MUNTONS TROUBLE SHOOTING GUIDE

FLAVOUR PROBLEMS

FAULT	CAUSE	ACTION
Acetaldehyde (Green apple	Bacterial contamination. Rapid fermentation. Poor 0^2 control. Green/ rough beer.	Check yeast handling and general hygiene (Zymononas, Acetobacter). Avoid oxidation. Remove with warm maturation before chill 21ºc +
Acetic (Vinegary).	Bacterial spoilage	Check yeast handling and general hygiene (Lactobacillus, Acetobacter)
Astringent.	Bacterial spoilage Oxidation.. Pesticide residues. Over attenuation. Overdose of roasted malts.	Check yeast handling and general hygiene. Reduce oxygen in headspace for packaging / storage Check water (brewing liquor) supply. Check fermentation control. Check recipe requirements.
Bitter.	Wild yeast Grist. Too much bittering hop.	Check yeast handling and general hygiene Reformulate amount of speciality malt or hops. Adjust bittering hop quantity
Bready / Harsh / Drying	Speciality malt. Over pasteurisation Oxidation.	Can be positive in stouts and porters. Adjust grist specification (less highly roasted product) Check pasteurisation control Reduce oxygen ingress in packaging / storage
Butterscotch (Diacetyl, Buttery, Milky).	Yeast. Bacterial contamination Maturation. Low wort FAN. Pipe Lines.	Can be positive if in ale. May need longer maturation or fresh yeast Check hygiene particularly in fermentation (Pediococcus, Lactobacillus). Condition for longer. Increase yeast count. Consider raising temperature. Optimise wort specification. Can be due to low valine level Check hygiene and cleaning processes
Carbonation..	Conditioning	Check gas specifications and equipment serviceability.
Catty / Blackcurrent leaves / Ribes / Cat Urine (Tom cat).	Over aged product Overpasteurisation. Oxidation	Check storage temperature and stock rotation Check pasteurisation regime Prevent / minimise air or oxygen entry during filling.
Cheesy / Sweaty / Rancid	Aged or Stale Hops. Bacterial spoilage	Do not use old hops. Check store temperature and stock rotation Check yeast handling and general hygiene
Cooked vegetable.	Over pasteurisation. Oxidation.	Check pasteurisation control Check air/oxygen ingress in processing / packaging
Dimethyl sulphide (DMS, Tomatoes, Sweetcorn).	Malt Bacterial spoilage. Wort.	Check DMS precursor (S-methyl methionine, SMM) in malt Check hygiene in fermentation (*O. proteus)* Ensure a vigorous, evaporative boil
Dry.	Fermentation.	Do not overattenuate. Check mash temperatures

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Earthy / Musty / Rusty.	Brewing liquor Mould growth.	Seek specialist advice of water consultant Check storage areas for dryness and hygiene
Estery (Fruity solvent)..	Fermentation.	Reduce temperature and/or original gravity
Fishy.	Tank resin.	Check integrity of tank linings
Fruity (Estery)..	Yeast	Check yeast strain. Check wort gravity is not too high
Goaty	. Yeast.	Check yeast strain, wort composition and oxygenation
Grassy.	Malt or Hops.	Keep storage areas dry and clean.
Honey.	Yeast. Over ageing.	Check yeast strain Check storage times / conditions
Husky / Grainy	Mash conditions	Adjust mash and sparge pH downwards
Lab-ox..	Packaging (Lubricants in cans).	Wash cans correctly
Lightstruck (Skunky)..	Ultraviolet light on hops / hop products.	Keep product out of direct sunlight
Meaty (Marmite)	Yeast.	Yeast breakdown (autolysis). Check yeast strain, handling and fermentation/ rest duration
Medicinal/ TCP	Plastic packaging or tubing Water.	Check sanitizer formulation and usage. Check integrity of tubing and packaging. Taste water and seek specialist advice. Wort – mash run off, phenols coming through
Metallic / Inky / Tin-like.	Contact with metalic surfaces. Fat oxidation. Additives. Aged product Brewing liquor.	Check integrity of all vessels Check pasteurisation and raw materials. Check priming sugars, caramels and filter powder Reduce storage time Seek specialist advice on water consumption
Mouldy.	Storage area..	Fungal contamination Check holding tanks, packaging and fungicide stores
Onion / Garlic.	Aged hops.	Check hop storage and usage.
Parsnips	Bacterial Spoilage	Check yeast handling and general hygiene (*O.proteus).* Pay particular attention to wort hygene
Phenolic (Spicy, Herbal, Cloves, Bakelite).	Yeast Uncured lacquer. Dispense tubes. Brewing liquor. Bacterial spoliage.	Wild yeast infection. (Can be a desirable note if a speciality yeast for wheat beer or if peated malt is used) Check specification and integrity of tank and packaging lacquers Check integrity and sanitising CIP procedure for plastic tubing Seek specialist advice. Check yeast handling and general hygiene (coliforms)
Rancid (sick / vomit).	Bacterial spoilage.	Check adjunct general hygiene (anaerobes).
Rotten eggs (Hydrogen sulphide).	Bacterial contamination Yeast. Brewing salts	Check yeast hygiene in fermentation and maturation (*Zymomonas, Pectinatus*). Check fermentation control (yeast strain, oxygenation, pitching rate, temperature etc. Check yeast strain. Reduce SO4

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Rotten vegetables (Leeks, Drains).	Yeast breakdown. Over pasteurisation.	Check yeast during maturation Check pasteurisation control.
Salty.	Brewing liquor. Coolant leakage.	Reduce calcium chloride additions Check coolant system for leaks.
Sherry-like.	Over-aged product	Check maturation conditions
Soapy.	Fermentation Cleaning process.	Check yeast strain, oxygenation (before and during fermentation) and wort composition. Check all detergent is rinsed away during CIP
Solvent (Nail varnish	Tank Lacquer Plasticiser leaks. Yeast.	Check integrity of tank lacquers Check for leaks Reduce fermentation temperature. Check yeast strain and oxygenation
Sour	Yeast Bacterial spoilage	Yeast autolysis. Check hygiene and yeast handling Contamination: Check hygiene throughout (*Lactobabillus, Pediococcus*).
Spicy stock	Yeast.	Check for wild yeast contamination. Renew yeast
Stale / Oxidised / Cardboard/ Papery	Over-aged product. Oxidation. Over pasteurisation	Check storage temperature and stock rotation Check for air/oxygen ingress in processing and packaging Check pasteurisation control. Overpasteurisation increases rate of aging
Sulphitic (striking match).	Yeast.	Check yeast strain and condition Other sources: Antioxidants, Finings, Primings
Sweet	Fermentation	Increase attenuation limit
Toffee	Over aging Oxidation	Reduce storage time Check for air/oxygen ingress in processing and packaging
Worty / Cereal.	Fermentation. Wort.	Incomplete. Increase fermentation time Ensure a vigorous evaporative boil to remove sulphury notes and DMS.
Yeasty	Yeast	Yeast breakdown. Improve yeast handling

PRODUCTION PROBLEMS

FAULT	CAUSE	ACTION
Beer fines then gets hazy	Wild yeasts or bacteria. Cellar / dispense temperature.	Improve hygiene. Fine at temperature lower than cellar or dispense. Check dispense python cooling.
	Cask disturbed.	Re-roll and put onto stillage
Cloudy Wort	Partially degraded starch	Optimise temperature to 63-68°C during mashing (all in temperature). Stand for 1 hour minimum after mashing.
	Milling too fine.	Husk pieces too small to form good filtration bed. Adjust mill to give less flour.
	Run-off too soon after mashing.	Extend stand time. Reduce speed of run off.
	Hole sizing in plates / plate placement.	Check that plate holes are correct size and that plates are placed in the correct positions
Excess or Fluffy Bottoms	Isinglass / Auxiliary finings addition rate.	Too much being added: optimise
	Too many fine particles.	Optimise copper fining
	Yeast count low/ high	Increase yeast count. Readdress yeast pitching rate/ strain
Hot/Cold Wort Clarity Poor	Incorrect boiling regime	Time copper fining addition correctly. Ensure boiling is vigorous and optimise evaporation rate and boil time.
	Wort run-off clarity poor.	Use slower run off.
	Wort pH	Should be 5.1 - 5.3 for efficient copper fining.
	Calcium level low	Seek specialist advice on water quality.
	A reduction in hopping level.	Increase fining rate since hop tannins normally increase cold break.
Slow Run-Off	Isinglass storage.	Ensure Isinglass is fresh / within use by date. Store as cool as possible (but not below 4C)
	Auxiliary fining ineffective.	Change auxiliary. Change isinglass blend. Leave at least 30 minutes between addition of isinglass and auxillary
	Dead yeast	Remove tank bottoms.
Layering	Loose bottoms	. Optimise isinglass / auxiliary finings.
	Too many fine particles	Optimise copper fining.
	Poor cellar handling	Improve rousing and handling regime
Loose / Fluffy Bottom	Check grist composition.	High sugar or syrup grist needs less copper fining. High dark malt grist needs less copper fining. Optimise fining regime according to grist.
	Copper fining addition rate.	Too high: carageenans won't sediment.
Low Extract	Grind too fine or coarse.	Adjust mill.
	Poor mixing in mash tun.	Ensure even mixing.
	Leaks in system	Check all pipe work, especially pump glands.
	Mash thickness.	Ensure liquor to grist ratio is correct for your system mash temperature.
No Flocculation or Sedimentation	Grease on tank or pipe work.	Check cleaning regime.
	Water quality (ionic balance)	Seek specialist advice on water quality.
	Suspended solids too low	Check brew house (mashing / copper) regime.

FAULT	CAUSE	ACTION
Over Attenuation	Poor cooling/skimming Fermentability too high.	Skim and/or cool easier. Check grist, mash thickness and temperature..
Slow Fermentation	Yeast pitching rate	Pitch more yeast. Normal pitching rate for worts up to 1060° is 1.7- 3.3g/l (pressed yeast, or about double for barm). This can be increased by up to 25% to compensate for poor viability.
	Yeast pitching time.	Pitch after vessel about quarter full of wort.
	Low yeast viability	Improve yeast handling. More frequent changes. Acid wash at 4°C to remove bacterial contamination, but only every 6-8 generations. Yeast viability should be at least 90% (target 95%). Store yeast <4°C, but do not freeze. Use within 72h. Slurry yeast in vessels at 1 to 2°C. Pitching temp 15 – 17C
	Wort temperature too low/high.	Correct at pitching. Too high creates yeast bite
	Wort oxygen level out of specification..	Adjust aeration (oxygenation). Rouse and check Range is 8 - 20 mg/litre. Use 10psi (0.7 bar) air differential at injection point to ensure small bubbles. Consider using pure (medical) oxygen Increase time / vigour of rousing.
	Zinc levels too low.	Add zinc salt or yeast food. Aim for 0.05 - 0.1 mg/litre. Levels up to 0.25 mg/litre may be necessary.
	Low ambient temperature.	Warm up room or vessels prior to use.
	Wort cloudy.	Optimise copper finings. Check efficiency of wort separation
Slow Fining	Too many fine particles (<10mm).	Optimise copper fining
	Excess copper fining.	Optimise copper fining.
	Yeast count too high or low.	Ensure yeast count about 1 million cells/ml. Rouse/mix racking tank to ensure even distribution of yeast count throughout racking.
	Wild yeast & bacteria.	Improve hygiene of all vessels / attachments
	Finings temperature too low.	Store as cool as possible (not <4°C), but note: cold increases viscosity; heat denatures protein.
	Residual fermentables too high	Check primings addition. Secondary fermentation increases CO2 absorbtion, causing flocs to float.
	Starch granules	Check wort for starch presence using iodine solution
	pH.	Keep in range 3.8 - 4.2.
Sticking Fermentation	Early / sudden cooling (thermal shock).	Adjust cooling sequence or raise temperature of attemperation coolant.
	Early flocculation.	Increase rousing time. Investigate calcium / phosphate balance in water (seek specialist advice).
	Mash temperature too high.	Lower mash temperature.
	Yeast deterioration.	Acid wash yeast: 4°C maximum. Replace cultures more often
	Lack of oxygen.	Adjust wort aeration (see Slow fermentation)
Patchy run-off / Intermittent cloudiness	Channelled bed.	Ensure good mixing during mashing. Coarse grist grind. Check sparging doesn't create channels and is even.

Production of problem worts	Last runnings too weak.	Cut off collection at 1005°. Liquor back if necessary.
FAULT	**CAUSE**	**ACTION**
Slow run-off	Milling too fine	Adjust mill
	Blockages in mash system.	Check for blockages in: plate holes, underbed, pipe work leading from mash vessel
	Sparge conditions.	Check that sparging is even. Check sparge temperature is high enough, but not higher than 78C
	Set mash.	Optimise stand time/temperature after mashing (63-68°C, 1 hour minimum stand). Underlet bed and recirculate to refloat bed. Rake bed gently.
	Adjunct addition too high.	Use higher percentage malt in grist.
	Too fast a run off	Bed is pulled down and slows run off. Underlet bed and recirculate to refloat bed.
	Pump blockage.	Clear blockage
Variation between casks	Yeast levels.	Yeast slugs in cask. Improve agitation before fining and racking.
	Fining homogeneity..	Check mixing in holding tank. Rouse before use
	Poor fining dispersion	Roll casks before stillage.