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THYROID VALUES IN NORMAL DONKEYS

Matthews, N.S.*1; Taylor, T.S1.; Taylor, E.V2.Barling, K.S.1
1The Texas Veterinary Medical Center, Texas A & M University, College Station, TX, USA.
2East Texas Veterinary Clinic, Nacadoches, TX, USA.

Although normal hematological and biochemical values have been reported in donkeys (Brown, 1969; Nayeri, 1978; Zinkl, 1990), we were unable to find much information about normal values for thyroid function. Since differences in hematology and biochemical values exist between horses and donkeys, we wondered if horse normal values were appropriate to use in donkeys.

Materials and methods

Blood samples were drawn from 15 Mammoth (greater than 56 inches at the withers), 11 standard (36 to 56 inches at the withers) and 10 miniature (less than 36 inches at the withers) donkeys and submitted to the Texas Veterinary Medical Diagnostic Laboratory for analysis of triiodothyronine (T3) and thyroxine (T4). The 5 Mammoth intact jacks and 10 females ranged in age from 5 to 14 years of age. The 3 castrated male and 8 female standard donkeys ranged in age from 3 to 20 years of age. The 6 male (4 jacks, 2 castrated) and 4 female miniature donkeys ranged in age from 1.5 to 8 years of age. All animals were dinically healthy. Samples were drawn into serum separator tubes and spun down (to separate serum from cells) before submission to the laboratory. Mean (± SD) values for T3 and T4 for each group are presented below. Values for T3 and T4 were analyzed for sex and donkey size using ANOVA. Significance was set at $p < 0.05$.

Results

Mean (± standard deviation) values for T3 and T4 are presented in Table 1. Values for T4 were significantly different between male and female Mammoths and T4 values in Mammoth jacks were significantly higher than for miniature jacks. Although all donkeys fell within the laboratory reference range for T3 (0.1 to 1.1 ng/ml) in horses, values for T4 in 3 donkeys (1 mini and 2 standard) were below the reference range (0.5 to 4 °g/dl) for horses.

Table 1. Mean (± standard deviation) values for T3 and T4 in donkeys

	T3 (ng/ml)	T4 (°g/dl)
Mammoth (all)	0.56 (±0.21)	1.7 (±1.16)
Female	0.49 (±0.21)	1.1 (±0.54)
Male	0.70 (±0.10)	2.9 (±1.11)
Standard (all)	0.63 (±0.18)	1.2 (±0.63)
Female	0.61 (±0.20)	1.2 (±0.63)
Male	0.66 (±0.11)	1.7 (±0.81)
Miniature (all)	0.7 (±0.19)	1.3 (±0.52)
Female	0.75 (±0.25)	1.3 (±0.61)
Male	0.66 (±0.16)	1.4 (±0.50)

Discussion

Although sample size was small, it appears that there are significant differences between the sizes and sexes of the donkeys, which we did not expect to see. It is interesting that while T3 values for the donkeys were in the middle of the horse range, values for T4 were always in the low end of the range. Values for T3 from our study seem to compare well with those reported in another study during non-breeding season (Bugalia, 2000) as well as those reported by Yousef (1979). The T4 values from our study appear to be markedly lower than reported in both other studies. We are not sure how large the donkeys were in these studies and donkey size did appear to be related to differences in values in our study. Yousef reported a decrease in T3 and T4 with heat exposure which might also be a reason that donkeys in our study had lower T4 values; samples were collected during the summer when it is usually consistently between 38 and 40∞ C in Texas. Some of the jacks in our study (both Mammoth and miniature) were used for breeding, although we did not have information as to whether they were considered to have "low libido". Bugalia reported differences in values between jacks with high libido and those with low libido, as well as seasonal differences (breeding vs. nonbreeding season). Apparent conflicts in data between these studies might be resolved by a larger study with larger numbers of intact males and females, over different seasons, of various size or breeds of donkeys.

Normal reference ranges need to be established for normal donkeys rather than evaluating blood tests on the basis of horse normals.

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