

# Health Effects TESTING

## HISTORY

In June 2000, representatives of the U.S. Congress announced that biodiesel had become the first and only alternative fuel to have successfully completed the Tier I and Tier II Health Effects testing requirements of the Clean Air Act Amendments of 1990. The biodiesel industry invested more than two million dollars and four years into the health effects testing program with the goal of setting biodiesel apart from other alternative fuels and increasing consumer confidence in biodiesel.

## TESTING

The first tier of health effects testing was conducted by Southwest Research Institute and involved a detailed analysis of biodiesel emissions. Tier II was conducted by Lovelace Respiratory Research Institute, where a 90day sub-chronic inhalation study of biodiesel exhaust with specific health assessments was completed.

## RESULTS

Results of the health effects testing concluded that biodiesel is non-toxic and biodegradable, posing no threat to human health. Also among the findings of biodiesel emissions compared to petroleum diesel emissions in this testing:

- ▶▶ The overall ozone (smog) forming potential of the speciated hydrocarbon exhaust emissions from biodiesels 50% less.
- ▶▶ The exhaust emissions of carbon monoxide (a poisonous gas and a contributing factor in the localized formation of smog and ozone) from biodiesel are 50% lower.
- ▶▶ The exhaust emissions of particulate matter (recognized as a contributing factor in respiratory disease) from biodiesel are 30% lower.
- ▶▶ The exhaust emissions of sulfur oxides and sulfates (major components of acid rain) from biodiesel are completely eliminated.
- ▶▶ The exhaust emissions of hydrocarbons (a contributing factor in the localized formation of smog and ozone) are 95% lower.
- ▶▶ The exhaust emissions of aromatic compounds known as PAH and NPAH compounds (suspected of causing cancer) are substantially reduced for biodiesel compared to diesel. Most PAH compounds were reduced by 75% to 85%. All NPAH compounds were reduced by at least 90%.

## SIGNIFICANCE

The health effects testing results provide conclusive scientific evidence using the most sophisticated technology available to validate the existing body of testing data. The comprehensive body of biodiesel data serves to demonstrate the significant benefits of biodiesel to the environment and to public health. This will lead to increased consumer confidence and increased use of biodiesel. Since the majority of biodiesel is made from soybean oil, a promising new market is materializing for soybeans.

