



Quality Control in a Snack Food Plant

APPLICATION BRIEF

Snack foods represent hundreds of billions of dollars annually in the global food market and are a significant part of food purchases around the world. This food segment includes potato chips, tortilla chips, and various other prepared snacks like nuts, dried fruits and granolas.

The snack food segments are highly competitive markets where brand loyalty and consistent product quality can result in increasing market share and concomitant production and distribution efficiencies. Consistent product quality and efficient production are keys to a successful product.

PROCESS CONTROL ANALYSIS POINTS IN A SNACK FOOD PLANT

Production of snack foods varies widely depending on the nature of the product, from a simple multi-stage dehydration for dried fruits to a lengthy cooking, grinding, pressing, baking, frying and coating process for tortilla and other chips. Many steps in these processes offer the opportunity to improve the process or ensure product quality if the proper analytical data are available. Some of the process points in a snack food plant where quality measurements can help control the process, saving money and improving consistency and quality include:

- Raw material testing to verify supplier integrity and ingredient quality
- Monitoring dough or masa for consistency
- Monitoring moisture and fat levels at fryer or 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 snack food production can 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?

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The speed of analysis allows 100% measurement of incoming ingredients and finished snack foods. Raw ingredients suppliers can be verified to ensure they are providing quality materials, and to flag out of specification loads for claims. Finished products can be validated to ensure sufficient seasoning and oil content. The use of NIR ensures consistent quality in manufacturing and can reduce re-work costs.

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

VALUE PROPOSITIONS FOR NIR IN SNACK FOOD PLANTS

Moisture Control: The most common analysis point for snack foods 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. In the case of dried fruits, the payback time can be a couple of months.

Raw Ingredient Monitoring: Incoming raw ingredients such as flour and corn, as well as whole grains like wheat, corn 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: Many snack foods have oil, cheese or other coatings applied to the product after the oven. In many cases, NIR can be used to ensure the consistent application of these coatings.



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 Snack Food			
SUBSTANCE	CONSTITUENTS	SAMPLING ACCESSORIES	PART NUMBER
Crackers	Fat, Moisture	US-LGOP-0001 Large Open Cup with plunger	APPS-CALB-019
Frozen Finished French Fries	Moisture, Solids, Oil	US-LGOP-0001 Large Open Cup with plunger	US-CALB-241
Pita Chips	Moisture, Oil	US-LGOP-0001 Large Open Cup with plunger	US-CALB-243
Potato Chips	Moisture, Oil	US-LGOP-0001 Large Open Cup with plunger	US-CALB-242
Potato Chips Expanded	Moisture, Oil, Seasoning, FFA	US-LGOP-0001 Large Open Cup with plunger	APPS-CALB-161
Potatoes - Raw/Dried	Moisture, Solids	US-LGOP-0001 Large Open Cup with plunger	US-CALB-240
Seasoning	Seasoning	US-LGOP-0001 Large Open Cup with plunger	APPS-CALB-022
Tortilla Chips	Moisture, Oil	US-LGOP-0001 Large Open Cup with plunger	US-CALB-244

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