

The effects of bentonite on rumen protozoal population and rumen fluid characteristics of sheep fed palm kernel cake

ABSTRACT

The effects of bentonite (B) on rumen protozoal population and rumen fluid characteristics of sheep fed palm kernel cake (PKC) were studied for a period of 21 days. Two groups, each comprising two sheep were fed either PKC or PKC + B ad libitum. A third group was left at pasture. Rumen fluid was sampled through a rumen cannula three times daily from all animals. Palm kernel cake contained 16% crude protein, 1% crude fat and high amounts of copper, zinc, iron and manganese. Protozoal population in the rumen fluid decreased significantly ($p < 0.05$) after the onset of feeding PKC or PKC + B. However, sheep given bentonite supplementation at 2% of the dietary dry matter, maintained higher protozoal densities ($15 \times 10^4/\text{ml}$) when compared to animals fed only PKC ($8 \times 10^4/\text{ml}$). With both diets, the protozoa were mainly of the small entodinia species. Animals at pasture had higher protozoal population ($47 \times 10^4/\text{ml}$) with varying species of entodiniomorphids and holotrichs. Rumen fluid pH and ammonia concentration was significantly ($p < 0.05$) higher in animals at pasture compared to animals fed PKC or PKC + B. Volatile fatty acid concentration was significantly ($p < 0.05$) lower in animals fed PKC when compared to animals at pasture. There was a shift in fermentation pattern in animals fed PKC or PKC + B towards a lower acetate; and higher propionate, isovalerate and valerate. Studies in vitro also showed the positive effect of bentonite on protozoal numbers.

Keyword: Bentonite; Protozoa; Palm kernel cake