

Analysis of Fish Preservation Methods for Traditional Fishermen Boat

Authors : Kusno Kamil, Andi Asni, Sungkono

Abstract : According to a report of the World Food and Agriculture Agency (FAO): the post-harvest fish losses in Indonesia reaches 30 percent from 170 trillion rupiahs of marine fisheries reserves, then the potential loss reaches 51 trillion rupiahs (end of 2016 data). This condition is caused by traditionally vulnerable fish catches damaged due to disruption of the cold chain of preservation. The physical and chemical changes in fish flesh increase rapidly, especially if exposed to the scorching heat in the middle of the sea, exacerbated by the low awareness of catch hygiene; many unclean catches which contain blood are often treated without special attention and mixed with freshly caught fish, thereby increasing the potential for faster fish spoilage. This background encourages research on traditional fisherman catch preservation methods that aim to find the best and most affordable methods and/or combinations of fish preservation methods so that they can help fishermen increase their fishing duration without worrying that their catch will be damaged, thereby reducing their economic value when returning to the beach to sell their catches. This goal is expected to be achieved through experimental methods of treatment of fresh fish catches in containers with the addition of anti-bacterial copper, liquid smoke solution, and the use of vacuum containers. The other three treatments combined the three previous treatment variables with an electrically powered cooler (temperature 0~4 °C). As a control specimen, the untreated fresh fish (placed in the open air and in the refrigerator) were also prepared for comparison for 1, 3, and 6 days. To test the level of freshness of fish for each treatment, physical observations were used, which were complemented by tests for bacterial content in a trusted laboratory. The content of copper (Cu) in fish meat (which is suspected of having a negative impact on consumers) was also part of the examination on the 6th day of experimentation. The results of physical observations on the test specimens (organoleptic method) showed that preservation assisted by the use of coolers was still better for all treatment variables. The specimens, without cooling, sequentially showed that the best preservation effectiveness was the addition of copper plates, the use of vacuum containers, and then liquid smoke immersion. Especially for liquid smoke, soaking for 6 days of preservation makes the fish meat soft and easy to crumble, even though it doesn't have a bad odor. The visual observation was then complemented by the results of testing the amount of growth (or retardation) of putrefactive bacteria in each treatment of test specimens within similar observation periods. Laboratory measurements report that the minimum amount of putrefactive bacteria achieved by preservation treatment combining cooler with liquid smoke (sample A+), then cooler only (D+), copper layer inside cooler (B+), vacuum container inside cooler (C+), respectively. Other treatments in open air produced a hundred times more putrefactive bacteria. In addition, treatment of the copper layer contaminated the preserved fresh fish more than a thousand times bigger compared to the initial amount, from 0.69 to 1241.68 µg/g.

Keywords : fish, preservation, traditional, fishermen, boat

Conference Title : ICFAS 2023 : International Conference on Fisheries and Aquatic Sciences

Conference Location : Bangkok, Thailand

Conference Dates : January 16-17, 2023