

Draught beer quality - challenges and opportunities

David Quain

red.ts Ltd, 9 Wheatfield Court, Willington, Derbyshire, DE65 6PT, United Kingdom
(e-mail: david.quain@red-ts.com)

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SUMMARY

In the majority of European markets, draught beer is in slow long-term decline. Whilst numerous factors – political, economic, social and technical – have been implicated, poor beer quality has played a significant role in consumer dissatisfaction with draught beer. The challenge to raise the quality bar is being met by innovation from cellar to tap. This paper describes the numerous developments that range from the consumer (mystery shopper accreditation) to technology led such as improved product cooling, glassware that aids presentation, dispense tubing that deters biofilm attachment, better and assured line cleaning and the opportunities from real time, remote data logging.

INTRODUCTION

Draught beer accounts for about 10% of the world's beer market which in 2004 totalled over 1500 million hectolitres (mhl) (2). Within Europe, draught beer fares better contributing anywhere between 10% (Poland) and 72% (Ireland) of the total country market. Indeed in 2004, market data from the Brewers of Europe (14) shows a total volume of 316 mhl of which 28.5% (90 mhl) was draught beer. Surprisingly though, despite these substantial volumes, draught beer has received a remarkably poor press in the brewing and associated literature over the decades. What there is, is dominated by the microbiology of draught beer with publications from the Universities of Birmingham (1980's) and Sunderland (1996) together with VTT in Helsinki (1996) plus occasional pieces on line cleaning and glassware (see 3 for a review). More recently however, there are some encouraging signs that draught beer is starting to achieve a more appropriate and proportional voice in the brewing press with a feature in August 2006 on dispense in the Brewer & Distiller (International).

Draught beer in the UK represents about 55% (of a total market in excess of 57 mhl) and at 32 mhl is the biggest segment of the world market (2). Accordingly, it is no surprise that much of the activity in beer dispense – particularly innovation, communication and commercial exploitation – stems from the UK. This has been driven by a number of factors, most notably the long term decline of draught beer against a backdrop of massive change in the industry. This paper seeks to consider the inputs that have triggered change and how - through innovation - the quality of draught beer in the UK's on-trade may change for the better such that the category bucks the trend and begins to grow.

UK DRAUGHT BEER MARKET - CAUSES AND CONSEQUENCES

Changes in the UK beer market over the last 20 years have been dramatic and a cause for industry-wide concern (12). Most notably (Figure 1) the annual volume through the on-trade has declined by some 18 mhl whilst correspondingly the off-trade has grown by almost 14 mhl. Within the on-trade (Figure 2), ale and stout have suffered a linear decline ($r^2 = 0.9949$) from 30 mhl in 1985 to just shy of 12 mhl in 2005. Extrapolation of this trend suggests that – if nothing changes – ale and stout will be no more by 2018! However in a relative sea of calm, during this period lager has moved from 18.2 to 19.4 mhl. This is perhaps surprising given the widely perceived growth in lager; however the decline in the total on-trade market means that lager has a 62% share in 2005 compared to 38% in 1985.

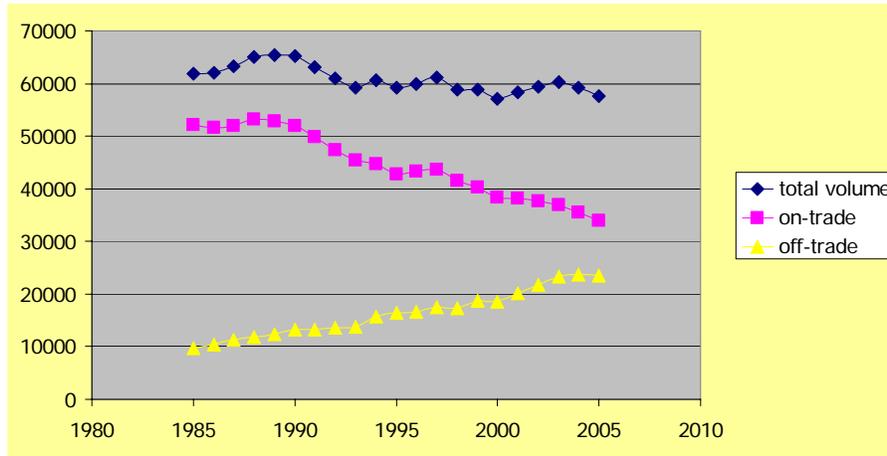


Figure 1: the UK beer market between 1985 and 2005. All volumes in hl (x1000).

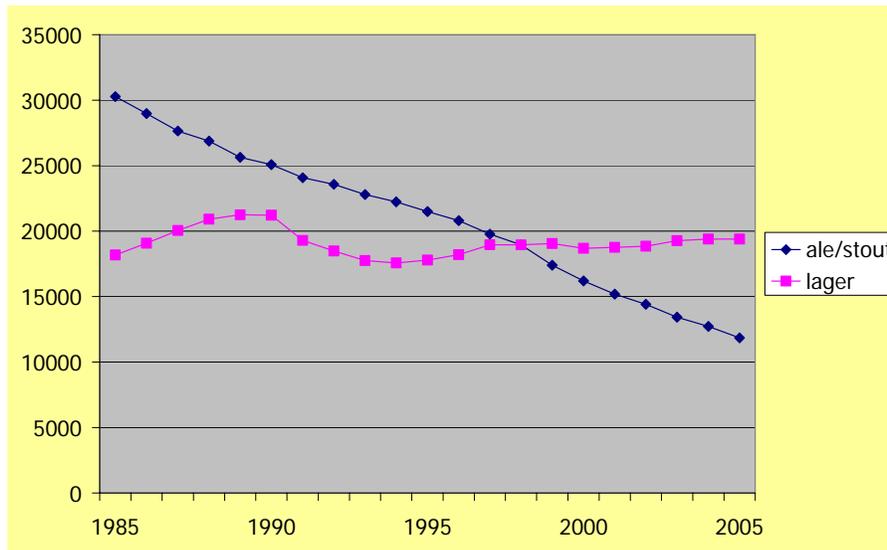


Figure 2: on-trade market between 1985 and 2005. All volumes in hl (x 1000).

There are a host of reasons for these long-term market changes. Inevitably some are bigger than others and some have impacted for a brief period, whilst others underpin events over many years. To provide some structure to this analysis, likely contributing

factors are segmented into *political, economic, social and technological* or PEST (see below, Table 1)

<p style="text-align: center;"><u>POLITICAL</u></p> <ul style="list-style-type: none"> ■ 1989 Beer Orders – cutting the tie ■ Monopolies and Mergers Commission ■ Drink driving legislation ■ Duty ■ Licence reform ■ Smoking ■ Responsible v binge drinking 	<p style="text-align: center;"><u>ECONOMIC</u></p> <ul style="list-style-type: none"> ■ Manufacturing to service economy ■ Consumers are money rich, time poor ■ Growth of the off-trade ■ Supermarkets use beer as a loss leader ■ Brewers without tied estate ■ PubCo’s growth/consolidation ■ PubCo’s buy own equipment
<p style="text-align: center;"><u>SOCIAL</u></p> <ul style="list-style-type: none"> ■ Ageing demographic profile ■ Wider consumer choice – wine <i>etc</i> ■ Drinking less ■ Drinking better ■ Responsible drinking ■ Other leisure opportunities 	<p style="text-align: center;"><u>TECHNOLOGICAL</u></p> <ul style="list-style-type: none"> ■ Flavoured alcoholic beverages ■ ‘Extra cold’ lager (2-5°C) ■ Decline of cask beer/ale ■ Growth of bottled beers ■ Bottled cider over ice ■ On-trade quality ■ Innovation

Table 1: PEST analysis of UK on-trade market 1985-2005

Of the many elements detailed above, a number are outside the direct control of the industry and some have been imposed through social change. Two factors however, beer quality and innovation, have the power (individually and collectively) to proactively and positively influence consumers perception of draught beer and the on-trade.

PRODUCT QUALITY – A COMPETITIVE WEAPON

Arguably with the exception of price, the poor or indifferent beer quality in the on-trade has been the major contributor to the decline of draught beer volumes. Clearly ‘quality’ is not solely a UK problem and its problems and benefits translate across the brewing world. Perhaps three key issues are at the root of the problem, all of which can be changed through education and training. Firstly, the fundamental housekeeping that underpins good quality beer dispense is at best variably applied. Secondly, there is a lack of understanding between line cleaning and good quality beer such that the activity is viewed as a loss of beer and, by inference, profits. Finally, and most damning, is the lack of reverence for beer and lack of recognition that beer is a food that demands the same hygienic mindset.

Happily there are encouraging signs that the stakeholders in the draught beer experience are increasingly dissatisfied with product quality. When asked, consumers express forthright opinions such that ‘49% of drinkers will not order the same drink if the quality

is poor' and '34% of drinkers will go to a different outlet if quality is poor' (7). A survey of 780 licensees identified 'fobbing' together with 'temperature' and 'head' as the most common problems encountered (8). Audits by Cask Marque (15) have shown that 25% of accounts surveyed have dirty lines and 40% have dirty glassware. Similarly High Street retailers are increasingly vocal on the subject. For example Tim Martin, non-Executive Chairman of J D Wetherspoon, was quoted as saying 'it's a cliché but standards have got to improve – temperature of wine, temperature of beer, quality of real ale, cleanliness and so on.'(6) Finally the major Brewers/brand owners - who since the 1989 Beer Orders no longer have pub estates – are acutely aware of the quality issue. InBev UK in their 2004 'market report' noted that 'it is time for the industry to work more closely together to tackle the root causes of poor quality' and 'retailers need to become passionate about quality through educating all staff about its growing commercial importance, for example, by creating standards for all outlets to follow and by running training for new bar staff'.

Defining quality

Definitions of beer quality abound but, for the purposes of this paper, draught beer quality will be considered in terms of a sensory experience. Drinking beer is essentially a cascade of the senses involving sight then touch followed by aroma and then taste. Indeed the old adage that consumers 'drink with their eyes' captures a key element of draught beer inasmuch that what they see will either rapidly assure the consumer or signal potential concerns in product quality. There is a tacit expectation that beer will look right, will be clear and bright and with a head of foam. Glassware can do a lot to reinforce quality and it should be appropriate (size and shape) and, critically, clean and pristine! Where branded glassware is in use, the glass should match the brand. Of course the glass should reflect the anticipated temperature of the product and should not still be warm from washing. The final step in the sequence – tasting – should confirm expectations with a balanced brand specific aroma that is not tainted by off-flavours or staleness.

Tasting will also flag the temperature of the product, an attribute that is frequently a concern with draught beer. Fobbing beer is an all too familiar sight in bars which acts as a visual clue to temperature issues in the cellar or under bar or, worse still, dirty lines. However, with the market 'drinking colder' and the significant growth in 'extra cold' and 'super chilled' lagers (2-4°C colder than 'normal' lager at 6°C), product temperature at dispense has become an ongoing issue for consumers, retailers and brand owners. In part this is down to the success of this dispense category as (9) since 2002 extra cold technology has (on its own) grown overall sales of standard lager from 39 per cent to 43 per cent of total on-trade beer sales. Further, the extent to which extra cold is taking over is shown by cold brands representing just 23 per cent distribution in the on-trade in 2003 – a figure that has hit over 50 per cent in 2006.

Draught beer quality in the UK is by no means assured. In addition to the attitude, behaviour and knowledge of bar staff, the dispense process is overcomplicated and slow to change and evolve. To a degree, dispense is trapped in a world where ale is king. However, we are where we are and the sheer scale of the UK on-trade will ensure that

fundamental change is sluggish. It is worth emphasising that the complexity of the journey from cellar to glass is a vulnerable one and a quality product is dependent on each element in the process delivering its role correctly. Unfortunately this means that the failure of any one part of the process can lead to a poor quality product and experience.

IMPROVING QUALITY – TRAINING & EDUCATION

Encouragingly, there is growing evidence that the UK industry is waking up to the challenges of on-trade quality with an enhanced approach to training and education. For example, the Beer Academy (16) in liaison with the Institute of Brewing & Distilling is focused on the provision of education and training in the understanding and appreciation of beer. The ‘Beautiful Beer’ campaign from the British Beer & Pub Association (17) aims to (i) drive up beer quality and standards in the on trade, (ii) educate and enthuse people about beer and (iii) run a PR programme to communicate a new image of beer to consumers. The forerunner to Beautiful Beer, Coors ‘Beer Naturally’ programme was described in detail at the EBC in Dublin (5).

Not surprisingly training remains an issue in the UK on-trade. The Publican survey (8) in 2006 revealed that 47% of participants had received no training from their supplier and a shocking 23% who had never had any training in cellar management. Although the numbers can doubtless be debated, they remain directional in flagging a fundamental need. Anecdotes of wheat beer being returned from pubs as being ‘cloudy’ tell their own story!

An important development that is already ‘making a difference’, is the introduction by the BII of an accredited qualification, ‘award in beer and cellar quality’ (18). The aim of this award is to ‘help candidates ensure that their beer is consistently served in an optimum condition’. Encouragingly, in the Publican Beer Report (8), 32% of the 780 participants had this qualification.

The changing shape of the industry has impacted on training provision. Brewers who, historically, provided this to staff in the on-trade, have passed much (if not all) of the responsibility to the Pub Companies. Encouragingly, some PubCo’s are implementing detailed and long term plans to train new and current pub leaders and their staff in cellar management, line cleaning, presentation and product knowledge. Of course, installing best practice doesn’t happen overnight and these Companies recognize that to embed cultural change in a change-adverse industry will potentially take years. However, whilst contributing to an upswing in product quality, good and ongoing training significantly improves throughput and account profitability.

CELLAR MANAGEMENT

In some respects cellar management is all about getting the simple things right. For example cellar temperature is typically set at 11-13°C. Whilst arguably the wrong temperature for a lager-rich portfolio, the dispense ‘supply chain’ assumes the product has been equilibrated to this temperature. If the container has not had time to cool or the cellar cooling is off, set incorrectly or doors are left open, the product will start its

journey higher than 11-13°C and the likely knock-on effect is that in-glass temperature will be higher than specified and will be dispensed with difficulty and associated fob.

Glycol cooling

The growth of the extra cold category has driven a number of innovations in cooling. Whilst brand owners have favoured under bar cooling solutions, sports stadia and a number of high street retailers have implemented glycol based cooling solutions. At its simplest - remote coolers in cellars are reconfigured with a glycol/water mix to replace the water/ice medium that has been used in the UK. The advantage being that glycol can be set at a lower temperature (-3°C) rather than the 0°C or so of an ice bath. This enables the product to be cooled to a lower temperature and then distributed to the bar colder than from a conventional remote. The differential is reinforced by glycol (rather than water) cooling of the dispense lines within the python/trunk line. Whilst offering an upside in colder beer distribution (and associated microbiological benefit), glycol based coolers need to be carefully sized as they have no 'reserve' for busy trading sessions.

Lines and cleaning

Perhaps the biggest challenge in establish best practice in cellar management is installing a routine of regular and effective line cleaning. There is no debate that best practice (1) is to clean every seven days. Regrettably, line cleaning has a bad reputation in the on-trade with allegedly between 10-80% of accounts failing to meet best practice. The mindset that line cleaning 'costs' needs to be changed such that cleaning is recognised as being 'value adding' and 'generates account profitability'. Figure 3 clearly shows the commercial benefit of weekly line cleaning and, conversely, the financial consequences of infrequent cleaning.

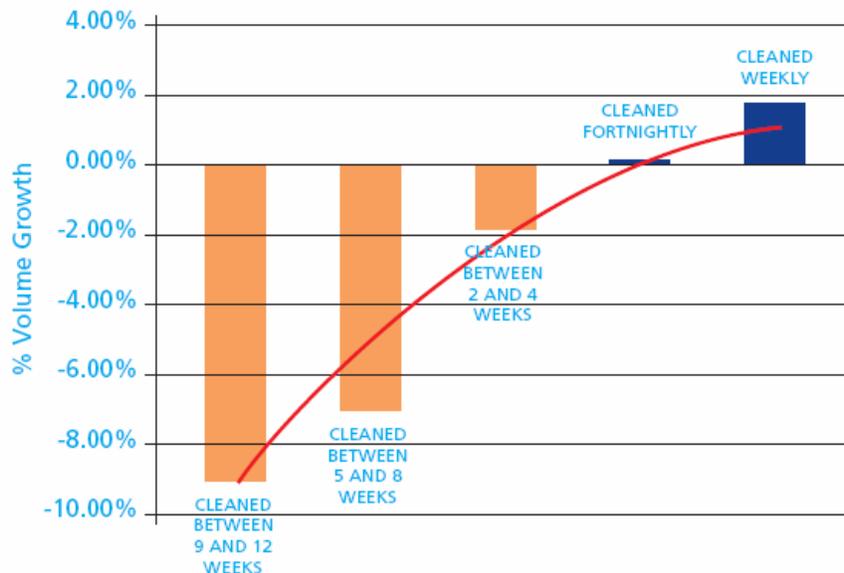


Figure 3: pubs that line clean every seven days are more likely to show volume growth (source – a UK Pub Company).

In passing, on the subject of line cleaning, it is a false economy to use ‘cheap and cheerful’ line cleaning solutions! Branded line cleaners are carefully formulated to optimise effective cleaning. Building on this, assessment of line cleaning is occasionally required, be it to resolve problems or via a hygiene audit. Real time microbiology using bioluminescence has found widespread application in the brewing and wider food industry to validate cleaning (11). In the case of line cleaning, a word of caution. Analysis of rinse water post cleaning is likely to provide an optimistic view of the success of the clean. Although technically more demanding, measurement of the ATP loading on an internal surface of the line will be more meaningful as to the hygienic status.

Innovation in line cleaning has been marked. Notably from the perspective that (i) ‘technology x’ can reduce the frequency of line cleaning without impact to product quality and, thereby minimise beer losses and/or (ii) that automation can free staff up for more useful activity. However as noted by Buttrick (4) only about 4% of accounts have adopted such technology. The reasons are many, but system complexity and a lack of financial recovery appear to be key.

An alternative approach is through developments in line tubing materials such that microbial attachment is reduced. For example micro-organisms are less able to attach to the smoother and slippier (but more expensive) nylon beer line tubing than the popular MDP (mid density polythene). Accordingly manufacturers have developed MDP tubing which is extruded with an internal nylon layer which meets both financial and microbiological needs! In addition to a nylon liner, a new generation of tubing includes antimicrobial substances (e.g. silver) which add further hygienic robustness. However, rather than viewing such developments as a route to relax line cleaning frequency, a preferable position is that these beer lines result in thinner biofilms which are then more effectively removed through conventional line cleaning.

Other innovations focus on cellar routines that either cause inconvenience or contribute to product wastage. These include pre-programmable keg changeover that facilitates stock rotation and removes the human element. Another development chases beer in the line with water near the end of a trading session. This ‘beer saver’ technology elegantly manages the removal of beer from the line – without compromise to product quality – that would normally ‘sit’ between sessions and require to be subsequently ‘pulled through’. Not only does this reduce wastage but leaving the line water blocked offers benefits to line hygiene.

UNDERBAR COOLING

The conventional supply chain from cellar to tap is routinely capable of achieving in glass temperatures of 6°C. The advent and subsequent growth of extra cold lagers was only possible through the use of brand specific under bar ‘ice bank’ coolers that took out a further 4°C or so of product temperature. Whilst an acceptable technical solution with one or two extra cold products, the rapid growth in the sector demanded more fit for purpose solutions. Although effective in cooling beer, shelf coolers have a large footprint

under a font (occupying space that could be used for glassware), require power, push out heat behind the bar, are typically single lines and are (relatively) noisy.

In response to these concerns brand owners have collaborated with manufacturers to design new solutions that support extra cold brands. At one end of the scale are small heat exchangers with a product coil immersed in a 'pod' with cold water circulating through from the python. This solution ticks a number of the boxes particularly in terms of size, power and no heat. A more sophisticated solution with a small footprint, no heat output that requires power but cools two beer lines has also found support. Using an alternative coolant to ice, 4°C can be trimmed to deliver an in glass temperature of 2°C.

FONTS

Fonts and T-bars remain an important route to communicating with consumers. In addition to branding, individual fonts are increasingly used to communicate 'cold' through condensation or ice growth. Indeed, such fonts also contribute directly to product quality by keeping the beer within the font cold. Such trace cooling minimises the fobbing issue for 'occasional' less frequent drinks which can involve warmer beer being dispensed. Further sophistication (and cost) can include fonts and taps with faster dispense (< 10 seconds rather than 18-20 seconds), creamer action and glass washing or 'refreshing'. T-bars typically offer less diversity and are frequently used in a generic manner in High Street accounts. After some years of getting bigger, fonts and T-bars have become smaller, sleeker and more pleasing on the eye and, importantly, intrude less on communication between consumer and bar staff.

Building on the growth of the extra cold category, stand alone panels (and fonts) are being used to communicate to consumers the temperature of products being dispensed in at least one High Street PubCo. This neatly raises the profile of dispense temperature in the on-trade with the potential of making it a unique selling point (USP) for a retailer.

In terms of beer quality, 'overfonting' has been an increasing concern. Bars can be seen festooned with numerous fonts of the same brand or indeed fonts of brands unfamiliar in a draught format. Regrettably such enthusiasm for a 'presence' on the bar leads to taps (outside the 'hotspots') which are infrequently used, with the result that throughputs are poor and quality is compromised. On top of the damage to brand and/or the account, there are the costs of the font and the unnecessary under bar services such as supplementary cooling and – ultimately – the installation of unnecessary remote coolers.

Insight into overfonting and other quality parameters can be gained from the use of flow monitoring data logging. Whilst this technology has the reputation in some quarters as the 'spy in the cellar', data logging can facilitate powerful insights into beer quality. In addition to overfonting, data logging can provide real time information on temperature, dispense speed and line cleaning. Figure 4 provides graphic insight into tap by tap throughputs by brand in a busy bar with 30 beer lines. Here the high numbered fonts significantly outperform the low numbered fonts because they are located in a more pleasant location within the bar.

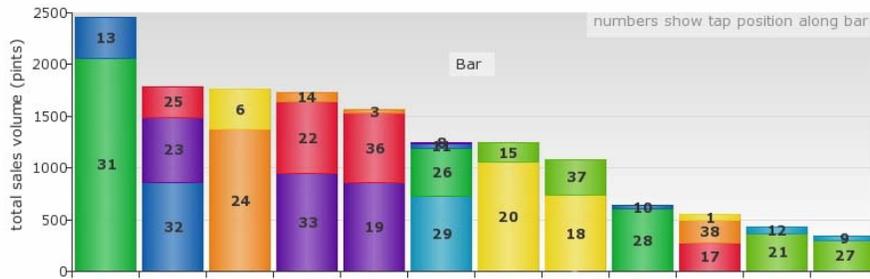


Figure 4: data logging insight into throughputs tap by tap in a busy bar (source SmartCellar)

LOW THROUGHPUT SOLUTIONS

A major threat to product quality is the ‘one size fits all’ thinking that applies the same dispense template to small low throughput bar as normal bars. This is a costly solution that - for example a small restaurant – adds unnecessary complexity and workload whilst inevitably resulting in the downward spiral of poor quality product. Recognition of this has triggered a number of innovative solutions that seek to deliver an excellent draught beer experience from bespoke technology with the downsides designed out. An example of a low throughput solution is focussed on accounts that serve 10-50 hl of beer per annum. The unit is integrated, all-in-one package that includes cooling, kegs (20 l), CO₂ provision and control which can be fixed or mobile. The ever present hygiene/line cleaning issue is dealt with elegantly through a single use, aseptically packed line that accompanies each keg. A similarly elegant solution has been developed for a stout so as to deliver its characteristic ‘theatre’ during dispense. Using a small pack product the familiar churn is generated via an ultrasonic drip tray (on trade) or pad (at home). Both these (and other innovations) have successfully provided a cost effective solution to deliver draught beer product quality and presentation in low throughput accounts that satisfy the needs of consumers.

GLASSWARE

It is a sobering realisation that the chain from cellar to tap can be nigh on perfect but all this good work can be undone by a dirty glass, a damaged or blemished glass or, particularly annoying, the wrong branded glass! Stillman (13) has, in a definitive paper, detailed the ‘fit to fill’ requirements of a glass as being free rinsing, visually bright, odour free, cool and dry and disinfected. Hopefully his advocacy of getting glassware right will strike a chord with retailers such that the perfect glass becomes part of the USP of great bars.

To reinforce the view, it is noteworthy that pub-goers view glassware as a mandatory element of the draught beer experience. The promotion of polycarbonate glasses - in an attempt to cut down on glass related incidents in the on-trade - has been poorly received by consumers (10) with 80% viewing a drink in a plastic glass to worth less than one served in a glass.

The move to branded and embossed glassware has been a welcome development in improving the quality perspective of draught beer. However, this good work is horribly

undone by using the wrong branded glass. To make things worse, branded glassware typically has nucleation sites that are optimised for the brand and its specified dispense temperature. Dispensing a lager at 6°C into a glass optimised for an extra cold brand will prove an interesting, if difficult experience!

Finally, in passing, it should be appreciated that nucleating glassware is all about replenishing and maintaining the head of foam, whilst the beer is being consumed. Such glassware should not be viewed as a 'patch' to repair other dispense related issues that result in a sub-standard presentation in the glass.

CONSUMER FEEDBACK

Generically the consumer is increasingly encouraged to share and feedback his or her views on their 'shopping experience'. This philosophy has yet to translate wholeheartedly into the on-trade. The reality is that 'people vote with their feet' and (if possible) move on to another account if their on-trade experience is not up to scratch. Although this is acceptable for the more flexible consumer, tentative consumers, will over time move from the on- to the off-trade as being a more reliable experience.

Cask Marque (15) goes some way to assure consumers in the UK of outlet quality. Pubs that join the Cask Marque scheme are assessed by a mystery shopper who checks all cask ales on sale for - temperature, appearance, aroma and taste. Although focussed on cask beers, it requires no great leap of imagination to conclude that other draught beers in these accounts will also be dispensed to a high quality. Indeed, Cask Marque assessors are increasingly active in auditing and assuring the quality of keg beers and lagers.

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