



Worthwhile Operational Guidelines & Suggestions

BROILER PROCESSING TIMELY INFORMATION – JULY 2010

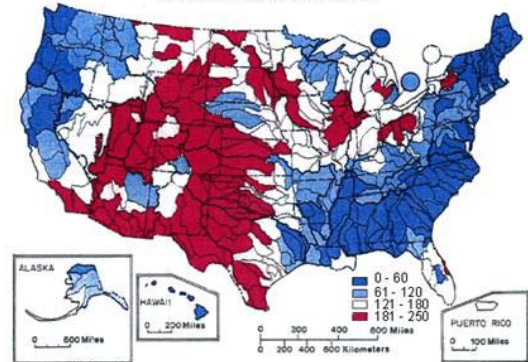
PROCESSING WATER QUALITY – HARDNESS

Water used in food plants, including that used during cleaning and sanitation activities, must be “potable” from private or municipal sources. Water potability, by definition, implies its fitness for human consumption without further treatment. Potable water will naturally contain dissolved minerals such as calcium and magnesium, which contribute its “hardness”. Water hardness classification by the US Geological Survey, measured grains per gallon (gpg) or milligrams per liter (mg/L) of calcium carbonate is presented in table. Water hardness can also be classified as carbonate (temporary – removed from solution by boiling; responsible for scale formation) and non-carbonate (permanent- can’t be removed by boiling; require water softeners or ion exchange column) hardness. It is possible to measure the level of total hardness in water by obtaining a total hardness water testing kit, which typically measures the level of calcium and magnesium in the water.

Water hardness varies by geographical location. It is well known that high concentrations of calcium and magnesium can decrease the efficacy of cleaners and sanitizers by precipitating minerals. Recent research* indicates that removal bacteria from the skin of poultry may also be influenced by the hardness of water used during processing. Reducing water hardness increased the ability of water to remove bacteria from the skin of poultry.

* Hinton, A., and R. Holser, 2009. Role of water hardness in rinsing bacteria from the skin of processed broiler chickens. *Int. J. Poultry Science* 8(2):112-115.

CONCENTRATION OF HARDNESS AS CALCIUM CARBONATE, IN MILLIGRAMS PER LITER



Mean hardness as calcium carbonate at USGS NASQAN stations during 1975 water year.

Soft Water	0-60 mg/L	0-3.5 gpg
Moderately Hard	61-120 mg/L	3.5-7.0 gpg
Hard	121-180 mg/L	7.0-10.5 gpg
Very Hard	>181 mg/L	>10.5 gpg



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