Body water turnover rate in Indian desert sheep and goat

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An efficient use of the available water resources of the habitat or range is a pre-requisite for successful occupation of the desert niche by a species or a breed. Body water turnover rate in a given environment is an accurate index of overall water use functions of an animal. There is no report available in the literature on the rates of body water turnover in any of the breeds of goat and sheep which thrive in the Rajasthan desert. The present report provides, for the first time, data on body water turnover rates in Marwari sheep and Marwari goats during summer.

Two-1½ year old Marwari goats and Three-3 year old Marwari sheep were used in this study during summer at Jodhpur (26°05'N, 73°01'E). The animals were maintained by grazing and browsing for approximately 8 h each day on a natural bushland comprising mainly Cenchrus ciliaris, Cenchrus setigerus, and Zizyphus nummularia. These grasses and bushes have an average moisture content of 4% (on dry weight basis). The mean maximum environmental temperature and relative humidity during the experimental period were 43°C and 25% respectively. Deuterium oxide was infused intraperitoneally in the form of 0.9 % saline solution. Each animal received 0.5 g D₂O/kg body weight. The syring was weighed before and after each infusion and the weight of D₂O infused was calculated from the difference in these weights. Prior to infusion of D₂O, the animals were restrained from feed and water for 18 h.

Equilibration of the marker in sheep and goat was reached about 6 h after the infusion. During this period the animals were not provided with any feed or water. After obtaining the equilibration blood sample, the animals were set free for normal grazing and watering. For the water turnover measurements, blood samples were taken after the equilibration of the marker in the body fluids on the 3rd and the 7th day after infusion. The blood samples were centrifuged and plasma separated. The plasma samples were subjected to heat distillation under vacuum with a cold trap to catch the water. The concentration of D₂O in the water distilled from the plasma samples was determined with the help of a MIRAN Infrared Spectrometer at 4 μ. The DOH space was calculated from the dilution of the marker in the body fluids (Foot and Greenhalg, 1970).

To estimate the water turnover, the decline in D₂O concentration in the body fluids was followed. The biological half life (T₁/₂) of the deuterium was calculated.
REFERENCES

