Behavioral and Neurophysiological responses of European Sea bass (*Dicentrarchus labrax*) groups reared under food constraint

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Introduction

Recently, Covès *et al.* (2006) have designed a monitoring system that simultaneously records the individual triggering activity of numerous fish when fed with a self-feeder. The authors were able to provide new insight on the voluntary food-demand (FD) of the European juvenile sea bass. Groups of 50 fish displayed individual differences in the food-demand activity.

What kind of social organization could explain these individual feeding status differences?
2 approaches were linked

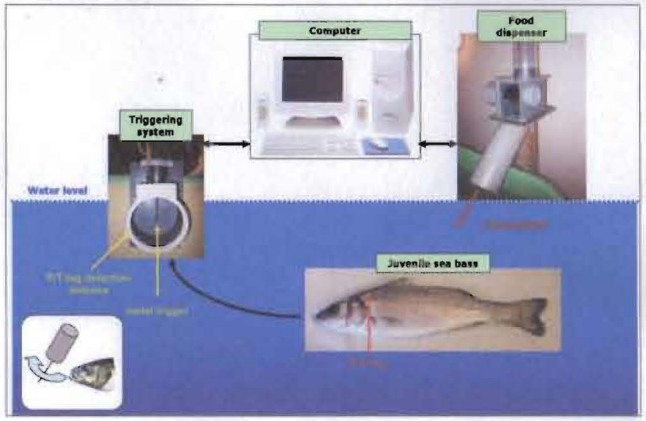
Behavioural monitoring

Physiologic parameters

Covès D., Beauchaud M., Attia J., Dutto G., Bouchut C. & Bégout M-L. 2006 - Long-term monitoring of individual fish triggering activity on a self-feeding system: An example using European sea bass (*Dicentrarchus labrax*). Aquaculture, 253:385-392.

Experimental protocol

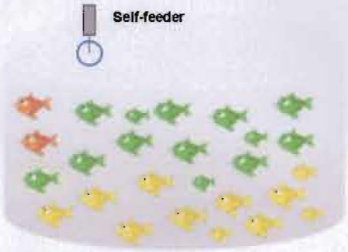
Self-feeding conditions: 50 fish x 6 tanks over 68-day experiment



Results & Discussion

Behavior

Food-demand behaviour monitoring



1-2 high-triggering fish
High food-demand
= 72-82% total FD

29 low-triggering fish
Low FD
= 14-23% total FD

17-19 null-triggering fish
Null FD

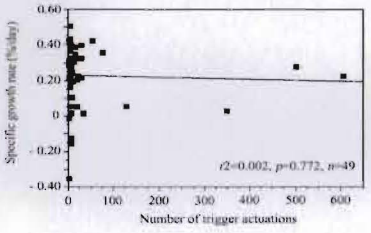
Social interaction observations

No aggressive act

No territoriality

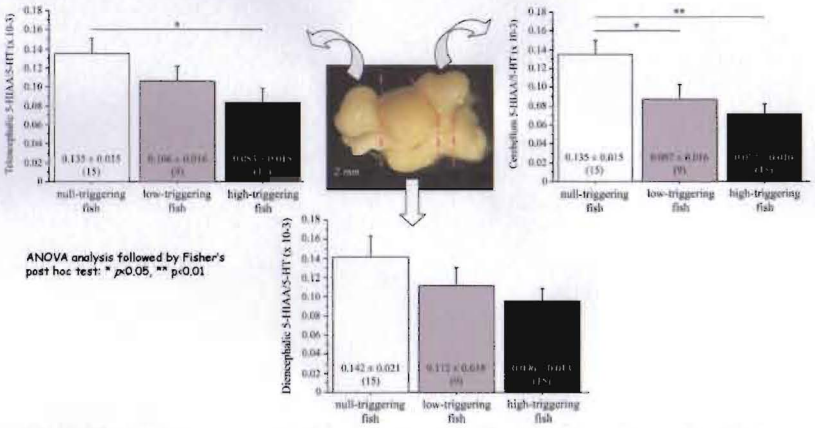
Physiology

Individual growth



Regression analysis

Brain serotonin level = a social stress index



ANOVA analysis followed by Fisher's post hoc test: * $p<0.05$, ** $p<0.01$

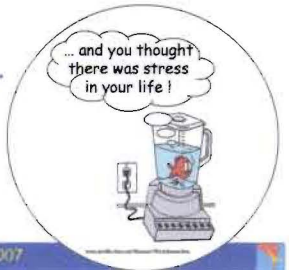
No competition noticed between the fish for the access of the trigger. The high-triggering fish actuate strongly the feeder and seems to maintain its food satus without sign of aggressivity. This individual has no preferential access to food resources and consequently, has not the best growth. **But**, these individuals seem significantly stressless and appear to be responsible for the food-provisioning of the whole group.

Conclusions

A dominance scheme would explain the food-demand activity and the stress differences, but the absence of aggressive interactions do not confirm it. The assessment of other neurophysiological factors, as AVT (arginine vosotocin), could confirm this hypothesis. More experiments must be done to determinate if the high-triggering fish has an advantage of its great activity, e.g. in feed intake.

Applications ...

Studies should provide basic behavioral and physiological indicators of social stress in sea bass to improve their welfare in aquaculture.



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