

## **Water spinach (*Ipomoea aquatica*) as a feed resource for growing rabbits**

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Three experiments were carried out to investigate the nutritional value of water spinach as a feed for rabbits. The experiments were done in the ecological farm of the Center for Livestock and Agriculture Development (CelAgrid-UTA Cambodia) located in Rolous village, Rolous commune, Kandal Stoeung district, Kandal province, about 26 km from Phnom Penh City, Cambodia.

The hypothesis was that water spinach would support high levels of growth which may be improved by supplementation to increase the energy density of the total feed with broken rice

In the first experiment digestibility coefficients and N balance was determined in growing rabbits fed a basal diet of water spinach supplemented with broken rice. Four Local and 4 New Zealand White male rabbits with an initial live weight of  $1.75 \pm 0.10$  kg were fed whole water spinach (*Ipomoea aquatica*) ad libitum supplemented with broken rice (0, 4, 8 and 12g/day) according to a duplicated 4\*4 Latin Square design. The rabbits were confined in the metabolism cages made from wood and wire mesh designed to allow separation of faeces and urine. Water spinach was collected along the canal of CelAgrid-UTA Cambodia in the morning before feeding to the animals. Broken rice was purchased from the market near Phnom Penh. The average ambient temperature was  $25.9 \pm 0.96$  °C in the morning at 6: 00 am,  $31.7 \pm 1.59$  °C in the middle of the day (12:00 am) and  $28.3 \pm 1.90$  °C in the afternoon at 6: 00 pm during the trial (10 July to 19 August, 2004).

There were no significant differences for the interaction genotype x diet in any of the indices examined. There was a significant decrease in faecal pH with increasing levels of broken rice. However, there was no significant effect among treatments on the DM, NH<sub>3</sub> and short chain fatty acid concentrations in the faeces. Faecal DM content was higher for local than for NZ White rabbits. There were no significant differences in digestibility indices between levels of broken rice. There was a trend ( $P < 0.10$ ) for DM and organic matter digestibility indices to be higher in the local than in the NZ genotype. This trend was significant ( $P < 0.05$ ) in N digestibility favouring the local breed. There was no significant effect on N retention due to genotype or the level of broken rice.

The second experiment was to investigate the quality of water spinach in terms of growth of rabbits and the effects of supplemental energy. Sixteen crossbred (Local x New Zealand White) growing rabbits, averaging  $961 \pm 145$  g live weight were used in a randomized block design to study the effect of broken rice supplementation (0, 4, 8 and

12 g/day) to water spinach fed *ad libitum*. The animals were housed in individual cages made from wood and wire mesh. Water spinach and broken rice were purchased in the local market. The average ambient temperature was  $31.6 \pm 1.60$  °C at midday (12: 00 am) during the trial (9 July to 30 September, 2004). As the level of broken rice given to the rabbits was increased from 0 to 6 g/head /day, the effective offer level of the water spinach also increased. This resulted in the animals selecting more of the leaves than the stems at least. When further increments of broken rice were given 8 to 12 g/head/day the ratio of leaf to stem in the feed consumed decreased. There was no effect of the level of broken rice on growth rate or feed conversion efficiency. Rabbits fed only water spinach growth rate was 18.1 g/day during the first 6 week period, decreasing to 9.3 g/day between 7 and 12 weeks. The growth rate over 12 weeks averaged 14 g/day.

That rabbits were highly selective given the opportunity suggested that these animals may be able to obtain a more nutritionally valuable diet. This was tested by increasing the on offer whole plants.

In the third experiment, increasing offer levels (8, 10, 12, 14, 16 and 18% of live weight in DM) of water spinach was evaluated with twelve New Zealand White rabbits with an initial live weight of  $897 \pm 95.2$  g. The water spinach was taken from the first and second harvests of plants established in CelAgrid-UTA Cambodia, after 30 days of first growth (or regrowth). Over the period of this study (16 September to 15 November, 2004) average air temperature, as measured daily at 12:00 am, was  $30.7 \pm 0.89$  °C. Increasing the offer level of water spinach from 8 to 18% of live weight (DM basis) increased the proportion of leaf consumed, the intake of crude protein and the digestibility of the DM and the crude protein. Digestibility of crude fiber decreased with increase in the proportion of leaves consumed. Live weight gain was depressed with increasing offer level. The decrease in the crude fiber content of the diet, as the rabbits selected “low-fiber” leaves and discriminated against “high-fiber” stems, may be related to the decreased production.

It is concluded that fresh water spinach as the sole feed of rabbits can support acceptable growth rates of 14 to 20g/day with DM feed conversion between 3.83 and 5.18. The crude fiber level in water spinach appears to be too low to support maximum performance and better results may be achieved by providing supplementary feed sources that are high in fiber.

**Key words:** *Water spinach (Ipomoea aquatica), rabbits, digestibility, DM feed conversion, daily weight gain.*