

Nutri-Plex Omni™ Maximizes Yeast Production in Lab Testing and Process Data



Trial Objective

Using both laboratory trials and process data, the objective was to compare the effectiveness of Nutri-Plex Omni's powdered yeast nutrient complex in maximizing yeast health and higher yields during a more-consistent fermentation process.

Product Overview

Nutri-Plex Omni™ is a dry powdered nutrient that was developed to maximize the potential of yeast used for ethanol production with all starch and sugar based substrates. This nutrient contains a basic form of nitrogen through ammonia and a proprietary enzyme. It also contains sterols and unsaturated fatty acids that are components of the yeast cell membrane and are responsible for its integrity and fluidity.

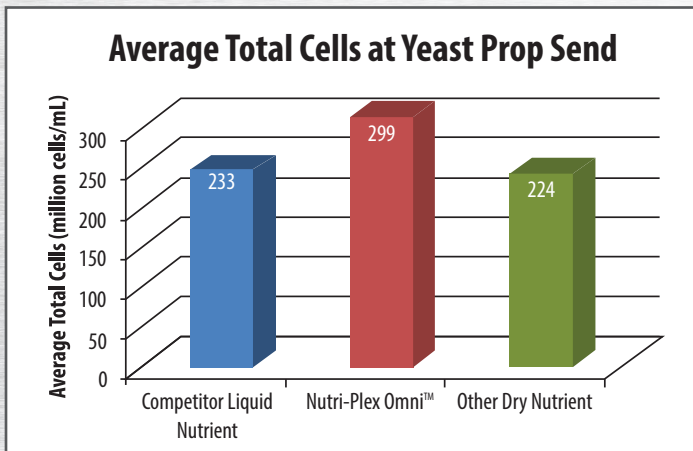
Performance

Nutri-Plex Omni™ usage in ethanol production facilities has been shown to:

- Improve cell mass in propagation
- Reduce production of glycerol during fermentation
- Improve the rate of kinetics early in fermentation
- Decrease lactic acid production by improving kinetics and thus excluding bacterial activity
- Increased yield (ethanol per liquefaction solids)

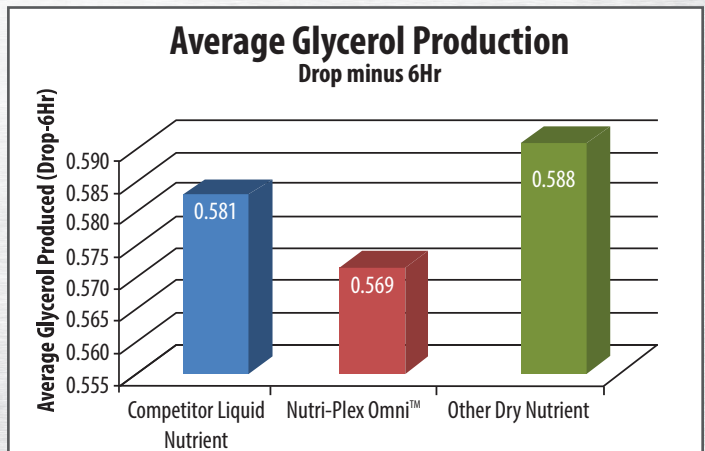
Increased Yeast Propagation

Graph 1 shows a typical 8 hour propagation of a 50 MMGY facility and the resulting total number of cells counted compared to other nutrients.



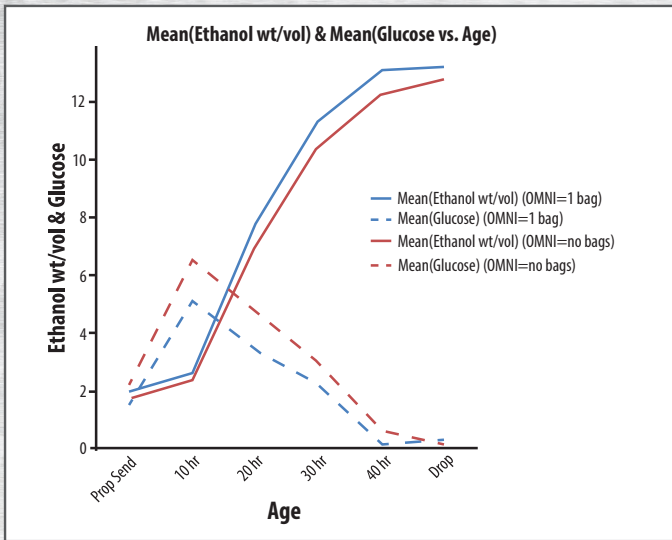
Significant Reduction in Glycerol

Graph 2 shows that delta glycerol was reduced by as much as 0.2% w/v with Nutri-Plex Omni™ in 50 MMGY ethanol production facilities.



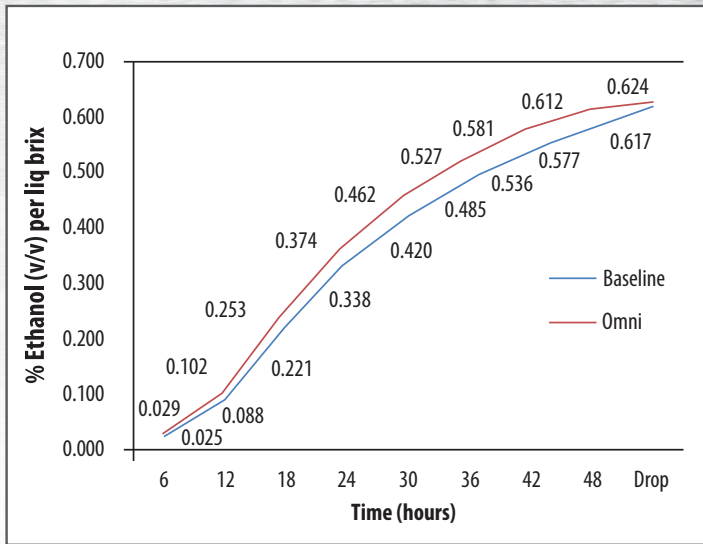
Increased Fermentation Kinetics

Graph 3 shows a typical progression of fermentation kinetics for a 100 MMGY ethanol plant. Fermentation kinetics were greatly increased as seen by the glucose utilization and ethanol formation when using Nutri-Plex Omni™.



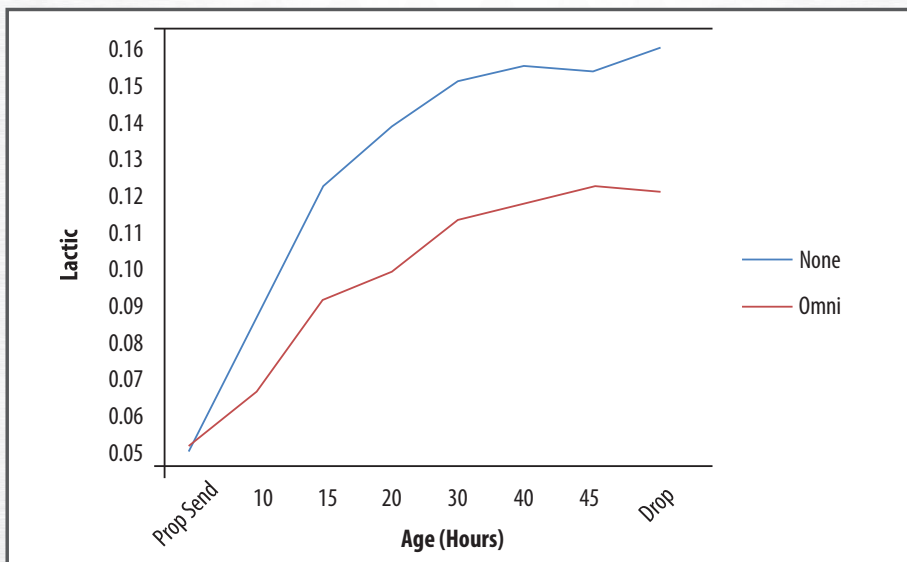
Increased Glucose Kinetics

By increasing glucose kinetics and ethanol formation in fermentation, lower lactic acid and osmotic glycerol stress was realized. The result is an increase in fermentor yield performance (% ethanol per liquefaction brix). Graph 4, below, shows a typical yield curve at a 100 MMGY ethanol production facility.



Lactic Acid Production

Graph 5 shows that average lactic acid production by bacteria was significantly controlled in propagation when using Nutri-Plex Omni™. Lactic acid concentrations were also much lower over the course of fermentation. The improved propagation allows a more potent yeast cell population thus excluding bacterial growth.



Proven Results. Proven Benefits.

Understanding that no two ethanol plants are exactly alike or operate the same, the results of using Nutri-Plex Omni™ may vary. However, the data above shows that the addition of Nutri-Plex Omni™ has a positive benefit on carbohydrate utilization resulting in increased yields and plant profitability.

Propagation Nutrient	EtOH %w/v ave.	EtOH %v/v ave.	Total gal. (EtOH)	Fermenter (\$)	Increase (\$)	Cost	Profit
Urea	12.79	15.86	113460	\$ 165,650			
OMNI (1 bag)	12.93	16.03	114702	\$ 167,464	\$ 1,813	\$ 136	\$ 1,676

Note: Fermenter Volume for this test was 730,000, at a 98% fill. All financial calculations were executed with a base Ethanol Price of \$1.46 per gallon.

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