WHC Lab
Brewing & Distilling

Thiol Unleashed

"A Thiol Unlocking Hybrid Yeast"

Volatile thiols are important flavour molecules present in food and beverage products. Fruity thiols are responsible for many desirable flavours in modern beer like:

3MA - grapefruit **3MHA - passion fruit**

4MMP - blackcurrant

With very low sensory thresholds, manipulating their presence can have dramatic effects on the flavour and aroma of finished product. Hops, malt, and fruit can contribute to the thiol content of a beer - however, many of these thiols are trapped in a bound, odourless state, unable to unleash their full flavour potential until yeast-mediated enzymatic reactions occur.

β-lyase

Coded for by the IRC7 gene, β-lysase is the enzyme responsible for the liberation of bound thiol precursors. Unfortunately for brewers, not every yeast has this gene - and those that do might not always be the best choice for brewing beers. In fact, many yeast with known high β-lysase activity are wild and also produce phenolic off-flavours in combination with poor attenuation - making them unsuitable for most beer brewing applications.

How to use Thiol Unleashed

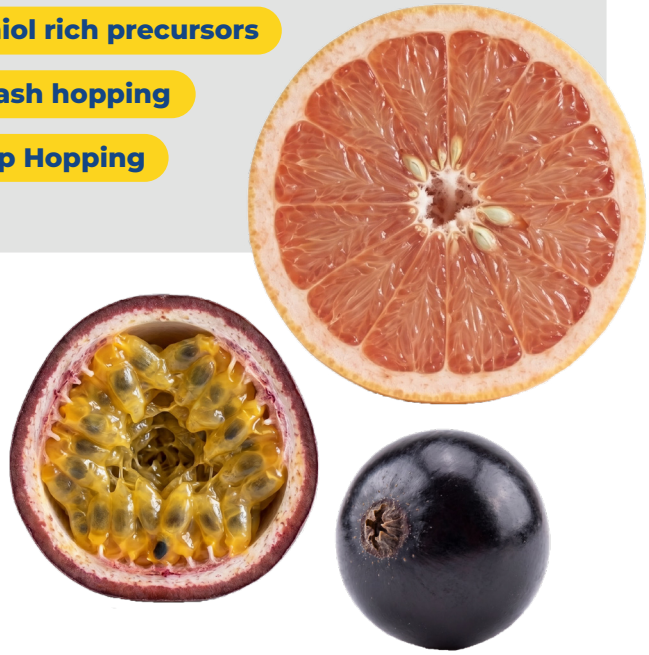
Used as a straight swap for your regular IPA yeast - Thiol Unleashed will match or exceed the quality and quantity of yeast derived flavours, with a typical ale fermentation profile. To maximise the potential of this yeast strain we need to boost the presence of bound thiol precursors. There are several techniques we can utilise.

Thiol boosting products

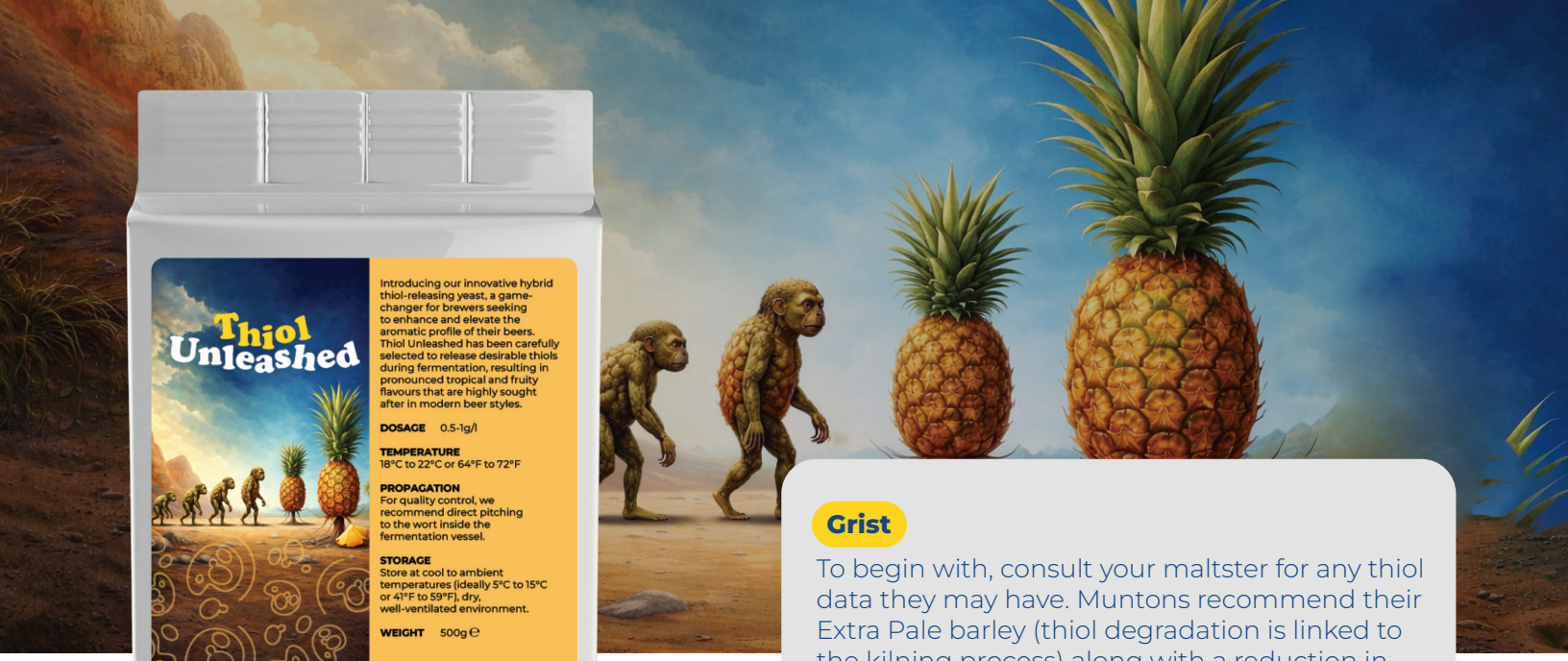
Thiol rich precursors

Mash hopping

Dip Hopping



To create cutting edge modern beer that pushes boundaries we set out to combine the properties of a popular brewing strain, with the **thiol releasing** potential of a **β-lysase producing yeast species** - with none of the down sides.



So what can be done?

Yeast is everywhere in nature and for thousands of years since its domestication - we have been selectively breeding for traits suited to brewing. Unfortunately, results relying on random mutagenesis take time - and we want fruity IPAs now!

Researchers have successfully identified the location of the IRC7 gene and using cutting edge CRISPR technology can insert this gene into popular brewing strains to exaggerate its expression. But GMO technology is outlawed in most of the world and these strains are unavailable to brewers.

Hybridisation

Working closely with our research partners we were able to create several interspecies hybrids using three high performing brewing strains and three wild Saccharomyces strains (S. uvarum and S. eubayanus). The resulting offspring were put through rigorous fermentation trials to assess their brewing potential and β-lysase activity. We are proud to present our newest yeast strain Thiol Unleashed - a hybrid yeast strain which overly expresses the important IRC7 gene in combination with elite brewing performance. The result? Thiol Unleashed will unlock novel and diverse flavour and aromas in your ingredients that'll take your beers to previously unobtainable heights.

Grist

To begin with, consult your maltster for any thiol data they may have. Muntons recommend their Extra Pale barley (thiol degradation is linked to the kilning process) along with a reduction in adjunct additions like wheat or oats which have few thiols.

Mash Hopping

It seems counterintuitive to add extra hops early in the brewing process to create modern IPAs. As it happens, the mash temperature range is ideal to get bound thiols out of hops and into your wort without contributing to hop bitterness. Some surprising hop varieties are known to be thiol-rich and many people have success with Cascade or Saaz and other noble hops.

Dip Hopping

Making a hop tea in the FV at the beginning of transfer is another way to ensure bound thiols enter your wort. Consult with your hop suppliers for up to date harvest thiol concentrations

Thiol Boosting Products

Thiols can be frequently found in other ingredients like fruit. Grape skins from a particular New Zealand breed have been shown to contribute huge tropical aroma. Consider a multipronged approach to your thiol boosting recipe design.

Environmental Impact

Utilising Thiol Unleashed can decrease the environmental impact of a beer by allowing increased efficiency of ingredients and even a reduction in hop additions.