MILESTONE
HELPING CHEMISTS

ENHANCED PRODUCTIVITY AND QUALITY RESULTS IN **TOTAL FAT DETERMINATION**

CUSTOMER

De Heus Animal Nutrition is an international producer of a complete range of compound feed, premixes, concentrates and feed specialties, providing farmers with nutritional concepts to keep animals healthy and let them produce optimally.

CHALLENGE

The De Heus laboratory in the Netherlands needed to reduce analysis time and to produce more accurate and reliable results on several raw materials and feed matrices. The adopted Soxhlet method is a time-consuming and labor-intensive technique and it is not able to provide reproducible results on samples with bound fat.

SOLUTION

The lab purchased Milestone's ETHOS X microwave extraction systems to replace the Soxhlet technique. The ETHOS X performes total fat determination on several feed samples in a fraction of the time with reduced solvent usage and disposal.

BACKGROUND

De Heus Animal Nutrition has more than 90 production locations in more than 20 countries. Customers are small and large livestock farmers, integrations and traders. The feed products must always have the same high nutritional quality. This requires constant control of compound feeds, raw materials and concentrates of animal feed in local labs according to quality regulations and standards.
Rowan Bosch, laboratory manager in the Netherlands at De Heus Animal Nutrition, now relies on microwave sample preparation for his lab.

CHALLENGES

Fat determination in food and feed matrices is a routine analysis for the Dutch laboratory, which performed this procedure with the classical **Soxhlet** method. The process is based on an outdated, cumbersome, labor-intensive and matrix-dependent method that can process no more than 15 samples per day. This approach limits the lab's efficiency and productivity, thus impacting the overall production process too.
Moreover, the Soxhlet method undergoes a multi-step process, that includes long **hydrolysis and extraction procedures**, which imply elevated acid and solvent volumes.
Morever, De Heus had some **underestimation** difficulties in analyzing specific matrices, such as powder-like products in which bound fat is determined, due to the technique's limitations.

LAB PROFILE
EXTRACTION | FAT DETERMINATION

THE ETHOS X IMPLEMENTATION

De Heus has been using Milestone's ETHOS EASY microwave digestion system for approximately 5 years. "It is extremely easy to use and robust: in all these years, it routinely processes 45 samples a day without any single problem." says Rowan Bosch.

"When it comes to fat determination, colleagues who have been involved in animal nutrition for a long time – including myself at first – were skeptical about the adoption of microwave technology" states Bosch.

De Heus decided to send its most difficult samples as a test to Milestone's facilities. The first results that came back even exceeded their expectations, so they moved forward with the investment.

They started to use the ETHOS X mainly for total fat determination. "We use it every day now; 30 samples go through it routinely. The system is **maintenance-free** and it is **fast and accurate".**

This new method has allowed De Heus to replace all the previous methods of total fat determination and to **standardize the use of a single method** in all of their samples, both for raw materials and final products. Moreover, in the ETHOS X, **hydrolysis and extraction** are carried out in a single step and more rapidly, ensuring a higher productivity and a better workflow.

Bosch also underlines that, besides the fact that the results were very good, there are many other advantages:

*"The first reason we chose ETHOS X was the need for **faster results**. If I were to carry out 45 samples in the traditional way, it would take a full week, including preparation. Now I can quickly manage 30 samples every day.""*
– Rowan Bosch, Laboratory Manager, De Heus Animal Nutrition

"It still seems too good to be true."
– Rowan Bosch, Laboratory Manager

- 25% **chemical consumption and waste disposal**.
- Lower **energy costs**.
- **Reduced handling** and operational time.

Last but not least, samples prepared with the ETHOS X are also used to calibrate the Near-Infra Red (NIR) system.

The initial implementation has been very easy and smooth and its validation only takes 2 weeks' time.

This new approach finally resulted into a **better turnaround time** for the production process and has given more **reliable and accurate results**.

FURTHER APPLICATIONS AND PLANS

De Heus is further expanding the ETHOS X capabilities to Fatty Acid Methyl Ester (**FAME**) analysis performing the complete fatty acids profile within the same platform.

In addition to fat analysis, De Heus also performs **ash content determination**. Overnight, it incinerates around 30 to 40 samples at 550°C inside a conventional oven, taking approximately 8 hours. This process entails safety problems with sample fumes escaping into the laboratory, which require long ashing times and high-energy consumptions. With the implementation of the PYRO microwave furnace, the warming up process takes only 5 minutes and the cooling down phase is just a matter of minutes. These results are comparable with international standards and are extremely accurate. Thanks to PYRO, De Heus can deliver results within the same day.

ABOUT MILESTONE

With over 50 patents and more than 20,000 instruments installed in laboratories around the world, Milestone has been widely recognized as the global leader in metals prep technology for the past 35 years. Committed to providing safe, reliable and flexible platforms to enhance your lab's productivity, customers worldwide rely on Milestone for their metals digestion, organic extractions, mercury analysis and clean chemistry processing needs.

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