ECONOMIC IMPLICATIONS OF BRUCELLOSIS IN BOVINE

H.H. Panchasara, J.S. Patel, and P.R. Patel

Livestock Research Station, S. D. Agricultural University,

Sardarkrushinagar - 385 506. (Gujarat)

(Received 23/08/2011, Accepted 27/04/2012)

ABSTRACT

The study highlights the direct and financially accountable economic losses due to brucellosis in bovine. Among 396 cattle and 643 buffaloes screened for brucellosis using i ELISA, 72 (18.18 %) cattle and 76 (11.82 %) buffaloes were found positive. Economic losses accruing due to brucellosis were maximum (86.03 to 86.44 %) due to reduction in milk production followed by treatment cost and loss of calf due to abortion.

KEY WORDS: Economics, Brucellosis, bovine.

INTRODUCTION

Brucellosis cause heavy economic losses to the livestock industry through abortion, premature birth, retained foetal membrane, decreased milk production, delayed conception and infertility. A real economic impact of this sub clinical disease remains to be estimated. It may well run over Rs. 500 crore annually (Renukardhya et. al. 2002). Michel (2003) reported brucellosis as one of the important causes of considerable economic losses due to reduced production. Hence, the present study was conducted to assess economic losses due to brucellosis.

MATERIALS AND METHODS

The study was conducted on the cattle and buffaloes of North Gujarat during the period 2003-2005. A total of 869 cattle and 1088 buffalo serum samples were screened for Brucella antibodies by RBPT, STAT and i ELISA. Economic losses due to disease could be direct loss and indirect losses. Since it was difficult to quantify the indirect losses for the want of reliable data like public health significance, spread of infection to healthy population, only the components which were significantly financially accountable were taken into account to quantify monetary losses such as loss of calf due to abortion, reduction in milk yield and treatment cost. Considering 91.66 % animals to calve each year and 10 % loss of production of total lactation yield, monetary loss of milk production in 100 adult animals was calculated by using following formula adapted from Patel (1999) with modification.

Monetary loss of milk in 100 adult animals (Rs.) = A x B x C x D / 100

Where A= Av. Milk loss per animal, B=Prevalence of brucellosis, C= Market value of milk, D= Per cent of animal calved during the year. Losses accruing as a result of calf loss due to abortion were calculated using the formula given by Mathur and Sharma (1974).

Keeping in view zoonotic significance of brucellosis and spread among healthy population, positive animals have to be disposed of. Economic losses due to disposal were calculated (Patel, 1999)

RESULTS AND DISCUSSION

Among 396 adult cattle screened for brucellosis, 72 (18.18 %) were positive by i ELISA. Similarly, among 643 adult buffaloes, 76 (11.82 %) were positive. Projected losses due to reduction in milk yield of Brucella positive animals were found to be Rs. 46240.01 (231.24 x 12 x 18.18 x 91.66 / 100) in cattle and Rs. 32736.44 (177.36 x 17 x 11.82 x 91.66 / 100) in buffaloes. Annual monetary loss of $ 25 million in USA from brucellosis due to loss in milk production has been reported (Gilman,

1963) however; present findings of loss in milk production substantiated the findings of Mathur and Sharma (1974).

From 396 cattle and 643 buffaloes, 21 (5.30 %) cattle and 19(2.80 %) buffaloes aborted. Monetary losses due to loss of calf were found to be Rs. 1943.19 (91.66 x 5.30 x 400 / 100) in cattle and Rs. 2181.51 (91.66 x 2.80 x 850 / 100) in buffaloes. Mathur and Sharma (1974) reported higher losses in cattle calves. However, higher losses observed in the present study could eventually be due to higher price of buffalo calves.

Projected economic losses due to culling of cattle and buffaloes in a population of 100 female animals were found Rs. 102440.00 (6500 x 15.77 / 100) and Rs. 156450.00 (15000 x 10.53 / 100), respectively.

In the present study, abortion caused extended calving interval of 231.45 days in cattle and 190.12 days on buffaloes. Significant association of abortion ($P< 0.05$) with calving interval ($R= 0.48$) has also been reported by Xolalpa et al. (2003). Greater loss in cattle compared to buffaloes was due to more extended calving interval in cattle.

Out of 343 cattle and 570 buffaloes, (With more than one lactation) screened for abortion, retained placenta and repeat breeding problem, 23 cattle (6.71 %) and 23 buffaloes (4.04 %) were Brucella positive had extended calving interval. Monetary loss due to extended calving interval was found to be Rs. 1164.77 (75 x 6.71 x 231.45 / 100) in cattle and Rs. 576.06 (75 x 4.04 x 190.12 / 100) in buffaloes.

Considering prevailing market price of the medicines, veterinary fees and labour cost, per day treatment cost for abortion, retained placenta and repeat breeding were found to be Rs. 250/-, Rs. 320/- and Rs.150/- respectively.

Total treatment cost for a case of abortion, retained placenta and repeat breeding were Rs. 250/-, Rs. 320/- and Rs.506.25 (4050/8), respectively in cattle while these figures were Rs. 250/-, Rs 320/- and Rs. 375/- (2250/6) in buffaloes. Jeyakumari et. al. (2003) estimated Rs. 150.40 cost of treatment for retained placenta per animal.

Major factor of economic losses was due to reduction in milk production followed by treatment cost and loss of calf due to abortion. Gilman (1963) reported similar findings.

The loss due to culling of positive reactors in the population of 100 animals was Rs. 102440/-in cattle and Rs, 156450/- in buffaloes. Higher economic losses caused by culling of positive animals than losses in maintaining such animals was recorded because economic losses due to reduced milk production , loss of calf, extended calving interval and treatment cost only has been taken into consideration. The actual losses, however could be many folds provided the non quantifiable losses like permanent loss of fertility, spread of infection in healthy animals, loss of draft power in draft animals (Partuotomo et al., 1985), condemnation of animals (Atallah and El Kak, 1998) and zoonotic importance of the disease were taken into consideration; often there is loss of animal itself due to such infection.

Based on these findings, test and elimination appeared to be the most ideal method to achieve desired objective. It is difficult to advocate this method of eradication in the Indian context because; legislation on slaughter of cow is banned. Hence, test and segregation of positive reactors along with the calf hood vaccination should perhaps be the only pragmatic method.

REFERENCES

Atallah, S. T. and El, Kak, A. A. (1998). Economic loss due to infection of cattle and buffaloes with tuberculosis and brucellosis. Lexandria Journal of Agricultural Research. 43(3): 367-376.

Gilman, H. L. (1963). Diseases of cattle, 2nd edn, American veterinary publications, Inc., New York p. 576.

Jeyakumari, M, Thirunavukkarasu, M and Kathiravan, G (2003). Economic impact of postpartum reproductive disorders on dairy farms. Indian J. of Anim. Sci.. 73 (12): 1360-62.

Mathur, A. C. and Sharma, G. L. (1974). Studies on the estimates of economic losses caused by brucellosis among bovines and its control in India. Indian J. Anim. Sci. 44(9): 654-66.

Michel, A. L. (2003). From farm to fork - zoonoses and meat safety. Consistency of quality: abstracts and proceedings of the 11th-International-Meat-Symposium, Centurion, South Africa, 29-30-January,-2003.229-231.

Partoutomo, S., Ronohardjo, P., Wilson, A. J. and Stevenson, P. (1985). Review of diseases in Indonesia affecting draught power in domestic animals. ACIAR Proceedings Series, Australian Centre for International Agricultural Research. 10: 140-146.

Patel, J. S. (1999). Epidemiology, clinicopathology and treatment of sarcoptic mange in Mehsana buffaloes. Ph.D. thesis submitted to GAU, Sardarkrushinagar.

Renukaradhya, G. J., Isloor, S. and Rajsekhar, M. (2002). Epidemiology, zoonotic aspect, vaccination and control; eradication of brucellosis in India. Vet. Micro. 90:183-195.

Xolalpa, C. V., Perez Ruano, M. and Soto, C. R. (2003). Association of brucellosis with reproductive failure and productive and reproductive efficiency indicators. Revista de Salud Animal. 25(3): 196-200.

❑