

ACOUSTIC DOPPLER VELOCIMETRY ALLOWS DETERMINING DAILY SWIMMING ACTIVITY OF SEA BASS *Dicentrarchus labrax* L.

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Acoustic Doppler Velocimeter (ADV) has been used for the measurement of turbulence produced by fish swimming activity (Masaló *et al*, 2004) supplying a quantitative measure, which can be related with both environmental conditions and daily behaviour. The knowledge of fish activity is an important tool, not only for the study of fish behaviour but also to assess its influence in the homogeneity of water quality and in the sediment dynamics into the tank. Traditionally, behavioural studies of activity in fishes have been developed using video-tracking methods, ultrasonic pressure transmitters, infrared sensors or through indirect measures as oxygen consumption. The present study was conducted in an on-growing farm and tries to determine the daily swimming activity of European Sea Bass (*Dicentrarchus labrax*, L.), using ADV.

Experiments were made in a 46 m³ tank, with octagonal shape, 167 cm of water depth and circular flow pattern. The body weight of fish averaged 48 g and growing density was 35.5 kg m⁻³. Measurement of velocity was made at a 95 cm depth point, for a period of 40 h, registering 20 seconds every 5 minutes with a 25 Hz frequency. Water salinity and temperature were 15 ‰ and 15 °C respectively, and fish were exposed to an artificial photoperiod (8:00 to 23:30 hours lighting). During the experiment, fish weren't fed.

Data processing was made, according to Masaló *et al* (2004), applying three filters: COR (>70), SNR (>5) and *Phase-space threshold despiking* filter. The Root Mean Square (RMS) of velocities, in every axis and in velocity magnitude, was the parameter used to measure flow turbulence, which is mainly due to fish swimming activity.

The results obtained showed an increase of turbulence in the measurement point during the light period, which can be related with an increase in fish activity (Figure 1). RMS averages of light and dark periods are presented in table 1. Accordingly, ADV seems to be a reliable tool to detect changes in fish activity.

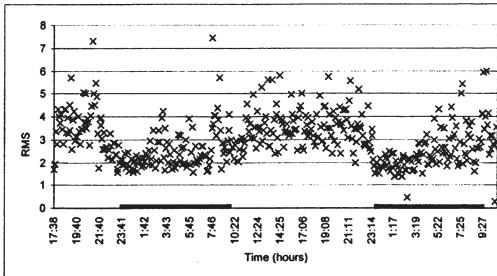


FIGURE 1: Evolution of RMS-magnitude during the experiment. Dark horizontal bars represent the dark-period.

Period	RMS average			
	X	Y	Z	Mag
Light	3.754	3.591	2.704	3.399
Dark	2.656	2.439	1.813	2.368

TABLE 1: RMS average of light and dark period during the experiment.