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Summary only

STOMACH FERMENTATION AND DIGESTA FLOW IN MACROPODINE MARSUPIALS AND SHEEP

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The macropodines (kangaroos and wallabies) are herbivorous marsupials possessing a digestive system comparable to that of the ruminants. Ingested food is subjected to extensive microbial fermentation and modification in a capacious forestomach, and secondary fermentation occurs in the hindgut.

Comparative experiments were undertaken with three macropodine species and sheep fed chopped lucerne hay *ad libitum*. Acid-detergent fibre digestibility was lower in all macropodines (mean, 38%) than in the sheep (49%), but the proportion of digestible organic matter apparently fermented in the macropodine forestomach (mean, 63%) was similar to previously published estimates for ruminants.

The mode of flow of digesta and the pattern of fermentation in the macropodine forestomach were also investigated and found to be markedly different from the ruminant. The macropodine stomach is essentially an elongated cylindrical structure. Ingested food is subjected to tubular flow along the length of the forestomach, and although local mixing of digesta is very effective, total mixing of forestomach contents does not occur. This results in a changing pattern of microbial activity; soluble dietary constituents are rapidly fermented in the cranial region of the forestomach and the production of volatile fatty acids and ammonia decreases as digesta is transported caudally along the forestomach.