



**WORLD BREWING CONGRESS**  
August 13–17, 2016 • Denver, Colorado, U.S.A.

#ElevateBeer



# Modern approaches to beer taster training

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# Overview

- ▲ **Beer tasting**
- ▲ **Choosing the right trainees**
- ▲ **Materials, methods and environment**
- ▲ **Assessment of taster performance**
- ▲ **Summary and conclusion**





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# 1. Beer tasting



# Assessment methods

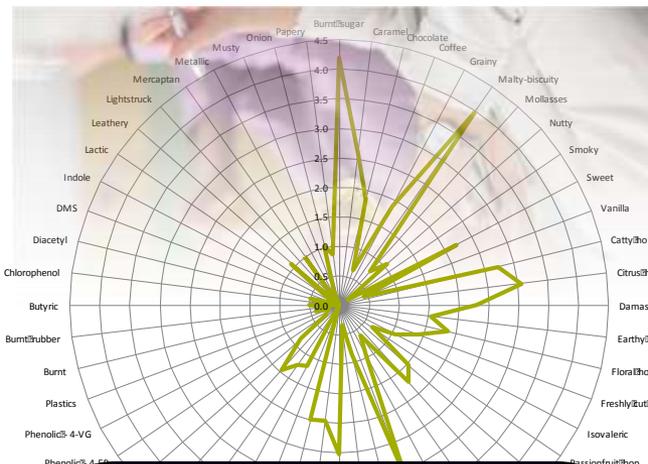
method

**A = B?**

Difference tests

Quality tests

**A = OK?**



Descriptive profiling

# Tasting skills gap between small and large breweries

<10,000 hl

Annual production

>1,000,000 hl



Survey of 179 breweries – reported at *Trends in Brewing*, Ghent – April 2016



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# 2. Choosing the right trainees



# What do beer tasters have to do?

Rate the intensity of flavors in beer

Identify flavor compounds in beer

Evaluate the quality of beer samples on the basis of their flavor

3

2

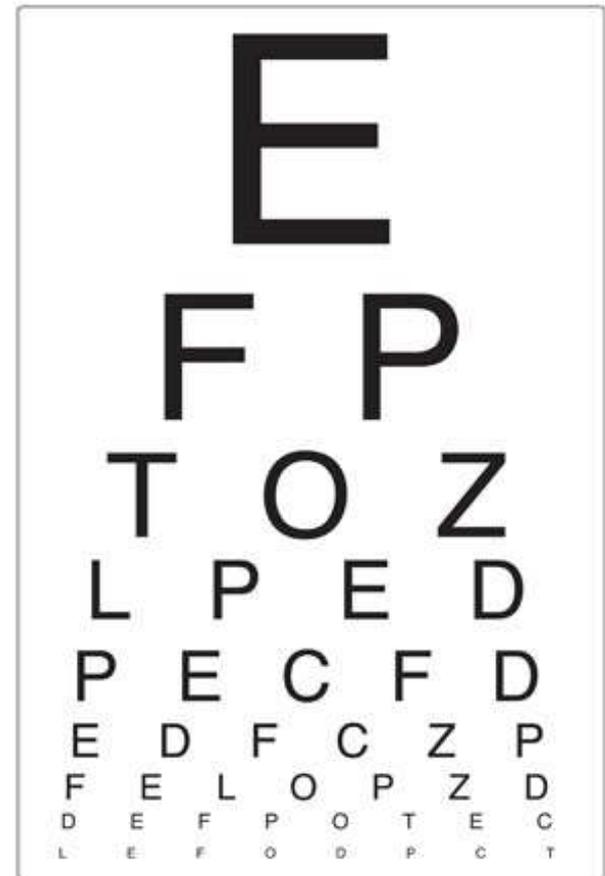
1



# Assessment of trainee tasters on the basis of taste acuity is flawed

Patient: "I'm having trouble hearing what people say"

Doctor: "Can you read the top three lines of the chart for me?"



# The ideal taster

The ideal taster

Easy to train

Enthusiastic

Available

Reliable

Gifted



# The ideal taster

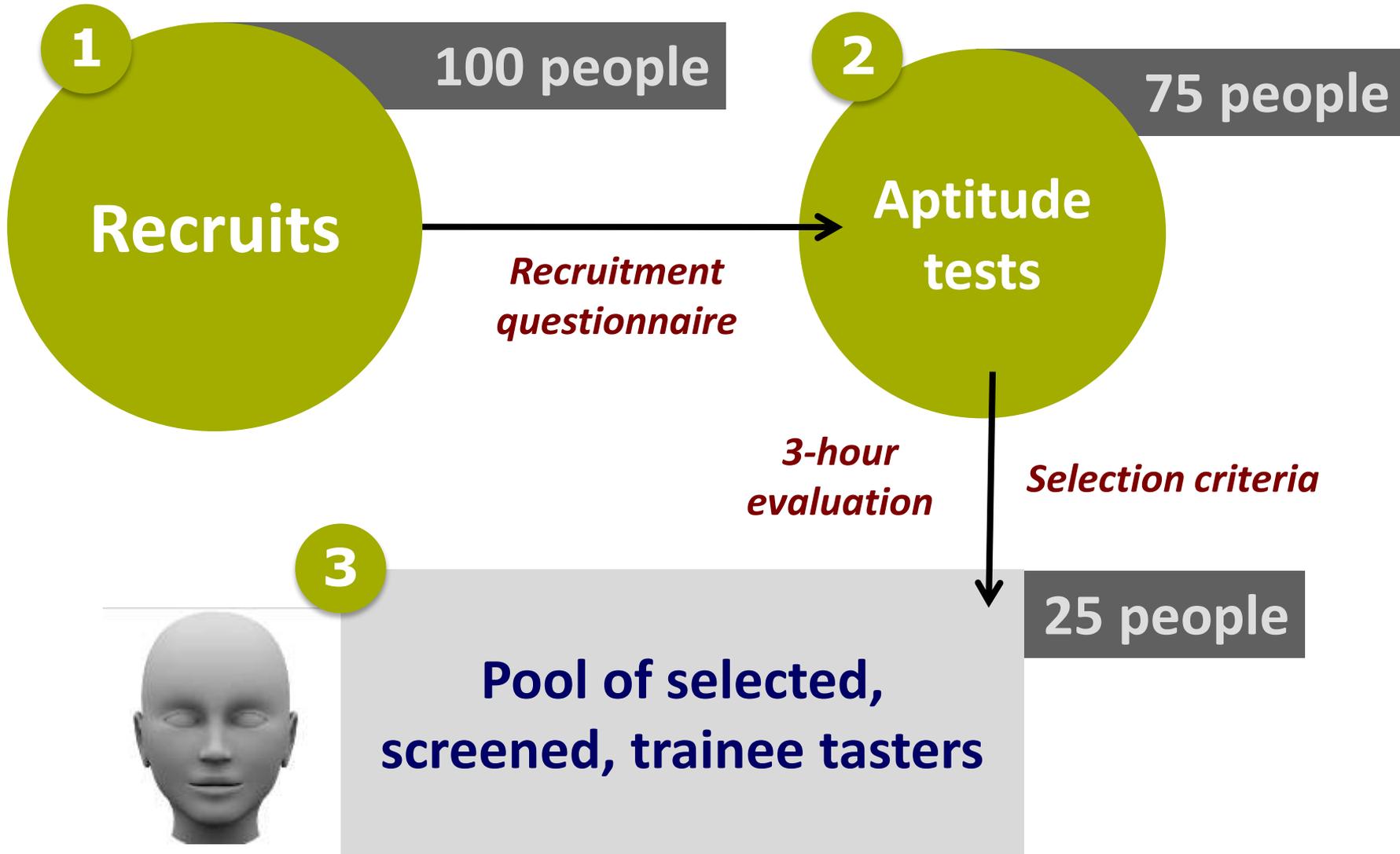
The ideal taster

**We have no  
reliable means  
of evaluating our  
“gift” for tasting**

**We need help to  
compare  
ourselves to  
others**



# Trainee selection and screening



**1** **2 samples**

**Session #1**  
Warm-up session

*Training in the correct way to evaluate beer samples*

**2** **11 samples**

**Session #2**  
Recognition test session

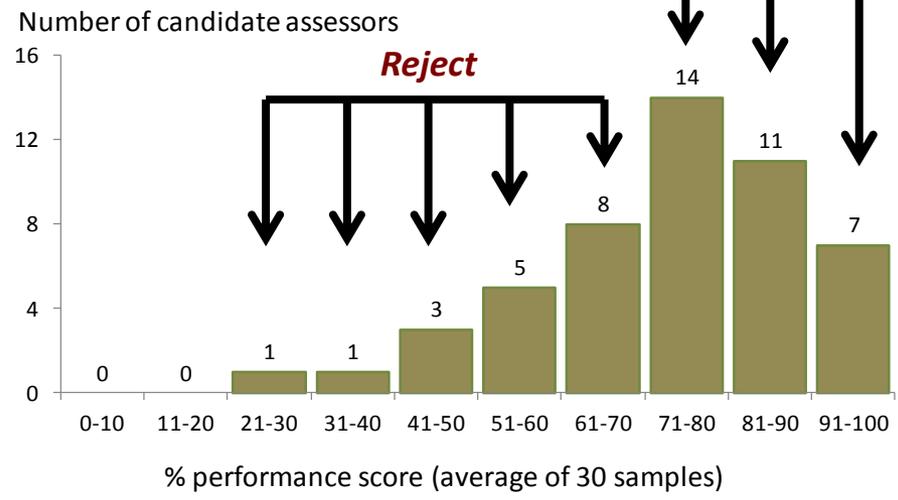
*Training to recognize 10 different flavors in beer*

**3** **11 samples**

**Session #3**  
Recognition test session

*Training to recognize 10 different flavors in beer*

**5**



**4** **10 samples**

**Session #4**  
True / false test session

*Blind testing of 10 beer samples*



# With the right people

right people



Training is easy

Scoring during training is high

Performance after training is good

Attendance levels at tasting are high



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# 3. Materials, methods, and environment



**Beer used to train tasters should be .....**



**Fresh**

**Defect-free**

**There is NO requirement for beer to be neutral in flavour – if you make IPA, use IPA!**

It takes a lot of beer to train 25 tasters over 5 days!



materials, methods, environment

# Plastic glasses – essential, rather than optional

materials, methods, environment



# Taste forms – easy to understand, easy to use



## TEST 6 – RECOGNITION TEST

Name .....

Date .....

You will be presented with 10 samples. All of these have one dominant flavour character comparison with the control sample.

Using both your sense of smell and taste, describe the dominant flavour in each sample.

Sample number	Dominant flavour
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

### Possible flavour characteristics:

butyric, citrus hop, damascenone, diacetyl, ethyl butyrate, ethyl hexanoate, isoamyl biscuity, mercaptan



## TEST 7 – TRUE / FALSE TEST

Name .....

Date .....

You will be presented with 10 samples. Please decide whether the statements below are true or false for each sample by placing a tick in the appropriate column.

You must make a choice in each case.

Sample number	Statement	True	False
1	This sample has an acetic flavour		
2	This sample has an isovaleric flavour		
3	This sample has a metallic flavour		
4	This sample has a musty flavour		
5	This sample does not have a grainy flavour		
6	This sample does not have a sulphury flavour		
7	This sample has a smoky flavour		
8	This sample does not have a sour taste		
9	This sample has a bitter taste		
10	This sample has a diacetyl flavour		

# Delegate documentation – informative and detailed

materials, methods, environment

## A brief guide to the flavor of beer

Close to 200 chemicals determine the flavor of the wide range of beer styles enjoyed by consumers today. These include almost 100 positive flavor characteristics and a similar number of off-flavors and taints. These flavors originate from raw materials, process conditions, microbiological contamination, or tainted processing aids or packaging materials. Training to detect and identify such flavor notes involves tuition and practice. This is best done using beer samples to which low levels of individual 'sensory-pure' flavors have been added.

This short guide describes 48 of the most important flavor characteristics found in beer.

With few exceptions the names used to describe these flavors are those recommended by global brewing industry authorities, including the European Brewery Convention (EBC), American Society of Brewing Chemists (ASBC), Master Brewers Association of the Americas (MBAA), and Brewing Congress of Japan (BCJ).



### Key

1 mg / l = 0.001 g/l (parts per million)  
 1 µg / l = 0.000001 g/l (parts per billion)  
 1 ng / l = 0.000000001 g/l (parts per trillion)

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Icon	Attribute	Chemical	Assessment	Threshold	Origins	Importance	Remarks	Flavor category
	Acetaldehyde	Acetaldehyde	Cover the beer with your hand and swirl the glass to release the aroma. Remove your hand and take a single long sniff. Repeat as necessary.	5 mg / l	Produced by yeast during fermentation. Indicative of fermentation problems and poor control of dissolved oxygen in packaging of beer.	Present in all beers. Characteristic flavor of some beer styles, eg Bière de Garde (French Country Beer). Off-flavor at high concentrations.	The flavor impact of acetaldehyde is influenced by the sulfur dioxide concentration in the beer. Addition of sulfur dioxide to beer suppresses the flavor of acetaldehyde.	Off-flavor
	Acetic	Acetic acid	Without covering the glass, swirl the beer to release the aroma. Take a single short sniff. Repeat as necessary.	90 mg / l	Produced by yeast during fermentation. Too much yeast growth, contaminating bacteria and wild yeasts can produce excessive levels.	Present in all beers. Characteristic flavor of some beer styles, eg Lambic beer from Belgium. Off-flavor at high concentrations. Common problem in draught-dispensed beers.	The intensity of this flavor increases with decreasing beer pH value. Also produced by Brettanomyces yeasts prominent in barrel ageing.	Off-flavor

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excellence in professional tasting

# Pure beer flavor compounds – covering all important attributes



- ▲ Free of sensory impurities
- ▲ Stabilized by encapsulation
- ▲ Extensively analysed and validated
- ▲ Added to beer to create training samples

# The ASBC flavor terminology details four compounds for hop flavour training - we use 36

**Geraniol** Isovaleric acid Ethyl-2-methylbutyrate 3-(Methylthio)-hexyl acetate  
Nerol 4-Mercapto-4-methylpentanone Limonene oxide  
D-Carvone  $\beta$ -Caryophyllene L-Carvone 3-Mercapto-hexylacetate  
Geranial  $\beta$ -Damascenone  $\beta$ -Citronellol *cis*-3-Hexenal  
*trans,cis*-2,6-Nonadienal **Linalool**  $\lambda$ -Undecalactone  
 $\beta$ -Farnescene Eugenol Isobutyl-methoxypyrazine  $\lambda$ -Nonalactone  
*cis*-3-Hexenyl acetate **Myrcene**  
Ethyl-3- Terpinyl acetate  $\alpha$ -Humulene Methanethiol  
methylbutyrate  
 $\beta$ -Ionone Geranyl acetate  $\alpha$ -Pinene Isoamyl isobutyrate  
Dimethyl disulphide Ethyl-4-methylpentanoate Dimethyl trisulphide

# The importance of “sensory purity”

99.9%

- ▲ Each of us is “blind” to several flavor compounds - this genetically-inherited ‘blindness’ is called anosmia
- ▲ Trace contaminants are often present in odour-active chemicals
- ▲ Their presence can cause people who are anosmic to a specific chemical to believe they can detect it, and others to mistake its flavor character for something else

***GC-  
olfactometry  
can be used  
to assure the  
sensory  
purity of  
flavor  
standards  
used in  
training***



# Beer flavor quality training course

## Training course for 25 people

Day 1	Day 2	Day 3	Day 4	Day 5
Recognition test	Recognition test	Recognition test	Recognition test	Quality assessment test
Recognition test	Recognition test	True-false test	Stop-go test	Quality assessment test
Recognition test	True-false test	Recognition test	Stop-go test	Quality assessment test
Recognition test	Recognition test	Recognition test	Recognition test	Revision session
	Recognition test	Stop-go test	True-false test	Flavor identification test

# Typical flavors - craft beer training

materials, methods, environment



# Beer flavor quality training course

▲ **5 days**

▲ **24 sessions**

▲ **40 flavours**

▲ **250 samples**



**90%**

correct answers

100%

80%

materials, methods, environment

The training environment is less important than having the right people, tools and approach – and trainer

materials, methods, environment







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# 4. Assessment of taster performance

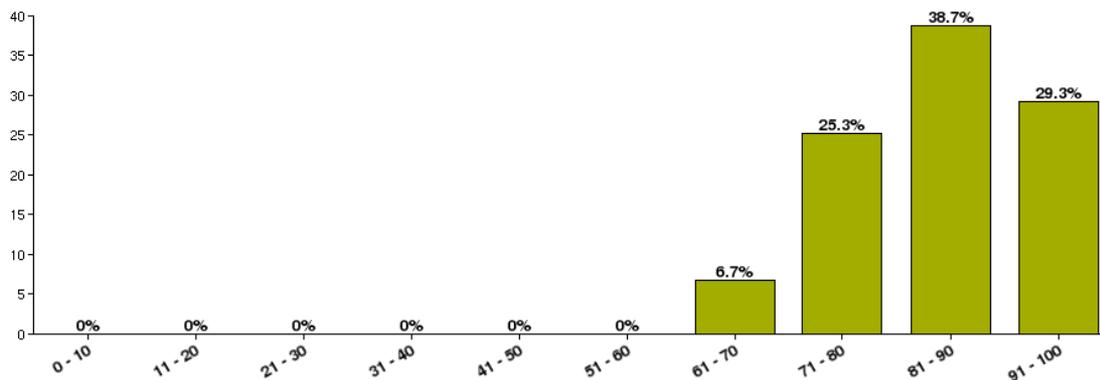


# Objective validation of assessor performance

Measure  
Measure  
Measure

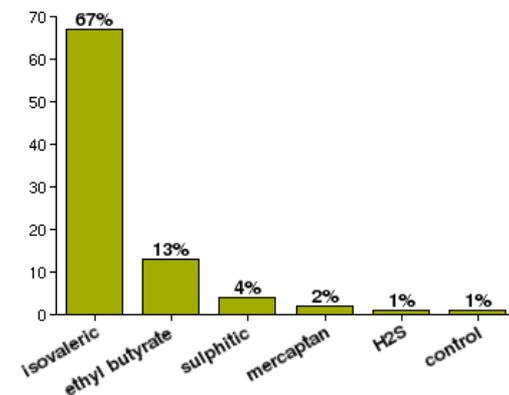
validation of assessors and tests

panel performance comparison

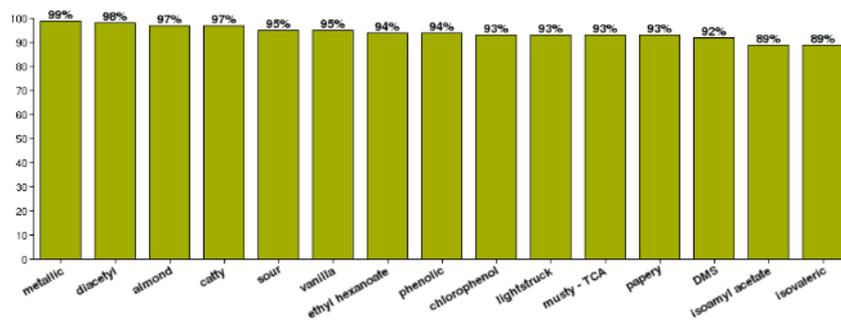


butyric (68% results correct - 32% results incorrect)

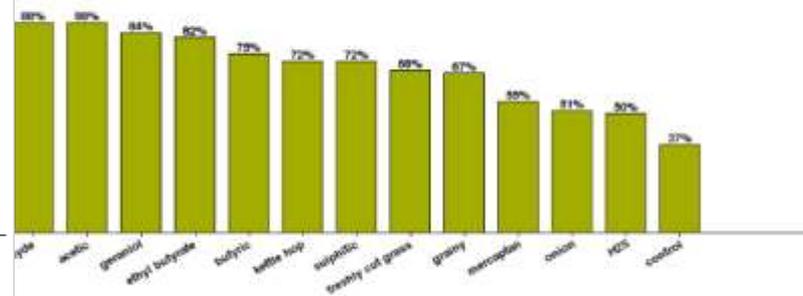
[The information below shows the %'s of the incorrect results]



attribute performance chart (1/2)



attribute performance chart (2/2)





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# 5. Summary and conclusions



# Summary and conclusions

- ▲ **With selected, screened trainees and the right tools and techniques, taster skills can be developed predictably, consistently and quickly**
- ▲ **Taster training is within the reach of all breweries, using flavors tailored to the styles of beer made by the brewery**
- ▲ **Measurement of taster performance for every sample contributes objectivity to the taster training process**