THE SITUATION OF CYSTICERCOSIS/TAENIASIS IN ANIMALS/MAN IN BALI

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Abstract. The Balinese always serve "lawar" at traditional ceremonies. It consists of half raw pork mixed with coconut and vegetables. In Bali, not all families have toilets in their houses and their animals are usually reared around the house area.

The prevalence of taeniasis in humans in Bali varied form 0.8% to 23% and most worms recovered from patients were *T. saginata* (Sutisna, 1989). Although pork was consumed more often than beef, the prevalence of cysticercosis in pigs and cattle was always low. Suweta *et al* (1978) reported a prevalence rate of 0.15% for cysticercosis in pigs. It has been reported (Anon, 1988) that while cysticercosis in pigs from 1975–1986 varied from 0.02% to 2.63%, it has not been found since 1986. The prevalence of cysticercosis in cattle from 1977 to 1981 varied from 0.30% to 2.39%.

INTRODUCTION

The island of Bali is inhabited by about 3 million people; 90% follow the Hindu religion. The Balinese consume pork more frequently then beef. Pigs are slaughtered at every traditional/ religious ceremony. A special dish, "lawar", is prepared from half raw pork mixed with coconut and vegetables and served at every ceremony.

These people live very closely with their animals; animals are reared in the nearby fields and around their houses. It is customary for farmers to slaughter their own animals, especially pigs, at home or in the village and report this to the local veterinary service, but reports are not always made. It was estimated that three times more pigs were slaughtered than reported and about 5% of the slaughtered cattle were not reported (Anon, 1988).

Many villagers do not have toilets in their homes; instead, they defecate in their yards, ricefields, and nearby streams.

This paper will review the prevalence of cysticercosis in animals and its significance to taeniasis in man in Bali, Indonesia.

MATERIALS AND METHODS

The data presented in this paper were obtained from research carried out in Bali and from government service reports.

RESULTS

Cysticercosis was first reported from swine in Bali by LeCoultre in 1920 (Anon, 1980). The overall prevalence of cysticercosis in swine from Bali between 1975 and 1986 varied from 0.02% to 2.6%, with the highest infection rate occurring in 1986 (Table 1). Since then, *Cysticercus suis* has not been found in swine in Bali (Anon, 1988).

The prevalence of cysticercosis bovis in cattle on Bali from 1977 to 1981 varied from 0.3% to 2.4%; in buffaloes in 1979 and 1980, it was 1.5% and 0.07%, respectively (Table 1). The highest prevalence rate for *C. bovis* has been found in cattle on Bali in 1980. *C. bovis* has not been found in either cattle or buffaloes on Bali since 1981 (Anon, 1988).

The prevalence of taeniasis in humans on Bali has varied from 0.8% to 23%, and most cases are due to *Taenia saginata* (Simanjuntak *et al*, 1977; Bakta and Suwarno, 1983; Wijana and Kapti, 1983 – all as cited in Sutisna, 1989). Rasidi *et al*, (1981, as cited in Wisna, 1989) reported a 1% prevalence of taeniasis in residents of the Regency of Jembrana, Bali. Wijana and

Table 1

Cases of cysticercosis in animals in Bali, Indonesia

Year	Total animals observed (head)			Total cases found (head)			Prevalence (%)		
	Cattle	Buff	Swine	Cattle	Buff	Swine	Cattle	Buff	Swine
1975	32059	–	20148	–	–	59	–	–	0.29
1976	40200	–	40136	–	–	201	–	–	0.50
1977	32192	117	31706	119	–	86	0.62	–	0.27
1978	33842	104	30988	102	–	181	0.30	–	0.58
1979	31586	801	31187	476	12	306	1.51	1.50	0.98
1980	35288	278	15356	844	2	90	2.39	0.72	0.59
1981	34887	517	49126	674	–	60	1.93	–	0.12
1982	39883	26	69054	–	–	69	–	–	0.10
1983	50149	–	106442	–	–	41	–	–	0.04
1984	56750	64	122802	–	–	23	–	–	0.02
1985	59733	586	157585	–	–	91	–	–	0.06
1986	57263	132	75932	–	–	2	–	–	2.63
1987	70778	51	148207	–	–	–	–	–	–
1988	59657	110	149112	–	–	–	–	–	–

Source: Information data of livestock 1988
The Veterinary Service of Bali Province, Denpasar-Bali

Kapti (1983, as cited in Sutisna, 1989) found that prevalences of taeniasis varied from 0.5% to 9.6% in villages of the Abiansemal District in the Regency of Badung, Bali. Bakta and Suwarno (1983, as cited in Sutisna, 1989) documented a very high prevalence of taeniasis (23%) in residents of the village of Penatih in the Regency of Badung and *T. saginata* was identified as the etiological agent in most cases. In Penatih, 97% of the residents stated that they enjoyed eating lawar and most of them (63%) preferred lawar made from pork. This was not surprising, as only 5.8% of Penatih residents raised cattle in the yards, whereas 72% raised pigs in their yards. Likewise, only 64% of the residents of Penatih had toilets in their houses. When Sutisna (1989) examined 515 residents of the village of Renon, in Denpasar, Bali, he found 37 cases (71.%) of taeniasis and more infections were diagnosed in males (8.9%) than females (5.2%). Only one of 37 cases was caused by *T. solium*; the others were from *T. saginata*.

DISCUSSION

The data on cysticercosis in animals on Bali does not support the data on taeniasis in humans during the 1980s. The most likely reason is the system for detecting infections in animals, particularly swine, is not accurate. The slaughter of domestic animals, particularly swine, is only partially monitored by the veterinary services.

The reports of cysticerci in the liver of swine from other regions of Asia where only *T. saginata*-like cestodes have been found in humans (Fan *et al*, 1987 and 1988, as cited in Cross, 1989) have not been confirmed in the Balinese. However, the clandestine slaughter of domestic animals, especially swine, on Bali makes it difficult to study the epidemiology of cysticercosis and taeniasis in Bali. As more pork is consumed than beef, one would expect *T. solium* to be more common than *T. saginata*. However, the studies reviewed here indicate that *T. saginata* is the most common

etiological agent of taeniasis on Bali. Thus, the so-called Taiwan *Taenia* may be an etiological agent of taeniasis on Bali.

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