



PROFICIENCY TESTING
SYSTEMS

PROGRAM 2020



...quality assured

Proficiency Testing Systems In Quality Assurance Program 2020

Test the reliability of your analyses!

❖ **Chemistry** ❖ **Microbiology** ❖ **Sensory**

Proficiency testing systems are an efficient instrument for internal and external quality assurance. Concerning accreditation and certification bodies, proficiency tests are a significant tool to demonstrate the analytical performance of the own laboratory. At a glance there is a plenty of information regarding the effectiveness and accuracy of the used method and the competence of the personal equipment. Furthermore the failures or tendencies in analysis can be recognized and corrected to guarantee the analytical performance on a constant high level. Confidential results avoid expensive charges and lead to high economic efficiency. Finally you are able to enhance the business confidence and the reliability of the certification authorities.

The **proficiency testing program** for quality assurance of MUVA KEMPTEN GMBH is one of the worldwide most important schemes for chemical, microbiology and sensory analysis of food. Since 25 years, MUVA KEMPTEN GMBH has experience in performing proficiency testing studies and in the applied statistics. MUVA KEMPTEN GMBH cooperates with a number of national and international working groups and is - since a long time - close with quality management and analytical quality assurance.

The whole expert knowledge of the MUVA KEMPTEN GMBH is available to our proficiency testing team and as a matter of course our clients can access it at any time.

muva kempten GmbH
Your accredited international provider for proficiency testing schemes in food analysis

FROM OUR PROFICIENCY TESTING PROGRAM YOU CAN EXPECT

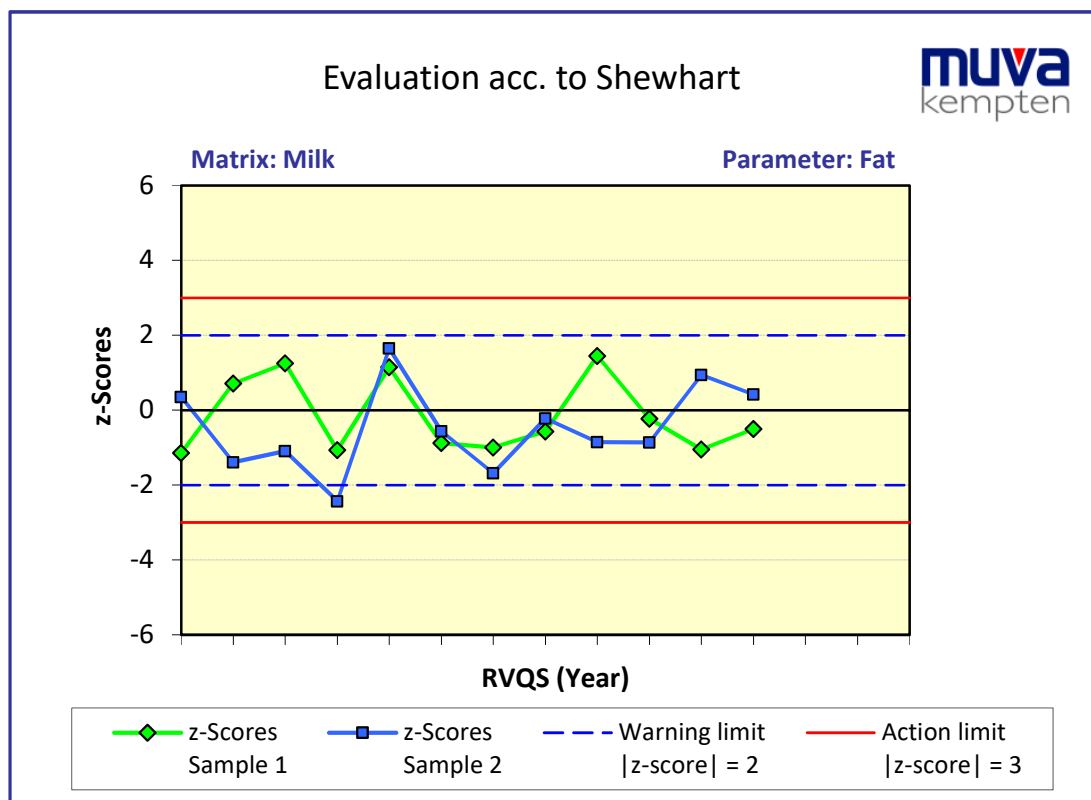
- ❖ a precise and reliable planning and organization which complies with recognized international standards like the new standard DIN EN ISO/IEC 17043:2010-05 and ISO 13528:2015 as well as the International Harmonized Protocol for Proficiency Testing of (Chemical) Analytical Laboratories
- ❖ a neutral and strictly confidential treatment and presentation (encoded) of your results
- ❖ a detailed report with a traceable and understandable evaluation, together with clear graphical and tabular presentations and recommendations as well as helpful suggestions
- ❖ a certificate which presents your own z- and z'- scores, well-arranged
- ❖ a good value for money

PROFIT FROM A CONTINUOUS PARTICIPATION IN PT BY OFFER "EVALUATION OF YOUR PERFORMANCE DEVELOPMENT"

By means of the graphical evaluation of your analytical performance

- ❖ the competence of the laboratory is presented excellently and can so be documented to third parties in an easy way
- ❖ Tendencies and systematic failures (bias) become apparent at a glance
- ❖ The competence of e.g. your technicians, different devices etc. can be tracked over a longer period

Example: Performance Development as Shewhart Control Chart



Please regard our registration form on the homepage: www.muva.de → [proficiency testing!](#)

- ❖ Set up an account in our comfortable online portal
- ❖ Two weeks at the latest before sample shipment, you receive the study announcement together with the relevant target dates (dispatch of the samples, deadline for results). You can download all supporting documents, which will be available on the online portal in time. If you require additional sample material, please inform us immediately via an informal e-mail. It is possible to cancel the registration within one calendar week after receiving the announcement of the present proficiency test. We feel free to charge the costs incurred. After the above-mentioned dead line, we will invoice the total costs of the proficiency testing study.
- ❖ We will inform you about the sample shipment in a separate e-mail. As announced, you will receive two samples, which are tested for homogeneity and stability, equal in composition, but with different contents in selected parameters. It is on your choice if you will analyse all or some of the provided parameters. Ideally, you will analyse each parameter in duplicate with the method of your choice. Further duplicate determinations are possible (e.g. using another method, on a different day or by different technicians). Please report the results until the fixed target date (usually within 3 weeks).
- ❖ The submission of results is possible in the online portal – both simply and conveniently. Results for one or both samples and for the parameters of your choice can be entered and either transmitted collected or one by one.

More detailed information on using our online portal are available at [www.muva.de / proficiency_testing](http://www.muva.de/proficiency_testing)

- ❖ Within 1 - 2 months, the report (with all information encoded) will be accessible in the online portal. Additionally downloading is possible. You will receive the certificate and the invoice by post.
- ❖ The report contains the following information
 - ◆ the number of participating laboratories
 - ◆ the used methods
 - ◆ all data of homogeneity
 - ◆ the summary of results
 - ◆ recommendations and the annex

In the annex, you find the tables with

- ◆ all single and mean values
- ◆ the corresponding methods with all relevant information
- ◆ the performance criteria z-score and z'-score
- ◆ the estimated, extended measurement uncertainty for the laboratory that provided three or more results for a method
- ◆ statistical data (extensive information on the statistical evaluation you may find in our statistical protocol under [www.muva.de / proficiency_testing](http://www.muva.de/proficiency_testing))

as well as graphical presentations (see examples on the following page).

- ❖ After the study, we are glad to be at your command for questions and recommendations. In between the studies and in case of disappointing results we recommend using the reference materials of MUVA KEMPTEN GMBH.
- ❖ The proficiency tests in chemical and microbiological studies take place, starting by a number of ten laboratories. The sensory proficiency testing studies take will proceed with more than five participating laboratories, due to the fact that each panel participate with several panellists. In average, the number of participants is usually about 35 participants per proficiency test. The participation is possible for laboratories of all scientific fields and not limited to special topics.
- ❖ Amongst others laboratories of food research and testing institutes, food testing laboratories, private laboratories, as well as food, veterinary and costumes inspection services participate in the proficiency testing studies of MUVA KEMPTEN GMBH.

CALCULATION OF THE METHOD DEPENDING MEASUREMENT UNCERTAINTY BASED ON THE NORTH TEST

Starting at 3 results provided by a laboratory (in chemical proficiency testing schemes at minimum 6 single results) using one method for analysis, the contributions of the uncertainty are determined from the standard deviation calculated on basis of the single results (= reproducibility) and the bias of the single results in relation to the assigned value. The extended measurement uncertainties are assessed on basis of the North Test and they are listed in the evaluation tables of each parameter. If a laboratory provided sufficient results for more than one method, the measurement uncertainties are estimated and listed separately for each method.

These measurement uncertainties are for information only but they can be an excellent tool for the plausibility check of the own estimated measurement uncertainty. It is not suitable to use it as generally valid measurement uncertainty for subsequent results in routine analysis.

Example: Extract of an evaluation table with extended measurement uncertainty of a laboratory

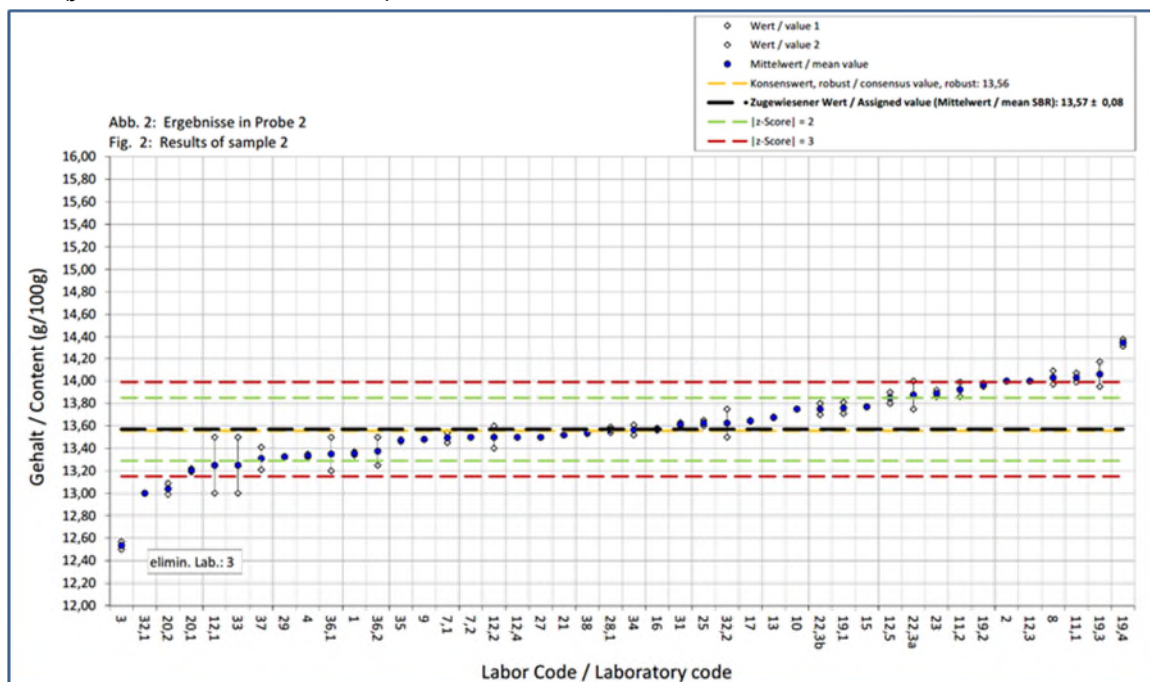
Tab. 1: Ergebnisse in Probe 1 Table 1: Results of sample 1							Zugewiesener Wert ± Unsicherheit Assigned value ± uncertainty		1,58 ± 0,04 (g/100g) (g/100g)	
Lab Code	X _{1lab} Wert 1 Value 1 (g/100g)	X _{2lab} Wert 2 Value 2 (g/100g)	X _{lab} Mittelw. Mean (g/100g)	Meth. Code	Methode / Method Beschreibung Description	Norm (Standard) Standard	Kommentar Comment	Bewertung Performance z-Score z'-Score		Messunsicherheit / measurement uncertainty U _{lab}
1,1	1,51	1,47	1,49	b52	102 °C	VDLUFA C 35.9		-1,02	-0,69	
1,2	1,42	1,47	1,45	b52	102 °C	VDLUFA C 35.9		-1,53	-1,04	
2	keine Ergebnisse / no results									
3	1,58	1,54	1,56		102 °C	ÖNORM EN ISO 3727-1		-0,23	-0,15	
4	1,64	1,66	1,65		102 °C		int. Meth.	0,80	0,54	
5,1	1,58	1,64	1,61	b52	102 °C	VDLUFA C 35.9		0,34	0,23	0,20
5,2	1,55	1,54	1,55	b52	102 °C	VDLUFA C 35.9		-0,40	-0,27	
5,3	1,47	1,46	1,47	b52	102 °C	VDLUFA C 35.9		-1,31	-0,89	
6	1,50	1,57	1,54	b53	102 °C	VDLUFA C 35.10		-0,51	-0,35	

GRAPHICAL PRESENTATION OF THE PROFICIENCY TESTING RESULTS

The different graphical representations allow a quick overview on all data. Furthermore, it is possible to gain additional information.

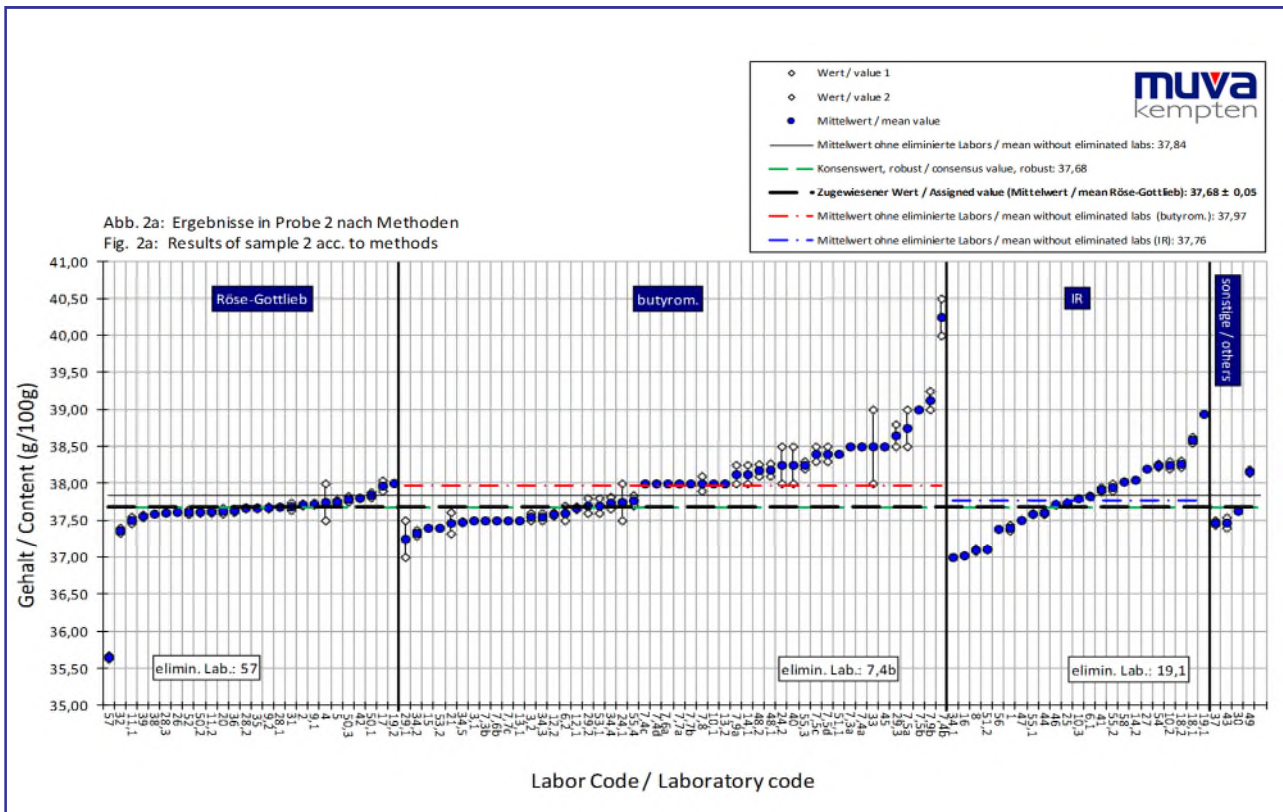
The following figure shows the data sorted by ascending values. This graph also presents the warning and action limits of the corresponding evaluation criteria. Thus, the distribution with regard to the evaluation criteria are visible at a glance.

Example: Evaluation of the results sorted by size with limits of the evaluation criterion z-score (fat content in cream cheese)



The figure “evaluation of the results according to the methods” allows the assessment of the efficiency of the different methods. Moreover, the participants are able to compare their own results with those of the other laboratories within the methods as well as between the methods.

Example: Evaluation of the results according to the methods (fat content in cream)



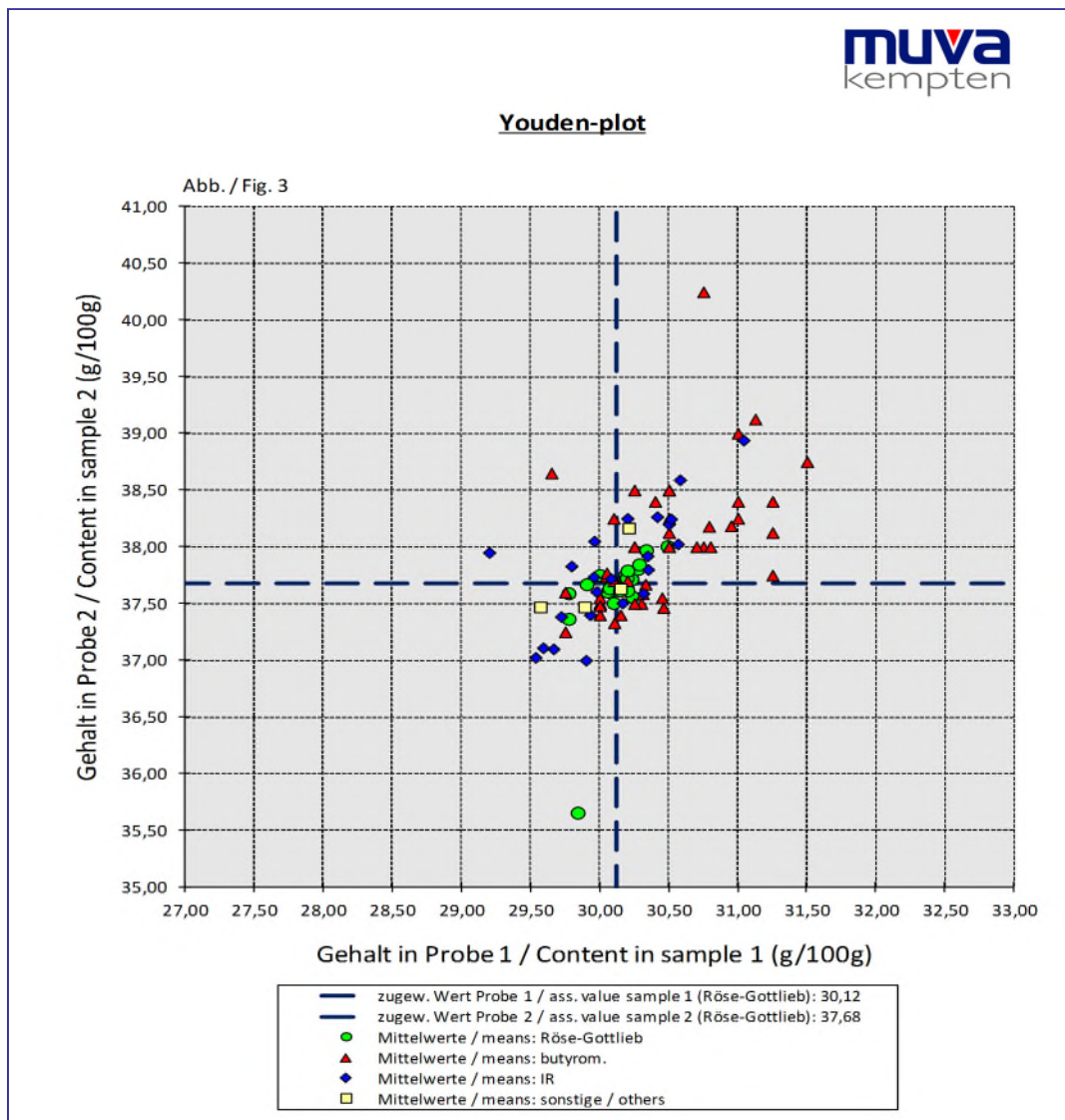
The figure of z-scores shows the performance of the participants at a glance. Additionally the laboratories are able to detect systematic errors (e.g. if the z-scores in both samples are >3).

Example: Colored figure of z-scores for dry matter in milk powder



The Youden-Plot demonstrates very clearly, when a method is affected by a systematic error.

Example: Youden-Plot, fat content in two cream samples, view for tendencies



INNOVATIVE SENSORY PROFICIENCY TESTING SYSTEM

DESCRIPTION OF THE SENSORY PROFICIENCY SYSTEM FOR FOOD INDUSTRY



Assure the quality of your senses!

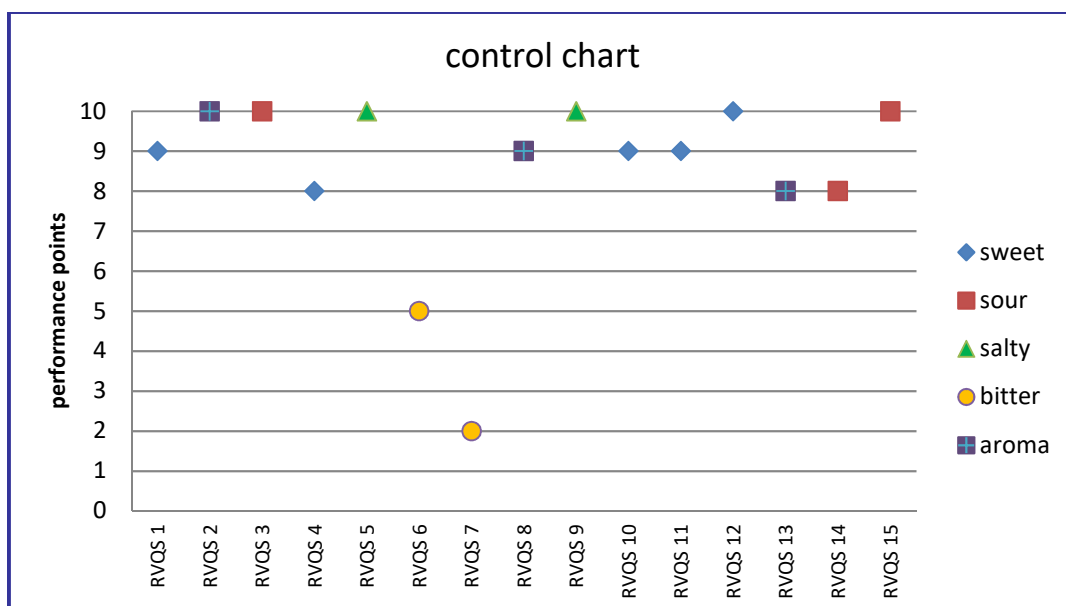
❖ **Odour** ❖ **Taste** ❖ **Touch** ❖ **Sight** ❖ **Hearing**

Research and development in sensory proficiency testing schemes support the assurance for quality at sensory working. Sensory panels have the possibility to compare their performances with other panels. Moreover the assessment of the individual panelist among each other is very important for the quality assurance, too. It can be an excellent instrument to select and supervise sensory panels. Our Sensory Proficiency Testing System consists of different tests used in the daily routine work and the offer of four senses – odour, taste, touch and sight. So the validation of the quality and performance of your panel and panelists can be enabled.

PERFORMANCE DEVELOPMENT

On the subject of the evaluation of the sensory proficiency testing studies “rank order”, MUVA KEMPTEN GMBH developed a new point system for the assessment of the panelists’ performance. According to the page test and regarding the identification of the correct basic taste or odour points between 0 and 10 are assigned. The top of the score 10 is given for the correct rank order and the correct identification of the basic taste. For sensory analyzing the identification of the correct basic taste as well as the correct aroma is very important, so if there is a failure in the identification the points are divided of two. With the aid of this point system a continuous monitoring of quality is possible; for example by the use of control charts.

Example: Performance card of continuous participation in proficiency testing studies



The composition and process of the sensory PT's are equivalent to the chemical and microbiological PT's.

<p>RANK ORDER</p> <p>Identification of the test criteria in taste (basic tastes) or odour (aroma) and ranking test according DIN ISO 8587:2010 with 4 analyzing samples.</p>
<p>PROFILE TESTING</p> <p>Profiling of an analyzing sample by two reference samples in 5 attributes.</p>
<p>TRIANGLE TEST</p> <p>Evaluation of the level of significance of the panelists and panels according DIN 4120:2005-04 by testing 6 sets of triangle tests.</p>
<p>PACKAGING MATERIAL</p> <p>Intensity test in odour and taste of a utensil according to DIN 10955:2004-06 and a triangle test.</p>
<p>FATS AND OILS</p> <p>The analyzing of "virgin, cold-pressed rapeseed oil" and "frying fat" according to characteristic and dissimilar attributes given in the German Method "DGF Einheitsmethode C-II 1 (2009)" (DGF = German society of fat science).</p>
<p>TESTING ACC. TO DIN EN ISO 22935</p> <p>Evaluation of milk and dairy products according to the 5-point-scale of DIN EN ISO 22935.</p>
<p>ODOUR THRESHOLD VALUE (TON) AND TASTE THRESHOLD VALUE (TFN) IN DRINKING WATER ACCORDING TO DIN EN 1622</p> <p>Determination of the odour threshold value (TON) and the taste threshold value (TFN) in drinking water by the use of a comparison of pairs according to DIN EN 1622.</p>

For comparability at a glance, all results are listed encoded in tables and graphics. See the examples at point "graphical presentation of the results". In all proficiency testing studies the interesting statistical values – for example mean, median, standard deviation etc. – are calculated. In the reports there is also statement about the qualification for sensory measurements for each panel and each assessor.

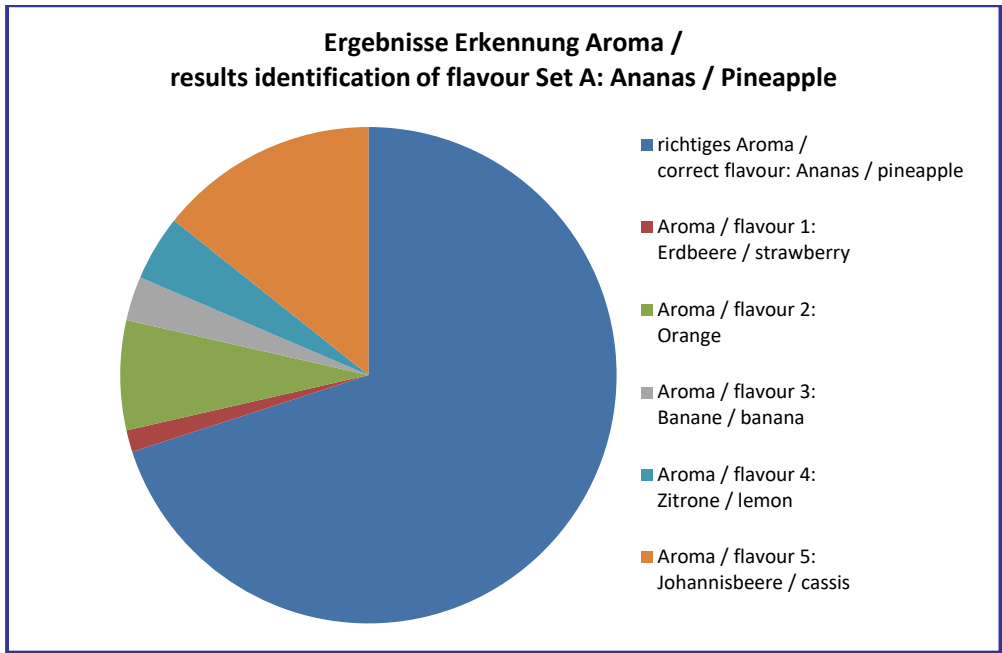
ASSURANCE OF THE MATERIAL

The material is tested of homogeneity to ensure the sensory properties. The homogeneity test is equivalent with corresponding chemical analyses according to BCR/48/93. Sensory experts of MUVA KEMPTEN GMBH organize the sensory measurements. The verification of the material occurs consecutively monitoring by the performance of the proficiency testing and the chemical and microbiological quality assurance.

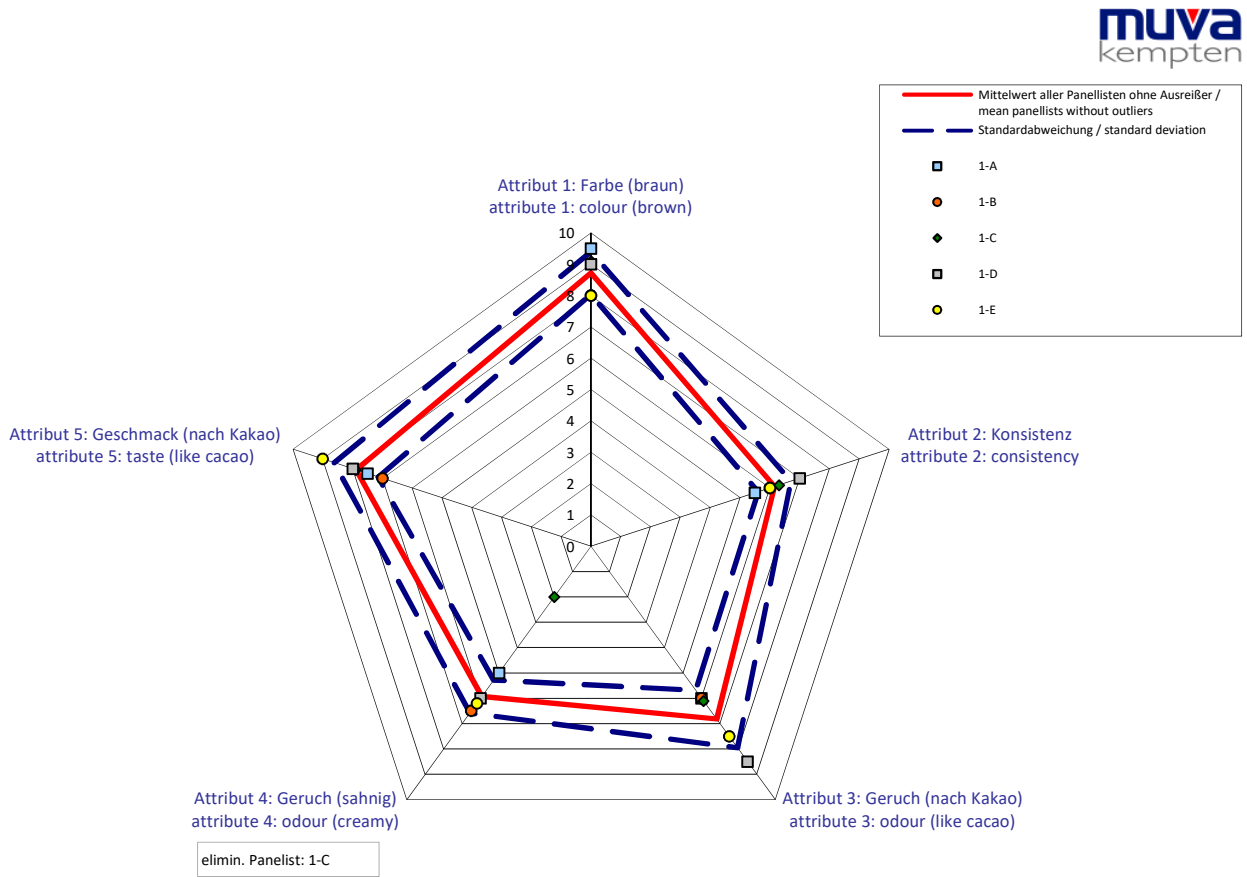
EN ISO 4120:2007; 8.2 is used to ensure the homogeneity and similarity of the analyzing material for the triangle test.

An independent randomized charge of 10 samples was used to form 18 randomized triangle tests which should be analyzed by 18 different and independent panelists. The results are evaluated according to table A.2 of EN ISO 4120:2007.

Example for a graphic presentation: Identification of the correct aroma in a circle diagram.



Example for a graphic presentation: Results in profile testing by using a spider web.



REFERENCE MATERIAL

After participation in proficiency testing studies of MUVA KEMPTEN GMBH, you have the opportunity to buy the material used in this muva proficiency testing study.

We recommend using our muva reference material in the meantime of the proficiency studies for a regular (statistical) quality control of your own panel and each individual assessor.

WORKSHOP AND INHOUSE-TRAINING

Every year, the department of proficiency tests and reference materials of MUVA KEMPTEN GMBH offers minimum one workshop dealing with quality assurance and / or statistics in quality assurance.

Additional we are glad to visit your company for special training dealing with subjects of your own choice.

Please contact us.

REBATE SYSTEM FOR PROFICIENCY TESTING IN CHEMISTRY AND MICROBIOLOGY

The rebate for the proficiency testing studies in chemistry and microbiology is based on the transaction volume of the customer in proficiency testing / reference material of the previous year. The discount is as follows:

- *from 5.000,- €: 5% rebate*
- *from 10.000,- €: 10% rebate*
- *from 15.000,- €: 15% rebate*
- *from 20.000,- €: 20% rebate*

REBATE SYSTEM FOR PROFICIENCY TESTING IN SENSORY

The discount for the proficiency testing studies in sensory depends on the number of panelists as follows:

- *3 – 5 persons (incl. panel evaluation) 5% rebate*
- *6 – 9 persons (incl. panel evaluation) 10% rebate*
- *≥ 10 persons (incl. panel evaluation) 15% rebate*

SHIPPING CONDITIONS

The dispatch of the sample materials for the proficiency testing studies is ex works.

Packing and shipping costs will be charged according to the expenses. Do not hesitate to contact us for more information.

REGISTRATION TERMS

There is the possibility to select a subscription or to register yearly. We ask for your understanding for the following arrangement. Please note that we need your registration for your participation in proficiency testing studies performed in January 2019 at the latest by the end of November 2018.

Please note the valid [general terms of business](#) as well as the [privacy statement](#) drawn up by muva kempten GmbH (www.muva.de).

PROGRAM PROFICIENCY TESTING STUDIES 2020

PLEASE NOTE, THE REGISTRATION WILL TAKE PLACE IN OUR NEW COMFORTABLE ONLINE PORTAL WITH IMMEDIATE EFFECT

- Please register as a customer first: <https://service.muva.de>
- For the efficient use of the portal, we provide **instructions** for set up an account, EP registration and submission of results on our [Homepage](#).
- If you are one of our **subscription customers**, we kindly ask you to set up an account and to register your proficiency tests by the online portal once. Of course, there is also the option of a standing order.
- Please indicate in the field „comments“, when registering if you need **Additional sample material** or the **number of panellists**. If this is unknown at the time of registration, you can send us an informal e-mail at any time.
- From January 2020, the submission of the **results** will also take place via your personal account in the online portal.
- For an additional charge of € 9.00 you can still receive the **results report** in **paper form**. If applicable, please indicate this also in the field "comments".

Please contact us for any questions, we are glad to support you!

**MUVA KEMPTEN GMBH –
your accredited international provider for proficiency tests in food analysis**

Typ	Product	EPQS	Period	Parameter	Prices (€) ¹⁾	
					Report e-mail	add. results ²⁾
CHEMISTRY						
MILK						
A	Milk	817	Jan.	Fat, Dry Matter, Protein, Lactose (monohydrate), Freezing Point, Density	225	78
A	Milk	842	May	Fat, Dry Matter, Protein, Lactose (monohydrate), Freezing Point, Calcium	225	78
A	Milk	858	Sept.	Fat, Dry Matter, Protein, Lactose (monohydrate), Freezing Point, pH value	225	78
AL	Milk (low in lactose, lactose free)	831	March	Lactose (monohydrate), Galactose, Glucose	135	45
K	Raw Milk shock frozen	829	March	Fat, Dry Matter, Protein, Lactose (monohydrate), Freezing Point, pH Value, Casein	270	90
K	Raw Milk shock frozen	865	Oct.	Fat, Dry Matter, Protein, Lactose (monohydrate), Freezing Point, pH Value, Urea	270	90
MILK PRODUCTS						
D	Cream	822	Jan.	Fat, Dry Matter, Protein	159	55
D	Cream	855	Aug.	Fat, Dry Matter, Protein	159	55
E	Evaporated milk / Coffee cream	844	May	Fat, Dry Matter, Protein, Phosphorus, Ash	209	75
H	Butter	828	Feb.	Water, Solid non-fat, pH Value, Cholesterol, Butyric Acid Methyl Ester, Chloride, Sodium (sodium chloride)	189	70
L	Yoghurt	825	Feb.	Fat, Dry Matter, Protein, Total Lactic Acid, pH Value	199	75
CHEESE						
C	Processed cheese	830	March	Fat, Dry Matter, Protein, Lactose (monohydrate), pH Value, Citric Acid, Ash, Chloride, Sodium (sodium chloride)	265	95
C	Processed cheese	854	Aug.	Fat, Dry Matter, Protein, pH Value, Phosphorus, Ash, Chloride, Sodium (sodium chloride)	265	95
F	Cream cheese	837	April	Fat, Dry Matter, Protein, Lactose (monohydrate), pH Value, Total Lactic Acid, Chloride, Sodium (sodium chloride)	175	65
V	Cheese (hard / semi-hard cheese)	820	Jan.	Fat, Dry Matter, Protein, pH Value, Chloride, Sodium (sodium chloride)	190	69
POWDER						
B	Milk powder	823	Feb.	Fat, Free Fat, Dry Matter, Protein, Lactose (monohydrate), Ash	245	87
B	Milk powder	852	Aug.	Fat, Dry Matter, Protein, Lactose (monohydrate), pH value, Ash	245	87
G	Whey powder	818	Jan	Fat, Dry Matter, Protein, Lactose (monohydrate), Calcium, Magnesium, Nitrate, NPN, Ash, Total Lactic Acid	289	115
P	Whey protein concentrate / Sodium caseinate	840	April	Fat, Water, Protein, Lactose (monohydrate), Ash	215	80
T	Carbohydrates / Vitamins (in baby foods)	839	April	Glucose, Fructose, Lactose (monohydrate), Saccharose, Vitamin A, Vitamin C, Vitamin E	219	80
U	Minerals / Trace Elements (in baby foods)	847	June	Sodium, Potassium, Calcium, Magnesium, Iron, Zinc, Copper, Manganese, Phosphorus, Chloride	298	129

Typ	Product	EPQS	Period	Parameter	Price (€) ¹⁾	
					report e-mail	Add. result ²⁾
OTHERS						
VP	Alkaline Phosphatase in milk and cheese	819	Jan.	Phosphatase Activity; qualitatively + quantitatively	150	50
AM	Aflatoxin M1 in Milk	866	Oct.	Aflatoxin M1	160	55
FS	Fruit Juice	849	June	Glucose, Fructose, Titratable Acid, Soluble Solids (°Brix), Ethanol, pH value, Patulin	179	65
S	Canned Sausage	857	Aug.	Fat, Water, Protein, Hydroxyproline, Ash, Chloride, Sodium (sodium chloride)	179	65
FM	Fatty Acid Distribution in Raw Milk	868	Oct.	C4 to C20; (C14:1, C16:1, C18:1, C18:1-trans, C18:2, C18:2-trans, C18:3)	223	75
N	Chocolate / Nut-nougat-cream	846	June	Fat, Milk Fat, Dry Matter, Protein, Lactose (monohydrate), Saccharose, Theobromine	199	70
HST 1	Veterinary Drugs in Milk	871	Nov.	Possible groups of substances: β -Lactam, Tetracycline, Sulfonamide, Cephalosporine, Quinolones; quantitative	245	89
HST 2	Veterinary Drugs in Milk	872	Nov.	Possible groups of substances: β -Lactam, Tetracycline, Sulfonamide, Cephalosporine; qualitative	165	59

Typ	Product	EPQS	Period	Parameter	Price (€) ¹⁾	
					report e-mail	Add. result ²⁾
MICROBIOLOGY						
OEE	E. coli / Enterobacteriaceae	869	Nov.	E. coli, Enterobacteriaceae in frozen Milk	199 ³⁾	55
OK	Mesophilic, Aerobic Bacterial Count	851	July	Total Bacterial Count (in Powder and freeze dried Cheese)	199 ³⁾	55
OH	Yeasts	826	Feb.	Yeasts (Capsules in Milk Products)	199 ³⁾	55
OK	Mesophilic, Aerobic Bacterial Count	833	March	Total Bacterial Count in frozen Milk	199 ³⁾	55
OEC	E. coli / Coliforme / Enterobacteriaceae	834	March	E. coli, Enterobacteriaceae, Coliforme in frozen Milk	199 ³⁾	55
OHS	Yeasts / Moulds	835	March	Yeasts, Geotrichum in frozen Milk	199 ³⁾	55
OK	Mesophilic, Aerobic Bacterial Count	860	Sept.	Total Bacterial Count in frozen Milk	199 ³⁾	55
OEC	E. coli / Coliforms / Enterobacteriaceae	861	Sept.	E. coli, Enterobacteriaceae, Coliforms in frozen Milk	199 ³⁾	55
OHS	Yeasts / Moulds	862	Sept.	Yeasts, Geotrichum in frozen Milk	199 ³⁾	55
OST	Staphylococcus	863	Sept.	Staphylococcus in frozen Milk	199 ³⁾	55

Basically the samples of all chemical and microbiological proficiency testing studies are unfit for consumption!

¹⁾ Net price plus packing and shipping costs (will be charged according to the expenses)

²⁾ Additional double determination (results) or additional material

³⁾ The basic price includes 10 results, each additional results is calculated separately. With registration for all PT studies (spring and autumn) there is a **discount of 10%** for these participations. **All sample materials contains strains of safety group S1.**



Please use our comprehensive services!



Accreditation
Provider of proficiency tests



Accreditation
Testing laboratory