

The Necessity of Feedstock Testing in an Era of Increasing Biofuel Production

As U.S. biofuel producers process record amounts of inputs, feedstock authentication is critical to vet suppliers, protect equipment and preserve reputation.

LANCASTER, PA, UNITED STATES, September 16, 2026 /EINPresswire.com/ -- As U.S. biofuel production ramps up to meet aggressive federal Renewable Fuel Standard volumes for this year and next, biobased diesel manufacturers that have been running far below capacity over the past several years are now pushing high volumes of feedstock through their processes. Some producers have had to secure new contracts with unproven suppliers. For those who use feedstock aggregators, they too could be procuring feedstock whose quality, composition or origin are not fully known.



Richard Heiden, founder, R.W. Heiden Associates LLC

Biobased feedstock used for biofuel production—and not just the waste-derived variety—can contain foreign substances that hinder or fail to participate in conversion reactions, reduce yields, foul equipment or compromise eligibility to generate valuable RIN or tax credits. However tainted these materials may be, they can still pass common screening tests that suggest “suitability for purpose,” providing false legitimacy to those who supplied them. The bottom line is, if biodiesel and renewable diesel producers are not completely sure what is in their feedstock, then a whole litany of problems could arise as a result.

Richard Heiden, who holds a doctorate in analytical chemistry from Rensselaer Polytechnic Institute, is the founder, president and chief science and technology officer of [R.W. Heiden Associates LLC](#). He is one of the world’s leading experts in biobased feedstock analysis, dedicating the better part of his long career—more than 20 years—to identifying and understanding contaminants in feedstock that adversely affect biofuel production and performance. Heiden’s research and findings on biodiesel and feedstock have been presented at



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numerous technical meetings including ASTM and AOCS since 2007 and published in a variety of scientific journals over the years.

"When it comes to waste oil, you really don't know what you're getting," Heiden says. "The whole spectrum of what might be in waste oil is pretty big."

Some biofuel producers may not think it is necessary to spend additional money on advanced feedstock testing. "It's an extra annoyance in the lab," Heiden says. "There are canned tests out there, but they really don't address many fundamental compositional issues. At R.W. Heiden Associates, we provide specialized feedstock testing for our clients to thoroughly identify entities in feedstock that don't belong there."

The specialized process R.W. Heiden Associates has developed is a form of gas chromatography that allows highly reliable impurity scans of low volatility feedstock samples at a reasonable cost. This screening process has a long, successful history tracking yield-reducing feedstock impurities at biodiesel plants for nearly 10 years.

"The results are patterns that are predictable for good feedstocks," Heiden says. "Then, if the client wants to pursue an objectional instance further, we address particular components that are questionable through mass spec or other hyphenated analytical tools."

Ultimately, the idea behind this unique deep-dive screening is to find feedstock vendors who are reliable. The advanced tests developed by R.W. Heiden Associates, which are based upon modified approaches to common test methods, provide a clear record of feedstock authenticity at an affordable cost.

"This tells us whether the components present are the types of feedstocks that interest them and are compatible with their process, and whether there are other undesirable foreign impurities in the material," Heiden says. "We don't screen for all levels of impurities, but we do go down to 0.1%. We fingerprint the material so the client can determine whether the feedstock is potentially suited for their process." A sampling program is designed that addresses the biofuel producer's concerns.

All bio production processes are at least somewhat different, so what constitutes a suitable feedstock can be a complicated question. Most biobased diesel producers require triglycerides, diglycerides and monoglycerides, while some technologies such as enzymatic biodiesel production can also process free fatty acids.

"The enzymatic process is susceptible to a whole range of things compared to standard transesterification," Heiden says. "Enzymes can be fairly susceptible to impurities, which will

adversely affect the rate of reaction. And for renewable diesel and sustainable aviation fuel (SAF) producers, catalyst poisons in the feedstock are a real concern for hydrotreatment catalysts. You have to expect almost anything to be in some waste feedstocks.”

While waste materials like used cooking oil (UCO) or animal fats are typically the focus of feedstock composition or component investigations, even virgin crop oils considered “clean,” such as refined, bleached and deodorized (RBD) soybean oil, can warrant a closer look—particularly when new or untested suppliers are factored into the equation. Also among factors are those that can influence the sensitivities of fatty acid methyl esters (FAME) to low temperatures.

“The basic transesterification reaction is well established,” Heiden says. “But different feedstocks, or even the same type of feedstock like soybean oil from different suppliers or processors, can influence things like cold-flow performance—just from variations. When we get closer to winter, impurities that commonly show up in soybean and rapeseed oil, and have little perceivable influence in warm weather, also can become real concerns.”

Heiden was one of the earliest researchers investigating low solubility impurities like sterol glucosides in blended biodiesel from soybean oil. He began this long journey in the early 2000s, when commercial biodiesel production in the U.S. was expanding rapidly.

Thorough and comprehensive feedstock testing, even on so-called “clean” feedstocks, and particularly as winter approaches, can help vet prospective suppliers, keep processes running efficiently, protect expensive equipment, and preserve the reputation of your company and its finished biofuel.

For more information on feedstock testing, click [here](#) to read Heiden’s recently published article in the Winter 2026 print edition of the trade journal Biobased Diesel®.

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