

Renal and salivary excretions of plasma purine derivatives in swamp buffaloes and zebu cattle

ABSTRACT

This study compared the recovery rate of intrajugular-administered allantoin in the urine and saliva between swamp buffaloes and zebu cattle to examine whether it could explain the lower excretion rate of urinary purine derivatives (PD) in the buffaloes. Three male swamp buffalo yearlings, with an average body weight of 349 ± 40.35 kg, and three Thai native cattle (154 ± 3.26 kg) of similar age and sex were used in the study. Animals were kept in individual pens and fed at a maintenance energy level with a diet containing 65% monk bean husk (*Vigna radiata*) as roughage and 35% concentrates. Allantoin solution was infused into the jugular vein in four incremental rates equivalent to 0, 5, 10 and 15 mmol/d and urine was collected daily in acidified form. Daily PD excretion was linearly correlated with intrajugular allantoin infusion in both species. The relationship between daily urinary PD excretion (Y, mmol/d) and intrajugular allantoin infused (X, mmol/d) was $Y = 0.75\pm 0.318X + 22.45\pm 2.98$ ($r^2 = 0.36$, $n = 12$, $MSE = 38.02$, $CV = 21.9$, $p < 0.01$) for swamp buffaloes and $Y = 0.96\pm 0.10X + 15.93\pm 0.92$ ($r^2 = 0.91$, $n = 12$, $MSE = 3.60$, $CV = 8.27$, $p < 0.01$) for zebu cattle. The salivary PD concentration was not correlated with intrajugular allantoin infusion in both species, with values for buffaloes numerically lower than those for cattle. The present study reconfirmed previous studies that buffaloes have a lower plasma PD excretion rate via the renal route and a significant proportion (22%) of the plasma PD loss is via the saliva. However, results of our present and previous studies suggest that differences in purine base (PB) metabolism between buffaloes and zebu cattle occur before the purine compounds reach the plasma pool.

Keyword: Allantoin; Purine derivatives; Swamp buffaloes; Zebu cattle