KERRY

BSG

Benefits

- Reduces **Diacetyl*** content in beer.
- Shorter and more consistent maturation times.
- Reduces energy consumption and drives sustainable brewing.
- Improves fermentation and maturation vessel utilization and turnaround time.
- Suitable for all types of brewing processes.
- Suitable for dry hopping as it reduces diacetyl during **Hop Creep.****
- Increases and optimizes production capacity.

What is Diacetyl?

* **Diacetyl** is a flavor compound present in most beers (and many wines), giving a buttery aroma. It is generated as a by-product of amino-acid metabolism in yeast during fermentation. These compounds are collectively known as Vicinal Diketones (VDK's) or 'butter bombs'.

The chemical name of these VDK's are 2,3-butanedione and 2,3-pentanedione.

Did you know?

** **Hop Creep** is an unintended fermentation that can occur in dry hopped beer initiated by naturally-present starch-degrading enzymes present in hops. Biomatex L (ALDC) is recommended to be dosed at the onset of fermentation to support the control of diacetyl levels during Hop Creep.

Biomatex L (ALDC)

An enzyme solution for diacetyl control in beer during fermentation.

How does Biomatex L (ALDC) work?

Biomatex L (ALDC) converts α-acetolactate and α-acetohydroxybutyrate produced during fermentation directly into the flavorless compounds acetoin and 2,3-pentanediol, respectively. This prevents the formation of Vicinal Dikentones in beer, which even at very low levels give a strong 'buttery' off flavor to beer.

During normal fermentation, this reaction is relatively slow compared to the reaction speed of Biomatex L (ALDC).

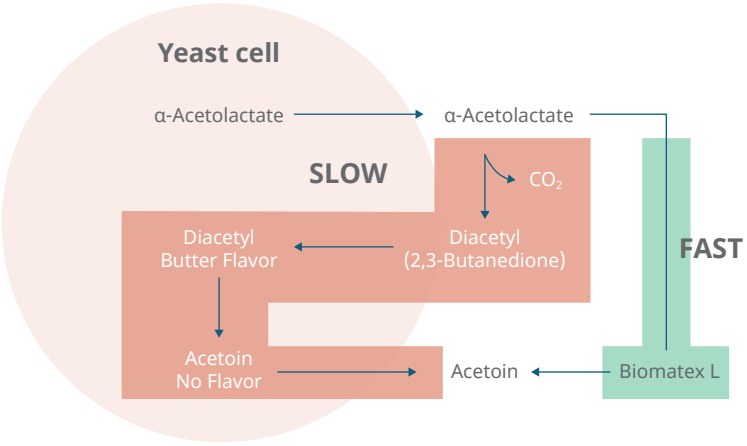

Figure 1. Generation and reduction of Diacetyl in the presence of Biomatex L (ALDC) during fermentation.

Application Dosage

- Biomatex L (ALDC) is added before and/or during fermentation.
- Typical dosage rate is 0.5 – 5.0 g/hL (5 – 50 ppm)
- Biomatex L (ALDC) is best added to cold wort during wort cooling in the fermenter before starting fermentation.

Application Results

- Biomatex L (ALDC) converts 2,3 pentanedione in fermenting beer directly to acetoin, eliminating diacetyl formation during fermentation.
- Biomatex L (ALDC) is reliable and robust in most brewing protocols and process conditions and is easily applied at the start of fermentation.

Storage and Shelf Life

- Biomatex L (ALDC) should be stored in cool, dry conditions. Store product at 36 – 50°F (2 – 10°C) and away from direct sunlight.
- The enzyme will provide optimal activity if stored as recommended and used within 24 months.
- Do not allow to freeze.

Note. The optimal dose depends on local processing conditions, raw materials and with experience using Biomatex L (ALDC) in your process.

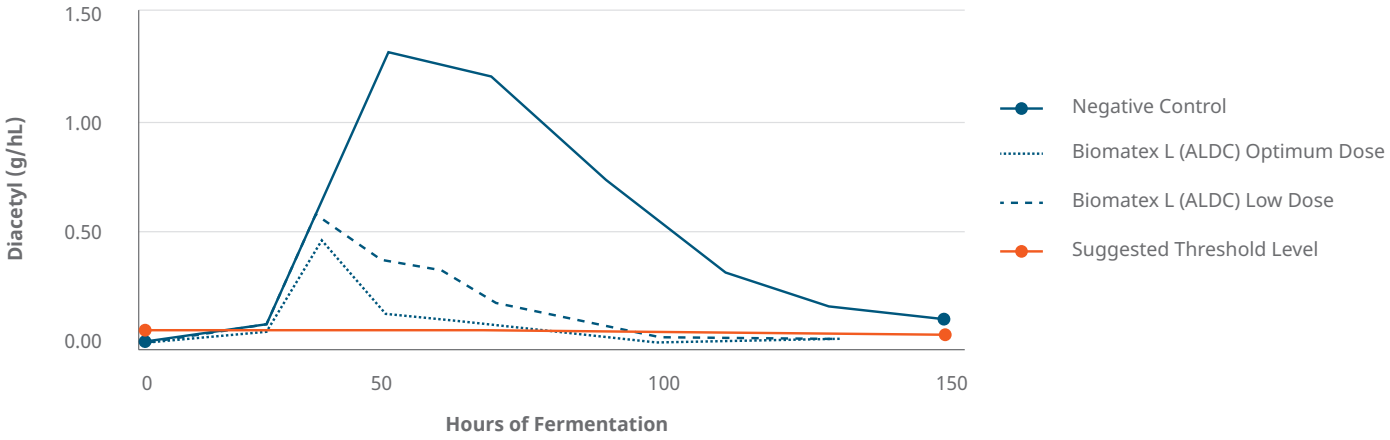

Figure 2. Reduction in diacetyl using Biomatex L (ALDC) during fermentation at 54°F in all-malt wort at 12°P

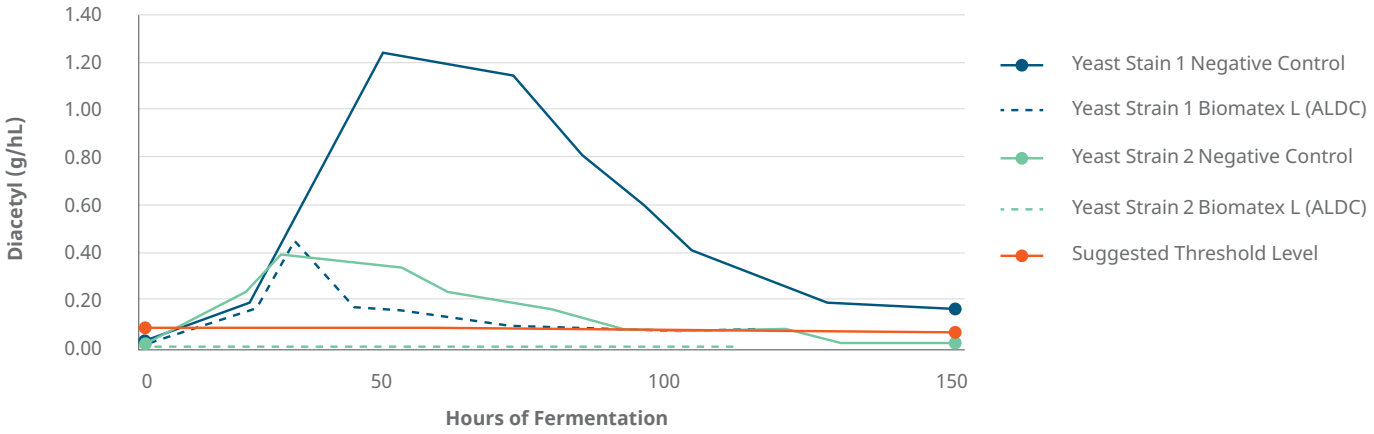

Figure 3. Reduction in diacetyl using Biomatex L (ALDC) during fermentation at 54°F in all-malt wort at 12°P comparing 2 different yeast strains.

Biomatex L (ALDC) for Hop Creep

Biomatex L (ALDC) works to reduce excess amounts of Diacetyl produced during dry hopping or hop creep.

Hop Creep is an additional fermentation in dry hopped beer initiated by naturally present hop-derived starch degrading enzymes.

These enzymes hydrolyze unfermentable dextrin into fermentable sugars when added during the dry-hopping process, which can potentially cause re-fermentation and reactivation of yeast, producing diacetyl.

This process can increase production time because beer can be 'out of specification' for diacetyl levels, alcohol content or residual sugars.

Application

- Biomatex L (ALDC) is added at onset of fermentation and additionally before dry hopping to obtain maximal diacetyl reduction.
- (Enzyme may lose activity due to low pH after fermentation so recommend additional dose).

Dosage

- Biomatex L (ALDC) at start of fermentation 0.5-5.0 g/hL (5-50ppm).
- Prior to dry hopping, Biomatex L (ALDC) can be added. Exact dose will depend on the process conditions.

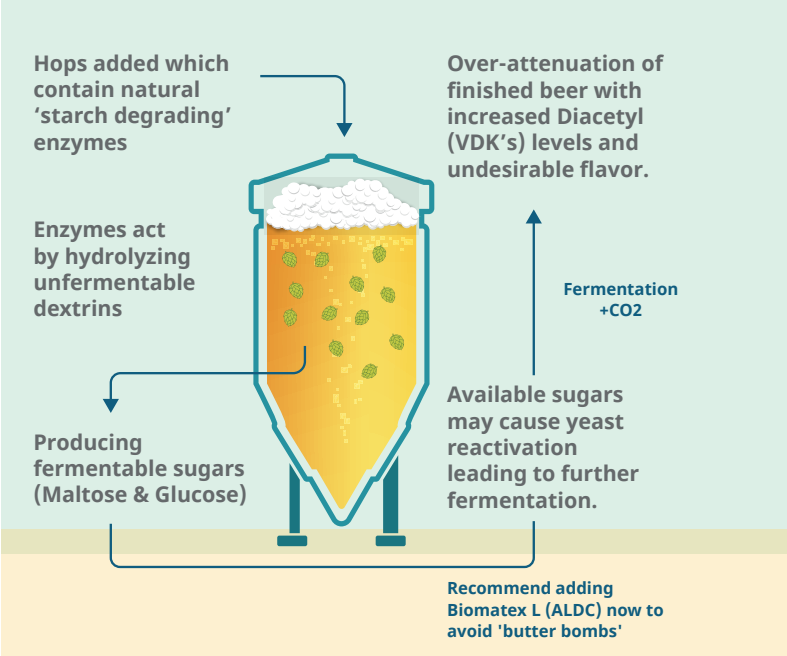

Figure 4: How Hop creep is formed in beer?

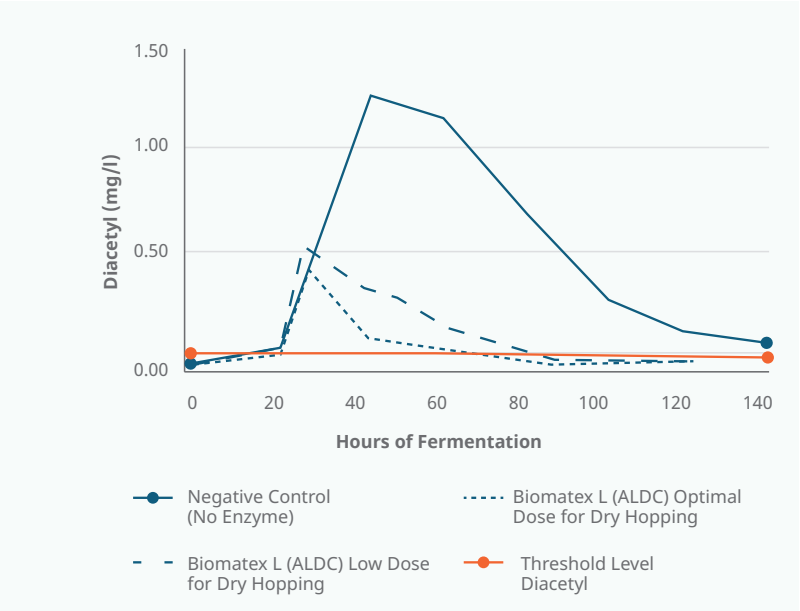

Figure 5: Reduction in diacetyl using Biomatex L (ALDC) during fermentation at 57°F in all-malt wort at 12°P for dry hopping.

Benefit

- Reduce amount of Diacetyl after dry hopping.
- Used in different styles of dry hopped beer e.g. IPA & Low Alcohol level beer.
- Maintain beer in specification.
- Increase efficiency and capacity.
- Reduces maturation time.
- Reduces risk of 'diacetyl bombs'.