

# Xylanase enzyme reducing mortality yields €1 extra income per placed pig

Nowadays, typically formulated fattening pig diets consist of more than 20% of Non-Starch Polysaccharides (NSP). The NSP fraction exists of a variety of dietary fibres, mainly arabinoxylans and cellulose, which are all known to be non-digestible to the animal's intestinal tract.

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These indigestible NSPs do have a direct and/or indirect impact on the overall nutrient utilisation and thus the technical performance of the pig. As more and more field data becomes available, it is clear that NSP fibres have an impact on the pig's gut health status as well.

## NSP fibres and probiotic hindgut fermentation

The breakdown of NSPs by the xylanase enzyme Hostazym X, a complex of enzyme activities produced via surface fermentation, is known to deliver short chain sugar fragments at the gut level, the so-called arabinoxylan-oligosaccharides (AXOS). These AXOS act as a prebiotic as they can be converted, via fermentation, by the bacterial gut flora into short-chain-fatty-acids (SCFA), which can easily be absorbed by livestock like pigs.

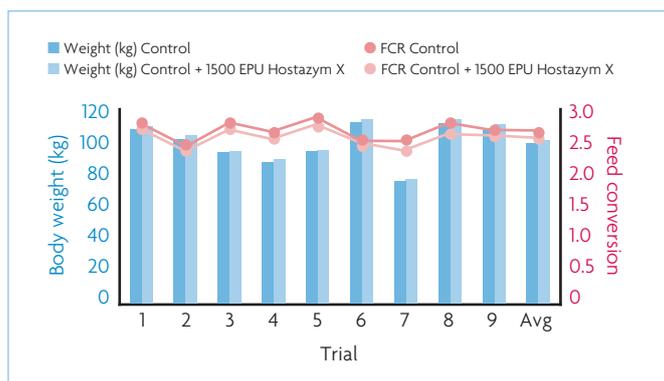


Fig. 1. Growth and feed conversion in various pig fattening trials when adding 1500 EPU of Hostazym X to the diet.

This prebiotic effect of Hostazym X will induce several positive effects such as a drop in pH and a change in microbial composition in the hindgut, which will both lead to a healthier pig and gut environment.

Huvepharma has performed a series of large-scale fattening pig trials, where it was possible to quantify this health effect of Hostazym X, by reducing the mortality rate.

## Hostazym X effect on growth and feed conversion

Over the past years, Huvepharma has performed many trials showing the beneficial effect of adding Hostazym X to fattening pig diets by improving the growth rate and decreasing feed conversion (FCR).

Independent of the diet composition, a consistent improvement is shown in each trial in growth (on average +1.9%) and in feed conversion (on average -3.7%) independent of the feed formulation, breed and management circumstances under which the pigs were kept.

This positive effect of Hostazym X on growth and FCR is often linked to three different mechanisms:

- A reduction in viscosity.
- The release of nutrients captured inside indigestible fibre structures.
- The formation of AXOS (prebiotic components) produced by the breakdown of arabinoxylans present in the raw materials in the feed formulation.

The combination of these three mechanisms leads to the improvements in growth and feed conversion as shown in Fig. 1.

Besides the zootechnical improvements when Hostazym X was included in the pig's diet, Huvepharma suspected another beneficial effect could be present.

As the overall gut health status of the pigs was expected to be improved when Hostazym X was added to the feed, this effect should be able to be quantified.

When analysing our database in more detail, we were able to identify and find a parameter to quantify this gut health boosting effect.

## Consistent impact on pig mortality

Digging into the database of large-scale trials at major pig integrators and commercial farms in the USA and Europe, which were set up under normal practical conditions, Huvepharma found a consistent reduction in mortality rate in the Hostazym X treated groups.

In each of the studies, commercial finisher pigs were used: mixed-sex, and animals were kept for the normal grower and finishing period from around 11kg up to slaughter-weight of about 115kg. The pigs were all housed in pens each containing the regular number of pigs, about 15 to 20 animals per pen. The pens were always randomly assigned to the control group (no Hostazym X) and to the treatment group (with Hostazym X).

All trials were set up to measure normal data like growth and feed conversion, and the mortality rate was also recorded. It was found that the mortality rate in the Hostazym X treated group was about 25% lower than in the non-treated group. Since mortality in fattening pigs is relatively low, it is quite logical that in standard academic trials one will not notice this effect, as the number of animals used in this kind of set-up is far too low.

In Table 1, the data of the individual trials are shown, which clearly indicates the consistent effect of Hostazym X. In every single trial, the mortality rate in the Hostazym X supplemented group is lower than in the control group, even if the

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Table 1. Analysis of pig fattening trials (11-115kg) showing the effect of Hostazym X on pig mortality. \*EPU: Endo-Pentosanase Unit.

	Group size (N)	Diet composition	Hostazym X dose (EPU*/kg feed)	Pig mortality rate (%) and number of pigs		
				Control group	Hostazym X group	Reduced mortality by Hostazym X addition
Trial 1	1335	maize-soy-DDGS	1500	3.35 (45)	2.26 (30)	32.54
Trial 2	256	wheat-soy	1500	4.30 (11)	3.10 (8)	27.91
Trial 3	468	maize-soy-DDGS	1500	9.67 (45)	7.07 (33)	26.89
Trial 4	530	maize-soy	1500	3.59 (19)	2.87 (15)	20.06
	530	maize-soy	3000	3.59 (19)	1.79 (9)	50.14
Overall			1500			26.85

	Piglets placed	Mortality (%)	Pigs delivered	FCR	Start weight (kg)	Slaughter weight (kg)	Meat (kg)	Feed (kg)	Feed price (€/kg)	Feed costs (€)	Meat price (€/kg)	Meat income (€)	Revenue (€/kg)
Control	1,000	4.00	960	2.65	11	115	110,400	26,4576	0.23	60,852.48	1.4	15,4560.00	93,707.52
Control + Hostazym X	1,000	3.00	970	2.65	11	115	111,550	26,7332	0.23	61,486.36	1.4	15,6170.00	94,683.64
Difference	0	-1.00	10	0	0	0	1,150	2756		633.88	0	1610	976.12

**Table 2. Revenue calculation for 25% mortality reduction per 1,000 pigs placed (revenue = meat income - feed costs).**

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standard mortality is already at a relatively low level.

Overall, the addition of a standard dose of Hostazym X (1500EPU/kg) to the feed resulted in a decreased mortality rate of more than 25%.

When added at double dose (3000 EPU/kg of feed), Hostazym X showed a further drop in mortality rate of up to 50%.

In all the trials shown in Table 1, no differences were observed in clinical pathology between the control groups and the enzyme-treated groups.

In addition, all the other circumstances within one trial were kept the same which indicates that the observed effect of Hostazym X on mortality reduction could not be related to a specific infection pressure or certain swine disease.

From Table 1, it can be calculated

that the number of delivered pigs to the slaughter house increased by using Hostazym X in the diet of the pigs. This means that, per cycle of pigs set up in a farm, the deliverable kg of live weight is increased, which leads to a better occupancy rate of the available space and equipment.

### Economics

As mentioned earlier in this article, the use of Hostazym X in fattening pig diets results in a reduced mortality rate of 25% on average.

When recalculated, on a scale of 1,000 pigs placed with a normal mortality rate of 4%, 10 more pigs on these 1,000 placed will survive and reach the slaughterweight.

Of course, because 10 more pigs survive and reach slaughter weight, the feed intake of these 10 extra

pigs has to be taken into account in the economic calculation.

Nevertheless, a clear extra financial gain of almost €1,000 more income is yielded per 1,000 placed pigs (see Table 2).

Recalculated per placed pig, the reduction in mortality by using Hostazym X in the diet leads to a higher income of about €1 per placed pig!

This extra benefit of mortality reduction and delivering more pigs to the slaughter house is in addition to the already existing economic advantages of Hostazym X, namely the improved feed conversion and increased weight gain of fattening pigs.

Especially in today's diets where additional support is needed to manage the pig's gut health, the use of Hostazym X in the diet proves to have a strong positive contributing

effect. In other recent Huvepharma research, it was shown that Hostazym X reduces the inflammatory reaction of the gut wall.

This is because Hostazym X most probably alters the gut flora via the breakdown products it generates after degrading the complex fibre structures in the diet. By doing so, Hostazym X positively influences the health status of the gut wall and creates a healthy environment for optimal nutrient digestion and uptake by the pig. ■

