

# Innovating gluten analysis

Speed & precision

BioSystems  
Y15

Food & Beverage analysis

human - centred biotech





# What is gluten

Gluten is found in certain cereal grains as a group of structural proteins, primarily composed of prolamins and glutelins.

Grains containing gluten include all species of wheat, barley, rye, and some cultivars of oat; moreover, cross hybrids of any of these cereal also contain gluten, e.g. triticale. Gluten constitutes around 80% of total protein in bread wheat and it is a key compound in bakery and related technological processes in food industry.

## Why is it analysed?

Certain of these proteins trigger celiac **disease**, **allergies**, or **intolerances** in some individuals, which can only be avoided in a gluten-free diet.

Gluten analysis is frequently tested using immunoassays based on antigen-antibody bond to detect and sometimes quantify the amount of gluten in a particular matrix. Proper and thorough labelling is essential and mandatory in most countries.

Regulations (EU) 1169/2011 and 828/2014 in the European Union, as well as similar ones in other countries, ensure appropriate gluten labelling and indicate the maximum permitted level (generally 20 ppm).

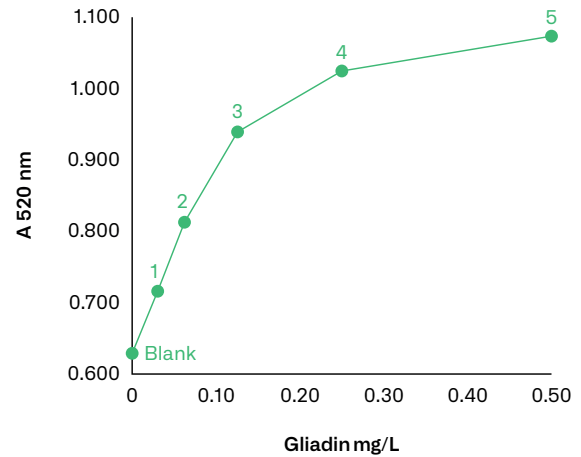


# Our gluten analysis

We present a **new method** for quantifying gluten, based on an **immunoturbidimetric reagent automated in BioSystems Y15 analyser**. This method has the advantages of rapid tests (speed) while accurately quantifying Gluten (like ELISA) in automated way. Other analytes of interest in food industry can be done in the same platform like sugars, organic acids or histamine.

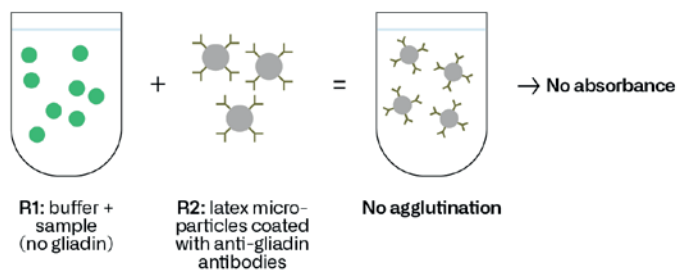
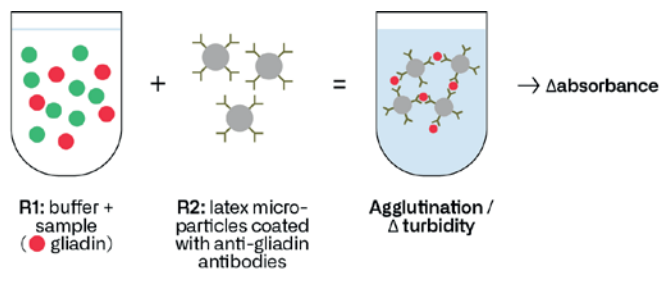
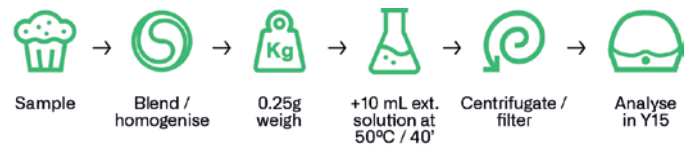
The Gluten test employs **immunoturbidimetry** with latex nanoparticles coated with a monoclonal antibody. This antibody specifically recognises the 33-mer fragment known for its high toxicity. This fragment is present in prolamins like gliadin.

When these coated nanoparticles react with gliadin in the sample, it increases the turbidity of the medium, which is measured using spectrophotometry. The increase in absorbance is proportional to the gluten concentration in the sample. Calibrators are supplied in the kit and are traceable to Gliadin from Prolamin Work Group (PWG).

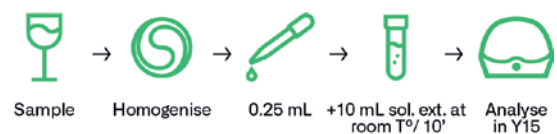


Gliadin/Prolamin in the sample is extracted in a single step with a user-friendly extraction solution (Ref. 31003), in a faster and safer way than other methods.

## Solids extraction:



## Liquids extraction:



Once extracted, the liquid sample is placed in the autoanalyser, giving direct results in ppm within 10 minutes for the first sample (with a capacity of up to 75 tests per hour).

We have also developed a spike solution to create internal controls (Ref. 31002). Gluten concentration is 250 mg/L of gluten and traceable to PWG. Spike solution can be used diluted in the extraction buffer (Ref. 31003) or directly added to the matrix in order to evaluate recoveries.

## Gluten performance characteristics | Ref. 31000:

Limit of quantification: 2,5 mg/kg (mg/L) gluten  
Measurement interval: 2,5 - 40 mg/kg (mg/L) gluten

### Precisión:

Matrices	Gluten contamination Source	RSDr	
		mg/kg	
Corn flour	Wheat flour	5	10,7
		20	8,4
Rice flour	Wheat flour	5	9,2
		20	11,7
Red wine	Wheat flour	5	3,5
		10	3,4
Sausage	Wheat flour	5	8,0
		20	10,5
Cacao powder	Gluten Spike Solution	5	7,1
		10	3,6
Cookies	Gluten Spike Solution	2,5	4,1
		10	2,0

The reagent has been validated according to the AOAC Guidelines, and it shows excellent results in front of the official method (R5 antibody – Category I from CODEX Alimentarius).

FAPAS. Quality Control Material		R5 antibody kit		BioSystems Y15 Gluten		
Reference	Matrix	Assigned value, Xa (range for  z  ≤ 2)	Nº of data points Xa	Mean (n=5) mg/kg	Bias, mg/kg	Bias (%)
T27247BQC	Cake mix	19,3 (9,6 - 28,9)	100	12,1	-7,20	63
T27252AQC	Oat based foodstuff	16,6 (8,3 - 24,9)	61	18,3	1,70	110
T27262QC	Cooked biscuit	76 (38,0 - 114,0)	73	90,2	14,20	119
T27264BQC	Infant soya formula	24,8 (12,4 - 37,2)	52	36,8	12,00	148
T27271AQC	Cake mix	39,2 (19,6 - 58,8)	68	38,2	-0,98	97
T27275AQC	Cake mix	14,9 (7,5 - 22,4)	94	17,8	2,87	119
T27301BQC	Cake mix	16,0 (8,0 - 24,0)	78	17,0	0,95	106
T27314QC	Cooked Biscuit	56,3 (28,1 - 84,1)	58	55,1	-1,22	98
T27331AQC	Cake mix	13,9 (6,9 - 20,8)	88	16,6	2,70	119
T27331BQC	Cake mix	5,53 (2,76 - 8,29)	48	4,1	-1,46	74

FAPAS. Material de Control de Calidad		Kit de anticuerpo R5		Y15 Gluten BioSystems		
Reference	Matrix	Reference value (U)	Nº of data points RV	Media (n=5) mg/kg	Bias, mg/kg	Bias (%)
TYG001RM	Cake mix	14,4 (1,7)	95	14,7	0,3	103
TGY002RM	Cake mix	28,8 (2,4)	103	28,0	-0,8	97



## BioSystems Gluten kit

Our gluten quantification method allows you to perform automated analysis by immunoturbidimetry, obtaining fast and accurate results.

Key features include:

- Immunoassay: quantitative and direct method
- Ready-to-use reagents and standards
- No calibration required for every run
- No washing step
- No need for trained personnel
- Single-step extraction without requiring a fume cabinet

Producto	Código
Gluten	31000
Gluten Spike Solution	31002
Gluten Solución de Extracción	31003

# BioSystems Y15

## Automatic Random Access Analyzer

Analyser for the measurement of different analytes in food and beverage samples.

### Highlights

150 cycles/hour (75 results/hour).

Samples continuous loading.

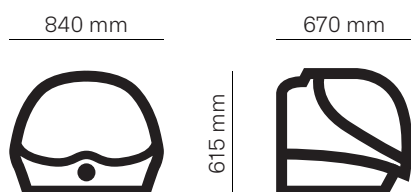
Dedicated reagents, minimum handling.

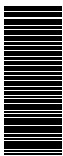
Automatic pre and post dilution.

User-friendly and adaptable software, direct results.

Item	Quantity	Code
BioSystems Y15 analyser	-	83106
BioSystems Y15C analyser	-	83106C
Reaction rotor	10 units	AC11485
Concentrated Washing Solution	500 mL	BO13416
Concentrated System Liquid	1000 mL	12889
Sample wells (pediatric cups)	1000 units	AC10770
Reagent bottles 50 mL + caps	10 units	BO11493
Reagent bottles 20 mL + caps	10 units	BO11494
Amber reagent bottles 50 mL + caps	10 units	BO13442
Halogen lamp Y15 6V/10W	1 unit	LA10429U

### Dimensions





BioS705-24 ZSW00005



**BioSystems S.A.**

Costa Brava 30, 08030 Barcelona (Spain)

t. +34 933 110 000

[www.biosystems.global](http://www.biosystems.global)

[foodbeverage@biosystems.global](mailto:foodbeverage@biosystems.global)