Checking feed value with NIRS

The better you understand what's in your silage or fresh grass, the smarter your feeding strategy can be. Analysis provides insight - and increasingly, that insight is delivered through NIRS. But not all NIRS methods are the same. For rapid checks and basic feed quality assessment, handheld devices are useful. For detailed nutritional profiling and high-stakes decision-making, laboratory-based NIRS remains the gold standard.

Near-Infrared Spectroscopy (NIRS) is an increasingly popular technique for analysing the nutritional content of silage and fresh grass. It helps farmers make informed decisions about feed strategies. NIRS analyses samples by shining near-infrared light on the sample and measuring the reflected light. Each material produces a unique spectral 'fingerprint', which gives information on the composition of forage.

Choosing the right method

Farm-based handheld devices offer speed and convenience, while lab setups provide greater detail and accuracy. Key factors influencing accuracy include sensor quality, spectral range, database robustness, and sample preparation. Handheld devices typically cover a small light range, suitable for general nutrient detection. High-end lab instruments can analyse a broader light range, giving deeper insights into feed composition.

Sample preparation challenges

Moisture and sample uniformity are critical to NIRS accuracy. Water strongly absorbs infrared light, making wet samples difficult to analyse without advanced equipment. Proper grinding and drying, common in lab settings, ensure consistent and reliable results. On-farm devices must cope with unprepared samples, which can reduce accuracy.

'Pick the method that works best for your specific goal'

Reference and accuracy

The reliability of NIRS hinges on the quality of its reference database and calibration models. Eurofins Agro maintains an extensive and regularly updated NIRS database based on thousands of lab-tested samples. Lab-based systems offer the highest precision. Well-calibrated handheld devices typically have an accuracy level 1.5 to 2 times lower than laboratory methods. Less sophisticated handheld units can be 2 to 3 timesless accurate, or even more.

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NIRS technology to unravel feed value

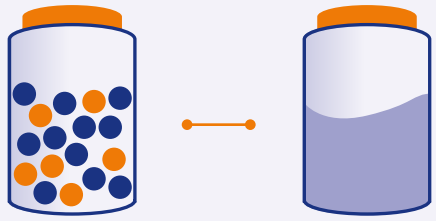
To get the best results with NIRS, it's all about taking a correct sample, preparing it carefully and choosing the NIRS method that fits your needs. Handheld scanners offer convenience and quick results, while lab-based setups provide more detailed and accurate analysis. Both have their advantages but knowing what you're aiming for will help you pick the right one.

CONSIDERATIONS BEFORE CHOOSING

HANDHELD | LABORATORY

1. Ensure the right analysis for your goal

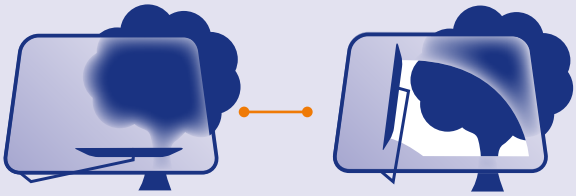
Whether you're using handheld or dry NIR, the way you prepare your sample affects the accuracy of your results. Imagine you're taking a handful of candy from a jar: If the jar is well mixed, your handful represents the whole jar. If the jar is not mixed, your handful might only reflect one type of candy. It's the same with NIR analysis: Handheld NIR often analyses fresh, unprocessed samples - quick and convenient, but more sensitive to variation. Dry NIR uses dried and ground samples - more consistent, but requires more preparation.



Not mixed and ground | Mixed and ground

2. Prepare the sample by drying

Moisture can cloud your results - literally. In dry NIR, samples are dried and ground before analysis. This removes moisture variability and gives highly consistent results. In fresh (handheld) NIR, the natural moisture in the sample is part of the measurement. The drier materials like hay often give more reliable results. Very wet silages can be more variable, making accurate readings more challenging.



No clear view | Clear view

3. Realise which information you need

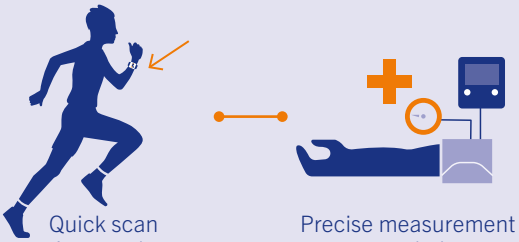
Sometimes, it's enough to know the main components of a sample - just like glancing at a full shopping cart. But other times, you need to know exactly what's inside.

This is similar to how NIR devices differ in spectral resolution. Handheld NIR devices give you a general overview - like seeing a full cart but not the details. In-lab NIR measurements offer more detail - like unpacking the cart and laying everything out clearly on the table.

Getting the gist of it | Knowing exactly what's inside

4. Choose the best approach

To monitor your fitness day to day you would use a fitness tracker on your wrist. However, to get a high quality annual checkup, you would visit the hospital and be seen by a professional. You can use a high quality handheld NIRS device to check your forage day to day, but you should send a sample to the lab to get deeper insight several times per year.



Quick scan is enough | Precise measurement needed

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