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Influence of feeding frequency on diurnal variations in liver and muscle RNA/DNA ratios in *Misgurnus anguillicaudatus*

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Abstract

We investigated the effect of the feeding regimen (group 1: fed twice daily at 8:00 and 18:00 for 28 days followed by 5 days of fasting; group 2: fed twice daily at 8:00 and 18:00 for 28 days and then fed once daily at 8:00 for 5 days; and group 3: fed twice daily at 8:00 and 18:00 for 33 days) on the circadian rhythms of the RNA/DNA ratio in the liver and muscle of the loach Misgurnus anguillicaudatus. The experiment was carried out with a photoperiod of 14 hr (light):10 hr (dark), with light from 07:30 to 21:30, followed by sampling. Cosine rhythm analysis and parametric analysis revealed obvious diurnal variation regularity in all three groups. The amplitude and phase of diurnal regularity in the RNA/DNA ratios increased after

feeding. The highest value in group 2 was higher than that in group 3. Correlation analysis showed a correlation coefficient between the RNA/DNA ratios of the two tissues of 0.85. The coefficients of variation in the maximum RNA/DNA ratio and two cycles of chi-square values in liver tissue were lower than those in muscle tissue, but the stability of the ratio was more reliable and representative in liver than in muscle. These results suggest the occurrence of some altered circadian rhythms of the RNA/DNA ratios in the liver and muscle of the loach *M. anguillicaudatus* and that the best sampling time was after 4 hr of daily feeding.

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