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Nine-banded Armadillos in Captivity: Prevention of Losses Due to Parasitic Diseases. Some Remarks on Mycobacteria-free Maintenance

TO THE EDITOR:

As with other free-living animals, a number of parasitic diseases occur in nine-banded armadillos (*Dasypus novemcinctus*.) Through changes in the living conditions of the animals after capture (confined space, change of diet, long transport), their resistance may be reduced to such an extent that death can result. Especially lung strongyloidoses are often observed.

It has been useful to treat the newcomers with CITARIN L: 2.5% (Bayer), a broad-spectrum anthelmintic. A subcutaneous injection of 0.2 ml/kg is given twice at weekly intervals (1 ml of the 2.5% aqueous solution contains 29.5 mg levamisol-HCl). This agent possesses high activity both against full-grown lung worms and their larval stages. Besides, a number of nematodes invading the gastro-intestinal tract are effectively combated by this treatment which is well tolerated by the armadillos. It can also be applied successfully in the case of parasitic invasion at an advanced stage. The influence on the course of an infection cause by *M. leprae* has not been investigated. Only an increase of PPD-induced lymphocyte proliferation due to levamisol has been reported (1).

As with other experimental animals, a special standard is required if the armadillos are kept for immunological studies. Our experience with guinea pigs indicates that the mycobacterial contamination of drinking water, litter, and food may lead to non-

specific Jones-Mote-reactions (2). Such a contamination is also observed with armadillos kept under conventional conditions. To prevent mycobacterial contamination, the following measures have been taken:

1) **Diet.** The armadillos are fed a standard, mycobacteria-free diet consisting of granulated fish food (TROUVIT 100 Bio 00 Granulat, produced by Milkivit Werke A. Trow GmbH, D-8859 Burgheim, West Germany). A 5 kg animal receives 1 cup of food daily (100 ml of cold [previously boiled] water is added with stirring to 100 g of the granular material and offered in a one-way soup dish). The following composition of Trouvit 100 (which is mainly used as food for trout fry) is indicated by the producer:

- 50% raw protein (mainly from sea animals)
- 7% raw fat
- 2% raw fibers
- 10% raw ash
- 1.5% calcium
- 1.5% phosphorus
- 0.5% sodium
- 38,000 I.U./kg vitamin A
- 2,000 I.U./kg vitamin D₂
- 50 mg/kg vitamin E 50

vitamins of the B-complex in the composition usual for trout fry (no details are given).

This diet was recommended to us by Dr. Leiker of the Royal Tropical Insitiute Amsterdam and by J. L. Schuurman, Univer-

sity of Amsterdam. Experience has shown that it meets the demands of a sole diet for nine-banded armadillos.

2) **Supply of drinking water.** Tap water which has been heated twice is used as drinking water (warm tap water is heated to 80°C in a boiler and left standing in sealed plastic vessels to cool down before use). The armadillos adapt readily to drinking from plastic bottles with a sipping device. We are using 500 ml bottles fitted with a 15 cm sipping device. The bottles are replaced daily, cleaned, and kept in a 1% Lysotan solution until use (Lysotan is a disinfectant for drinking water plants and is produced by Schülke & Mayr, D-2000 Hamburg.).

3) **Caging and litter.** Cages made of aluminum sheets (dimensions: 80 × 60 × 24 cm) with a wire cover have proven suitable for housing armadillos. The cages are replaced once or twice weekly, cleaned in an automatic machine at 80°C, and disinfected with Septo DA 1% (a special disinfectant for dishwashers, produced by Messrs.

Weigert, D-2000 Hamburg). As litter we are using the remainders of unprinted rotation paper which is folded into large pieces. Enough paper must be provided to the animals as nesting material; otherwise they get restless and try to escape.

The above mentioned measures have led to the standardization of feeding and the mycobacteria-free maintenance of nine-banded armadillos.

—J. M. Kazda, Ph.D.

*Department of Microbial Ecology
Forschungsinstitut Borstel
D- 2061 Borstel
Federal Republic of Germany*

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