

CHANGES INDUCED BY FEEDING SUPPLEMENTAL ENZYMES, YEAST
CULTURE AND EFFECTIVE MICRO ORGANISMS IN THE GROWTH
NUTRIENT DIGESTIBILITY AND GUT MICROFLORA OF THE
DOMESTIC RABBIT (Oryctolagus cuniculus)

By

Shanmuganathan Thayalini

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ABSTRACT

Two feeding trials were carried out at the University livestock farm, Mawela, Uda-Peradeniya for periods of 7 and 10 weeks respectively.

In the first experiment, forty eight, 9-10 weeks old New Zealand White rabbits (average body weight 2150g) of both sexes were allotted to 8 treatments (6 animals per treatment) according to Complete Randomized Design (CRD). The objective was to study the effect of supplemental effective Microorganisms (EM), yeast culture (Yea-Sacc¹⁰²⁶) and enzymes (cellulase and chitinase) on nutrient digestibility at two different dietary qualities. A low quality ration (LQR) or commercial broiler finisher ration (BF) was fed restricted with or without additives (LQR + EM ; LQR + yeast culture ; LQR + enzyme ; BF + EM ; BF + yeast culture ; BF + enzymes). Dried grass (*Brachiaria brizantha*) and water were provided *ad libitum*. Rabbits were caged individually and individual feed intake was measured weekly. Nutrient digestibility values were estimated during 5th, 6th and 7th weeks of the trial. Body weights of animals were recorded at the beginning and at the end of the experiment.

Low quality ration contained lower amounts of CP, energy, NFE and a higher amount of CF as compared to the BF feed. Average DM intake was lower with LQR (134 g/day) than with BF (136 g/day). Yeast and EM improved the total DM intake of LQR fed animal by 3.4 and 2.5% respectively. All the additives improved the body weight gain of LQR fed rabbits with a remarkable increase observed with enzymes (51%). EM and enzymes improved the CP digestibility of LQR by 3.3% while the

improvement with yeast was 10.5%. The CP digestibility of BF was increased from 0.698 to 0.711 by EM. The CF digestibility of LQR was also improved by 9.1-17.7% with additives.

In the second experiment, twenty four 8-9 weeks old, male (1984g body weight) and female (1987g body weight), New Zealand White rabbits were allotted to 4 treatments in a Randomized Complete Block Design (RCBD) to study the effect of supplemental EM, yeast culture and enzymes on their performance. A basal feed was prepared to contain all the nutrients required by rabbits (NRC, 1977) and was used as the control. The three dietary treatments were prepared by adding the three additives at the rate used in the experiment 1. Water and experimental diets were provided *ad libitum* during the experiment. Weekly feed intake and growth rate, nutrient digestibility at ileum, caecum, large intestine and in faeces, carcass characteristics and gut micro-organisms were evaluated to study the animals' response to treatments.

Sex of the rabbits did not have any influence on any of the parameters tested. All the additives significantly improved feed intake, body weight gain and feed efficiency of rabbits. The highest average feed intake (114.26g / head / day) was observed with enzymes which was 9.1% higher than the control. Yeast and EM significantly ($p < 0.05$) improved the feed intake by 4.9% and 4%, respectively.

Enzymes increased the body weight gain of rabbits by 59.8% as compared to the control. The improvements in body weight gain with yeast and EM were 34.4% and 32.6%, respectively. Beside increased feed intake, the feed efficiency was also

improved by 31.7% when enzymes were added to the feed. EM and yeast too improved the feed efficiency significantly. These results suggest that the increased feed intake was due to higher growth rate of animals. Higher weights of liver, pancreas and caecum were observed with all additives, which are difficult to explain.

Enzymes and yeast improved the carcass recovery percentage by 25% as compared to the control. Crude protein digestibility at ileum, caecum, large intestine and in faeces were significantly increased by all 3 additives. Crude protein digestibility at ileum, caecum, large intestine and in faeces with enzyme treatment were 0.74, 0.71, 0.75 and 0.77, respectively, as compared to 0.67, 0.65, 0.68 and 0.70, respectively, in the control group. A similar increase in CF digestibility was also observed with additives. Compared to EM, yeast and enzymes had a greater influence on CF digestibility.

Microbiological analysis showed an increase in lactic acid bacteria in the caecum and large intestine of rabbits fed with yeast and EM. Enzymes increased the lactic acid bacteria only in the caecum. Colony forming units (cfu) of yeast and mold were generally higher in the caecum of rabbits fed with yeast culture. The cost-benefit analysis showed that the feed cost per kg live body weight in rabbits was reduced by 23.8% and the same per kg dressed weight by 39% when the diet was supplemented with enzymes. The corresponding values obtained for yeast were 15.9 and 32.5% and for EM 15.5 and 27.6%, respectively.

Results clearly demonstrate that the nutritive value of low quality feeds, especially of agro-industrial by products, and thereby the performance of rabbits fed on them can be improved by supplementing them with EM, yeast or enzymes. These findings indicate that in Sri Lanka, rabbits could be reared more economically on locally available, inexpensive feed stuffs if the feed is supplemented with appropriate additives like EM, yeast and enzymes.