

## SURVEY OF TUBERCULIN TESTING PRACTICES AT ZOOS

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Of 340 questionnaires concerning TB testing practices sent to AAZV members, 117 replies were received. Of those received, 21 individuals believed that the questionnaire did not apply to their situation. This left 96 relevant replies on which the results of this survey are based.

The *Tuberculin Testing Frequency of Primates* had 90 responses, some having multiple answers. Of these responses, 6 tested yearly, 64 tested on arrival, 59 tested on departure, 52 tested regularly, and 22 tested occasionally (Fig. 1).

The *Tuberculin Testing Frequency of Hoofstock* had 70 responses, some also with multiple answers. Of these responses, 3 tested suspects only, 59 tested on arrival, 50 tested on departure, 27 tested regularly, and 28 tested occasionally (Fig. 2).

The *Tuberculin Testing Route of Primates* had 60 responses. Of these responses, 51 tested the eyelid only, 7 tested both the eyelid and abdomen, 1 tested solely the abdomen, and 1 tested both the eyelid and inguinal region (Fig. 3).

The *Tuberculin Testing Route of Hoofstock* had 46 responses. Of these responses, 34 tested only in the caudal fold, 4 tested only in the neck area, 14 tested in the eyelid, and only 1 tested in the abdomen (Fig. 4).

The *Tuberculin Types Used in Primates* had 89 responses with some listing multiple tuberculins. Certain of these tuberculins may be similar or exact in nature. Mammalian-15. Cooper's-27. PPD Bovis-7. KOT-9. MOT-20. Human Isolates-18. Jen Sal-15. PPD-6. PPD Avian-7. PPD Hominis-1. ARS-1. (Fig. 5).

Similarly, the *Tuberculin Types Used in Hoofstock* have multiple listings in some responses and are presented as close to the actual information as possible. There were 64 responses. Mammalian-3. Cooper's-5. PPD Bovis-29. KOT-2. MOT-10. Human Isolates-4. Jen Sal-4. PPD-13. Bovine-10. APHIS-1. PPD Avian-6 (Fig. 6).

The results of the *Tuberculin Amounts Used* are as follows: 43 of 43 used 0.1 ml for hoofstock; 60 of 65 used 0.1 ml in primates, and 5 of 65 used 0.1 for most primates and between 0.05 ml and 0.1 ml for smaller primates (Fig. 7).

The results of the *Time Interval Tuberculin Tests Are Read* is as follows: of 97 responses, 65 were read at 24, 48, and 72 hr; 1 read at 24 hr only; 4 read at 24 and 72 hr; 2 read at 48 hr only; 5 read at 48 and 72 hr; and 20 read at 72 hr (Fig. 8).

Only 28 of 94 individuals responding sedated animals to read the *Tuberculin Test Site*, and this pertained almost exclusively to hoofstock (Fig. 9).

In addition, 42 of the 96 responding did *Comparative Testing* (Fig. 10). Of these 42, 29 listed the specific tuberculins used. Following is a list of these tuberculins used and the number of times out of 29 that they were used (many responses listed multiple tuberculins being used) (Fig. 11).

With regard to the *Handling of TB Suspects* in species that have experienced previous non specific reactions (NSR's) there were 66 responses with various diagnostic techniques used or dispositions which are listed by frequency below. Those mentioning euthanasia stressed it as being a last resort (Fig. 12).

## SUMMARY

In summary, tuberculin testing procedures of primates and hoofstock in zoos show some uniformity in testing sites, amounts of tuberculin used, and time intervals when tests are read. However, there remains a great amount of variability in types of tuberculin used, interpretation of tests, and disposition of animals. Major efforts are needed to develop more uniform guidelines for testing each of the species that are susceptible to mycobacterial diseases.

Table 1. The following are summaries of observations regarding Tuberculin Test Status vs. Tuberculosis Status. Each entry represents a separate response.

### Tuberculin Positive Animals Proven Non-Tuberculous at Necropsy:

Cherry crowned mangabey	American elk	<i>Callithrix jacchus</i>	Capuchin monkey
Mule deer	Roan antelope	Spider monkey	

### Tuberculin Positive Animals Proven Tuberculous at Necropsy:

3 Tibetan macaques	Hamlyn monkey	<i>Macaca nemestrina</i>	14 Wisent
Markhor	Bison	Rhesus macaque	2 Elipsis waterbuck

### Tuberculin Negative Animals Proven Tuberculous at Necropsy:

Dama wallaby	Mandrill
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### Tuberculin Positive Animals Remaining Healthy:

Several primates and some hoofstock: up to one year follow-up

Orangutan colony

Orangutans

Giraffes: lived 3 years, proven not tuberculous

Orangutans: follow up tests negative

Orangutans and tapirs

Squirrel monkey colony: no lesions in animals dying of other causes

Primates: anesthetized and given intradermal test on abdomen and chest X-ray

Orangutans: fine for past ten years

Orangutans: gastric lavage - all negative, chest X-ray - TB never seen

Howler monkey: all ancillary tests negative

Primate

Orangutans: no TB at necropsies up to 15 years

Orangutans

Tapir: died 1 year later, no TB

Chimpanzee: still living past 4 years

2 White rhinos, African elephant, gibbon, orangutan: all still living

2 Orangutans

2 Orangutans: remained TB positive and healthy for over 10 years

Chimpanzee: tested negative at third testing time

Gorillas and orangutans: all negative within 30 days

Roloway monkey

Seals: 1 year therapy

5 Rhinos: 1981, one died since

Camels, rhinos, orangutans

Several orangutans

Orangutans: history of reaction to avian, bovis, and mammalian

Fig 1. Freq. of TB Testing, Primates (N=90)

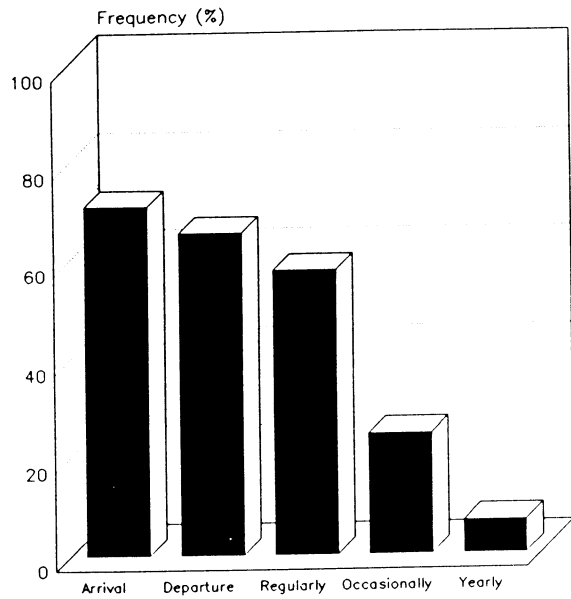


Fig 2. Freq. of TB Testing, Hoofstock (N=70)

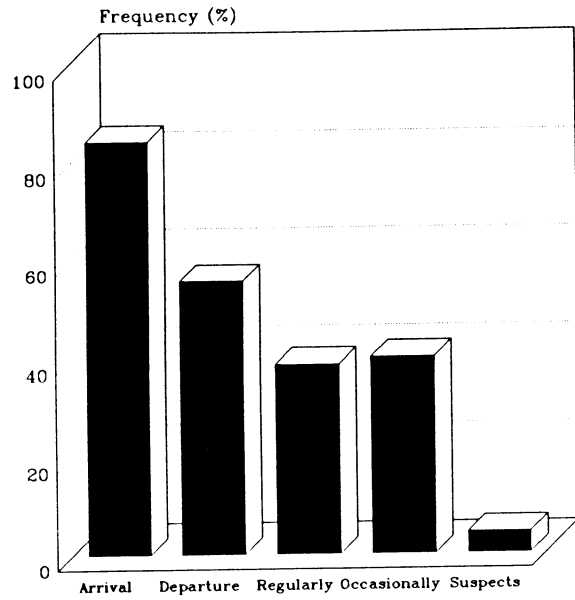


Fig 3. TB Testing Routes, Primates (N=60)

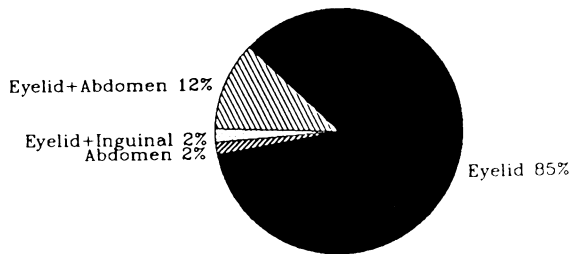


Fig 4. TB Testing Routes, Hoofstock (N=46)

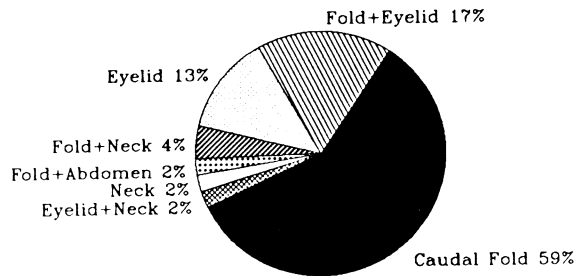


Fig 5. Tuberculin Types, Primates  
(N=89)

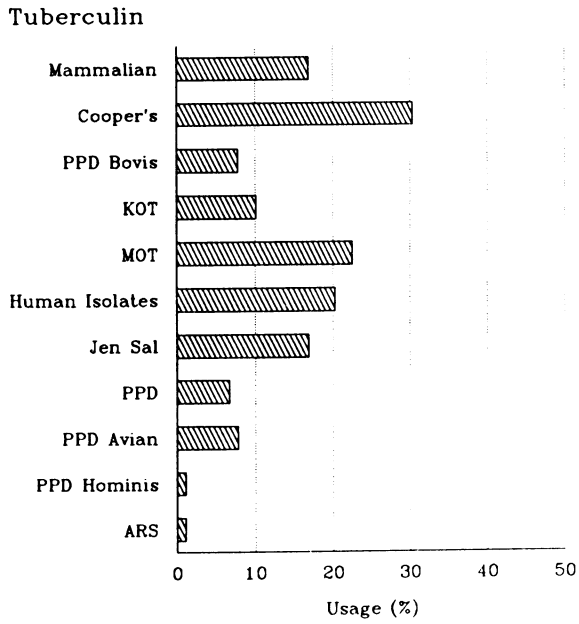


Fig 6. Tuberculin Types, Hoofstock  
(N=64)

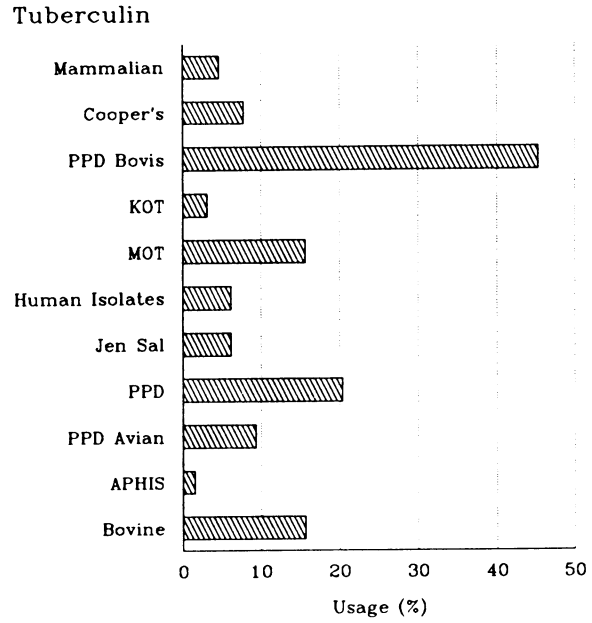


Fig 7. Tuberculin Amounts, Primates  
(N=65)

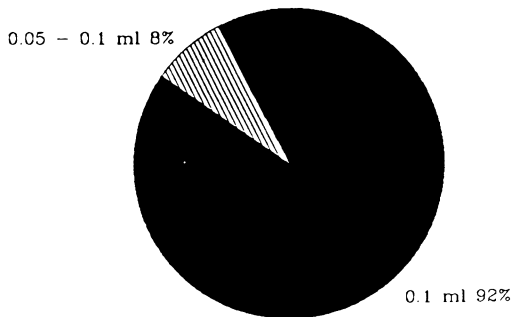


Fig 8. Times TB Tests Read, P & H  
(N=97)

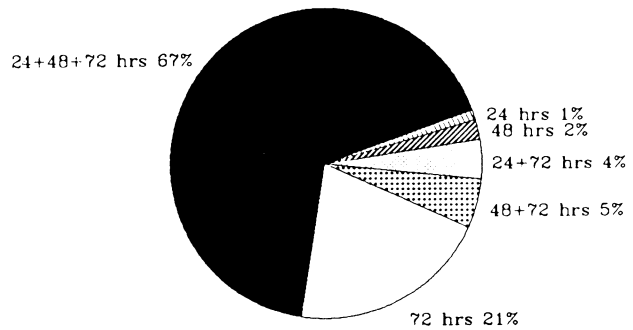


Fig 9. Sedation During TB Testing  
(N=94)

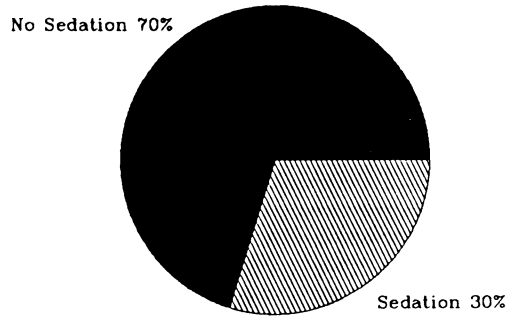


Fig 10. Testing  
(N=96)

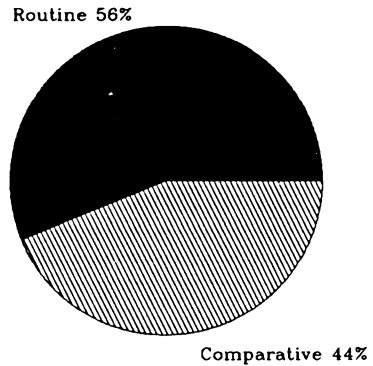


Fig 11. TB Types, Comparitive Testing  
(N=29)

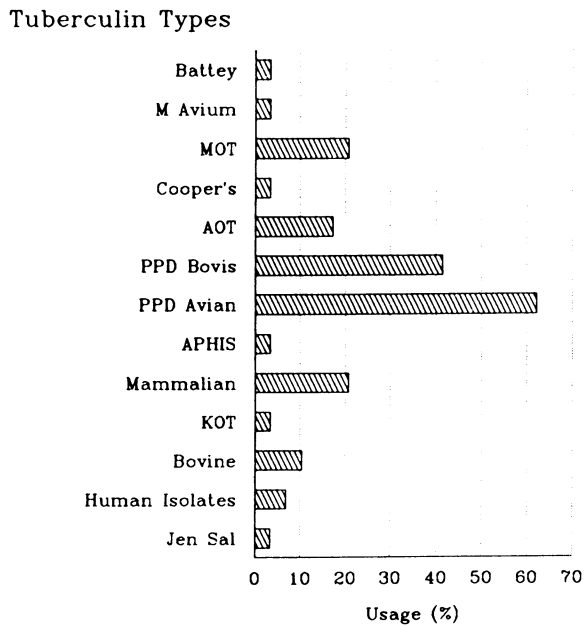


Fig 12. Handling of NSR's  
(N=66)

