

DIFFERENCES IN THE CHEMICAL COMPOSITION AND ENERGY CONTENT (POULTRY AND RUMINANTS) OF DIFFERENT LUPIN, FIELD PEA, FABA BEAN, AND NARBON BEAN CULTIVARS

ABSTRACT

Samples of lupins, field peas, faba beans and narbon bean were collected from different locations in the Western Cape over a 2-year period. Hectolitre mass (HLM) and thousand seed mass (TSM) was determined. Samples were analysed for dry matter (DM), ash, crude protein (CP), and ether extract (EE) acid detergent fibre (ADF), neutral detergent fibre (NDF) and amino acids. *In vitro* organic matter digestibility (IVOMD) and true metabolisable energy nitrogen corrected (TMEn) were determined. Amino acid availability was determined during TME determination. The composition and energy values of different grain legumes as well as different grain legume cultivars were compared by analysis of variance. The energy content of the grain and the physical and chemical composition of samples were compared by stepwise regression analysis. *Lupinus (L.) albus* had the highest TMEn (12.49 MJ/kg) value, followed by field peas (11.35 MJ/kg), narbon beans (11.25 MJ/kg), faba beans (10.90 MJ/kg), *L. angustifolius* (10.46 MJ/kg) and *L. luteus* (10.20 MJ/kg). *Lupinus angustifolius* (94.12%) was superior in IVOMD followed by *L. luteus* (91.69%), field peas (91.80%), faba beans (90.04%), narbon beans (86.80%) and *L. albus* (84.41%). *Lupinus luteus* had the highest CP content (39.36%) followed by *L. albus* (38.19%), *L. angustifolius* (33.89%), faba beans (26.00%), field peas (24.74%) and narbon beans (23.76%). Faba beans had the highest lysine content on DM basis (2.22%), followed by *L. albus* (1.96%), field peas (1.93%), *L. angustifolius* (1.86%), narbon beans (1.75%) and *L. luteus* (1.70%). Important correlation coefficients with TMEn for lupins were EE (0.82) and TSM (0.80). Important correlation coefficients with IVOMD for lupins were EE (-0.93), ADF (0.83), NDF (0.81) and TSM (-0.94). True metabolisable energy could be predicted by ash and EE ($R^2 = 0.74$), or by TSM ($R^2 = 0.62$). *In vitro* organic matter digestibility could be predicted by using EE ($R^2 = 0.86$) or TSM ($R^2 = 0.88$).