

# ESTER flavor analysis

Overview of measured elements

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**ESTER**

## Sensory analysis

The ESTER sensory analysis is a descriptive analysis of your beer by a trained panel. Every beer is tasted by at least 8 trained tasters and the results are normalized to guarantee a high quality profile. The following elements are taken into account in the sensory description.

Malt aroma	Hop taste: Melon, cantaloupe, watermelon, honeydew	Red fruit and tart taste: wood
Malt aroma: Cereal, flour, grains	Hop taste: Stone fruit, peach, plum, apricot	Red fruit and tart taste: red fruits
Malt aroma: Bread crust	Ester aroma	Red fruit and tart taste: wine
Malt aroma: Caramel	Ester aroma: Solvent, nail polish	Body fullness
Malt aroma: Roasted, coffee, chocolate	Ester aroma: Banana	Alcohol
Malt aroma: Smoked, burnt toast	Ester aroma: Flowers, roses	Astringency
Malt taste	Ester aroma: Fruity, pear	Carbonation intensity
Malt taste: Cereal, flour, grains	Ester taste	Carbonation (Sting (sparkling water))
Malt taste: Bread crust	Ester taste: Solvent, nail polish	Carbonation (Creaminess (foaming))
Malt taste: Caramel	Ester taste: Banana	Bitterness
Malt taste: Coffee, chocolate	Ester taste: Flowers, roses	Sweetness
Malt taste: Smoked, burnt toast	Ester taste: Fruity, pear	Acidity
Hop aroma	Red fruit and tart aroma	Metallic
Hop aroma: Citrus	Red and sour aroma: acetic acid (vinegar, acidic)	Sulfury (drainpipe)
Hop aroma: Tropical fruit	Red fruit and tart aroma: lactic acid (tart, sour cream)	Acetaldehyde (green apples)
Hop aroma: Noble hops, dried grass, dried herbs, hay	Red fruit and tart aroma: sour cherries	Diacetyl (buttery, caramel, butterscotch)
Hop aroma: Woody, resinous	Red fruit and tart aroma: wood	DMS (cooked, cabbage, corn)

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Hop aroma: Melon, cantaloupe, watermelon, honeydew	Red fruit and tart aroma: red fruits	Phenolic off tastes
Hop aroma: Stone fruit, peach, plum, apricot	Red fruit and tart aroma: wine	4VG (smoky, clove, medicinal, dentist)
Hop taste	Red fruit and tart taste	Brett (barnyard, cheesy, leathery, sweaty)
Hop taste: Citrus	Red fruit and tart taste: acetic acid (vinegar, acidic)	Aroma appreciation
Hop taste: Tropical fruit	Red fruit and tart taste: lactic acid (tart, sour cream)	Taste appreciation
Hop taste: Noble hops, dried grass, dried herbs, hay	Red fruit and tart taste: sour cherries	Overall appreciation
Hop taste: Woody, resinous		

## Chemical analysis

The ESTER chemical analysis is performed with a combination of instruments that provide the best insights in the flavor chemistry of your beer. We provide quantitative data where we can, and *relative* where we have to (mainly when using GC/MS, these are shown in italic font). Depending on your sample, specific compounds might be excluded because they are not detected by our equipment.

The following chemical compounds are measured.

Ethanol	<i>Geraniol</i>	<i>3-Methylbutyl octanoate</i>
FAN	<i>7,8-Dimethylfurazano[f]quinoxaline</i>	<i>2-Undecanol</i>
Glucose	<i>2,4-Di-tert-butylphenol</i>	<i>Maltol</i>
Lactic acid	<i>2-Methyl-4-octanone</i>	<i>O-Benzylhydroxylamine</i>
Fructose	<i>Ethyl 9-hexadecenoate</i>	<i>Carotol</i>
Glycerol	<i>2,2-Dimethyl-4-ethynyltetrahydro- pyran-4-ol</i>	<i>Difurfuryl ether</i>
Ammonia	<i>3-Decen-2-one</i>	<i>2-Ethylhexanol</i>
Acetic acid	<i>Trans-Beta-Farnesene</i>	<i>1-Penten-3-one, 1-(4-methoxyphenyl)-4-methyl-</i>
SO <sub>2</sub>	<i>1-Acetyl-4,6,8-trimethylazulene</i>	<i>Alpha-Terpineol</i>
Iron	<i>Ethyl cinnamate</i>	<i>Nerolidol</i>
Betaglucan	<i>Isobutyl isovalerate</i>	<i>1-Pentanol</i>
Color	<i>4-Carene</i>	<i>Pyrazine, methyl-</i>
pH	<i>Guaiacol</i>	<i>2-Furanmethanol</i>
Polyphenol	<i>Ethyl 5-methylnonanoate</i>	<i>Styrene</i>
Protein	<i>Ethyl 3-furoate</i>	<i>Pyrazine, 2,6-dimethyl-</i>
Glucose, fructose, sucrose	<i>Nonadecane</i>	<i>Isobutyl isobutyrate</i>
Total glucose	<i>1-Dodecanol</i>	<i>S-Methyl 3-methylbutanethioate</i>
Bitterness	<i>Ethyl Oleate</i>	<i>Ethyl tiglate</i>
Diacetyl	<i>Tropolone</i>	<i>Ethyl-4-methyl pentanoate</i>
Pentadione	<i>Ethyl Myristate</i>	<i>Pentyl propanoate</i>
Hexyl acetate	<i>Ethyl laurate</i>	<i>1-Octen-3-ol</i>
1-propanol	<i>Ethyl (3E)-3-heptenoate</i>	<i>.alpha.-Phellandrene</i>
Isobutyl acetate	<i>Pyridine-2-Aldoxime</i>	<i>Formaldehyde</i>

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Ethyl valerate	2-Methylbutyl propionate	Benzene, 1-methyl-3-(1-methylethyl)-
Diethyl sulfide	Ethyl octadecanoate	.beta.-Phellandrene
Butanol	1-Decanol	.beta.-Ocimene
Phenylethyl acetate	Heptadecane	1-Octanol
Isoamyl acetate	2-Nonanol	Acetone
Ethyl butyrate	Butylated hydroxytoluene	Benzoic acid, ethyl ester
Amyl acetate	gamma-Terpineol	1-Nonanol
Isoamyl alcohol	Caryophyllene	3-Cyclohexen-1-ol, 4-methyl-1-(1-methylethyl)-, (R)-
Ethyl isovalerate	4-Tert-Amylphenol	2-Methyl-1-propanal
Carbon disulfide	Spiro[3.5]nona-5,7-dien-1-one, 5,9,9-trimethyl-	2,6-Octadien-1-ol, 3,7-dimethyl-, (Z)-
Ethyl decanoate	Isobutyl 2-methylbutyrate	Citronellol
Ethyl hexanoate	Gamma-nonalactone	2-butanone
Dimethyl disulfide	2,2,4-Trimethyl-1,3-pentanediol diisobutyrate	Isopentyl hexanoate
Phenylethyl alcohol	1,4-Di-tert-butylbenzene	Phenol, 4-ethyl-2-methoxy-
Ethylmethyl sulfide	Methyl salicylate	Butyraldehyde
Ethyl acetate	Oxalic acid, butyl 2-phenylethyl ester	2-methyl-butanal
Octyl acetate	Adamantane-2,4-diol	2-pentanone
Dimethyl trisulfide	Dodecanoic acid	4-Vinylguaiaicol
1-hexanol	Hop ether	3-Methylbutanal
Isobutanol	2-Methylbutyl 2-methylbutyrate	2-hexanone
Methyl geranate	Cyclopentene, 3-isopropenyl-5,5-dimethyl-	Pentanal
2-Decanol	4-Chloroaniline	Ylangene
Ethyl (Z)-4-Decenoate	Trans-longipinocarveol	2-Buten-1-one, 1-(2,6,6-trimethyl-1,3-cyclohexadi en-1-yl)-
Isobutyl Decanoate	Bicyclosesquiphellandrene	Octanoic acid, 2-methylbutyl ester
3-(3-Oxo-2-prop-2-ynyl-cyclopentyl)-propionic acid, methyl ester	(Propoxymethyl)benzene	Hexanal
4,4-Dimethyl-5-methylene-2-ethylamino-2-thiazoline	Octadecane	.gamma.muurolene

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<i>5-Aminouracil</i>	<i>Prenyl butyrate</i>	<i>2,4-hexadienal</i>
<i>Ethyl 9-decenoate</i>	<i>5.beta.,7.beta.H,10.alpha.-Eudes m-11-en-1.alpha.-ol</i>	<i>Calacorene</i>
<i>Pyrrrole-2-Carbonitrile</i>	<i>Ethyl heptanoate</i>	<i>Heptanal</i>
<i>Ethyl nonanoate</i>	<i>Myrcene</i>	<i>Isoaromadendrene epoxide</i>
<i>Eicosane</i>	<i>6-Methyl-5-hepten-2-one</i>	<i>Humulene epoxide I</i>
<i>Linalool</i>	<i>Isopropyl dodecanoate</i>	<i>Humulol</i>
<i>2-Ethyl-M-Xylene</i>	<i>4-Isobutoxy-2-butanone</i>	<i>Humulene epoxide II</i>
<i>2-Pentadecanone</i>	<i>Isopentyl isobutyrate</i>	<i>tau-Cadinol</i>
<i>Furfuryl acetate</i>	<i>Copaene</i>	<i>2-nonanone</i>
<i>Farnesol</i>	<i>Ethyl 3-hexenoate</i>	<i>Nonanal</i>
<i>(E)-Calacorene</i>	<i>Ethyl 5-methylhexanoate</i>	<i>2-decanone</i>
<i>Alpha-humulene</i>	<i>3-Ethyl-2,5-dimethylpyrazine</i>	<i>Decanal</i>
<i>Nonanoic acid</i>	<i>4-Terpineol</i>	<i>2-undecanone</i>
<i>Linolelaidic acid ethyl ester</i>	<i>Octanoic Acid</i>	<i>Hexadecanoic acid, methyl ester</i>
<i>Heneicosane</i>	<i>cis-Thujopsene</i>	<i>Undecanal</i>
<i>2-Methylbutyl Valerate</i>	<i>Isoamyl propionate</i>	<i>2-dodecanone</i>
<i>Bicyclo[4.4.0]dec-1-ene, 2-isopropyl-5-methyl-9-methylene-</i>	<i>Ethyl nicotinate</i>	<i>Dodecanal</i>
<i>Hexanoic acid</i>	<i>Isoamyl decanoate</i>	<i>2-tridecanone</i>
<i>Phenylnitromethane</i>	<i>Ethyl palmitate</i>	

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