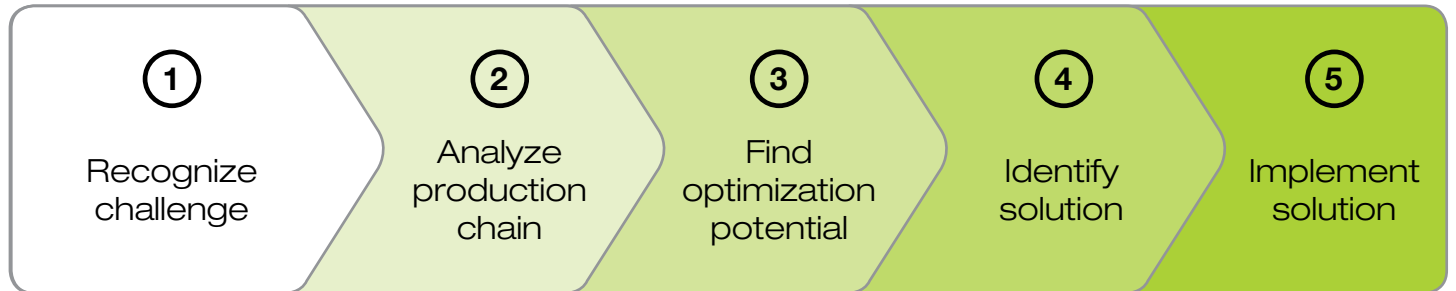


5 Step Guide

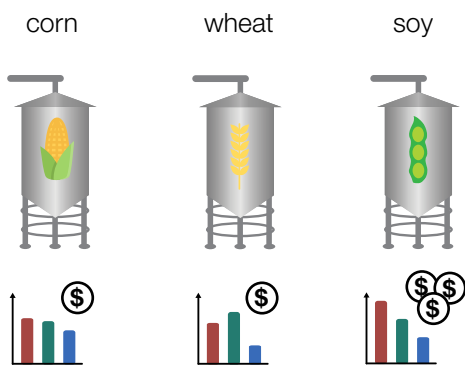
To Make More Money in Feed Production

Follow these 5 steps and easily maximize your profit in feed production:



1 The challenges in feed production

Goods separation



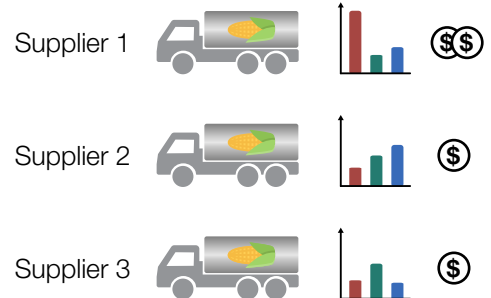
Storage of different raw materials according to their quality in terms of required nutrients and costs.

Relevant ingredients for feed production

- Protein
- Fat
- Moisture

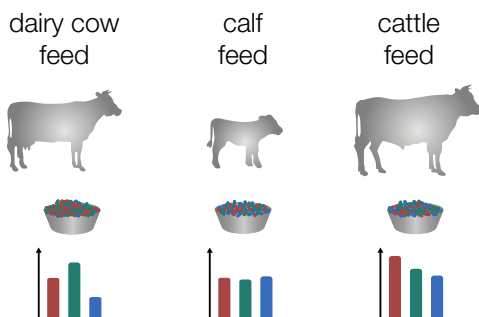
- Ash
- Crude fibre
- Gluten
- Starch
- others

Raw material inspection and payment of supplier



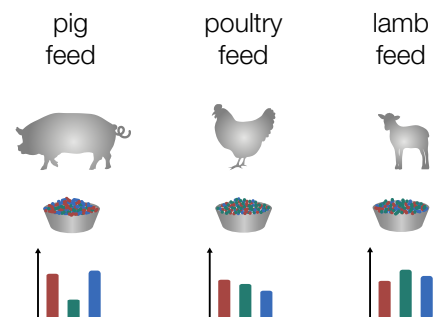
Raw materials are natural products that fluctuate in composition with time and by supplier. Therefore impacting their selling price and quality.

Typically large variety of products



Several 100 recipes with different quantities of

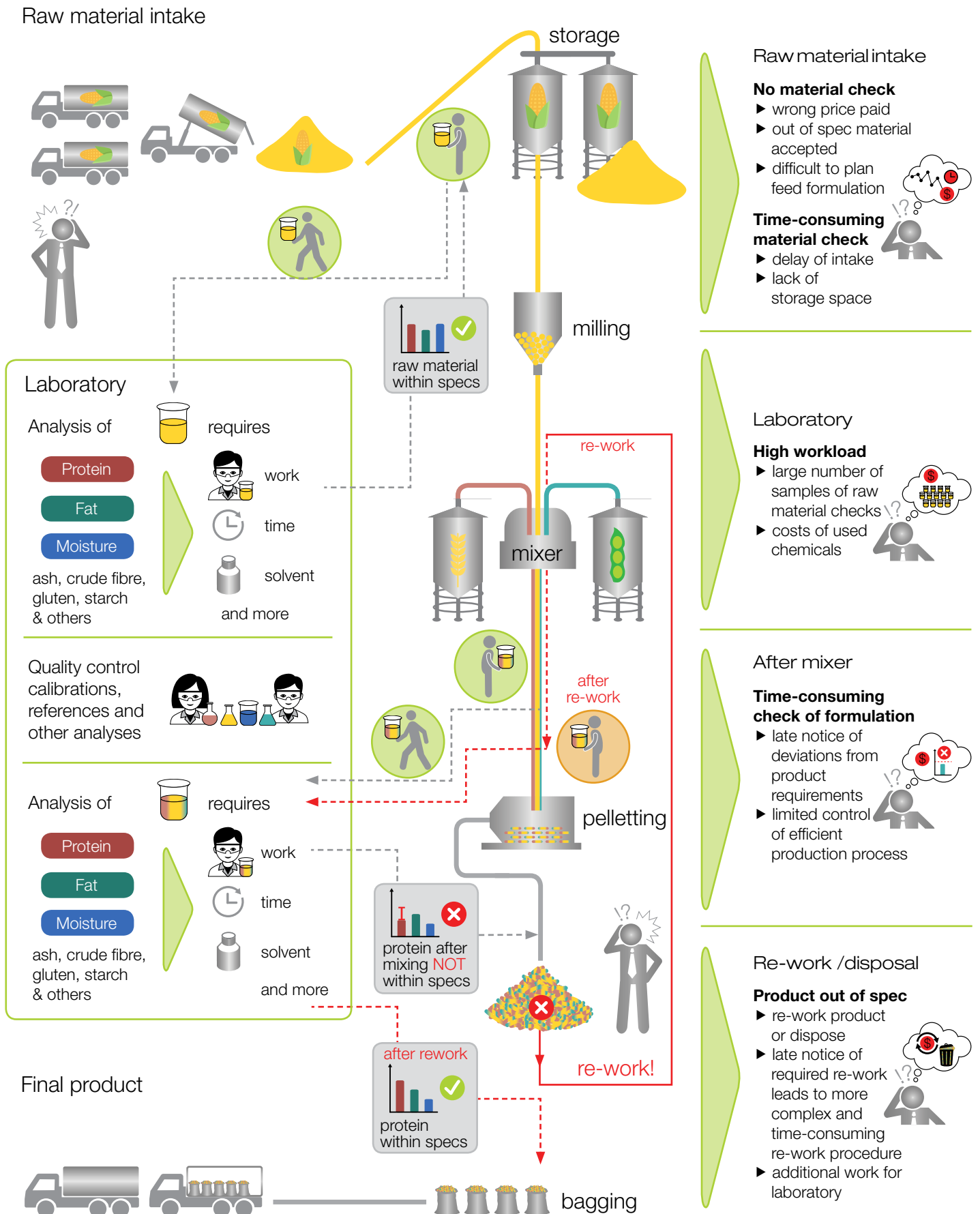
- Protein
- Fat
- Moisture
- others



Blending the raw materials results in a myriad of products throughout the feed industry. Several hundred or even more different customized compositions for various types of animals / pets are commonly found in just a single mill.

Maximizing profit in feed manufacturing is challenging: tight margins, time and cost pressure, variable quality of raw materials and highly regulated products are amongst the most important factors.

2 Analyse your production chain



3 Find optimization potential

Raw material inspection



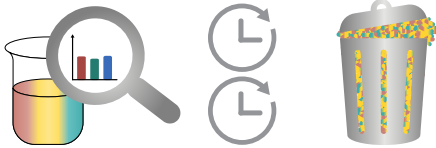
Composition and available amount of raw materials fluctuate over time. The price of natural products is variable and depends on product quality (and other factors).

Pay the right price according to raw material quality.



Know the nutrient profile of entire incoming batches during unloading at raw material intake. Pay the right price for your incoming materials.

After mixer check



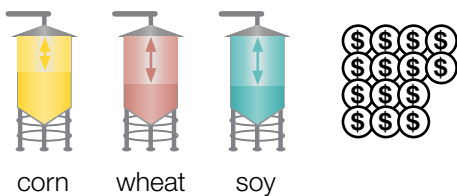
Conventional product analytics require time and lab resources. Formula deviations are often recognized (too) late.

Save time and resources for checks during production and react quickly.



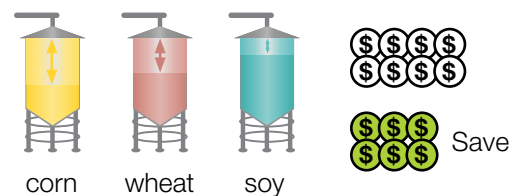
Real-time measurements of feed composition (e.g. protein content) in the production line allows operators to immediately correct process deviations and adjust formulations.

Raw material usage



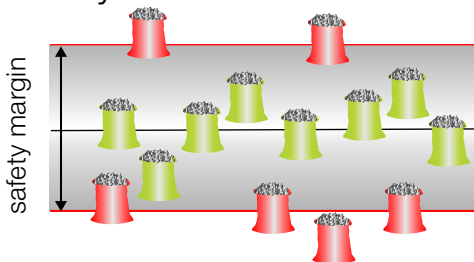
Costs of raw materials differ depending on the type and quality. Higher dosing of expensive goods (e.g. soy) leads to higher total costs.

Optimize feed composition and minimize use of expensive goods.



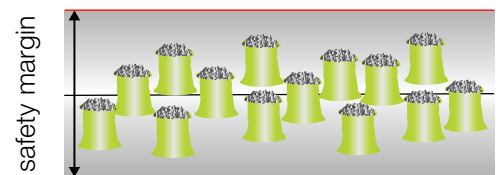
Use more cost-effective combination of raw materials by reducing expensive ingredients.

Quality issues



Late recognition of quality fluctuations lead to more out-of-spec products and subsequently more rework or disposal.

Notice quality issues early and achieve stable quality standard.



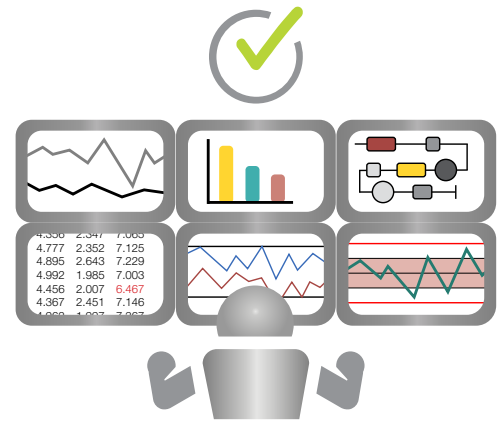
Early notice of deviations from product specifications allow for quick adjustments and significantly less out-of-spec products.

4 Identify solution for feed production challenge

Real-time process control

NIR-Online process analyzers yield direct and immediate information regarding a product or intermediate and display these as real-time trend charts to a control room. Fast intervention of process engineers may either optimize safety / tolerance margins for profit increase or simply reduce batches to waste or re-work. Moreover, entire incoming truck or shiploads or final products may be inspected. Errors resulting from sample taking for laboratory purposes are thus excluded. Therefore, proper storage and correct delivery are ensured.

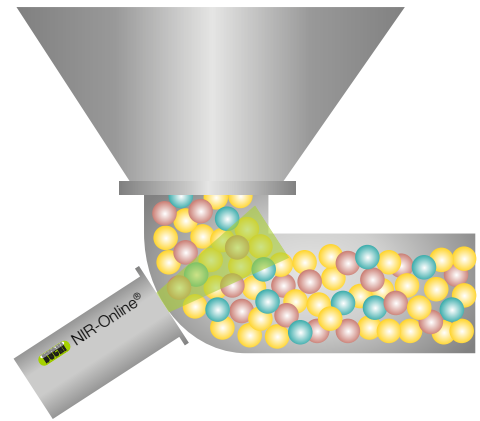
Full overview of your production process from the control room and in real-time for immediate corrective actions.



In-line measurement

Maximize your production efficiency and quality by correcting deviations immediately. Simultaneous monitoring of e.g. moisture, protein or fat directly inside a machine indicates when to start or stop a batch leading to maximum output. Additionally, optimum production parameters reduce mechanical wear and tear. The functional interaction of NIR-Online process analyzers and their dedicated software is designed to meet industry demands at all points of production.

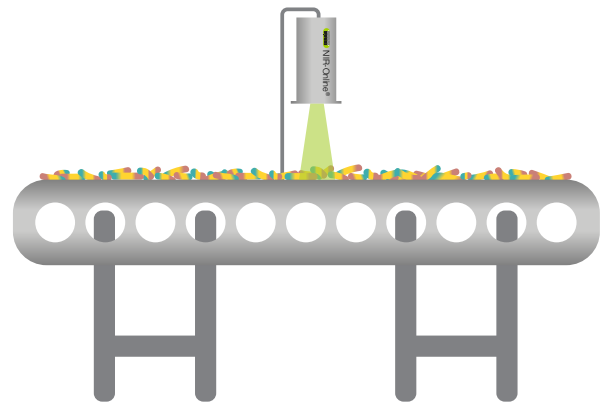
Analyze entire batches in the production line and avoid misleading results!



Near-Infrared (NIR) technology

NIR spectroscopy is an industry-proven, non-destructive analytical method. Almost any kind of sample can be directly scanned without any sample preparation on e.g. a conveyor belt or in a pipe within milliseconds. NIR process integration is straightforward and leads to the qualification of multiple chemical and physical properties simultaneously as well as sample quality.

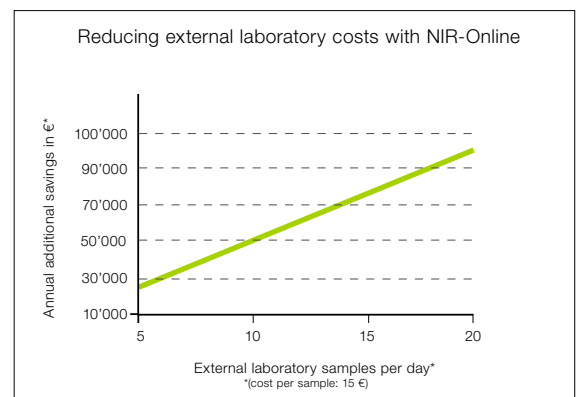
Apply convenient NIR-measurements and benefit from the broad range of parameters to analyze!



Fast payback of investment

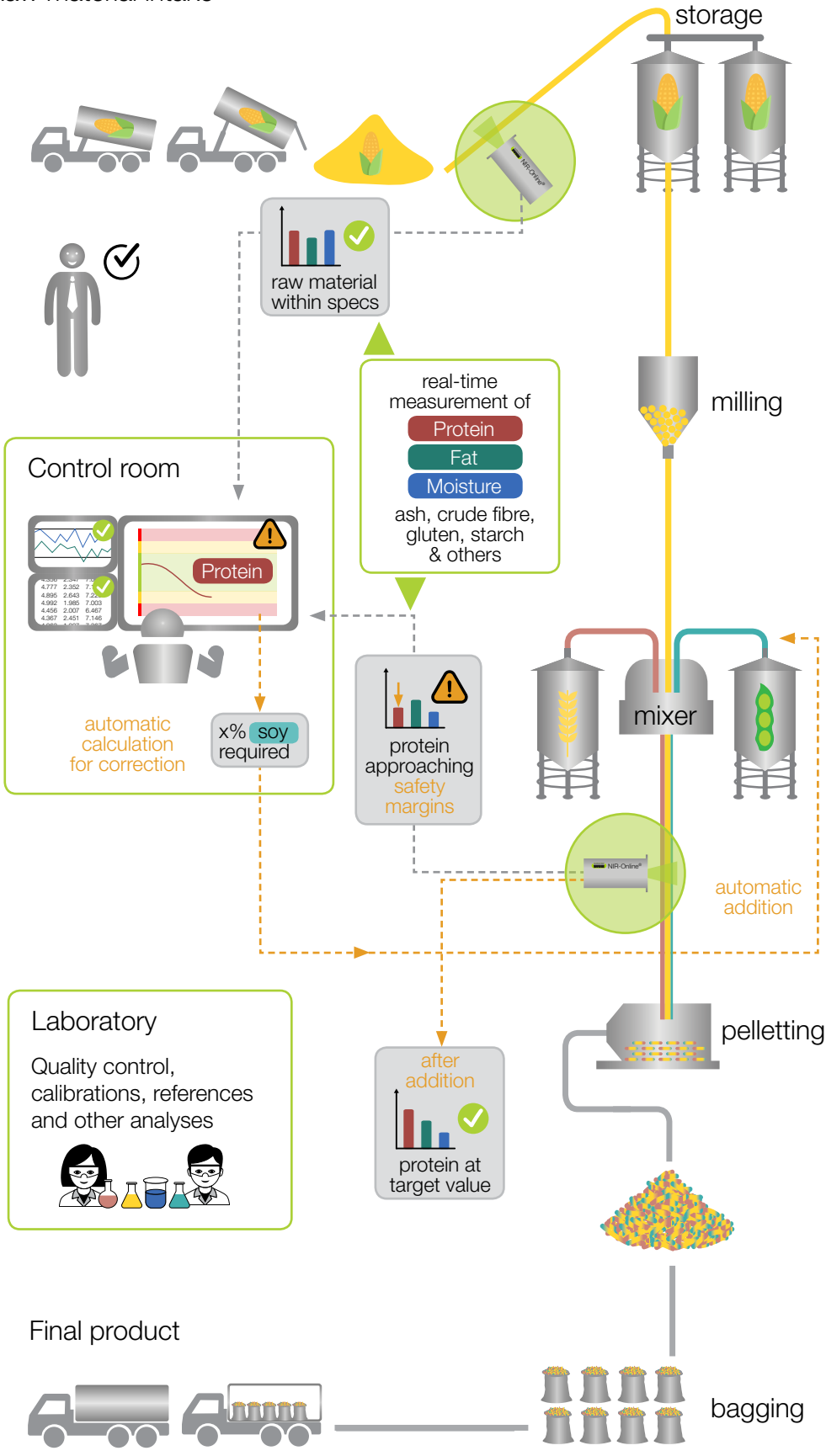
Laboratory methods usually do not analyze entire batches, but rely on sampling routines introducing an additional source of error. In case an in-house laboratory does not exist these samples have to be sent out to external partners in addition. Here, payback of an NIR-Online process analyzer directly correlates to the amount of samples and price per analysis charged by external laboratories.

Save up to €100'000 per year by reducing external laboratory costs!



5 Implement real-time process control with NIR-Online

Raw material intake



Raw material intake

Real-time check by NIR-Online

- ▶ pay correct price for incoming goods
- ▶ reject out of spec materials
- ▶ quick check saves time
- ▶ check entire batches during unloading
- ▶ easily plan feed formulation according to raw material composition

Control room

Process control with NIR-Online

- ▶ convenient overview of measured nutrient levels in the central control room
- ▶ immediate notice of deviations from specifications
- ▶ automatic correction measures to adjust product (e.g. add x% of soy)

After mixer

Real-time formulation check by NIR-Online

- ▶ product deviations recognized right away
- ▶ adjust product mix in real-time
- ▶ avoid time-consuming and expensive rework or disposal

Laboratory

Decreased workload with NIR-Online

- ▶ quality monitoring and responsibility partially shifts to operators
- ▶ save lab time
- ▶ reduce solvent use

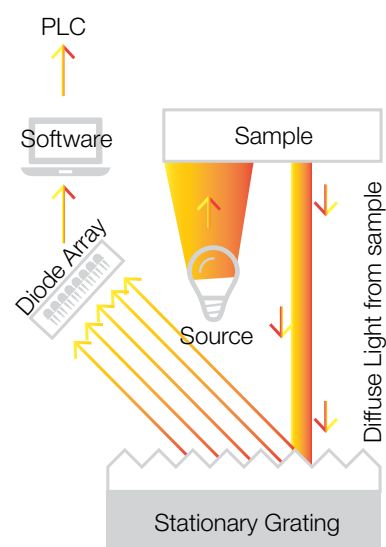
Make more money with inline measurement!

NIR-Online background and further information

Functional principle of NIR-Online process analyzer

NIR-Online process analyzers rely on the following principle of operation: Light is constantly emitted from a tungsten halogen lamp on a sample. The diffusely reflected light from the sample is directed to a dispersive element (stationary grating) and the resulting spatially distributed monochromatic light is detected by means of a diode array usually consisting of 256 diodes. Each diode collects the intensity of a certain wavelength range depending on its spatial position.

These individual diode signals are commonly referred to as pixels. Division of measured intensity (I) by intensity of a white reference spectrum (I_0), as well as conversion of pixels to a wavelength scale, results in a so-called spectrum, I/I_0 plotted against nm or cm^{-1} . Chemometric software predicts molecular properties of the sample from the measured spectra after according calibration.



NIR-Online white papers and short notes

[Process control raises productivity and profit margins:](#) NIR-Online for feed manufacturing, RKW Kehl, Germany

[State of the art technology to secure quality:](#) NIR-Online for mixed feed production processes, Austing feed plant, Germany

SN 261/2016: [Monitoring soy beans quality](#)

SN 263/2016: [Soybean meal quality control](#)

SN 280/2016: [Monitoring raw material quality in feed industry](#)

SN 281/2016: [Monitoring the mixing step in feed industry](#)

SN 282/2016: [Pellets quality control in feed industry](#)

More BUCHI-applications under:
www.buchi.com/application-finder

Other NIR-Online applications

[Maximizing profit and quality in the grain milling industry,](#) Schlossmühle Ober-Ramstadt, Germany

[Profit increase through maximum oil extraction,](#) BUNGE Oil Mill, Germany

[NIR-Online in the bakery industry,](#) Montebianco S.p.A., Italy

SN 253/2016: [Biodiesel process control](#)

SN 257/2016: [Crude oil composition](#)

SN 258/2016: [Degumming steps of crude oil](#)

SN 259/2016: [Refined bleached deodorized oil](#)

SN 260/2016: [Monitoring soapstock composition](#)

SN 262/2016: [Residual oil control in white flakes](#)

SN 283/2016: [Raw material in flour milling industry](#)

SN 284/2016: [Mixing in flour milling industry](#)

SN 285/2016: [Milling in flour milling industry](#)

NIR-Online solutions at BUCHI

[NIR-Online «Inspection» Solution](#)

Efficient inspection of all incoming and finished goods

[NIR-Online «InprocessControl» Solution](#)

Optimize your production output

[NIR-Online «Pipe» Solution](#)

Always full control - even for hot and pressurized materials

[NIR-Online «ExProof» Solution](#)

Certified safety for hazardous environments

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