Eighteen male Merino sheep (34.83 ± 2.73 kg) were used in this experiment with a completely randomised block design to evaluate the effects of diet preference on feed intake, apparent digestibility and nitrogen balance. The sheep were fed ad libitum one of three experimental diets: Flinders grass hay (F); freshly cut Desmanthus leptophyllus (D) and a choice of Flinders grass hay and fresh cut D. leptophyllus (D+F). The results showed that sheep had a 70% preference for D and had a 30% preference for F when they were provided the D+F diet. The highest dry matter intake (DMI) and organic matter intake (OMI) (P < 0.05) were recorded for the D+F diet compared with the other two diets. The dry matter digestibility (DMD), organic matter digestibility (OMD) and nitrogen digestibility did not differ between the D and the D+F diet, but these values were significantly higher (P < 0.05) than those of the F diet. Sheep fed either the D or the D+F diet gave rise to positive nitrogen balance, while the F diet was in negative nitrogen balance. Both D and D+F diets had greater (P < 0.05) efficiency of nitrogen retention in comparison with the F diet. Lower nutrition utilisation of the F diet was relative to loss of sheep liveweight, whereas sheep given either D or D+F diet slightly increased their liveweight. It is suggested that in the semi-arid sheep country, diet quality and animal production could be enhanced by utilisation Desmanthus spp. during the dry season.