.M. 2003. Nutrition of Dairy Cattles on Pasture-Based Systems. Penn State Extension. Grantville. p 47-52.
- NRC. 2001. Nutrient Requirement for Dairy Cattle. 7th Edition. National Academic Press. Washington DC.
- Salleh AS. 1989. The Development of Dairy Industry in Sabah. Proceedings of Seminar on Animal Production and Health. Tawau, (MY). Department of Veterinary Services Industry of Malaysia. 1989 June 12-14. p 21-31.
- Sivarajasingam S, S.Yusoff, N. Mohamad N, G. Sivasupramaniam, M.O. Abas & J.Eusof. 1983. Dairy cattle production in Peninsular Malaysia. In: Malaysian Livestock Industries: Status and Potential; Sixth Annual Conference of the Malaysian Society of Animal Production. Genting Highland, Pahang, Malaysia (MY). 1982 August 10-11. p 73-78.
- Talukder, M.A.I., J.M. Panandam, Y. Halimatun & I. Idris. 2013. Milk composition and quality of Sahiwal-Friesian crossbreed cow studied in Malaysia. *The Agriculturists* 11(2): 58-65.
- Zahari, M.W. & M. Farid. 2011. Oil Palm Byproducts as Feed for Livestock in Malaysia. Universiti Malaysia Kelantan. Kota Bharu, Kelantan.