

Acetaldehyde

Minnesota Home Brewers Association: Sean P. Hewitt 1/26/06

Alcoholic

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Troubleshooting Off-flavors - Acetaldehyde				
Describe/Discuss	Ever Appropriate?	If so, what styles?	How is it caused?	How can it avoided/controlled?
<ul style="list-style-type: none"> - Green apples - Grassy - can taste and smell acetic/cidery 	Yes, at low levels	L/S/P American Lagers (from yeast character is optional)	<ul style="list-style-type: none"> - Premature removal from yeast - Bacterial spoilage - Oxidation - Premature flocculation - Oxygen depletion 	<ul style="list-style-type: none"> - Allow ferment to complete - Practice good sanitation and beer handling to avoid O2 contact - Good yeast strain - Aerate wort prepitching - Long lagering will reduce

Troubleshooting Off-flavors - Alcoholic				
Describe/Discuss	Ever Appropriate?	If so, what styles?	How is it caused?	How can it avoided/controlled?
<ul style="list-style-type: none"> - Hot, Spicy - Vinous aroma - Pricky mouthfeel - warmth 	Yes	Stronger ales and lagers	<ul style="list-style-type: none"> - High amount of fermentables - Underpitching - Low O2 or FAN 	<ul style="list-style-type: none"> - Pitch sufficient yeast quantity - Aerate wort prepitching

Astringent

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Troubleshooting Off-flavors- Astringent			
Describe/Discuss	Ever Appropriate?	If so, what styles?	How can it avoided/ controlled?
<ul style="list-style-type: none"> -Dry, Mouth puckering -In Flavor and Mouthfeel -like grape skins 	No	N/A	<ul style="list-style-type: none"> - Don't overcrush - Keep sparge temp low - Use acidified water in sparge - Reduce hop immersion times - Practice good sanitation - Reduce spice additions
			<ul style="list-style-type: none"> - Extraction of tannins (overcrushing, oversparging) - Alkaline water - Lengthy Hop Immersion times - Polyphenols from acetabacter - Oxidation - Spices

Bitterness

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Troubleshooting Off-flavors- Bitterness			
Describe/Discuss	Ever Appropriate?	If so, what styles?	How can it avoided/ controlled?
<ul style="list-style-type: none"> - Mouth puckering - Bitter - Flavor - Mouthfeel 	Yes	IPA's Pales ales English Bitters	<ul style="list-style-type: none"> - Use hops with lower alpha acids - Reduce hop boil times
			<ul style="list-style-type: none"> - High AAU hops - Lengthy hops times

Buttery

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Cardboard

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Troubleshooting Off-flavors- Buttery			
Describe/Discuss	Ever Appropriate?	If so, what styles?	How is it caused?
<ul style="list-style-type: none"> - Butterscotch - Diacetyl - Aroma - Mouthfeel, a slickness on the palate 	Yes	Scotch Ales Bitters Dry Stouts Czech Pils Oktoberfest	Diacetyl: - Premature racking - Low fermentation temperature - Mutant yeast - Lactic acid bacteria (Pectococcus) - Long periods of wort cooling
			How can it be avoided/controlled? - Allow ferment to complete - Higher temperature primary fermentation - Good pure yeast strain - Practice good sanitation - Quick wort chilling

Troubleshooting Off-flavors- Cardboard			
Describe/Discuss	Ever Appropriate?	If so, what styles?	How is it caused?
<ul style="list-style-type: none"> - Papery - Wet cardboard - Rotten fruit - Stale - Sherry-like - In Aroma and Flavor 	No	NA	- Aeration of hot wort - Aeration of beer during bottling - excessive age - High storage temperatures - Adding tap water to finished without boiling
			How can it be avoided/controlled? - Quiet transfer of beer when siphoning or transferring - Serve beer in appropriate amount of time - Cool (<55F) storage temps - Add only boiled water

Cloudiness

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Troubleshooting Off-flavors- Cloudiness			
Describe/Discuss	Ever Appropriate?	If so, what styles?	How is it caused?
<ul style="list-style-type: none"> - Cloudy - In Appearance 	Yes	Wheat Beers Lambics American Wheat	<p>Chill haze:</p> <ul style="list-style-type: none"> - Insufficient conversion time <p>Permanent Haze:</p> <ul style="list-style-type: none"> - High sparge temps <p>Bacterial Haze:</p> <ul style="list-style-type: none"> - Poor sanitation <p>Powdery Yeast</p>
			<ul style="list-style-type: none"> - Longer mash - Use protein rest - Use finings - Use filtration - Reduce sparge temps - Practice good sanitation - Use well-flocculating yeast strain

Cooked Corn

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Troubleshooting Off-flavors- Cooked Corn			
Describe/Discuss	Ever Appropriate?	If so, what styles?	How is it caused?
<ul style="list-style-type: none"> - DMS (dimethyl sulfide) - Vegetal (Sweet cooked corn, celery, cabbage, parsnips) - Shellfish or oyster-like in higher amount - in Aroma and Flavor - Precursor S-methyl-methionine (SMM) occurs naturally in Pale malt, turns into DMS with heat, evaporates 	Yes	American Lagers Cream Ales	<p>Covered boil</p> <ul style="list-style-type: none"> - not boiling wort for at least an hour <p>Wild yeast or Zymomonas bacteria (converted from Dimethyl sulfoxide)</p> <ul style="list-style-type: none"> - High level of adjuncts - Overnight cooling
			<ul style="list-style-type: none"> - Open, rolling boil for an hour - Poor sanitation - Reduce corn or rice in mash - Quick wort cooling

Fruitiness

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Light Body

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Troubleshooting Off-flavors- Fruitiness			
Describe/Discuss	Ever Appropriate?	If so, what styles?	How is it caused?
<ul style="list-style-type: none"> - Esters - in Aroma and Flavor - Strawberries - Raspberries - Pear - Plums - Grapefruit - Banana - Apricots. etc 	Yes	<ul style="list-style-type: none"> Ales American Dark Lagers (very light) Dopplebock (in dark versions) Elisbock 	<ul style="list-style-type: none"> - Alcohols combining with acids at higher temperature. (Ethyl acetate, Isoamyl acetate, Ethyl Hexanoate)
			<ul style="list-style-type: none"> - lower fermentation temperature - Choose a different yeast

Troubleshooting Off-flavors- Light Body			
Describe/Discuss	Ever Appropriate?	If so, what styles?	How is it caused?
<ul style="list-style-type: none"> - Watery - Weak - in Flavor and Mouthfeel 	Yes	<ul style="list-style-type: none"> American Light lagers Lambics 	<ul style="list-style-type: none"> - Lack of dextrins - Poor quality malt - Large percentage of sugar - Over-long protein rest - High mash temperature
			<ul style="list-style-type: none"> - Use quality malt - Keep percentage of sugars small - Reduce length of protein rest - Lower mash temperature - Use dextrin or wheat malt. Flaked malt

Low Head Retention

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Phenolic

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Troubleshooting Off-flavors- Low Head Retention			
Describe/Discuss	Ever Appropriate?	If so, what styles?	How is it caused?
<ul style="list-style-type: none"> - Flat - In Appearance and Mouthfeel 	Yes	<ul style="list-style-type: none"> Lambics High Alcohol Beers 	<ul style="list-style-type: none"> - Insufficient proteins in beer causes high surface tension - Dirty/oily glasses - Low protein grist
			<ul style="list-style-type: none"> - Shorten protein rest - Use clean well-rinsed glasses - Use flaked wheat or barley - Lower alcohol by lowering the grist bill - use hops with high alpha acids

Troubleshooting Off-flavors- Phenolic			
Describe/Discuss	Ever Appropriate?	If so, what styles?	How is it caused?
<ul style="list-style-type: none"> - Band-aid - Medicinal - Clove-like - Plastic - Smoky - in Aroma and Flavor 	Yes	<ul style="list-style-type: none"> Some Belgians beers Smoke beers Some Wheat beer 	<ul style="list-style-type: none"> - Wild yeast - Improper sanitation - Some malt types - Some yeast strains - Chlorophenols in water - Improper rinse of chlorine sanitizers
			<ul style="list-style-type: none"> - Use pure yeast strains - Practice good sanitation - Use "clean" malt - Use yeast less prone to phenolic production - filter tap water - Use non-chlorine sanitizers

Sherry-like

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Sourness

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Troubleshooting Off-flavors- Sherry-like			
Describe/Discuss	Ever Appropriate?	If so, what styles?	How is it caused?
<ul style="list-style-type: none"> - Sherry - Vinous - Wine-like - Paper-like - Old 	Yes	<ul style="list-style-type: none"> Barleywines English Old Ales 	<ul style="list-style-type: none"> - Oxidative yeasts acting on higher alcohol beers creates aldehydes (ie. trans-2-nonenal)
			<ul style="list-style-type: none"> - Use different yeast strain - Create less alcohol by lowering glist bill - Serve beer younger - Ferment cooler

Troubleshooting Off-flavors- Sourness			
Describe/Discuss	Ever Appropriate?	If so, what styles?	How is it caused?
<ul style="list-style-type: none"> - Tart - Sour - In Aroma, Flavor and Mouthfeel - perceived on sides on the tongue 	Yes	<ul style="list-style-type: none"> Witbier Lambics Flanders Ale Berliner Weisse (optional sourness) American Wheat or Rye, Dry Stout, Witbier and Saison 	<ul style="list-style-type: none"> - Lactic acid (from lactic acid bacteria) - Acetobacter (from acetic acid) - excessive acid rest - mashing too long
			<ul style="list-style-type: none"> - Practice good sanitation - Don't employ over-fergthy mash or low temp mash

Match the flavor/aroma descriptor to the definition and you may use a descriptor more than once.

Acetaldehyde	Alcoholic	Astringent
Diacetyl	DMS (dimethyl sulfide)	
Estery	Grassy	Light-Struck
Metallic	Musty	Oxidized
Phenolic	Solvent	Sour/Acidic
Sulfur	Vegetal	Yeasty

- _____ Aroma, flavor, and warming effect of ethanol
- _____ Sweet, cooked or canned corn
- _____ Smokey, plastic, or medicinal
- _____ Stale, musty, or moldy
- _____ Harsh graininess or huskiness
- _____ Fusel alcohols
- _____ Fresh cut grass or green leaves
- _____ Similar to acetone or lacquer thinner
- _____ Spicy (clove or pepper)
- _____ Similar to the aroma of a skunk
- _____ Artificial butter, butterscotch
- _____ Cooked, canned or rotten vegetables (cabbage, onion, celery, asparagus)
- _____ Tartness in aroma and flavor
- _____ Cardboard or papery
- _____ Aroma and/or flavor of fruits, fruit flavorings, or roses
- _____ Dryness in the finish/aftertaste
- _____ Rotten eggs or burning matches
- _____ Can be sharp and clean (lactic acid) or vinegar-like (acetic acid)
- _____ Tinny, coinny, copper or iron
- _____ Sometimes perceived as a slickness on the tongue
- _____ Sometimes described as "hot"
- _____ Bready or yeast-like
- _____ Winy/vinous or sherry-like
- _____ Puckering, lingering harshness
- _____ Green Apple