

A GUIDE TO HUMANE ELECTRICAL STUNNING IN FISH

Electrical stun/kill of fish is becoming an increasingly common way of dispatching farmed fish. There are now several machines available for purchase and several machines that have been made by individual farmers. However just because the machines use electricity does not make them humane. To the casual observer the differences are not obvious.

The definition of humane slaughter is as follows: *the animal shall be rendered instantly unconscious and remain so until death supervenes*. In practice instantly is taken as within 1 second with no visible signs of recovery of normal brain function.

The critically important point of humane stunning happens in the first second of treatment. The film clips attached to this document show the difference between a good stun and an inhumane stun by halting the treatment after 1.0 seconds. What is shown on the clips is explained below:

Good stun – The application of a 1 second stun produces the equivalent of an epileptic fit in the fish. This is usually seen as a shuddering of the muscles which can last several seconds. Any coordinated motion is lost including gill movements, eye movements and of course swimming movements. All these are temporary and fish nearly always recover full sensibility within a few minutes after exposure to a 1 second stun pulse. [Watch the “Good Stun” video.](#)

Bad Stun – During the application of electricity the fish remains motionless however, [as seen on the “No Stun” video](#), as soon as it is removed the fish will react. In the case of the film clip the escape reaction was severe but in others the reaction is less pronounced. In all cases however coordination returns within a few seconds.

The application of electricity for prolonged periods of time at a level which does not instantly stun fish can also give the appearance of a good stun however the fish may have been conscious through the treatment and is immobile due to muscle exhaustion.

If you do possess a machine and can switch the electricity on and off in one second then you too can determine whether the machine is humane by observing the fish. However this presupposes that you possess a machine and that you are able to carry out this test. For a variety of reasons this may be impractical hence you need to assess the machine by examining its design.

Comparing functionality and aspects of the design of different machines

Generally speaking manufacturers of stunning equipment are evasive about what voltages and waveforms are used in their machines. A competent electronic technician can, however, easily measure these parameters during the machine's operation and, with the help of a ruler, convert these measurements to frequency, waveform, voltage gradient (voltage orientation) and water conductivity.

Armed with these parameters the Humane Slaughter Association should be able to advise on whether the machine is likely to be considered humane for the species of harvested fish.

The instruction manual is perhaps a simpler place to start. Does it specify the species? Does it mention water conductivity? Does it advise you on treatment times? Does it enable the operator to change the treatment parameters and give specific guidance as to the settings to be used?

Specifying the species of fish that the machine can stun is important because different fish require fundamentally different voltage gradients. If the manual is silent on this then it is unlikely that the machine has been properly evaluated and it is unlikely provide humane stunning.

Unless the machine specifies sea water, mention should be made within the manual of water conductivity. There is a complex relationship between voltage gradient and water conductivity in delivering a humane stun. In the UK fresh water can be as low as 25 micro-Siemens and as high as 1,000 micro-Siemens. If the machine is to be able to cover the whole of this range then the voltage gradient will have to vary by a factor of 5. If the manual is silent on the subject of water conductivity then again its ability to provide humane stunning must be questioned.

Treatment times will also vary according to species and the minimum time should either be automatically set by the machine or clear guidance should be contained within the manual. A manual that is silent on the subject might mean a machine that was not designed with humanity in mind.

Independent Verification

The Humane Slaughter Association has access to scientists who can make a judgment as to whether a machine is likely to be humane or not. If the manufacturer does not make the machine's technical data available to HSA then it would be wisest not to waste your money.