



## LEAST COST FORMULATIONS, LTD.

824 Timberlake Drive, Virginia Beach, VA 23464

Phone: (757) 467-0954 FAX: (757) 467-2947

# QC Assistant™

The QC Assistant is a remarkable tool designed to analyze raw materials at a fraction of the cost - and with the same or better accuracy - than conventional AOAC methods. In addition, the QC Assistant is invaluable in every aspect of meat processing and blending. This easy-to-use software program runs on a convenient Sharp PC-1360 pocket computer or a standard IBM PC. Using the QC Assistant you can:

- Perform raw material and preblend analyses quickly, accurately, and inexpensively
- Validate lab data

- Cost non-commodity or in-house trims in seconds
- Determine sample sizes for coring or grab samples
- Know how to blend or correct using up to six meats to a specific fat content
- Know how to pump hams or roast beefs to a specific PFF value
- Back-analyze products to infer estimates of excessive shrink, meat or lab variation

## ***Save Money Every Time You Analyze Materials***

To use the QC Assistant, you type in the moisture content of a skeletal trim or pre-blend on the hand-held computer. At the press of a button, the QC Assistant determines the moisture, fat, protein, and ash contents as well as the bind, color, and collagen constants. Analyses made

by the QC Assistant are of comparable accuracy to those of certified laboratories. Best of all, you only need an inexpensive moisture measurement to get fast and precise results; you can save up to \$10 every time you analyze materials.

## ***A Simple, Effective Solution You Can Use Immediately***

The QC Assistant is designed for use by anyone who deals with raw material characteristics or costs; no computer experience is needed to make use of its amazing features. A step-by-step System Description Manual, complete

with detailed examples, is included with the QC Assistant. Over 100 QC Assistants are in use in the meat industry throughout the world.

# Solving the problem of testing for fat

By Robert A. LaBudde  
and Martha Bednarz

**P**lagued by variability of raw materials on the one side and institutional customers with tight specs on the other, ground beef and fresh sausage manufacturers have, until now, been obliged to use expensive QC analytical techniques. Here is a unique solution that equals the accuracy of other analytical methods—at approximately one-tenth of the cost.

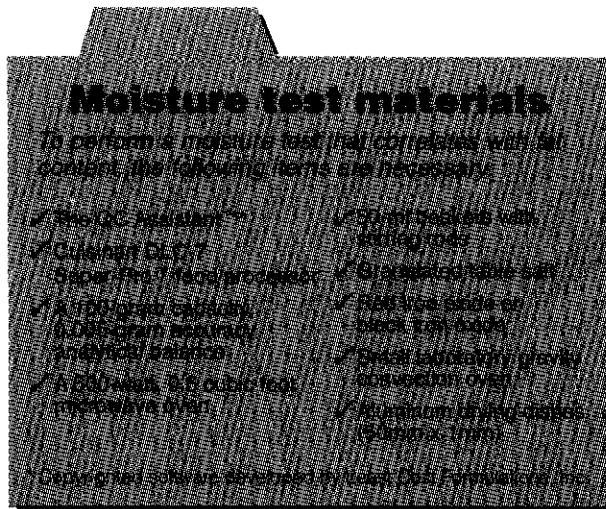
First, let's look at a typical scenario. A ground beef processor purchases individual lots of 50-50 and 90-10 raw materials. These tend to vary greatly in composition since they're delivered from many different suppliers. During batch processing, the plant grinds and mixes the materials to obtain a specified target fat content. The blend is sampled, analyzed, and adjusted. Even the largest processors usually use one of several rapid analysis techniques during processing. Results must be obtained fast so the mixture can be quickly corrected for fat content.

One key consideration, no matter what fat analysis system is used: The standard deviation for fat (a mathematical measurement of how widely fat percentage varies from batch to batch) in finished product should be less than 1%. Why? A standard deviation of 1% for 20% fat ground beef results in a range of fat analyses of 18 to 22%; a standard deviation of 0.5% reduces the variation to 19 to 21%, and reduces "giveaway" by 1 to 2 cents/lb.

## Under/over difficulties

The traditional way of monitoring product specs is fraught with difficulty. With incoming materials, core sampling a fixed number of combos per lot can cause errors. Some materials are over-sampled; others under-sampled. With preblend sampling, meat is usually fine ground and presents no significant sampling problems (except for mixing issues). But for fresh pork sausage or coarse-ground blends, sampling imprecision is a major source of error—even more so than lab analysis.

Our system, The QC Assistant, uses moisture analysis as the basis for in-plant QC. Moisture can be measured faster, more accurately, and at a lower



cost than fat. The moisture-to-fat relationship in uncooked beef and pork is reliable enough to accurately predict fat content from moisture. Here are the recommended procedures:

When the base blend is made and mixed, a "grab" sample of 10 to 20 handfuls is taken as uniformly as possible from the mixture. If the meat has not been ground fine already, run through a 1/8-inch plate to reduce and mix. If already ground fine, hand mix the sample to make uniform. Comminute 2 to 3 lbs. of the fine ground meat by pulse-chopping in a Cuisinart Food Processor for up to 2 minutes (The Cuisinart has several advantages over conventional comminution equipment. The most important of these is that it is fast, inexpensive, sturdy and produces a more finely comminuted sample). Tare a 50-ml beaker with stirring rod and 4 teaspoons of salt/iron oxide. Add 5 to 10 grams of meat to the beaker and weigh.

Next, heat for about 3 minutes in the microwave to dry. Cool for 4 minutes. Weigh dry. Use The QC Assistant to calculate moisture content and fat content. If fat differs from the expected target by more than 2%, perform another microwave moisture test. If the moisture duplicates differ by more than 0.5%, recomminute the sample, discard the two moisture values. Then repeat the moisture tests in duplicate until agreement is obtained to a level of at least 0.5% or better.

Once a week, send a comminuted sample for which you have performed steps 1 to 4 to an outside lab for moisture and fat analysis. The lab's moisture level should agree within 0.5% with your average of microwave and drying oven values, and the fat percentage should agree to within 1% with

The QC Assistant's value. Differences larger than these mean the lab may be in error!

With the above procedures, moisture is measured with a standard deviation of 0.3% and fat about 0.5%. That's as good as the best AOAC-approved methods. Worst-

case precision is 0.5% for moisture and 0.7% for fat, and the 10 to 20% rate of crude errors experienced with other systems is eliminated. For samples too large for the Cuisinart or for comminuting meat coarser than 1/4 inch, the Stephan VCM 12 vertical bowl chopper is recommended.

Use of The QC Assistant to determine fat content from the microwave moisture is superior to direct measurement because microwave moisture is rarely in error by more than 0.5%.

Traditional fat analysis techniques generate crude errors >1% in 1 of 10 samples. The QC Assistant/Microwave Moisture combination is an ideal backup system in case of unexpected breakdown of critical rapid analysis equipment. The program can also be used to perform blend correction calculations. □

*Author LaBudde is founder and president of Least Cost Formulations, Ltd., Virginia Beach, VA. Martha Bednarz is founder and president of ONYX Communications, Inc., Beverly, MA. Information about lab QC procedures, microwave testing, and The QC Assistant software is available from Least Cost Formulations, Ltd., 824 Timberlake Drive, Virginia Beach, VA. 23464 (804)467-0954.*

*The principles outlined in this article are taken from "Process Control the Easy Way," a seminar given by Least Cost Formulations in February, June, and October. Topics covered include analysis methodology, process control, and costing.*

## A pocket computer for QC

**A** PROGRAM has been developed for a pocket computer that can now accomplish tasks associated with formulation. Using a pocket computer provides a fast, simple, on-the-floor method for predicting raw materials analysis, to cross-check lab data, adjust formulations for fat content and make decisions involving materials costs.

The program, called the QC Assistant, was developed by Least Cost Formulations, Virginia Beach, Va., which loaded the program into a Sharp PC-1261 pocket computer from Radio Shack.

The QC Assistant is designed to predict an analysis of meat or a preblend on the basis of a moisture and/or fat measurement, to cost trim from commodity prices, to determine pickle pump and PFF value, to calculate mixture of lean and fat meats to attain a given fat analysis, and to determine how large a sample is needed to obtain a specified standard deviation of analysis.

The software has been documented

in a manual that specifies, step-by-step, procedures to follow to use the pocket computer for each of its tasks. This means that the computer can be used by those who are not trained in more complex computer operations.

The pocket computer operates on two CR 2032 lithium batteries, which will last about 300 hours. An optional printer/cassette interface is recommended to allow the user to run the computer independent of batteries, because when the batteries die, the program is lost. At that point the pocket computer must be returned to Least Cost Formulations in order to have the program reloaded.

Those who can benefit from use of the QC Assistant, according to Least Cost Formulations, are persons who must deal with raw materials characteristics or costs.

Purchasing personnel can estimate value of non-commodity or in-house trimmings, and cost-accounting personnel can provide a reasonable basis for

transfer prices of in-house generated trimmings.

Quality control personnel can quickly characterize raw materials, replace a fat analysis with a quick and accurate moisture test, cross-check lab data and screen crude errors. Sample sizes can be quickly determined for accuracy in characterizing raw materials.

Those in production can use the QC Assistant to quickly determine the proper amounts of lean and fat meats to mix to obtain a desired fat value or how much correction meat to add to a blend to bring the fat back within tolerance.

Management can use the QC Assistant to provide a quick test of cost-accounting values for in-house trimmings, make break-even decisions on cutting or trimming operations vs. sausage formulation and check controversial lab data for validity. □

*For more information on Least Cost Formulation's QC Assistant, write in 380 on the reader service card in this issue.*

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