

## Doemens Collaborative Trials

Trust is good, but proof is better



chemical-technical



microbiological



sensory

## General information

Analysis results should be valid, accurate and comparable. The performance of an individual quality assurance laboratory can be assessed by taking part in collaborative trials. In such trials, homogeneous, standardized samples are analyzed by multiple laboratories using the same standardized measurement methods. The highest possible number of laboratories are encouraged to participate in these trials and the results are evaluated statistically at one central location – Doemens.

Each participant can use the results to evaluate their own laboratory operations to determine whether they routinely obtain correct, accurate analysis results. This assists individual brewery laboratories in comparing their work with other laboratories associated with the beverage sector, official agencies for food safety and monitoring, customs administration as well as trade and service institutes for the beverage industry. Furthermore, by participating in collaborative trials, valuable insight can be gained with regard to the suitability and performance of various analysis methods.

Collaborative trials with a focus on sensory analysis help to assess not only the strengths and weaknesses of a sensory panel as a whole but also its individual members with regard to their abilities to evaluate aroma and flavour impressions in beer.

For more than 20 years now, Doemens has conducted collaborative trials for the beverage industry. These trials are offered at regular intervals for beer, wort, non-alcoholic soft drinks and mineral water. Doemens' laboratory holds collaborative trials for chemical-technical, microbiological as well as sensory analysis.

## Why participate?

- For an objective and independent comparison of the quality of routine analyses achieved by multiple laboratories analyzing identical sample material → this provides a basis for reviewing the actual analytical performance of a laboratory in order to optimize it
- Statistical evaluation of the Doemens collaborative trial in accordance with the 13528:2015 and DIN 38402-A45 guidelines

- Rapid statistical evaluation of the submitted analysis results → this facilitates a quick response
- Laboratories can clearly and objectively establish how close their results are to the “correct values” and how precise the analyses are, given the limits of precision for the respective methods.

## Participation

Participation in collaborative trials is open to any company in the beverage industry (domestic/international) with its own laboratory and also to professional trade and service institutions. Each laboratory is assigned an identification number in order to maintain anonymity. The pool of participants currently comprises about 300 companies.

## Conducting the trials

As part of every trial, Doemens sends out a suitable quantity of homogeneous, standardized samples to the participants, who then conduct the analysis using a specified method. The results are communicated to Doemens, where they are compiled, evaluated statistically and expressed as a graph in a report. The statistical evaluation of chemical-technical analysis, for example, includes the parameters “reproducibility R”, “repeatability r” or “mean values for the individual laboratories xi”. The evaluations clearly show which values deviate from the mean.



*Excerpt of analysis results from a collaborative trial on alcohol content (standard-strength beer) submitted by different laboratories*

## Collaborative trials for beer

### Chemical-technical analysis

- Conducted four times per year
- Five different kinds of beer (non-alcoholic beer, low-alcohol beer, standard-strength beer, strong beer, beer-based beverage)
- Parameters measured:
  - original gravity (1)
  - alcohol (2)
  - real extract (3)
  - apparent extract (4)
  - final attenuation (5)
  - carbon dioxide (6)
  - diacetyl (7)
  - turbidity (8)
  - foam stability (9)
  - beer colour (10)
  - pH (11)
  - bittering units (12)
  - yeast cell count (13)
  - osmolality (14)

### Microbiological analysis

- Qualitative analysis: Quarter 2 and 4  
Qualitative + quantitative analysis: Quarter 1 and 3
- Beer sample with microorganisms (inoculation possible with: pure brewing yeast strains, either top-fermenting or bottom-fermenting, foreign or wild yeast strains, *Pediococcus* sp., *Megasphaera* sp., *Leuconostoc* sp., molds, bacteria, microorganisms which do not spoil beverages, *Lactobacillus* sp., *Pectinatus* sp., *Lactococcus* sp., *Kocuria*/*Micrococcus kristinae*)
- The participants identify the microorganisms inoculated in the beer sample and conduct a quantitative analysis to determine the number of colony-forming units

## Collaborative trials for sensory analysis

- Beer: conducted four times per year; water: twice per year
- Flavour identification: in each round, four flavour ampules are sent out for the type of beverage selected by each laboratory. The contents of the ampules are added to the beverage and mixed
- Sensory analysis plus: the training of a tasting panel can be optimized through participation in collaborative trials
  - in each round of the collaborative trial, participants also receive samples from a previous round labelled with the names of the flavours they contain
  - targeted training for tasting teams

## Collaborative trials for wort

### Chemical-technical analysis

- Twice per year
- Sterile wort
- Parameters measured:
  - extract
  - pH
  - limit of attenuation
  - color
  - TBN
  - total nitrogen (Kjeldahl)
  - polyphenols
  - coagulable nitrogen
  - FAN
  - bittering units
  - beta-glucans
  - photometric iodine value
  - DMS and precursors
  - oxalate

## Collaborative trials for non-alcoholic soft drinks

### Chemical-technical analysis

- Conducted twice per year
- Beverages containing artificial sweeteners or sugar
- Parameters measured:
  - extract [° Brix]
  - carbon dioxide
  - pH
  - total titratable acidity
  - ascorbic acid
  - caffeine
  - artificial sweeteners

### Microbiological analysis

- Conducted twice per year
- Non-alcoholic beverage sample inoculated with microorganisms (yeast strains, acid-tolerant Gram-negative bacteria, lactic acid bacteria, bacteria which do not spoil beverages, molds, acid-tolerant bacteria)
- The participants identify the microorganisms inoculated in the beverage sample



## Collaborative trials for mineral water

### Chemical-technical analysis

- Conducted once per year
- Mineral water
- Parameters measured:
  - carbon dioxide
  - pH
  - total hardness
  - conductivity
  - hydrogen carbonate
  - calcium
  - magnesium
  - sodium
  - potassium
  - nitrate
  - nitrite
  - iron
  - manganese
  - chloride
  - sulfate
  - fluoride
  - ammonia

## Monitoring individual laboratory performance

Should the analysis results exhibit strong deviations from the correct values, the laboratory director can use this information to seek the root cause of the error. Doemens offers consulting to assist with this process.

## Prices for collaborative trials

	BEER	
	BASIC ANALYSIS (1-5)	COMPREHENSIVE ANALYSIS (1-14)
CTA (1 beer)	112.00 €	128.00 €
CTA (2 beers)	146.00 €	179.00 €
CTA (3 beers)	179.00 €	213.00 €
CTA (4 beers)	214.00 €	271.00 €
CTA (beer-based beverage as the fifth beer type)	261.00 €	322.00 €
Microbiology (qualitative)	140.00 €	
Microbiology (qualitative & quantitative)	245.00 €	

	SENSORY COLLABORATIVE TRIALS (BEER, WATER)	
NUMBER ON SENSORY PANEL	SENSORY ANALYSIS	SENSORY ANALYSIS PLUS
1-8	146.00 €	184.00 €
9-16	171.00 €	245.00 €
17-24	194.00 €	305.00 €

	NON-ALCOHOLIC SOFT DRINKS		
CTA	TYPE 1 (sugar)	TYPE 2 (artificial sweeteners)	TYPE 1 & TYPE 2
		179.00 €	179.00 €
Microbiology (qualitative)	140.00 €		

	WORT	MINERAL WATER
CTA	255.00 €	184.00 €

All prices listed do not include VAT and shipping costs.

# Registration and Consulting

## Contact

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## Registration/ Consulting

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