

THE EFFECT OF LIPID ON *IN VITRO* ASSESSMENT OF RICE POLLARD  
AND WHEATEN CHAFF BY RUMINANTS

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It is generally known that rumen micro-organisms adapt to changes in the diet of the host animal. *In vitro* estimation of digestion is intended to give the same values as those found *in vivo*. However, the microflora for *in vitro* tests, obtained from animals on a standard diet differ from those maintained by diets of widely different composition. This is particularly true of diets containing high or low levels of lipid. The present work of evaluating diets based on rice pollards and wheaten chaff and containing up to 20% oil, investigated the possibility of adapting the microflora from one diet to a diet under test by an *in vitro* fermentation system using a triple incubation subculturing technique similar to that of Burroughs *et al.* (1950).

In Experiment 1, for the first culture a rumen inoculum (10 ml) was obtained from a sheep fed a pelleted diet of wheaten chaff and oats (2:1) and incubated with a wheaten chaff substrate (400 mg) plus 25 ml of McDougall's Buffer pH 6.8 and 1.5 ml Burroughs Salt Solution. Inocula for the second and third cultures were obtained from a portion (10 ml) of the preceding incubation and incubated with a new lot of the same substrate and buffers. Each of the three subcultures gave consistent VFA production, equivalent to a digestibility at 24 hr of 37.5% and at 48 hr of 49.9% of the OM fermented. These values were obtained using the factors reported by Weston and Hogan (1971) for a diet which has an *in vivo* OM digestibility of 50-55%.

In Experiment 2, substrates of wheaten chaff, with and without hydrolysed rice bran oil (HRBO) were incubated as in Experiment 1. Addition of HRBO depressed the VFA production only for cultures 2 and 3 to maxima of 18.3% and 29.9% at 24 and 48 hour periods, respectively. The addition of calcium carbonate in amounts stoichiometric to HRBO, overcame the fat induced depression of the VFA's in these cultures.

Substrates consisting of equal parts wheaten chaff and (i) defatted rice pollard, (ii) rice pollard or (iii) rice pollard and calcium carbonate were incubated with successive subcultures as before. The net VFA production from the three cultures with defatted pollard as substrate was similar (21.2-22.5 mg/100 mg non fat OM). As observed in Experiment 2, the VFA production from rice pollard was progressively suppressed in successive cultures (1-3) as compared to defatted rice pollard. Addition of calcium overcame this suppression in cultures 1 and 2, but not in 3. From these results it is apparent that the effect of oil on microbial fermentation as reported by Davison and Woods (1960) was more obvious in cultures 2 and 3. The results indicate a need for caution in application of *in vitro* techniques to assess digestibility of feeds of high lipid content.

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