age. Ninety-six day old keets were randomly assigned to four dietary treatments each having four replicates (n = 6/replicate). The four treatments were 3% fishmeal (control), 4.5% *mopane* worm meal, 9% *mopane* worm meal and 13.5% *mopane* worm meal. At 7 and 13 weeks of age, blood and faecal samples were collected from three randomly selected birds from each replicate and analyzed for minerals. At 13 weeks of age, all birds were sacrificed and left tibiae collected for determination of bone physical dimensions and mineral composition. Meat samples were collected from the thighs and decomposed by microwave digestion and analyzed for various minerals. Data were regarded as a split plot design with four dietary treatments and analyzed using the General Linear Model Procedures in Statistical Analysis System. Dietary treatment had no significant (P>0.05) effect on bone length. Bone weights for birds fed 9% *mopane* worm meal and bone widths for birds fed 4.5% *mopane* worm meal had lower weights (5.96 g) and widths (5.79 mm) than the other three treatments which did not differ significantly from each other. Bone mineral composition of guinea fowl fed diets with 4.5% *mopane* meal had significantly higher P (353.62 mg/l), Na (1332.96 mg/l) and K (1841 mg/l) contents than other treatment diets where the control and 13.5% *mopane* worm meal diets did not differ significantly. Generally, meat and blood mineral compositions of guinea fowl fed 4.5% *mopane* worm meal were higher than those fed on 13.5% *mopane* worm meal diet whilst control and 9% *mopane* worm meal were the same. Dietary treatments and age had a significant (P<0.05) effect on the daily mineral intake, faecal excretions and retention as percentage of mineral intake. Blood mineral composition and mineral retention increased with age as more minerals were required to support growth. Diets containing 3% fishmeal, 4.5% *mopane* meal and 9% *mopane* meal generally promote higher mineral intakes, bone physical development, bone and meat mineral compositions and retentions compared to 13.5% *mopane* worm meal. Results from the present study suggest that *mopane* worm meal can replace fishmeal up to 9% without negatively affecting mineral intake, retention and utilization.