The JuiceScreener combined with its SGF Profiling technique can deliver unparalleled amounts of information derived from one single experiment, instead of multiple individual analysis steps. This provides higher throughput and reliability than conventional techniques leading to a significant reduction of cost per sample. This enables up to 5 times more sample investigations with no change in budget, resulting in an improved and more comprehensive quality control screening.

Features
- Automated push-button evaluation and reporting solution based on a 400 MHz NMR solution.
- Reliable screening method provides targeted and non-targeted multi-marker analysis.
- Targeted Analysis: Simultaneous absolute quantification of relevant organic compounds with reference to A.I.J.N. and NMR distribution.
- Non-Targeted Analysis: NMR profile is compared with the corresponding group of reference spectra. Deviating concentration levels and even unknown signals are detected automatically.
- Statistical analysis and concentration distribution curves of all compounds quantified are based on an extensive NMR spectroscopic database of more than 16,000 reference juices, obtained from production sites all over the world and is regularly updated.
Push-Button Routine

SGF Profiling is a fully automated push-button routine that needs no interaction by the operator. From sample bar code registration, preparation and handling, to data acquisition and statistical evaluation, all steps are under the control of SampleTrack™, Bruker’s laboratory information system.

Targeted and Non-Targeted Multi Marker Analysis

SGF Profiling delivers a standard targeted multi-marker analysis incorporating absolute quantification of:

- Sugars (glucose, fructose, sucrose)
- Main fruit acids (citric acid, malic acid, isocitric acid, quinic acid)
- Perishable indicators (ethanol, fumaric acid, lactate, HMF)
- Process control parameters (galacturonic acid, phlorin)

In addition the technique allows a non-targeted multi marker approach that is based on the simultaneous assessment of concentration deviations of hundreds of compounds. In contrast to targeted standard analytical routines, it can detect the appearance of unexpected ingredients to enable the detection of unknown fraud.

Spectroscopic Database

The screening is based on an extensive spectroscopic database that includes thousands of NMR spectra from mainly authentic juices. Currently the database includes about 40 different fruit types from more than 50 production sites worldwide. In addition, the database also provides access to over hundreds of small molecule compounds for further analysis of unknown ingredients.

Sample Verification

Whole NMR-Profile of a specific sample (black line) is compared with corresponding group of reference spectra (database; colored)

SGF Profiling

Quantification

SGF Profiling delivers the absolute concentrations of more than 30 ingredients that are critical for juice assessment. The values are compared to reference standards and NMR distribution. Deviations indicate characteristic quality issues, such as the addition of sugar.

Sample Classification

Sample classification helps to further differentiate between similar fruit types such as orange, blood-orange and mandarin. More specialized models can even distinguish between direct juice and rediluted juice, and enable to origin determination.

Verification

After sample classification the uni- and multi-variate verification delivers even more information, such as unexpected deviation from the reference group and detects mixtures if existing.

Regression Analyses

The regression analysis, based on training data sets, evaluates additional parameters such as titratable acids, potassium and magnesium.

Estimation of Fruit Content

Included in the final report is also an estimation of the fruit content.

Routine quality control using the JuiceScreener

SGF Profiling archives all results in the form of a standardized sample quality report