

On site production of liquid feed enzymes: a unique globally applied tool

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In today's animal feed production, heat treatments like extrusion and pelleting have found their way as a tool to improve animal performance by improved feed technology. However, there are also negative aspects to the use of high temperatures in feed processing such as destruction of heat sensitive additives (like enzymes).

This has led to the development of tools to apply heat sensitive compounds after the heat treatment process, called Post Pelleting Liquid Application (PPLA).

To feed the PPLA system with liquid enzymes, manufacturers need to produce the enzyme as a liquid, stabilise it by adding stabilising agents and conservatives, pack it in 1000 litre Intermediate Bulk Containers (IBCs) and transport it to the feed mill, where it is stored until the IBC is connected to the PPLA system for use. This complete process requires a stable and cool environment to guarantee the concentration of the enzymes in liquid form.

Working with liquid enzymes packed in IBCs has many downsides as enzymes in liquid form tend to be less stable than dry enzymes. An example of a stability study conducted with commercially available

phytases on the market is shown in Fig. 1. It can be seen that the activity of liquid phytase (in IBC) is decreasing with up to 50% when stored for 12 weeks at 40°C. Therefore, IBCs with liquid enzyme require a lot of temperature controlled storage space and cooled transport. Next to this, the manipulation of the IBCs also poses extra labour costs and often results in leakage or spillage.

WSP enzymes

The development by Huvepharma of instant water soluble enzyme powders (WSP enzymes) has opened the way to produce liquid enzymes freshly at the feed factory when needed.

With these WSP enzymes, liquid enzymes can be tailor made at the feed mill in any desired amount and concentration just prior to application with the PPLA.

For dissolving the WSP enzymes, special equipment has been developed, the Huvematic, which allows the enzymes to be dissolved even in cold and hard water.

The Huvematic weighs very accurately the desired quantity of WSP enzymes and the needed quantity of water, mixes them together so the liquid enzyme is produced at the right concentration. The Huvematic can run to produce two enzymes at the same time (for example a phytase and a NSP'ase) and has enough production capacity to serve multiple PPLA lines in the same feed mill.

The dry WSP enzymes are commercially available under the brand names OptiPhos, Hostazym P and Hostazym X and are packed in boxes containing two aluminium sealed bags of 10kg each.

One box containing 2 x 10kg of WSP enzymes, can replace 2-3 1000 litre IBCs filled with liquid enzymes.

This recent innovation by Huvepharma is new in most areas of the world, however it is already common practice for more than three years in the US where it was intensively tested.

Large broiler integrators in the US have embraced this technology to avoid inconveniences related to li-

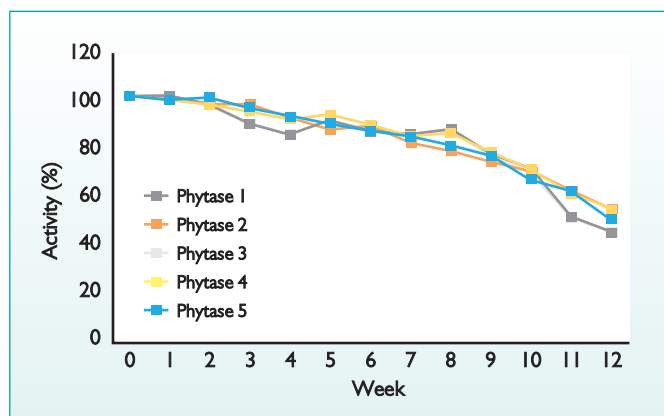


Fig. 1. Different commercial liquid phytases sold in IBCs show poor stability at 40°C indicating the need for cooling.

uid enzymes in IBC (as described above), and can be considered as the pioneers. The initial concept in the US was initiated for the use of a liquified phytase (OptiPhos) and led to the installation of this concept in multiple feed mills.

Due to this success, Huvepharma also extended this concept for the production and application of liquified NSP'ase (Hostazym X) using the same formulation technology developed in their R&D laboratories.

This success encouraged Huvepharma to launch the concept of the WSP enzymes globally. In the last year, local (country) registrations of the WSP enzymes have been taken care of. Collaboration with multiple construction companies to support Huvepharma with the installation and maintenance of the Huvematic has also been established.

Europe was the first continent to follow the US experience with multi-

ple operational units, while others are in the process of construction and implementation.

In hot and humid areas this concept has been welcomed with a high enthusiasm. The challenging conditions like high temperatures and high humidity allow a roll-out of the concept in South-Asia, Pacific region and South America, solving the current difficulties with the IBCs, regarding stability, activity and extra labour.

At the same time, partners were found to support Huvepharma with equipment and related technical support allowing the implementation of the Huvematic concept in the large poultry integrations of that area.

Conclusion

Instant water soluble enzyme powders (WSP enzymes) are a unique tool for the production of liquid enzymes on site, offering the nutritionist flexibility and security in formulation.

Avoiding the need for IBCs, reducing waste, spoilage and labour cost has been a bonus offered to the feed mill manager.

Despite some scepticism this concept has been implemented with satisfaction in the last year worldwide and provided a solid base of experience for future new cases. ■

OptiPhos is an instant water soluble enzyme powder.



One of the installed Huvematics.

