GROWTH PERFORMANCE AND BODY COMPOSITION OF BURBOT 
*Lota lota* FED DIFFERENT DIETS WITH VARYING LEVELS OF 
CRUDE PROTEIN AND CRUDE LIPID

Introduction

Although burbot is considered to be an excellent coldwater aquaculture candidate, not much is known about its nutritional requirements. This makes it difficult to choose the ideal feed. Feeding the fish with the wrong level of crude lipid and protein could affect performance and reflect in unwanted changes in the organoleptic quality of burbot as diet composition can significantly alter the concentration of whole body proximate constituents.

In order to acquire a starting point for more specific nutritional experiments, 6 commercial diets with different levels of crude protein (CP) and crude lipid (CL) were tested to obtain indication levels for their requirement. SGR, FCR, and body composition were compared between burbot juveniles fed different commercial feeds during ten weeks.

Materials and Methods

- 77 fish /tank (starting ABW 17.91±0.85g)
- 18 tanks (140l) in RASt at 18°C
- 6* commercial diets (composition see table1); 3 replicate tanks/diet
- 2 weeks acclimatization + 10 weeks experimental diets
- 24h feeding – 12h light / 12h darkness

Collected data:
- at samplings every 2 weeks and final sampling:
  - *SGR, FCR, mortality*
  - Body composition data: 9 fish at initial stocking
    - 3 fish/tank at final sampling
  - *Hepatosomatic & Viscerosomatic Index (HSI/VSI)*
  - *Total lipid (%TL):* Micro Folch procedure
  - *Total protein (%TP):* Kjeldahl method

Results

- Diet A (CL=25%) had a significantly higher SGR (1.63±0.04 %.day⁻¹) than treatments with CL ≤ 20%. (Figure 1)
- Five of the treatments had an FCR < 1, with Diet A having a significantly lower FCR (0.81±0.02). (Figure 1)
- Fish fed High %CL diet had a significant higher HSI and %TL in body composition. (Table 2)

Discussion

In this trial a high fat diet resulted in a higher lipid content in the body composition of the fish. This has also been observed in other fish species. Probably the higher % of total lipid found in the fish fed diet A could be explained by a higher fat deposition in the liver, as these treatments also resulted in the highest HSI-values.

The bigger liver possibly contributed to the higher growth rate for the treatments with higher %CL. Altought fat gain is less interesting in most aquaculture species, this could have a positive outcome for burbot. Its liver is considered a delicacy in some countries, which makes it an added value for burbot on the market. Research should find out if changes in dietary lipid affect the taste of the liver.

The lower % total protein found in fish fed high %CL, could also be explained by the presence of a bigger liver in those fish. Liver contains in comparison with other body tissues a higher % total lipid which could lower the fraction of % total protein in the body composition. More tissue-specific analyses should complete this research.

Further trials with purified diet containing different inclusion levels of CL and/or CP, aiming at %CL>20 and %CP ±50, should lead to the development of an optimal diet that fulfills the dietary requirements.

Conclusion

- Promising SGR and FCR values for coldwater species
- Changes in dietary lipids have an effect on fat content in the body composition and weight gain.
- Indication that burbot diet should contain crude lipid level > 20 for optimal growth

Acknowledgement

This research is part of the AquaVlan project.
We especially acknowledge the support of the Province of East-Flanders.