

## Conductivity, Salinity, Relative Humidity, Turbidity & Chlorine

During different cycles and quality control phases of food production, parameters such as conductivity, salinity, relative humidity, turbidity and chlorine are closely monitored.

### Conductivity

**Drinks.** The conductivity of spring or deep well waters, which are used for bottled water, are continuously monitored to ensure their purity. Moreover, a substantial quantity of water used for soft drinks is municipal or ground water, which means it is pretreated and its conductivity controlled.

In breweries, conductivity is checked to make sure that the filtration system is properly functioning. It is also monitored when mixing salt with yeast. In order to ensure a good and consistent quality for beer and to detect any contamination by micro-organisms, the conductivity of the finished product is constantly controlled.

High temperature used during the blanching and mashing cycles in fruit juice production, is normally obtained by using steam boilers. Consequently, the conductivity value of in-going water in the steam-generators is closely monitored. In order to ensure complete cleaning of vessels utilized in drink production, the concentration of the cleansing agent after dilution is checked using conductivity meters.

**Milk.** Conductivity is checked for impurities, infections, and for safety reasons upon collection, as well as delivery.

**Vegetables and Canned Food.** Conductivity is checked in the preservatives added to vegetables, as well as waste lyes from potato peels. It is also controlled in salt brines, washing and cleaning lyes and refrigeration brines.

**Added Water.** Water is added in many food processes and as a result its quality is of paramount importance. Where water is filtered or treated, its conductivity needs to be checked.

### Salinity

**Cheese.** The salt content of salt baths after molding is an important factor in cheese production. They vary from 16% to 23% based on type and whether the end-product is a soft or hard cheese.

### Relative Humidity

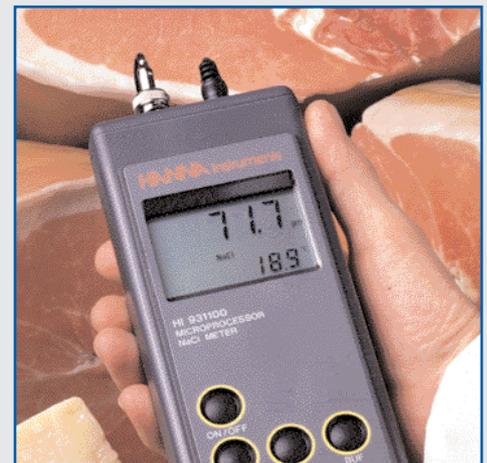
**Meat.** Relative humidity of deep-freeze meat in storage should be around 80%. Likewise, humidity of salted meat used in the production of ham, prosciutto and sausages is kept around 80% for several months. Subsequently, the transformed product is matured at a predetermined humidity based on the type of finished product required. Humidity control is very important in this stage since humidity is lowered to help dehumidification and later raised to generate molds and flavor.

**Drinks.** To ensure a consistent quality of underground water used in the production of mineral water and soft drinks, many atmospheric parameters including air humidity are checked at the extraction site. CO<sub>2</sub> is often added in the storage tanks to produce sparkling drinks and to prevent oxidization. Too much humidity can be dangerous due to its oxidizing effects. Humidity is therefore checked to make sure that the drying agents are not depleted.

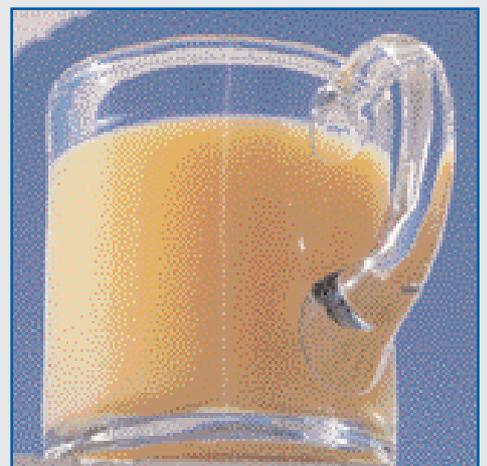
**Cheese.** The humidity of the maturation chamber in cheese production determines the quality as well as the length of maturation needed. Too low a humidity will cause weight loss and is consequently an economically undesirable condition. High humidity, on the other hand, can cause molding on the surface of the cheese.



**Turbidity of water used in the production of mineral water and soft drinks is checked to guarantee its consistency.**



**Salinity checks are important in salt baths, especially in the dairy industry**

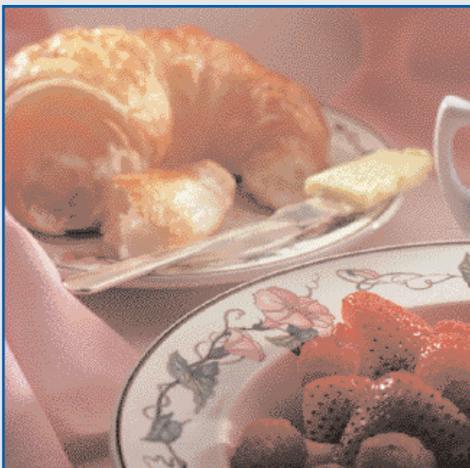




**Monitoring humidity during cheese maturation is very important.**



**Humidity influences pastry processing.**



**Chocolate.** Once chocolate is manufactured, it should be stored at a relative humidity of around 60%.

**Confectionery.** Humidity can have a detrimental effect on confectionery during coating, cooling and packaging. Humidity is also monitored in the in-going and outgoing air used in the coating process.

**Bread and Pasta.** Milled flour used for pasta and bread making has to have a 12-13% moisture content for nutritional and commercial motives. Fresh pasta, on the other hand, can have a moisture content of up to 30%, where the figure for dry pasta is around 12%. During fermentation of dough for bread making, the humidity must be kept under strict control.

**Fruit.** Fresh fruit should be conserved in a strictly controlled environment with a relative humidity typically in the 45-50% region.

### **Turbidity**

**Drinks.** In mineral water or soft drink production, it is indispensable to continuously monitor the turbidity of spring or deep well waters. This is to ensure the overall quality, establish limits of suspended solids and to ensure that the turbidity is in the 0.1-0.2 NTU range.

Similarly, where municipal water is used for making soft drinks, the water is pre-treated and its turbidity controlled.

During the fermentation process, especially in automatic systems, the turbidity of beer is controlled before and after the addition of yeast, to establish its quality. Furthermore, turbidity of beer is checked to ensure proper functioning of the filtration system.

Similar tests are carried out in wine making to detect whether any yeast or micro-organisms have remained after filtration.

**Oil.** Turbidity of cooking oils such as soya and corn are monitored during their production in order to establish their density.

**Added Water.** The quality of water used in many food processes is important in order to guarantee consistency of the end-product. Where water is treated or filtered to obtain clarity, it is crucial to check the turbidity to ensure it is in the acceptable range, usually around 1 NTU.

### **Chlorine**

**Meat.** The slaughtered carcasses in abattoirs are often washed down with water containing a certain level of chlorine to inhibit growth of pathogens and micro-organisms.

**Fruit and Vegetables.** As with meat, fresh fruit and vegetables are washed and rinsed with chlorine-enriched water for hygiene and conservation purposes. The chlorine concentration should be closely monitored since too high a level can become a health hazard.