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## Resource Use Efficiency in Urban and Peri-urban Livestock Enterprises in Niamey, Niger

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### Abstract

Urban livestock (UL) systems are often criticised for their poor management and low nutrient use efficiency. In Niamey, Niger, 13 representative sheep/goat and cattle keeping, low (LI) and high input (HI) UL enterprises were subjected to a comprehensive nutrient management monitoring during 11/2005–01/2008. Nutrient inputs through feeds and outputs through faeces were quantified through regular weighing and sampling, accompanied by regular weighing of animals. In the HI sheep/goat system, daily offers (TLU<sup>-1</sup> basis) of feed nitrogen (N), phosphorus (P) and potassium (K) were highest during the cool dry season, averaging 208.7 g N, 35.8 g P and 169.1 g K. Although these offers exceeded N, P and K requirements of fattening sheep/goats 2.9-, 4.4- and 7.9-fold, a live weight gain of only 104 g d<sup>-1</sup> was achieved. During the hot dry and rainy season, weight gains in the HI sheep/goat system were 86 and 53 g d<sup>-1</sup> and exceeding those of the LI system 1.2- and 2.4-fold. In the HI cattle system, daily offers of N, P and K exceeded the maintenance requirements of beef cattle in all seasons. However, cattle lost 651 and 232 g d<sup>-1</sup> in the hot dry and rainy season while they gained 33 g d<sup>-1</sup> in the cool dry season. In the LI cattle system, weight changes of +714, +300 and -914 g d<sup>-1</sup> were obtained in the cool dry, rainy and hot dry season. Partial nutrient balances (per TLU<sup>-1</sup> d<sup>-1</sup>) amounted to +110.8 g N, +8.0 g P and +85.7 g K in the HI sheep/goat system versus +4.4 g N, -6.2 g P and +1.0 g K in the LI system ( $p < 0.05$  for all). Balances averaged +28.6 g N, +2.5 g P and +21.5 g K in the HI cattle system and +2.2 g N, -0.6 g P and +4.3 g K ( $p > 0.05$  for all) in the LI system. The combined poor feed conversion and highly positive partial nutrient balances point to the severity of inefficient nutrient use in Niamey's UL enterprises and call for an analysis of the environmental consequences resulting from there.

**Keywords:** Cattle, live weight changes, partial nutrient balance, roughage, small ruminants, West Africa