



Hostazym® X outperforms competitors, again!

In a recent trial Hostazym® X was challenged against competing NSP enzymes Econase® XT, Natugrain® TS and Roxazyme® G2. The trial was performed in Poland at Piast facilities, and set up to measure broiler zootechnical performance.

Trial design:

- 960 Ross 308, female
- 10 replicates per treatment
- Real production environment, trial pens were installed in the middle of a 10.000 bird house to mimic practical conditions
- 3 phases feeding, starter, grower and finisher
- Growth period: from 1 to 42 days
- 5 treatments: Positive Control (standard diet) and 4 commercial enzyme products on top of Positive Control

Diet	Starter	Grower	Finisher
Wheat/Maize/SBM	50/10/30	40/25/25	35/30/25
CP (%)	21,5	19,5	18,5
dLys	1,33	1,09	0,96
AME (kcal/kg)	2900	3050	3100

Dose of test Products:

Treatment	Dose	Dose (U/kg)
Control	-	-
Econase® XT	2x min. EU registered dose	16000 BXU/kg
Natugrain® TS	minimum EU registered dose	280 TXU/kg xylanase 125 TGU/kg glucanase
Roxazyme® G2	minimum EU registered dose	135 U/kg xylanase 35 U/kg glucanase & 40 U/kg cellulase
Hostazym® X	minimum EU registered dose	1500 EPU/kg

Measurements:

Body Weight gain (BWG), Feed Intake (FI). Feed Conversion Ratio (FCR) and European production efficiency factor (EPEF) were calculated.
EPEF= (Liveability, % x Final Body Weight, kg)/ (FCR x Age, days) x 100

Results:

The results of the trial are shown in Figures 1 and 2.

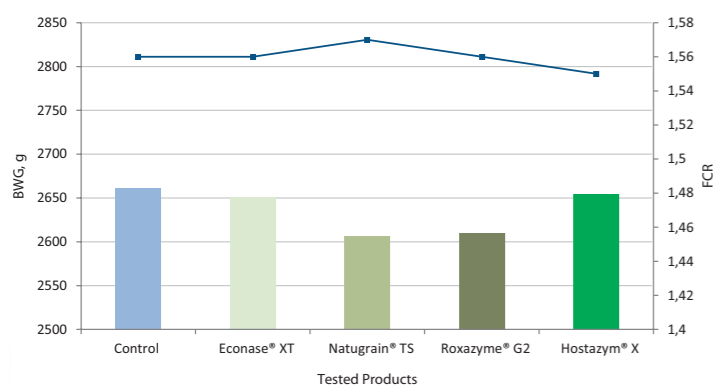


Fig. 1: Effect on BWG and FCR

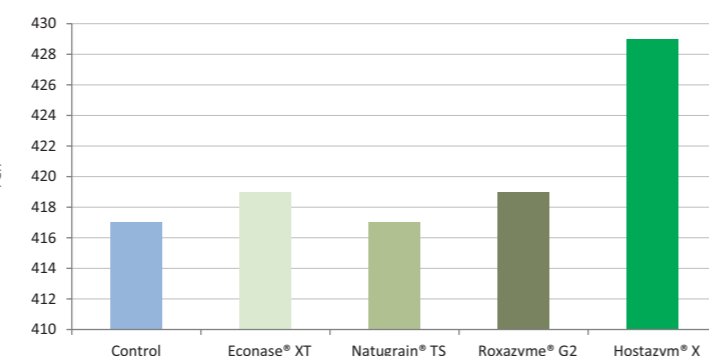


Fig. 2: Effect on EPEF

Key observations:

- Overall performance was very good and significantly above breed specifications
- Lower FCR registered for Hostazym® X treatment than competitor enzymes
- Hostazym® X had the highest body weight gain.
- Natugrain® TS and Roxazyme® G2 had poor performance for BWG, more than 50 g below control treatment
- Hostazym® X had the highest EPEF amongst treatments (+12 points over the control)
- Overall, Hostazym® X outperformed all competitors in this trial.

CONCLUSION:

Again, Hostazym® X proved to be a superior enzyme, due to its enzymatic complex which supports optimal animal performance.

Let's Talk About Enzymes...

Milestone: Hostazym® X now EU approved for use in Fattening pigs!

Enzymes are subject to an onerous registration procedure, before they are allowed to be used in compound animal feeds in Europe. The registration procedure contains several important steps. Evidence in the form of safety studies has to be supplied by the company that wants to register the enzymes to prove the enzyme is safe for animals, humans and the environment.

Another important part of the EU registration procedure is to prove that the enzyme is efficacious in the animals for which registration is sought. It means that for every individual species at least 3 trials have to be provided that show a significant improvement in zootechnical results or digestibility at an established minimum dose.

The whole procedure, from starting up the necessary trials up to receiving the final written approval can take between 2 and 5 years, depending on the questions EFSA and the EU committee may ask about the dossier supplied or the information in it.

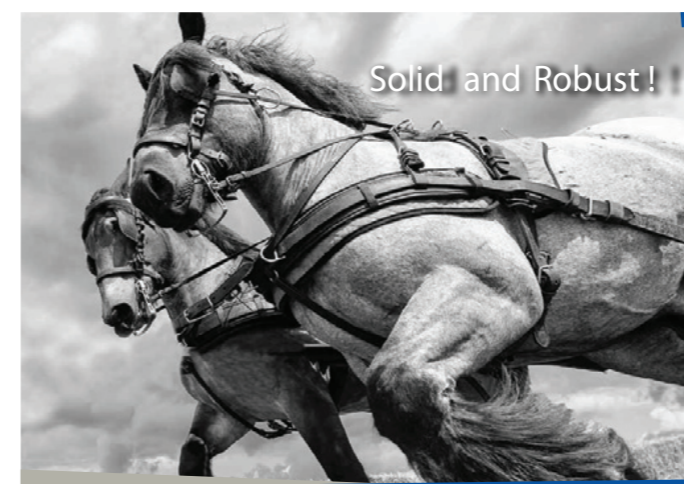
When a product is finally approved, the registration is valid for a 10 year period, after which the enzyme has to be

reviewed again, a full new registration procedure is started up again, according to the valid criteria.

On the 3rd of June 2015 the EU committee voted and approved the renewal of the registration of Hostazym® X for the use in feeds for poultry and pigs. This means that Hostazym® X has been reviewed against today's modern standards regarding efficacy and safety, and has passed all criteria set by EFSA and the EU. Even more important, the registration is not only renewed, but also extended with the approved use of Hostazym® X for fattening pigs and minor poultry species, like ducks, geese and game birds.

With the obtained registration Hostazym® X now can be used in all feed mills, in both pig- and poultry feeds, to improve performance.

Hostazym® X is well known for its profitability, reliability and its robustness: It is a strong product which delivers under all circumstances, independently from the feed formulation or the type of raw materials used. It's a product for the benefit and the profitability of the farmer, feed mill and integrator.



Hostazym® X has received a new European registration!

approved for

- fattening pigs **NEW**
- minor poultry species **NEW**
- piglets
- broilers
- turkeys
- layers

EU-registration number: 4a1617.

Do pigs need an NSPase?

Despite some scientific discussion on the mode of action of Non Starch Polysaccharides (NSP) degrading enzymes (NSPase) in pigs and a clear lower market penetration of this products in pig nutrition, when compared to poultry, there are several studies that support the added value of Hostazym® X when used as nutritional tool in pig nutrition.

The consistent response of Hostazym® X in improving zootechnical performance of pigs over different diets and production conditions is remarkable and relies on the unique enzymatic complex present in Hostazym® X and its effectiveness in degrading fibre.

BACKGROUND

Fibre, specially the NSP fraction, is by far the most important dietary factor influencing the flow of nutrients from small to large intestine in growing pigs. In the large intestine, the rate and overall degree of degradation of fibre polysaccharides is influenced by the chemical nature of the fibre, the solubility and the degree of lignification. Thus, β-glucans, soluble arabinoxylans and pectins are all rapidly degraded in the caecum and proximal colon, whilst the insoluble arabinoxylans and cellulose are degraded more slowly at more distal locations of the colon (Knudsen et al, 1993).

Scientific data shows that the digestibility of NSP at the small intestine segment is low in pigs, Table 1. Additionally, it is known that some NSP cause a reduced gastrointestinal transit time and also increased stool output, explained by the fact that the carbohydrates escaping digestion in the small intestine act as the main substrate to the colonic microbial fermentation action, stimulating microbial growth and increasing bacterial cells mass and generating fermentation end-products such as short chain fatty acids (SCFA) and gases (H₂, CO₂, CH₄).

These end-products are of particular interest to pig nutrition because of the interactions with the host in a variety of metabolic processes. The SCFA produced are rapidly absorbed from the gut lumen and subsequently utilised by the animal as substrates of energy metabolism providing a substantial amount of the metabolised energy.

The use of NSPases will alter/influence these process significantly both by increasing digestibility of NSP at small intestine and by making available for fermentation at the large intestine a specific combination of oligosaccharides. These fermentable oligosaccharides are as variable as the fibre structure present in the feed, the exogenous NSPase being used and the animal health status.

Table 1. Coefficient of digestibility of NSP in the small intestine and total tract of piglets and growing pigs

	Small intestine	Total tract
Piglets 0-10 days post-weaning ^a	0,03	0,57
Piglets 14-28 days post-weaning ^b	0,14	0,67
Growing pigs ^c	0,21	0,70

Source: ^a Laerke et al (2003) and Hopwood (2004); ^b Gdala et al (1997), Jansen et al (1998) and Pluske et al (2007); ^c Knudsen et al (2008)

HOSTAZYM® X CONCEPT

Products of Hostazym® X enzymatic complex hydrolysis will influence positively gut microflora and promote positive fermentation processes leading to additional uptake of energy by the pig. This effect will contribute to better zootechnical performance and/or production efficiency.

Proof of Concept: Five different trials were conducted at different times and places to evaluate the efficacy of Hostazym® X on improving zootechnical performance of fattening pigs.

Table 2 summarizes each trial set up and diets used. All trials showed significantly better results with the use of Hostazym® X.

Table 2. Summary of Trial Set Up

Trial description	Fattening period	Base diet composition	Nº of animals
1. Spain 2011	From 34 to 93 kg	70% Wheat + 15 % Soyabean meal + 10% Sunflower meal	520
2. Spain 2011	From 30 to 88 kg	35% Wheat + 40% Barley + 15 % Soyabean meal + 5% Rapeseed meal	420
3. Spain 2011	From 37 to 93 kg	10% Wheat + 70% Barley + 5% Soyabean meal + 10% Rapeseed meal	560
4. Poland 2007	From 30 to 110 kg	20% Wheat + 45% Triticale + 10% Rye + 15% Soyabean meal	300
5. Poland 2013	From 31 to 110 kg	70% Triticale + 10% Barley + 10% Soyabean meal + 5% Rapeseed meal	300

The results of the 5 trials clearly show that Hostazym® X has a consistent positive effect on reducing FCR. This effect was obtained in all types of diets, from simple to high complex fibre structures. Results are shown in Figure 1.

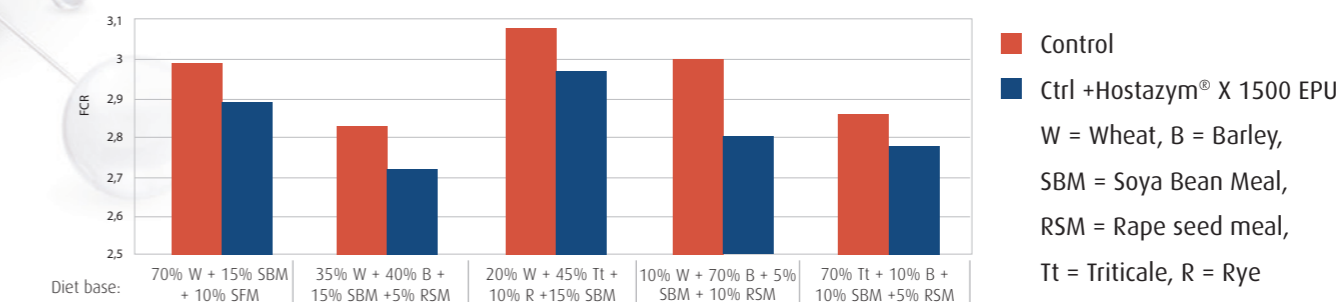


Figure 1. Overall FCR of five different trials using different diets

The FCR improvement is supported by a significant improvement on body weight gain, which ranged from +0,5 to +3,0 kg at the end of each trial. Results are shown in Table 3.

Table 3. Average Weight Gain of five different trials using significantly different diets

Average Weight Gain (kg)	Control	Control + Hostazym® X 1500 EPU	Δ	Fattening period
Diet base: 70% W + 15 % SBM + 10% SFM	58,3	58,8	+0,5	From 34 to 93 kg
Diet base: 35% W + 40% B + 15 % SBM + 5% RSM	55,9	58,2	+2,3	From 30 to 88 kg
Diet base: 10% W + 70% B + 5% SBM + 10% RSM	55,5	56,2	+0,7	From 37 to 93 kg
Diet base: 20% W + 45% Tt + 10% R + 15% SBM	79,2	82,2	+3,0	From 30 to 110 kg
Diet base: 70% Tt + 10% B + 10% SBM + 5% RSM	76,3	78,6	+2,3	From 31 to 110 kg

The efficacy of Hostazym® X in improving the performance of fattening pigs is supported and explained by its efficacy in releasing nutrients from the diet. Results of nutrient digestibility improvement by Hostazym X are shown in Table 4.

Table 4. Fecal Nutrient Digestibility (%)

Item	Control	Control + Hostazym X 1500 EPU	p value
Dry matter	81,50	83,17	0,038
Crude Protein	77,03	78,89	0,039
Crude Fat	45,29	64,90	0,006
Crude Fibre	32,55	37,86	0,043
N free extract	89,78	90,41	0,516
Organic matter	83,42	85,17	0,009
Gross energy	80,97	82,29	0,097

CONCLUSION:

- ✓ Pigs do need an NSPase!
- ✓ Hostazym® X is a superior enzymatic complex to support optimal pig performance.
- ✓ The unique properties of Hostazym® X make it a valuable nutritional tool to support efficient pig production, both by improved zootechnical performance and/or reduced feed costs.