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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_{rms} was applied on individual fish for 1 s. As a result, the cod and haddock received an electrical current of 0.34 ± 0.09 and 0.36 ± 0.12 A_{rms}, 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_{rms} (coupled AC/DC current) for more than 3 s.

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