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BEEF CATTLE PREGNANCY RATE IN MANOKWARI: HUSBANDRY SYSTEM EFFECT

TINGKAT KEBUNTINGAN SAPI POTONG DI MANOKWARI:PENGARUH SISTEM PEMELIHARAAN

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ABSTRAK

Tingkat kebuntingan ternak sapi potong di suatu wilayah adalah indikator penting bagi pengelolaan ternak tersebut secara berkelanjutan. Ternak sapi dengan tingkat kebuntingan yang tinggi akan memberikan jaminan bagi tingkat kelahiran yang juga baik, jika ditunjang dengan system pemeliharaan yang memadai. Dengan demikian dapat dipastikan bahwa populasi ternak tersebut juga akan terjaga dengan baik. Informasi mengenai tingkat reproduksi ternak sapi potong di Kabupaten Manokwari belum cukup tersedia dan jika sudah adapun masih merupakan penggalan data yang belum terhimpun sebagai data lengkap kabupaten. Penelitian ini bertujuan untuk menyajikan informasi mengenai tingkat reproduksi ternak sapi potong secara khusus tingkat kebuntingan pada empat distrik dengan manajemen pemberian pakan yang berbeda sebagai baseline data dalam pengelolaan pembibitan ternak sapi di Kabupaten Manokwari. Enam ratus dua ekor sapi betina dari empat distrik (Prafi, Oransbari, Ransiki dan Manokwari) di Kabupaten Manokwari dijadikan contoh dalam penelitian ini. Hasil penelitian menunjukkan bahwa ada perbedaan tingkat kebuntingan pada ternak sapi pada sistem pemeliharaan yang berbeda. Sapi betina yang dipelihara dengan sistem dilepas pada suatu areal terbatas (ranch/pastura) dan sistem digembalakan dengan menggunakan tali leher memiliki tingkat kebuntingan yang lebih baik (rata-rata 58%) dibanding ternak sapi yang dipelihara dengan sistem diikat dan diberi hijauan potongan (rata-rata 31%) . Ketersediaan pejantan, rasio jantan betina, kesehatan ternak, ketersediaan pakan, pengelolaan padang rumput dan ternak adalah faktor utama yang mempengaruhi tingkat kebuntingan ternak sapi di Kabupaten Manokwari.

Key words : *Sapi potong, tingkat kebuntingan, sistem pemeliharaan*

ABSTRAK

Pregnancy rate of beef cattle in a region is an important indicator for the sustainable management of livestock. Cattle with a high pregnancy rate would provide a guarantee for the birth rate is also good, if supported by adequate system maintenance. Thus it can be ascertained that the cattle population will also be maintained. Information on the rate of reproduction of beef cattle in Manokwari district was not enough available and if it is still as for a piece of data that has accumulated as a complete data districts. This study aims to provide information about the rate of reproduction of beef cattle in particular pregnancy rate in the four districts with different feeding management as baseline data in the management of cattle breeding in Manokwari. Six hundred and two cows from four sub-districts (Prafi, Oransbari, Ransiki and Manokwari) in Manokwari an example in this study. The results showed that there were differences in the level of pregnancy in cattle at different maintenance systems. Cattle are kept with the system removed at a limited area (ranch / pasture) and grazing system using the neck strap has a better pregnancy rate (average 58%) than cattle maintained tied systems and forage pieces (average The average 31%). Availability of males, the ratio of male female, animal health, the availability of feed, pasture management and cattle are the main factors affecting the pregnancy rate of beef cattle in Manokwari.

Key Word: *Beef Cattle, pregnancy rate, system maintenance*

INTRODUCTION

Pregnancy rate is defined as number of cows pregnant divided by total cows in the herd times 100%. Pregnancy examination as a routine practice at the end of the breeding season is an important tool for improving the reproductive efficiency within the beef cow herd because it will give warnings of infertility and problem breeders. Pregnancy rate is also a function of both male and female reproductive condition.

Pregnancy rates on a cattle herd is also depend largerly on cattle husbandry system applied.This is vary according to the activity of the farmer, land availability, environment and other aspect. This study aims to provide information about the rate of reproduction of beef cattle in particular pregnancy rate in the four districts with different feeding management as baseline data in the management of cattle breeding in Manokwari.

MATERIALS AND METHODS

The study was undertaken at Manokwari District, West Papua Province, Indonesia. Manokwari District is situated between 0°15 North latitude and 3°15 South latitude, with 134°45 East longitude and 132°35 West longitude. The annual rainfall is approximately 4900 mm falling throughout the year, and with an average daily temperature of 27 °C.

Four sub-districts were chosen based on the population of cattle. There are Prafi sub-district, Oransabari sub-district, Ransiki sub-district and Manokwari sub-district.

Farmers were personally surveyed to collect information about their cattle husbandry. Farmers that responded positively were then involved in this study. Their cattle are ear tagged and observed throughout the study for nine months.

Table 1. Locations, Number of Farmers/ Farms and Number of Cows Involved in the Study.

Location	Number of Farmers/Farms	Number of Cows
Prafi	73	380
Oransbari	20	80
Ransiki	1	110
Manokwari	1	32
Total	95	602

The variable measured in this study was pregnancy status. Pregnancy status was determined by rectal palpation of the uterus of the cows. The normal non-pregnant uterus is characterised by absence of fluid in both horns, meaty consistency in both horns and slightly coiled in both horns. The normal pregnancy is characterised by the presence of fluid in uterus and cornual asymmetry, presence of amniotic vesicle, foetal membrane slip, palpation of foetus and palpation of placentomes. In this observation the presence of amniotic vesicle, the presence of foetus and placentomes determined pregnancy. Cows were classified as Pregnant (P) and Not Pregnant (NP). The accuracy of the pregnancy diagnosis was maximized by the second and the third period of observation.

The husbandry systems used was:

1. Pasture, cattle (male and female) were grazing in a paddock,
2. Tethered pasture, cattle were gazing along roadside or empty field during the day and tied around farmers' house and given cut and carry grasses at night, and
3. Zero grazing, cattle were tied around farmers' houses and fed grasses that cut and carried.

Data were analyzed using the Chi-square procedures of SAS (1996). he effects of husbandry system on cow pregnancy were investigated.

RESULT AND DISCUSSION

The pregnancy rates of cows subjected to different husbandry systems are presented in Table 2. Husbandry system had a significant influence ($P<0.01$) on pregnancy rate. Cows under the pasture

system and tethered in pasture and zero grazing system had a 26% higher pregnancy rate than those that were raised under the tethered zero grazing system. Low pregnancy rates for cows raised under tethered zero grazing were mainly a result of insuficiency in quantity and quality of the feed offered mostly because cattle raising is only a secondary source of income for farmer compared to rice growing.

Table 2. The Pregnancy Rates of Beef Cattle on Different Husbandry System and Location

Husbandry System and Location	Number of Observation	Pregnancy Rates (%)	Chi-square
Pasture	142	57.75	P = 0.003
Pami	32	59.38	P = 0.015
Ransiki	110	57.27	P = 0.015
Tethered Pasture+Zero grazing	414	57.59	P = 0.003
Oransbari P	34	52.63	P = 0.015
Prafi	380	58.09	P = 0.015
Tethered Zero grazing	46	31.11	P = 0.003
Oransbari Z	46	31.11	P = 0.015

The pregnancy rates observed in this region during the study was lower than those reported by Darmadja (1980) and Pane (1982). The low pregnancy rates of the cows raised on native pastures suggested that management of this group of animal was lacking. Cows were not well manage and there was little or no grazing management applied. Cattle tick (*Boophilus microplus*) and fly (*Haemotobia spp*) burdens were high and it was likely that they also had a high worm burden. Ticks and flies were visible on almost all the cows observed. Suthers and Utah (1981) and Suthers *et al.* (1983) showed that high infestation of ticks on cattle may lead to a blood loss of between 120 and 300 ml per day. Further they stated that the diminishing of red blood cell and serum proteins by tick infestations would increase the requirement for protein relative to energy. Previous report from Holroyd *et al.* (1984) stated that on less tolerant cows, infestation of buffalo fly (*Haemotobia* spp) reduced growth rate and feed conversion efficiency. Others studies showed that worms in the abomasums and small intestine of cows tended to increase urea excretion in urine, while worms in large intestine tend to increase fecal N losses (Dargie, 1980; Symons and Steel, 1978; Topps, 1983). This effect was more pronounced under conditions where cattle health management was poor, where overstocking was evident and nutrition was of low quality. This is highlighted by the following example from Manokwari.

The ranch under investigation was invaded by weeds such as *Solanum torvum* and *Cassia tora*. Dense stands of trees covered almost 30% of the ranch. The bull to cow ratio at 1:5, was very high and not efficient. Many bulls in a herd caused fighting between bulls when cows were on oestrus, and this was a major problem since the bulls were kept with the cows all year. In Indonesia for cattle raised on a range system, it is recommended that the mature bull to cow ratio should be in the order of 1:12-15 (DITJENNAK-IPB, 1978). Neville *et al.* (1979, 1988) had suggested wider bull to cow ratio of 1:28 since their calving crop was higher (87%) compared to the herd with bull to cow ratio of 1:18 that was 81 %. Proper management during the breeding season should result in each female being bred by a single fertile bull each time she is in oestrus. Bull overlap (more than one bull breeding a cow in oestrus) is not desirable, mainly because increased risk of bull injury through competition for oestrus females, additional pressure from social dominance and the extra costs for maintaining more bulls (Neville *et al.*, 1988). Eliminating bull gathering within breeding pastures can decrease overlapping bull. This can be achieved by dividing the breeding herd into separate pastures that reduce mixing of breeding groups.

Cattle and pasture management is the key to improved reproductive performance of the beef cattle in Manokwari. The work undertaken in this study gives further justification to the development of husbandry systems involving development of improved pastures containing introduced forages and legumes for use as supplemental grazing sources during critical nutritional periods e.g. prior to mating and during lactation.

Pregnancy rates of cows that were raised under combination tethered on pasture and zero grazing were similar to grazing system. Even though the cows in this group were more closely raise, there is some health problem found mostly internal parasite. The majority of cattle in this group were free from ticks and flies. However worm infestations were still evident. Farmers in this husbandry group reported 13% of their cows, which are approximately 85% calves up to six months of age, died because of worms. Nutritional management was more manageable in this system. The cattle grazed on vacant land, along the roadside, sports fields, under plantations and on agriculture fields. All of these grazing area provided not enough roughage to meet the animal's needs but farmers did have access to tree legumes such as *Gliricidia sp.* and/ or *Leucaena glauca* to fed the cows during the night. The main problem with this husbandry system was the inability of farmers to detect oestrus and to find a bull to breed the cow on the right time since not all farmers had a bull. Furthermore, all cows that were a year old were tied up so natural behavioral responses, e.g. riding behavior, could not be observed. The pregnancy rate of this husbandry system group can be improved if the farmer is able to detect oestrus and breed their cow at the right time.

The reproductive performance of cows raised with tethered zero-grazing system tended to be low with cows calving every two years, because it took them this long to have gained enough weight and body condition after calving and lactation. This is because the farmers only depend on grass from empty land or grasses along roadside to feed their cattle. These areas had previously been heavily grazed which resulted in the remaining grasses being those with low palatability and low nutrient content. The grass given to each cow was not enough (less than 15 kg/day) to meet it daily nutrient requirements. The nutritional quality of the grass was likely to be sub-optimal because they were in the flowering stage when it was cut and given to the animal. According to the NRC (1996) cattle of 200 kg live weight should consume approximately 20 kg of forage DM/day, or about 10% of body weight.

The cattle raised under the tethered zero-grazing practices are managed according to the farming season i.e. the farmers follow a rice monoculture pattern. The farmers with this type of agriculture cultivation system considered the animal as a living bank. Fertility of the cows is further compromised due to limited access to bulls.

Therefore to improve the reproductive performance of the cows in this system it is essential that nutritional management be improved in order to ensure body condition can be maintained within a narrow band 2 – 3. This supports previous researchs which showed that nutrient intake, weight change and body condition dictated cows' reproductive performance (Dunn and Kaltenbach, 1980; Richards *et al.*, 1986; Ma'sum *et al.*, 1998; Wirdahayati *et al.*, 1998). Putu *et al.* (1999) showed that supplementing cows diet with 3 kg concentrate feed (3543% total diet), consisting of coconut cake, cassava cake, cassava flour, rice barn and mineral (17% CP and 72% TDN) two months "pre-partum" to two months "post-partum" increased daily gain 0.3 kg in Bali cattle and Peranakan Ongole cattle, increase calving rate of Bali cattle (34 head) by 13% and 6% calving rate for Peranakan Ongole cattle (32 head). They also reported that calf mortality rate declined 7% in Bali cattle and 19% in Peranakan Ongole cattle.

Fertility management is also needed e.g. farmers need to be able to detect oestrus and they need to have access to sound fertile bulls. This study support the observations of Darmadja (1980) in Bali who showed that there was an effect on agricultural cultivation patterns and the nutritional management system (e.g. grazed, mixture of grazed and housed, and housed) on the cow's reproductive performance.

Pregnancy rate was also affected ($P< 0.05$) by location. The cows raised in Oransbari had lower pregnancy rates (41.3%) when compared to Pami, Prafi and Ransiki (59.4, 57.9 and 57.3% respectively). These findings showed that the low reproductive performance of Bali cattle in this area was most likely determined by management practices. The difference between locations was

mainly due to the variation in cattle husbandry as seen in Table 2.

Health status of all cows, in all location was questionable because there was no specific health program applied to those cows. Parasites infestations were a major problem in Manokwari and impacted on conception rates and animal weight gain. In Ransiki, Pami and Oransbari, parasites such as flies and ticks were visible. In Prafi and Oransbari internal parasite caused problems for cows and calves especially for cows with poor body condition. Effective parasite control is essential for optimal cow-calf performance. Rickard *et al.* (1992), Myers (1988) and Stromberg *et al.* (1997) reported that eradication of worms in cows resulted in increased pregnancy rates of 9 to 12%. Those studies showed that worm infestation may lead to competition for the little available nutrients derived from the pasture and the energy available to the cows in the presence of worms may barely meet their maintenance levels leaving little or minimal energy for growth, production and reproduction. It was also suggested that de-wormed cows might do better than those given access to nutritional supplements but not de-wormed.

In Oransbari, the low number of mature and genetically sound bulls available may also have contributed to the low pregnancy rate. The ability of farmers to detect oestrus at a right time and mate the cow on the right time was also questionable since all the cows on tethered zero-grazing system on this site was tethered all the time around farmers' house. McCool (1992) and Wirdahayati (1994) stated that no real evidence of photoperiod cyclicity effect in Bali cattle, but oestrus is predominantly event at the nighttime period. O'Farrell (1978) noted that early morning and late evening were the times of greatest oestrus activity and over 33% of visible oestrus periods in the herds of his study lasted less than 6 h. In other studies cows housed in outdoor paddocks and cows in loose housing systems showed the highest frequency of mounting and other oestrus behavior during the nighttime period (Hall *et al.*, 1959; Barr, 1975; Hurnik *et al.*, 1975). A peak of oestrus activity during the night was found in one study with 65% of the mounting activity occurring between 19.00 and 07.00. Esslemont and Bryant, 1976), supporting the value of including periods for detection of oestrus late in the evening. Foote (1974) pointed out that frequent oestrus checks and enough time to observe all cows properly for signs of oestrus were important aspects of successful reproduction management. Furthermore, Esslemont *et al.* (1985) found that watching for oestrus three or four times a day, and not leaving more than 8 h between obervations improved oestrus detection rates to 80% in *Bos taurus* cattle.

Because the farmer's cultivation activity meant that they were in the field early in the morning and did not return until late in the evening it is unlikely that oestrus detection will occur. Apparently, one reason for the delayed pregnancy in this location was the fact that cows were not exposed to the bulls. Consequently, females entering their oestrus periods in the afternoon hours or during the night were not served by the bulls. In addition, oestrus periods were not accurately or clearly recorded in many cases and no oestrus expectancy charts were used as a guide in detecting the future (i.e. 21 days later) occurrence of oestrus. This was an indication that an understanding of how important correct oestrus detection on reproductive performance was lacking.

It is obvious that accurate records or the use of oestrus expectancy charts are indispensable under a management system where bulls are with the cows for limited period of time. In addition to lowering the percentage of cows pregnant, the combined effects of lack of bull presence and the limited access of the females to a bull or express the oestrus may also lead to prolong post-partum intervals which will in turn increase calving intervals.

At Ransiki and Pami however, the problem was different. There were too many bulls compared to the number of cows serviced. This resulted in fighting by the bulls. This appeared because of the cattle on these sites were raised on free range with limited management input. Reproductive performance of individual bulls has been shown to be influenced by social interactions between bulls in multi-sire breeding (Lehrer *et al.*, 1977). More over they stated that dominant bulls tend to sire more offspring (65-100%) or achieve more services than subordinate ones (< 35%). However, if dominant bulls have lower reproductive capabilities than subordinate bulls, they could lower reproductive rates by failing to service or impregnate all the females under their influence and by preventing subordinate bulls from servicing. This phenomenon may have been manifested in one study in which mixed age groups of bulls achieved lower

pregnancy rates than did groups of young, similarly aged bulls at pasture (Blockey, 1979).

Undertaking a breeding soundness examination and culling the low fertility bulls to reduce the number that needs to be maintained in the breeding herd and ensure adequate reproduction is probably the best way to improve reproductive performance on this region. Also need to get the bull and cow ratio correct.

CONCLUSION

This study showed that cows manage under ranching system and combination of tethered on pasture and zero grazing had better pregnancy rate (58%) than to the Zero grazing groups (31%). Bull availability, bulls to cows ratio, cattle health condition, feed availability and overall pasture and cattle management were the main factors determine cows pregnancy rates in Manokwari.

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