

# How to study spatial cognition in the Arctic charr (*Salvelinus alpinus*)

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## 1 Spatial cognition

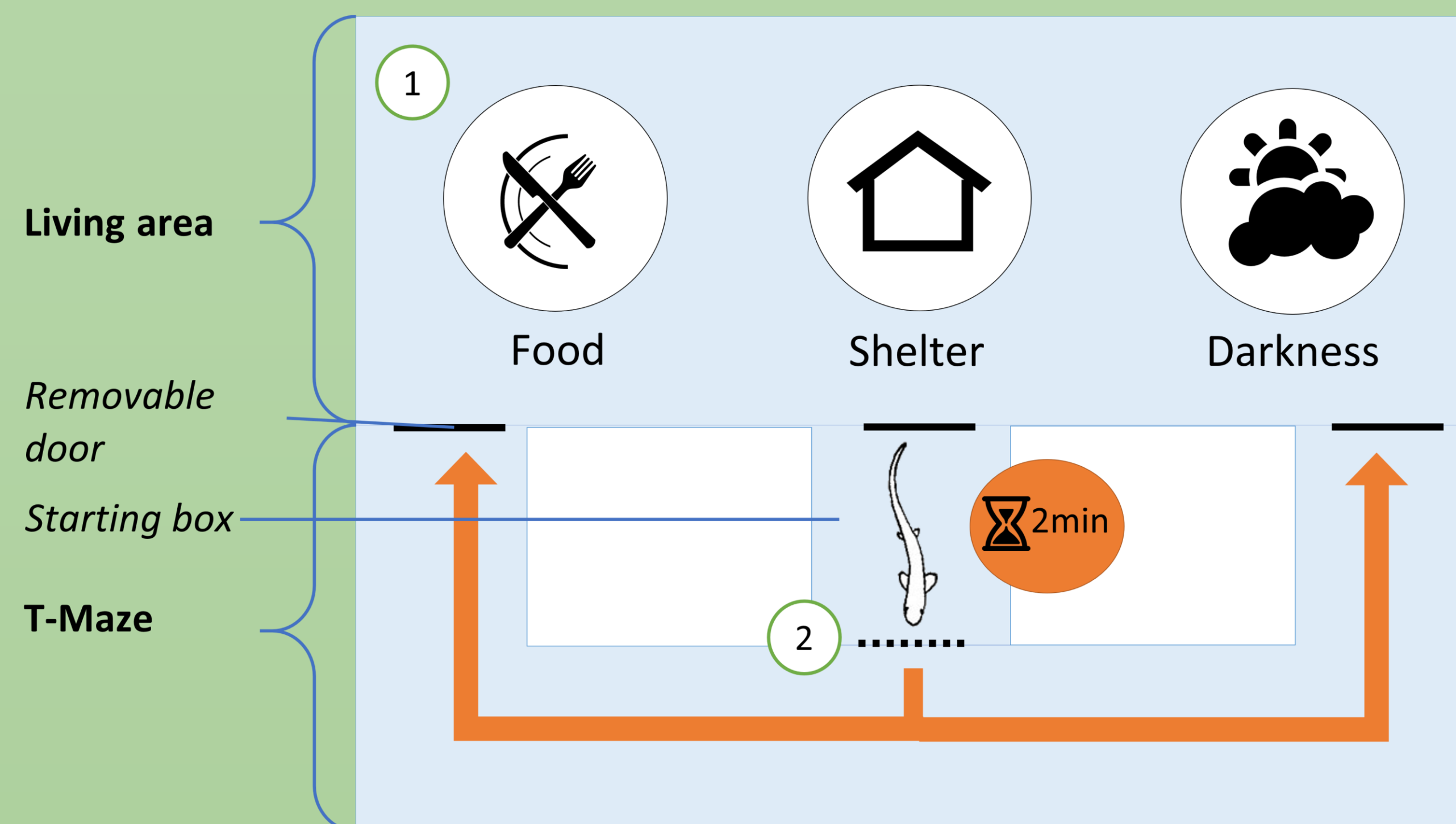
**Egocentric strategies**  
(self-centred referential)



**Motor response:**  
Use of proprioceptive and kinesthetic information (turn right/ left)

**Beaconing:**  
Use of landmarks

## 2 Housing & Laterality test



### 2.1 Housing

- Acclimation (Day 1 – Day 3, feeding 3 times a day)
- Laterality test (Day 3)
- No access to the testing zone

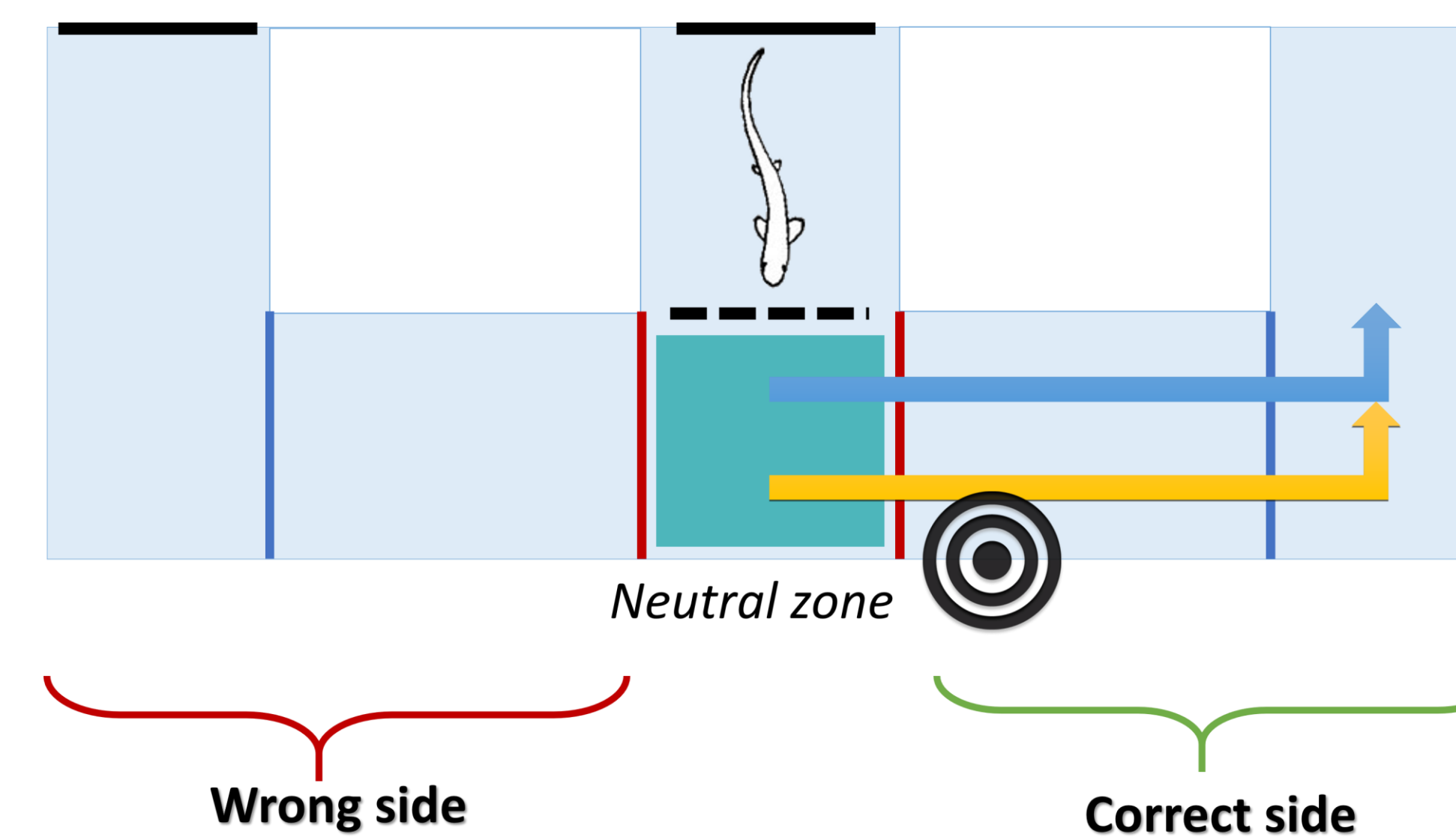
### 2.2 Laterality test

- Only 1 trial
- Starting box (2min)
- Exit starting box: limited to 20 min
- First turn: preferred side

## 3 Training

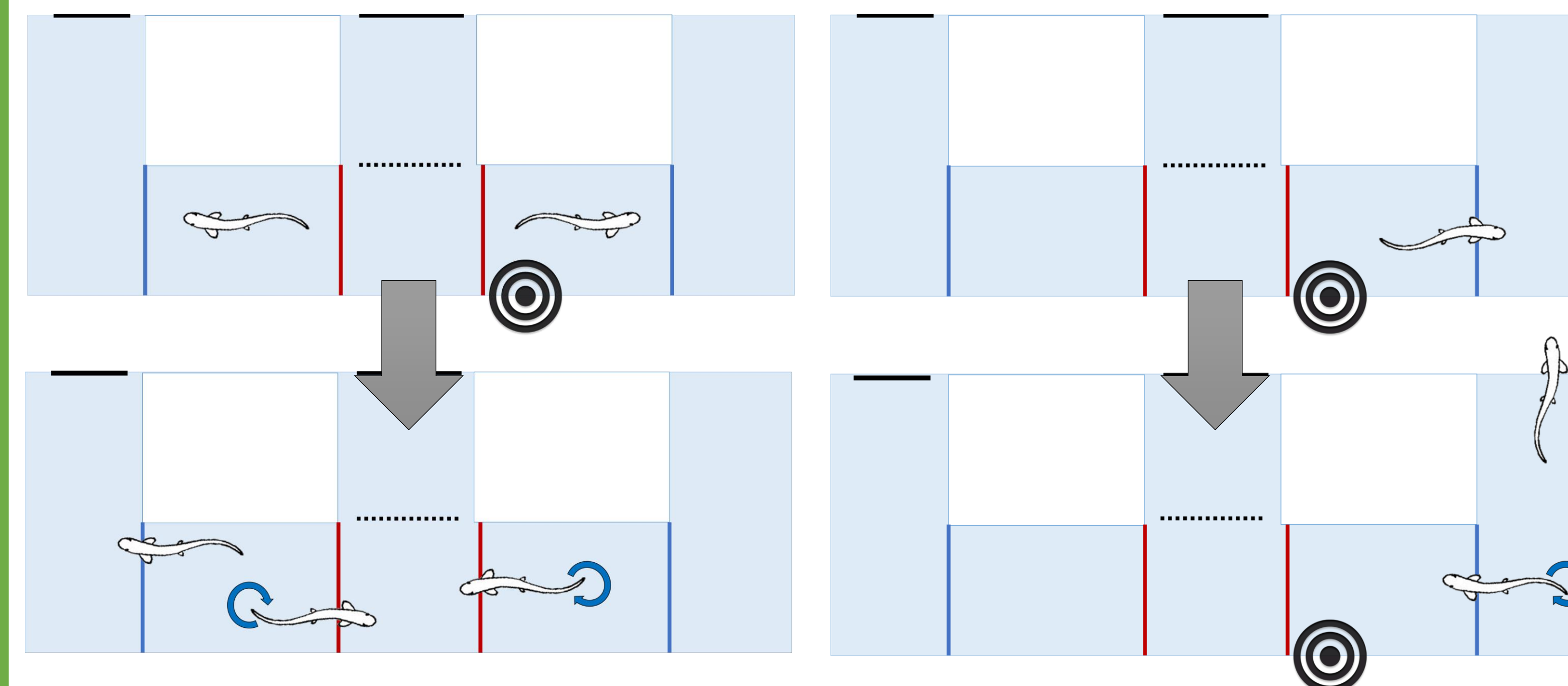
- Landmark: placed at the opposite side of the preferred one
- 3 trials twice a day

**Example of a fish displaying a right turn preference:**



1. Starting box (2min)
2. 20 minutes to reach Neutral Zone
3. 20 minutes to make a choice (cross the virtual red line either on the right or left)

**Different options:**

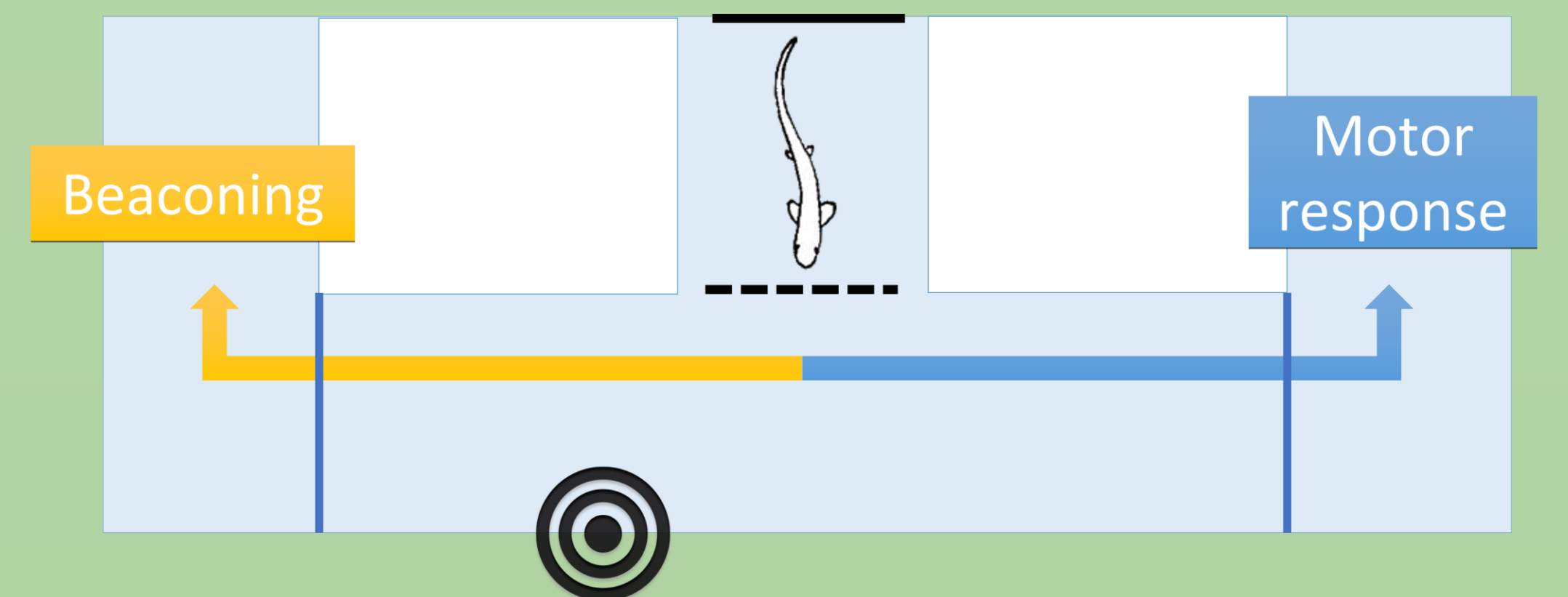


Considered as « wrong » choices  
1 pellet distributed

Considered as « correct » choices  
3 pellets distributed

- Learning criterion: **9/10** correct choices in a row

## 4 Conflict test & Training sessions



**Experimental design**  
Conflict test 1 – Training 2 – Conflict test 2 – Training 3 – Conflict test 4

**Conflict test**

- Landmark: opposite side of training configuration
- Both doors open
- Assessment of the strategy used by the fish (Motor response/Beaconing)
- Full ration given

**Training sessions**

- Back to training sessions
- Criterion: 4/5 correct choices.

## 5 Measured variables

- ⌚ Latency (sec) to exit the starting box
- ☑ Number of trials to reach the criterion in the Conflict test
- ⊗ Strategy used by the fish (Motor response or Beaconing)
- 📊 Proportion of fish that learned

