

THE NUTRITIVE VALUE OF PYRETHRUM MARC AS PROTEIN  
SOURCE FOR GROWING YOUNG FRIESIAN HEIFERS

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A B S T R A C T

Two experiments were conducted at the National Animal Husbandry Research Station, Naivasha to study the digestibility of pyrethrum marc and the performance of Friesian heifers fed on rations based on pyrethrum marc as the major source of protein. Four diets were formulated to contain 0, 25, 50 and 75 % pyrethrum marc. The rest of the diets was made up of Rhodes grass (Chloris gayana) hay. These diets were denoted as 100H, 75H25P, 50H50P and 25H75P respectively.

In the first experiment, the in vivo digestibility of pyrethrum marc was studied using Red Masai sheep. The chemical composition and in vivo digestibility coefficients of pyrethrum marc were: dry matter, 87.6 and 68.9 %; organic matter, 92.0 and 70.7 %; crude protein, 14.1 and 55.3 %; crude fibre, 25.9 and 66.8 %; ether extract, 2.5 and 13.3 %; nitrogen-free extract, 49.5 and 74.2 %. Nutrient digestibility coefficients of the four rations used in this study were: dry matter, 41.9, 50.2, 52.7 and 52.4 %; organic matter, 45.4, 53.6, 55.3 and 55.3 %; crude protein, 44.7, 52.1, 48.1 and 46.5 %; crude fibre, 45.9, 48.4, 50.4 and 44.5 %; ether extract, 32.7, 27.0, 20.5 and 28.0 %; nitrogen-free extract, 46.8, 59.2, 61.8 and 65.5 % for 100H, 75H25P, 50H50P and 25H75P respectively. All rations containing pyrethrum marc had higher ( $P < 0.05$ ) in vivo digestibility coefficients of dry matter and organic matter than Rhodes grass hay but this difference was not significant ( $P > 0.05$ ) among rations containing pyrethrum marc.

In the second experiment nutrient intake (total and digestible), weight gains and feed efficiency of Friesian heifers given the four diets were studied. Total nutrient intake by the Friesian heifers fed the four diets were ( $\text{g/kgW}^{0.75}/\text{day}$ ): dry matter, 100.7, 119.0, 136.0 and 154.8; organic matter, 90.8, 107.6, 124.0 and 142.1; crude protein, 5.8, 11.8, 13.4 and 21.4; crude fibre, 42.5, 42.6, 47.6 and 46.1; ether extract, 1.8, 2.1, 2.4 and 2.7; nitrogen-free extract, 40.7, 51.1, 60.7 and 71.8 on 100H, 75H25P, 50H50P and 25H75P respectively. Dry matter intake (DMI) and organic matter intake (OMI) by the heifers increased ( $P < 0.01$ ) with each increase in pyrethrum marc in the diet. Crude fibre intake was higher ( $P < 0.01$ ) in rations 50H50P and 25H75P than in 100H and 75H25P. Digestible nutrient intake by the Friesian heifers fed the four diets were ( $\text{g/kgW}^{0.75}/\text{day}$ ): dry matter, 38.5, 54.3, 64.8 and 73.6; organic matter, 37.1, 52.0, 62.5 and 72.1; crude protein, 0.51, 0.62, 0.64 and 1.37; crude fibre, 8.2, 7.4, 8.4 and 6.1; ether extract, 0.011, 0.010, 0.009 and 0.013; nitrogen-free extract, 7.7, 13.0, 19.2 and 21.8 on 100H, 75H25P, 50H50P and 25H75P respectively. DDMI, DOMI and DCPI by the heifers were higher ( $P < 0.01$ ) in all diets containing pyrethrum marc than for hay only. Digestible crude fibre intake was higher ( $P < 0.01$ ) in 100H than in rations 75H25P and 25H75P.

Average daily gain (ADG) of the Friesian heifers increased ( $P < 0.01$ ) with each increase in pyrethrum marc in the ration up to 75% inclusion level. ADG were 130.3,

302.4, 450.5 and 521.0 g for heifers fed rations 100H, 75H25P, 50H50P, 25H75P respectively. ADG was highly positively correlated to the following estimates of intake, DMI, OMI and CPI all expressed on metabolic body weight ( $\text{g}/\text{kgW}^{0.75}/\text{day}$ ). These relationships were high for DDMI, DOMI and DCPI. Feed efficiency (kg gain per 100 kg DMI) was 2.7, 5.8, 6.7 and 7.8 kg for rations 100H, 75H25P, 50H50P and 25H75P respectively.