

## THE EFFECT OF PROTEIN CONTENT OF THE DIET ON GROWTH RATE OF REDCLAW CRAYFISH REARED IN AN EARTHEN DAM

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Redclaw crayfish farming is a relatively new industry and little is known about the nutritional requirements of this species. With the increased population densities involved with farm production, crayfish require formulated diets. These supplement 'natural' feed sources which may influence growth response to pelleted feeds. The aim of this trial was to examine the growth response of Redclaw to different dietary protein levels when reared in an earthen dam.

Crayfish were kept in a stock water dam in pyramid shaped mesh cages, with a base area of approximately 450 cm<sup>2</sup> and made of 1 cm plastic coated wire mesh. Three crayfish (mean 9.56g, s.d. 2.92) were placed in each cage in about 1 m of water on the dam floor. Crayfish were allowed to acclimatise for two weeks and, except for the unfed group, were fed equally, once daily at about 2.5% of initial body weight

Four diets were prepared with 8, 16, 24, 34% crude protein (CP), based on starch, canola oil, mineral vitamin premix, Peruvian fishmeal and soybean meal. The two protein meals were added in 2:1 ratio on a CP basis. Diets were allocated randomly to cages with ten replications for each diet. Five cages of crayfish were also held as unfed controls. Redclaw were weighed initially, then again at three and five weeks. Water temperature and pH were monitored daily during the trial and dissolved oxygen level measured weekly.

Any dead animals were replaced during the first week of the trial but not thereafter. The total survival for all treatments was 80 %. Table 1 shows average liveweight gain for the total, five week, trial period. 'Unfed' animals had the lowest growth rate which was not significantly different from the 8 and 16% diets. During the last two weeks unfed animals had a zero growth rate but better survival due to reduced cannibalism compared with the first three weeks of the trial. Growth rates were highly variable within treatments but there was an overall linear response to protein content. The poor performance of the 16% diet may have been due to poor survival in the first three weeks.

**Table 1. The effect of dietary protein (CP%) on average live weight gains over five weeks of Redclaw**

Diet % CP	LWG (g) $\pm$ s.d.	Survival %
Unfed	1.98 <sup>a</sup> $\pm$ 1.617	73
8	2.60 <sup>ab</sup> $\pm$ 1.236	87
16	2.29 <sup>ab</sup> $\pm$ 1.080	77
24	3.95 <sup>bc</sup> $\pm$ 1.383	87
34	4.29 <sup>c</sup> $\pm$ 1.666	83

Values with the same superscript are not significantly different at P=0.05

A sample of detritus from the dam bottom beside cages was hand collected and was analysed for carbon and nitrogen content. The detritus had a C:N ratio of 14:1 with a N content of 13.3 g/kg DM. Detritus with a C:N ratio of 17:1 or lower is suitable for Redswamp crayfish growth (D'Abramo and Robinson 1989) which is probably why, together with cannibalism, unfed animals showed some growth. The 34% diet gave the highest growth rate and was significantly higher than unfed animals, 8% and 16% CP diets. The optimum CP content may still be higher than 34%. This result is within the range of results found under laboratory conditions (D'Abramo and Robinson 1989). In conclusion it appears that the protein level for best growth of Redclaw crayfish is at least 34%. The very large intra-treatment variation suggests factors other than diet have a large effect on crayfish growth.

D'ABRAMO, L.R. and ROBINSON, E.H. (1989). *CRC Critical Reviews in Aquatic Sciences* **1**, 711-728.