# Beverages

## Ensure safe and high quality goods

**Sensitive test systems to analyse your products and equipment on various parameters**

- Microbiology/hygiene
- Constituents
- Product adulteration
- Vitamins
- Allergens
- Mycotoxins

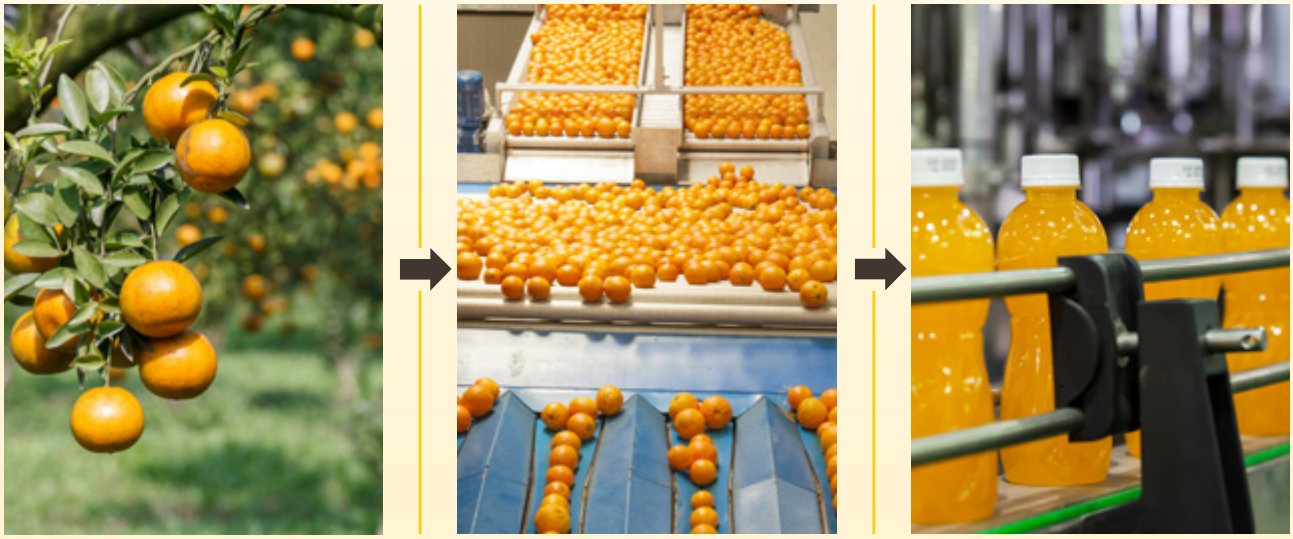
## Ensure safety throughout the food production chain

From primary production to the final product many steps need to be controlled and monitored to obtain safe and high quality products.
R-Biopharm test kits can be applied throughout the whole production chain: from raw materials to intermediates to final products, from the inspection of incoming goods to hygiene monitoring and finally to product analysis for correct labeling. Our large portfolio of different test formats can be used to analyse for example:

- Fruit juices & concentrates
- Alcoholic beverages, e.g. wine, beer, spirits
- Potable water
- Non-dairy drinks, e.g. soy milk, almond milk

**Reasons for analysing beverages during different production stages:**

- Identity- and authenticity control of raw materials
- Control of the hygienic status
- Determination and control of the parameters for nutritional information
- Control of the conformity of the recipe
- Compliance to official regulations on residues and contaminants
- Quality control



## Choose the appropriate products for your needs

This brochure will give you an overview of test kits that will help you check and control your production processes. Further technical details (e.g. detection limits, test formats) and order numbers can be found in our Product Catalogue Food & Feed Analysis.
Your local distributor and our customer service team can also give you further advice on which tests are suitable for your individual needs and give technical support. In addition R-Biopharm offers technical trainings on specific parameters throughout the year. Please check the “Analysts Workshops” brochure on our website: *www.r-biopharm.com/events*.

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# Production steps in brief

## 1. Inspection of raw materials

Poor quality raw materials make poor quality products. Thus, the inspection of all incoming (raw) materials is the first crucial step in the production process to ensure product consistency and minimize material costs, discard and rework. With our wide range of test formats and parameters you can check if incoming materials comply with legal requirements and verify if your own specifications are met by your suppliers. Sorting out substandard materials before money is spent processing them is one of the most cost effective methods of ensuring a persistent high quality of the final product. Protect your process right from the beginning by using R-Biopharm test kits!

**Check for:**

- Microbiology/hygiene
- Acids, sugars & other constituents
- Allergens
- Mycotoxins

## 2. In-process control

The quality requirements for foods and beverages are very high. Regular in-process controls are essential to ensure the safety, consistency and shelf life of the final product. Additionally, you can monitor certain constituents and spoilage organisms to make sure that processes are running within specifications. This will ensure batch-to-batch consistency, minimize economic and quality losses and prevent product recalls.

**Check for:**

- Microbiology/hygiene
- Acids, sugars & other constituents
- Allergens
- Mycotoxins

## 3. Final product control/Labeling

Final products have to match all quality criteria before being dispatched to customers. This includes controls to eliminate all possible health hazards such as (cross-) contamination with allergens and pathogenic organisms. Furthermore, products must be labeled according to existing regulations which often vary by country and by product. R-Biopharm test kits help you to label your products properly and dispatch them with confidence.

**Check for:**

- Microbiology/hygiene
- Acids, sugars & other constituents
- Vitamins
- Allergens
- Mycotoxins

## Hygiene & cleaning control at all stages of the manufacturing process

HACCP systems are implemented in most companies to certify the safety and consistency of products. Potential biological, chemical or physical hazards can be introduced by raw materials, the process, the equipment, the environment and employees. Apart from microorganisms, the presence of allergens can also lead to serious health risks for consumers. Cross contaminations by e.g. dust or insufficient cleaning of shared equipment are the main reason for the unintentional presence of allergens in food and beverages.

Use our rapid and reliable test systems to check raw materials, final products, production lines, staff and cleaning efficiency (CIP water) for microbial and allergen (cross-)contaminations.

Sampling with Promedia ST-25

| Relevant cleaning parameters |
|---|
| • AMP/ATP |
| • Protein residues |
| • Allergens subject to labelling (e.g. gluten, soya, milk) |

| Relevant indicator parameters |
|---|
| • *E. coli* |
| • Heterotrophic bacteria/count |
| • Total aerobic count |
| • Total Coliforms |
| • *Pseudomonas aeruginosa* |
| • Yeasts and moulds |

| Relevant cleaning parameters |
|---|
| • Test plates |
| • Swab tests |
| • Lateral flow test strips* |

* These tests are part of the ● Allergens product portfolio.

## Microorganisms: yeasts and bacteria

Contaminations with spoilage organisms can significantly affect product quality and taste, and as a consequence, can have severe financial impact. Thus, it is very important to identify spoilage organisms during production. Furthermore, some spoilers may not be deactivated by pasteurization, and it is therefore crucial to detect them as early as possible.

Traditional microbiological analysis using culture media and microscopes is time consuming, requires a lot of experience and can lead to misinterpretation of mixed cultures.
In contrast, real-time PCR is a highly specific and fast method able to reliably detect spoilage organisms and yeasts in beer, wine and other beverages.

| Beer | Wine | Juice |
|---|---|---|
| • Beer spoilage-specific screening and identification of over 30 parameters | • Acetic acid bacteria | • Beer spoilage-specific screening and identification of over 30 parameters |
| • Hop resistance gene detection | • Biogenic amines forming bacteria | |
| • *Lactobacillus, Megasphaera, Pectinatus, Pediococcus* | • *Dekkera bruxellensis* (Brettanomyces) - quantitative detection | |
| • Top and bottom fermented yeast | • *Lactobacillus* | |
| • Yeast screening | • *Oenococcus oeni* | |
| • Further specific parameters | | |

| Available test formats/accessories |
|---|
| • Real-time PCR + DNA preparation kits |

GEN-IAL® real-time PCR for screening and species identification

## Acids, sugars, alcohols & additives

Constituents such as sugars, acids and alcohols are measured in raw materials and final products for several reasons, e.g. to give nutritional information on labels, to ensure uniform quality or to comply with legislative requirements. By testing critical parameters during production, corrective measures can be taken to ensure the highest possible output and to avoid discard. Enzymatic tests are widely used because they are easy to use and give precise results, even in complex matrices. Many enzymatic methods have been validated by international organizations such as the OIV (International Wine Office), EU and AOAC.

### Examples of relevant parameters in different beverages (further parameters available)

| Wine | Beer & spirits | Fruit juices |
|---|---|---|
| • Acetaldehyde | • Acetaldehyde | • Acetic acid |
| • Acetic acid | • Acetic acid | • Ascorbic Acid |
| • Ascorbic Acid | • Ascorbic Acid | • Ammonia |
| • Ammonia | • Ammonia | • Citric acid |
| • Citric acid | • Citric acid | • Ethanol |
| • Copper | • Ethanol | • Formic acid |
| • Ethanol | • Formic acid | • Lactic acid |
| • Formic acid | • Lactic acid | • Glucose |
| • Lactic acid | • ß-Glucan | • Glucose/Fructose |
| • Glucose / Fructose | • Glucose | • Formic acid |
| • Gluconic acid | • Glucose/Fructose | • Gluconic acid |
| • Glycerol | • Glycerol | • Glycerol |
| • Iron | • Malic acid | • Isocitric acid |
| • Malic acid | • Oxalic acid | • Malic acid |
| • Sorbitol/Xylitol | • Starch | • Nitrate |
| • Starch | • Sucrose | • Oxalic acid |
| • Sucrose | • Sulfite/SO2 (free + total) | • Sorbitol/Xylitol |
| • Sulfite/SO2 (free + total) | | • Starch |
| • Tartaric acid | | • Sucrose |
| • Urea | | • Sulfite/SO2 (free + total) |

| Available test formats/accessories |
|---|
| • Enzymatic tests |
| • Colorimetric tests |
| • Ready-to-use test cartridges for single testing |

RIDA®CUBE SCAN for single testing with ready-to-use test cartridges

## Food allergens and intolerances

In most countries it is mandatory to label ingredients which can cause allergies or intolerances. However, unintended contaminations during storage and production due to carryover are very common. Additionally, fining agents such as milk protein, egg (ovalbumin) or lysozyme used in wine can remain in the finished product and must be labeled. That is why manufacturers should test their final products as well as incoming raw materials to ensure correct labeling and to avoid product recalls. R-Biopharm offers validated test systems for the detection of the most common allergens including all 14 allergens listed in EU directive 2007/68/EC Annex IIIa. Furthermore, substances that are linked with food intolerances can be detected with our test systems

### Examples of relevant parameters in different beverages

| Wine | Beer & spirits | Fruit juices | Non-Dairy Drinks |
|---|---|---|---|
| • Casein | • Gluten/Gliadin (incl. fragments) | • Sulfite | • beta-Lactoglobulin (incl. fragments) |
| • Egg (ovalbumin) | • Sulfite | | • Casein |
| • Lysozym | • Nuts | | • Milk |
| • Histamine | | | • Gluten/Gliadin (incl. fragments) |
| • Sulfite | | | • Nuts |
| | | | • Peanut |
| | | | • Soya |

| Available test formats/accessories |
|---|
| • ELISA |
| • Lateral flow test strips |
| • Enzymatic tests |
| • Real-time PCR + DNA preparation kits |
| • Assay controls |

Various test systems for swabbing and product testing

## Vitamins

Many foods and beverages are enriched with essential vitamins to ensure a sufficient supply of the population. Manufacturers need to make sure that the added and natural vitamin content matches with the label on the package until the declared shelf life. Our vitamin test kits and clean-up columns allow quick and reliable determinations

| Relevant parameters | |
|---|---|
| • Vitamin B1 (Thiamin) | • Vitamin B7 (Biotin) |
| • Vitamin B2 (Riboflavin) | • Vitamin B9 (Folic Acid) |
| • Vitamin B3 (Niacin) | • Vitamin B12 (Cyanocobalamin) |
| • Vitamin B5 (Pantothenic Acid) | • Vitamin C (Ascorbic Acid) |
| • Vitamin B6 (Pyridoxin) | |

| Available test formats/accessories |
|---|
| • Microbiological based tests |
| • Immunoaffinity columns |
| • ELISA |
| • Enzymatic tests |
| • Spiking standards |

RIDASCREEN® Enzyme immunoassays (ELISA) for high sample throughput

Comprehensive product range for screening of mycotoxins

## Mycotoxins

Mycotoxins are toxic secondary metabolites produced by fungi (moulds) which can infect agricultural products, such as fruits and cereals, during growth, harvest, storage or processing. Due to the frequent occurrence of mycotoxins and their severe toxic effects, many countries have set maximum levels e.g. 2 µg/kg Ochratoxin A in wine in the European Union. R-Biopharm developed specific detection methods to ensure compliance with these regulations

| Relevant parameters | Typically found in |
|---|---|
| • Aflatoxin (B1, B2, G1, G2, M1) | Beer, milk, soya milk |
| • DON | Cereals-based beverages, e.g. beer |
| • Fumonisins | Cereals-based beverages, e.g. beer |
| • Ochratoxin A | Wine, beer |
| • Patulin | Apple juice, cider, apple liqueurs |
| • T-2 / HT-2 toxin | Cereals-based beverages, e.g. beer |
| • Zearalenon | Cereals-based beverages, e.g. beer |

| Available test formats and accessories |
|---|
| • ELISA |
| • Immunoaffinity and solid phase clean-up columns |
| • Test cards |
| • Spiking solutions/dried mycotoxin standards |
| • Pectinase (for use prior to patulin determination) |

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