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Small-scale Cider Brewing Guide (20 L batches)

I. Overview

- **The “wort”:** 20 L fresh apple juice (no additives), typical SG ~1.045–1.055, OR apple juice concentrate at ~70° Brix (~1.340). Dilute to the required concentration [use this [calculator](#) – approximately 3.5 L concentrate + 20.3 L water = 23.8 L apple juice at 1.050]. Remember, apple juice ferments dry (close to 1.000), so a 1.050 juice will result in >6% ABV.
- **Yeast choice:** Any cider or wine yeast, e.g., SafCider AB-1/AC-4, N96, or even beer yeasts or Kveik if you want faster fermentation. Experiment and pitch per manufacturer's instructions.
- **Nutrient/nitrogen management:** Because apple juice has a low nutrient content, the addition of nutrients, particularly nitrogen, is crucial for yeast health, fermentation control, aroma and taste development, and the eventual quality of the cider. However, data on how much to add and when is fragmented and highly variable, including non-linear results; for example, medium YAN concentration can be worse than low and high concentrations. The recommended nutrient additions below are based on my research and limited cider/perry brewing experience, which didn't produce H₂S with SafCider AC-4.
- **Important note:** If you plan to backsweeten and bottle-condition, you must chemically stabilise (sulphite + sorbate) or pasteurise the finished bottles to prevent refermentation and bottle bombs. Options and doses are discussed below.

II. Step-by-step protocol (20 L)

1. Inspect & prepare the juice

- Check colour, smell and SG. Dilute if necessary. Typical SA pressed/desert apple juices provide clean, fruity bases with low tannin, resulting in a lighter body than traditional English/French ciders.
- If juice looks brown from oxidation, SO₂ will help limit further enzymatic browning, but it won't fully reverse prior oxidation.

2. Sanitise & sulphite treatment (optional but recommended for control)

Goal: control wild microbes, PPO (polyphenol oxidase) activity, and buy time to add selected yeast.

- Add potassium (K, or sodium [Na]) metabisulfite to target ~50 ppm SO₂ (common home/cider target for sanitising). A practical conversion many cidermakers use: ~90 mg K-metabisulfite per litre ≈ ~50 ppm SO₂. For 20 L → ~1.8 g K-meta total. Wait 12–24 hours before adding pectolase or pitching yeast, so the free SO₂ can bind and dissipate enough to avoid harming your yeast.
- Why wait? Free SO₂ is antimicrobial; waiting reduces the risk that the sulphite will stress or kill your pitched yeast.

3. Optional: Pectolase treatment (NOT necessary when you use juice concentrate)

- If you plan to use pectolase (pectin enzyme) to reduce haze from freshly-pressed juice, only add it 12–24 hr after the SO₂ addition; otherwise, the SO₂ will inhibit the enzyme. Add per enzyme label.

4. Yeast pitching & nutrients

- **Yeast:** follow manufacturer's instructions; a typical practical amount for 20 L is the equivalent of a single sachet of dry yeast, or ~0.5 g/L (~11 g for 20 L).
- **Nutrient additions:**
 - At T0 (pitching the yeast): 0.5g/l DAP **and** a yeast nutrient like Fermaid K as recommended by the manufacturer.
 - At T48 (day 2): Add another batch of nutrients as at T0.
 - At T96 (day 4): Add half the amount of each nutrient as at T0.
- **Pitch the yeast.**
- **Watch for H₂S (rotten-egg smell):** It is a sign of yeast stress/nitrogen deficiency. Add a small dose of DAP and Fermaid K as a corrective measure.

5. Fermentation management

- **Ferment temp:** ~18–20 °C for most cider/wine/ale yeasts, Kveik options vary. Let ferment until activity stops and SG is stable over 2–3 days. Cider typically ferments more slowly than ale and can take up to two weeks to finish.
- **Headspace:** cider usually produces little krausen, so you can fill the fermenter almost to capacity.
- **Racking:** when fermentation is done (stable SG), rack off gross lees to reduce autolysis and off-flavours; do this under CO₂, if possible, to prevent oxidation.

6. Clarify / cold crash / secondary

- Cold crash to help improve clarity; rack to a clean bucket (secondary) if you want a clearer product and to reduce yeast load before backsweetening or packaging.
- If you want more tannin/mouthfeel, add oak chips, tannin powder, or tea in secondary (dose as required).

7. Backsweeten & stabilise, or leave dry?

- The BJCP sweetness targets are helpful when planning backsweetening (see section below).
- When you backsweeten, balance the sweetness with acidity (using citric or malic acid) – sweetness without acidity can taste bland and flat.
- If you want to backsweeten (to SG target or taste), ALWAYS ensure fermentation is stopped or the yeast is prevented from reproducing; otherwise, added sugars will just ferment again. If you bottle condition this is particularly important! One of two different approaches could be followed:

A) **Chemical stabilization + backsweeten** (common)

- Rack cider and add sulphite (Campden) + potassium sorbate. Typical practical doses used by homebrewers: ~1/2 tsp potassium sorbate per 4 L → scaled to 20 L, this is ~8.5 g sorbate. Add sulphite at the same time, using 1 Campden tablet per 4 L or a K-meta dose to reach ~50 ppm free SO₂. Wait 24–48 hours before sweetening to allow for stabilisation.
- Bench test small samples to dose sweetness (more below). Sweeten to taste with apple concentrate, honey, sugar syrup or non-fermentables.
- Note: Potassium sorbate **does not kill yeast**; it prevents yeast reproduction. You still need sulphite and sorbate together to stabilise for effective backsweetening.

B) **Pasteurise after bottling** (for sweet, carbonated bottles)

- Bottle the sweetened cider and **pasteurise** the bottles in a water bath: **heat to ~60–65 °C** and hold for about **10 minutes**. This inactivates yeast and prevents further fermentation — but

watch bottle pressure & bottle strength (risk of bottle bombs if mis-timed). For safety, many homebrewers prefer to keg + force-carb.

- **Back-sweetening bench trials (do this every time)**
 - Prepare 100 mL samples of the cider (chilled).
 - Add known small sugar/concentrate increments (e.g., 0.25 g, 0.5 g, 1 g per 100 mL) or measured tsp of concentrate; mix and taste.
 - Choose the concentration you like, then scale up proportionally for 20 L.
 - **Scale rule of thumb:** to move a dry cider into a medium taster range, you may need ~10–25 g sugar equivalent per litre, depending on starting dryness and acidity.

8. Carbonation & packaging

- **Keg + force carb:** safest for sweetened cider (no bottle bomb risk). Purge keg with CO₂, transfer, force carb, then pressure-bottle fill with CO₂ if desired.
- **Bottle conditioning:** only if you want natural carbonation, but this requires precise sugar dosing and leaves a real risk of overpressure. If you back-sweeten before bottle conditioning, you must stabilise (using sulphite and sorbate) or pasteurise after achieving the desired carbonation.

9. Troubleshooting & common issues

- **H₂S (rotten-egg smell):** usually yeast nutrient deficiency/stress. Remedies: Administer oxygen early (if during the growth phase) and add a small dose of DAP or Fermaid K as a corrective measure.
- **Oxidation (brown, sherry/cooked apple flavours):** happens early in pressing or from oxygen exposure; sulphites limit PPO browning but can't always reverse prior oxidation. Reduce O₂ exposure during transfer by purging the headspace with CO₂ and avoid topping up with oxidised juice.
- **Lacking tannic dryness:** add tannin powder, oak chips or tea to build astringency and structure.
- **Refermentation after sweetening:** If not stabilised, sugars will ferment again: always stabilise with sulphite and sorbate and/or pasteurise or use non-fermentable sweeteners .

10. BJCP sweetness / FG approximation (for planning)

Use these as reference targets when deciding to backsweeten or style your cider:

- Dry: FG < ~1.002.
- Semi-dry / off-dry: FG 1.002–1.004.
- Medium: FG 1.004–1.009.
- Semi-sweet: FG 1.009–1.019.

From the BJCP cider guidance, which is helpful in judging and planning balance.

11. Sources & further reading

- **How to Make Hard Cider** <https://howtomakehardcider.com/>
- **Home cider making** (includes recipes) <https://www.homecidermaking.com/>
- BJCP 2025 Cider Guidelines (sweetness/FG & styles). bjcp.org
- Lallemand / Fermaid K product & dosing guidance. lallemandwine.com
- Practical Campden / SO₂ dosing discussion. [Google Groups](#)
- **The Cider Workshop** group discusses all aspects of growing, making and consuming cider (and Perry, Calvados, Pommeau, etc.) from orchard to glass. <http://www.ciderworkshop.com/>
- Potassium sorbate & stabilisation/pasteurisation guidance. beersmith.com
- **The Wittenham Hill Cider** Pages <http://cider.org.uk/frameset.htm>