THE ECONOMIC IMPACT OF SHEEP-ASSOCIATED MALIGNANT CATARRHAL FEVER ON BUFFALO FARMERS IN BOGOR DISTRICT, WEST JAVA

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ABSTRACT

To determine the demography of the buffalo population and the pattern of the buffalo trading in the Bogor district of West Java, and to assess the economic impact of SA-MCF on buffalo farmers using data from this survey and the preceding abattoir survey. A single-stage cluster survey was used for the survey and the sampling frame included every village in the five sub-districts. Twenty-three villages were selected from 78 in the sampling frame. Buffalo farmers were interviewed using participative rural appraisal technique. The standard questionnaire contained a number of check questions about their buffalo farming activities for a year ago. The collected data then was analysed using a two-stage cluster sampling technique. Of the 177 buffalo farmers in the 23 villages sampled, 101 (57%) were interviewed. The mean number of buffalo farmers per village was 7.70 (S.E.=1.05), the mean number of buffalo per farmer in a year was 2.41and the estimated buffalo population in the five sub-districts was 1450. In the same period, 14.8% of buffalo were sold to a local abattoir and 66% of these were unhealthy at the time of slaughter. The average time between onset of illness in buffalo and submission for emergency slaughter was 1.57 days (S.D.=0.58). The average loss, per farmer, from premature sale of unhealthy buffalo for emergency slaughter was Rp 80,200.- (S.E.=Rp 74,100.-), with range from nil Rupiah to Rp 1,370,000.-.

Key words: Bogor, buffalo, economic, malignant catarrhal fever

INTRODUCTION

Sheep-associated malignant catarrhal fever (SA-MCF) is a clinicopathological entity that affects Bali cattle *(Bos javanicus)*, swamp buffalo *(Bubalus bubalis)*, *Bos taurus* and *Bos indicus*. SA-MCF is of considerable economic importance in Indonesia, where large and small ruminants are commonly kept together in traditional farming units and where large ruminants have a vital economic role in providing draught power (DANIELS *et al.*, 1988).

The clinical signs of SA-MCF in buffalo are often not so marked as in cattle and diagnosis of the disease on clinical signs alone is unreliable (BEVERIDGE, 1981; BLOOD and HENDERSON, 1979; DANIELS *et al.*, 1988). Until recently, a diagnosis of SA-MCF could only be confirmed by the detection of characteristic histopathological changes in dead animals. Isolation of the highly cell-associated causative agent of SA-MCF, ovine herpes virus-2 (OHV-2), has proved impossible to date, and until now, infection with OHV-2 has not been able to be confirmed by viral isolation. The development of a specific polymerase chain reaction probe for OHV-2 has provided a new tool for detecting infection with OHV-2 and for confirming a diagnosis of SA-MCF in live animals (BAXTER *et al.*, 1993).

Because of the difficulties of confirming infection with OHV-2 and SA-MCF in live animals until the advent of the probe for OHV-2, no formal studies on the prevalence of SA-MCF in Indonesia had been reported. As a result, it has been difficult to assess the economic effect of SA-MCF on livestock farmers in Indonesia. Following the introduction of the OHV-2 probe to Indonesia, a survey of buffalo sent for slaughter at local abattoirs in Bogor district was conducted in 1993-1994 (WIYONO *et al.*, 1994). The survey estimated the prevalence of sickness and OHV-2 infection in buffalo submitted to such abattoirs.

This paper reports a survey to determine the demography of the buffalo population and the pattern of buffalo trading in the Bogor district of West Java, and assesses the economic impact of SA-MCF on buffalo farmers using data from this survey and the preceding abattoir survey.

METHODS

Five sub-districts within Bogor district were included in the survey: Caringin, Ciawi, Cijeruk. Cisarua and Megamendung. A pilot survey showed that although the population of most villages was 4,000-7,000, very few families in each village kept buffalo usually less than 20. A single-stage cluster sampling technique was therefore used for the survey and the sampling frame included every village in the five sub-districts. Twenty-three villages were selected from 78 in the sampling frame. Each village was selected with a probability proportional to its buffalo population according to official census data.

The survey was conducted in January 1994. The head of each selected village was asked to compile a list of the buffalo farmers in the village. Farmers on each list were subsequently interviewed using participative rural appraisal techniques, with a standardised questionnaire to guide the line of questioning and ensure that core data was collected by the interviewer. [5][reference] The questionnaire contained a number of check questions to determine the validity of farmer responses. Farmers were questioned about their buffalo farming activities from the beginning of November 1992 until the end of December 1993.

To compensate for the poor response rate in some villages, data was analysed as if it had been collected using a two-stage cluster sampling technique (HANSEN and HURWITZ, 1943).

RESULTS

Findings are summarised in Table 1. Some farmers were unable to be contacted and some refused to be interviewed. Of the 177 buffalo farmers in the 23 villages sampled, 101 (57%) farmers were interviewed. The range in response rate was 20-100%. The mean number of buffalo farmers per village was 7.70 (S.E.=1.05). There was an average 2.05 (S.E. $=4.24\times10^{-2}$) buffalo per farmer at the beginning of November 1992 and an average 2.76 (S.E.$=4.69\times10^{-2}$) buffalo per farmer at the end of December 1993. The mean number of buffalo per farmer between November 1992 and December 1993 was 2.41, and the estimated average buffalo population of the five survey *kecamatan* for the same period was 1450.

From the beginning of November 1992 until the end of December 1993, there was a substantial turnover of the buffalo population: the equivalent of 43% of the population in November 1992 died or was sold and the average number of buffalo per farmer increased by 35%. In the same period, 14.8% of buffalo were sold to a local abattoir and 66.0% of these were unhealthy at the time of slaughter: 9.75% of buffalo were sold to a local abattoir and were sick at the time of sale. The average time between the onset of illness in buffalo and submission for emergency slaughter was 1.57 days (S.D. =0.58), range 0-3 days.

Table 1. Demography of the buffalo population and patterns of buffalo trading in Bogor. November 1992 to December 1993.

Variable: per buffalo farmer (01.11.92-31.12.93)	Range		Mean	Standard error
	Min	Max		
Buffalo that died (not slaughtered) on-farm	0	1	0.0497	6.99×10^{-3}
Buffalo slaughtered on-farm	0	1	0.0205	9.01×10^{-3}
Buffalo sold or given away	0	4	0.7910	2.94×10^{-2}
Buffalo sold to a local abattoir	0	4	0.3570	2.72×10^{-2}
Buffalo that were unhealthy and sold to a local abatoir	0	4	0.2350	2.00×10^{-2}

The average loss, per buffalo farmer, from premature sale of unhealthy buffalo for emergenc slaughter was 80.2×10^3 Rp (S.E.=74.1×10^3 Rp) - range 0 -1.37×10^3Rp.

DISCUSSION

Losses resulting from infection by OHV-2 might have manifest themselves as premature sal of buffalo to local abattoirs because of sickness, or unexpected deaths of buffalo on the-farm.

Losses attributable to premature slaughter

The period from the beginning of November 1992 until the end of December 1993 containe 6 dry season months and 8 wet season months. The proportion of animals submitted to loca abaftoirs that are sick halves during the dry season[3]. The proportion of buffalo that were sold to local abattoir and were sick at the time of sale over a one-year period, 7.98%, was estimated b multiplying the proportion of buffalo that were sold to a local abattoir and were sick at the time d sale from the beginning of November 1992 until the end of December 1993, 9.75%, by a correctio factor of 9/11. The proportion of buffalo submitted to emergency abattoirs that were sick because o infection with OHV-2 was 0.218[3].

Therefore an estimated 1.74% of buffalo were being submitted annually for emergenc slaughter because they were sick as a result of OHV-2 infection. The number of sick buffal submitted to local abattoirs for emergency slaughter ranged from 0-4 per farmer. Although th average loss resulting from OHV-2 infection of buffalo was small, individual loss might be quit high in some cases.

Losses attributable to on-farm mortality

From the beginning of November 1992 until the end of December 1993, 0.85% of buffal were healthy and slaughtered on-farm. A further 2.06% of buffalo died on-farm from unknow causes. The rate of OHV-2 infection amongst buffalo that die on-farm is unknown. The shor average time from the onset of sickness in buffalo to submission for emergency slaughter, 1.5 days, suggests that farmers rapidly discriminate between sick buffalo that may be treate successfully and those that may not. Following the onset of clinical signs of SA-MCF, treatment i invariably unsuccessful and it is probable that a farmer who believes a buffalo has SA-MCF wil send it for emergency slaughter rather than retain the buffalo and treat it. It is likely, therefore, tha the proportion of buffalo that die on-farm as a result of infection with OHV-2 virus is small.

The results of the two surveys suggest that approximately 2% of buffalo in Bogor district die on-farm or are prematurely slaughtered each year as a result of infection with OHV-2. The loss to some farmers is much higher because of clustering of disease. There is no known cure for SA-MCF. Control will therefore depend on a better understanding of risk factors for SA-MCF and their management, and the development of a vaccine against OHV-2.

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