

### Nitrate Measurement in Turf Grass



**NO<sub>3</sub><sup>-</sup>** Nitrate concentration in grasses can be used as an indicator of soil Nitrate (N) availability for their growth. Research at the University of Connecticut suggests verdure sap nitrate-N concentrations at 200-300 ppm as the optimum level.

### Measurement Of Calcium In Drinking Water



**Ca<sup>2+</sup>** It is helpful to determine the amount of calcium contained in water, since this will enable one to ascertain whether the water is hard, or if the water (if drinking water) has minerals. This can be determined using atomic absorption spectroscopy (AA) or inductively coupled plasma atomic emission spectroscopy (ICP). However, a much simpler way is by ionizing acid-bound calcium using acidizing pretreatment. The LAQUAtwin Ca<sup>2+</sup> can be used to measure the total amount of calcium.

### Measurement Of Calcium In Milk And Milk Beverages



**Ca<sup>2+</sup>** It is often necessary to determine the calcium content of milk and milk beverages. This may be done by atomic absorption spectroscopy (AA) or inductively coupled plasma atomic emission spectroscopy (ICP). Alternatively, by ionizing protein-bound calcium using an acidizing pretreatment, the LAQUAtwin Ca<sup>2+</sup> can be used to measure the total amount of calcium easily.

### Measurement Of Calcium In Soil



**Ca<sup>2+</sup>** All plants need calcium rich soil to grow. The calcium is used by the plant in developing the plant cell walls and membranes. Furthermore, it is a non-leaching mineral (it will stay in the soil) and will improve water penetrability and reduce soil salinity. It is thus helpful to determine the amount of calcium contained in soil. Generally, Atomic Absorption Instruments (AA) or Inductivity Coupled Plasma-Optical Emission Spectrometry Instruments (ICP-OES) are used to measure the amount of calcium ions present in soil.

### pH of Brine For Canned Food Testing



**pH** Many foods are canned and it is important that these foods are properly and adequately acidified. Thermally processed acid foods are generally safe. However, if products are not properly acidified there can be a risk to food safety. Inadequate acidification can lead to botulism and premature expiry.

Food Standard 2.3.1 states that 'fruits and vegetables in brine, oil, vinegar or water, other than commercially canned fruit and vegetables, must have a pH not greater than 4.6'.1

In order to determine the pH level, and hence ensure the freshness of canned foodstuffs, the Horiba LAQUAtwin pH meter can be used.

### pH of Cement for Floor Installation Testing



**pH** When flooring tiles are installed, it is very important that the subfloor level has a certain pH level. When the alkalinity in a concrete subfloor is high, it can stop the floor covering adhesive from bonding properly to the concrete. This is a problem that has only recently been discovered and the new Australian Standard for resilient flooring installation (AS 1884-2012) now says that a pH test must be carried out on a concrete subfloor as part of the pre-installation assessment.

### Conductivity and Elephant's Foot Testing



**COND** A physiological disorder in greenhouse hydroponic sweet pepper (*Capsicum annum* L.), where the base of the plant's stem becomes swollen below the cotyledon level and wounds develop at the base of the stem's epidermis has been named "Elephant's Foot".

Sodium is a mineral constantly present in soil, but an excess of it concentrated at the base of the plant stem has been shown to have a correlation with Elephant's Foot in plants. It is necessary to analyse the conductivity of soil in which hydroponic sweet pepper is grown to consider the extent to which the stem of the plant has accumulated salt.

### pH Measurement To Determine Freshness Of Meat Products



**pH** Fresh meat must have a pH value in the range of 5.5 to 6.2.1 During temporary storage, especially when it is not properly preserved, the fresh meat will turn rancid and have a pH value below 5.3.

The LAQUAtwin pocket pH Meter is used as quality control check to ensure freshness of the meat, before selling to consumers. This is an easy, quick check method used to abide to the Vietnamese Standards in ensuring that customers are purchasing fresh meat that can be safely consumed.

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## Measurement Of pH In Plant Tissue



**pH** It is often necessary to measure the pH of plant tissue to determine plant health. At pH values above 6.4 plants can be prone to insect attacks and at pH values below 6.4 plants can be prone to specific diseases. Thus an optimal pH of 6.4 is desired. Whilst laboratory soil and tissue tests are beneficial tools, they often do not yield results for days or weeks. We can thus use an alternate method of diagnosing plant health using the LAQUAtwin pH meter.

The LAQUAtwin pH meter is used to determine the pH of plant tissue. This is an easy and quick method used to ensure that plant tissue is at the optimum pH.

## Measurement of Potassium in Rice



**K<sup>+</sup>** Potassium is a necessary nutrient for soil in which rice grain is grown, as it is critical in maximising yield.

In order to profitably produce rice, reliable information regarding the potassium content of the soil must be available to farmers. Thus, we can analyse the potassium content of the plant tissue in the roots of the rice grain.

To determine the potassium content, the Horiba LAQUAtwin K<sup>+</sup> ion meter can be used. This is an easy and quick method used to determine the potassium content of soil for the growth of rice crops.

## Measurement of potassium in soil



**K<sup>+</sup>** Typically, Atomic Absorption (AA) or Inductivity Coupled Plasma-Optical Emission Spectrometry (ICP-OES) is used to measure potassium ion, by first extracting the potassium ion from sample soils by 1 mol/L ammonium acetate (CH<sub>3</sub>COONH<sub>4</sub>). These are the methods performed in laboratories.

A simpler method for a rapid measurement of potassium ion in soil uses the LAQUAtwin potassium ion meter B-731. The extraction method is the same as the lab method. The following procedure explains how you can measure K<sup>+</sup> with good correlation to analytical lab tests.

## Measurement of Shelf Stable Acid in Preserved Foods



**pH** Many foods are canned and it is important that these foods are properly and adequately acidified. Thermally processed foods are generally safe. However, if products are not properly acidified there can be a risk to food safety. Inadequate acidification can lead to botulism and premature expiry.

Food Standard 2.3.1 states that 'fruits and vegetables in brine, oil, vinegar or water, other than commercially canned fruit and vegetables, must have a pH not greater than 4.6'.

In order to determine the pH level, and hence consider the freshness of canned foodstuffs, the Horiba LAQUAtwin pH meter can be used.

## Soil Salinity and Impact On Yield of Sugar Cane



**Na<sup>+</sup>** Sugar cane is a major source of sugar used in the food industry today. The growth of sugar cane crops is impacted adversely by soil salinity. Thus, it is necessary to determine the sodium content of the soil in areas where sugar cane crops are being grown.

Sodium is a mineral constantly present in soil, but an excess of it can cause the yield of sugar cane to dwindle. Thus, it is beneficial to measure the salinity of soil on which sugar cane crops are grown.

## Sodium Value Check for Canned Food



**Na<sup>+</sup>** Sodium is a mineral needed for normal body function, but an excessive intake of it can cause high blood pressure and hypertension. The 2010 Dietary Guidelines for Americans recommends that individuals consume less than 2300 mg of sodium per day.

A growing concern is the large sodium content especially in canned foods. Many foods are misleading in their sodium content and it is important that people know about the amounts of sodium they are ingesting.

## Measurement Of Sodium In Athletes' Sweat



**Na<sup>+</sup>** It is useful to determine the amount of sodium present in sweat as replacing sodium (Na<sup>+</sup>) lost from sweating plays an important role in preventing fluid and electrolyte imbalances. By finding the amount of sodium lost, one may estimate the amount of electrolyte that should be replaced.

Sweat can usually be tested for sodium content by a ion chromatography techniques in analytical laboratories. But most athletes do not have ready access to such facilities. The Horiba ion tester can be used instead of the traditional ion chromatography in order to determine the amount of sodium in sweat.

## pH Measurement To Determine Acidification of Sushi Rice



**pH** Rice used for sushi must have a pH of less than 4.6. At pH levels below 4.6, most pathogenic bacteria do not grow or produce toxins<sup>1</sup>. Thus, the rice must be acidified using acetic acid (vinegar) to be classified as non-hazardous. The LAQUAtwin pocket pH Meter is used as quality control check to ensure that the rice is adequately acidified, before selling to consumers. This is an easy, quick check method used to abide to the ANZ Standards<sup>2</sup> in ensuring that customers are safely consuming sushi.