



Quality Control in an Cookie & Cracker Plant

APPLICATION BRIEF

Cookies and crackers represent billions of dollars annually in the global food market, and are a significant part of food purchases around the world. This food segment includes saltines, graham crackers, cracker meals, chocolate chip cookies, oatmeal cookies, wafer cookies and sandwich cookies among others.

The cookie and cracker segments are highly competitive markets where brand loyalty and consistent product quality can result in increasing market share and concomitant production and distribution efficiencies. Several large multi-national companies dominate the various product segments, however many smaller companies are also present with allergen- or sugar-free products or high end cookies and crackers with novel ingredients. Consistent product quality is a key to commanding and maintaining market share.

PROCESS CONTROL ANALYSIS POINTS IN A COOKIE AND CRACKER PLANT

There are multiple points in a snack food or cereal plant where quality measurements can help control the process, saving money and improving consistency and quality including:

- Raw material testing to verify supplier integrity and ingredient quality
- Monitoring and controlling mixers to ensure dough consistency
- Monitoring and controlling moisture levels at the oven exit
- Monitoring and controlling oils, cheese or other ingredients sprayed on the product

NIR analysis is a proven technique that provides simultaneous results for moisture, protein, fat, fiber, ash, and other parameters in under a minute. Applications for cookie and cracker production include the analysis of both the raw ingredients as well as the finished product which enables optimization of the process from start to finish.

The speed of analysis allows 100% measurement of incoming ingredients and finished products. Raw ingredients suppliers can be verified to ensure they are providing quality materials, ensuring production and product consistency and reducing re-work and discard costs. Final products can be monitored to ensure product quality and optimize the manufacturing process.





WHAT IS NIR ANALYSIS?

NIR analysis is a proven technique that provides simultaneous results for moisture, protein, fat, fiber, ash, and other parameters in under a minute. The speed of analysis allows 100% measurement of incoming ingredients and final products. Raw ingredients suppliers can be verified to ensure they are providing quality materials, and to flag out of specification loads for claims.

SpectraStar™ XT Series NIR Analyzers, shown on the left, offer outstanding accuracy and reliability for rapid compositional analysis of solid, slurry, or liquid samples.

VALUE PROPOSITIONS FOR NIR IN COOKIE & CRACKER PLANTS

Moisture Control: The most common analysis point for cookies and crackers is at the oven exit. Controlling the moisture levels for the final products is critical for product quality. Elevated moisture affects the texture and mouth feel of the product, and can also have an adverse microbiological and product stability effect if not controlled. Over drying the product can also affect the palatability of the product and increases drying and ingredient costs. NIR analysis at the oven exit provides almost instant feedback to the plant operators allowing them to adjust the oven temperatures and optimize the moisture levels, usually within 0.5%. The result is more consistent product quality, lower energy and ingredient costs, and less out of specification product. In many plants, controlling moisture alone can result in a payback time of less than 6 months for a SpectraStar analyzer.

Raw Ingredient Monitoring: Incoming raw ingredients such as wheat flour and corn meal, as well as whole grains like wheat, oats and rice can be highly variable in composition and quality, and yet many manufacturers do little quality control of these ingredients. Critical ingredients can be analyzed for protein, moisture, ash and other parameters to ensure consistent quality from the raw materials. Quality monitoring of raw ingredients will produce more consistent products and reduces re-work and discard.

Final Product Monitoring: Various cookies and crackers are finished with a spray containing shortening and / or sugar. NIR monitoring can ensure that the proper amount of coating is applied to the products as they leave the oven.

Quality Control Laboratory Costs: At-line analysis of raw ingredients and finished products will significantly reduce the need for laboratory analysis while producing real-time analytical data in time to be of use to the plant operators. The savings in technician resources, chemicals, hazmat disposal and instrumentation can be several thousand dollars a month or more at a medium sized cracker facility.



ABOUT THE SPECTRASTAR™ XT SERIES NIR ANALYZER

From analyzing moisture, protein, fat, sugar, and fibers, to more complex parameters such as ash, fatty acids, and lignin, the SpectraStar™ XT NIR Analyzer Series is trusted by thousands of quality laboratories and production facilities to enhance their processes and make data-driven decisions.

- Obtain vital quality parameter data in about 30 seconds, enabling quick response for quality control.
- Access an extensive library of robust calibrations developed from hundreds-to-thousands of samples. Calibration customization is also available.
- Minimal sample preparation, only minimal training required, and environmentally friendly.
- Available with KPMLink™, a cloud-based software suite to support the real-time remote configuration of product settings, calibrations, and more.



Ready-to-Use SpectraStar XT-R Calibrations for Cookie & Cracker Makers

SUBSTANCE	CONSTITUENTS	SAMPLING ACCESSORIES	PART NUMBER
Crackers	Fat, Moisture	US-LGOP-0001 Large Open Cup with plunger	APPS-CALB-019
Chocolate	Fat, Moisture, Sugar, Lactose	US-ISIH-0307 Ring cup	US-CALB-121
Cocoa Powder	Fat, Moisture	US-LGOP-0001 Large Open Cup with plunger	US-CALB-123
Dark Chocolate	Moisture, Fat, FFA, Sucrose, Lactose, Milk Fat	US-ISIH-0307 Ring cup	APPS-CALB-033
Milk Chocolate	Moisture, Fat, FFA, Sucrose, Lactose, Milk Fat	US-ISIH-0307 Ring cup	APPS-CALB-034
White Chocolate	Moisture, Fat, FFA, Sucrose, Lactose, Milk Fat	US-ISIH-0307 Ring cup	APPS-CALB-035
Ground Wheat	Moisture, Protein, Fat, Fiber, Ash, Gluten, Vitreousity, Ca, P	US-LGOP-0001 Large Open Cup with plunger	APPS-CALB-151
Hard Wheat Flour	Moisture, Protein14M, Ash14M, Protein, Ash	US-LGOP-0001 Large Open Cup with plunger	APPS-CALB-013
Oat Flour	Moisture, Protein, Fat, Fiber, Ash	US-LGOP-0001 Large Open Cup with plunger	APPS-CALB-116
Soft Wheat Flour	Moisture, Protein14M, Ash14M, Protein, Ash	US-LGOP-0001 Large Open Cup with plunger	APPS-CALB-014
Raisins	Moisture, Glycerin, Oil	US-LGOP-0001 Large Open Cup with plunger	APPS-CALB-145
Corn Flour	Moisture, Protein, Oil, Ash, Fiber	US-LGOP-0001 Large Open Cup with plunger	US-CALB-179
Corn Meal	Moisture, Protein, Oil, Fiber, Ash	US-LGOP-0001 Large Open Cup with plunger	US-CALB-183
Molasses	Brix, Sucrose	US-SRCP-0025A Small Round Cup 25mm (and 0.2mm reflector)	APPS-CALB-081
Sugar	Moisture, Color	US-LGOP-0001 Large Open Cup with plunger	APPS-CALB-112
Seasoning	Seasoning	US-LGOP-0001 Large Open Cup with plunger	APPS-CALB-022

FOR MORE CALIBRATIONS, CONTACT US TODAY!

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