

Mighty Fine Brine

Using these procedures coupled with the right brine mixer and brine-mixing tank will enable you to effectively achieve the product you desire. **by Danny Shull**

Today, consumers are demanding poultry products that are moist and taste good. Proper marination will help the processor provide these products. With ingredient technology changing rapidly, there are a number of technological issues to consider.

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One of the first steps in successful marination of poultry products is to choose the right equipment. There are three things to consider: First, your brine-mixing tank should be of the proper design. Next, your mixer should be of adequate design to put your dry ingredients into solution. Also, your process should allow you to do it right the first time every time.

A properly designed brine-mixing tank should be a cylinder with a concave bottom. A proper sized tank will have a height of about 1.4 times the diameter. The depth of the bottom should be about one-fourth the diameter of the tank. Also, the bottom should have a drain port very near the center of the tank. Finally, baffling should be none to minimal. Turbulence during the mixing process is important as is mixing flow.

Your choice of mixers can make a big difference in the quality of the brine mix. Certain brands and types are more effective than others at putting difficult-to-dis-

solve ingredients into solution. Some mixers may not put your ingredients into solution at all. Many sodium phosphates, in fact, are difficult to get into solution. Suspended sodium phosphates have very little function in the product. Isolated soy protein requires a very good mixer to completely hydrate. Using the right high-shear mixer can make a big difference.

Many brine-mixing methods are being used today with a wide range of results. Using the proper brine-mixing procedures will enhance your product quality and improve your yields.

Steps For Proper Brine Preparation

- Measure the amount of water required for the formulation into the brine-mixing tank. Start the mixer.

- Add the dry sodium phosphates slowly with the mixer running. Continue mixing for 10 minutes or until the sodium phosphates are completely dissolved. This may only take five minutes or less, depending on the type of sodium phosphates. The sodium phosphates must be totally in solution to be effective. An easy way to test whether or not the sodium phosphates are in solution is to set a sample of your brine aside for several days. Undissolved sodium phos-

phates will settle out of the brine quickly. Sodium phosphates that are in total solution will not settle out. I have seen the brine stay clear for a year.

- Add the salt slowly with the mixer running. Continue mixing for about two minutes or until the salt is completely dissolved.
- Add the sugars slowly (if any are used) with the mixer running. Continue mixing until the sugars are completely dissolved.

When using isolated soy protein, hydrate it first, before adding the sodium phosphates. This step will take one to 20 minutes, depending on the type mixer being used.

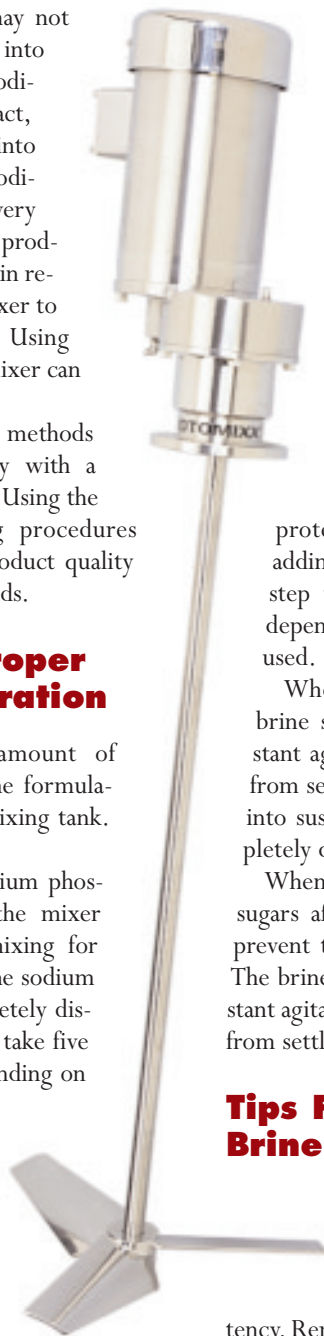
When using food starches, the brine solution must be kept in constant agitation to prevent the starches from settling out. The starches only go into suspension; starches do not completely dissolve until cooking.

When using carrageenan, add the sugars after the carrageenan. This will prevent the carrageenan from swelling. The brine solution must be kept in constant agitation to prevent the carrageenan from settling out.

Tips For Successful Brine Preparation

Using several additional brine making tips will help in your daily brine making to assure consistency. Remember: Quality can be defined as consistency.

The water meter or measuring device should be checked comparing the



amount of measured water to a scale at least once a week. Water weighs 8.33 pounds per gallon at sea level. Weigh the ice. Measuring water or ice by a mark or with a bucket or shovel is not a consistent method.

The water temperature should be less than 40 F, or 4.4 C, before adding the sodium phosphates. Ice, if used to lower the water temperature, must be completely melted before adding the sodium phosphates. If ice is used, remove an equal amount of water.

Sodium phosphates dissolve better in warmer water (about 65 to 70 F or 18 to 21 C). Part of the functionality of the sodium phosphates are lost at elevated temperatures.

The proper time required to dissolve the sodium phosphates must be determined and adhered to. This can range from two to 20 minutes.

Sodium phosphates, salt and sugars go into solution. Many other ingredients are

only dispersed and must be kept agitated to prevent settling of those ingredients.

Hydrocolloids, especially carrageenans will start to hydrolyze or swell at temperatures above 30 F, or -1 C. This varies with the type of carrageenan being used. The brine solution must be kept below 30 F, or -1 C.


Do not continually mix air into the brine. This is caused by continuing to run the mixer when the brine level is too low.

Do not hold used brine overnight. Unused brine may be held overnight depending on the ingredients used in the brine and the finished product for which the brine will be used. Any brine held overnight must be well agitated before being used.

Brines with ingredients that do not dissolve such as starches, spices, and carrageenans must be continuously agitated before and during injection.

Water is the most important ingredient in the brine solution. Water quality issues

are purity, hardness, taste and bacteria. Do we have the same source of water all year? What varies about the water source through the year? Meat and poultry processors who have standardized water have achieved increased yields on further processed products and improved product consistency overall.

Using these procedures coupled with the right brine mixer and brine-mixing tank will enable you to effectively use your brine ingredients to achieve the product you desire. Furthermore, the proper choice of ingredients to do the job you need to do is very important as well. This, however, is another discussion, entirely. 

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