***BrewYourOwnAtHome*®™**
("If you can drink it, you can make it.")
Phone (02) 6296 1412

Email: colin@brewyourown.com.au
ABN: 48932058773 001

Colin and Kim Marshall
Shop 5 Kambah Village, Primmer Ct,
PO Box 2066,
KAMBAH
A.C.T. 2902
AUSTRALIA

GRAIN BREWING

THE FINAL FRONTIER

Have you tried kits and malt extract brewing and feel it's now time to have a go at making beer the real way? If so welcome aboard.

Not only is it possible to successfully mash at home, but with care and some planning you can routinely produce world class beer.

We suggest that before starting you have a good read of this pamphlet and if possible read any good books on the subject, for example, "Homebrewers Companion" by Charlie Papazian, "The Complete Handbook of Home Brewing" by Dave Miller, "New Brewing Lager Beer" by Greg Noonan and "Brew Your Own Real Ale at Home" by Graham Wheeler & Roger Protz or any of the Classic Beer Series.

INGREDIENTS

MALT

Malt is the basis of all beer and it is impossible to brew without it. Once you have brewed a few times you will become familiar with the different types of malts and the influence they have on your brews. It is outside the scope of this pamphlet to fully explain what malt is and how it is produced other than to say it is derived from barley and is a completely natural product. For a full explanation as to what malt is, we would suggest again that you consult the abovementioned books.

All malts produced in Australia are not the same as each other. In fact quite the opposite is true, as the majority of Australian Malts are produced for export to South East Asia. In these countries they follow more closely the Dutch and German brewing tradition, which calls for different mashing techniques. Different types of malts have to be handled in different ways. This is explained in the modification section and is borne out in the recipes.

Varieties of Malt

Lager (Franklin) Malt : This is a light coloured malt and is used for producing lagers and pilsners. It is described as lowly modified.

Ale Malt : This is a pale coloured malt used specifically for English style beers, and is excellent in ales and stouts. It is described as fully modified.

Wheat Malt : As the name suggests this is made from wheat instead of the traditional barley. It is very light in colour (about the same as lager malt) and requires some special treatment as it contains large amounts of insoluble protein. This is explained in more detail in the section on Modification. It is great for making Weizen Bier or as it is known in Australia, Wheat beer. Small quantities are excellent for producing a frothy long lasting head on any beer. This malt is made specifically for the Redback Brewing Company.

Munich Malt : This is normal malt similar to ale malt except that it has been more highly kilned to produce a richer colour. As the name implies it is excellent for making pale & dark Munich style lagers.

Munich Dark : A slightly darker version of Munich Malt

Amber Malt : This is an even more highly kilned malt than "Munich Malt". It has a beautiful rich malt aroma and flavour suitable for adding a strong smooth character to your beer. Due to the high kilning temperatures, Amber malt contains very little Enzyme power and therefore needs to be mashed with a good proportion of pale malt to convert it's starches to sugars.

Lager, Ale, Wheat, Amber and Munich malt all require mashing to extract their malt sugars.

Crystal Malt : This is normal malt that has been treated so that sugar is produced within the grain. This is achieved by heating the grains to the mashing temperature (65 degrees) in a closed kiln to retain the moisture within the grain. This causes the interior of the grain to liquify, and the sugars formed within the grain caramelize. The kiln is then opened to allow out the hot moist air and then the temperature is raised to a point where the interior of the grain crystallizes, hence the name. If you crack open one of the grains you will see what we mean.

Light Crystal : This is a type of crystal malt. It is only slightly roasted which results in it retaining a very pronounced malt aroma. This is a beautiful malt to use in any beer to add malt flavour and body, as well as some colour.

Dark Crystal : A darker version of crystal malt;

Chocolate Malt : The type of chocolate malt we have available for sale is actually a dark crystal malt, it is excellent in stouts and is perfect for making Brown Ales.

Roast Malt : This is malted barley that has been roasted until it carbonises, this gives it an aroma similar to coffee and accounting for its very dark colour.

Roast Barley : This is unmalted barley that has been treated in the same way as roast malt but has a sharper, more burnt character to it. Roast barley is the principal flavouring ingredient in stout.

MODIFICATION

Modification refers to the amount of germination which takes place in the grain during the malting process and from this we then know how the grain has to be mashed. Put simply, any malt that is under-modified has to have a protein rest during the mashing cycle. The protein rest makes certain enzymes become active and breaks down insoluble protein into soluble protein. If this were not to occur, the finished beer would be extremely hazy. Therefore this is an essential part of the mash when using undermodified malt.

SUGARS

It is our belief that to produce first class beer, cane sugars should be either omitted or used very sparingly. The Germans actually have a law forbidding the use of anything other than Malt, Hops, Yeast and Water in their beer. In other words no sugar is used, and we've yet to taste a bad German beer.

If you are to use sugar it should only be as a flavouring adjunct and never just as source of alcohol. This therefore rules out the use of white sugar and dextrose. Small amounts of some dark sugars can add subtle flavour characteristics and are particularly good in English style beers.

We would never recommend more than 500 grams in a 25 Litre batch.

HOPS

Hops are the flowers of the female hop plant which is a perennial deciduous climbing vine. They are the seasoning in beer used to add bitterness to balance the sweetness of the malt and impart their aromas to the finished product. Almost all hops available for sale in Australia are pelletised, made by crushing the hop flowers and forming them into pellets.

The importance of hops in the beer cannot be overstated and it is essential to use fresh hops at all times. We store all our hops in the deep freeze and we strongly recommend you do the same with any you have at home. Below is a list of all the hops we have available along with approximate alpha acid ratings for these varieties. Also included is a guide to their aromatic qualities:

Fuggles 4 % Semi Aromatic
Cluster 6 % Semi Aromatic/Bitter
Pride of Ringwood 10% Bitter
Goldings 5 % Aromatic
Willamette 7 % Semi Aromatic
Tettnang 5% Very Fine Aroma
Saaz 3% Very Fine Aroma
Sticklebract 12% Aromatic
Green Bullet 15% Aromatic
Super Alpha 9 % Bitter
Hallertau Triploid 9 % Fine Aroma
Pacific Gem 15% Bitter
Hallertau Aroma 3 % Aromatic

The alpha acid figure is the total bittering component in the hops when they are fresh and will differ from crop to crop & year to year. For example, if you required a particular level of bitterness applying the above quoted figures you would need three times as many Saaz hops as Pacific Gem.

There is a formula that can be used to calculate the quantity of hops required in a given recipe, based on the European Brewing Convention (EBC) Bitterness Units (BU). Bitterness Units are expressed as milligrams of alpha acid per litre of beer and some typical figures for well known commercial beers are as follows:

Victoria Bitter 22 BU
Coopers Sparkling Ale 24 BU
Guinness Stout 47 BU
Fosters Lager 18 BU
Bass Pale Ale 28 BU
Lowenbrau 24 BU
Pilsner Urquell 40 BU
Cascade Premium Lager 25 BU

As you can see there is quite a bit of variance between different styles of beer. This is very useful information as home brewers are almost always trying to reproduce a particular commercial brand. With this information, and the final gravity of the beer, which determines the sweetness and body of the beer, the bitterness levels of any beer can be reproduced.

The formula for this is as follows:
BITTERNESS UNITS = 10 x Required BU x Batch Size = g Alpha Acid.

This figure is then divided by the alpha acid figure for the type of hops you are using and a efficiency factor. To show this more clearly we will give an example for a 25 litre batch of Bass Pale Ale:

(1) (2) (3) (4) (5)
BU = (10 x 28 x 28) divided by (31 x 3.5)

= 72 grams of Goldings hops in the boil.

Now what do all these figures mean ?

(1) This figure of ten is there to ensure we get an answer in whole numbers ie; 72 instead of 7.2;
(2) This is the BU figure for Bass Pale Ale.
(3) This is the batch size in litres. It is 28 instead of 25 due to the amount of wort that stays in the boiler at the transfer stage (explained later), that liquid which is heavily saturated with protein matter from the boil.
(4) This is the utilisation factor, or the amount of Alpha acid that is actually used during the boil. Brewing chemists have established that 31% is the maximum achievable in a 90 minute boil. You would use figure of 25 if you were using cone hops.
(5) The alpha acid content of Goldings hops as a percentage by weight.
Here is another example:

Fosters Lager BU = (10 x 20 x 28) divided by (31 x 9.5) (Pride of Ringwood);
= 19 grams of hops in the boil.

This is another important ingredient in beer as even the strongest beer is 90% water. So it is important to use the cleanest and most chemically neutral water you can. As a general rule of thumb, Canberra's water is soft and is perfect for Lager style beer once the chlorine has been removed from it. This can be achieved by aerating, filtering or boiling, the first of these being the simplest method.

When making beers with quantities of dark grain it is essential to add various mineral salts to the mash to balance out the acidity of these grains. It is beyond the scope of this paper to fully explain the chemistry involved in water treatment. For further information again consult the texts previously mentioned.

For simplicities sake we have included the water treatment for various beers in the recipe list at the end of this brochure.
Yeast is probably considered the least important ingredient in the minds of amateur brewers, yet it has the ability to add all manner of subtleties to the finished beer, both good and bad.

For too long amateur brewers have suffered by having to use second rate brewing yeasts. No matter how good all your other ingredients are, if you have a sub-standard brewing yeast, you will finish up with sub-standard beer.

All is not gloom and doom though as new pure brewing yeasts are becoming available on the market. These are strains sourced from breweries all around the world and when used properly will give superb results. They are available in liquid packs in many Lager types as well as Ale and Wheat beer styles. Some of the available styles in the Wyeast or the White Labs ranges are:

German Ale, London Ale, Irish Ale, Scottish Ale,
European Ale, Bavarian Wheat, American Lager, Danish Lager,
Californian Steam, Bohemian Lager, Bavarian Lager, Czech Pilsner,
Munich Lager, Belgian Abbey, Swedish Ale, Kolsch,
Belgian Lambic, German Wheat, Belgian Trappist, Belgian Wheat.

EQUIPMENT

To be able to brew successfully you will need a certain amount of specialised equipment. The most important is a large pot capable of holding 25 to 30 litres of liquid and in this you can mash your grains and later use as the boiler. This is only one method but usually works out to be the most inexpensive.
More experienced mashers often use a gravity fed system using three stainless steel containers (sometimes beer kegs) with ball valves outlets. The mashing vessel usually has a false bottom drilled with many small holes (approx 2mm) spaced about 8mm apart. LPG is the usual method of heating.

We have devised a system utilising two polyethylene fermenters and an element. This gives the control you require to mash accurately and also the power required to boil your wort. These are a great unit and really take the hard work out of mashing. No doubt you will have your own ideas on what gear you would like to try using. We would suggest that before attempting your first mash you come in or call us to discuss your equipment needs. This may save a lot of headaches.

MASHING PROCEDURE

THE MASH

To explain the mashing procedure we will run through the basic procedure we use when brewing using the double bucket method. You can then relate this to your own equipment set-up.

Firstly, ensure that your equipment is clean, most importantly the electrical element. It will not function accurately if it is discoloured or coated with a protein film.

Once everything is cleaned, add the water to the mashing vessel, known as the mash tun. We use 4 to 4.5 litres of water per kilo of malt. This is partly due to the gap left between the top and bottom bucket, which means slightly more water is needed to achieve the required mash consistency. You may find you need less using a different system, but never use less than 2.5 litres per kilo of grain.

Heat the water to 72 degrees Celsius. The grain is added next. It should be all added at the same time, and once in, stirred continuously until properly wetted.

The temperature will now have dropped to 65 - 66 degrees. It is now up to you to maintain this level for the next 90 to 120 minutes. This requires a little effort at the start of the mash. Removing 2 litres through the tap every 15 minutes or so and adding it back into the top of the mash, then stirring, will to ensure proper heat distribution.

A drop in temperature of 2-3 degrees over the period of the mash will not be seriously detrimental, however the strike (initial) temperature is important.
Once 90 minutes has elapsed it is time to prepare for the sparging stage.

A Brief Word On The Effect Of Temperature During The Mash.

You may be wondering about the temperature quoted for the mash of 65-66. This temperature has been found to produce the required balance for most beers. By balance we mean the proportion of maltose to dextrins and other complex unfermentable sugars.

Maltose is a fully fermentable sugar and when malted barley is mashed at 65-66, 80% of the total sugar produced will be of this type. The remaining 20% will be made up of dextrins and other less fermentable sugars.

The type of sugars produced is related directly to temperature. Using 65 as a mid point, the nearer the mash temperature is to 60 degrees the higher the proportion of maltose. This will result in a thinner beer lacking in body, as the residual dextrins supply much of the beer's flavour. The nearer the temperature is to 70 degrees, the higher the proportion of dextrins, which can result in a thicker, more syrupy beer due to the proportion of unfermented sugar.

High mashing temperatures are good for making full bodied Stouts and Scotch Ale type beers.

SPARGING AND WORT CLARIFICATION

Sparging is the process whereby the wort is separated from the grain and the grain bed is used as a filter to remove as much grain matter (draff) from the wort as possible. The grains are then rinsed with hot water to extract the remaining sugar.

To do this effectively, the mash must be heated to 76-78 degrees. This lowers the viscosity of the sweet wort, thinning it down so that it then flows better, allowing a good separation from the grain. Higher temperatures than this will result in the extraction of unwanted tannins and starch from the grains, causing harshness and haze problems.

Once the temperature has reached 76-78 degrees, open the bottom tap to slowly allow out some wort. At this stage it is necessary to filter out as much trub as possible if we want to achieve a truly professional result. This is done by returning the wort back to the mash as gently as possible to avoid agitating the mash bed. This should be done until the wort starts to run clear which usually takes 10 minutes. This use's the grain bed as a filter to remove as much draff as possible from the wort to be boiled. This may seem like a lot of work, but it will make the beer taste much cleaner and allow the flavour of the malt to come through fully.

When the wort becomes fairly clear it is time to transfer our first runnings into the boiler. When the level of the wort drops to just above the surface of the grain bed it is time to add the heated sparge water (78 degrees). Again this is best done gently to avoid disturbing the grain bed, using roughly the same volume of sparge water as was used in the mash.

If you can use a hose to avoid splashing the wort as it drops from the mash vessel to the boiler this will result in smoother beer due to the reduced chance of oxidation.

It is also advisable to keep the flow rate through the outlet hose to around 1 to 2 litres per minute. This will again reduce the chances of drawing through any unwanted draff into the boiler and

will also allow the hot water to percolate slowly through the grain and remove all the malt sugars.

As you can see by a simple bit of arithmetic the sparging and clarification process can take quite a while. This may seem an awful lot of effort, but if you aiming for perfection this is what is required.

BOILING THE WORT

The most difficult part of the process has now been completed and it is now time to boil the wort. There are several reasons for boiling the wort. These are as follows :

(a) Destruction of the diastatic enzymes from the mash. Even after a long mashing and sparging process there will still be some diastatic activity in the sweet wort. Diastatic activity means the activity of the enzymes in the grain that convert starch in the malt into sugar. If this were allowed to continue the correct ratio of maltose to dextrins would be affected resulting in an unbalanced beer.

(b) Sterilisation.

(c) Extraction of bitterness from the hops.

(d) Removal of excess protein which can cause haze and flavour problems.

(e) Evaporation of excess water.

A very important point to note before you return the sweet wort to the boiler is to clean out the boiler and most importantly clean the element. This is best done with a scourer pad. It is important to remove the protein residue that will have built up on the element during the mash. If this is not removed it may char onto the element during the boil resulting in burnt flavours in the beer or, at the very worst, the element cutting out completely.

Once your boiler and element are clean, fill the boiler with the sweet wort. As soon as the element is covered, turn the thermostat control to position 10 and allow the wort to come to the boil. We have found from experience that if you leave the mashing container in the boiler it increases the capacity of your boiler and also acts as strainer at the end of the boil to hold back trub and hop residues.

It is important to make sure that your boiler is not over full because as the wort comes to the boil it will kick and bubble violently, which could result in a boil over. For this reason, when boiling take the element out of the mashing unit and fit it into a 50 litre aluminium boiler. This allows us to boil up to 40 - 45 litres of wort without boilover problems.

Once on the boil, leave the sweet wort to boil for 30 minutes before adding the hops, and then boil for a further 60 minutes. The hops only need to be boiled for this amount of time to extract their bitterness and if boiled for any longer harsh flavours can be extracted from them. The long boil is to remove the optimum amount of protein from the wort thus forming a good "Hot Break”.

HOT BREAK

Hot Break refers to the removal of protein from the wort by mechanical action due to the violent boiling action. This protein precipitates out of the wort to form a layer of fine debris on the bottom of the boiler.

If this were to remain in the wort it would cause haze problems and have an adverse affect on the flavour.

Hot break will generally be achieved by a 90 to 120 minute boil. The addition of Irish Moss 20 minutes before the end of the boil will greatly help this phenomena to occur.

COOLING THE WORT AND THE COLD BREAK

The hot wort in the boiler must be cooled as quickly as possible for the following reasons :

(a) To bring the temperature down so that the yeast can be pitched before rogue bacteria can take hold.

(b) To achieve the cold break.

The " Cold Break " is a phenomenon similar to the hot break. Although the hot wort appears relatively clear, once the temperature drops below 50 degrees Celsius a fine mist like material will appear and fall to the bottom of the boiler. This is more protein matter and it is our job to try to stop it being transferred into the fermenter.

To do this we need to cool the wort while it is still in the boiler. This is best done with a piece of copper formed into a coil. The coil is placed into the hot wort and cold water is circulated through the coil and then out to waste.

It normally takes 15 to 30 minutes to cool 28 - 30 litres to pitching temperature.

To avoid transferring any trub into the fermenter it is wise to locate the tap at least 50 millimetres above the bottom of the boiler. Tapping off from this point reduces the amount of trub and if transferred using a filter bag reduce it considerably.
Brewing Extract & Efficiency

Have you ever wondered how much sugar you may be leaving behind in your grain bed after mashing and sparging? Even if you feel you get a good extract you may be interested in knowing what efficiency you are achieving.

The formula below is based on the laboratory extract figure for Australian well modified malted barley. This figure is expressed as "Brewers Degrees per Kilogram Litre" (BD/KL). This means the maximum possible extract attainable from a kilogram of malt mashed to produce a litre of wort. "Brewers Degrees" (BD) are a simplified version of an "Specific Gravity" (SG) reading and are expressed as follows:

SG 1.050 = 50 Brewers Degrees
SG 1.012 = 12 Brewers Degrees

The BD/KL for Australian well modified malt is for"ale" 307, and for lager 302. This means that by following a strict procedure as laid down by the European Brewing Convention (EBC), one kilogram of malt mashed to produce one litre of wort would have an SG of 1307, or 307 BD/KL.

If this figure is entered into the following formula, efficiency can be calculated:

Extract Efficiency = Original Gravity in BD x Volume x100
BD/KL x Weight of Malt in Kg
This may look a little complicated but it is easier to understand when an example is used. This is an example for a brew made with 5 Kg of malt made up to 25 litres with an OG of 1050.

Extract Efficiency = 50 x 25 x 100
307 x 5

= 81.43 %

This figure has other uses. Once the percentage has been checked over several brews and an average is calculated, it can be used to calculate the required weight of malt needed to achieve a desired OG.

Quantity of Malt = OG in BD x Volume x 100
EBC Extract x Mash Efficiency

If a brew of 25 litres @ OG 1050 is desired and efficiency has been calculated at 82 % :
Quantity of Malt = 50 x 25 x 100
307 x 82

= 4.96 Kg say 5 Kg
A quick look at this indicates that we should roughly achieve 10 degrees of gravity for every kilo of malt.

All of the figures for the Australian malt were obtained from Kevin Mitchell, Plant Manager at Barrett Burston Maltings in Collingwood and are based on malt produced in 1992.

FERMENTATION

After all the hard work of mashing and boiling you should now have the perfect environment for the yeast to take up residence.

The most crucial thing now is temperature, both the pitching temperature and that during fermentation. It is most important that you add the yeast at the correct temperature. If too high, the yeast at worst can be killed and at best the flavour will be spoiled by esters developed by the high temperature.

Esters are a form of acid that will be present in the beer as fruity flavours such as pineapple, banana, butterscotch. These flavours when occurring in small amounts can add subtle character to Ale style beers but when they overpower the beer can make it undrinkable.
So it is up to us to control the temperature of the ferment to reduce the esters or in the case of lager style beer to do away with them completely.

As you can well imagine, the type of beer produced is tied directly to the type of yeast you use. For the sake of simplicity we will recommend the type to use, as well as the correct fermentation temperatures. This is all in the following recipe list. Once you become more experienced you may want to start experimenting with types of yeast and different temperatures.

SECONDARY FERMENTATION & CLEARING

Once the primary fermentation appears to slow (usually the third or fourth day) you should rack your brew into a secondary fermentation vessel, leaving the sediment in the primary fermenter. A

vessel exactly the same as your primary fermenter is perfect for this job and is an essential item in any amateur brewer's armoury. This will separate the beer from the yeast in the primary fermenter and will allow it to clear of most of the remaining yeast.

Bottle sediment will be reduced, and the flavour and shelf life of your beer will be greatly improved. This is best done using a piece of tubing which fits over the outlet of the tap, this is then placed in the bottom of your second fermenter and the tap opened. Avoid splashing the beer at all cost, in order to reduce oxidisation (allowing air to come in contact with your brew) which can destroy your beer.

Once filled immediately add finings and allow to sit for 5 to 8 days.

RECIPES

(1) AUSSIE LAGER
3500g Lager Malt *
75g Crystal Malted Grain
500g Dextrose
35g Cluster Hops, 25g in Boil(18BU), 10g in Soak
1 Sachet DCL SafLager Yeast (Ferment at 10 - 15 Degrees)
1 Sachet of Finings

(2) AUSSIE BITTER
3500g Lager Malt *
75g Crystal Malted Grain
500g Dextrose
20g Pride of Ringwood Hops(22BU), all in the Boil
1 Sachet DCL SafLager Yeast (Ferment at 10 - 15 Degrees)
1 Sachet of Finings

(3) DIETALE
2500g Lager Malt *
75g Crystal Malted Grain
500g Dextrose
25g Cluster Hops (20BU), all in the Boil
1 Sachet DCL SafLager Yeast (Ferment at 10 - 15 Degrees)
1 pkt dry enzyme (alpha amylase)
1 Sachet of Finings

(4) AUSSIE LIGHT
1500g Lager Malt *
375g Crystal Malted Grain
250g Dextrose or White sugar
250g Malto Dextrin Powder
35g Cluster Hops, 25g in Boil(20BU)
1 Sachet SHB Lager Yeast (Ferment at 10 - 15 Degrees)
1 Sachet of Finings

(5) CZECH PILSNER
4500g Lager Malt **
75g Crystal Malted Grain
120g Saaz Hops, 90g in Boil(35BU),30g Soak

Wyeast Bohemian Yeast or White Labs WLP 800 Pilsener yeast (Ferment at 8 -10 Degrees)
1 Sachet of Finings

(6) TRADITIONAL OKTOBERFEST LAGER
5750g Munich Malt
40g Tettnang Hops (25BU)
2 Tsp Calcium Carbonate
Wyeast Bavarian Lager or White Labs WLP830 German Lager yeast (Ferment at 6- 10 Degrees)

(7) VIENNA LAGER
4750g Lager Malt
600g Munich Malt
350g Crystal Malt
65g Tettnang Hops (25BU)
1 Tsp Calcium Carbonate
Wyeast Bavarian Lager Yeas or White Labs WLP830 German Lager yeast (Ferment at 6 - 10 Degrees)

(8) DORTMUND LAGER
4500g Lager Malt *
275g Crystal Malted Grain
50g Hersbrucker Hops, all in the boil (27BU)
20g Tettnang Hops in Soak
Wyeast Munich Yeast or White Labs WLP830 German Lager yeast(Ferment at 7 - 10 Degrees)
1 Sachet of Finings

(9) TRADITIONAL MUNICH LAGER
2500g Lager Malt *
2000g Munich Malt
500g Amber Malt
300g Crystal Malt
200g Chocolate Malt
65g Hersbruck Hops, all in the Boil (34BU)
Wyeast Bavarian Yeast or White Labs WLP 838 South German Lager yeast(Ferment at 7 - 10 Degrees)
1 Sachet of Finings

(10) DRY
2500g Lager Malt *
75g Crystal Malted Grain
500g Dextrose
60g Tettnang Hops, 35g in the Boil(20BU), 25g soak
10g Dry Hop
Wyeast Pilsner Yeast or White Labs WLP 800 Pilsener yeast (Ferment at 7 - 10 Degrees)
1 Pkt dry enzyme (alpha amylase)
1 Sachet of Finings

(11) LONDON BEST BITTER
4000g Ale Malt #
300g Crystal Malted Grain

150g Wheat malt
15g Chocolate malt
500g Brown sugar
110g Goldings Hops, 80g in the Boil(30BU), 30g in Soak,
1 Sachet Danstar London Ale Yeast (Ferment at 18 - 20 Degrees)
1 Sachet of Finings

(12) YORKSHIRE E.S.B
4000g Ale Malt #
400g Crystal Malted Grain
60g Malted Wheat
500g Brown Sugar
100g Molasses
50g Willamette Hops, all in the boil(35BU)
30g Goldings Hops in Soak
Wyeast European Ale Yeast or White Labs WLP002 English Ale yeast (Ferment at 18 - 20 Degrees)
1 Sachet of Finings

(13) INDIA PALE ALE
4000g Ale Malt #
350g Crystal Malted Grain
500g Demerara Sugar
135g Goldings Hops, 105g in the boil(40BU), 30g in Soak,
1 Tsp Calcium Sulphate
1/2 Tsp Magnesium Sulphate
1 Sachet DCL S-04 Ale Yeast (Ferment at 18 - 20 Degrees)
1 Sachet of Finings

(14) NORTHUMBERLAND BROWN ALE
3000g Munich Malt ##
1500g Ale Malt
250g Cara Pils Malt
75g Chocolate malt
200g Lactose Powder
30g Willamette Hops(22BU), all in the Boil
Wyeast European Ale Yeast (Ferment at 18 - 20 degrees)
1 Sachet of Finings

(15) STRONG ALE
4500g Ale Malt #
1700g Amber Malt Extract
200g Crystal Malted Grain
500g Demerara sugar
35g Vienna Gold Hops, all in the Boil(25BU)
2 Sachets DCL S-04 Ale yeast (Ferment at 18 - 20 Degrees)
1 Sachet of Finings

(16) BELGIAN TRAPPIST ALE
3000g Ale Malt ##
2000g Munich Malt
500g Amber Malt
300g Crystal Malt

50g Chocolate Malt
500g Coffee sugar
30g Hallertau Triploid Hops, all in the Boil(32BU)
2 Tsp Calcium Carbonate
Wyeast Belgian Ale Yeast or White Labs WLP500 Trappist Ale yeast(Ferment at 20 - 22 Degrees)
1 Sachet of Finings

(17) IRISH STOUT
4500g Ale Malt ##
400g Roast Barley
1000g Flaked Barley
500g Malto Dextrin Powder
30g Pacific Gem Hops, all in the boil(40BU)
2 Tablespoons Calcium Carbonate
Wyeast Irish Stout Yeast or White Labs WLP004 Irish Ale yeast (Ferment at 18 - 20 Degrees)
1 Sachet of Finings

(18) BLACK VELVET MILK STOUT
2500g Ale Malt ##
2000g Munich Malt
300g Roast Barley
500g Lactose
15g E4 Hops, all in the boil (25BU)
2 Tablespoons Calcium Carbonate
Wyeast Irish Stout Yeast or White Labs WLP004 Irish Ale yeast (Ferment at 18 - 20 Degrees)
1 Sachet of Finings

(19) BAYSIDE WHEAT BEER
3000g Wheat Malt **
2500g Pils Malt
30g Hersbrucker hops, all in the boil (16BU)
Wyeast Wheat Beer Yeast or White Labs WLP300 Hefeweizen yeast(Ferment at 15 - 18 Degrees)
1 Sachet Finings
MASHING SCHEDULES
* = Protein rest at 50 Degrees for 20 mins then mash at 66 for 2 hrs.
** = Protein rest at 50 Degrees for 45 mins the mash at 66 for 2 hrs.
# = Mash in at 71 Degrees then mash at 66 Degrees for 2 hours.
= Mash in at 74 Degrees then mash at 68 - 69 Degrees for 90 mins

We would like to thank Laurie Cahir of Southern Home Brewing Supplies of Edithvale, Victoria, for granting us permission to use his excellent article as the basis for this one.