BioSystems

Safety and added value, guaranteed

Food & Beverage analysis

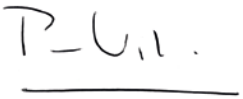
After 40 years, BioSystems - a group of 15 companies - is a reliable partner for laboratories over the 5 continents in the fields of **In-vitro Human and Veterinary Clinical Diagnostic**, **Food & Beverage Analysis** and **Monitoring of Bioprocesses**.

Today, the scientific advances in Biotech and Digital technologies drive BioSystems to focus on better understanding your needs and expectations and so provide **Analytical Solutions** to deliver the best **User Experience**.

BioSystems worldwide team of **Scientists, Engineers** and **Expert Professionals** devote their best efforts to continuously design and develop new solutions and improve existing ones.

I'm convinced that **working together**, we will **design** the best solutions to your future needs.

I invite you to explore BioSystems Product List.



Pau Vila Cases Ph. D.
CEO
BioSystems S.A.

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Enzymatic / Chemical Reagents

Advantages

- Liquid reagents*, stable until the expiry date
- Standards included in the kit
- Dedicated reagents
- Ready to use
- Automation in BioSystems instruments

*Except some lyophilized components: 12810, 12820, 12825 and 12828.

Enzymatic and chemical reagents are simple and efficient methods used to measure substances in food and beverages through photometry. BioSystems reagents are a sensitive and specific way to identify sugars, organic acids, additives, cations and other components in food and beverages, in order to control processes, quality and nutrition facts.

Furthermore, the analysis of by-products produced by microorganisms like lactic acid, acetic acid, ethanol or histamine is important to control the presence/absence of growing and thus, control the hygiene and the process of our products in a rapid and efficient way.

Sugars

The enzymatic method is the official analytical method in some cases, and is a quick, affordable, and efficient alternative for measuring sugars compared with laborious manual methods or chromatography.

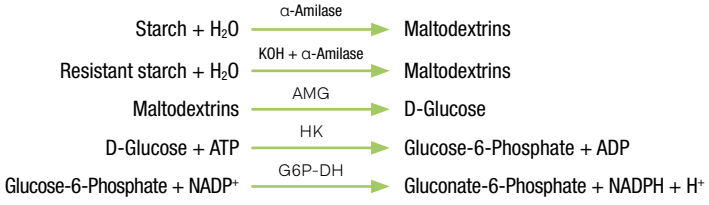
The analysis of **sugars** is a tool required when monitoring different food processes, in the detection of adulterations and the measurement of nutritional parameters (labelling). Simple sugars, monosaccharides and disaccharides, as well as starch, occur naturally in many foods and beverages and/or they are added artificially for various technical purposes.

	Reagent	Code
Sugars	Total Starch	12848
	D-Glucose/D-Fructose	12800
	Sucrose/ D-Glucose/D-Fructose	12819
	Maltose/Sucrose/D-Glucose/D-Fructose	12893
	Lactose/D-Galactose	12882

Total Starch | Ref. 12848

Starch is a carbohydrate formed by glucose polymers (amylose and amylopectin). Starch is the natural energy source in different vegetables, such as cereals and potatoes. Starch is widely used in the food industry as an additive (thickener and texturizer) and its analysis is of interest for labeling and other technological purposes.

Starch in the sample generates, by means of the reactions described below, NADH that can be measured by spectrophotometry.

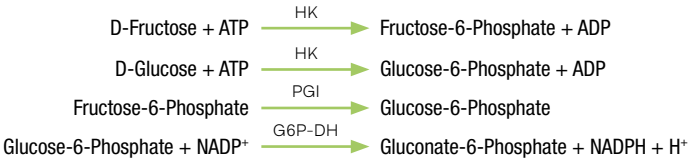


Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	7.20 g/L
Limit of detection:	0.04 g/L

D-Glucose / D-Fructose | Ref. 12800

The D-glucose/D-fructose kit detects the most common isomer of both sugars, and therefore measures their exact content in several food matrices such as juices and beverages, vegetables, cereal, dairy and meat products, or honey.

D-fructose and **D-glucose** in the sample generate NADPH (by the following reaction), which can be measured by spectrophotometry. The configuration of these reagents allows **D-glucose/D-fructose** to be determined if the enzyme PGI is added or **D-glucose** to be determined if it is not.



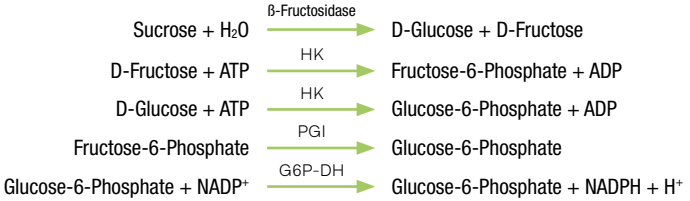
Kit volume:	120 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	D-Glucose: 8 g/L (ST1)* D-Glucose: 2.40 g/L (ST2)* D-Glucose/D-Fructose: 8 g/L (ST1)* D-Glucose/D-Fructose: 2.40 g/L (ST2)*
Limit of detection:	D-Glucose: 0.03 g/L (ST1)* D-Glucose: 0.003 g/L (ST2)* D-Glucose/D-Fructose: 0.02 g/L (ST1)* D-Glucose/D-Fructose: 0.002 g/L (ST2)*

*ST: Sample Type

Sucrose / D-Glucose / D-Fructose | Ref. 12819

The Sucrose/D-glucose/D-fructose kit measures sucrose or the sum of the three simple sugars in different food matrices such as juices and beverages, vegetables, cereal, dairy and meat products.

Sucrose, D-fructose and **D-glucose** in the sample generate NADPH (by the following reaction), which can be measured by spectrophotometry. The configuration of these reagents allows **Sucrose** or **Sucrose/D-glucose/D-fructose** to be determined.



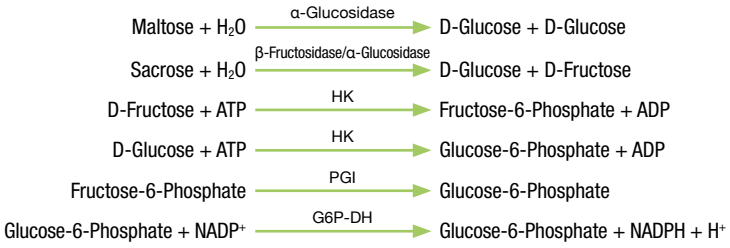
Kit volume:	60 mL
Method:	Two-reagent end point or two-reagent differential determination, reading at 340 nm
Limit of linearity:	Sucrose: 4 g/L (ST1)* Sucrose: 1.20 g/L (ST2)* Sucrose/D-Glucose/D-Fructose: 8 g/L (ST1)* Sucrose/D-Glucose/D-Fructose: 2.40 g/L (ST2)*
Limit of detection:	Sucrose: 0.08 g/L (ST1)* Sucrose: 0.01 g/L (ST2)* Sucrose/D-Glucose/D-Fructose: 0.07 g/L (ST1)* Sucrose/D-Glucose/D-Fructose: 0.05 g/L (ST2)*

*ST: Sample Type

Maltose / Sucrose / D-Glucose / D-Fructose | Ref. 12893

The maltose/sucrose/D-glucose/D-fructose kit measures the sum of the four simple sugars in different cereal based products.

Maltose, sucrose, D-fructose and **D-glucose** in the sample generate NADPH (by the following reaction), which can be measured by spectrophotometry.



Kit volume:	60 mL
Method:	Two-reagent differential determination, reading at 340 nm
Limit of linearity:	10.5 g/L
Limit of detection:	0.05 g/L

Lactose / D-Galactose | Ref. 12882

Lactose is a disaccharide, formed by a D-glucose and a D-galactose molecule. D-galactose is therefore a monosaccharide. Both substances are found naturally in milk and dairy products. They can be also added externally as additives in different foods. Its analysis allows us to correctly label the nutrition facts as well as lactose presence in case of intolerances.

Lactose and/or **D-galactose** in the sample generate, by means of the reactions described below, NADH that can be measured by spectrophotometry.

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	D-galactose: 1.31 g/L (ST1)* D-galactose: 0.53 g/L (ST2)* Lactose: 2.50 g/L (ST1)* Lactose: 1.00 g/L (ST2)*
Limit of detection:	D-galactose: 0.001 g/L (ST1)* D-galactose: 0.002 g/L (ST2)* Lactose: 0.003 g/L (ST1)* Lactose: 0.004 g/L (ST2)*

*ST: Sample Type

Organic Acids

The analysis of different organic acids in food matrices can be used to measure additives, to detect bacterial or fungal by-products (lactic acid, acetic acid, etc.) and to monitor processes such as fermentation. Moreover, the content of different organic acids found in a given food matrix provides information about the quality of the product.

	Reagent	Code
Organic Acids	D-Lactic Acid	12801
	L-Lactic Acid	12802
	L-Malic Acid	12803
	Acetic Acid	12810
	Acetic Acid (liquid)	12930
	D-Gluconic Acid / D-Gluconolactone	12811
	Tartaric Acid	12808
	Citric Acid	12825
	Ascorbic Acid	12828
	Pyruvic Acid	12826
	L-Glutamic Acid	12830
	D-Isocitric Acid	12844
	Total Acidity	12846
	pH/Total acidity (Milk)	12890

D-Lactic Acid | Ref. 12801

D-lactic acid is an acid produced by various microorganisms as a result of glucose metabolism. The presence of D-lactic acid is usually an indication of undesired fermentation in many foods such as juices, beverages, milk, or sugar beet, and it can be used as a very quick method of monitoring for the appearance of microorganisms in order to ensure product safety and hygiene.

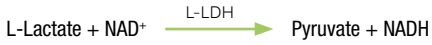
D-lactic acid in the sample yields NADH (by the following reaction), which can be measured by spectrophotometry.

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	0.250 g/L
Limit of detection:	0.004 g/L

L-Lactic Acid | Ref. 12802

L-Lactic acid is an organic acid produced by various microorganisms as a result of glucose metabolism. The presence of L-lactic acid can be used in the detection of undesired fermentations or to control the acidity in some products that might contain it.

L-lactic acid in the sample yields NADH (by the following reaction), which can be measured by spectrophotometry.



Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	3 g/L (ST1) 0.6 g/L (ST2)
Limit of detection:	0.02 g/L (ST1/ST2)

*ST: Sample Type

L-Malic Acid | Ref. 12803

L-malic acid is an organic acid naturally present in different fruits and vegetables. Also it can be found in different foodstuff added artificially as a flavor.

L-malic acid in the sample yields NADH (by the following reaction), which can be measured by spectrophotometry. The equilibrium of this reaction moves toward L-malic acid formation. The enzyme glutamate-oxaloacetate transaminase (GOT) causes the equilibrium to shift by eliminating oxaloacetate, which is converted into L-aspartate in the presence of L-glutamate.

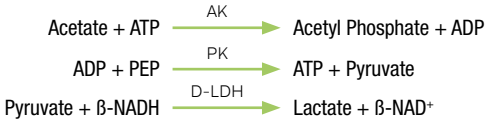
Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	4 g/L
Limit of detection:	0.03 g/L

Acetic Acid | Ref. 12810/12930 (liquid)

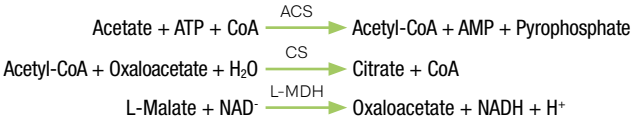
Acetic acid is an organic acid produced by various micro-organisms as a result of ethanol metabolism. It is analyzed to control the amount of this acid in different foodstuff.

Acetate in the sample consumes (12810) or generates (12930), through the reactions described, NAD^+ (12810) or NADH (12930), which can be measured by spectrophotometry.

Ref. 12810



Ref. 12930



Kit volume:	100 mL
Method:	**12810**: two-reagent, fixed-time determination, reading at 340 nm **12930**: two-reagent differential determination, reading at 340 nm
Limit of linearity:	**12810**: 1.3 g/L **12930**: 1.3 g/L (ST1)*; 160 mg/L (ST2)*
Limit of detection:	**12810**: 0.03 g/L **12930**: 0.02 g/L (ST1)*; 1.13 mg/L (ST2)*

*ST: Sample Type

D-Gluconic Acid | Ref. 12811

Gluconic acid occurs naturally in fruit or honey. As a food additive, it is an acidity regulator.

D-gluconic acid in the sample yields NADPH (by the following reaction), which can be measured by spectrophotometry.

D-gluconolactone can be determined according to the same principle after alkaline hydrolysis.

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	2 g/L
Limit of detection:	0.003 g/L

Tartaric Acid | Ref. 12808

Tartaric acid occurs naturally in many fruits like grapes, bananas or citrus. It is commonly used as a leavening agent in food preparation. It is added to foodstuff as an antioxidant and to impart its distinctive sour taste.

Any **tartaric acid** in the sample reacts with vanadium salt in acidic medium, forming a colored complex that is assayed by spectrophotometry.

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 520 nm
Measurement interval:	0.06 to 6 g/L

Pyruvic Acid | Ref. 12826

Pyruvic acid is an intermediate compound of fermentation processes in different food and beverages.

Pyruvate in the sample yields oxalacetate due to the action of the enzyme known as D-lactate dehydrogenase. This reaction consumes NADH that is oxidized to NAD+ and the disappearance can be measured by spectrophotometry.

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	400 mg/L
Limit of detection:	6 mg/L

L-Glutamic Acid | Ref. 12830

Glutamic acid is an amino acid that occurs naturally in some foodstuff and it is also used as a flavor enhancer.

L-glutamic acid present in the sample generates, by means of the coupled reactions described below, NADH that can be measured spectrophotometrically.

$$\text{L-Glutamate} + NAD^+ + H_2O \xrightarrow{\text{GLDH}} \text{2-oxoglutarate} + NADH + NH_4^+$$

$$NADH + NBT + H^+ \xrightarrow{\text{Diaphorase}} \text{formazan} + NAD^+$$

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 560 nm
Limit of linearity:	400 mg/L
Limit of detection:	2.5 mg/L

Ascorbic Acid | Ref. 12828

Ascorbic acid is an organic acid that occurs naturally in different plant-based foods (juices, vegetables, fruits, etc.), or is added artificially as a preservative (meat products, desserts, etc.). Its powerful antioxidant action stops foods from undergoing oxidative processes, while determination of ascorbic acid levels indicate the food's quality at source and throughout its shelf life.

Ascorbic acid in the sample lowers MTT in the presence of PMS, forming dehydroascorbic acid and MTT-formazan that can be assayed by spectrophotometry. In a second determination, ascorbic acid is eliminated by oxidation and other reducing substances (Xred) are measured. The difference between the results is the ascorbic acid concentration.

$$\text{Ascorbic Acid} + X_{red} + \text{MTT} \xrightarrow{\text{PMS}} \text{Dehydroascorbic Acid} + X_{ox} + \text{MTT-formazan}$$

$$\text{Ascorbic Acid} + \tfrac{1}{2}\,O_2 \xrightarrow{\text{AO}} \text{Dehydroascorbic Acid}$$

Kit volume:	90 mL
Method:	Two-reagent differential determination reading at 560 nm
Limit of linearity:	1000 mg/L (ST1)*; 2500 mg/kg (ST2)*
Limit of detection:	1.11 mg/L (ST1)*; 1.04 mg/kg (ST2)*

*ST: Sample Type

Citric Acid | Ref. 12825

Citric acid is an organic acid that either occurs naturally in different plant-based foods (juices, vegetables, fruits, etc.), or is added artificially as a preservative (meat products, desserts, etc.). Measurements of some organic acids (citric, malic, tartaric, or isocitric) are used to detect juice adulteration, as each fruit has a specific profile of organic acids.

Citrate in the sample yields oxaloacetate due to the action of the enzyme known as citrate lyase. All oxaloacetate from citrate in the sample is converted into L-malic acid by the enzyme L-malate dehydrogenase. This enzyme uses NADH as a coenzyme and is oxidized to NAD^+. The disappearance of NADH may be read by spectrophotometry.

$$\text{Citrate} \xrightarrow{\text{CL}} \text{Oxaloacetate} + \text{Acetate}$$

$$\text{Oxaloacetate} + \text{NADH} + \text{H}^+ \xrightarrow{\text{L-MDH}} \text{L-malate} + \text{NAD}^+$$

Kit volume:	50 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	1000 mg/L (ST1)*/ 2000 mg/L (ST2)*
Limit of detection:	11 mg/L

*ST: Sample Type

D-Isocitric Acid | Ref. 12844

D-isocitric acid is an organic acid which, together with measurements of citric and other acids, is used to determine whether juices are authentic because it serves as an indicator of adulteration. Measurements of some organic acids (citric, malic, tartaric, or isocitric) are used to detect juice adulteration, as each fruit has a specific profile of organic acids.

D-isocitric acid in the sample generate, by means of the reaction described below, oxoglutarate, CO_2 and NADPH that can be measured by spectrophotometry.

$$\text{D-isocitric Acid} + \text{NADP}^+ \xrightarrow{\text{ICDH}} \text{2-oxoglutarate} + \text{CO}_2 + \text{NADPH} + \text{H}^+$$

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	1000 mg/L
Limit of detection:	8 mg/L

Total Acidity | Ref. 12846

The quality of juices is quantified by different parameters, including sugars and total acidity. The acids that contribute to the total acidity are different depending on the fruit, variety and ripening point and are expressed in grams of citric acid per liter.

The acids of the sample modify the pH in the reaction mixture that, in the presence of the blue bromothymol (BTB) indicator, can be measured by spectrophotometry.

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 620 nm
Measurement interval:	1.3 – 15.5 g/L citric acid

pH/Total Acidity (Milk) | Ref. 12890

The measurement of pH and total acidity of the milk serves to control the acidity due to the proliferation of bacteria, mainly lactic acid bacteria.

Acids presents in the sample modify the pH of the reaction mixture that can be spectrofotometrically measured in the presence of the indicator bromothymol blue (BTB).

Kit volume:	120 mL
Method:	Two-reagent differential determination reading at 620 nm
Measurement interval:	6.10 – 7.10 pH

Ions

	Reagent	Code
Ions	Iron	12817
	Calcium	12824
	Copper	12814
	Potassium	12823
	Magnesium	12878
	Phosphate (Phosphorus)	12877

Calcium | Ref. 12824

Calcium is a metal cation that occurs naturally in various foods such as dairy products, or is added artificially to enrich products because of its beneficial properties for the human body.

Calcium in the sample reacts with 2,7-[bis(2-arsonophenylazo)]-1,8-dihydroxynaphthalene-3,6-disulfonic acid (Arsenazo III). The color increase is directly proportional to the calcium concentration of the sample.

Calcium (Ca) + Arsenazo III $\xrightarrow{\text{pH=6.5}}$ [Ca - (Arsenazo III)]

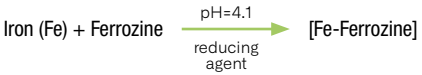
Kit volume:	80 mL
Method:	Two-reagent differential determination reading at 635 nm
Limit of linearity:	180 mg/L (ST1)*; 162 mg/L (ST2/ST3)*
Limit of detection:	2 mg/L

*ST: Sample Type

Iron | Ref. 12817

Iron is an ion that naturally occurs in different foodstuff or is added artificially due to the potential benefits in health. Its analysis is useful to control the quality of the products.

Any **iron** in the sample reacts with 3-(2-pyridyl)-5,6-bis (4-phenylsulfonic)-1,2,4-triazine (ferrozine) sodium salt in acidic medium and in the presence of a reducing agent. The color increase is directly proportional to the iron concentration of the sample.

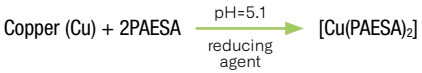


Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 560 nm
Limit of linearity:	30 mg/L
Limit of detection:	0.1 mg/L

Copper | Ref. 12814

Copper is an ion that can be found in different foodstuff. Its analysis is useful to control the quality of the products.

Any **copper** in the sample reacts with 4-(3,5-dibromo-2-pyridylazo)-N-ethyl-N-sulfopropylaniline (PAESA) sodium salt in acidic medium and in the presence of a reducer. The color increase is directly proportional to the copper concentration of the sample.

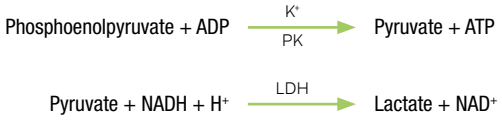


Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 560 nm
Limit of linearity:	7 mg/L
Limit of detection:	0.4 mg/L

Potassium | Ref. 12823

Potassium is an ion that naturally occurs in different food products and its control is useful for agricultural monitoring and to control the quality of the products.

Potassium in the sample consumes NADH (by the following reaction), which can be measured by spectrophotometry.



Kit volume:	80 mL
Method:	Two-reagent kinetic determination reading at 340 nm
Limit of linearity:	4000 mg/L (ST1)*; 500 mg/L (ST2)*
Limit of detection:	20 mg/L (ST1)*; 13 mg/L (ST2)*

*ST: Sample Type

Magnesium | Ref. 12878

Magnesium is an ion that naturally occurs in different foodstuff. Its analysis is useful to control the quality of the products.

Magnesium in the sample reacts with xylidyl blue in alkaline medium forming a coloured complex that can be measured by spectrophotometry.

Kit volume:	100 mL
Method:	Monoreagent end-point reading at 520 nm
Limit of linearity:	240 mg/L
Limit of detection:	9 mg/L

Phosphate (Phosphorus) | Ref. 12877

Phosphates are naturally present in some foods and are used as additives (acidulants and acidity correctors).

The inorganic **phosphate** present in the sample reacts with the molybdate in acid medium, resulting in a complex that is quantified by spectrophotometry.

Kit volume:	105 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	300 mg/L
Limit of detection:	2 mg/L

Sulfite | Ref. 12845

Sulfites are preservatives added artificially to different foods such as meat products, seafood, jams, cookies, or beverages. They can cause hypersensitivity in some people, and as such they are regulated as both allergens (Food Labeling Regulation 1169/2011) and additives, and their maximum permitted limits by food group are established in Regulation 1129/2011.

Sulfite in the sample reacts with 4,4'-(4-iminocyclohexa-2,5-dienylidenemethylene) dianiline chromogen (pararosaniline; PR) and formaldehyde (F) in acid medium. In a second reaction, free sulfite is removed by oxidation and the rest of substances (I) that are able to react with the chromogen are measured. The difference between the results obtained from the two reactions is the sulfite concentration.

$$SO_2 + PR + I \xrightarrow{pH = 0.9 \,/\, F} [PR\text{-}F\text{-}SO_2] + [PR\text{-}F\text{-}I]$$

$$SO_2 + PR + I \xrightarrow[+\text{Oxidizer - } SO_2]{pH = 0.9 \,/\, F} [PR\text{-}F\text{-}I]$$

Kit volume:	300 mL
Method:	Two-reagent differential determination reading at 560 nm
Limit of linearity:	500 mg/kg
Limit of detection:	1.72 mg/kg

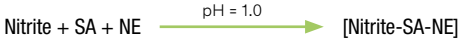
Nitrogenous Substances

	Reagent	Code
Nitrogenous Substances	Ammonia	12809
	Nitrite	12842
	PAN (Primary Amino Nitrogen)	12807
	Urea	12879
	Protein (Milk)	12559

Nitrite | Ref. 12842

Nitrites are substances that can be found naturally in certain vegetables and are added to meat products to act as preservatives. They are essential additives because of the protection they offer against Clostridium botulinum. They also improve the organoleptic properties of some foods. However, under certain circumstances they produce nitrosamines, which have potentially harmful effects. Given the risk they may pose to human health, their maximum limits are regulated.

Nitrite in the sample react with sulfanilamide (SA) and naphtylethylenediamine (NE) in an acid media generating a compound measured spectrophotometrically.

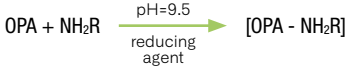


Kit volume:	50 mL
Method:	Two-reagent differential determination reading at 560 nm
Limit of linearity:	5.00 mg/L (167 mg/kg)
Limit of detection:	0.05 mg/L (1.7 mg/kg)

PAN | Ref. 12807

Primary amino nitrogen measure the amount of these nitrogenous compounds like amino acids in a particular foodstuff giving us potential information of the quality of the product. Amino acids and peptides contribute in the food flavor by being precursors of aromatic components and colored substances that are formed by thermal and/or enzymatic reactions that occur during the production, preparation and storage thereof.

Any molecules in the sample that contain a **primary amino nitrogen** react with o-phthaldialdehyde (OPA) in the presence of a reducing agent in basic medium, yielding a chromogen that is assayed spectrophotometrically.



Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	400 mg/L (ST1)*; 200 mg/L (ST2)*
Limit of detection:	2 mg/L (ST1)*; 1 mg/L (ST2)*

*ST: Sample Type

Ammonia | Ref. 12809

Ammonia is nitrogenous compound found in different foodstuff naturally or added externally as a pH regulator and its analysis is also useful as a hygienic indicator in milk.

Ammonia in the sample consumes NADH (according to the following reaction), which is then assayed by spectrophotometry.

Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	200 mg/L
Limit of detection:	3 mg/L

Urea | Ref. 12879

Urea is a by-product of protein metabolism. Urea analysis in milk is used as an indicator of the nutritional balance in livestock feed.

Urea in the sample consumes, by means of the reactions described below, NADH that can be measured by spectrophotometry.

$$\text{Urea} + H_2O \xrightarrow{\text{urease}} 2NH_4^+ + CO_2$$

$$NH_4^+ + \text{NADH} + H^+ + \text{2-oxoglutarate} \xrightarrow{\text{glutamate dehydrogenase}} \text{Glutamate} + NAD^+$$

Kit volume:	120 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	600 mg/L
Limit of detection:	20 mg/L

Protein (Milk) | Ref. 12559

Protein analysis in milk is of great interest in the dairy industry. The concentration of protein in milk is variable and depends on genètic and environmental aspects.

The **protein** present in the sample reacts with pyrogallol red and molybdate in acidic medium, producing a coloured complex that is quantified by spectrophotometry.

Kit volume:	100 mL
Method:	One-reagent end point, Bichromatic, readings at 600 and 670 nm
Limit of linearity:	50 g/L
Limit of detection:	0.5 g/L

Other parameters and Multicalibrators

	Reagent	Code
Other parameters	Acetaldehyde	12820
	Glycerol	12812
	Polyphenols (Folin-Ciocalteau)	12815
	Histamine*	12829
	Ethanol	12847
Multicalibrators	Multical	12818
	Ions Multical	12841
Pretreatments	Carrez Reagent	12837

*See more in page 33

Ethanol | Ref. 12847

Ethanol is the type of alcohol produced when any sugars present in a sample are fermented by yeasts, which are generally Saccharomyces. These yeasts occur naturally in fruits and can be transferred to the corresponding juices during processing. If ethanol is observed in a juice, then it means the presence of these undesired microorganisms can be indirectly monitored and it offers the opportunity to ensure the total absence of any alcohol, thus guaranteeing product hygiene or a zero alcohol content that is necessary in certain diets, e.g., Halal.

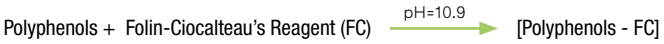
Ethanol in the sample reacts with alcohol dehydrogenase in the presence of NAD^+ in a basic media generating a compound measured spectrophotometrically.

Kit volume:	60 mL
Method:	Two-reagent, Fixed-time determination reading at 340 nm
Limit of linearity:	2000 mg/L
Limit of detection:	25 mg/L

Polyphenols (Folin-Ciocalteau) | Ref. 12815

Polyphenols are a group of compounds that are naturally present in different foodstuff with antioxidant properties.

Any **polyphenols** in the sample react with Folin-Ciocalteu's reagent in basic medium. The color increase is directly proportional to the polyphenols concentration of the sample.

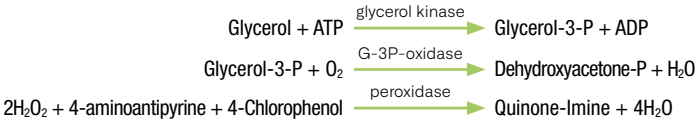


Kit volume:	80 mL
Method:	Two-reagent, End-point determination reading at 670 nm or 750 nm
Limit of linearity:	3000 mg/L
Limit of detection:	60 mg/L

Glycerol | Ref. 12812

Glycerol or glycerine is a component of different foodstuff and its analysis is also useful for industrial applications.

Glycerol in the sample yields (by the following reaction), a colored complex that is assayed by spectrophotometry.



Kit volume:	100 mL
Method:	Monoreagent end-point determination reading at 520 nm
Limit of linearity:	1 g/L
Limit of detection:	0.01 g/L

Acetaldehyde | Ref. 12820

Acetaldehyde can be found in foodstuff for different reasons. It is important in dairy products like milk and yoghourt but also it is checked in different beverages (soft-drinks, wine, beer, etc.).

Acetaldehyde in the sample yields NADH (by the following reaction), which can be measured by spectrophotometry.

Kit volume:	50 mL
Method:	Two-reagent differential determination reading at 340 nm
Limit of linearity:	200 mg/L
Limit of detection:	0.1 mg/L

Multical | Ref. 12818

Multiparameter calibrator

Parameter	U	1	2	3	4	5
Acetic Acid	g/L	0.15	0.30	0.60	0.90	1.20
Ammonia	mg/L	23	45	90	135	180
Citric Acid	mg/L	113	225	450	675	900
D-Gluconic Acid	g/L	0.20	0.40	0.80	1.20	1.60
D-Glucose	g/L	0.90	1.80	3.60	5.40	7.20
D-Gluc./D-Fruc.	g/L	0.90	1.80	3.60	5.40	7.20
Glycerol	g/L	0.113	0.225	0.450	0.675	0.900
D-Lactic Acid	mg/L	0.028	0.056	0.113	0.169	0.225
L-Lactic Acid	g/L	0.34	0.68	1.35	2.03	2.70
L-Malic Acid	g/L	0.45	0.90	1.80	2.70	3.60
PAN	mg/L	45	90	180	270	360
Sucrose/Glu./Fru.	g/L	0.90	1.80	3.60	5.40	7.20

Traceability: aqueous reference standard

Ions Multical | Ref. 12841

Multiparameter calibrator

Parameter	U	1	2	3	4	5
Calcium	mg/L	20.3	40.5	81.0	121.5	162.0
Copper	mg/L	0.8	1.6	3.2	4.7	6.3
Iron	mg/L	3.4	6.8	13.5	20.3	27.0
Potassium	mg/L	188	375	750	1125	1500
Magnesium	mg/L	4.5	9.0	18.0	27.0	36.0

Traceability: aqueous reference standard

Biosystems Instruments

Robust, easy-to-use, highly reliable instruments for photometric analysis.

Y350

Semi-Automatic Analyzer LED Technology
Code: 80176

- LED range: 280, 340, 405, 420, 505, 520, 620, 635, 670, 750 nm
- Preprogrammed methods, validated by the R&D Department
- User friendly software
- USB port for data export
- Minimal reagent consumption
- Can be used in fieldwork
- Low maintenance
- User configurable accessories: batteries, flow-cuvettes, etc.

Y15 | Y15c

Random Access Automatic Analyzer
Code: 83106 / 83106C

- 150 test/hour
- Wavelengths: 340, 405, 420, 520, 560, 600, 620, 635, 670 nm
- Preprogrammed methods, validated by the R&D Department
- User-friendly software
- Minimal reagent consumption
- Innovative design
- Cooling system included (only in Y15c)

Applications per sector (enzymatic/chemical)

		Enology	Vegetables and juices	Dairy products	Meat products
Sugars	D-glucose/D-fructose	•	•	•	•
	Sucrose/D-glucose/D-fructose	•	•	•	•
	Lactose/D-Galactose		•	•	•
	Maltose				
	Starch				•
Organic acids	D-Lactic	•	•	•	
	L-Lactic	•	•	•	
	L-Malic	•	•		
	L-Ascorbic	•	•		•
	Citric	•	•		
	Acetic	•	•	•	
	Tartaric	•	•		
	D-Gluconic	•	•		
	L-Glutamic		•		•
	D-Isocitric		•		
	Total Acidity	•	•		
	pH-Total Acidity (milk)			•	
Alcohol	Ethanol		•		
	Glycerol	•	•		
Nitrogenous substances	Ammonia	•		•	•
	PAN	•			
	Nitrite		•		•
	Urea			•	
	Protein (milk)			•	
Sulfite	Sulfite				•
Ions	Iron	•	•		
	Calcium	•	•	•	
	Copper	•			
	Potassium	•	•		
	Magnesium	•	•		
	Phosphate/Phosphorus		•	•	•
Other parameters	Polyphenols	•	•		
	Histamine	•			

Seafood	Cereal products	Honey	Biotechnology
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Allergens

Advantages

ELISA

- Rapid and standard methods (20’ + 20’ + 20’)
- Easy handling, low cost
- Reliable results
- High sensitivity
- Validated in different matrices
- Spike solutions available

RAPID TEST

- Results in 10 minutes
- Reliable results
- Easy Handling
- Low cost
- High sensitivity

Food allergens are protein substances from different sources that can cause mild-to-severe immune reactions when consumed by sensitive individuals, even at low concentrations. Potentially allergenic foods are listed in Annex II of Regulation (EU) 1169/2011 and in bodies of regulation around the world, and labelling is compulsory.

It is estimated that 2% to 4% of adults and 6% of children have some kind of food allergy, a trend on the rise in recent years. Consequently, these substances must be detected in raw materials and finished products to ensure consumer safety.

The ELISA allergen test kits are a rapid, efficient tool for analyzing the presence of these substances at very low concentrations, due to the specificity of antigen-antibody binding reactions.

Also rapid tests detect the presence of these substances in a fast and reliable way (screening).

	Allergens	Presentation	Code
Allergens ELISA [1]	Milk (ß-Lactoglobulin)	96 wells	14112
	Milk (Casein)	96 wells	14113
	Milk Total	96 wells	14123
	Egg White	96 wells	14117
	Ovalbumin	96 wells	14125
	Lysozyme	96 wells	14122
	Fish	96 wells	14118
	Crustaceans	96 wells	14116
	Almond	96 wells	14111
	Cashew	96 wells	14114
	Lupine	96 wells	14121
	Hazelnut	96 wells	14120
	Peanut	96 wells	14126
	Walnut	96 wells	14130
	Pistachio	96 wells	14127
	Mustard	96 wells	14124
	Sesame	96 wells	14128
	Soy	96 wells	14129
	Coconut	96 wells	14151

[1] Sulfite reagent available (see Enzymatic/Chemical reagents)

	Allergens	Presentation	Code
Allergens Rapid Test	Milk	10 tests	14210
	Egg	10 tests	14209
	Fish	10 tests	14211
	Crustaceans	10 tests	14208
	Soy	10 tests	14215
	Almond	10 tests	14214
	Hazelnut	10 tests	14212
	Peanut	10 tests	14213
	Mustard	10 tests	14216
Spike Solutions	Almond	3 mL	14150
	Casein	3 mL	14151
	Gluten (Gliadin)	3 mL	14152
	Soy	3 mL	14153
	Ovalbumin	3 mL	14154
	Lysozyme	3 mL	14155
	Milk	3 mL	14156
	ß-Lactoglobulin	3 mL	14157
	Egg White	3 mL	14158
	Hazelnut	3 mL	14159
	Peanut	3 mL	14160
	Walnut	3 mL	14161
	Mustard	3 mL	14162
	Sesame	3 mL	14163
	Crustacean	3 mL	14164
	Fish	3 mL	14165

Gluten

Advantages

ELISA

- Rapid methods
- Easy handling, low cost
- Reliable results
- High sensitivity

RAPID TEST

- Results in 15 minutes
- Easy handling, low cost
- Reliable results
- High sensitivity
- R5 Antibody
- All items needed for on-site testing are included

Gluten is the protein portion of various cereal grains (wheat, rye, barley and oats). Continuous consumption by people affected by celiac disease will cause the condition to worsen and become chronic. Consequently, it is included in the allergic substances annex of Regulation 1169/2011 and must be listed on the label.

Because the condition is common, a legal limit has been set for the labelling of gluten-free products (20 ppm) to inform consumers and provide products that improve their quality of life.

The ELISA Sandwich kit is used to determine the substance in various raw materials and finished products quickly and efficiently. The rapid kits are used to detect gluten on surfaces and in foods and include all items needed for on-site gluten testing, in accordance with current legislation.

	Gluten	Presentation	Code
Gluten ELISA	Gluten Sandwich (Gliadin)	96 wells	14119
Gluten R5 Rapid Test	Gluten R5 Flow Through (Food)	10 tests	14206
	Gluten R5 Flow Through (Surfaces)	10 tests	14207

Histamine

Advantages

ELISA

- Rapid and sensitive methods
- Validated in different matrices
- Easy handling, low cost
- Reliable results
- Detection limits in compliance with current legislation

Y15

- Automated: high precision and accuracy
- Reagents are ready to use
- Simple extraction procedure
- Calculations are done automatically
- *Spike Solution* available to get controls

Biogenic amines are produced by microorganism action on amino acids present in foods. The substances cause some odors and can trigger adverse effects for health at high concentrations.

Histamine – a biogenic amine present in fish, wine and cheese – is the result of bacterial decarboxylation of histidine, an amino acid which causes headaches, vasodilation and increased temperature at high concentrations, an effect also known as histamine shock. The maximum limit for histamine in fish has been set at 50 to 200ppm, according to the body of legislation.

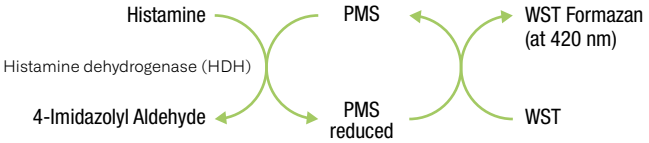
The histamine kits provide efficient histamine testing in a variety of matrices, using different formats (rapid tests, ELISA and enzymatic kits).

	Histamine	Presentation	Code
Histamine	Histamine*	100 mL	12829
	Histamine Spike Solution	10 mL	12891
	Histamine High Sensitivity	96 wells	FCE3100
	Histamine Fast	48 wells	FCE3600
	Histamine Rapid Test	24 tests	FCL3200

*Automation in BioSystems Y15 Instrument.

Histamine | Ref. 12829

Histamine in the sample originates, by means of the coupled reactions described below, a coloured complex that can be measured by spectrophotometry.



Kit volume:	100 mL
Method:	Two-reagent differential determination reading at 420 nm
Limit of linearity:	200 mg/kg
Limit of quantification:	10 mg/kg

PERFORMANCE TESTED
AOAC
RESEARCH INSTITUTE
LICENSE NUMBER 072001

Histamine Kit for automated procedure has been certified as AOAC Performance Tested Method℠ #072001.

Mycotoxins

Advantages

ELISA

- Rapid and standard methods
- Easy handling, low cost
- Reliable results
- High sensitivity
- Validated in multiple matrices

RAPID TEST

- Results in 10 minutes
- All items needed for on-site testing are included
- Easy handling, low cost
- Reliable results
- Cut-off in compliance with current regulation

Mycotoxins are toxins produced by fungi from the *Fusarium*, *Aspergillus* and *Penicillium* genera. These molds colonize a wide variety of products, such as cereals, nuts, dried fruits, grapes, coffee and cocoa, and have carcinogenic or neurotoxic effects. They are highly stable to processes used in the food industry and pose a high risk to health and, therefore, must be tested, as established in current regulations.

Mycotoxins are highly stable to food industry treatments and represent a huge risk to human health. Regulation (UE) 1881/2006 and other legislation around the world stablish the maximum level permitted in different foodstuff.

ELISA kits and rapid tests to determine mycotoxins are a rapid, efficient tool to analyze the presence of these substances at the levels required by the legislation and have been validated in various matrices.

	Mycotoxins	Presentation	Code
Mycotoxins ELISA	Aflatoxin B1	96 wells	14100
	Total Aflatoxin	96 wells	14104
	Aflatoxin M1 Fast	96 wells	14102
	Deoxynivalenol (DON)	96 wells	14105
	Fumonisin	96 wells	14106
	Ochratoxin A	96 wells	14108
	T-2/HT2 Toxin	96 wells	14109
	Zearalenone	96 wells	14110
Mycotoxins Rapid Test	Aflatoxin B1	10 tests	14200
	Total Aflatoxin	10 tests	14201
	Ochratoxin A	10 tests	14202
	Ochratoxin A in wine	10 tests	14203
	Zearalenone	10 tests	14204
	Deoxynivalenol (DON)	10 tests	14205

Applications per sector (Immunoassay)

		Enology	Vegetables and juices	Dairy products	Meat products
Allergens	Milk (ß-Lactoglobulin)		•	•	•
	Milk (Casein)	•	•	•	•
	Total Milk	•	•	•	•
	Egg White (Ovomucoid)				•
	Egg (Ovoalbumin)	•			
	Egg (Lysozyme)	•		•	
	Fish	•			
	Crustacean				
	Soy			•	•
	Cashew				•
	Lupin		•		•
	Almond			•	
	Hazelnut		•		
	Peanut			•	
	Walnut			•	
	Pistachio			•	
	Coconut			•	
	Mustard			•	•
	Sesame			•	•
	Gluten	•		•	•
Mycotoxins	Aflatoxin B1				
	Aflatoxin M1			•	
	Total Aflatoxin				
	Deoxynivalenol (DON)				
	Fumonisine B1			•	
	Ochratoxin A	•	•		
	T-2/HT2 Toxin				
	Zearalenone			•	
Histamine	High Sensitivity	•		•	•
	Fast				
	Rapid Test				

Seafood	Cereals & Nuts	Sweets
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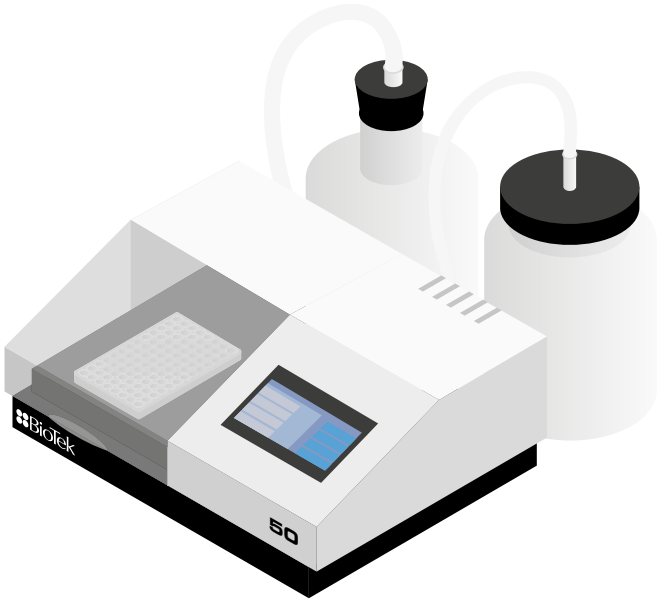
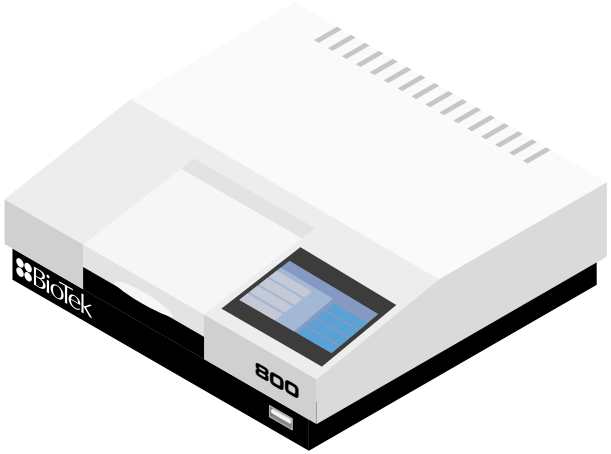
ELISA Instruments



Robust, easy-to-use, highly reliable equipment for ELISA plate washing and reading.

50TS: ELISA microplate washer

The Bio-Tek plate washer automates plate washing processes and includes a dispensing mode.
Code: E76159



800TS: ELISA microplate reader & SW Gen5

The Bio-Tek plate reader is based on absorbance reading at the wavelengths used in ELISA assays (405, 450, 490, 630). The reader comes with user-friendly advanced software (Gen5) to facilitate data management as well as to obtain and adjust concentrations to various calibration curves.
Code: E76158

Software Gen5 data management (**included**): Flexible, robust and efficient software. Used together with ELISA reader, Gen5 optimizes time and allows the management of the obtained data.

Manufactured by: **BioSystems S.A.**
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BioS/09-21 99851