LIQUID ICE WITH AN ANAESTHETIC ADDITIVE IMPROVES ANIMAL WELFARE IN FARmed SEA BREAm DURING STUNNING AND SLAUGHTERING

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The traditional procedure for stunning and slaughtering of farmed seabream involves the use of crushed ice mixed with seawater. This system causes enough stress on the fish, as the stunning stage lasts more than 5 minutes, and agony to death by hypothermia takes longer than 20 minutes. Pre-slaughtering stress, combined with slaughtering methods involving increased physical activity before death, leads to the consumption of the energy reserve of glycogen at the expense of ATP, as well as increased levels of lactic acid, and consequent drop in muscle pH postmortem in fish. These processes affect negatively on the quality and accelerate the loss of fish freshness. Therefore, they are investigating new methods to achieve the aforementioned decrease stress and increase animal welfare. In this paper a new technology for stunning and slaughtering of farmed fish using liquid ice with a nanoencapsulated anaesthetic agent is presented. When this technology, developed by the authors, is applied on farmed sea bream times of stunning of 10-15 seconds are achieved, resulting in very low levels of stress. In tests performed on farmed seabream with weight of 465.75 ± 102.12 g, and using liquid ice at -5°C, the blood lactate level was 0.83 ± 0.18 mmol / L. Whether the traditional procedure is applied (using a mixture of crushed ice / seawater in a ratio 1:1 at a temperature of -0.5°C) the lactate level increased to values of 5.88 ± 3.29 mmol / L, which corresponds to times of stunning exceeding 4.25 minutes. The high level of stress in the fish stunned with the traditional system also manifested in higher levels of pCO₂, HCO₃ and glucose, in blood. Partial pressure of carbon dioxide increases from 13.40 ± 1.68 mmHg with liquid ice to values of 16.53 ± 1.92 mmHg for the traditional system. HCO₃ from 11.93 ± 1.51 mmol / L with liquid ice to 13.16 ± 0.50 mmol / L using the traditional system. Glucose increases from 258.00 ± 73.41 mg / mL for liquid ice, to 461.25 ± 35.35 ng / mL using crushed ice plus seawater.