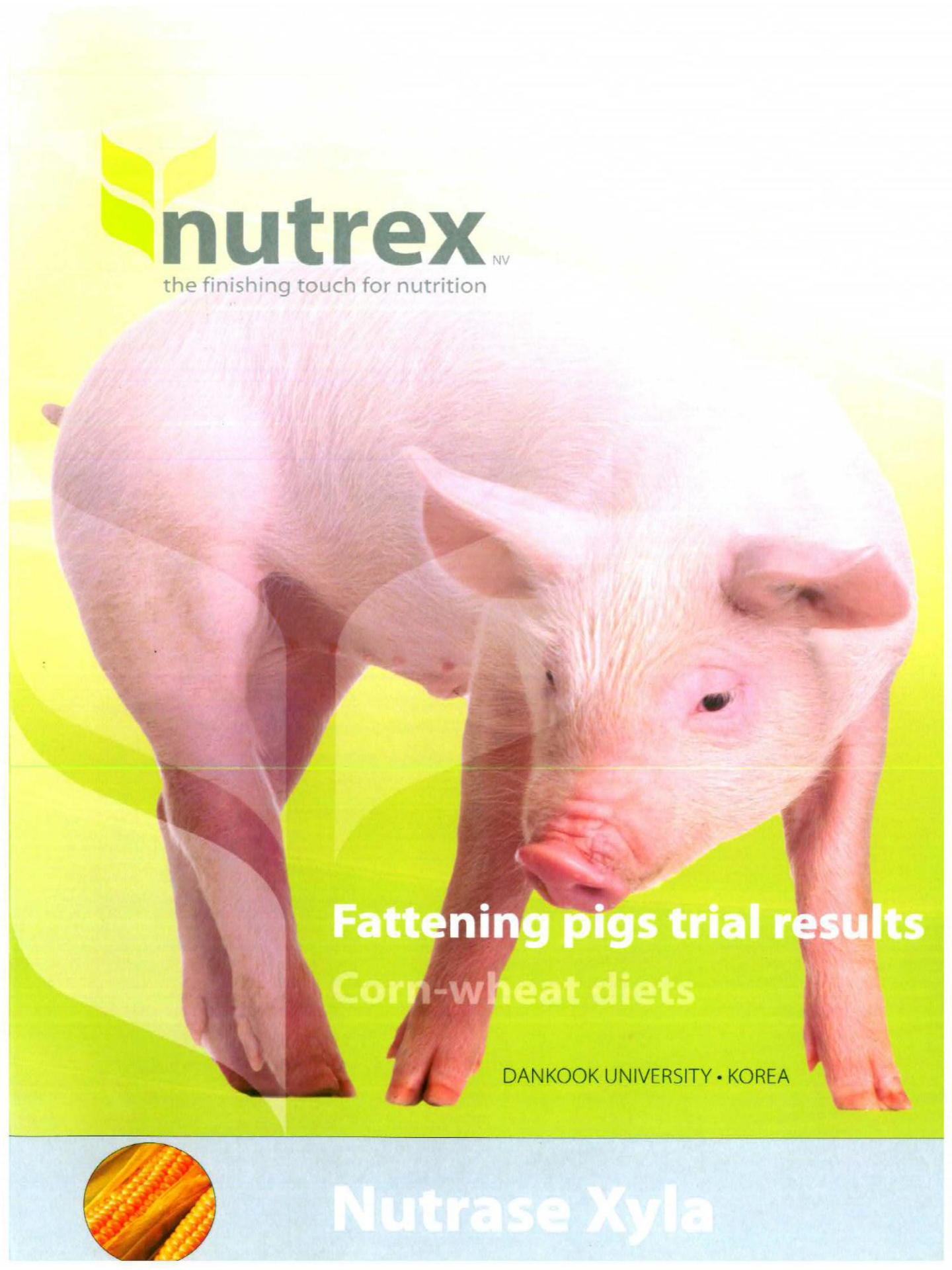
nutrex NV

the finishing touch for nutrition



Fattening pigs trial results

Corn-wheat diets

DANKOOK UNIVERSITY • KOREA

Nutrase Xyla

THE EFFECT OF NUTRASE XYLA IN LOW ENERGY DIETS ON THE GROWTH PERFORMANCE AND NUTRIENT AVAILABILITY IN FATTENING PIGS FED A CORN BASED DIET OR A CORN-WHEAT BASED DIET

S. M. HONG[1], H.J. KIM[1], J.P. WANG[1], S.C. KIM[1], K.Y. LEE[1], J.H. CHO[1], I.H. KIM[1]
ENZ/FPG/DUK/WC/1541

[1]Dankook University - Swine research center, Cheonan, Republic of Korea

Introduction

Non Starch Polysaccharide (NSP) degrading enzymes have been used extensively in wheat-based diets and diets for poultry for many years. Although there has been widespread acceptance of cereal-degrading enzymes in the poultry industry, relatively less enthusiasm has existed for the use of enzymes for pigs diets.

University and field performance studies have demonstrated that certain enzymes can bring added value to diet formulations for pigs by increasing the nutritive value of feedstuffs, reducing nutrient excretion, and improving productivity and profitability of the pig industry.

This study was set up to evaluate the effects of supplementation of growing/finishing diets with a bacterial endo-xylanase, Nutrase Xyla.

Materials and Methods

The experiment consisted of a pen trial using 144 piglets, starting at around 20 kg each, for the duration of 16 weeks.

144 piglets (20 kg each) were blocked by weight and ancestor with 4 pigs per pen and 12 pens per treatment, distributing full siblings to the various treatment groups.

Diets

Three starter, three grower and three finisher diets were formulated, the details of which are shown in table 1.

- Feed 1 was a corn-soybean meal based diet, with a low wheat inclusion, formulated according to the standards of the South Korean swine industry.
- Feed 2 was formulated according to the same standards, taking into account an NE_{pigs}-uplift of 33,8kcal/kg feed for Nutrase Xyla. This resulted in an altered formula with reducing the feed cost.
- In feed 3 a large part of the corn, soybean meal and tallow were replaced by wheat, wheat pollards and DDGS resulting in a substantial cost reduction and reduction of the nutrient and energy levels.

Measured and calculated parameters

Animals were weighed, and feed use recorded, at start, after 6 weeks (~40kg), after 12 weeks (~75kg) and after 16 weeks being the end of the trial. The final weight of the pigs was approximately 110kg.

Average daily gain (ADG), and feed conversion (FC) were calculated from these measurements and are presented in the trial results section.

Treatments

TABLE 2: TREATMENTS

	DIET	ENZYME	INCLUSION LEVEL
1	Feed 1 (Positive control)	-	0
2	Feed 2	Nutrase Xyla	100 ppm
3	Feed 3	Nutrase Xyla	100 ppm

TABLE 1: DIETS - PRINCIPAL INGREDIENTS (%). ENERGY LEVELS AND RELATIVE FEED COSTS (%)

	STARTER FEEDS (WEEK 0 TO 6)			GROWER FEEDS (WEEK 7 TO 12)			FINISHER FEEDS (WEEK 12 TO 16)		
	FEED 1	FEED 2	FEED 3	FEED 1	FEED 2	FEED 3	FEED 1	FEED 2	FEED 3
Corn	45.50	40.00	30.00	50.58	51.67	40.00	53.32	54.11	30.00
Soybean meal (44%CP)	27.60	25.84	23.53	25.40	25.20	12.61	21.10	21.00	8.33
Wheat	15.27	18.13	31.53	10.00	10.43	22.37	10.00	10.34	30.00
Wheat pollards	-	5.00	5.00	-	-	14.2	-	-	15.00
Toasted soybeans	3.00	3.00	-	-	-	-	-	-	-
Tallow	3.00	2.97	2.32	3.90	2.97	1.10	3.20	2.38	1.28
Molasses	2.00	2.00	2.00	3.00	3.00	3.00	3.00	3.00	3.16
DDGS	-	-	3.00	3.00	3.00	3.00	5.00	5.00	3.00
Rapeseed meal	-	-	-	1.00	1.00	2.00	2.00	2.00	5.00
Sugar beet pulp	-	-	-	-	-	2.00	-	-	2.00
Premix	3.63	3.05	2.61	3.12	2.72	2.20	2.38	2.16	2.22
NUTRIENT & ENERGY LEVELS									
NE_{pigs} (kcal/kg)	2414	2413	2334	2445	2444	2284	2426	2425	2234
Crude protein	19.16	19.31	18.4	19.09	19.13	16	18.09	18.15	15.5
Dig. Lysine	1.058	1.058	0.950	0.942	0.957	0.790	0.788	0.805	0.690
Ca	0.880	0.775	0.700	0.893	0.739	0.560	0.729	0.645	0.560
Dig. Phosphorous	0.368	0.375	0.350	0.332	0.333	0.300	0.282	0.283	0.280
FEED COST									
Relative feed cost	100	98	89	100	99	87	100	99	87

Results and Discussion

Table 3 and figure 1 show the results of the trial obtained for the 3 treatment groups.

Treatment 1 versus treatment 2

It's clear that addition of 100 ppm Nutrase Xyla releases more than the estimated 33,8 kcal/kg feed of NE_{pigs} as there is an improvement of ADG and of FCR with treatment 2, compared to treatment 1 in all phases.

In the starter diet, inclusion of Nutrase Xyla improved performance despite the partial replacement of corn and soybean meal by wheat pollards and the reduction of tallow inclusion.

In the grower and finisher diets, the replacement of tallow by corn was also overcome by inclusion of Nutrase Xyla, resulting in better ADG and FCR.

Over the entire growth period, the inclusion of Nutrase Xyla in the reformulated diet resulted in 2,6% higher ADG and a 2,4% better FCR.

Treatment 1 versus treatment 3

Analysis of the results obtained by treatments 1 and 3 demonstrates that it was possible to lower the feed cost by up to 13% by reducing the inclusion levels of noble raw materials such as corn, soybean meal and tallow by including high levels of wheat, wheat pollards, rapeseed meal and sugar beet pulp.

addition of 100 ppm Nutrase Xyla makes it possible to upgrade the nutritional quality of wheat, even up to a level that exceeds that of corn. FC was improved by 3.3% and average daily weight gain increased by 2.7%.

Overall, the use of Nutrase Xyla in the reformulated diet with much lower energy and nutrient levels even resulted in a slight improvement of 1% for ADG and almost 0.8% for FCR.

TABLE 3: TRIAL RESULTS

TREATMENT	FEED 1	FEED 2 + 100PPM NUTRASE XYLA	FEED 3 + 100PPM NUTRASE XYLA
0 - 6 WEEKS			
ADG (g)	662	689	677
ADFI (g)	1452	1471	1500
FCR	2.193	2.135	2.216
6 -12 WEEKS			
ADG (g)	872	890	878
ADFI (g)	2228	2222	2215
FCR	2.555	2.497	2.523
12 -16 WEEKS			
ADG (g)	935	953	937
ADFI (g)	2961	2957	2924
FCR	3.167	3.103	3.121
OVERALL			
ADG (g)	801	822	809
ADFI (g)	2120	2124	2124
FCR	2.647	2.584	2.625

FIGURE 1: TRIAL RESULTS - DAILY WEIGHT GAINS AND FC