

# Prebiotic effect of Hostazym® X improves gut health and reduces mortality!

In everyday practice, Hostazym® X is being repeatedly recognized as a unique and strong enzymatic complex, among the NSP (Non-Starch Polysaccharides) feed enzymes on offer. This superior status can be attributed to its robust production process of Surface Fermentation (SF) on a wheat bran substrate, and to its exceptional match with the composition of a wide range of feedingstuffs. In addition, its dual affinity for degrading both soluble and insoluble NSP fibres has a major impact upon the consistent increase in animal performance via improved nutrient utilization. Recent findings with Hostazym® X supplementation into diets of both pigs and poultry, are clearly indicating an underlying and prebiotic effect on the gut microflora.

## BACKGROUND

In biochemical tests, different enzyme products do not all have the same preference for attacking soluble or insoluble arabinoxylan fibres (AX). For instance In Figure 1, the microbial source of Hostazym® X (highlighted as centered curve), shows a 'balanced' affinity for both types of NSP.

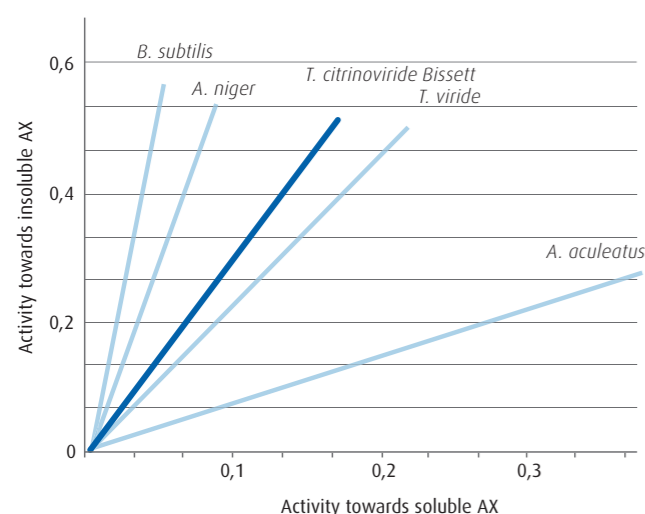


Figure 1. Substrate selectivity for endo-β1,4-xylanase of different xylanases (adapted from Moers et al., 2003).

Nutritionists are looking in practice for two main issues to be solved by NSP enzymes: breaking down cell walls and so release encapsulated nutrients (degrading insoluble AX), and reducing viscosity (degrading soluble AX) (Fig. 2). The simultaneous degradation of both NSP types by Hostazym® X, results in end products called AXOS (arabinoxylan-oligosaccharides) which have a high prebiotic potential.

Small non-viscous sugars formed by the enzymatic breakdown, can rapidly be fermented by favorable bacteria in the hindgut (lower intestine). The type of AXOS that is being formed as an end product of enzymatic degradation is depending on the specific microbial source of the applied NSP enzyme. These genetic differences in AX specificity (or fibre-splitting pattern) are visualised In Figure 3.

Thanks to the balanced approach of Hostazym® X, a 'complete' degradation of AX fibres into non-viscous products will be achieved. These AX molecules generated by Hostazym® X, will lead to fermentation processes by favorable bacteria in the hindgut, producing Short-Chain-Fatty-Acids (SCFA). These are easily absorbed as fast energy sources for the gut, and contribute to (intestinal) immune development and gut wall integrity.

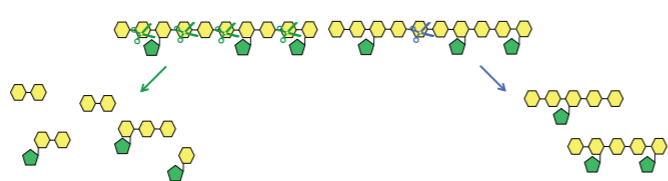


Figure 3. Deviation in substrate specificity (see active sites of splitting) for two genetically different xylanases, resulting in different end products (left vs. right pathway) (adapted from C.M. Courtin, 2014).

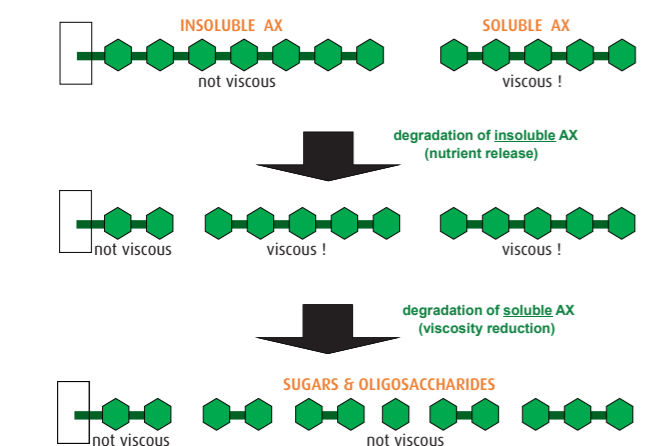


Figure 2. Preferable pattern of arabinoxylan (AX) degradation into non-viscous end sugars (Internal source).



# Let's Talk About Enzymes...

## Super-dosing OptiPhos® brings consistent benefits in growth and feed-conversion

OptiPhos® delivers much more than only replacement of inorganic phosphorus. When phytase is applied in a higher dose than usually for plain phosphorus release, this is called super-dosing. The result of super-dosing OptiPhos® is a higher growth and lower feed conversion of the animals due to an improved availability of other nutrients, like amino acids and fatty acids, instead of phosphorus alone. The release of these other nutrients is caused by a (complete) destruction of all the phytate in the feed. This phytate is always and naturally present in raw materials like corn, soya and wheat. Intact phytate acts as an Anti-Nutritional Factor (ANF) and binds to minerals, amino acids, fatty acids and even to starch. All these valuable nutrients are bound to phytate, and so become unavailable for the digestive system of the animal, and will be excreted. With the addition of OptiPhos® to these feeds, and especially at super-dosing, this loss is prevented because OptiPhos® will destroy the ANF effects of the phytate in the stomach of the animals, so early and fast enough for the animal to optimally profit from the availability of these valuable nutrients.

The super-dosing effect of OptiPhos® has already been recognized in an early stage, and has been patented in many countries.

Huvepharma has performed a lot of trials, in research stations as well as in practice, which have proven this super-dosing effects by showing improved results (growth and feed conversion) when OptiPhos® is applied in the feeds at higher doses.

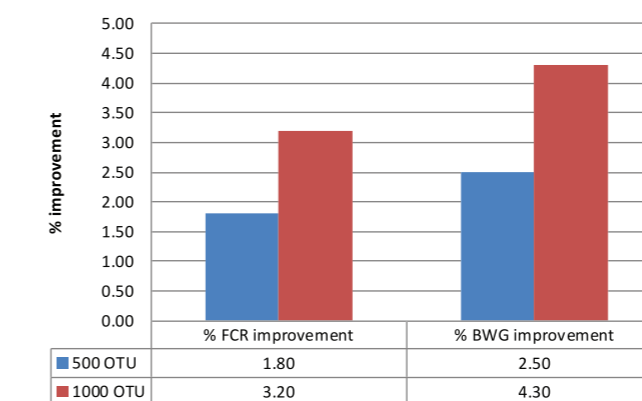


Figure 1. Improvement in FCR and BWG in % derived via meta-analysis of broiler trials with 500 or 1000 OTU added to the feed as super-dosing (0.12% avP replacement included).

When putting all of these data together via meta-analysis, OptiPhos® shows at 500 OTU and replacing 0.12% avP in the feed an improvement 1.8% on FCR, and 2.5% on BWG. At 1000 OTU and 0.12% avP replacement the results increase further to an improvement of 3.2% on FCR and 4.3% in BWG.

Most of the trials were done with broilers slaughtered at a weights between 2.2 and 2.5 kg. For those birds super-dosing OptiPhos® at 500 or 1000 OTU respectively led to a reduction between 0.03 to 0.05 in FCR, and an increase of 55 to 98 grams extra weight.

This meta-analysis clearly shows the super-dosing effect of OptiPhos® in practice, leading to an increased profit in broiler production. When calculating the benefit per 100 000 broilers slaughtered at a weight of 2.5 kg, a FCR of 1.70, feedprice of € 0.25 and a life bird price of € 1/kg this brings € 6700 extra profit, including already the extra costs for phytase superdosing.

Table 1. Absolute improvements of FCR and extra BWG found by meta-analysis of trials with broilers fed with 500 or 1000 OTU OptiPhos® as super-dosing, and slaughtered at 2.2 - 2.5 /kg feed.

	500 OTU	1 000 OTU
FCR improvement	0.03	0.05
Extra BWG (g)	55	98

### CONCLUSION

- OptiPhos® as superdosing starts already at 500 OTU and increases further with higher inclusion.
- Superdosing of OptiPhos® brings up to 0.05 FCR improvement and 100 grams of extra growth.

# TRIALS IN TURKEYS



## TECHNICAL PERFORMANCE

### SUPPLEMENTAL USE OF HOSTAZYM® X (ON TOP)

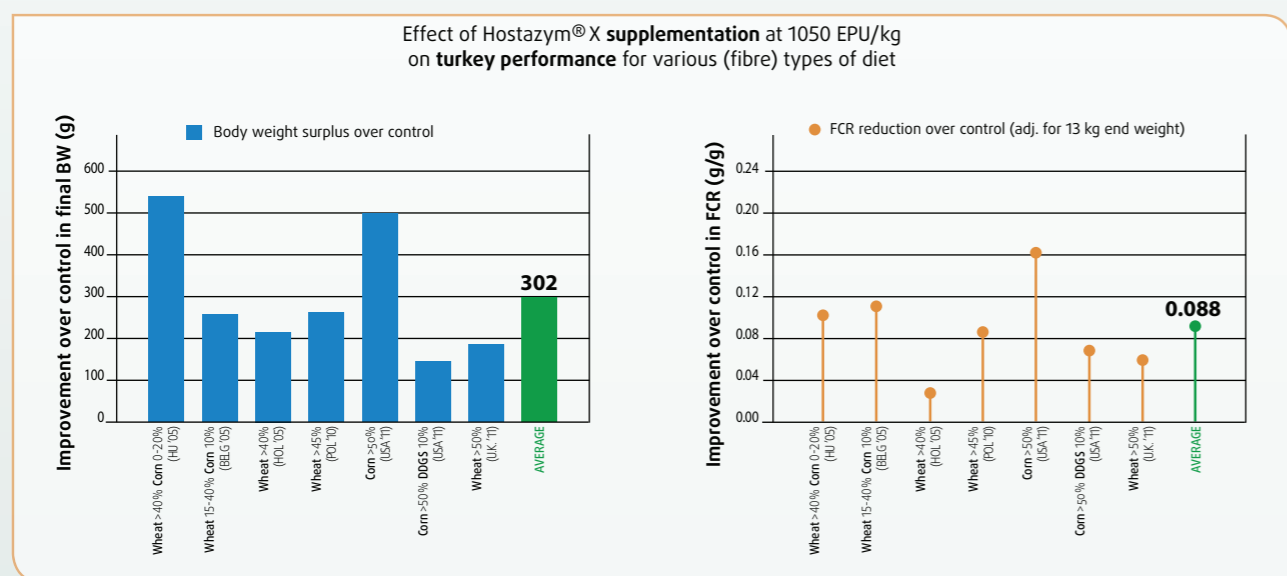
Multiple efficacy trials have been conducted during recent years to demonstrate the effect of Hostazym® X supplementation on **zootechnical results**.

**SET-UP:**

- Hostazym® X added on top
- Turkey hens slaughtered at 12-18 wks (8-12 kg end weight)
- Turkey toms slaughtered at 12-18 wks (10-20 kg end weight)
- Corn, wheat and corn/wheat diets (varying NSP fibre profiles)



**RESULTS:**

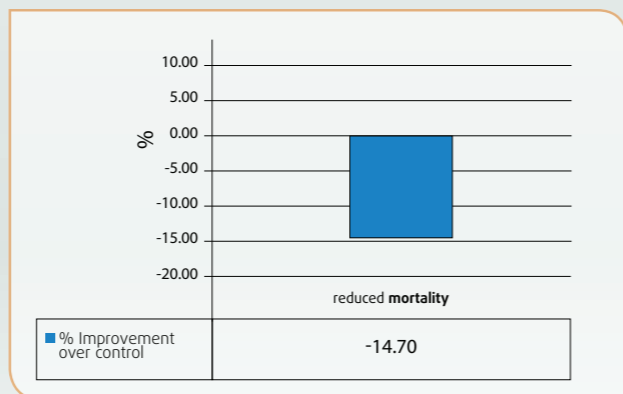
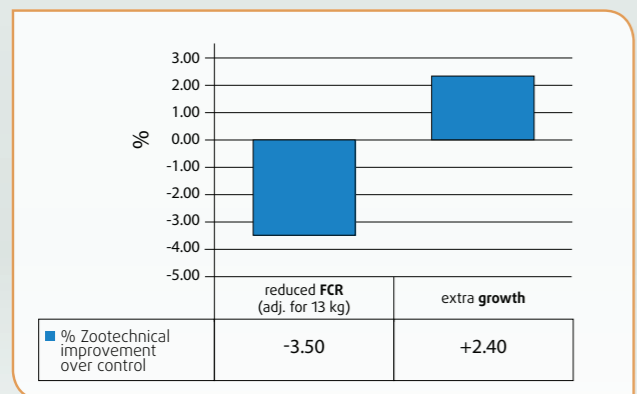


**CONCLUSIONS:**

Hostazym® X at recommended dosage boosts turkey performance and health on various cereal-based feeds.

Combining all the above trials gives the following multi-diet outcome in **zootechnical performance of turkeys** supplemented with Hostazym® X at 1050 EPU/kg of feed (meals and pellets).

Hostazym® X also improved health status and reduced the **mortality rate of turkey** hens and toms already at the cost-effective dosage of 1050 EPU/kg of feed.



Hostazym® X applied in turkey feed at already the low dosage of 1050 EPU/kg gives

- + 302 grams higher end Body Weight (+ 2.5%)
- - 0.088 lower Feed Conversion Rate (- 3.5%)
- a relative reduction in overall mortality up to 15%

# TRIALS IN LAYERS



## TECHNICAL PERFORMANCE

### SUPPLEMENTAL USE OF HOSTAZYM® X (ON TOP)

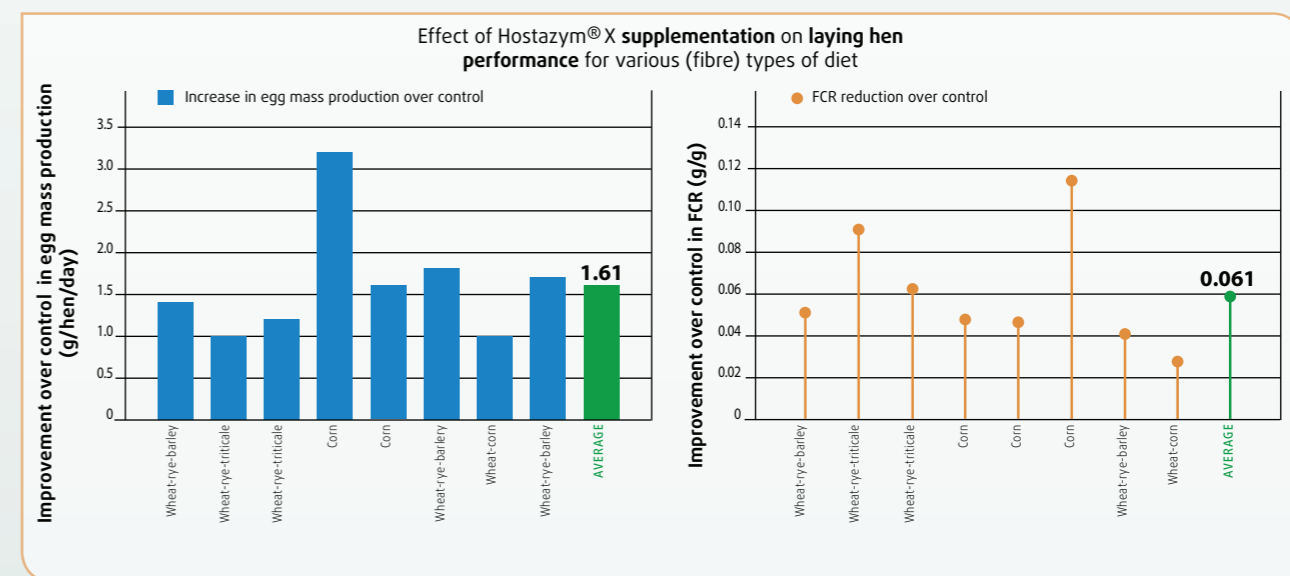
Many trials in laying hens have been performed to demonstrate the effect of Hostazym® X supplementation of improving **zootechnical results**.

**SET-UP:**

- First-cycle (from wk 20 of age) and second-cycle (from wk 45 of age) of laying hens. Trial duration 24 to 26 wks.
- Practical layer diets supplemented with Hostazym® X, in the range of 1050 to 1500 EPU/kg feed.
- Wheat, corn and wheat/corn diets (varying NSP fibre profiles).



**RESULTS:**

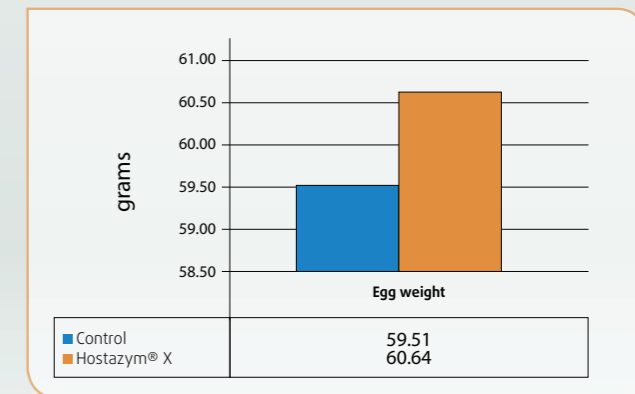
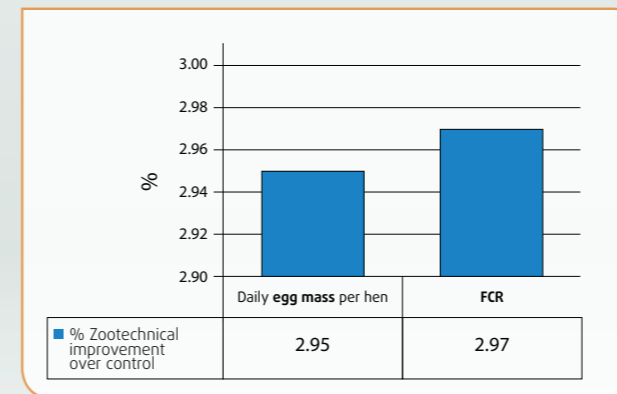


**CONCLUSIONS:**

Hostazym® X at recommended dosage boosts laying hen performance in a variety of cereal-based feeds.

Combining all the above trials shows a strong improvement of the **zootechnical performance of layers** supplemented with Hostazym® X in the range of 1050 to 1500 EPU/kg feed.

Hostazym® X addition to the diet of layers also shows a clear effect on **egg weight**. Compilation of the above trial results, revealed an increase of +1.13 g or 2% in mean egg weight.



Hostazym® X applied in layer feed in the range of 1050 to 1500 EPU/kg yields up to

- + 1.61 grams/hen/day of extra egg mass production (+ 3%)
- - 0.061 lower Feed Conversion Rate (- 3%)
- + 1.13 grams of higher egg weight (+ 2%)