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Abstract

The unavailability of weaned burbot (*Lota lota*) fingerlings is a bottleneck for the development of the culture of this species.

A co-feeding and a direct weaning protocol resulted in similar performances. High SGR were recorded but cannibalism rates were high. Therefore early grading is recommended.

The later protocol will be preferred in practice because of lower costs in terms of A. nauplii use and labour.

Introduction

The AquaVlan project is investigating the potential of new species for aquaculture diversification. The Aquaculture Education and Research Facility (Aqua-ERF) of the University College KaHo Sint-Lieven selected *Lota lota* because of the superb quality of the meat and high prices in local markets.

The unavailability of weaned fingerlings was identified as a threat for the development of the aquaculture of this species. In literature, only one reference was found that reported a successful weaning of burbot fry.

Aqua-ERF started weaning experiments in order to develop a practical weaning protocol.

Materials and Methods

Larval Rearing:

150.000 Yolk sac larvae till 53 days from first feeding, 2x250L tanks
First A. nauplii AF, followed by OF and enriched GSL.

Weaning:

Inserts of salmonid hatching trays at a density of 47 fry l⁻¹.

Two weaning protocols were tested:

- 1) **Co Feeding (CF)**: during 15 days the amount of A. nauplii was gradually reduced and the amount of dry feed (Aglonorse) increased.
- 2) **Direct Feeding (DF)**: direct switch to dry feed.

Fry were fed continuously over 24h. Each treatment was conducted in triplicate. After 29 and 49 days fry were weighed, counted and graded.

Results

Larval Rearing

Swim bladder hyperinflation probably due to elevated CO₂ levels resulted in low larval survival.

29 days

No statistical difference ($p \leq 0,05$) for any of the parameters was found although size distribution (< and > 3mm) after grading was almost significant ($p = 0,0501$). (Table 1)

49 days

After grading over 3mm grid on day 29, replicates were pooled: 2 size classes per treatment with 1 replicate. At day 49, a second grading resulted in 4 size classes (S, M, L, XL). (Graph Size Distribution)
Results are indicative. No clear differences between both protocols are observed. (Table 2)

Discussion

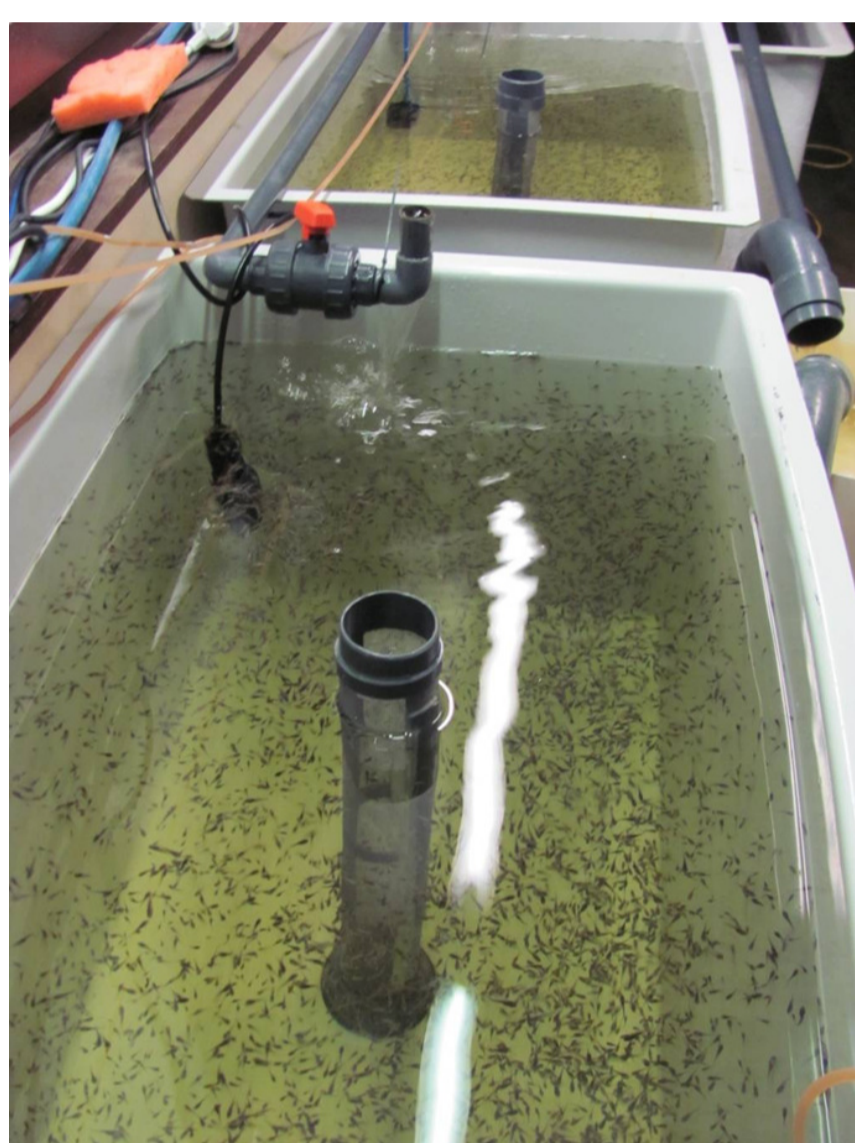
Larval Rearing

A reduced biofilter performance due to the low rearing temperature (12°C-14°C) resulted in elevated ammonia and nitrite levels. Also a bad gas stripping design resulted in elevated CO₂ levels. At day 30 these circumstances probably caused the observed swim bladder hyperinflation followed by death. These elements have to be taken into account when applying RAS in burbot larviculture.

Weaning

There seems to be no difference in survival, cannibalism rate and growth performance between both weaning protocols. After 29 days, DF results in more large fry but this difference disappeared after 49 days.

Burbot fry can be weaned and high SGR were recorded in this experiment. Larval survival has to be improved especially by earlier grading which will probably reduce the rate of cannibalism.

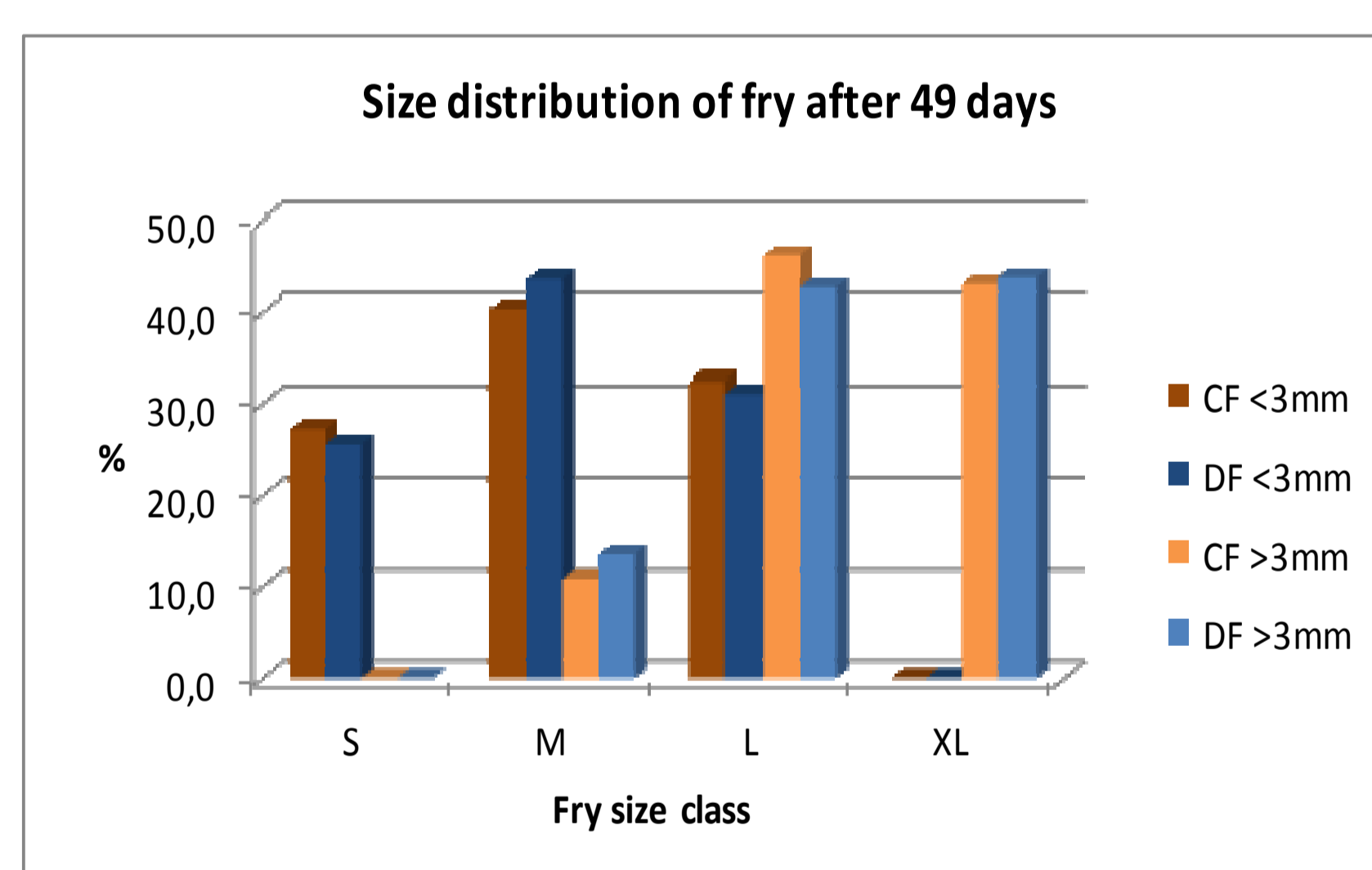


| | CF | DF |
|----------------------------|-------------|-------------|
| Survival (%) | 16,7 ± 3,9 | 15,2 ± 1,9 |
| Cannibalism (%) | 30,0 ± 9,2 | 29,4 ± 5,5 |
| SGR (%.day ⁻¹) | 3,10 ± 0,25 | 3,44 ± 0,19 |
| % < 3 mm | 45,3 ± 12,4 | 37,2 ± 6,4 |
| % > 3mm | 54,8 ± 12,4 | 62,8 ± 6,4 |

Table 1: Results after 29 days.

| | Survival (%) | Sgr (%.day ⁻¹) |
|----------|--------------|----------------------------|
| CF < 3mm | 12,6 | 2,52 |
| DF < 3mm | 13,3 | 2,59 |
| CF > 3mm | 16,5 | 4,72 |
| DF > 3mm | 13,8 | 4,52 |

Table 2: Results after 49 days (no replicates).



Conclusion

With these first results, a proof of concept of a practical weaning protocol is established. Cost reduction seems possible by eliminating a co-feeding period.

Although these are first steps and more research is needed, it is possible to wean burbot fry eliminating the bottleneck of future availability of weaned fingerlings.



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