Abstract

The apparent ruminal degradation and escape of amino acids (AA) administered in 9 different mixtures of essential AA and 8 different mixtures of nonessential AA were studied using two cows fitted with ruminal cannulas. The 600-mmol AA mixtures, which were administered intraruminally using polyethylene glycol as a liquid marker, contained equal amounts of two, four, or eight AA. The amounts of each of the AA in the mixtures were 300, 150, and 75 mmol, respectively. Ruminal degradation and escape were compared with values previously reported for AA administered individually. Across doses, the mean rate of initial degradation (degradation during the 1st h after administration) of essential AA was 26% when the AA were administered in mixtures and 45% when the AA were administered individually. For nonessential AA, the corresponding values were 34 and 54%. Across doses, mean ruminal escape during the first 8 h after essential AA administration was 22% when the AA were administered in mixtures and 16% when the AA were administered individually. For nonessential AA, the corresponding values were 13 and 11%. After intraruminal administration of AA, both individually and in mixtures, significant negative correlations were found between rates of degradation during the 1st h and ruminal escape during an 8-h period. Some AA mixtures caused a net increase in the concentration of other AA in ruminal fluid 1 h after administration. Twelve of the mixtures that did not contain Ala caused a considerable net increase in the concentration of this AA, and 3 AA mixtures containing Arg and Ala caused a marked net increase in the concentration of Trp.