



INSTRUMENTATION AND ANALYSIS

Introduction

A questionnaire on Instrumentation and Analysis was circulated prior to the MCBA meeting in Loughborough in January 2012. The purpose of the questionnaire was to identify common methods used by MCBA brewers to control their brewing process. The preliminary results were discussed at the meeting. Further completed questionnaires were received after the meeting and a final Summary Table was prepared.

Results

In total 14 brewers provided completed questionnaires and the results are summarised in Table below.

Key points to note

1. There was extensive use of thermometers and hydrometers (refractometers) at most of the key stages by most of brewers, as expected.
2. Iodine testing and use of pH meters were common.
3. Some use a combination of refractometer and hydrometer for different tasks (sparge control at high temperatures vs gravity at ambient temperatures) and one brewer used both at stages where hydrometer is used normally.
4. No use of microscope by anyone to check yeast.
5. All metric except one brewer who mixed Metric and Imperial.
6. At the meeting the use of correction factors for refractometry was discussed but most brewers do not use a correction factor.
7. No “unusual” tests noted.
8. Only 50% who replied calculate mash efficiency and this dropped to 20% for calculation of brewhouse efficiency.
9. Only 1 brewer measured temperature of the grist routinely but most stored warm before mashing.
10. The use of temperature strips for fermenters was discussed at the meeting and, in general, these were recommended as both useful and accurate.

Conclusions

An interesting exercise even if there were no great surprises but, minor surprises to author were Key points 5 and 7 above.

Some areas that could have been considered but were missed were

- Water Analysis
- Sparge water temperature and bed temperature during sparging
- Sparge flow rate measurements

MCBA	Activity	Assay	Method	Numbers	Step	Activity	Assay	Method	Numbers
1	Water	pH	pH meter	4		6 Fermentation			
		Temperatur	Thermometer	14		Pre-yeast addition	Gravity	Hydrometer	7
2	Grain	Temperatur	Thermometer	1			Gravity	Refractometer	3
3	Mashing (assumed 90min.)						Temperature	Thermometer	6
	Start	Starch	Iodine	3			pH	pH meter	1
		Temperatur	Thermometer	14			Temperature	ATC800	1
		pH	Litmus paper	1			Temperature	Thermocoupl	1
	15 minutes	Temperatur	Thermometer	1		Post yeast addition			
	Middle (45min.)			1		During	Gravity	Hydrometer	7
	60 minutes	Temperatur	Thermometer	1			Temperature	Strips	1
	End	Starch	Iodine	5			Temperature	ATC 800	1
		Temperatur	Thermometer	4		End	Gravity	Hydrometer	11
	Throughout	Temperatur	Thermometer	1			Gravity	Refractometer	3
4	Sparging						Temperature	Thermometer	6
	Start	Gravity*	Refractometer	2			pH	pH meter	1
		Gravity	Refractometer	1			Temperature	ATC 800	1
		Temperatur	Thermometer	1			Temperature	Thermocoupl	1
	Middle					7 Racking			
	End	Gravity	Refractometer	5		8 Packaging	Gravity	Hydrometer	9
		p	pH meter	1			Temperature	Thermometer	4
		Gravity	Hydrometer	1					
	Throughout	Gravity	Refractometer	1		9 Calculate mash	Yes		9
5	Boiling					10 Calculate	Yes		4
	Start	pH	pH meter	4		11 Volumes in	Litres		13.5
		Gravity	Hydrometer	7		12 Weights in grams	Grams		13.5
		Gravity	Refractometer	3					
		Temperatur	Thermometer	3					
	Cooled	Gravity	Hydrometer	7					
		Temperatur	Thermometer	13					
		Gravity	Refractometer	3					
		pH	pH meter	1					