# PREVALENCE AND ECONOMIC IMPORTANCE OF LIVERFLUKE INFESTATION IN SLAUGHTERED CARABAOS AND CATTLE

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## ABSTRACT

**Separate surveys were conducted in Baybay and Ormoc, Leyte to determine the prevalence of liverfluke infestation or fascioliasis and the economic importance of infested livers of slaughtered carabaos and cattle. Results showed that there was no significant relationship between the age of the animal and infestation rate. However, there was an increasing trend of infection in cattle from 1-8 years old. The type of pasture (lowland or upland, dry or wet) was found to be significantly related to liverfluke infestation rate ($P < .05$). There was significant relationship between the established system of feeding roughage and liverfluke infestation rate in carabaos but not in cattle. An average liverfluke prevalence rate of 18% in cattle and 59% in carabaos was found in Ormoc City. In Baybay, the prevalence rate was 57% in carabaos and 18.5% in cattle. The average percentage liver condemnation for carabaos was 22%, and 2.42% for cattle, which would amount to an average annual loss of ₱5865 and ₱462 per year, respectively.**

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**KEY WORDS:** Carabao. *Bos bubalus bubalis*. Cattle. *Bos* sp. Liverfluke infestation. Fascioliasis. Trematode. *Fasciola gigantica*. Distribution. Effect of pasture area and management practice. Economic importance.

## INTRODUCTION

Carabaos *(Bos bubalus bubalis* Linn.) and cattle *(Bos* sp.) are affected by many diseases, one of which is liverfluke infestation or fascioliasis, caused by a trematode, *Fasciola gigantica.* Fascioliasis is a major problem especially in areas where there are permanent slow-flowing bodies of water which provide suitable habitats for the

snail intermediate hosts.

Mechanical damage to the liver and anemia following blood-sucking by worms result in considerable economic losses which are manifested through mortality, liver condemnation, stunted growth, reduced work efficiency, malnutrition, decreased milk production, and susceptibility to secondary infection.

Surveys were conducted to assess the extent of fascioliasis in carabaos and cattle in Baybay and Ormoc City and estimate the economic loss due to condemnation of affected livers.

## MATERIALS AND METHODS

*Sampling* — Using the simple random sampling method, 10 carabaos from each of the 10 barrios in Baybay and Ormoc City were selected for fecal sampling. Each survey has 10 sampling areas with a total of 100 samples except for Ancheta (1980) who examined only 60 heads due to insufficient number of cattle in Baybay.

To determine the economic losses due to liver condemnation, 30 randomly selected livers of carabaos or cattle slaughtered in the abattoirs were examined.

*Examination of Specimens*

*Fecal examination.* — Fecal samples from selected carabaos and cattle were taken directly from the rectum and examined quantitatively for the presence of Fasciola eggs using the Zinc Sulphate Flotation Technique (British Ministry of Agriculture, Fisheries and Food, 1977).

*Liver Examination.* — To determine the economic importance of the parasite in terms of liver condemnation, livers selected at random were weighed prior to examination by the meat inspector and all livers subsequently condemned due to fasciolias sis were weighed. Livers are condemned if there was extreme billiary cirrhosis and the presence of *Fasciola* parasites in the bile ducts.

The annual value of condemned livers in the municipalities was estimated using the formula:

Annual value of condemned livers (₱) = Amount of condemned livers (kg) x current liver price/kg x F*

## RESULTS AND DISCUSSION

*Age Group Distribution.*

The rate of liverfluke infestation among carabaos in Baybay and Ormoc City fluctuate with the different age groups (Table 1a). In cattle, Ancheta (1980) and Maniwang (1980) observed an increasing trend of infection from 1-8 years old; however, increase could not be ascertained beyond this due to a relatively small sample of animals representing older groups (Table 1b).

There is no significant relationship between age of the animal and infestation rate. Although cattle of ages 1-8 years old and carabaos of

*F is a factor to convert to 12 months depending on the number of months the total livers condemned was recorded.

**Table 1a.** Age distribution of carabaos in selected barrios of Baybay and Ormoc City examined for fascioliasis.

| Age (years) | Number Examined | Infestation Infested | (%) |
|---|---|---|---|
| 1-2 | 10 | 4 | 40.00 |
| 3-4 | 55 | 32 | 58.18 |
| 5-6 | 53 | 29 | 54.70 |
| 7-8 | 32 | 21 | 65.62 |
| 9-10 | 27 | 16 | 59.26 |
| 11-12 | 10 | 6 | 60.00 |
| 13-14 | 3 | 2 | 66.67 |
| 15-16 | 9 | 5 | 55.56 |
| 17-18 | 1 | 1 | 100.00 |

**Table 1b.** Age distribution of cattle in selected barrios of Baybay and Ormoc City examined for fascioliasis.

| Age (years) | Number Examined | Infestation Infested | (%) |
|---|---|---|---|
| 1-2 | 15 | 2 | 13.33 |
| 3-4 | 47 | 7 | 14.89 |
| 5-6 | 39 | 7 | 17.95 |
| 7-8 | 17 | 4 | 23.53 |
| 9-10 | 14 | 2 | 14.29 |
| 11-12 | 13 | 3 | 23.08 |
| 13-14 | 8 | 2 | 25.00 |
| 15-16 | 7 | 0 | 0.0 |

ages 9-16 years old appeared to have higher mean infection rate, the degree of susceptibility of young and old animals to the infestation could not be definitely determined as a result of uneven age group sample number.

*Pasture Area.*

The pasture available to all sample animals except for the 20 heads of cattle from ViSCA was unimproved, characterized by improper drainage and the presence of indigenous vegetation such as cogon *(Imperata cylindrica),* talahib *(Saccharum spontaneum),* and other native grass species.

A significant relationship between the type of pasture area and percentage of liverfluke infestation of carabaos and cattle was noted by Ancheta, Sabarez, Vencilao (1980) ($P < .05$, $P < .01$ (Tables 2a, 2b). Since the snail host of liverfluke thrives well in areas where water is present, unimproved pasture may become contaminated and thus predispose the animals to infestation.

*Feeding Practices.*

The most common method of feeding carabaos was by tethering (75.5%) followed by zero grazing + tethering combination (27%), and cut-and-carry (2.5%) (Vencilao, 1980; Sabarez, 1980). Percentage infestation rate was highest in zero grazing + tethering and lowest in the cut-and-carry method (Tables 3a, 3b).

In cattle, the combination of zero grazing and tethering was more favored (43%), followed by tethering (37%), range and zero grazing (12%), cut-and-carry (6%), and range method (2%) (Ancheta, 1980; Maniwang, 1980).

The animals were given supplementation in the form of salt (granulated or block), beer, urine, and eggs. The amount and fre-

**Table 2a.** Relationship between type of pasture and frequency of liverfluke infestation among sampled carabaos in Baybay and Ormoc City.

| Pasture Area | Infested | Non-infested |
|---|---|---|
| Upland | 20 | 34 |
| Lowland | 62 | 29 |
| Combination | 34 | 21 |

**Table 2b.** Relationship between type of pasture and frequency of liverfluke infestation among sampled carabaos in Baybay, Leyte.*

| Pasture Area | Infested | Non-infested |
|---|---|---|
| Dry pasture | 2 | 23 |
| Wet pasture | 7 | 28 |

*Survey in Ormoc City is inadequate on these data.

quency of supplementation vary depending on the availability of the feedstuff.

The result of these surveys is not conclusive due to limited data in each of the parameters used. Although animals that were allowed to graze, especially on range, had greater probability of infestation (Ancheta, 1980) than those in zero grazing (cut-and-carry), one could not ignore the fact that those animals fed using the latter system could also ingest infective larvae especially if they were given grasses growing abundantly near or along creeks and canals. These places are suitable habitats for snail host of liverfluke and offer risk of infestation.

A significant relationship between feeding practices and infestation rate was noted only in carabaos (Sabarez, 1980; Vencilao, 1980) but not in cattle (Ancheta, 1980; Maniwang, 1980).

*Other Management Practices.*

Except for the 20 heads of cattle from ViSCA (Ancheta, 1980) and 10 cattle heads from Ormoc City (Maniwang, 1980), all other sample animals had never been defluked. The lack of control measures to eliminate the parasites from the infested animals allows further contamination of pasture and spread of infestation.

*Distribution of Liverfluke.*

Separate surveys of Maniwang (1980) and Vencilao (1980) in Ormoc pointed a liverfluke infestation rate of 18% and 59% in cattle and carabaos, respectively (Table 4). In Baybay, 18.54% of the cattle examined was infested with the parasite (Ancheta, 1980) and 57% of the carabaos examined was infested (Sabarez, 1980). This percentage is very low compared with the 94% prevalence reported by Dumay *et al.* (1975) in their initial survey on the prevalence of liverfluke infestation in various municipalities in Leyte. This difference could be attributed to the variability of the prevailing conditions in the places surveyed which affects fluke and snail host development. The low infestation rate in cattle could be attributed to their non-wallowing habit.

**Table 3a.** Liverfluke infestation rate among sampled carabaos under different systems of feeding roughages.[1]

| Type of Grazing | Infested | Non-infested |
|---|---|---|
| Tethering | 88 | 63 |
| Cut-and-carry | 1 | 4 |
| Zero grazing + tethering | 27 | 17 |

[1] Samples from Ormoc City and Baybay, Leyte.

**Table 3b.** Liverfluke infestation rate among sampled cattle under different systems of feeding roughages.[1]

| Type of grazing | Infested | Non-infested |
|---|---|---|
| Range | 1 | 2 |
| Tethering | 11 | 47 |
| Cut-and-carry | 2 | 8 |
| Zero grazing + tethering | 12 | 57 |
| Range + zero grazing | 1 | 19 |

[1] Samples from Ormoc City and Baybay, Leyte.

*Economic Importance of Fascioliasis.*

The percentage condemnation of all carabao livers examined at Baybay and Ormoc City abattoirs was 28.47% (Sabarez, 1980) and 15.54% (Vencilao, 1980), respectively (Table 5). Two percent (2.42) of the cattle livers examined at Ormoc City abattoir was condemned for fascioliasis (Maniwang, 1980).

Considering that the price of liver at the time of survey was ₱15/kg, it was estimated that the average annual value of condemned livers was ₱5,865 in carabaos and ₱462 in cattle ($1.00 = ₱7.80).

**Table 4.** Percentage distribution of liverfluke infestation among sampled cattle and carabaos in Baybay and Ormoc, Leyte as of June-October, 1979.

| Place | Infestation (%) | |
|---|---|---|
| | Cattle | Carabaos |
| Ormoc City | 18.01[1] | 59.01[1] |
| Baybay | 18.52[2] | 57.02[1] |

[1] 100 samples
[2] 60 samples

**Table 5.** Average weight of livers examined and livers condemned; percentage loss due to infestation.

| Kind of Animal | Wt. of non-infested livers (kg) | Wt. of condemned livers (kg) | Infestation (%) |
|---|---|---|---|
| Carabao | 15.31[1] | 6.09 | 28.47 |
| | 69.15[2] | 10.75 | 15.54 |
| Cattle | 28.45[3] | 0.69 | 2.42 |

[1] Taken at Baybay abattoir for 8 weeks.
[2] Taken at Ormoc City abattoir for 4 weeks.
[3] Taken at Ormoc City abattoir for 2 weeks.

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