

# HACCP & Food Quality Products



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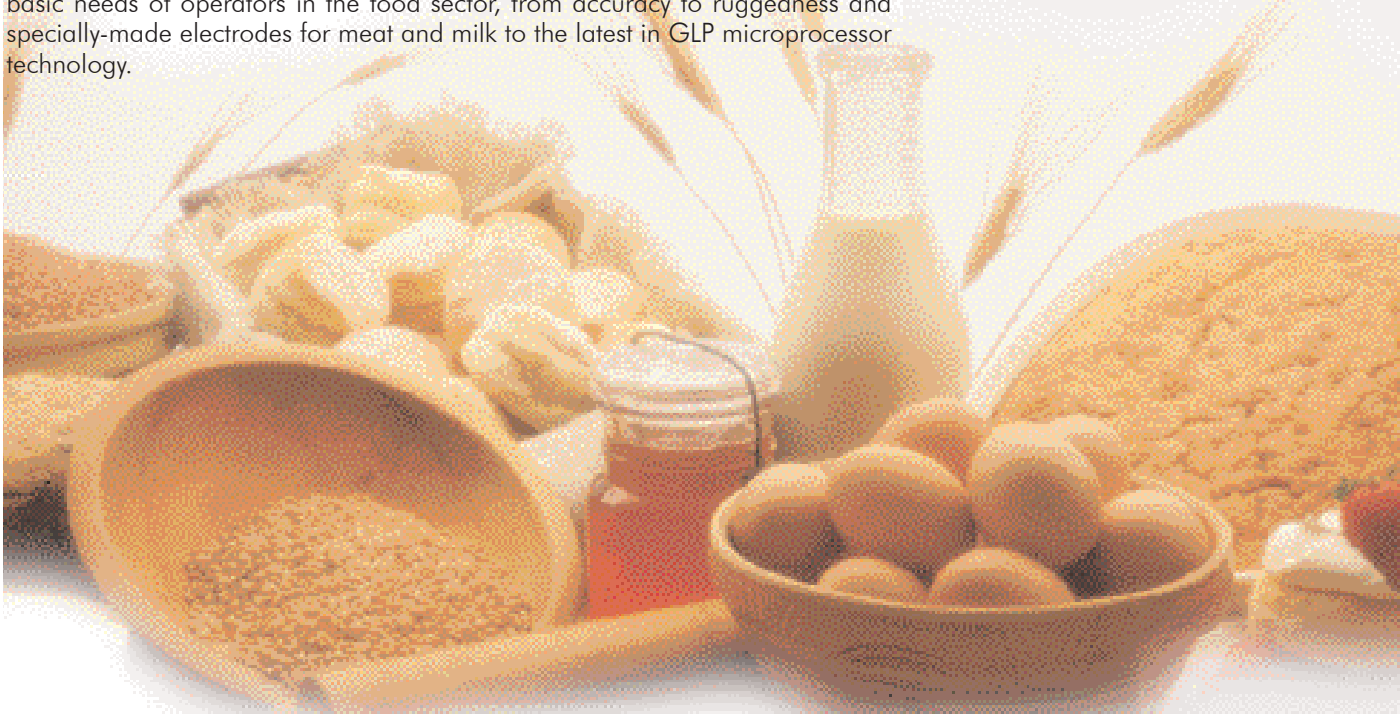
## ***Professional Instruments for HACCP & Food Quality Testing***

Operators in the food sector need an extensive range of products in order to guarantee the quality of food supplied to the public. Legislation has made such controls obligatory for anyone preparing, manufacturing, distributing or serving food. In order to satisfy this need, we have manufactured an equally vast range of products with the necessary accuracy and reliability to check the quality of food in all phases of preparation and distribution. For example, to satisfy the needs of HACCP (Hazard Analysis and Critical Control Points), we have produced a complete range of thermometers and pH meters to check food from production to transport and from catering to storage.

Some **HANNA** instruments' portable and pocket thermometers have become synonymous with temperature control in restaurants and catering facilities. The already extensive range has been now further enhanced. You can choose from pocket meters with the range most appropriate for your application. There is also a vast selection of shapes and configurations to best fit your needs. For example, some of our thermometers are available with interchangeable or fixed probes, as well as meters with a hinged, folding, or even chisel probe for frozen samples. The more professional portable meters offer just as wide a range of measurement scales, fixed or replaceable probes and additional features.

For the adverse measurement conditions found in food production areas, typically with high humidity and condensation problems, we have manufactured a substantial array of waterproof meters. For those operators who prefer extra rugged instrumentation, we have added the shockproof series. As for documentation, a must in certain production cycles and important for HACCP programs, you can choose from a range of printing and/or logging meters. These are stand-alone meters that can measure, print and log the parameters without any supervision.

As far as pH is concerned, legislation is making pH control just as important as temperature. For example, the European Community's Directive 89/397/CEE sets the pH level as the most crucial factor together with water activity and temperature for safe storage of perishable food. To satisfy these demands, we offer specifically-designed portable and bench pH meters. The range covers all the basic needs of operators in the food sector, from accuracy to ruggedness and specially-made electrodes for meat and milk to the latest in GLP microprocessor technology.



## Temperature

Temperature of food is constantly monitored to keep growth of pathogens and micro-organisms under control. These checks and controls during different production cycles have been put in place to ensure that food remains edible and its quality as well as its value is enhanced. In fact, foodstuff needs to be kept at the correct temperature while stored, displayed and on the move. The table below lists recommended temperatures for different goods. With catering services, it is important that food is kept and served at the right temperature. It is therefore vital to monitor and document the temperature to which food has been exposed. Temperature also plays an important role in the processing and preparation of food.

### Meat

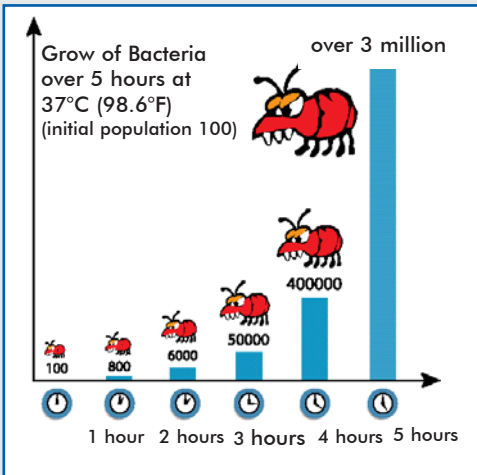
The temperature of meat at slaughterhouses needs to be checked as an important quality test. Fresh meat should be stored at around 2°C (35.6°F). If the meat is deep-frozen, the storage temperature and the temperature at the center should be around -22°C (-7.6°F) with the surface temperature reaching -35°C (-31°F). In order to thaw the meat properly, the surrounding temperature should be 7°C (44.6°F).

### Ham and Sausages

The temperature of salted meat stored for several months is around 2°C (35.6°F). Afterwards, the product is rinsed and dried at around 25°C (77°F) prior to maturing at a preset temperature for a particular product. As far as sausages are concerned, the mixed ingredients are cooked at a certain temperature and then cooled at around 5 to 15°C (41 to 59°F).

### Drinks

Temperature of spring or deep well waters extracted for making drinks must be continuously monitored to ensure purity. During the production of soft drinks, syrup is pasteurized before being added, to prevent bacteriological problems and as a result, its temperature is monitored. In order to prepare fruit juices, fruit pulp is heated to just below boiling point for a few seconds to reduce micro-organisms. Once the mash is cooled, the vessel is heated above boiling point to prepare the mash for a strainer and later the mash is heated to up to 120°C (248°F) for a few seconds to pasteurize it. Temperature control also plays a crucial role in beer production. For example, malt has to be heated to 75°C (167°F) during the mash process. The type of yeast used for fermentation is also temperature-dependent. By controlling the fermentation temperature, one can determine the period needed for the product to fully develop. Temperature is controlled during filtration which is needed in order to remove particles and improve the taste and longevity of beer. In order to remove protein, beer is cooled down to almost 0°C (32°F). As with many other products in the market, beer is also pasteurized at around 60°C (140°F) after it has been bottled to eliminate any presence of infectious organisms.



If temperature is not properly controlled, bacteria can grow to dangerous levels in just a few hours

Product	Recommended Temperature
Chunks of Meat	≤ 7°C
Minced Meat	≤ 4°C
Innards	≤ 3°C
Frozen Chicken	≤ -12°C
Deep-freeze Chicken	≤ -18°C
Fresh Fish	≤ 2°C
Smoked Fish	≤ 7°C
Frozen Food	≤ -18°C
Milk	≤ 7°C
Fruit and Vegetables	≤ 10°C
Eggs	≤ 8°C
Dried Fruit	≤ 25°C

Temperature plays an important role in the processing and preparation of edible products containing meat

## **Milk and Dairy Products**

Milk temperature is checked for impurities and infections upon collection. During storage, the temperature of stored milk is normally kept below 5°C (41°F). Milk is homogenized at about 60°C (140°F) in order to slow down cream formation. Pasteurization of milk results in the reduction of micro-organisms by a 95% factor and it is attained by raising the temperature to over 72°C (161.6°F). For UHT (Ultra Heat Treated), milk is heated to 135/150°C (275/302°F) in a pressurized vessel for a few seconds. If the process is repeated for several minutes, all micro-organisms, including spores, are destroyed and the sterilized milk will have a 12 month shelf life. As far as cheese is concerned, temperature needs to be adjusted before and during various processes, for example, when rennet is added. Temperature in the maturation chamber also determines the period of maturation needed. Likewise, temperature is important in various processes producing butter, for example, skimmed milk is separated from cream at around 55°C (131°F) and cream is then cooled to about 8°C (46.4°F). The temperature of incoming milk is raised to 45°C (113°F) before the addition of culture for yogurt manufacturing. In order to denature the whey proteins, milk is also raised to very high temperatures. The incubation temperature is maintained for a few hours prior to its cooling to about 10°C (50°F).

## **Chocolate**

By increasing the temperature to about 50°C (122°F), the fermentation of cocoa beans is started. At different stages of chocolate manufacturing such as crystallization, accurate temperature measurement is a must. Once the chocolate is ready, the storage temperature should be monitored to ensure that it stays in the 15°C (59°F) range

## **Coffee**

In order to invoke an aroma, coffee beans are heated up to 200°C (392°F). Also during roasting, the temperature is closely monitored. In order to provide a long shelf life, the finished product is frozen at -40°C (-40°F) prior to drying. To produce a good coffee, it is important to ensure that the temperature of coffee machines does not exceed 80°C (176°F).

## **Bread and Pasta**

The temperature of stored grain silos is controlled to ensure that premature fermentation does not occur. During pasta production, water at about 25°C (77°F) is added to wheat flour and during fermentation of dough for bread making the temperature is kept at around 30°C (86°F). The oven temperature for baking should be around 260°C (500°F) and once baked, bread is cooled to room temperature. For semi-finished products that can be flash-baked, the dough has to be stored at very low temperatures.

## **Sanitization of Machinery**

The temperature of cleansing agents, together with their concentration, have a significant bearing on how effectively the machinery is sanitized. The temperature for fermentation vessels can range from room to 40°C (104°F). For milk and yogurt tanks may reach 70°C (158°F) and as high as 150°C (302°F) for steam sterilizers. In addition, regulatory bodies recommend a certain minimum temperature for cleaning agents to be effective that varies from 24°C (75.2°F) for iodine and ammonia to 49°C (120.2°F) for chlorine.



Temperature control is important in beer, wine and soft drink production.

