

# Chapter 8

## Energy Requirements of European Eel for Trans Atlantic Spawning Migration

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### 8.1 Introduction

#### 8.1.1 Migration

An important aspect of the reproduction of European silver eels is the huge distance they have to swim to reach their spawning grounds. After leaving the West European coast they still have to swim 5,000–6,000 km to the Sargasso Sea, the assumed spawning area. So, obviously long term swimming capacity is a major requirement for successful reproduction. Migrating eels don't feed; therefore they rely for their energy completely on fat stores (Tesch 2003), which can be as much as 30% of their body weight. Silver eels must swim across the Atlantic Ocean within 5–6 months, as this is the difference between the time they leave and the time the first larvae are observed in the Sargasso Sea. From the time needed to cross the ocean the minimal swimming speed of  $0.4 \text{ m s}^{-1}$  can be calculated. The long distance migration suggests two major questions: (1) Do they have enough energy reserves? (2) Are they built to swim long distances? To know whether they have enough energy left over for successful reproduction after arrival at the spawning site, it is important to know the energy consumption during long term swimming as well as the amount of the initial fat stores.

Long term swimming experiments were, to our knowledge, never carried out before with fishes. This requires the construction of special equipment, suitable to run continuously for at least several months; such as available at the Institute of Biology Leiden. Long term swimming may be a much heavier burden to animals than short term swimming, since under those conditions the experimental animals do not have the opportunity to recover. This may be a constant stress making them sensitive to otherwise harmless viral and bacterial infections. Thus far nothing was

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