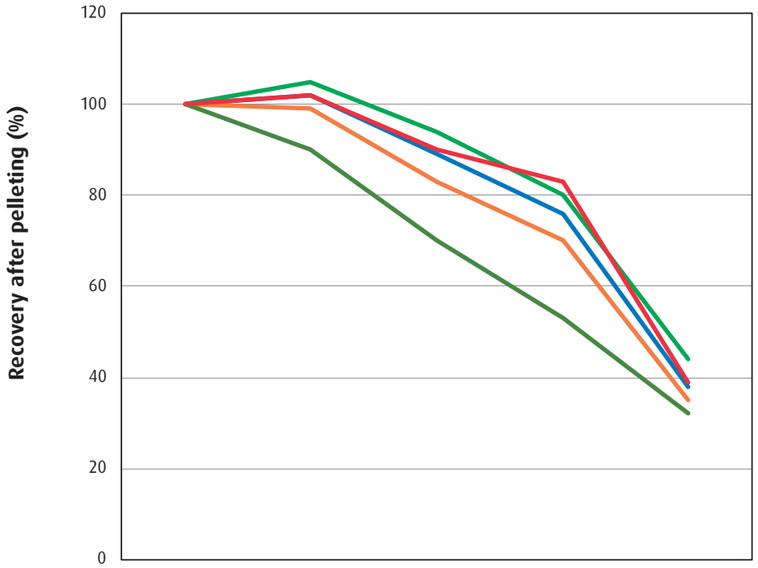
OptiPhos® CT showing strong pelleting stability versus competitors

In a recent pelleting trial at Ghent University (Belgium), OptiPhos® CT was compared with several commercial available phytases. The test was conducted under practical conditions, as a typical Dutch broiler feed was used, which was pelleted on a 2 mm by 20 mm die. A quite severe conditioning time was used (90 sec) while temperatures applied were 75, 85 and 95ºC, respectively.

Results of this trial show (Fig. 2):

- Both Hiphos®, and especially Quantum Blue®, underperformed regarding pelleting stability compared to OptiPhos®.
- The intrinsic stability of Quantum Blue® seems not to be strong enough to protect the product against normal pelleting temperatures.
- No phytase completely survived temperatures of 95°C, although some companies claim stability at this temperature.

At temperatures above 85°C, a post pelleting liquid application is the preferred application method to safeguard that enough phytase activity remains in the feed. Pelleting at high temperatures can be questioned, not only because enzymes can be destroyed by the temperature effect, but also other ingredients/ nutrients, in particular amino acids, can be destroyed or reduced in digestibility. Other feed additives, like (natural) vitamins, can be damaged as well, meaning loss of nutritional value of the feed.



	mash	75° C	80° C	85° C	95° C
OptiPhos®	100	102	89	76	38
Hiphos®	100	99	83	70	35
Axtra phy®	100	105	94	80	44
Quantum blue®	100	90	70	53	32
Phyzyme XP TPT®	100	102	90	83	39

Fig. 2: pelleting stabilities of several commercially available phytases (%)

KEY FACTS:

- *Optiphos® CT has shown to be heat stable up to 85°C.*
- *No phytase is heat stable above 85°C, some are not even heat stable at 80°C.*
- *Post pelleting liquid application is the preferred option when temperatures are exceeding 85ºC during feed processing to safeguard that enough phytase activity remains.*

Enzymes Newsletter Q2 / 2014

Let's Talk About Enzymes...

HOSTAZYM® X: WHY IS IT DIFFERENT FROM OTHER NSP ENZYMES?

PART 1 – PRODUCTION METHOD

There are two main production methods for enzymes:

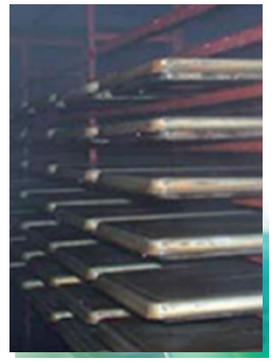
Submerged Fermentation process:
This process is used to produce most of the commercially available enzymes. The enzyme producing organisms are cultivated in a liquid nutritive medium in big fermentors. The nutritive medium composition, as well as pH, temperature and dissolved oxygen need to be strictly controlled to have a high quality enzyme produced. After a certain time the enzymes will be harvested via separation methods and further processed to be marketed as dry or liquid enzymes.

Surface Fermentation process:
The organism which produces the enzyme is grown on the surface of a solid feed material such as wheat bran or rice bran. Surface fermentation takes place in much more harsh conditions (e.g., temperature = 55ºC) which results in more robust enzymes than those produced via submerged fermentation. After fermentation the enzymes are harvested via extraction, precipitation and ultrafiltration processes and further processed to be marketed as dry or liquid enzymes.

Hostazym® X is produced via a surface fermentation process using wheat bran as substrate. Because wheat bran contains many NSP fractions, both soluble and insoluble, Hostazym® X is a natural mixture of enzyme activities and a perfect match to degrade the NSP's present in grains like corn, wheat and barley.

The main activity in Hostazym® X is endo 1,4 β-xylanase, on which it is standardised. However 1,3 (4) β-glucanase, cellulase and protease are also present.

Picture 1: submerged fermentation is a liquid process taking place in a fermentor



Picture 2: Hostazym® X is produced by a Surface Fermentation process

KEY FACTS:

- *Due to the production of Hostazym® X on wheat bran, it can break down complex types of fibre.*
- *Enzymes produced via surface fermentation are more robust than those produced via submerged fermentation.*
- *Due to its ideal complex of enzyme activities, Hostazym® X fits all type of diets: maize, wheat, barley or rye based.*

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Analysis of Hostazym® X in external (customer) labs

Many feedmills require an adequate check of the enzyme activity of Hostazym® X in their feeds, for instance to check if dosing was done appropriately and if processing in the factory (pelleting as the most important one) does not reduce the enzyme activity.

The analysis of enzymes is however quite complex as it can be influenced by many analytical factors, such as the extractability of the enzyme from the feed sample, the lab variability, the repeatability of the analysis method itself and even the presence of enzyme inhibiting factors in the feed.

Recently a comparison test between our lab in Bulgaria (Biovet) and a customer lab in Thailand was performed, in order to validate the analysis of Hostazym® X.

After an in depth discussion regarding the analytical protocol, the analytical method was implemented in the lab in Thailand. Blind samples, prepared by Biovet, were divided in two identical samples of which one was analysed in Thailand and the other at Biovet.

The results of this comparative test are shown in Table 2.

As can be seen from this table, the analytical results of both labs are quite similar (max. variation is 6.8% where normally up to 20% is still acceptable).

The repeatability of the analysis in the lab in Thailand was also evaluated and has shown to be within limits (max 7.3% variation) (Table 3).

KEY FACTS:

- ***Huvepharma® fully supports its customers to implement and validate analytical methods in their own labs.***

Conclusion When the analytical protocol is correctly discussed, transferred and validated, a correct analysis of Hostazym® X locally is feasible.

Table 2: comparison between analysis of Hostazym® X at Biovet and at a customers' lab.

Sample	Units	Thailand	Biovet	Difference (%)
1	EPU/g	20167	19900	-1.3
2	EPU/g	17837	18500	3.6
3	EPU/g	6966	7455	6.6
4	EPU/g	7724	8290	6.8
5	EPU/ml	18356	18100	-1.4

Table 3: in lab repeatability of the analysis (lab in Thailand)

Sample	Units	Assay 1	Assay 2	Average	Difference (%)
1	EPU/g	19657	20677	20167	5.1
2	EPU/g	17382	18293	17837	5.1
3	EPU/g	6998	6935	6966	0.9
4	EPU/g	8004	7443	7724	7.3
5	EPU/ml	15826	15552	18356	1.5

Enzymes Newsletter Q2 / 2014

HUVEPHARMA
We add performance to your business

Hostazym® X improves early lay performance on a corn soy DDGS layer diet

At Iowa State University (USA) a layer trial with Hostazym® X in a corn soy based diet was performed.

The trial was conducted with Hy-Line® w-36 hens during the first 24 weeks of their laying cycle (age 19-43 weeks) on a control feed (2775 Kcal ME/kg) or the control feed + Hostazym® X added at 1050 EPU per kg of feed. Feeds contained 40-50% corn, 17-25% of soybean meal, 10% DDGS, 5% of bakery meal and soya oil as source of supplemented fat.

Results showed that during this 24 week period the inclusion of Hostazym® X resulted in an increase in lay performance of 1.9% (90.1 vs 88.2%; 2 extra eggs per hen housed) combined with a higher egg weight (+ 0.9 g) (Table 1). This yielded a 2.1 g/d increase in egg mass production (56.0 vs. 53.9 g/d; $p < 0.05$). As feed intake was similar between groups, it could be calculated that the inclusion of Hostazym® X in the feed yielded a 0.07 lower feed conversion (Table 1).

Due to the inclusion of Hostazym® X, the average egg mass production during the trial (measured at the end of each 4 week subperiod) showed at some time intervals a significant increase (Fig. 3).

KEY FACTS:

- ***Hostazym® X added to a corn-soy diet with 10% DDGS increases laying percentage.***
- ***Hostazym® X can significantly improve egg mass, egg weight and FCR.***
- ***Hostazym® X to optimize the performance on feed containing DDGS opens new formulation perspectives.***

Conclusion Hostazym® X on a corn/soy/DDGS based layer diet has a positive effect on laying percentage, and improves egg mass, egg weight and FCR.

Table 1: effect of Hostazym® X at 1050 EPU/kg on technical performance in early lay (19-43 weeks of age).

	Lay (%)	Egg weight (g)	Egg mass (g/hen/d)	Feed conversion
Control	88.2	61.2	53.9[a]	1.82
Hostazym® X	90.1	62.1	56.0[b]	1.75

values in a column with different superscript are significantly different P<0.05

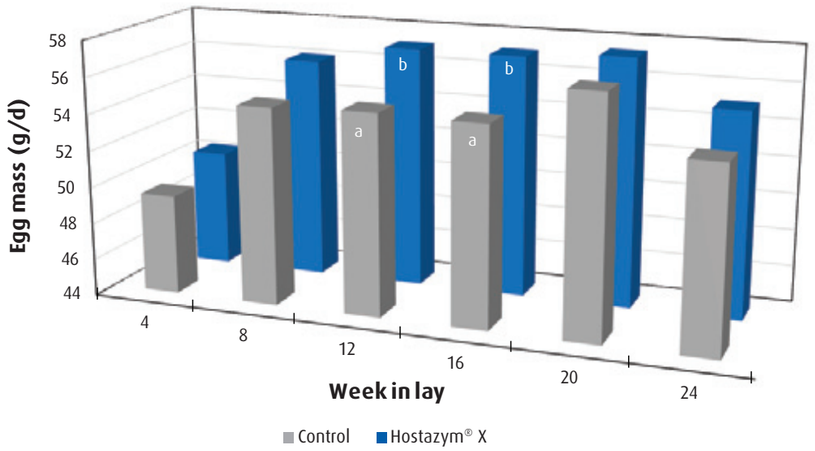

Fig. 3: egg mass production at the end of each 4 week subperiod (a,b different superscripts mean statistically significant P<0.05)