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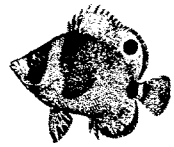

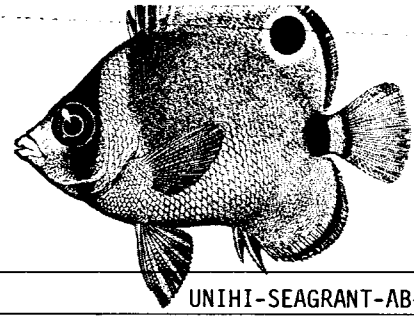

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guidelines for preparing chilled seawater brine

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Chilled seawater brine can aid the fisherman in preserving the quality of his fish. The basic ingredients of chilled seawater brine are ice, seawater, and salt. The amount of salt has a direct effect on the coldness of the brine solution because salt lowers the freezing point of water. Seawater contains about 0.3 pounds of salt per gallon of seawater; however, without ice, this mixture is not adequate for preserving fish. If you add no additional salt to this kind of brine you should be able to get a temperature of about 28°F under ideal conditions.

Most brine solutions used in fish processing plants and aboard large fishing vessels are mechanically refrigerated and circulating systems. This type of system is usually too expensive for small boat fishermen. However, some fishermen do use hand-mixed brine solutions in their fishboxes with good results.

There are several important factors to consider if you use a chilled seawater brine. First, the salt must be dissolved to do any good. As you add salt to the seawater be sure to stir it in well. It is increasingly difficult to dissolve salt in colder brines, and salt will dissolve slower as the salt concentration increases. It might be best to pre-mix the salt in a bucket of seawater until it is completely dissolved.

Fine grain salt will dissolve faster than coarse grain salt or Hawaiian rock salt. Whether you use fine or rock salt, remember that the salt must be dissolved in order to cool the seawater. Both rock and fine grain salt can be purchased in 50-pound bags for less than $4.00.

The second factor to consider is that you must know how much seawater is in your fishbox. There are two ways to determine the volume of seawater used and, therefore, to know how much salt to add to your brine mixture. The easiest way is to measure the seawater into your fishbox by using a 5-gallon bucket or similar vessel. The other way is to use a simple formula. Multiply the length of the box times the width of the box times the height of the water times 7.5. For example, if your fishbox is 3 feet wide x 6 feet long and you want your brine 6 inches deep, multiply 3 x 6 x .5 x 7.5 to get the number of gallons of seawater in the fishbox, or 67.5 gallons of seawater in this case.

The third factor is to be sure to use ice in the brine solution. The addition of salt allows you to get a lower fishbox temperature, but ice is the most important ingredient for cooling fish. Research has shown that the holding temperature for fresh fish is between 30°F and 40°F. The brine solution should be a lot colder than necessary so that, as it warms up, it stays within the optimum range of 28°F to 32°F. During your fishing trip, it would be ideal to keep the temperature in the fishbox in this range since ice melts at 32°F.

The brine solution in a fishbox will heat up from the addition of fish, heat from the sun, and lack of ice due to melting. Either a thermometer to measure temperature or a salometer to measure percentage of salt can be used to check your brine solution. A thermometer would be very helpful in the mixing and remixing operation. You can use the long-stemmed ones that are found in scientific supply houses. A salometer, available at chemical supply houses, can measure the percentage of salt in a brine solution which should be kept between 3 percent to 5 percent salinity.

The expected length of your fishing trip and the kind of fish caught will determine when to mix your brine. For the best results, place the fish in a brine solution that is already cold. Too much salt in a brine solution can cause your fish to freeze, especially smaller fish. One bottom fisherman we talked to used a handful of rock salt for a medium-sized cooler while an ahi fisherman on a recent trip used 15 pounds of rock salt for four large ahi. Note that the lowest freezing point in a brine solution is about -6°F at a concentration of 23.3 percent salt (about 1/4 salt and 3/4 water); additional salt in the brine solution will make it warmer. This is called the eutectic point.

Don't rely on salt to preserve your fish. Salt makes for a colder temperature in your fishbox, but it is the ice that preserves the quality of fish. Your fish will be in better shape if you return with ice in the fishbox. Brine solutions should not be re-used for sanitary reasons. Stir the solution occasionally; the motion of the boat won't keep it mixed.

There is no standard recipe or rule-of-thumb to follow for mixing a seawater brine because there are so many variables to consider, such as size, amount, and temperature of fish; length of trip, amount of ice used; etc. The best advise is to experiment, using a thermometer or salometer to help get an accurate reading. One advantage of using a brine solution is that the salt actually prevents bacterial decay in fish. Another advantage is that salt lowers the temperature of water. In both cases the fish is kept fresher longer.

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