Reproductive Indices in Determining Regular Calving of Holstein-Friesian Cows Maintained under Intensive and Semi-Intensive Managements in Central Java

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ABSTRACT

Reproductive efficiency of dairy cows can be determined by various reproductive indices (RIs) as essential components of regular calving period. The aims of this research were to assess some RIs, correlate among those RIs and describe possible causes of their variation for Holstein-Friesian (HF) cows maintained under two different conditions in Banyumas district, Central Java. Data of reproduction of HF cows were collected for 458 records from a dairy breeding station (BS), 1992 – 2002, and for 417 records from a number of small dairy holders (SDH), 1996 - 2002. A number of RIs studied were intervals from calving to first service (CFS), first service to conception (FSC), days open (DO) and calving interval (CI). Pearson correlation method was used to correlate (r) among RIs. Simple regression up to the third levels was used to investigate the effects of individual RIs (CFS and FSC) on DO and (CFS, FSC and DO) on CI. Means of each RI of HF cows between the BS and SDH were compared by the least square technique of GLM analysis by considering location, age-, season- and year of calving as dependent variables. Location resulted in very significant effect ($P<0.01$) on CFS, DO and CI, at a range of 1.58 – 21.56 %. Adjusted means of CFS, FSC, DO and CI in the BS were 78, 22, 134 and 410 d respectively; and those in SDH were 91, 24, 156 and 427 d respectively. For both locations, FSC was a more major factor in affecting DO compared to CFS with the r value of FSC-DO almost twice the strength against CFS-DO (BS= 0.84 vs. 0.48; SDH= 0.82 vs. 0.44 %). Further, DO had the highest effect on CI compared to individual FSC or CFS, r value = 0.98 (the BS) and 0.97 (SDH. Lengthening each day of DO resulted in linearly increased CI of 0.99 d (the BS) and 0.98 (SDH). Major differences in RIs of HF cows in the current study compared to those in temperate and other tropical regions require definite researches in assessing various physiological and environmental factors affecting reproductive performance of HF cows under specific tropical region of Central Java.

Key words: reproductive indices, days open, Holstein-Friesian cows, tropical region

INTRODUCTION

Reproduction plays a key role to achieve profitability in a dairy production as an inefficient reproduction results in many kinds of adverse indicators such as less milk and fewer calves per cow per year, increased culling rates, slow genetic improvement, increased replacement cost, increased breeding cost or AI services and low net returns (Dekkers *et al*., 1998). It is desirable that cows have a good fertility because the more frequently a dairy cow calves, the greater is the amount of milk produced in her lifetime. According to Plaizier *et al*. (1997) inferior reproduction in dairy cattle causes a severe disadvantage in dairy production operation by reducing the amount of milk produced per cow per day of herd life, increasing breeding costs, intensifying the rates of voluntary and involuntary culling and slowing the rate of genetic progress for the traits of economic importance in a dairy herd.

Factors governing reduced reproductive performance in dairy cattle are numerous and often difficult to diagnose. Even under optimal conditions, the reproductive process is less than perfect because of the multiple factors which contribute to produce a live calf (Stevenson, 2001). Overall reproductive performance at a herd level is directly influenced by the reproductive activity of individual cows. A dairy cow is clearly fertile if she has the ability to