STUDY OF DISEASES OF DAIRY COWS IN THE SUBDISTRICT OF CISARUA, WEST JAVA

Simson Tarigan, A.J. Wilson and M. Darodjat

Research Institute for Veterinary Science, Bogor

ABSTRACT

Using a questionnaire and collection of blood and faecal samples, a disease investigation survey was conducted on dairy cattle in the Cisarua subdistrict of Bogor, West Java. The main purpose was to obtain information on some economically important diseases in these animals indicating possible areas for further research. The study revealed that poor reproductive performance and subclinical mastitis appeared to be the biggest problems. The age at first calving was very late ($\overline{X}$ = 3.2 years) and the inter-calving interval was long ($\overline{X}$ = 1.4 years). Ninety-three percent of the cows studied had subclinical mastitis. The long inter-calving interval and subclinical mastitis reduced daily milk production significantly.

INTRODUCTION

The occurrence of a disease is determined by a number of physical and biological variables. To ascertain the most important variables of disease, broad studies are required so that accurate information on epidemiology can be obtained. From such epidemiological information diseases can be listed in terms of importance and areas requiring further research can be identified.

An attempt was therefore made to study the epidemiology of major diseases of dairy cattle in the subdistrict of Cisarua, Bogor between April and May 1985.

MATERIALS AND METHODS

Questionnaire

Twenty-three dairy cattle owners from a total sample size of 274 in Cisarua were interviewed by questionnaire. The questionnaire obtained information on disease type and occurrence, mortality rates, management and reproductive performance.

Disease Investigation Procedures

Blood, serum, faeces and quarter milk samples were collected from 50 cows for haematology, serology, presence of parasite eggs and bacteria respectively. The haematology examination covered red and white cell counts by Coulter counter, haemoglobin level by haemoglobinometer and packed cell volume. Serology to detect antibodies to brucellosis and leptospirosis was conducted using the Rose Bengal and micro-agglutination tests respectively. The degree of bacterial subclinical mastitis was estimated from both the number of somatic cells present in milk samples and the isolation of pathogenic bacteria.

RESULTS

Questionnaire

Details of the 23 farmers showed that they were aged between 24 and 60 years and had an average of 3-4 years experience in managing dairy cattle. The farmers owned 249 dairy cattle whose herd structure is shown in Table 1.

Table 1. Herd structure and ownership of dairy units

	Numbers	Percentage	Numbers per respondent
Calf:			
male	21	8	
female	37	15	1.2
total	58	23	2.5
Heifer	60	24	2.6
Dairy cow			
lactating period	93	37	4.3
dry period	38	16	1.4
total	131	53	5.7
Total	249	100	10.8

The most common age group was the adult female (53%) of which 37% were lactating. Calves and heifers represent 23% and 24% respectively. The followings are the detail of the results:

(1) The dairy management system can be classified into three categories: (a) on site family ownership, (b) on site family ownership with labours, and (c) absentee landlord ownership using labours. The number of cattle owned by the first, second and third category was 6, 10 and 19 respectively producing an average of 10.6, 13.7 and 8.0 litres of milk/day/cow respectively. The difference in daily milk production between these three management systems was very significant (P < 0.01).

(2) All respondents, except one, owned pasture; however the majority had to look for additional grass to meet daily requirements. All respondents gave concentrates to their animals.

(3) Standard of housing in all cases was good.

(4) The diseases reported by respondents included mastitis, lameness, digestive disorders (bloat and diarrhoea), traumatic pericarditis and metritis.

(5) Mortality rates of calves and cows were 11.6% and 5.4% respectively for the last one year.

Disease Investigation Procedures

Subclinical mastitis

The presence of subclinical mastitis (SM) was measured according to somatic cell count (SCC) and the presence of pathogenic bacteria. The prevalence of SM in adult cows based on SCC only was 88.4% of cows or 57.3% of quarters. The respective figures were 93% and 77.4% when both SCC and the presence of pathogenic bacteria were used as criteria.

The most common pathogenic bacteria isolated from the milk samples was *Streptococcus agalactiae*, which accounted for 55% of positive samples, followed by *Staphylococcus aureus* (11.1%), *Staphylococcus epidermidis* (7.8%), *Streptococcus dysgalactiae* (3.3%) and *Streptococcus uberis* (2.2%).

The average number of milk somatic cells at first, second and third lactation were 1,424,000; 2,359,000 and 3,621,000 per ml milk respectively. Those numbers tended to increase with the increasing number of lactation; however, analysis of variance showed that the numbers were not significantly increased (P > 0.05). If a greater number of milk samples had been examined the numbers would probably be significantly different (Syrstad and Ron, 1979).

The influence of SM on milk production was analysed by correlating the number of SCC with milk production (Little and Hills, 1972). Somatic cells alone accounted for 1.56% in reducing daily milk production. However, taking into account the length of lactation variable, which had very significant

influence on milk production, the influence of the SCC became greater (5.15%). Both the SCC and the period of lactation variables accounted for 24.48% on reducing milk production.

Infertility

The reproductive performance of the 131 cows studied is summarised on Table 2. This shows that reproductive performance is very poor with the average ages at first, second and third calving being 3.2, 4.4 and 6.0 years respectively. The average calving interval was 1.4 years.

There was a tendency that the longer the cows were kept by the respondents the worse their reproductive performance became. This seemed to be caused by poor farm management. At first calving, there were 23% of the cows calved at the acceptable age (*i.e.* 2-2.5 years); however, at the second and third calving the percentage decreased to 19 and 10% respectively (Table 2). Not only did the percentage of the cows which calved at an acceptable age became smaller with increasing number of calvings but also the median ages at calving of the prolonged calving cows became higher with the increasing number of calving. Furthermore, the inter-calving interval between the second and the third calving was 0.4 year (5 months higher) than that between the first and the second calving (Table 2).

The effect of the prolonged inter-calving interval on milk production was analysed from 93 lactating cows. The average daily milk production at the first, second and third three months of lactation, 16.1; 12.5 and 11.1 l/cow respectively, was decreased slightly; however, after the period of the third three months (*i.e.* after the period of 9 months of lactation), at which the cows should have been dried off, the average of daily milk production dropped suddenly. Most of the cows included in this category produced only 3 litres of milk per cow daily. Twenty nine percent of the lactating cows were included in this category. Thus the prolonged calving interval in

Table 2. Reproductive performance of dairy cows in Cisarua

Calving	Percentage of cows calving (years of age)											Range x 25.0	Calving interval (years)
	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0		
First	9*	14*	43	11	14	5	4	—	—	—	—	3.2 ± 1.4	1.2
Second	—	—	5*	14*	23	22	11	3	—	—	—	4.4 ± 1.4	1.4
Third	—	—	—	—	—	10*	10	12	13	48	7	6.0 ± 1.4	1.6

Note: * percentage of cows calved at acceptable age

46

such a large proportion of cows caused a great financial loss both from milk and calves losses.

Disease

Bacterial. None of the 50 sera collected were positive to *Brucella abortus* antigen. Only two of the 50 sera were weakly positive to *Leptospira hardjo* and *L. tarrasovi* respectively.

Parasitic. Examination of 50 faecal samples for eggs of *Fasciola* spp., *Paramphistoma* spp. and nematodes suggested that parasitic infestations were not significant.

Haematology. A summary of haematological parameters from a sample of 50 cows is shown on Table 3. This shows no differences between cows in their first, second and third lactations, and also that mean values of total RBC, WBC, haemoglobin and PCV were all in the normal range.

Table 3. Haematological values of dairy cows in Cisarua

Lactation	Mean ± 2 standard deviation			
	RBC (x 10/ml)	WBC (x 10/ml)	PVC (%)	Hb (mg %)
First	6.1 ± 3.2	9.3 ± 9.0	28.2 ± 25.6	11.0 ± 2.8
Second	6.3 ± 2.8	9.3 ± 4.4	32.2 ± 11.2	11.6 ± 4.0
Third	6.8 ± 1.7	9.0 ± 3.8	33.0 ± 8.8	12.0 ± 3.0
All	6.4 ± 2.4	9.2 ± 5.8	31.1 ± 15.2	11.5 ± 3.2
Standard of adult female Frisian cow*	6.6 ± 3.0	7.0 ± 3.0*	33.0 ± 10	11.7 ± 2.0

* Penny and Scofied (1966)

DISCUSSION

Of the diseases mentioned, poor reproductive performance (low calving rates and long inter-calving intervals) and SM were the most important constraints to production in the dairy cattle studied.

The proportion of lactating dairy cows was only 39% of the total number of adult cows. This figure should be much higher *e.g.*, 69% (Sudono, 1984). The main cause of this situation does not appear to be disease as the incidence of the common infertility diseases brucellosis and leptospirosis was very low. The main cause is probably bad management, and reproductive performance could be increased by improving the AI service and by improved oestrous detection. The need for better nutrition should also be investigated.

A large amount of potential income is being lost by the farmers in this study. Increasing the incomes of small holder farmers is a fundamental aim of the Indonesian government. Thus a great effort is required by the extension services to bring information and technology to farmers so that milk production and reproductive performance can be dramatically improved thus increasing real income.

The haematological and helminthological results indicate that general herd health is good when animals are permanently stalled. Major constraints are, probably influenced by the management system.

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