Easyzyme®

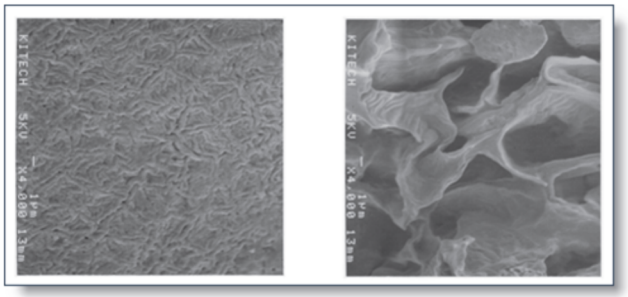
An NSP enzyme for swine and poultry diets

Introduction

Swine and poultry diets in North America have traditionally been based on corn, soybean meal, and fat. However, with the new era of bio-fuels in the United States, co-product feed ingredients from bio-fuel and human food production must be considered in formulation. These co-products are generally limited in monogastric animal diets due to poor digestibility of non-starch polysaccharides (NSP) and presence of anti-nutritional factors.

The result of ADM and cooperative research for coproduct utilization in swine and poultry diets has led to the commercialization of a novel enzyme (Easyzyme®†). Easyzyme is a microbial fermentation enzyme that is specifically designed to increase digestibility of NSP that exists in corn, wheat, soybean, and their respective coproducts. Furthermore, it has been shown that Easyzyme can enhance performance of pigs, poultry and other monogastric animals.

Scanning Electron Microscopy of Easyzyme treated SBM



Without Easyzyme (control, ×4000) With Easyzyme (×4000)

* 1 hour after treatment (Easyzyme, 0.02%)

Easyzyme contains guaranteed enzymatic activities of alpha-galactosidase, glactomanannase, xylanase and beta-glucanase. It is produced from a single fermentation process of two fungi organisms - *Aspergillus niger and Aspergillus oryzae*. The unique process of fermentation and microbial selection leads to the production of ancillary enzymes such as amylase, phytase, cellulase and protease that complement the primary enzymes and assist in the breakdown of complex substrates (NSP) in the feed ingredients (see above electron microscopy of soybean meal).

Easyzyme Research and Validation

Easyzyme has been tested and proven to support growth performance, NSP digestibility, and villi height of the small intestine of nursery pigs at the University of Illinois, Texas Tech University, and/or University of the Philippines. Kim et. al (*2003 Journal of Animal Science*) found that Easyzyme significantly increased energy (64.4 vs. 68.6%; P < .01) and amino acid ileal-digestibility (76.2 vs. 78.4%; P < .05) of corn-soy diets fed to nursery pigs.

ADM *in-vitro* laboratory studies (S03601 and S06302) found that Easyzyme improved dry matter digestibility of ileal digesta collected from pigs fed corn-soy diets (64.5 vs. 62.8%), corn-soy-DDGS diets (58.8 vs. 57.9%) or corn-soy-wheat midds diets (60.8 vs. 55.9%). ADM *In-vivo* swine research study (S08109) and published research data showed that nursery pigs fed Easyzyme had 3% to 7% better daily gain when fed corn-soy-DDGS diets (Table 1).

Table 1. Effect of Easyzyme on performance of nursery pigs fed corn-soy-DDGS diets^

	Corn-Soy	+30% DDGS	+30% DDGS + Easyzyme
	Daily gain (lb/day)		
ADM S08109*	1.07	1.04	1.11
Published data**	1.17	1.19	1.23
	Feed/gain		
ADM S08109**	1.38	1.30	1.32
Published data**	1.50	1.39	1.40

^Test pig weight: 20-50 lb; duration: 3 to 4 weeks
Diet effect: *P <0.10; **P <0.05
2007 Midwest ASAS/ADSA abstract

ADM conducted two grow-finish trials to evaluate whether Easyzyme could support performance of grow-finish pigs fed diets containing high levels of co-product ingredients. In the 39-day finisher study (S04203), adding Easyzyme to diets with high wheat midds resulted in 7% better daily gain

(Figure 1), with no significant effect on feed efficiency. The initial three phase data (51 days; 50 to 175 lb BW) from the on-going grow-finish study (S08205) indicated that adding 0.01% Easyzyme into diets with high levels of DDGS resulted in significantly better feed efficiency (P < 0.05; Figure 2).

Figure 1. Effect of Easyzyme on daily gain of finishing swine fed corn-soy-wheat midds diets

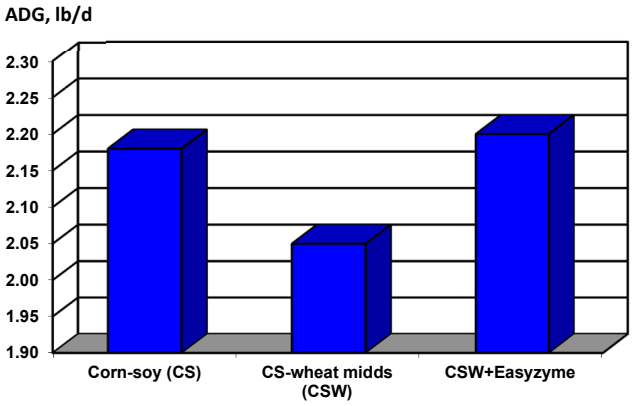
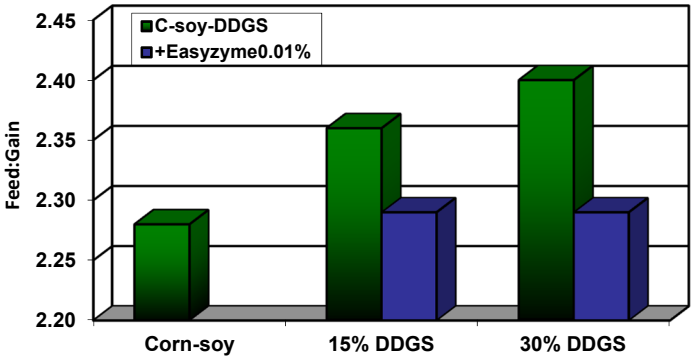


Figure 2. Effect of Easyzyme on feed:gain of grower pigs (50-175 lb) fed corn-soy-DDGS diets



Results from a small sow study at Texas Tech University showed decreased sow weight loss during the first week after farrowing (Ji and Kim, *Asian-Australian Journal of Animal Science*, 2004; Table 2). In addition, Easyzyme enhanced production performance in laying hens, broiler chickens and tilapia fish (Research data from the vendor or university).

Table 2. Effect of Easyzyme on performance of lactating sows

	Control	Control + Easyzyme
No. sows	10	10
Sow wt at farrowing, lb	362.34	360.14
Sow wt change, lb		
Week 1**	-16.37	2.42
Week 2	-7.04	-0.55
Week 3	-4.75	-6.51
Overall*	-28.16	-4.64

*P < 0.05; **P <0.01
Source: Ji and Kim, 2004. *Asian-Aust. J. Anim. Sci.*

Summary

Research from ADM and four university trials demonstrated that nursery and grow-finish pigs fed Easyzyme in diets containing high levels of co-products, such as DDGS or wheat midds, responded with better performance.

How Easyzyme is believed to work

- Increase intestine villi height in weanling pigs
- Improve digestibility of dietary NSP, releasing more energy for growth
- Enhance digestion of other nutrients such as amino acids

Product Description

ADM's Easyzyme is a stable multi-enzyme produced by fermentation methodology and by blending with a compatible high-quality carrier to produce a free-flowing, stable and mixable product.

Easyzyme is a source of carbohydrase enzymes. Carbohydrase enzymes improve the digestibility and availability of non-starch polysaccharides (NSP).

Product Options

1. ***Easyzyme***
   Product Number: 530270
   Packaging: 20 kg (44.1-lb) bag
   Usage rate for swine and poultry: 0.2 lb per ton or 0.01% in complete diets

2. ***Easyzyme Mixer 1***
   Product Number: 530490
   Packaging: 50-lb bag
   Usage rate for swine and poultry: 1.0 lb per ton or 0.05% in complete diets

†Easyzme is a registered trademark of EASY BIO, Inc.

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