



EFFECT OF CLAWS BINDING IN AMERICAN LOBSTER (*Homarus americanus*) HOUSING: PRELIMINARY STUDY OF EMOLYMPHATIC PARAMETERS

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American lobsters are crustaceans traditionally marketed live and, once caught, are subjected to different type of stressors that can affect their welfare. The European legislation does not assess specific retention requirements and the only invertebrates welfare references are the EFSA Animal and welfare Scientific panel opinion (2005) [1] and the guidelines created by the Sea Fish Industry Authority, a public body in the United Kingdom [2]; therefore their management is demanded to the common sense of food business operators. Keeping lobsters claws tied before and during storage is not legally required, but it is suggested to prevent animals from damaging each other. Some authors, nevertheless, affirm that this practice may prevent lobsters from showing their natural behaviour and damage the claws. Aim of the study was to evaluate the effect of claws binding on lobsters welfare by analyzing seven different emolympatic stress parameters, vitality and weight. The study was performed in commercial aquaria of Lodi Acquaculture Research Centre, at the University of Milan. During the experiment, water temperature was 6°C; specific gravity was 1020, oxygen was 87%, un-ionized ammonia was <0.3 mg/l and nitrite <0.1 mg/l. A total of 24 lobsters of both sexes were assigned randomly to one of two experimental groups: control group was maintained with tied claws while treatment group was held with free claws. Animals were maintained unfed throughout the trial. Hemolymph samples were withdrawn from the ventral abdominal sinus (arthrodial membrane covering the articulated base of the 5th walking leg) of each animal at arrival (T0) and after 12 h (T1), 36 h (T2), 60 h (T3) and 108 h (T4). Vitality index and weight were measured at the same sampling times. Glucose, lactate, total protein, ammonia, urea, chloride, calcium and magnesium concentration were determined. Parameters were rather constant during the whole experiment. At T1, all the parameters determined resulted significantly higher if compared to T0 ($P < 0.01$); the effect of "time" confirmed the importance of lobster storage in high quality artificial seawater tanks [3].

Claws binding did not have a significant impact on vitality, weight, glucose, protein, ammonia, urea, chloride and magnesium, while calcium level was influenced by the treatment ($P < 0.05$). Moreover, the absence of claws binding can contribute to enhance aggressivity in the subjects and difficulties in animal handling by food business operators.

[1] Animal and Welfare Scientific Panel (AHAW). Opinion on the aspects of the biology and welfare of animals used for experimental and other scientific purposes, EFSA Journal, 292:1-46, 2005. [2] Jacklin M., Combes J. The Good Practice Guide to Handling and Storing Live Crustacea, Sea Fish Industry Authority Publication, 2007. [3] Bernardi C., Baggiani L., Tirloni E., Stella S., Colombo F., Moretti M. V., Cattaneo P. Hemolymph parameters as physiological biomarkers in American lobster (*Homarus americanus*) for monitoring the effect of two commercial maintenance methods, Fisheries Research, 161:280-284, 2015.