**Juicing Apples**

**Screening and chopping of apples**

Apple juice is a pure unfermented product and so requires the apples to be high quality, without any rot. Follow these guidelines for screening apples:

Do not accept any windfall apples that have been picked from a site that has held domestic livestock within the last 2 months – this is a legal requirement. Apples picked off the trees are fine.

Reject any that show signs of squishy brown rot as this can contain patulin, which is toxic, especially to pregnant women (ordinary bruises, cuts, peck marks, scabbing etc. are fine)

Cut smaller apples into 2 and bigger apples into 4 – the object of this is to check for internal rot (and reject relevant apples) and cut the apples into pieces that go more easily through the scratter.

Pick out larger leaves, slugs, other extraneous wildlife, but don’t worry too much about grass etc.

(For cider, you do not have to take so much care as the fermentation process kills a lot of potential pathogens.)

**Scratting**

Apples must be crushed to give pomace (a grated consistency) before pressing. Crushing is essential because a body of unbroken fruit presents a great resistance to pressure (even hydraulically powered commercial cider presses are fed with finely milled apples). In the Three Counties the process is known as scratting and the machine that does it is a scratter.

Apples can be crushed by pounding them in a bucket with a clean length of timber although this is a vigorous process and probably only for those in need of extreme aerobic exercise. Freezing and then thawing the apples before pounding will make the job easier. Cutting apples into slices is not sufficient. At the opposite extreme, food processors and liquidisers produce too fine a puree for pressing.

Vigo Presses offer a range of purpose-built apple scratters, from hand-operated to electrically powered, to handle all levels of production. These machines will make reasonably fast work of the fruit, producing a consistency appropriate for pressing.

Using the hand-operated crushers, halved or quartered apples are dropped into the stainless steel hopper, fall onto the blades, are cut and then crushed by the rollers and hooked blades. Colwall Orchard Group use Vigo’s “Crusher A” which retails at £245. This is sufficient for most domestic purposes and for Apple Day demonstrations. Juice yields can be significantly increased by scratting the apples twice.

Next step up is a small electric scratter - the most powerful electric mill on the market is the Spiedel Apple Mill. This 2.2kW/2.9 hp can mill whole buckets of apples and pears into a perfect pulp that will give a very high juice yield. It retails at £795 and is suitable for small scale commercial production.

Important notes

* Hand cranked scratters are best used on a firm surface – Colwall Orchard Group has one fixed on a Singer sewing machine base, and we fix others to 2x workmates using cable ties
* the handle of the scratter must not be turned until everyone has taken their hands out of the scratter funnel, unless you want pink juice
* do not allow children to use scratters unattended

**Pressing**

Once crushed, the apples can be pressed. The entry level equipment is a manual barrel press. In these the pomace is packed into the cage of the press (the barrel-like part) and pressed by a wooden piston. The piston is pushed down, putting pressure on the fruit, forcing juice out through the gaps in the cage staves. The staves are positioned closely to reduce the escape of pomace, pips and skin. We recommend using a straining bag (£7) to reduce the amount of solids in the juice. The juice flows onto the base plate of the press and out through the lip or drain hole into a jug, bowl or bucket. It is important not to exert too much pressure on the pressing plate as you run the risk of cracking it. Allowing the pomace to rest for a few minutes after the initial press will usually allow more pressure to be applied.

Once the pomace has been pressed dry, the mechanism is unwound, the cage lifted off the base plate and the cake of dry pomace pushed out or lifted out in the straining bag. The presses require minimal maintenance: a rinse with fresh water and a touch of food grade grease to the screw thread is all that is required. The pressed pomace can be composted or fed to livestock – pigs love it.

Colwall Orchard Group uses 20 litre Vigo presses which retail at £345. Vigo also supplies a larger 36 litre press for £445.

With practice you should be able to do three or more pressings in an hour. Apples will yield up to 50% or more juice by weight. As a rough guide, 20 lbs of apples will yield up to about one gallon of juice. Thus, for example, a 12 litre press used with apples will give an hourly output of around 5 gallons (23 litres).

If you wish to scale up then Hydropresses are extremely efficient. They work by inflating a balloon inside the drum using mains water pressure. They are expensive (40 litre, £745 and 90 litre, £950) and must be used in conjunction with an electric scratter (manual ones do not mill the fruit effectively enough) but easy to use, very fast and efficient. The 40 litre will produce 75 litres of juice per hour and the 90 litre 125 litres per hour.

The juice you will produce will be naturally cloudy and will contain small particles of suspended apple solid – as this contributes a great deal to the flavour and texture there is no need to filter it.

It is important that all vessels used to collect and transfer juice are of “food grade” plastics or glass.

Ascorbic Acid (vitamin C) is an antioxidant used to reduce browning in apple juice production. It can be added either to crushed apples prior to pressing or to juice collected from the press. Its purpose is purely cosmetic and it does not affect the quality of the juice. Sold in 100g (£5.24), 500g (£15) and 1kg (£25) re-sealable tubs by Vigo Presses, it has a long shelf life. Use in ratio of 0.5g per 1 litre of juice produced. It is important when labelling to refer to it as *Antioxidant (Ascorbic Acid)* and not *Vitamin C (Ascorbic Acid)* this is because its purpose is as an antioxidant and not a vitamin supplement.

**How to preserve apple juice**

Your juice is delicious drunk straight away but, as it is a natural product, it will deteriorate quite quickly by going brown and eventually fermenting. If you wish to keep it for any length of time it needs to be treated to kill the yeasts and destroy the enzymes which cause the changes.

Fresh apple juice will keep in the refrigerator for two to three days before it begins to ferment. Juice may be stored for longer periods by:

**Freezing**

Cut the top off an empty fruit juice carton, place a polythene bag inside, fill with juice, tie the top of the bag and freeze. Once frozen, the bag can be removed from the box and you have a brick of juice, which can be stacked in your freezer. One cubic foot will hold over five gallons. Juice can be frozen for months without any appreciable loss of flavour.

**Pasteurising**

Pasteurised juice can be stored for anything between 6 months and 2 years, depending on how it is stored. Careful pasteurisation will kill off any organisms that could cause spoilage of the juice whilst preserving its fresh apple flavour. Purpose built pasteurisers with both thermostats and timers for pasteurising juice in the bottle or in the bags for the bag-in-box are readily available and retail for around £200.

**Pasteurising in the Bottle**

Fill clean glass bottles with juice and close the caps loosely, place them in the tank of the pasteuriser, fill the tank with water to the required level and set the pasteuriser to 75°C. Set the timer on the pasteuriser to 25 minutes. Once the juice inside the bottles has reached temperature, the timer will start to count down. When the timer reaches zero, the caps on the bottles can be tightened, and the bottles carefully removed and allowed to cool. Most pasteurisers hold 13 x 75cl bottles so juice can be bottled in large batches relatively easily. The shelf life of bottle, pasteurised juice should be 1 – 2 years.

**Pasteurising in the Bag**

Alternatively, juice can be pasteurised in 5 or 10 litre bag-in-boxes for medium term storage. Using a filling stand, the bags can be filled with juice ready for pasteurisation and then sealed. Two 5 litre bags or one 10 litre bag can be pasteurised in the pasteuriser at any one time by the same process described above. Bag-in-boxes can easily fit into a fridge so are excellent for those who wish to serve chilled apple juice. The shelf life of bag-in-box pasteurised juice should be 6 - 12 months.

**Microwave**

Stand a bottle with its top loose, in the microwave and cook for one minute on full power. Give it a careful shake then cook for another minute. Two minutes should be enough unless there are a great many bottles in the cooker. Continue until the juice is hot but watch for it boiling out of the bottle. Allow to cool and screw down the top. This method is said to be very effective and is best for plastic bottles, though there is only usually room for small ones in the cooker. We have never tried this so can’t necessarily recommend it!

**Sulphite (Camden Tablets)**

These are used by home wine makers to kill yeast when the fermentation is finished and can be bought at home brew suppliers. They should work just as well on apple juice. They may impart a slightly sulphurous taste. Follow the instructions on the packet. We have never tried this so again we can’t necessarily recommend it!

**Commercial Juicing**

Once the scale of the operation reaches into the hundreds of bottles then it is worth considering transporting your apples to a commercial juicer. Several exist in and around Colwall including Clive’s Fruit Farm, Pershore College, Orchard Origins and others. These organisations vary in cost; the minimum weight they are willing to juice; the type and size of bottles available and their ability to store your apples until ripe.

Base prices are around £1.30 to £1.50 per 75 cl bottle and 80 to 90p per 33cl bottle. To these costs you need to add transport of apples and bottles and labels.

**Labelling of Apple Juice for sale**

**For fresh apple juice** e.g. made on Apple Day, sold direct to the public and intended for immediate consumption, we provide only minimal labelling as follows:



**For pasteurised juice, produced for direct sale to members of the public,** there are several pieces of information that legally must be included:

* your contact details, in enough detail to allow someone to successfully contact you by letter
* the contents of the bottle i.e. Apple Juice (it’s up to you whether you add variety details etc.)
* the ingredients in the contents.  If you are using any additives you need to specify them and if possible, identify the percentage/weight.  Note:  for legal purposes the content label is the front of the bottle - even if you add nice logo'd labels on the other side.
* 'Best before' (note, not ‘use by’) date.  This must reflect your level of confidence in the keeping quality of your product.  COG usually uses 2 years from the juicing date.
* the quantity of juice in the bottle

We also add guidance on the label where we feel it is appropriate.  We always put 'once open, refrigerate and drink within 3 days'.  Sometimes we add 'Shake well before use' - for those apples, like Catshead, that throw a lot of sediment. Sometimes we add further information about the provenance.

An example of our label is shown to the right.

**Commercial apple juice**

Once you are producing apple juice for ‘commercial’ use, which we would consider to be any re-sale of the juice through external outlets e.g. via a local village shop, further rules apply.

Food business operators need to register their food business with the local authority where they are based 28 days before trading. Anyone making or selling food is required to make sure that the food they produce is safe. We would advise you to consider gaining formal certification in food hygiene such as the Chartered Institute of Environmental Health’s Level 2 award in Food Safety. You will subject to potential inspection of your premises and will need to prepare a ‘Hazard Assessment and Critical Control Point’ (HACCP) plan. This takes you through every aspect of the process from harvesting, preparation, bottling and storage, to identify sources of potential hazard and the measures required to minimise risk. There is plenty of guidance, including HACCP templates, on line. (NB: This can be avoided by using external contractors to process, bottle and pasteurise your juice.)

For labelling purposes, as a minimum you would need to keep detailed records of your batches as they are produced and display batch information on the label so that if there were to be a problem, you would be able to withdraw the remaining stock from that batch if required.

Colwall Orchard Group/Tim Dixon/Helen Stace

October 2016