

CAT FLEA INFESTATION IN A NEWBORN JERSEY CALF IN BRAZIL.

F. J. BENESI¹, M. DE CAMPOS PEREIRA², C. S. CARDOSO DE SÁ¹, D. L. HOWARD¹, C. M. C. TEIXEIRA¹ & C. E. LARSSON¹

(1) Departamento de Clínica Médica, Faculdade de Medicina Veterinária e Zootecnia, Universidade de São Paulo, Av. Orlando Marques de Paiva 87, CEP 05508-900, São Paulo, SP, Brazil; (2) Departamento de Parasitologia, Instituto de Ciências Biomédicas, Universidade de São Paulo, Av. Prof. Lineu Prestes 1374, CEP 05508-900, São Paulo, SP, Brazil.

SUMMARY: This paper deals with the first description in Brazil of flea infestation and clinical signs in a newborn Jersey calf parasitized by the cat flea *Ctenocephalides felis felis*. Imidacloprid spot-on provided 100% efficacy 24 hours after treatment. The host-parasite relationship is discussed.

KEY WORDS: *Ctenocephalides felis felis*, calf flea infestation, imidacloprid.

INTRODUCTION

Fleas are temporary, highly specialized blood-sucking insects, ectoparasitic on warm-blooded hosts; about 94% infest mammals and only 6% are ornithophilic fleas (MARSHAL, 1981; LEHANE, 1996).

Although some 2,500 species and subspecies of fleas have been described throughout the world (LEHANE, 1996), only a few species have been recorded from domestic ruminants (YERUHAM *et alii*, 1989).

According to LEWIS (1972), the distribution of the members of the genus *Ctenocephalides* suggests an African origin, with a few exceptions, once the 12 species of this genus are found in the Afrotropical Region. Currently, 4 subspecies of *Ctenocephalides felis* are recognized (DRYDEN, 1993). *Ctenocephalides felis damarensis* and *Ctenocephalides felis strongylus* occur primarily in eastern Africa and are parasites of wild carnivores; *Ctenocephalides felis orientis* occurs from India to Australia and primarily infests cattle, sheep, and goats. *Ctenocephalides felis felis*, the cat flea, occurs worldwide and is the single subspecies found in the Americas, where certainly owe their present distribution to human agencies, having been introduced to most areas on domestic animals and pets. The cat flea has been frequently recorded from dogs, cats, and wild carnivores (THEODOR & COSTA, 1967). It also occurs on more than 50 hosts of several mammalian orders, including artiodactyls such as cattle, sheep, and goats (BLACKMON & NOLAN, 1984; YERUHAM *et alii*, 1989; DRYDEN, 1993; DRYDEN *et alii*, 1993).

The cat flea, besides causing severe discomfort, flea-allergy dermatitis and anaemia, is well known as a vector of pathogens such as typhus-like rickettsia. It is also the intermediate host for *Dipylidium caninum*.

Published reports of *Ctenocephalides* flea infestations in ruminants are relatively scarce (OBASAJU & OTESILE, 1980; YAKOBSOM *et alii*, 1981; DIPEOLU & AYOADE, 1982; FAGBEMI, 1982; BLACKMON & NOLAN, 1984; KILONZO & KHAMA, 1989; YERUHAM *et alii*, 1989; HOBLET, 1990; DRYDEN *et alii*, 1993). The main purpose of this study is to report, for the first time in Brazil, the occurrence of flea infestation and clinical signs in a Jersey calf heavily parasitized by the cat flea *C. f. felis*.

MATERIALS AND METHODS

The observations were based on a newborn Jersey calf, 5 days old, from a farm at Itapetininga, SP. The animal was sent to the Hospital of the School of Veterinary Medicine and Zootecnia of the University of São Paulo.

The calf was clinically examined (body temperature, visible mucosae, pulse, etc) and blood samples were collected with EDTA for erythron analysis. Red blood cell parameters were carried out by the method of JAIN (1986) and assessed following the standard values determined by BIRGEL Jr. (1991). The haematological evaluation was performed on days 1, 4 and 8 of the clinical observations.

Fleas were also collected and classified using the key of FURMAN & CATTS (1982).

The host received a single dose of imidacloprid 2.5 ml tube (Advantage®, Bayer do Brasil S.A.), applied in one spot on the skin at the top of the neck, and observed for adverse reactions daily, for 8 days after treatment.

RESULTS AND DISCUSSION

Preliminary examination of the calf detected the presence of massive numbers of fleas. The infestation rate, estimated by the hundred, was assessed by visual inspection only. Although fleas were found all over the calf, they were most numerous on the chest, abdomen, axillae, and legs. These areas were also contaminated with the excreta of fleas. Fleas were identified as *C. f. felis*.

The animal appeared restless showing pruritus, that indicates hypersensitivity associated to flea saliva. In contrast, in a study about severe cat flea infestation in Holstein calves, DRYDEN *et alii* (1993) did not observe evidence of pruritus or allergic dermatitis attributed to fleas.

Clinical examination showed that the body temperature was normal (39.3°C), the visible mucous membranes were slightly pale and there was indication of tachycardia (136/min.) and tachypnea (104/min.). The haematological evaluation showed normocytic/normochromic anaemia with tendency to the recovery of the values on day 8 (Table 1). The resulted anaemia is not surprising considering that during active reproduction, female cat fleas may consume an average of 13.6 ml of blood per day, which is equivalent to 15.15 times their body weight (DRYDEN & GAFFAR, 1991). In our report, the type of anaemia detected, probably related to the flea infestation, seems justified considering the life period of the calf, and thus the very short time of parasitism.

Table 1 - Haematological evaluation of the newborn Jersey calf infested with the cat flea *C. f. felis*.

Red Blood Cell Parameters	Day		
	1	4	8
Erythrocyte (x10 ⁶ /ml)	5.2	4.4	6.2
Haematocrit (%)	22	22	23
Hemoglobin (g/dl)	6.4	7.0	6.3
MCV (fl)	42.3	50.1	37.1
MCH (pg)	12.3	16.0	10.1
MCHC (%)	29.0	31.2	27.3

Imidacloprid, with recognized flea adulticide activity in dogs and cats (HOPKINS *et alii*, 1996), provided 100% efficacy for removal of fleas 24 hours after treatment. General or local adverse reactions due to treatment were not observed. Further studies, however, should be conducted in order to investigate

the potential use of imidacloprid or any other dairy cattle-safe ectoparasiticide for the elimination of *C. f. felis*.

Data from the present study, and their comparison with records published in the pertinent literature, raise some points. The cat flea, while tending to infest hosts of several families within the mammalian order Carnivora, is so adaptable that the fleas can parasitize almost any kind of mammal they meet or find anywhere - so they are termed indiscriminate or catholic fleas (TRAUB, 1985). Otherwise, the expression primary or true host has often been used to designate a single host, or a selected host judged to be of primary importance in the case of a species commonly occurring on several hosts, or to express relationships that appear to be derived from ancient, if not original, associations (HOLLAND, 1964). In addition, we think that the terms should be also employed for the host which, in nature, provides the flea with suitable conditions for indefinitely continued reproduction. According to this standard, dogs can properly regarded as the primary hosts for *C. f. felis*, *Ctenocephalides canis*, and *Pulex irritans* (HARMAN *et alii*, 1987). Cats appear to be primary hosts only to *C. f. felis* (GUZMAN, 1984; BAKER & ELHARAM, 1992), thence the term cat flea be the approved common name for the species. In contrast, the term accidental host has been loosely used to express associations that were judged to be the result of chance (HOLLAND, 1964). Thus the fleas will feed on such host when the primary host is absent. The accidental host serves to keep the fleas alive, but normally reduces its fecundity, sometimes drastically (LEHANE, 1996). Previous research has indicated that calves may not be an optimal host for *C. f. felis* reproduction (WILLIAMS, 1986, 1991), although results reported by DRYDEN *et alii*, 1993 indicate that cat fleas feeding on calves produce viable eggs. In one of the above investigations (WILLIAMS, 1986), 25% of the female cat fleas had evidence of reproductive failure or regression when feeding on calves.

Further examination of the farm revealed that dogs frequently infested with cat fleas were often observed on the premises. In addition, a pregnant bitch heavily infested with *C. f. felis* was brought into the calf pen at the time of parturition and probably acted as a primary source of infestation. It has been affirmed that rodents should be considered as a possible reservoir to the genus *Ctenocephalides*. But there are few records of *Ctenocephalides* from the order Rodentia (THEODOR & COSTA, 1967; DIPEOLU & AYOADE, 1982) and there is only one record of *C. f. felis* from rats and mice (THEODOR & COSTA, 1967).

High density confinement production systems for livestock are becoming more common. Dairy cattle are grouped in large operations to provide more efficient and economic milk production. Although dry cows are kept in pastures, most of the herd will be housed in a free stall or stanchion system with

limited or no access to pasture. A shed or barn is usually provided for the maternity stall or to the calf pens. The urine-and-manure-soaked bedding in these stalls and pens provides an excellent environment for some arthropods. Although most of the fleas eggs and hatching larvae normally do not survive under typical household conditions, thermal and humidity conditions favoring the reproduction and survival of the cat fleas apparently existed in the calf pen, resulting in massive infestation of the calf. Therefore, our findings are in general agreement with the report of DRYDEN *et alii*, 1993, who considered that wheat straw, used as bedding, becomes soaked with urine, feces, spilled milk, and feed, thus resulting in an ideal habitat for flea larvae and, eventually, adult flea emergence. This scenario may explain the flea infestation of our report.

SUMÁRIO

Este trabalho descreve, pela primeira vez no Brasil, infestação por pulgas e sinais clínicos em bezerro neonato da raça Jersey parasitado por *Ctenocephalides felis felis*. Imidacloprid spot-on proporcionou 100% de eficácia em 24 horas após o tratamento. A relação parasito-hospedeiro é discutida levando-se em conta a literatura especializada.

PALAVRAS-CHAVE: *Ctenocephalides felis felis*, infestação por pulgas em bezerro, imidacloprid.

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