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**Seemingly contradictory results regarding the welfare of fish
stunned using different methods**

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Stunning fish with CO₂ is still the dominating method used in Swedish aquaculture. In an on-site study the behaviours and plasma levels of cortisol and ions as well as blood haematological variables were compared for Arctic char (*Salvelinus alpinus*) stunned with CO₂ or electric exposure. CO₂ exposure triggered aversive struggling and escape responses for several minutes before the fish was immobilized, whereas in fish exposed to an electric current immobilization was instant. On average, it took 5 min for the fish to recover from electrical stunning, whereas fish stunned with CO₂ failed to recover. Despite this, the electrically stunned fish had more than double the plasma levels of cortisol compared to fish stunned with CO₂. This result is surprising considering that the behavioural stress reactions were much more pronounced following CO₂ exposure. Several possible explanations for these seemingly contradictory results will be presented and discussed.