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Short Communication

EFFECTS OF BODY CONDITION SCORE ON POSTPARTUM OESTRUS CYCLE IN DAIRY COWS

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ABSTRACT: The study objective was to determine the effect of body condition score on postpartum oestrus cycle in dairy cows. The study was carried out in Tsirang district from November to December 2013. A total of 80 Jersey cross cows; 40 cyclic and 40 postpartum anoestrus were chosen for the study. Cows, which exhibited normal heat signs with no history of repeat breeding and nymphomania, were considered as cyclic cows. Cows, which did not show oestrus signs within 90 days after calving, were considered as postpartum anoestrus cows. The visual scoring method, using the American standard (scale one to five), was employed to judge the body condition of cows. There was a significant association between the body condition and manifestation of oestrus cycle of cows. The mean value of first postpartum oestrus was recorded at 7.13 months, which was higher than the expected first postpartum oestrus that occurs within 2-3 months after calving, to achieve optimal calving interval. The results suggest that dairy cows need minimum body condition score of 3 to 3.5, for expression of normal oestrus cycle and to produce one calf per year.

Keywords: Postpartum anoestrus; Body Condition Score; oestrus; Jersey cross cows.

1. INTRODUCTION

Oestrus is the period when the female is receptive to male in the act of mating. The range of oestrus cycle in a cow is between 18 to 24 days with 21 days as an average (Banerjee 2010). A cow will come to first heat within 30 to 45 days after calving if the cow has calved normally and is under good management and feeding system. Cows that do not come to heat within 60 to 90 days after calving can be considered as problematic or postpartum anoestrus cows. Postpartum anoestrus is an interruption in the normal cyclical production of ova from ovaries, which occurs at varying degrees in cattle following parturition. The main factor for delayed ovulation and oestrus after calving are due to limited energy intake, lower body reserves, increased partitioning of energy to milk production and heavy suckling by calves. This nutritional status can be assessed by observing the body condition score (BCS) of dairy cow.

BCS is a good technique to assess the condition of dairy cows at regular intervals. The main purpose of BCS is to achieve a balance between economic feeding, good production and animal welfare. This can be done at important stages of production such as drying off, calving time, early lactation and at service. The amount of body fat in

animal at different stage of production cycle is an important factor, which enables reproductive efficiency. The display of oestrus behaviour can be delayed in cows having poor BCS and those cows under heat stress. Different points of scale are used to assess BCS of dairy cows. In Bhutan, the American standard of scale from 1-5 points is commonly followed; a score of 1 is assessed as extremely thin or emaciated and a score of 5 as being extremely obese. However, the study on effects of BCS on postpartum oestrus cycle in dairy cows has not been undertaken in Bhutan. Therefore, this study was initiated with the objective to evaluate the effects of BCS on oestrus cycle of a cow.

2. MATERIALS AND METHOD

2.1 Study area and data collection

The study was conducted in Tsirang district, covering three subdistricts of Kikhorthang, Rangthangling and Tsholingkhar. Dairy farming plays a vital role in generating household income, besides poultry and agriculture farming in the district. A total of 80 Jersey cross cows (40 cyclic and 40 postpartum anoestrus) were selected for the study. Convenience sampling method was used for selecting both the cyclic and postpartum anoestrus cows because BCS from cyclic cows were done as and when the cow was brought for artificial insemination service at District Veterinary Hospital. Cows that showed normal heat signs with no history of repeat breeding and nymphomania were considered as cyclic cows. The cows that did not show oestrus signs within 90 days after calving were considered as postpartum anoestrus cows. Visual scoring method was used to judge the body condition of cows. The scale of 1 was rated as emaciated, 2 for thin and skinny, three 3 as ideal, 4 for obese and 5 for very obese. The household survey was also carried out using a semi-structured questionnaire, consisting both closed- and open-ended questions. The survey gathered both qualitative and quantitative information on cattle holding, milk yield, parity and other management aspects of dairy farming at the household level.

2.2 Data analysis

The data obtained from questionnaire survey and visual scoring method were tabulated in Microsoft Excel 2016 and analysed using SPSS version 16.0 (Armonk, NY: IBM Corp). Chi-square test was conducted to determine the effect of cow condition on manifestation of oestrus cycle. Descriptive statistics was used to obtain means of household size, cattle holding, milk yield and parity.

3. RESULTS AND DISCUSSION

3.1 Household size and Cattle holding

The mean household size was over five persons per house with the total of 413 people across study areas (Table 1). The result of this study also revealed that less than three people from every household are working on the farm. In total, there were 344 heads of cattle with an average of over four cattle heads per household. The cattle holding per household in the study area ranged from 1-9.

3.2 Milk yield and parity

The mean milk yield of lactating cows in the study area was over four kg, which is very close to the mean milk yield of pure Jersey cow managed under farmers' conditions (Phangchung et al. 2002). The mean parity of a cow was over two numbers when the mean age of cow was less than six years.

3.3 Postpartum anoestrus period in cows

The duration of postpartum anestrus condition is being recognized as critical event in the reproduction of a cow. In this study, the mean value of first postpartum oestrus was recorded over seven months, which is much higher than the expected first postpartum oestrus that occurs within two to three months after calving to achieve optimal calving interval (Kamal et al. 2014). It can be explained that the higher open period directly affects the inter-calving period. Calving interval also determines the reproductive efficiency and based on this result, the calving interval is much longer (16 to 18 months), while the suggested calving interval, according to Thomas and Sastry (2000), for a cow is 12 to 13 months. The severity of negative energy balance before and after calving is the main factor delaying resumption of the first postpartum oestrus (Johnson et al. 2012). Thus, during the early postpartum period, it is advisable for the dairy farmers to allow cows to maximize dry matter intake with fresh, palatable and high-quality feed having adequate energy, protein, minerals and vitamins.

Table 1: Socio-demographic information of study area.

Parameters	Mean	SD
Household size (nos.)	5.16	3.32
Farm labour available (nos.)	2.72	1.68
Cattle holding per household (nos.)	4.30	2.13
Daily milk yield per cow (kg)	4.44	1.87
Cow age (years)	5.69	2.63
Parity (nos.)	2.34	1.66
Postpartum period	7.13	2.61

3.4 Effect of cow body condition on oestrus cycle

Statistically, the result showed significant association between body condition of a cow and

manifestation of oestrus cycle (χ^2 (2)=14.68, p≤0.01). Table 2 presents the contingency table on the effect of BCS on oestrus cycle of a cow. Among 40 cyclic cows; 18 cows had ideal BCS, 13 cows were fat and nine cows were thin and skinny. The result of postpartum anoestrus showed 26 cows as thin and skinny, 8 cows as ideal and 6 cows as fat. This result indicated that optimum body condition (3–3.5) is required for expression of normal oestrus cycle. Dominguez et al. (2011) reported similar result and claimed that BCS at calving has association with the length of the postpartum interval, leading to anoestrus condition. Looper et al. (1997) reported that cows with moderate BCS has shorter postpartum interval to first normal luteal activity, compared to thin and emaciated cows.

Table 2: Effect of body condition on oestrus cycle of cow.

Category	Thin and skinny (<2.5)	Ideal (3-3.5)	Fat (>4)	Total
1. Cyclic cows	9	18	13	40
2. Postpartum Anoestrus cows	26	8	6	40
Total	35	28	17	80

4. CONCLUSIONS

There is strong association between body condition score and manifestation of oestrus cycle in a cow. Optimum body condition is required to express normal oestrus cycle in dairy cows. From this study, it can be speculated that body condition score is important in judging the condition of cyclic and anoestrus dairy cows. It is important to provide balanced nutritional feed and mineral supplements before and after parturition to improve reproductive performance of dairy cows and increase the number of calves born per cow.

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