

Preparing a Saltbrine

Liquid brining is one of several methods used to prepare fish for the smoking process (details of salt use are discussed in the *Fish Notes* handout entitled "Salting Fish").

Making A Brine

An easy way to prepare a brine solution of any given strength is to refer to Column 3 in Table 1 and then add the prescribed amount of salt per gallon of water. For example, let's assume a particular quantity of salmon being prepared for smoking will require about 15 gallons of brine with 15.8% salt concentration. Simply find 15.8% salt in Column 1 and note that 1.882 pounds of salt/gallon of water is needed. Put 15 gallons of water in a tank and dissolve 28.23 pounds of salt (15 gallons X 1.882 pounds salt/gallon of water).

The result will be a solution which has exactly 15.8% salt by weight. The volume has increased slightly, but this increase is usually insignificant for most applications.

Measuring Salt Solutions

Salometer degree (°SAL) is a useful way of describing and measuring brines. This can be used to check brine preparations, but would be more useful when measuring the concentration of a brine that has been used and is now diluted.

A Salometer is an inexpensive device that measures brine density saturation (26.4% salt at 60°F) on a convenient scale of 0 to 100. Each °SAL would therefore represent about .26% salt by weight. Full saturated brine contains about 26.4% salt.

To read a salometer, place it in a see-through container which holds a sample of the solution being measured. The depth at which it floats measures the brine concentration. Readings are taken by noting the point on the scale where the salometer emerges from the surface of the brine solution. These readings in °SAL can then be used with Table 1 to obtain the per cent salt by

weight, specific gravity, and the amount of salt dissolved in each gallon of solution.

The exact °SAL reading is temperature dependent therefore the temperature of the brine should also be taken. If the temperature varies more than a few degrees from 60°F, then a correction factor should be used for accurate work.

A rule of thumb states that for every 10°F the brine is above 60°F, one degree salometer should be added to the observed reading. For each 10°F the brine is below 60°F, one degree salometer should be subtracted from the observed salometer reading.

Noteworthy Points:

Dissolving Salt: It is important that all salt added is dissolved if a solution is to have the proper strength. Finely ground salt, such as canner's salt or table salt, dissolves much faster than coarsely ground salt (rock salt). Hot water and agitation of a solution will also increase the dissolving action. Salt, however, will dissolve much slower as the salt concentration increases. The last bit of salt in a 90° SAL solution may take a long time to dissolve.

In summary, try to dissolve salt in a warm, well agitated tank and make sure it is all dissolved before using it or measuring its concentration.

Adding Salt to Existing Brines or Sea Water: If you want to increase the concentration of salt in a salt water solution, be sure to measure its strength and estimate its volume first. Then use the data in Table 1 to calculate how much more salt needs to be added (i.e. subtract the total amount of salt required in the final solution from the total amount of salt measured in the existing solution.)

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TABLE 1: SODIUM CHLORIDE BRINE TABLES
FOR BRINE AT 60°F

(1) Salo- meter Degrees	(2) Percent Sodium Chloride By Wt.	(3) Pounds Salt Per Imp. Gal. of Water	(4) Specific Gravity
	.000	.000	1.000
2	.528	.053	1.004
4	1.056	.107	1.007
6	1.586	.161	1.011
8	2.112	.215	1.015
10	2.640	.271	1.019
12	3.167	.328	1.023
14	3.695	.384	1.026
16	4.223	.440	1.030
18	4.751	.498	1.034
20	5.279	.557	1.038
22	5.807	.614	1.042
24	6.335	.676	1.046
26	6.863	.737	1.050
28	7.391	.798	1.054
30	7.919	.859	1.058
32	8.446	.922	1.062
34	8.974	.985	1.066
36	9.502	1.050	1.070
38	10.030	1.114	1.074
40	10.558	1.180	1.078
42	11.086	1.247	1.082
44	11.614	1.313	1.086
46	12.142	1.381	1.090
48	12.670	1.450	1.094
50	13.198	1.519	1.098
52	13.725	1.590	1.102
54	14.253	1.662	1.106
56	14.781	1.733	1.110
58	15.309	1.806	1.114
60	15.837	1.882	1.118
62	16.365	1.955	1.122
64	16.893	2.030	1.126
66	17.421	2.107	1.130
68	17.949	2.186	1.135
70	18.477	2.266	1.139
72	19.004	2.345	1.143
74	19.532	2.426	1.147
76	20.060	2.509	1.152
78	20.588	2.591	1.156
80	21.116	2.675	1.160
82	21.644	2.760	1.164
84	22.172	2.846	1.169
86	22.700	2.935	1.173
88	23.338	3.024	1.178
88.3	23.310	3.037	1.179
90	23.755	3.113	1.182
92	24.283	3.204	1.186
94	24.811	3.294	1.191
95	25.075	3.344	1.193
96	25.339	3.392	1.195
97	25.603	3.438	1.197
98	25.867	3.487	1.200
99	26.131	3.536	1.202
99.6	26.285	3.564	1.203
100	26.395	3.584	1.204

Moisture Removal: Brines greater than 60° SAL (15.8% by weight) tend to remove significant moisture from the fish. Removal of water is important in limiting bacterial growth and enzyme activity. (Liquid brine concentrations with a salt content below 8% by weight

***For further information
please contact your Fish
Safety Officer (775-0763)
or your local Health Authority***

will actually cause water absorption and swelling.)