BREWER'S CONTACT

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XP 64 PORTER TICKLES JUDGES TASTE BUDS

The 5th National Home Brewed Beer Festival received forty five entries this year, attracting over a hundred plus beer aficionados for the afternoon tasting session. Richard Burns of Cheers Wine Making and Brewing, Cheam and his team of volunteers organised a magnificent event, aided by some excellent live music to add to the already jovial atmosphere. Geoff Cooper who led the team of four beer judges commented on the high standard of beers brewed this year, constructive comments were left for each brewer, and they also made themselves available to discuss brewing in the afternoon session. A prize for people's choice was also awarded, the results of which are given below. The show was divided up into five categories, a first and a second where awarded together with highly commended. [HC] where there were other beers of considerable merit

Phil Turner Judging Bitter

Congratulations to the following winners
Kit & Extract. 1st Phil Wilcox 'Old Boots' 2nd Andrew Smith 'Not Sure Extractly.'
Speciality Beers. 1st David Edge 'XP64 Porter' 2nd Mike Carter 'Honey Ale'HC Gareth Evans 'Capitale'
Ordinary Bitters 'under1041' Gareth Evans 'Limp Stick' 2nd Paul Rasell 'Timmy Growser'
Special Bitters 1055 Dave Ranger 'Percy Peachfishers Pale Ale' 2nd Gareth Evans 'Rodent Speciale'
Strong Bitters 1st Russell Gower 'Special Bitter 4' 2nd Andrew Smith 'Long Time Ago' Barley Wine
Peoples Choice Gareth Evans 'Limp Stick' Bitter **Best in Show** David Edge 'XP64 Porter'
This event typifies what Craft Brewing is all about, swapping ideas, tasting a good cross selection of beers, meeting like- minded people, whether you are new to brewing, exhibiting or merely tasting come along for a unique experience. Yes I did manage to sample all of the beers over the course of the day, albeit in tiny sips! I personally learned a lot, so why not get brewing ready for the 6th Homebrew Festival to be held in Derby. A few points gleaned from the judges, bottle beer, and allow it to condition well in advance of the show, make sure you are entering your beer in the right style and gravity. If in doubt ask the show organisers, who are only to pleased to help.

Geoff Cooper presenting Dave Edge with his prize for best in show with organiser Richard Burns.

Inside Brewer Contact

SIXTH NATIONAL CRAFT BREWING FESTIVAL

The festival moves north to Derby for 2005. It will be held on Saturday 2nd April at the Brunswick Inn, Railway Terrace, Derby, two minutes walk from the railway station and ten from the bus station. It is being organised by David and Ralf Edge.
Sean Franklin of Rooster's Brewery has kindly sponsored the festival. Sean is not just a professional brewer pursuing the ultimate hop mixture, but a trained oenologist. First prize will be the opportunity to brew three barrels of your prize-winning beer at Rooster's Brewery in Knaresborough.
The festival will provide an opportunity for craft brewers to taste a variety of craft-brewed ales and get expert feedback from the judges, who will be trained beer judges supplemented by a commercial brewer with experience in both regional and micro breweries.
By holding the festival in England's real ale capital and indeed Derby CAMRA's pub of the year we hope to attract interest from the real ale fraternity and gain publicity for the Craft Brewing movement, and also give brewers from the Midlands and North an opportunity to enter. For those from further afield, Derby is a great centre for beer and other forms of culture – why not make a weekend of it?

The judging categories are:

Full mashed beers (bitter, golden, IPA, mild)

original gravity up to 1042

original gravity 1043 to 1055

original gravity 1056 and over

Full mashed Stouts, Porters, Old Ales and Strong Milds

Full mashed speciality beers i.e. wheat, lager, fruit, smoked etc.

Malt extract and kit beers of any original gravity,

although these may be changed on the day if there is an uneven entry for the categories.

Bottled and draught beers can be entered. Draught beers can be dispensed by gravity or with CO_2. Draught beer must be presented in bright condition, as there is not enough time for beers to settle. Barrels and Cornelius kegs are suitable.
Minimum quantities are 10 litres for draught beers and 6 standard pint bottles for bottled beers. Please bring more if you can, as people will be thirsty.
Judging takes place in the morning, with the doors opening at 13:30. Competitors and visitors can then sample the beers and read the judges comments. The prize winners will be announced at 16:00. Lunch is available beforehand at the Brunswick. Tickets cost £5 each and admit one person who can enter one beer. Additional beers can be entered for £5 each up to a maximum of three beers per brewer.
Start brewing now, or if you're entering a mature beer, make sure you keep back at least six pint bottles for the competition. Phone if you need advice on presenting bright beer in good condition.
Application forms including style guidelines, delivery details, and hotel and city information are available from the address below and the new CBA website. Book now, space is limited!
To ensure your beer has settled, we'll make arrangements nearer the time to accept bottled entries at MCBA events etc. Let us know in advance! Beers must be collected when the festival closes at 19:00 or on Sunday afternoon from 12:00 to 14:00.

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All communications to the organisers, not the venue.

ALCOHOL, THE DEMON IN THE DRINK

by G Kingham

The word originally derived from the Arabic 'al Kohl' meaning, "not clear". To the beer brewer it is the by-product of malt, which is a type of sugar, fermenting under the action of yeast, more commonly known by chemists as ethanol, (chemical symbol CH_3CH_2OH). It is a low molecular weight aliphatic compound. These are open chain molecules, the longer the chain, denoting the different types of alcohols, which are completely miscible in water. This means that two liquids will diffuse together easily. Because of this, it is readily distributed throughout the body and crosses important biological membranes, such as the blood brain barrier, affecting large numbers of biological processes. It is a colourless liquid, producing a sharp odour, boiling at 78.5 ^{0}C, and in beer it has a noticeable mouth-warming characteristic. Its calorific output is very high at seven calories per gram. Your body treats alcohol as a poison; women, Native Americans and Japanese people have a lower tolerance than men. For them the effects of drinking can be noticed sooner, in a ratio of two units to three. The reason is that they lack the ability to make an enzyme that helps breakdown alcohol – alcohol dehyrodgenase, in their stomachs which results in quicker absorption. About 10% enters the blood through the stomach. A further 80% is absorbed into the blood stream in the small intestines; this takes approximately 40 minutes after ingestion, eating, before or during drinking, helping slow down the process. The last 10% passes out of the body in sweat, breath and urine.

Once in the blood supply, the alcohol travels throughout the body, where it affects the brain, acting as a depressant, increasing the activity of the nervous system, altering the fluid contents of the ears and causing loss of balance. The reason why people often seem more active and talkative after a few drinks is because alcohol inhibits cells and brain circuits, which are normally inhibitory. Its effects on the kidneys is to inhibit the recycling action of water within the body, causing excessive urination, hence dehydration. Drinking plenty of water, during and after imbibing ale, can alleviate this feeling. The liver has a major role in dealing with alcohol. For every half pint of 4%/ 1040 OG beer taken, it requires approximately one hour to process. The way our liver metabolises ethanol is to use an enzyme, alcohol dehydrogenase, to convert it to acetaldehyde, which also dilates your blood vessels, causing that red flush and pressure in the brain, hence that headache. There is no magic cure for this; you just have to wait for your body to convert it to acetic acid, which in turn provides energy and CO_2 gas that is expelled via the lungs.

The benefits of a glass of ale are well known, a moderate two units intake of alcohol a day, reduces plaque deposits in the arteries, which cause arteriosclerosis, protecting against blood clot formation and promoting blood clot dissolution, helping to protect against heart attacks and strokes. In the United Kingdom, one unit of alcohol equals eight grams of pure alcohol in any drink. This is equivalent to half a pint of ale at 3.87% ABV. The recommended maximum daily intake for men is four units and women, three units.

There are other types of alcohols; these are known as higher or fusel alcohols, and are formed by certain types of yeast strains and higher fermentation temperatures, which are a characteristic of some Belgiam beers. They are recognised by the esters that are formed, such as vinous, sherry like, banana, spicy or fresh grass. The presence of wild yeast in your fermenter will also produce large quanties of undesirable fusel alcohols. White sugar is a glucose that is fully fermentable, leaving no residue or after taste. Its use in beer is to add alcohol and thin the body of a higher gravity beer, those above 1080 OG. At these levels a cloyingly sweet drink is often the end result, although careful hopping and a long maturation period, a year or more will aid in developing the beers, a thing craft brewers have the time to do. Malt, being a more, complex matter, has other ingredients that do not ferment out. These produce the main characteristic of your brew. As sugar is 100% fermentable it is used as a reference point to calculate he amount of malt needed to produce the desirable alcoholic levels. In order to calculate the amount of malt needed to produce a starting gravity we multiply the known sugar level by a factor of 0.62, this being the amount of fermentable extract available in your pale malts. There are published charts for quick reference in some home brew books, they also give values for other malts and grains; these can be commutated for a more accurate result. For example a sugar solution of a starting gravity of 1050 OG will produce an alcoholic level of 8.30% ABV [% Alcohol by volume]. If we multiply this by the fermentation factor for malt 0.62, we end up with an alcoholic level of 5.1% A/BV [8.3 x 0.62 = 5.1]

The way to work out your home brew strength is as follows,
Original gravity – Final gravity x 0.1275 [factor] = % Alcohol by volume. A rough rule of thumb is to take your original gravity, and divide it by four to obtain a quarter, as this will give an approximate final gravity. (50/4 = 12.5 :- 50 -12.5 x 0.1275 = 4.8% A/BV)
Brewing high gravity ales will result in a larger amount of alcohol that will eventually suppress yeast growth. Tolerant yeast strains are available for stronger brews. By thoroughly aerating and adding double the amount of yeast at pitching, will help obtain greater attenuaton levels. Also, a small quantity of fresh yeast culture of the same type may be added prior to bottling if your final gravity is still on the high side.
The craft brewer with the 'aid of alcohol' can evaluate hop aroma at home, this is achieved by purchasing a cheap bottle of Vodka, which is a neutral tasting high strength alcohol. Start by measuring out 150 ml of Vodka into a jar and adding 20 g of aroma hops of your choice, cover and leave to steep in a dark place for two to three days, then strain through a coffee filter paper into a clean jar, then waft away at those citrus or piney notes. This simple oil extraction should on no account be added to your brew. It is illegal to fortify beers. But more interesting is the chemistry behind this extraction method, the ethanol acts as a solvent, and has polymerized the hop oils, this means that they have been bound together and therefore will not mix freely in your beer, adding them would create a very unpleasant brew! The extract will only keep for a short time before further chemical reactions take place that permanently fix the compounds involved.

' Great News !' The CBA has a new website at www.craftbrewing.org.uk.

It aims to provides information on the CBA's aims and activities, publications and local organisations as well as providing references to other craft brewing resources, especially those relevant to UK Craft Brewing. It's rather raw and the Webmaster, David Edge, signalbox.brewery@ntlworld.com would appreciate your suggestions for links and pointers to high-quality resources. The aim is that overseas sites will link to us saying "the premier resource for British craft brewing" as they did when Gillian Grafton was the internet face of craft brewing in the UK. If you don't have a web connection. The material is available to CBA members in other ways, so please keep sending those questions to the Membership Secretary, who will find someone to respond."

Midlands CBA report

Ralf Edge organised a visit to two contrasting Nottingham breweries on 27th November, which was followed by a visit to some of Nottingham's more interesting places of refreshment recommended by new member Steve Robinson. At **Castle Rock** brewery, Peter Wooding presides over a 25-barrel plant. Peter returned to brewing after a career with Shipstones of Nottingham. The capacity is needed, as Harvest Pale, a light, hoppy pale ale, was SIBA National Champion 2003. It's a beer in the Deuchars 'IPA' mould, without the misleading name and rather drier. Castle Rock brews a monthly special in aid of the Nottinghamshire Wildlife Trust. The brewery suggested a donation to the Trust. £100 was collected; attracting matching landfill funding making it worth £1000. The current brew was a stout "Black Elder" which was fermenting frantically. The party was surprised by a degree of unorthodoxy in the matter of stout brewing; Woodings on recipes: ″I figured that God gives me black malt and roasted barley in 25kg sacks for a reason - one of each and get the gravity with pale"… and on water treatment: ″I brew all of the beers with the same water treatment; if you don't, you introduce risks from people getting it wrong". We are intrigued to know how the stout turns out using the water treatment that produces excellent pale ales. Yeast comes from the Kimberley brewery and there have been problems with achieving full attenuation; Kimberley rouse their yeast during fermentation using a fishtail and Black Sheep who also use it ferment in Yorkshire squares.
We then took the tram to Basford and the **Alcazar** brewery, where genial Canadian process engineer and home brewer David Allen has turned professional and produces an fascinating range of ales in a spick-and-span 12-barrel brewhouse. The range reflects the eclecticism of the home-brewer and the Christmas Porter was produced using surprisingly tiny amounts of spice. His beers are largely sold through the brewery tap, but Gaolers Ale, a 7.5% ABV old ale is contract bottled for Sainsburys. The bottled ales are pasteurised. Dave has tried sterile filtration and was unable to recognise his beers; he believes however that the pasteurised versions are close to the draught ones. He expressed an interest in bottling bottle-conditioned ales himself, and discussed this with some of the members. We suggested that the yeast he uses for all but his strongest ales - Nottingham - is very suitable for bottling due to its good flocculation and stability.

Northern Craft Brewers

Around twenty-four members gathered in St Thomas Church Hall in Huddersfield on Saturday 30th October for a self-assessment session of Bitter Beers. We had all been issued with 3.5kgs of Pale Malt and 175 grams of Crystal plus a Safale yeast and were instructed to use the hops of our choice and bring six pint bottles to this meeting.

We had eighteen entrants and eighteen jugs, six tables and a marking sheet each. Every bottle had a label indicating the hops used and a secret identity number. Each table had to give their first four placings. From this the clear winner of Gold Award was Joe Hughes with 50% Challenger, 50% Liberty and late hop of Styrian Goldings. Silver was awarded to Martin Pashley with 41% Goldings, 34% Bramling X and 25% Challenger. Joint Bronze went to Mark Tobin with 100% Green Bullet and Bill Lowe with 55% WGV, 18% Tetnang, 18% Cascade and 9% Fuggles. A very interesting and enjoyable exercise; the only variable being the hops that is, except the water treatment and brewing techniques!

Harry Goulding and his two wonderful lady helpers provided some excellent beer to get us started and a super buffet to sustain us. Also, Steve Taylor brought two Cornelius canisters of Copper Dragon to finish us off.

Two weeks before was the North-West Federation Wine and Beer Show at Morecambe where six of our members gained awards in the seven beer classes. These were: Joe Hughes, David Craven, Peter Kennett, Trevor Taylor, Dave Summerton and Bill Lowe.

Nine of our members went on a hop walk with some of the Midlands group and came away with bags of Fuggles and Goldings. We are still trying to find a suitable date for a visit to the "Mac brewers", possibly April or May 2005.

Our next meeting will be at "The Cheshire Ring", a Beartown Brewery pub; two minutes walk from Hyde Railway station (East of Manchester) on the last Saturday in January. A competition for Christmas Ale will be held. Everyone welcome. The food menu looks good.

Cheers, Bill Lowe.

SCOTTISH CRAFT BREWERS

By Bill Cooper

In the last issue I drew attention to our website at "scottishcraftbrewers.org". Les Howarth our webmaster diligently keeps it updated and it now contains pictures of our last two speakers and some helpful hints about using yeast, from our September meeting. Les has also established a Yahoo contact group at scottishcraftbrewers@yahoogroups.com which is getting under way and which we hope will help to keep our far-flung members in contact. Please feel free to join in if the mood takes you.

The September meeting was a visit to the Babbity Bowster in Glasgow, a pub which seems happy to let us have the use of a room and to taste our own beers, for the price of our lunches and a few of their beers. Our speaker was Professor Heng-Cherl Yom from Korea who is currently doing research at Heriot -Watt University International Centre for Brewing and Distilling, and who seems to have developed his brewing skills in Milwaukee. His topic was an in-depth talk on yeast, too deep in places for some of us, but fascinating and attention gripping none-the-less. Did you know that yeasts have some 6000 genes, about 1000 of which we know virtually nothing? Is it any wonder that some of our brews are not always perfect? Yom, as we are encouraged to call him, brought us back to earth with 10 crucial points about the handling of yeast which are appended at the end of this piece .

What would we do without Heriot-Watt? Michaela Miedl, (Picture above} from Austria, studied brewing at Munich, obtaining her masters degree. She has now come to HW to work for her Ph.D. Her subject was German beers and brewing, covering everything from the German purity laws to the Oktoberfest, the practice of decoction mashing, the development of hops (long before we knew them) and covering all the beer styles, including a hand-out with recipes. I don't think most of us realised just how far ahead of the game Germany has always been in brewing. They have the oldest brewery still in production, in the world, in the Bavarian State Brewery at Weihenstephan. They have been using hops since before 750 A.D. They established purity laws early in the 16th century, allowing only malted barley, hops and pure water to be used in the production of beer. (They included yeast as soon as they found out what it was.) The European Union insisted that beers imported into Germany did not have to meet this test but so far there has been little market for such imports. Perhaps most importantly they developed quality standards for the production of hops, and established the Hallertau as the primary source of top quality hops. We are grateful to Michaela for opening our eyes.

I conclude with a plug for our next meeting, which is on 23rd January at the Calton Centre in Edinburgh, when we have a yeast comparison test. Happy Christmas everyone and a super New Year.

10 Tips for Successful Fermentation

(copied from Dr. Yom's presentation).

1. Use the freshest yeast possible.

- Yeast is sensitive to temperature extremes and light.

- Keep refrigerated and use within 30 days of manufacture.

2. Culture up yeast if not at peak freshness.

- If over 1 month rejuvenate with SG1.020-1.025 half litre starter, cooled to 75°F/24^{O}C before pitching.

3. Use sufficient quantities.

- Double the pitching rate for every 0.008 above SG 1.048.

4. Pitch at the right time.

- The high kraeusen stage 36-72 hours after making starter is optimum.

5. Use the proper yeast for the beer type.

- Select the appropriate yeast for the style and the actual fermentation temperature.

http://beersmith.com/Yeasts/Yeasts.htm

More flocculent ale yeast = Clearer, maltier beer.
Less flocculent ale yeast = Drier, estery, fruity beer.
More flocculent lager yeast = Clearer, full-bodied beer.
Less flocculent lager yeast = Drier, colder-fermenting, longer to be bright.

6. Use the correct fermentation temperature.

- Culture yeast at 75°F, not fermentation temperature.
- Introduce the starter into your wort both at 75°F.
- Then adjust to proper fermentation temperature.

7. Perform proper aeration.

- Lack of aeration: lag time increase, prolonged fermentation, high final gravities, Off flavours.
- At 75°F, no threat of oxidation from vigorous aeration, CO_2 produced will purge any oxygen.
- More flocculent yeasts need more aeration.

8. Keep your fermentation temp constant.

- The temp changes at night can result in premature flocculation and stuck fermentation.

9. Don't rack prematurely.

- Results in a high gravity.
- Wait until ~90% sugars are attenuated for a 2nd fermentation.
- Top-fermenting yeast should not be harvested until 50% sugars are attenuated.

10. Avoid a prolonged yeast storage.

- Ensure that yeast cells are maintained in a minimal metabolic state, unaffected by stress.
- During storage, yeast uses endogenous reserves for basal functions.
- Depletion of these reserves due to a delayed storage and exposure to cold stress or ethanol stress may affect subsequent fermentation performance.

HUBBLE, BUBBLE ,BOIL & TROUBLE

by Graham Kingham

Foam, a decorative collar that crowns the craft brewed pint, then slips down the glass, sometimes leaving its lacy effect on the sides. Not every brew produces this effect, nor is it a prerequisite in all regional beers of Britain. What is this magic froth? Bubbles of carbon dioxide trapped in liquid, I hear you say, partly correct. The by-product of yeast fermentation is alcohol and carbon dioxide CO_2 (this is part of the carbon cycle, which is important to all life; basically all carbon is used and returned to the atmosphere for future recycling.) By formulating your recipe by including some of the following ingredients, flaked wheat, flaked barley, crystal malt or liquorice, liquorice: an ingredient, first used by brewers producing cheap imitations of Porter because true Porter grists produced hints of liquorice flavour without using liquorice itself. Used by modern brewers following these false recipes, e.g. 'Traditional Victorian' will aid head retention. Storage and priming techniques affect how much foam you can manufacture and how stable it is. The cheat's way of adding heading liquid does precisely the same as brewing a correct beer by using, gums, alginates [sea weed] or cellulose to the brew, the reason being that they add viscosity to the beer, causing the liquid to drain more slowly from the CO_2 bubbles. The other method is to hold the glass further away when you pour, introducing air to the drink; but the bubbles soon collapse due to their size. When serving, pouring down the side of a glass slowly greatly aids the formation of foam. Carbon dioxide is 1.5 times denser than air, a fact that we use to our advantage as it provides a blanket over the beer preventing oxygenation. It is a naturally occurring gas, found in the atmosphere at a concentrations of 0.035%. It does not go to a liquid stage but direct to a solid at – 78^{o}C, more commonly known as dry ice. [For the more scientifically minded this process is called conjugated.} Soluble in water, the volume of gas stored will increase under pressure, colourless and odourless, the colder the temperature the easier the gas will dissolve and the reverse reason why those bubbles magically keep appearing, as the drink warms. If, like me, you store your barrels in the garage throughout the year, as winter approaches the temperature can reach 2^{o}C, the need for constant re gassing as the CO_2 is absorbed, this causes a problem with pouring due, to lack of pressure and potential staling through oxygenation. Commercial beers, like Guinness, are impregnated with a mix of 60% nitrogen [the micro-sized bubbles add to the body and creamy effect] and 40% carbon dioxide. The size of the bubbles is of paramount importance; smaller bubbles retain their size better, forming a compact mass, exhibiting mechanical strength adding stability; larger bubbles eat smaller ones then burst, tearing the smaller one in the process, destroying the foam. Carbonation adds to mouth feel; too much masks the taste, and will turn your beer into Carbonic acid, recognised by being vinegary. Foam formation depends on the presence of a gas and a polypeptide, [a complex form of protein], which is hydrophobic, [a molecule with a tail that does not like water and will attach it self to another surface.] The following reasons are the cause of poor foam or foam inhibition, fatty materials in the wort, some hops, residue soap and detergents in glasses and barrels, hard water, over sparging and fermenting at a too higher temperature which produces higher alcohols. Beer at 5 to 5.7pH is more likely to referment, causing problems. Between 4.5 and 4.7 pH is good for foam stability. Most of the foam requirements are formed at the end of the wort stage. Lacing is partly caused by dirty glasses; the interior surface acts as a magnet to the hydrophilic molecules, [the head that is attracted to water] causing them to adhere to the sides trapping the foam as it descends. One solution our ancestor used was to rub salt on the inside of the glass then wash as normal. Gushing, that awful disappointing moment when you remove the top of a bottle and the contents do just that, a rapid and uncontrolled loss with such force a grand prix driver would have been proud, is caused by a supersaturated state of any one of the following:- bad barley, over priming, too much calcium in the beer or a lactobacillus infestation which is recognisable by a rancid taste. Priming your bottles or barrels with sugar or malt extract or even kraeusening, the continental way of priming beer with younger fermenting wort, has to be balanced out as too much addition will over gas the brew. Depending on your hydrometer reading you can dispense with priming and allow for natural conditioning, although a warm environment is required. On average beer has 4% sugar left afte fermentation. These consist of polysaccharides, [complex carbohydrates such as starch, the main ingredients in all plant life] which will slowly ferment. The amount of CO_2 volume that is present in beers such as, ale = 2.2%, lager =2.8%, wheat beer= 4%. So next time you lick that frothy moustache off your upper lip you now know how it got there, in the beer that is!

Starter cultures. Is fruit juice a possible growth medium?

By Dr Keith Thomas of Brewlab.

Every time Brewer's Contact arrives in the lab I am both impressed with the range of content material and also struck with more than a hint of guilt at not contributing some of the experimental work we have conducted at Brewlab. This summer that hint of guilt arrived at one of the quieter periods of the year. As a result it has generated the motivation to look into past laboratory books and assess some data on topics I have discussed with various craft brewing groups and courses over the past few years. This topic, and, hopefully others to follow, cover some of these issues to provide a feedback on ideas generated from practical brewing questions. In this instance the question concerned the best medium for starter cultures of yeast – a constant concern to all brewers keen to use other yeasts than those in a packet.

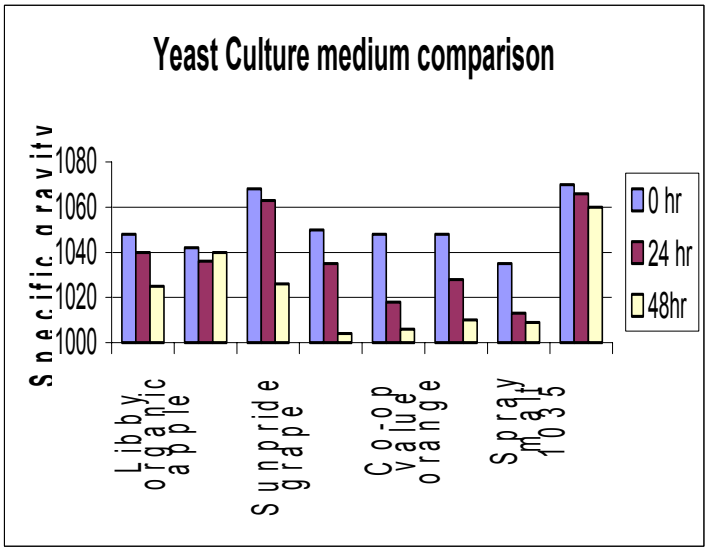
Most microbiologists and brewers are aware that the early stages of yeast culturing are critical for a successful fermentation in both providing an appropriate number of yeast without accompanying contamination. Give your yeast a poor start and it will struggle to produce enough cells to pitch your brew. Worse it may well allow bacteria and wild yeasts to grow instead. Without the use of a microscope this can be difficult to prevent and so result in bad beer, frustration and embarrassment. The standard and recommended medium for a starter culture is malt extract. Readily available from home brew suppliers this is a natural choice and allows the yeast to grow in the very medium it is targeted to service.

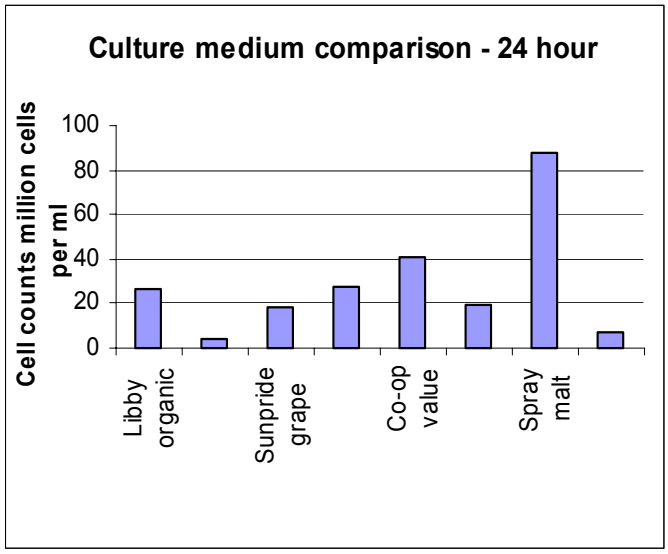
Both spray and syrup extracts are, however, difficult to handle aseptically and offer considerable opportunities for microbial contamination in the kitchen, garage or wherever your brewing operations may be centred. Moreover, spray malt is, in my experience, as big a haven to bacteria as the GBBF is to boozers. Used directly without a proper pressure cooking it will easily result in the worst beer you can imagine. Experienced brewers will be aware of the need for a thorough boiling to pasteurise malt extract but it still remains a hazardous part of the process.

Suggestions to overcome these limitations have included the use of fruit juice both because of the ready availability of sterile cartons and of their high sugar content which will encourage cell growth. I've had little experience of using juice but did promise to investigate its potential. Here are the results of that study. To assess and compare juices we purchased duplicate one litre cartons of common brand names and aseptically transferred them to two litre flasks. The juices chosen were all pasteurised and included an organic brand as well as others which may have contained preservatives and growth inhibitors. Each flask was inoculated with one million cells per ml of one of our common yeast strains and incubated unshaken at 25°C for 48 hours.

Samples were taken at 24 and 48 hours for yeast counts after shaking the flasks thoroughly to fully mix the yeast and assessed for specific gravity and yeast counts by haemocytometry. Samples of the fresh juice were also assessed for original gravity and for pH. In addition to the juices flasks we inoculated one litre flasks of sterile spray malt extract at 1035 and 1070 specific gravity to act as controls.

The results of the investigation are shown in Figures 1 and 2 below which profile the yeast counts and final gravities at 0, 24 and 48 hours (Figure 1) and cell counts (Figure 2).



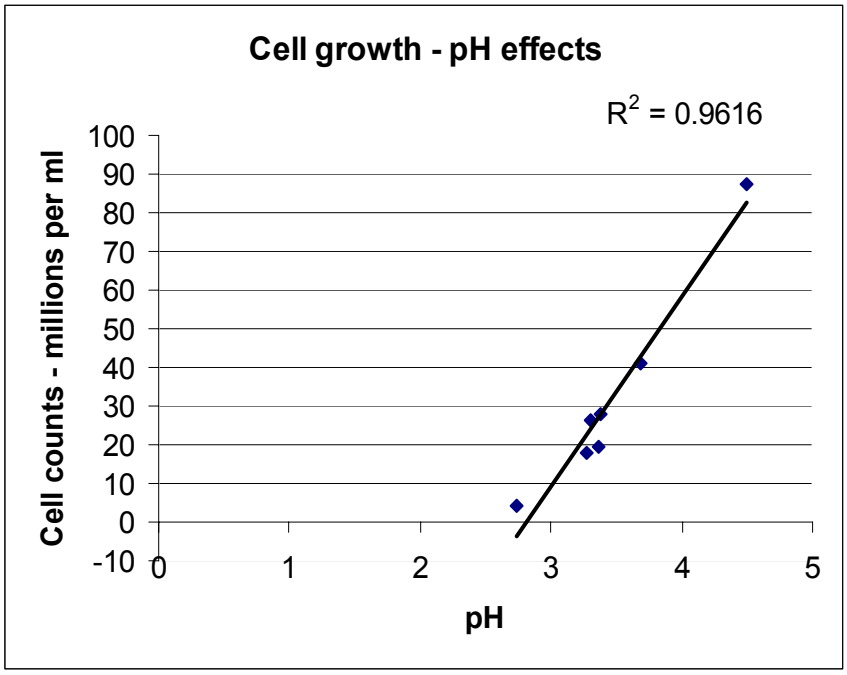


A simple scan of the profiles in Figure 1 illustrates that there is considerable difference between the juice samples with only three fermenting fully. However, yeast growth is the intended purpose of a starter culture rather than gravity fall. A comparison of yeast counts shown in Figure 2 illustrates that the juices differ similarly with those showing a high gravity fall producing more yeast.

Malt extract at 1035 og is clearly the most productive of the media producing 80 million cells per ml in 24 hours. Counts were not assessed at 48 hours because cells in the attenuated media had flocculated and could not be separated. However, as final attenuation was achieved within 24 hours it is unlikely that further cell multiplication would occur.

It is interesting that malt extract gave a greater productivity than the juices despite all of these having a higher original gravity. In fact cell production correlated negatively with original gravity ($R^2 = 0.345$). This value, however, is complicated by two very high gravity media producing low levels of yeast. Analyses in other experiments of productivity up to 1060 do show a positive effect which would be expected as the more sugar present the more energy for cell growth.

Correlation between cell growth and pH is, perhaps, more revealing as a much stronger correlation is evident, (R2 = 0.962), as shown in Figure 3. This graph excludes the 1070 malt extract value as being anomalous and suggests that pH may be a critical factor in cell growth.



A reason for this may be that the lower the pH of the medium the more the cells struggle to grow and the more energy they divert from cell growth. Of course, correlation does not confirm a causal relationship and other factors such as trace nutrients and inhibitors may also be relevant.

Conclusions from this brief study are that fruit juices cannot be guaranteed as a medium for starter cultures. Some support growth but others do not. Although they do offer a convenient and sterile medium which may be easily inoculated they fail to produce equivalent growth to malt extract.

Cell numbers are, of course, important for priming your fermentation with a total of $2*10^{11}$ cells being required for a 20 litre brew at $10*10^6$ per ml.

If the figures above are considered then malt extract would produce close to the total required for a 20 litre brew - $8*10^{10}$ - whereas even the best juice – Co-op value - only produces $4.1*10^{10}$ in total.

If you were forced to use a juice as a medium then avoid any with preservatives or with a low pH. In addition to under pitching the addition of an acidic fruit juice to a fermentation may affect wort flavour and pH. Unless you are looking to add a novel fruit character to your beer it looks best to use malt extract for starting your yeast.

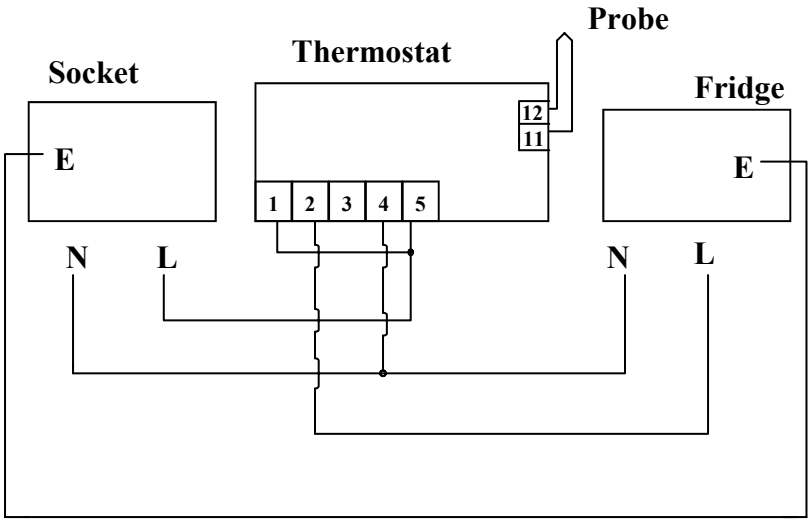
Cooling Summer Beers

by David Pond.

Fermenting beer and keeping it at serving temperature during the Summer months has been a problem for me ever since I started brewing 25 or so years ago. I remember reading James' account of how he had been wrapping wet towels round his fermenting vessel, I've tried it to no avail, and have put many hours of thought into the problem. Most of us have to work and whilst away the temperature can rocket and get out of control. Fermenting temperature has always been a problem for home / craft brewers especially in the summer months. I have long desired a control finding a domestic refrigerator too cold, and trying to judge the weather forecasts for cooler spells to avoid racing ferments is a waste of time it doesn't work. When on eBay recently, looking for chillers, I came across a digital thermostat that promised control to within 1 degree centigrade and I immediately ordered one. I have built it into a box with mains in and out and used it to override the thermostat on an old domestic fridge used for drinks. I can now ferment to within 1 degree centigrade and can start ferments higher or lower and adjust as it goes along at the touch of a button. Once the beer has fermented I can use the control on the fridge to O cellar[1] the beer at the correct temperature. I know I need two fridge's....These units are available from Eastmey@aol.com and cost £25 including postage. To buy the box and plugs etc, it will cost a further £10 or so. To build the box to contain it the box and plugs came from Maplin Electronics www.maplin.com. The use of a soldering iron is necessary but quite simple see wiring diagram.

For the box I drilled out the shapes for the unit and the plugs and filed them to size and shape. I used Euro plugs as used on computers to keep the size down but you could use a bigger box and 3 pin plugs and sockets and this would negate the use of a soldering iron.

Having perfect control over the fridge I am now thinking that the unit will control my mash temp more accurately than the stat on my mash tun which is little better than an on /off switch. Any other uses? I'm sure there must be!



Wiring Diagram

We would like to hear of any members who have manufactured any other type of brewing kit, small or large, mechanical or electrical. Ed

Caroline Trial

The Midlands CBA met at the Alexandra, James Street Rugby on 19th September to compare the results of a comparative brewing of Caroline's Fine Ale. The spec was 1045og, pale malt grist, Goldings as a copper hop only to 45 IBU (we gave an oz/gal figure too) and Gervin yeast. Eight beers were compared from seven breweries.

Scoring was done on three scales:

- Points out of five for the standard CAMRA flavour profile elements - malt, roast, caramel, hop, fruit, sweet, bitter, astringent, sulphur, yeast. We did not ask tasters to separate out aroma, taste and aftertaste.
- Yes/No for common faults: skunky, metallic, stale, phenolic, sour and vegetal
- Points out of five for both aroma and taste using the CAMRA pub survey scale:
  - 0: undrinkable-take back,
  - 1: barely drinkable to drinkable with resentment,
  - 2: competent but dull
  - 3: good beer in good form
  - 4: very good
  - 5: excellent.
- An overall score out of five was calculated by weighting the aroma and taste scores to emphasise taste.

The beers were tasted blind and eleven people scored them. Comments were made during the evaluation and where a beer had a particular characteristic we made a note to quiz the brewer afterwards. The results were averaged after the session and have been fed back to the brewers.

Results

Three beers were judged good. Congratulations to Peter Fawcett and Ray Carson for producing beers with a rather ordinary yeast and plain hopping that would outrank (say) Draught Bass in most pubs. Of the third, more anon. Two beers were judged average and three poor, but none undrinkable.

Faults: Skunky, metallic and stale flavours were absent. However all but two of the brews were judged to have at least one fault by three or more tasters. Four were judged phenolic, three vegetal and two sour.

Discussion - what did we learn?

The blind judging process and supply of averaged results allowed people to give feedback that would have been a lot harder person to person.

Beers that were expected to be unproblematic were generally presented earlier to protect tasters' taste buds. This does mean that someone knows which beer is which and could lead to a halo effect.

We thought we'd communicated the specification, but with beers supplied between 1043 and 1052 og it looks as though we didn't! Next time we'll do a form with a detailed spec and a second column for brewers to record what they did.

Gervin yeast was chosen because many of the members used it and because of its good flocculation - useful when tasting bottle conditioned ale that has been shaken around. Samples were generally clear to bright. However two disadvantages of this yeast were noted.

Firstly, there was a very solid deposit on the bottom of bottles, which is hard to remove. This was most evident with clear bottles (don't tell James). This might explain why some Midlands brewers who produce good ales in keg have problems with bottles - even if you sterilise a thick deposit of yeast, only outside is killed and when the bottle is re-used and the dirt disturbed, spoilage organisms escape from under the top (source: Brewlab).

Second, the third "Good" brew referred to above came from a split batch of wort fermented with yeast from a well-known West London brewery for the sake of comparison. The wort fermented with Gervin yeast scored only "Average". The beer with the non-standard yeast was far bitterer than the others so perhaps Gervin yeast pulls a lot of bitterness from the beer. Gervin users should perhaps consider using other yeasts for pale ales where the yeast characteristic is most noticeable and should ensure that bottle cleaning is very thorough.

One of the vegetal brews was Budvar, which was warmed and de-gassed and does taste vegetal in the circumstances. We possibly overdid the rough treatment of the Budvar, but the only other pale beer in the pub had lots of late hop and would have stuck out a mile. Owing to the variability of the brews submitted, we decided against a yeast trial for our next brew as most of the beers reflected the characteristics of the breweries to a far greater extent than that of the ingredients.

The recipe was a poor choice for the first comparison. The devastating simplicity left brewers nothing to hide behind and faults were ruthlessly exposed. The next recipe will be a bitter with 10% crystal and an "interesting" yeast, probably from White Labs, and also some late hopping.

Tastings should be arranged so members don't tuck into a ploughman's lunches complete with pickled onions and dark mild before evaluating beer.

Conclusions

The results were interesting, especially for the author, who needed taking down a peg. For those who scored low, there is some consolation that nobody scored "Undrinkable". We'd like to encourage more Midlands brewers to have a go at the crystal recipe and suggest that CBA members in the South and West have a go at even a one-off meeting to do something similar, but learning from our mistakes. The Membership Secretary can put you in touch with CAMRA tasting panels or qualified beer judges if you need a bit of help.

The process was great fun and thanks to Ray Carson for organising the meeting. Thanks too, to the landlord of the Alexandra for allowing us to drink our own beer in his pub.

Gluten Free Beer

By Andy Davison

Colin Penrose told us of his attempts to make gluten free beer in BC Vol4 Issue 3. I was looking at doing this a couple of years back when a friend was diagnosed coeliac. Unfortunately he found he is also highly intolerant to yeast so even gluten free beer is out of the question but it meant I did actually trawl the internet for solutions to the problems.
A US homebrewer called Craig Belser posted some ideas on the newsgroup rec.crafts.brewing and found that while red sorghum gave a bitter aftertaste white sorghum was much better as a base grain.
You can see his posts by going to www.google.com an clicking the 'groups' link, check the search within group only radio button and then search for gluten free beer. Looking on the web I found several websites including
http://www.glutenfreebrewer.com/default.htm which has some info on grains and malting equipment
http://www.mrgoodbeer.com/gf/ which has information on malting buckwheat and
http://www.fortunecity.com/boozers/brewerytap/555/gfbeer/gfbeer.htm which has information on malting sorghum.
Craig Belser who posted on rec.crafts.brewing set up the Bard's Tale Brewing gluten free brewery http://www.bardsbeer.com/ so he must have been doing something right.
andy@oiyou.force9.co.uk

March Issue.
Honey Brewing
Temperatures used in Brewing
Sugar's Role in Brewing

Craft Brew on Tap at Derby

CBA members may be interested to know that the CAMRA Derby Winter Beer Festival, 9-12 February 2005 will feature a number of beers brewed by CBA members. The list should include E&S Elland, Foxfield and Hoggleys not to mention the Brupaks' Upper Agbrigg Brewery and Rooster's, sponsors of the 6th National Craft Brewing festival. Visitors interested in a specific beer should contact Janette Edge on 01332 347601 as not all beers will be on at the same time.

Midlands Diary

08/01/05 "Going commercial"
A talk by Roy Crutchley of Hoggley's Brewery on how he turned a garden shed brewery into a small commercial craft brewery. Venue: Hoggley's Brewery, 38 Mill Lane, Kislingbury, Northampton NN7 4BD. Meet at Northampton Railway Station for the 11:30 'bus to Kislingbury

12/03/05 Comparison brew tasting (crystal bitters) Blind tasting of beers brewed to the crystal recipe (see Midlands section of the CBA Website www.craftbrewing.org.uk). There are a couple of other town centre pubs worth a visit so a good afternoon, early evening session is in order. Plus of course a visit to the Crooked Spire and mediaeval market for any who may be interested. Meet at 12:00 at the Market Pub, 95 New Square, Chesterfield S40 1AH, 5 to 10 minutes walk from the station.

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