



# Ethanol Yeast Help

## Two Experts Give Tips on Direct Pitch, Yeast Propagation

Yeast equals yield in an ethanol plant, so it's best to keep yeast handling consistent and on track.

Whether an ethanol plant is using direct pitch or yeast propagation, certain considerations need to be kept in mind to keep fermentation as efficient and cost-effective as possible.

According to Christopher Richards, global sales manager, Lallemand Ethanol Technology, Brookings, SD, ethanol producers have to select the fermentation system and the yeast format that will allow them to achieve maximum profitability.

"The best way to run a plant is to keep everything consistent," Richards said. "One thing that creates inconsistency is yeast propagation."

### Direct Pitch

Direct pitch has advantages over yeast propagation, Richards said (605-651-3933), because there are hidden costs in yeast propagation that ethanol producers need to consider for improving cost control and efficiency.

One of the benefits of switching from yeast propagation to direct pitch or liquid yeast is consistency, he said.

Direct pitch involves the delivery of a commercial cream yeast directly to the fermenter without propagation.

Although direct pitch might be considered cost prohibitive by some in the ethanol industry, Richards thinks propagating yeast has many hidden costs.

According to Richards, Lallemand cost-benefit analyses at several ethanol plants have found a total cost of propagation of up to a maximum of \$556,000 annually, including cleaning, energy, and other hidden and indirect costs.

"With direct pitch of cream yeast, ►

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*A Lallemand Ethanol Technology scientist inspects yeast cultures.*

especially stabilized cream yeast, a much reduced lag takes place on inoculation into fresh mash and results in a much higher

inoculation of yeast into the fermenter,” Richards said. “Also, no propagation step or equipment usage is needed.”

Richards has developed a spreadsheet that covers all the potential costs and benefits of both systems.

Data can be input in a couple of hours and the costs and benefits of direct pitch and propagation can be compared.

### **Yeast Propagation Tips**

Yeast propagation systems need to be fine-tuned for maximum results, according to Tom Kortuem, technical representative, Martrex, Minnetonka, MN (952-933-5000).

Because yeast is a living organism, it’s important to monitor the yeast and propagation tanks.

“Watch your levels of ethanol, glycerol, lactic and acetic acid, and also the sugar profile, in particular glucose,” Kortuem said.

The goal of propagation is to create a healthy yeast colony at the highest rate of growth that the yeast colony can achieve.

“Optimal conditions in a yeast propagator are glucose levels of

around 2%, a lower mash-to-water ratio that will allow the maximum amount of dissolved oxygen to be present in the mash, and about 600 parts per million of available nitrogen,” he said.

It also may include magnesium, potassium, or zinc salts.

Temperature and time also are very important, Kortuem said.

“Optimal temperatures can range from 90 to 95 degrees, depending on the yeast strains,” he said.

Optimal times of yeast propagation run between six and 10 hours and vary by strain characteristics. Different commercial strains have different characteristics.

“It also is important to monitor the yeast propagation times,” Kortuem said.

“A short propagation time may not allow a particular strain to achieve its maximum rate of growth, and a propagation time that is too long will result in yeast reaching the stationary phase as glucose levels may be diminished.”

*Jerry Perkins, editor*



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