

## Effects of on-board storage and electrical stunning of wild cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*) on brain and heart activity

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### Abstract

Cod and haddock captured with commercial trawling gear were taken immediately after landing on deck to on-board storage in dry bins for measuring brain and heart activity, and behaviour. Other groups were first stored in holding tanks and then electrically stunned with a prototype "dry stunner". For stunning 52 V<sub>rms</sub> was applied on individual fish for 1 s. As a result, the cod and haddock received an electrical current of  $0.34 \pm 0.09$  and  $0.36 \pm 0.12$  A<sub>rms</sub>, respectively. Electrical activity in the brain and heart was measured before and after electrical stunning. The fish remained conscious for at least 2 h after landing and during on-board storage as indicated by the electrical activity measured in brain and heart. Behavioural responsiveness to administered stimuli was absent in both species. After electrical stunning, both species showed a general epileptiform insult which was characterised by a tonic phase followed by a clonic phase and terminating with an exhaustion phase.

Since the fish remained conscious after landing and storage, electrical stunning and subsequent killing with a throat cut, may provide an option for improving fish welfare on-board commercial fishing vessels. In particular, we recommend to stun and kill wild cod and haddock as soon as possible after landing on deck using a dry stunner applying 52 V<sub>rms</sub> (coupled AC/DC current) for more than 3 s.

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