Technical Committee and Subcommittee Reports

2015–2016 Report of the Technical Committee

Committee Members: M. Eurich, *Chair*; S. Brendecke; L. Barr; R. Jennings; E. Jorgenson; K. Lakenburges; A MacLeod; C. Pachello; J. Palausky; A. Porter; N. Rettberg; E. Welten (EBC); and B. Foster (*senior advisor*).

The ASBC Technical Committee and Subcommittee chairs conducted a number of method evaluations through collaborative study, and coordinated a range of additional activities during 2015–2016. For 2016 there are 6 new methods recommended for inclusion in the ASBC *Methods of Analysis* (MOA):

Six methods were evaluated recommended for inclusion in the MOA for 2016.

- Rapid method for malt color, chaired by Betsy Roberts (Briess Malt), as a Provisional Method (PM) only.
- Tetrahydroiso-alpha acids in Hop Products by Spectrophotometry, chaired by Bob Smith (Hopsteiner).
- Hop tea sensory evaluation method, chaired by Amanda Benson (Deschutes Brewery).
- Hot steep malt sensory evaluation method, chaired by Cassie Liscomb (Briess Malt & Ingredients Co.).
- NIBEM for foam stability, chaired by Aaron Golston (Lagunitas Brewing Co.).
- Phenolic yeast detection, chaired by Trevor Cowley (SABMiller).

In addition, the following methods will continue for another year of collaborative study:

- Lipoxygenase activity in malt, chair TBD
- Hop analysis by GCMS, chair TBD.

The ASBC Technical Committee regularly reviews each section of MOA. In 2015/16 reviews of one section of the ASBC Methods of Analysis will be continued:

- Beer, chaired by Karl Lakenburges (Anheuser-Busch InBev) and Mark Eurich (New Belgium Brewing Co.)

In order to gather information on the requirements of the ASBC membership, the Coordination of New and Alternate Methods of Analysis Subcommittee submitted a survey to members in 2016 focused around packaging. Joe Palausky (subcommittee chair) worked closely with the Technical Committee to design the questions. Based on the polling results the Technical Committee will prioritize activities to address membership input.

In addition, the following topic will undergo preliminary analysis and ruggedness testing prior with the possibility of collaborative study in 2016:

- Beer Method 25B- Diacetyl, collaboration to update calibration standards to current industry practice.

As in previous years, the following standing subcommittees continue:

- Coordination of New and Alternate Methods of Analysis, chaired by Joe Palausky (Boulevard Brewing Co.).
- International Methods, chaired by Mark Eurich (New Belgium Brewing Co.)
- Craft Brew, chaired by Eric Jorgenson (Highland Brewing Co,).
- Sensory Science, chaired by Lindsay Barr (New Belgium Brewing Co.).
- International Hop Standards Committee, chaired by Bob Foster (MillerCoors).
- Packaging Methods, chaired by Scott Brendecke (Ball Corporation).
- Microbiological Methods in Brewing, chaired by Caroline Pachello (MillerCoors).
- Soluble Starch, chaired by Rebecca Jennings (Rahr Malting Co).
- Check Services, chaired by Rebecca Jennings (Rahr Malting Co) and Jodi Grider (ASBC SciSoc).

In 2015/16 the Technical Committee were involved in webinar/video development to provide additional content to MOA:

- The Craft Brew Subcommittee (Eric Jorgenson, Highland Brewing Co.) produced Webinars on Documenting the Way to Improved Quality and Diacetyl Measurement and Control.

One student grant proposal was submitted for consideration by ASBC BOD. Interested individuals should contact the Technical Committee Chair (Mark Eurich, New Belgium Brewing Co.):

- Comparison of Package Analyzers for Total Package Oxygen, chair TBD.

Two student grant evaluations were conducted in 2015/16. Results for NIR hop analysis were shared at the 2016 World Brewing Congress in a poster presentation by Dr. James Redwine (Kalsec®). Results for the Comparison of Package Analyzers for Total Package Oxygen were not presented based on the recommendation of the Technical Committee:

- Comparison of Package Analyzers for Total Package Oxygen, chaired by Scott Brendecke (Ball Corporation).
- NIR for hop analysis, chaired by Bob Foster (MillerCoors) and Aaron Porter (Sierra Nevada)

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The Technical Committee would like to thank the current subcommittee chairs for their hard work and dedication in conducting their respective collaborative studies during the past year. Furthermore we would like to formally acknowledge the many subcommittee members who have participated over the past year.

Finally, I would like to recognize the dedication and hard work put forth by all members of the Technical Committee over the previous year. The continual enthusiasm and commitment demonstrated by the team is sincerely appreciated and I firmly believe is key to ensuring that the ASBC Methods of Analysis remains contemporary, relevant, and of exceptional practical value to the brewing community.

Coordination of New and Alternate Methods of Analysis
(*Joe Palausky, j.palausky@boulevard.com*)

This is a standing subcommittee whose function is to collect, from various sources including polling members, new and alternate methods of analysis that may be useful for the industries our Society serves. These methods are reviewed to establish their merit and utility prior to evaluation.

Soluble Starch
(*Rebecca Jennings, rjennings@rahr.com*)

This is a standing subcommittee whose goal is to coordinate a testing program for soluble starch that will ensure a consistent supply of quality soluble starch for the Society. To further this goal, the subcommittee monitors process methodology utilized in the production of starch, investigates improved methods for starch quality testing, and evaluates potential new suppliers of starch.

Check Services
(*Rebecca Jennings, rjennings@rahr.com* and *Jodi Grider, jgrider@scisoc.org*)

This is a standing subcommittee to ensure value and relevancy of the ASBC Check Sample Service. This service provides subscribing members an opportunity to evaluate method accuracy and precision and instrument performance on a scheduled, regular basis. By comparing internal laboratory data to results from other laboratories around the world, a critical assessment of the analytical data generated by subscriber labs can be made and identification of areas for method improvement can be identified.

Craft Brew
(*Eric Jorgenson, ericj@highlandbrewing.com*)

The mandate of this subcommittee is to engage the craft brewing members of ASBC and explore opportunities to make the Society more relevant to these individuals. Additionally, the subcommittee aims to explore opportunities and pursue strategies to bring craft brewers who are not members of the Society into the ASBC.

Sensory Science
(*Lindsay Barr, lBarr@newbelgium.com)*

This is a standing subcommittee. It was formed on the recommendation of the Technical Committee to bring more focus to sensory science in ASBC and provide a forum for sensory scientists in the brewing industry to share and discuss current methodologies and propose new methodologies for collaborative testing. The current focus is on updating the beer flavor wheel(s), methods for shelf-life testing, in process evaluation, beer lexicon, and decision trees for sensory evaluation.

International Hop Standards Committee
(*Bob Foster, robert.foster@millercoors.com*)

This subcommittee was formed in 1996 between the ASBC and EBC and is a standing Committee whose goal is to produce, purify, and verify isomerized and un-isomerized hop standards for the brewing, hops, and related industries.

Packaging Methods
(*Scott Brendecke, sbrendec@ball.com*)

This is a standing subcommittee. It was formed to evaluate packaging methodology, review packaging methods within the MOA, and act as a liaison between ASBC and other packaging related organizations.

International Methods
(*Mark Eurich, meurich@newbelgium.com*)

The function of this standing subcommittee is to encourage collaboration between ASBC and international brewing organizations. The primary focus is shared method collaboration with both BCOJ and EBC.

Microbiological Methods in Brewing
(*Caroline Pachello, caroline.pachello@millercoors.com)*

This subcommittee aims to evaluate novel methods for analysis of microbiological samples in brewing, including yeast and bacteria related assays. During the coming year information on innovative methodology and techniques will be collected and assessed. Individuals interested in contributing and/or participating in collaborative work are encouraged to contact Caroline Pachello directly.

Hop Analysis by GCMS
(Joe Palausky, j.palausky@boulevard.com, Aaron Porter, AaronP@sierranevada.com and *Nils Rettberg, nrettberg@vlb-berlin.org)*

This subcommittee aims to develop methods for the analysis of hop compounds using GCMS. Full details of this subcommittee will be confirmed in due course as well as international collaboration with the European Brewing Convention Analytical Committee.

Lipoxygenase Activity in Malt
(TBD)

LOX is a family of enzymes that catalyze the oxygenation of poly-unsaturated acids. In combination with other degrading enzymes, they produce flavor active compounds and lead to a decrease in the shelf life and stability of beer. This subcommittee aims to evaluate the techniques which are currently being utilized across laboratories and to develop a standard procedure.

MOA Review: Statistical Analysis of Samples
(*Aaron MacLeod, macleoda@hartwick.edu*)

This subcommittee has been initiated to provide guidelines for the statistical analysis of data related to brewery samples. The subcommittee will focus on comparison and validation of analytical methods through single and multi-laboratory studies. It will address topics such as identifying the appropriate statistical test to apply, dealing with outliers, and interpreting results. The primary goal is to prepare a set of methods and guidelines to assist the non-expert in correctly analyzing data.

MOA Review: Beer

(Karl Lakenburges, Karl.Lakenburges@anheuser-busch.com and *Mark Eurich, meurich@newbelgium.com)*

This subcommittee is charged with reviewing the 'Beer' section of ASBC Methods of Analysis to ensure that all methods are relevant and are consistent with modern techniques.

AMERICAN SOCIETY OF BREWING CHEMISTS, INC.
Report of Subcommittee[1]

MALT COLOR – RAPID MICROWAVE METHOD

Subcommittee Members: E. Roberts**,** *Chair;* Adam, C; Barr, J; Barth, R; Bodah, Z; Fox, G; Golston, A; Griggs, D; Jennings, R; Jensen, S; Kim, U; Li, Y; Martens, C; Perry, E; Schwarz, P; Theriot, S; Thiel, R; and A. MacLeod (*ex officio*).

CONCLUSIONS

1. Repeatability coefficients of variation for the determination of malt color by the rapid microwave method ranged from 2.1 to 3.9% and were deemed acceptable.
2. Reproducibility coefficients of variation for the determination of malt color by the rapid microwave method ranged from and 4.2 to 5.9% and were deemed acceptable.
3. Based on a comparison of means using a paired t-test, the rapid method was significantly different from the standard reference method at the 95% confidence level.

RECOMMENDATIONS

1. The sub-committee recommends that the method be included in the *Methods of Analysis* as a provisional method.
2. Discharge the Sub-Committee

This was the 2nd year of the subcommittee's existence. The subcommittee was formed to evaluate a rapid method for malt color analysis. On the basis of polling by the subcommittee for Coordination of New and Alternate Methods it was determined that there was interest in a method for determination of malt color which did not require the use of a traditional mashing bath (1). Such a method could be used by a broader range of labs as an alternative to the

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standard method, Wort-9. A rapid method for malt color using a microwave oven extraction and subsequent spectrophotometric measurement of color has been proposed by Li et al. (2) Results from the previous year's study showed poor reproducibility. The study was repeated with clearer instructions to collaborators to verify the temperatures reached during the extraction. This year's study also included a comparison with the standard reference method for malt color.

PROCEDURE

Four sample pairs of commercial base and specialty malt, labeled A/B, C/D, E/F, and I/J, covering a range of color levels were sent to each collaborator. Collaborators were asked determine the color for each malt sample using the rapid microwave method according to the procedure in Appendix I. Collaborators were also asked to determine the color for each sample using the standard reference method Wort-9 for sample pairs A/B & C/D or Malt-9 for sample pairs E/F & I/J if a suitable mashing apparatus was available. Results were evaluated using the Youden unit block design (3).

RESULTS AND DISCUSSION

Results from 15 collaborators were received for the four sample pairs. Data for the determination of malt color using the rapid and reference methods are presented in Table I and II respectively. No outliers were identified using Dixon's ratio test (1) so all data was included in the statistical analysis.

The statistical summary of the malt color data obtained in the study are shown in Table III. Repeatability and reproducibility coefficients of variation for the determination malt color using the rapid method ranged from 2.1 to 3.9% and 4.2 to 5.9%, respectively, representing an improvement over the results obtained in the previous year's study. This year the collaborators were instructed to monitor the temperature during the extraction to ensure that proper conditions were reached and adjust the microwave settings accordingly. Repeatability and reproducibility coefficients of variation for the determination of malt color by the standard reference methods ranged from 0.8 to 2.5% and 2.7 to 7.8% respectively.

The comparison of means between the rapid and reference method data using the paired *t*-test is shown in Table IV. With the results of all four sample pairs included, the means were significantly different for based on the *t*-test at the 95% confidence level.

While the rapid method demonstrates slightly less precision, values compare well with the reference method thus it can be a valuable tool for assessment of malt color when results are needed quickly, or when a mashing bath is not available.

LITERATURE CITED

1. C. Powell, S. Brendecke; M. Eurich;L. Guerdrum; R. Jennings; K. Lakenburges; A MacLeod; D. Maradyn;C. Pachello; J. Palausky; A. Porter; F. Strachan and B. Foster. Report of the Technical Committee. J. Am. Soc. Brew. Chem. 72(4):296-298, 2014.
2. Li, Y. Maurice, M. . Development of a Fast and Reliable Microwave-Based Assay for Measurement of Malt Color. J. Am. Soc. Brew. Chem. 71(3):144-148, 2013.
3. American Society of Brewing Chemists, *Methods of Analysis*, Statistical Analysis-4 Youden unit block collaborative testing procedure, The Society, St. Paul, MN, 2014.

TABLE I
Malt Color (°ASBC) by rapid microwave method

	Sample Pair		Sample Pair		Sample Pair		Sample Pair	
Collaborator	**A**	**B**	**C**	**D**	**A**	**F**	**I**	**J**
1	3.15	3.48	9.58	9.23	14.78	14.70	63.47	63.44
2	3.45	3.30	10.11	10.47	14.58	15.90	64.74	66.57
3	3.53	3.33	10.34	10.97	14.25	14.43	65.18	65.25
4	3.73	3.61	10.62	10.62	14.65	14.96	69.39	69.09
5	3.27	3.34	10.96	10.32	14.27	14.53	69.27	69.84
6	3.21	3.18	10.58	10.93	15.16	15.12	62.47	63.13
7	3.15	3.20	10.39	10.59	14.88	14.96	70.41	69.14
8	2.73	3.25	9.87	9.79	13.91	13.00	71.40	65.70
9	3.23	3.28	9.60	9.78	14.50	14.02	66.34	64.82
10	3.39	3.61	10.78	10.45	15.14	15.00	71.54	71.21
11	3.30	3.30	10.70	10.80	13.80	14.50	- [a]	-
12	3.20	3.28	10.29	10.16	14.22	14.88	66.29	67.41
13	3.45	3.56	10.86	9.21	15.97	14.41	69.45	70.52
14	3.07	3.07	10.97	10.91	11.96	12.56	64.06	66.09
15	3.28	3.38	10.80	10.46	14.96	14.61	66.40	67.97
Mean	3.28	3.34	10.43	10.31	14.47	14.51	67.17	67.16
Grand Mean	3.31		10.37		14.49		67.17	

[a]Collaborator did not report a result for the I/J sample pair

TABLE II
Malt Color (°ASBC) by Standard Reference Method (ASBC-Wort 9 / Malt-9)

	Sample Pair		Sample Pair		Sample Pair		Sample Pair	
Collaborator	**A**	**B**	**C**	**D**	**A**	**F**	**I**	**J**
1	3.29	3.34	9.56	9.23	15.40	15.00	63.40	63.40
2	3.07	3.14	9.06	9.11	13.98	14.41	52.13	52.27
5	3.12	3.18	10.01	10.12	14.46	14.97	68.83	68.35
6	3.09	3.12	8.61	8.71	13.54	12.98	59.86	59.26
7	3.24	3.23	9.26	9.20	14.43	14.4	63.33	63.45
8	3.18	3.25	9.87	9.89	14.46	13.73	65.10	65.70
9	3.07	3.12	8.97	9.04	13.00	13.16	60.35	61.98
12	3.10	3.07	8.89	8.90	13.04	13.55	60.03	62.45
Mean	3.15	3.18	9.28	9.28	14.04	14.03	61.63	62.11
Grand Mean	3.17		9.28		14.04		61.87	

Table III
Statistical Summary of Results [a]

	No. of	Grand	Repeatability			Reproducibility		
Sample Pair	Labs	Mean	S_r	cv_r	r_{95}	S_R	cv_R	R_{95}
Rapid Microwave								
A/B	15	3.31	0.13	3.93	0.36	0.20	5.94	0.55
C/D	15	10.37	0.38	3.66	1.06	0.52	5.03	1.46
E/F	15	14.49	0.50	3.42	1.39	0.85	5.89	2.39
I/J	14	67.17	1.38	2.06	3.87	2.81	4.18	7.87
SRM Wort-9								
A/B	8	3.17	0.03	0.84	0.07	0.09	2.70	0.24
C/D	8	9.28	0.10	1.10	0.28	0.49	5.27	1.37
SRM Malt-9								
E/F	8	14.04	0.35	2.51	0.99	0.80	5.71	2.24
I/J	8	61.87	0.74	1.20	2.07	4.84	7.82	13.55

[a]All calculations were made based on (1).

Table IV. Comparison of methods for determination of malt color using the paired t-test for differences between means.

	Rapid Method	*Reference Method*
Mean	22.08	23.62
Variance	556.4	641.8
Observations	64	64
Pearson Correlation	0.9958	
Hypothesized Mean Difference	0	
df	63	
t Stat	-4.36[a]	
P(T<=t) two-tail	<0.0001	
t Critical two-tail	1.99	

[a] t statistic is greater (sign ignored) than t-critical indicating that the methods are significantly different at the 95% confidence level

AMERICAN SOCIETY OF BREWING CHEMISTS, INC.

Report of Subcommittee[1]

Tetrahydroiso-alpha acids in Hop Products by Spectrophotometry

Subcommittee Members: R. Smith *(Chair)* P. Aron; L. Barber; N. Bird; C. Ermey; J. Innes; T. Lambertsen (EBC); A. Newland; I. Petruncio; S. Rybka; X. Castane (EBC); R. Foster (*ex-officio)*

CONCLUSIONS

1. The spectral extinction coefficient, $E^{1\%}$, for tetrahydroiso-alpha acids of ICS-T3 was determined to be 481. Because this value was essentially identical to the published value of 480 used in the hop industry, $E^{1\%} = 480$ is to be used for alpha acids-derived, tetrahydroiso-alpha acids hop products.
2. Repeatability and reproducibility coefficients of variation for the spectral determination of tetrahydroiso-alpha acids in commercial hop products were in the range of 0.5 to 1.3% and 2.1 to 2.6%, respectively, and were judged to be acceptable.

RECOMMENDATIONS

1. The subcommittee recommends that the method for tetrahydroiso-alpha acids in hop products by spectrophotometry be included in the *Methods of Analysis.*
2. Because the spectral coefficient for beta acids-derived tetrahydroiso-alpha acids has been reported to be 4.8% greater than that of the alpha acids-derived tetrahydroiso-alpha acids (2), this subcommittee recommends that the extinction coefficient, $E^{1\%} = 503$ be used for beta acids-derived, tetrahydroiso-alpha acids hop products.
3. Discharge the subcommittee.

INTRODUCTION

In 2002 a spectrophotometric method for the determination of isomerized and reduced alpha acids in hop products was published (2). One aspect of this publication was the determination of tetrahydroiso-alpha acids in hop products. This method has been used by hop industry for a number of years and this subcommittee was charged with testing this method. There were two aims of this subcommittee: 1) determine the extinction coefficient for pure tetrahydroiso-alpha acids and 2) determine the repeatability and reproducibility of the spectrophotometric method

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with commercial hop products. This subcommittee used the HPLC standard, ICS-T3, to verify the published extinction coefficient for tetrahydroiso-alpha acids.

PROCEDURE OF SUBCOMMITTEE

Each collaborator was sent one vial of ICS-T3 which is the current HPLC standard for tetrahydroiso-alpha acids. The spectral extinction coefficient of ICS-T3 in alkaline methanol was determined by each collaborator. Each collaborator was sent two pairs of tetrahydroiso-alpha acids commercial products, with a low and high concentration of tetrahydroiso-alpha acids. Each pair was from a different batch of tetrahydroiso-alpha acids. These samples were diluted into methanol and then further diluted into alkaline methanol and the absorbance at 253 nm recorded. The concentration of tetrahydroiso-alpha acids was determined using the extinction coefficient of Maye, et al (2). The spectrophotometric results were evaluated using the Youden unit block design (1).

RESULTS AND DISCUSSION

The spectral extinction coefficient for the current tetrahydroiso-alpha acids standard, ICS-T3 was determined by this subcommittee to be $E^{1\%} = 481$; see Table 1. This result was nearly identical to the published value of 480 for alpha acids derived, tetrahydroiso-alpha acids (2). This subcommittee has decided to retain the published value of $E^{1\%} = 480$ for commercial tetrahydroiso-alpha acids products derived from alpha acids. The spectral extinction coefficient for beta acids derived, tetrahydroiso-alpha acids was published to be $E^{1\%} = 503$ (2) and this subcommittee recommends that this value be used.

TABLE I

Extinction coefficient of tetrahydroiso-alpha acids (ICS-T3) at 273 nm in alkaline methanol

Collaborator	$E^{1\%}$
1	483.6
2	482.8
3	480.2
4	479.2
5	473.2
6	482.9
7	481.4
8	461.4
9	494.6
10	489.4
Mean	480.9

Results of the concentrations of tetrahydroiso-alpha acids of two sample pairs with low and high concentrations are presented in Table II. One outlier was determined using the Dixon ratio test (1) and it was not used for the statistical calculations.

The statistical summary of the collaborative results is presented in Table III. The repeatability coefficients of variation for the concentration of tetrahydroiso-alpha acids ranged from 0.5 to

1.3% and were judged to be acceptable. The reproducibility coefficients of variation ranged from 2.1 to 2.6% and were also acceptable.

TABLE II
Tetrahydroiso-alpha acids (%, w/w) in Commercial Hop Products by Spectrophotometry

	Sample pair		Sample pair	
Collaborator	**1**	**2**	**3**	**4**
1	9.86	9.80	11.11	11.08
2	9.82	10.11	11.11	11.24
3	9.75	9.70	10.98	10.89
4	9.74	9.63	10.88	10.82
5	9.50	9.45	10.75	10.62
6	9.78	9.76	10.94	10.92
7	9.89	9.87	11.19	11.18
8	9.56	9.41	10.63[a]	11.28[a]
9	10.08	10.02	11.39	11.40
10	9.47	9.85	11.63	11.55
Mean	9.74	9.76	11.11	11.08
Grand mean	9.75		11.09	

[a] Data was deemed an outlier by Dixon ratio test.

TABLE III
Statistical Summary of Results

Sample	# of	Grand	Repeatability			Reproducibility		
pair	**Labs**	**mean**	S_r	cv_r	r_{95}	S_R	cv_R	R_{95}
1/2	10	9.75	0.12	1.26	0.34	0.21	2.13	0.58
3/4	9	11.09	0.05	0.49	0.15	0.28	2.56	0.79

LITERATURE CITED

1. American Society of Brewing Chemists. *Methods of Analysis. 2015 On-line Edition.* Statistical Analysis-4 Youden unit block collaborative testing procedure. The Society. St. Paul, MN, 2010.doi:10.1094/ASBC MOA-StasticalAnalysis-4
2. Maye, J.P., Mulqueen, S., Xu, J., and Weis, S. Spectrophotometric Analysis of Isomerized α-acids J. Am. Soc. Brew. Chem. 60:98-100, 2002.

AMERICAN SOCIETY OF BREWING CHEMISTS, INC.

Report of Subcommittee[1]

FOAM STABILITY MEASUREMENT BY NIBEM (IM)

Subcommittee Members: A. Golston, *Chair;* L. Barber; C. Cahill; W. Cornelissen (EBC); M. Cramer; M. Cronly (EBC); E. Flores; A. Harris; J. Irby; L. Lacke; H. Muto (BCOJ); Y. Sato (BCOJ); M. Schmitt (EBC); M. Schmitt; X. Castañé Sitjas (EBC); R. Solís (EBC); C. Soors (EBC); M. van Bokhoven (EBC); M. Vera (EBC); F. Verkoelen (EBC); J. Williams; W. Winning; I. Wojdyla; and K. Lakenburges (*ex officio)*.

Keywords: Collapse, Head retention

CONCLUSION

Repeatability and reproducibility coefficients of variation for the determination of foam stability by the NIBEM instrument with results compensated for temperature, pressure and humidity, ranged from 2.0 – 10.6% and 4.8 -12.8%, respectively, and were judged acceptable.

RECOMMENDATIONS

1. The subcommittee recommends that the method for Foam Stability by NIBEM be included in *Methods of Analysis*.

2. Discharge the subcommittee.

This is the subcommittee's first year of existence, started on the recommendation of the subcommittee for New and Alternate Methods of Analysis (2). Collaboration was first proposed in 2008 but was not initiated due to insufficient member interest (3). Given renewed interest in the brewing industry for beer foam stability analyses this subcommittee evaluated the NIBEM – T and NIBEM – TPH foam analyzers as viable instruments for use.

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PROCEDURE

Four sample pairs of commercial beers were sent to each collaborator. Each pair was of the same brand but from different production batches and were selected to cover a broad range of foam stability, including beer produced with different hop products and preservation conditions. Analysis was performed with automatic compensation for environmental conditions disabled. Results shown in Table I were compensated for temperature, pressure, and humidity, using the manufacturer's formulas. Results were evaluated using the Youden unit block design (1).

RESULTS AND DISCUSSION

Results from 19 collaborators were received for the four sample pairs. Results from one collaborator were excluded prior to statistical analyses because of incomplete data pertaining to experimental conditions. Data for the foam stability compensated for temperature, pressure, and humidity, are presented in Table I. Outliers were identified using Dixon's ratio test (1).

The statistical summary of the compensated foam stability is shown in Table II. Repeatability coefficients of variation for compensated foam stability ranged from 2.0 – 10.6% and were judged acceptable. Reproducibility coefficients of variation for compensated foam stability ranged from 4.8 -12.8% and were judged acceptable.

LITERATURE CITED

1. American Society of Brewing Chemists. *Methods of Analysis*, on-line ed. Statistical Analysis–4 Youden unit block collaborative testing procedure. The Society, St. Paul, MN, 2016.

2. American Society of Brewing Chemists. Report of the Subcommittee on Coordination of New and Alternate Methods of Analysis. *Journal* 72:296, 2014

3. American Society of Brewing Chemists. Report of the Subcommittee on Coordination of New and Alternate Methods of Analysis. *Journal* 66:253, 2008

Table I
Foam Stability (s) of Beer by NIBEM Compensated for Temperature, Pressure, and Humidity

	Sample Pair		Sample Pair		Sample Pair		Sample Pair	
Collaborator	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
1 [e]	307	287	328	313	249	238	132	127
2 [e]	291	275	294[a]	334[a]	251	228	154	154
3 [e]	276	277	322	319	239	226	156	130
4 [e]	282	259	306	291	228	214	110	151
5 [d]	291	257	304	286	217	204	94	128
6 [e]	299	271	298	288	232	207	109	134
7 [d]	300	288	334	312	255	227	130	156
8 [d]	285	264	316	308	238	225	112	150
9 [d]	275	276	326	311	237	224	121	144
10 [e]	310	283	336	326	250	234	143	159
11 [e]	307	261	331	311	256	221	122	149
12 [e]	303	284	334	304	248	235	108	140
13 [d]	334	294	368	341	284[a]	267[a]	218[a]	198[a]
14 [d]	257	255	306	277	226	219	139	182
15 [e]	303	303	329[a]	389[a]	228	229	170	167
16 [d]	281	266	315	300	213[a]	240[a]	118	161
17 [e]	311	292	335	309	245	235	118	169
18 [e]	318	296	344	345	253	239	126	155
19 [c]	…	…	…	…	…	…	…	…
Mean[b]	296.2	277.0	325.2	308.8	240.7	225.3	127.1	150.3
Grand Mean[b]	286.6		317.0		233.0		138.7	

[a] Outlier at P ≤ 0.05 based on totals and/or differences (1).
[b] Calculated excluding outliers.
[c] Data excluded due to incomplete information.
[d] Collaborator used NIBEM – T
[e] Collaborator used NIBEM – TPH

Table II
Statistical Summary of Results[a]

			Repeatability			Reproducibility		
Sample Pair	**No. of Labs**	**Grand Mean**	S_r	cv_r	r_{95}	S_R	cv_R	R_{95}
A/B	18	286.6	9.5	3.3	26.7	16.5	5.8	46.2
C/D	16	317.0	6.4	2.0	18.0	18.2	5.7	50.9
E/F	16	233.0	6.1	2.6	17.2	11.2	4.8	31.4
G/H	17	138.7	14.7	10.6	41.0	17.8	12.8	49.8

[a] All calculations were made based on Table I.

APPENDIX [Method Removed – will appear in *Methods of Analysis*]

AMERICAN SOCIETY OF BREWING CHEMISTS, INC.

Report of Subcommittee[1]

PHENOLIC YEAST DETECTION

(IM)

Subcommittee Members: T. Cowley (EBC), *Chair*; E. Belden; N.F Besora (EBC); M. Orive Camprubi (EBC); C. Carlucci (EBC); A. Cheung (EBC); A. Coony; V. Crisafulli (EBC); M. Davis; S. Depalma (EBC); M. Dörnberg (EBC); R. Eideman; A. Emeline Gless (EBC); R. Firli (EBC); G. Fisher (EBC); B. Gibson (EBC); D. Götsch (EBC); J. Grandell; C. Gutierrez (EBC); M. Hutzler (EBC); J. C. Juanes (EBC); K. Krogerus (EBC); H. Lemar (EBC); L. Marchesiani (EBC); S. Mather (EBC); B. Monsour; R. Norwood; J. Palausky; K. Pawlowsky (EBC); B. Perez (EBC); B. Radke; C. Rice (EBC); V. Rojano (EBC); E. Schürmeyer (EBC); K. Tafoya Gibbs; K. Tretter; S. Tynan; K. Vinkemeier; G. Vogeser (EBC); J. Vogt (EBC); C. Pachello (*ex-officio)*

Key Words: 2-methoxy-4-vinylphenol, 4-vinyl guaiacol, 4-VG, Contamination, Microbiology, Wild Yeast

CONCLUSION

1. The sensitivity for correct identification for the unknown phenolic yeast strain 2 was 100% at 24 hours and 100% at 48 hours which was considered acceptable. This strain produced a detectable amount of 4-vinyl guaiacol (2-methoxy-4-vinylphenol), in the matrix provided, by all the participants.
2. The specificity for non-phenolic unknown yeast strain 3 was 100% at 24 hours and 96.7% at 48 hours which was deemed acceptable.
3. The use of a pre-screening test to ensure collaborators could detect 4-vinyl guaiacol (4-VG) in the test matrix along with a prepared 4-VG reference control was used during testing. These additions significantly improved the results compared to the previous study performed by this subcommittee.

RECOMMENDATIONS

1. The subcommittee recommends that the method for Phenolic Yeast Detection be included in *Methods of Analysis*.
2. Discharge the subcommittee.

http://dx.doi.org/10.1094/ASBCJ-2016-4951-01

This was the second year for the subcommittee to evaluate the use of ferulic acid supplemented yeast medium to detect the presence of 4-VG from yeast strains able to decarboxylate ferulic acid resulting in the formation of this clove-like compound[1]. 4-VG is considered an off-flavor and off aroma note in beer if not intended for the particular style. The test method is subjective since it relies on the analyst's ability to detect the aroma. The aroma notes may vary in intensity depending on the yeast strain. This method has some limitations but will provide a sensory tool for laboratories lacking instruments for detecting 4-vinyl guaiacol.

PROCEDURE

Collaborators were sent 4 yeast strains on yeast and mold (YM) agar slants. Samples included the following yeast strains; strain 1 - Lager, non-phenolic (negative control); strain 2 – Ale, phenolic; strain 3 – Ale, PAD(–) gene test (indicating that yeast does not possess genes encoding phenolic acid decarboxylase enzyme); and strain 4 – Ale, phenolic. A sample of YM broth spiked with 4-VG was sent to all of the collaborators as a positive phenolic reference control. Prior to performing testing, yeast slants were streaked for isolation onto YM agar and incubated for 3-7 days to enable starting with healthy cultures. Each yeast culture was inoculated in duplicate into 20 mL of YM broth supplemented with 0.2 mL of a 1% wt/vol ferulic acid solution. After 24 and 48 hours of incubation at 27-28^{o}C, the cultures were subjectively evaluated for clove aroma resulting from 4-VG. Each laboratory was given a randomized order in which they were to assess the yeast strains.

RESULTS AND DISCUSSION

A total of 36 collaborators returned test results. Of these 36 collaborators, 3 were removed due to deviations from failure to report complete data and 2 were removed due to deviations from the test method. The order of testing was randomized between all groups.

Strain 1 was a control Lager yeast, non-phenolic producer. The specificity of detecting non-phenolic character for this strain was 100% at 24 and 48 hours (Table III). A positive reference control was utilized to help people recognize phenolic characteristics in the YM media matrix and was not scored.

Collaborators were introduced to unknown yeast strains 2, 3, and 4 for evaluation. Collaborators had 100% sensitivity for the phenolic yeast strains 2 and 4 at both 24 and 48 hours (Table IV). Strain 3 was a non-phenolic Ale yeast strain. The specificity for detecting non-phenolic character for this yeast strain was 100 % at 24 hours and 96.7% at 48 hours (Table III). One collaborator detected phenolic at 48 hours (Table II) for the non-phenolic yeast strain, in this case the strain was the last one to be assessed in their random order.

LITERATURE CITED

1. European Brewing Convention, EBC Analytica Microbiologica, Microbiological Techniques 2.3.9.5 (2013), Verlag Hans Carl Getranke-Fachverlag, Nuremberg, Germany. Retrieved December 9, 2013, from http://www.analytica-ebc.com

TABLE I

Phenolic Yeast Evaluation at 24 hours

Collaborator	Strain 1 NP Control Lager	Strain 2 Phenolic Ale	Strain 3 PAD(-) Ale	Strain 4 Phenolic Ale
1	NP	Phen	NP	Phen
2	NP	Phen	NP	Phen
3	NP	Phen	NP	Phen
4	NP	Phen	NP	Phen
5	NP	Phen	NP	Phen
6	NP	Phen	NP	Phen
7	NP	Phen	NP	Phen
8	NP	Phen	NP	Phen
9	NP	Phen	NP	Phen
10	NP	Phen	NP	Phen
11	NP	Phen	NP	Phen
12	NP	Phen	NP	Phen
13	NP	Phen	NP	Phen
14	NP	Phen	NP	Phen
15	NP	Phen	NP	Phen
16	NP	Phen	NP	Phen
17	NP	Phen	NP	Phen
18	NP	Phen	NP	Phen
19	NP	Phen	NP	Phen
20	NP	Phen	NP	Phen
21	NP	Phen	NP	Phen
22	NP	Phen	NP	Phen
23	NP	Phen	NP	Phen
24	NP	Phen	NP	Phen
25	NP	Phen	NP	Phen
26	NP	Phen	NP	Phen
27	NP	Phen	NP	Phen
28	NP	Phen	NP	Phen
29	NP	Phen	NP	Phen
30	NP	Phen	NP	Phen
31	NP	Phen	NP	Phen

NP = Non-phenolic Phen = Phenolic

TABLE II

Phenolic Yeast Evaluation at 48 hours

Collaborator	Strain 1 NP Control Lager	Strain 2 Phenolic Ale	Strain 3 PAD(-) Ale	Strain 4 Phenolic Ale
1	NP	Phen	NP	Phen
2	NP	Phen	NP	Phen
3	NP	Phen	NP	Phen
4	NP	Phen	NP	Phen
5	NP	Phen	NP	Phen
6	NP	Phen	NP	Phen
7	NP	Phen	NP	Phen
8	NP	Phen	NP	Phen
9	NP	Phen	NP	Phen
10	NP	Phen	NP	Phen
11	NP	Phen	NP	Phen
12	NP	Phen	NP	Phen
13	NP	Phen	NP	Phen
14	NP	Phen	NP	Phen
15	NP	Phen	NP	Phen
16	NP	Phen	NP	Phen
17	NP	Phen	NP	Phen
18	NP	Phen	NP	Phen
19	NP	Phen	NP	Phen
20	NP	Phen	NP	Phen
21	NP	Phen	NP	Phen
22	NP	Phen	NP	Phen
23	NP	Phen	NP	Phen
24	NP	Phen	NP	Phen
25	NP	Phen	NP	Phen
26	NP	Phen	NP	Phen
27	NP	Phen	NP	Phen
28	NP	Phen	NP	Phen
29	NP	Phen	NP	Phen
30	NP	Phen	NP	Phen
31	NP	Phen	Phen	Phen

NP = Non-phenolic Phen = Phenolic

TABLE III

Specificity for Non-Phenolic Yeast Strains at 24 and 48 Hours

Strain	# of Correct Dispositions 24 Hr	Total # of Classifications 24 Hr	Specificity for Non-Phenolic 24 Hr	# of Correct Dispositions 48 Hr	Total # of Classifications 48 Hr	Specificity for Non-Phenolic 48 Hr
1	31	31	100%	31	31	100%
3	31	31	100%	30	31	96.7%

TABLE IV

Sensitivity for Phenolic Yeast Strains at 24 and 48 Hours

Strain	# of Correct Dispositions 24 Hr	Total # of Classifications 24 Hr	Sensitivity for Non-Phenolic 24 Hr	# of Correct Dispositions 48 Hr	Total # of Classifications 48 Hr	Sensitivity for Non-Phenolic 48 Hr
2	31	31	100%	31	31	100%
4	31	31	100%	31	31	100%

APPENDIX [removed – method will appear in *Methods of Analysis*]

AMERICAN SOCIETY OF BREWING CHEMISTS, INC.
Report of Subcommittee[1]

SPECTROPHOTOMETRIC METHOD FOR THE DETECTION OF LIPOXYGENASE IN MALTED BARLEY (IM)

Subcommittee Members: R. Monsour, *Co-Chair;* K. Vinkemeier, *Co-Chair;* K. Allder (*EBC*); J. Ashlock; C. Carvalho; E. Goeke (*EBC*); D. Griggs (EBC); S. Harasymow (EBC); M. Izydorczyk; T. Henderson; A. Macleod; R. Lahlum; Y. Li (EBC); JD. Lowe; M. Maurice; J. Menert; T. McMillan; R. Mikulíková (*EBC*); S. Millard (*EBC*); M. Miller; J. Olsovska (EBC); G. Powell (*EBC*); H. Roderfeld (EBC); M. Rodriguez; M. Schmitt (*EBC*); S. Schwebel; X. Castane (*EBC*); P. Schwarz; I. Stuart; J. Vos (*EBC*); M. Walters; P. Zsoldos (*EBC*); and R. Jennings (*ex-officio*).

Keywords: LOX, flavor, stability, staling

RECOMMENDATIONS

1. The subcommittee recommends changing how the acetate buffer is made to yield a 0.1 M acetate buffer (pH 5.0) + 0.1 M sodium chloride, as well as modifying the borate buffer solution to yield a 0.05 M borate buffer (pH 9.0).
2. The subcommittee recommends changing the temperature of the circulating water bath which holds the phosphate buffer from to 25±1°C.
3. The subcommittee recommends removing the requirement for a temperature controlled spectrophotometer and to record the temperature at which the assay was run.

This report is published as submitted. The pages were numbered at the ASBC headquarters office, but the report was not edited.

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4. The subcommittee recommends adding a known control sample.
5. The subcommittee recommends a second year of collaborative testing.
6. The subcommittee recommends furthering steps to control the anomalies causing variances between labs to be 4 points of measure, not linear, in order to extrapolate more points.

This is the second year of the subcommittee's existence. The subcommittee was started on the recommendation of the Subcommittee for *Coordination of New and Alternate Methods of Analysis* (1). It was determined there was interest in the development of a standard method to detect lipoxygenase (LOX) in malted barley to be used across multiple laboratories.

In the first year, a questionnaire was distributed to all subcommittee members to determine methodologies currently in the malting industry. Based on the response to the questionnaire, a method of analysis for the detection of LOX in malted barley was constructed.

In the second year, the method was distributed and evaluated by the subcommittee members through collaborative testing. A total of eight samples representing four sample pairs (similar but distinct) plus two check samples were sent to each collaborator with a range of LOX activity values. A second control has been added to the set of samples for variability as well as to increase the reliability of testing. The collaborators were asked to follow the method included with samples and to note any deviations from the prescribed protocol.

PROCEDURE

Four sample pairs plus two check samples were pre-ground using a Buhler DFLU mill set to fine grind (**Malt-4**), vacuum sealed and sent to each collaborator. Each sample pair was of the same barley variety, malted under the same conditions, but were from different production lots. The sample pairs were chosen to include a range of LOX enzymatic activity.

To summarize the procedure, each malt sample was extracted with an acetate buffer, pH 5.0, for 20 minutes. The extract was reacted with a 2.5% linoleic acid solution in a phosphate buffer matrix, pH 6.8, for four minutes. The enzymatic activity was monitored by the change in absorbance at 234 nm. Absorbance readings were recorded at one and four minutes. Results were evaluated using the Youden unit block design (3). The entire method can be found attached to the end of this report.

CONCLUSIONS

1. Repeatability and reproducibility coefficients of variation for the determination of lipoxygenase activities in malted barley by spectrophotometry ranged from 0.57 to 45.79% and 2.88 to 58.09%, respectively, and were judged unacceptable.
2. Anomalies produced inconclusive data due to deviations from the procedure.
3. A second round of collaborative testing will be performed.

RESULTS AND DISCUSSION

Results from 14 collaborators were received for four sample pairs and two check samples. Results from two collaborators were excluded prior to statistical analyses because they did not follow the prescribed experimental protocol. Data for LOX activity is presented in Table I.

The statistical summary of the LOX activity data is presented in Table II. Repeatability and reproducibility coefficients of variation for the determination of LOX activity in malted barley by spectrophotometry ranged from 15.4 to 73.3% and 47.6 to 96.9%, respectively, and were judged unacceptable. The inconsistency in results was concluded to be due to a calculation error in chemical preparation and several deviations from the prescribed protocol. To eliminate some of these variations the subcommittee recommended modifications to the prescribed protocol and another year of collaborative testing is recommended.

Table I

Lipoxygenase activity (U/g) in Malted Barley by Spectrophotometry

	Sample Pair		Sample Pair		Sample Pair		Sample Pair		Check Samples	
Collaborator	**A**	**D**	**B**	**G**	**C**	**F**	**E**	**H**	**C1**	**C2**
1	6.0	6.4	2.9	3.1	14.7	22.6	13.9	11.2	5.6	5.9
2	11.5	11.9	0.9	0.6	25.0	41.0	31.0	17.3	11.5	8.4
3	19.2[a]	25.8[a]	-0.06[a]	-0.26[a]	42.7[a]	53.9[a]	46.4[a]	26.3[a]	19.2[a]	16.1[a]
4	4.7	7.1	1.3	0.4	12.6	24.7	15.2	9.4	4.7	5.3
5	7.7	10.2	0.8	0.3	20.4	30.4	21.6	14.4	7.7	8.0
6	9.6	12.5	1.2	1.0	24.9	50.5	27.5	18.6	9.6	9.8
7	7.2	9.1	0.6	0.4	19.3	37.6	22.9	13.2	7.2	6.5
8	7.4	8.9	0.6	0.4	18.1	36.4	25.0	14.4	7.4	8.1
9	4.1	5.0	0.0	0.0	10.9	18.6	11.4	8.8	4.1	3.8
10	17.8	21.4	1.2	0.5	46.6	103.8	118.1	30.4	17.8	16.1
11	13.6	18.5	3.4	3.0	31.3	46.0	33.3	21.9	13.6	10.9
12	4.8	6.3	0.3	0.0	15.4	26.4	16.4	8.0	4.8	5.7
13	9.6	7.6	1.5	1.2	16.6	31.2	22.1	9.8	6.9	7.2
14	13.0[a]	15.3[a]	6.7[a]	6.2[a]	17.1[a]	31.8[a]	26.0[a]	11.7[a]	13.4[a]	…
Mean[b]	8.67	10.41	1.22	0.90	21.30	39.10	29.86	14.77	8.41	7.98
Grand Mean[b]	9.54		1.06		30.20		22.31		8.19	

[a] Outlier because the collaborator did not follow the prescribed protocol.

[b] Calculated excluding outliers.

Table II

Statistical Summary of Results[a]

			Repeatability			Reproducibility		
Sample Pair	**No. of Labs**	**Grand Mean**	S_r	CV_r	r_{95}	S_R	CV_r	R_{95}
A/D	12	9.54	1.42	15.36	3.96	4.39	47.62	12.29
B/G	12	1.06	0.20	19.13	0.57	1.03	96.94	2.88
C/F	12	30.20	9.47	31.37	26.53	17.38	57.55	48.66
E/H	12	22.31	16.35	73.29	45.79	20.75	92.97	58.06
C1/C2	12	8.19	0.96	11.69	2.68	3.69	45.05	10.33

[a]All calculations were made based on Table I.

LITERATURE CITED

1. American Society of Brewing Chemists. Report of Subcommittee on *Methods of Analysis* Malt Review. *Journal* 67:262, 2009.

2. Melanie Nieuwoudt. LTP1 and LOX-1 in barley malt and their role in beer production and quality. *Stellenbosch University.* 1-6:1-24, 2014.

3. American Society of Brewing Chemists, Statistical Analysis – 4: *Youden Unit Block Collaborative Testing Procedure*; 1983.

APPENDIX [Removed from committee report]

AMERICAN SOCIETY OF BREWING CHEMISTS, INC.

Report of Subcommittee[1]

COORDINATION OF NEW AND ALTERNATE METHODS OF ANALYSIS

Subcommittee Members: J. Palausky, *Chair*; L. Barr; S. Brendecke; R. Foster;; R. Jennings; E. Jorgenson; K. Lakenburges; A. Macleod; C. Pachello; A. Porter; and M. Eurich (*ex officio*).

Associate Members: J. Masschelin (TTB)

Corresponding Members: E. Welten (EBC); and Masahito Muro (BCOJ).

RECOMMENDATIONS

1. Conduct on-line polling to obtain input on new and alternative methods.

The function of this subcommittee is to collect, from various sources, new and alternate methods of analysis that may be useful to the industries our Society serves. These methods are reviewed to establish their merit and usefulness, and a recommendation regarding collaborative testing is made to the Technical Committee. The subcommittee tracks and records the disposition of each method considered. The subcommittee is also charged with the responsibility of periodically reviewing existing methods for accuracy and usefulness.

STATUS OF SUBCOMMITTEE

Membership and Meetings

Given the very close tie this subcommittee has with the Technical Committee, it has been decided to make the New & Alternate Methods subcommittee an integral part of the Technical Committee's activities and align membership of the two groups. Additional subject matter experts will be added to this subcommittee, or consulted with on an as needed basis.

The subcommittee held a meeting at the 2016 ASBC meeting in Denver, CO. Topics of interest and discussion included:

- Test methods for HAACP plans. Spent grain handling? Comments were that unless it is used for human consumption there are not specific requirements. Feeding cattle =is another

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discussion point but perhaps only valuable for larger breweries.
- Are updated methods for haze, turbidity, etc. needed since most methods are for American light lager and Craft Brewer styles can differ significantly?
- Can guides for Craft Breweries be improved or expanded?
- Method for starch gelatinization method using differential calorimetry.

Topics for polling

Polling questions were developed for on-line polling to gather information on potential new methods for collaborative study. These questions were formatted into two web-based surveys with assistance and administration by SCISOC staff. The topics in the online poll along with background information are described below and in the Appendix.

Packaging. Based on discussions during the New and Alternative Methods session at the 2015 annual meeting, it was decided to use polling to gather information on the current state of packaging and member needs to identify potentially new methods that could be examined.

Topics to Archive:

None.

APPENDIX
Summarized Results from 2016 Online Polling

Top Line Results

- 95 individuals started the 2016 Packaging poll. The completion rate of the poll was 80%
- Both traditional (glass, cans, kegs) and non-traditional packages are being produced by ASBC members.
- Non-traditional packages in play – Beer in a box, Firkins, Plastic (PET) bottles

Summary of Packaging Poll

The following is a summary of comments submitted regarding new and/or alternative methods that are not currently in the MOA.

- Total Package Oxygen (TPO) -Hach 6110 "total package analyzer" reports fill volumes. Would be very nice to have some external/ASBC structured help to validate these measurements.
- Method for checking for catastrophic beer spoilers with broth.
- Can seam checkware
- Bottle washer detergent strength validation. Titration of caustic, phosphates, carbonates and aluminum is complex and not suitable at operator level.
- Final package product dilution (combination of Alcohol, pH and color) and CO2 and O2 measurement combined in one measurement.
- In-line (or simplified) sodium analysis validation CIP as part of CCP.

AMERICAN SOCIETY OF BREWING CHEMISTS, INC.

Report of Subcommittee[1]

BEER METHODS REVIEW

Subcommittee Members: K. Lakenburges, *Chair*; L. Barber; L. Chadwick; R. Jennings; J. Palausky; A. Porter; and M. Eurich *(ex officio)*.

RECOMMENDATIONS

The subcommittee recommends the following topics/methods be considered for future collaborative studies:

a. Dimethyl sulfide – need a method utilizing more modern instrumentation.
b. Dissolved Oxygen – need modern instrumental method(s) or guidelines.
c. Beer Haze (Physical Stability) – need methods utilizing modern instruments.
d. N-Nitrosamines – need a modern update.

This subcommittee was formed to review the methods listed in the Beer section of the MOA for clarity, relevance, and adherence to the guidelines for written methods listed on pages 18 to 22 of the *Subcommittee Chair Procedure Manual 2*.

The methods are revised by members of the subcommittee with a final review by all members of the subcommittee. Methods currently undergoing revision: Beer-4, -22, 23, -41, and -42.

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Craft Brewing Subcommittee Report – Journal ASBC 2016

Eric Jorgenson

The Grow-Your-Own-Lab series has been the focus of the Craft Brew Subcommittee, and we've made some good progress in 2016 so far, with a few more projects lined up for 2017. We also played a role in bringing the inaugural Lab-In-A-Fishbowl to CBC, and ASBC's first collaboration with the Brewer's Association.

Grow Your Own Lab

Polish "Guideline to Growing Your Quality Laboratory" sheet

The Grow Your Own Lab handout has been a big hit. I hand it out regularly to small craft breweries looking for guidance in their quality program. A few small adjustments have been suggested from the Craft Brew members (including a <1K category for microbreweries), which we will implement as applicable, and then use this guide as a framework around which to generate more content tailored to the different size breweries.

Sample plan templates

Speaking of generating more content, we are starting to work on example sampling plan templates that breweries of various sizes can use as a guide to base their quality testing regimen around. Using the GYOL handout at a framework, it will allow small and growing quality labs a sense of where their programs should be and what to be mindful of as they continue to grow. We are hoping for an early 2017 rollout.

GYOL webinars – 2016 Additions

"Introduction to brewing lab chemistry": Derek Gruter of Stone presents on chemical safety and the role of analytical chemistry in brewing labs.

"Documenting the way to improved quality": Aaron Golston of Lagunitas, Ben Chambers of Ninkasi, and Kate Devine of Russian River teamed up to deliver this webinar on documentation as an important means of influencing brewing quality.

"Diacetyl measurement and control": Bryan Donaldson of Lagunitas, Dan Driscoll of Avery, and Rick Blankemeier of Stone brought first-hand expertise to the table and presented on three unique ways of measuring diacetyl content in beer.

"Brewery package testing": This is the next webinar in the que, though we are still in the early stages of planning. It will cover the appropriate tests to be performed on packaged beer including bottles, cans, and kegs.

This report is published as submitted. The pages were numbered at the ASBC headquarters office, but the report was not edited.

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Lab In A Fishbowl

The inaugural Lab-in-a-Fishbowl took place at the CBC in Philadelphia in May – Tom Shellhammer and Eric Jorgenson presented on measuring specific gravity and yeast health & cell counting. The second Lab-In-A-Fishbowl took place at the WBC in Denver in August – Scott Briton, Kelly Tretter, Patricia Aron, and Tom Shellhammer presented on wort gravity, yeast health and cell counting, and IBU measurement. We have learned a lot from these first two sessions and will bring these improvements forward.

"Getting Started" webpage

A small entry-level webpage was created to help introduce new members to the ASBC and what we have to offer.

ASBC/Brewer's Association collaboration

The ASBC and BA are working together to generate some short videos on the basics of brewing quality control. A small team met up in Boulder to shoot at Avery (huge thanks to Dan for hosting!), with scriptwriting help from Allagash and Highland. The project is still in editing, though the majority of the recording is done.

We are looking forward to an engaging and productive 2017!