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## Application of Brewers Dried Yeast in Nursery Pig Diets

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### Introduction

Various feed additives are often added to nursery pig diets to improve performance and health outcomes. Live yeast and yeast-derived products such as yeast culture and yeast extract are sometimes added to nursery pig diets. In addition, residual yeast components from ethanol fermentation can end up in nursery pig diets when DDGS are fed. One rather unique yeast product that has been used as a feed additive is brewers dried yeast (AAFCO – 96.4 Brewers Dried Yeast), which is a co-product of the beer brewing process. Due to some of its functional properties brewers dried yeast has been added to animal feed to improve palatability and measures of immunity and gut health.

### Research in Nursery Pigs

An initial study conducted in nursery pigs found that feeding a relatively low level of a concentrated brewers dried yeast product (2.5 lb/US ton; Kent Natural Yeast) tended to reduce feed cost per lb of gain (FCOG) and income over feed cost over the course of the nursery period (Table 1). These economic benefits were likely driven by the numerical increase in average daily gain (ADG) and numerically improved feed efficiency (Feed/Gain)

**Table 1. Effect of brewers dried yeast (Kent<sup>®</sup> Natural Yeast) on nursery pig performance and economics (Study 1)<sup>1</sup>**

Item	Control	Brewers Dried Yeast (2.5 lb/US ton)
Body weight, lb		
Day 0	13.9	14.1
Day 34	40.2	41.4
ADG, lb	0.775	0.803
ADFI, lb	1.240	1.228
Feed/Gain	1.604	1.532
Mortality, %	0.0	0.0
FCOG, \$2	0.230 <sup>x</sup>	0.221 <sup>y</sup>
IOFC, \$2	9.78 <sup>x</sup>	10.38 <sup>y</sup>

<sup>1</sup>n = 160 pigs were used in a 34-day study. There were 10 pens containing 8 pigs/pen for each treatment group.

<sup>2</sup>FCOG = feed cost per lb of gain; IOFC = income over feed cost.

<sup>x,y</sup>Means with different superscript letters are different (P ≤ 0.10).

Data from a larger, follow up study conducted at a commercial research site investigating the effects of supplementing nursery pig diets with a more concentrated brewers dried yeast additive (1 lb/US ton; MicroGold I MC<sup>®</sup>) similarly revealed a reduced FCOG and increased IOFC when brewers dried yeast was fed (Table 2). In this study, Feed/Gain was significantly improved which drove most of the economic benefits of supplementing nursery pig diets with a concentrated brewers dried yeast product.

**Table 2. Effect of feeding a concentrated brewers dried yeast (MicroGold I MC®) on nursery performance and economics (Study 2)<sup>2</sup>**

Item	Control	Brewers Dried Yeast (1 lb/US ton)	SEM
Body weight, lb			
Day 0	12.27	12.27	0.01
Day 42	43.96	44.89	0.60
ADG, lb	0.739	0.765	0.015
ADFI, lb	1.003	1.012	0.019
Feed/Gain	1.358 <sup>a</sup>	1.323 <sup>b</sup>	0.009
Mortality, %	3.2	2.9	0.85
FCOG, \$	0.30 <sup>a</sup>	0.29 <sup>b</sup>	0.002
IOFC, \$	9.79 <sup>x</sup>	10.28 <sup>y</sup>	0.22

<sup>1</sup>A total of 630 pigs were used in a 42-day study with 21 pigs per pen and 15 pens per treatment group.

<sup>2</sup>FCOG = feed cost per lb of gain; IOFC = income over feed cost.

<sup>a,b</sup>Means with different superscript levels are different ( $P \leq 0.05$ ); Mean tends to differ from control ( $P \leq 0.10$ ).

### Potential Mechanisms Leading to Beneficial Effects

Several components found in brewers dried yeast may work via multiple mechanisms that lead to beneficial outcomes when fed to nursery pigs. For example, prebiotic yeast cell wall components (i.e.  $\beta$ -glucans, MOS) found in brewers dried yeast can stimulate immune function and bind pathogenic bacteria. From a nutritive perspective, brewers dried yeast contains vitamins and trace minerals. From a functional perspective, brewers dried yeast has also been found to have antioxidant activity and increase in vitro fiber fermentation.

**Figure 1. Some of the beneficial components of brewers dried yeast**



One particularly unique class of molecules found in brewers dried yeast are residual hop acids remaining from the beer brewing process. Certain hop acids have been shown to have antimicrobial and ionophore-like activity. The individual and combined activity of the functional components in brewers dried yeast can potentially improve immune function, decrease inflammation, improve antioxidant activity and improve some measures of gut health which may lead to the improved performance observed in nursery pigs fed diets supplemented with brewers dried yeast.