

# Ideal Analytical Tool for the Renewable Energy Industry

Ching-Hui Tseng,  
Kangming Ma, Nan Wang  
Cognis Corporation / QTA,  
Cincinnati, Ohio



## Introduction

- NIR technology has been commonly used in the field as a fast and non-destructive analytical tool for grain analysis.
- This technology should also be widely used in the renewable energy industry.



## Why NIR can be commonly used in the agricultural industry?

- Fast and non-destructive analysis
- Analyze only common traits such as moisture, oil, protein — no need to develop own applications
- Rugged instrument
- Easy to operate and maintain

## Why NIR can not be commonly used in the Renewable Energy Industry?

- More traits or properties need to be analyzed
- Need high performance NIR
- More variance between different plants
- Need in-house NIR experts to develop own applications

## An ideal NIR system for the Renewable Energy Industry

- A rugged and high performance NIR system
- Can do more complicated analysis
- Do not need in-house expert to develop and maintain the applications

## QTA Internet-enabled NIR system

- Rugged and high performance FT-NIR is provided
- Can do complicated analysis such as compositional contents, trans-fat, acid value, hydroxyl value, iodine value, degree of polymerization ....
- Methods are developed and maintained by QTA experts remotely

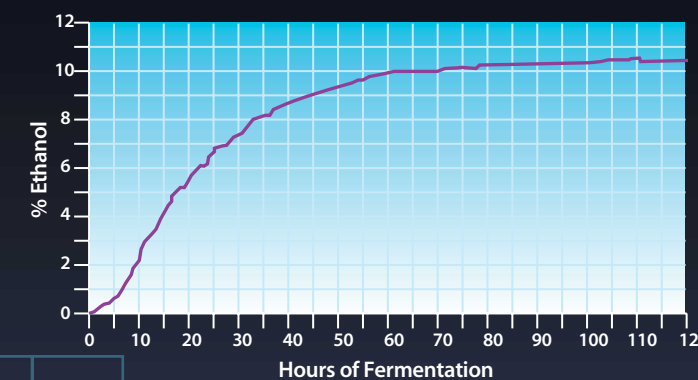
## Example of QTA application in the Renewable Energy Industry

- Analysis of incoming corn for alcoholic fermentation:
  - Protein, moisture, oil, starch
  - Reject loads of corn on the basis of moisture
  - Track corn suppliers more closely
  - More information of the crop for process optimization



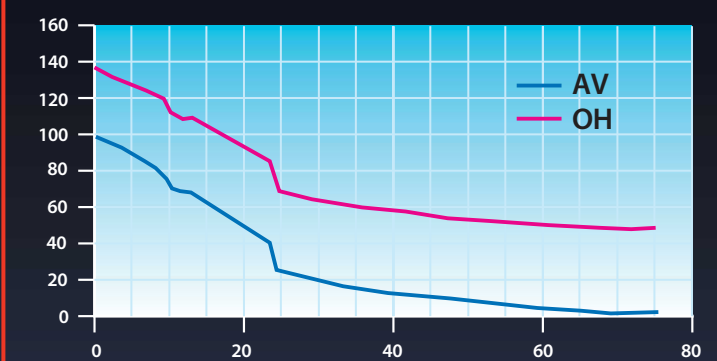
## Example of QTA application in the Renewable Energy Industry

NIR profile of ethanol production during fermentation



## Example of QTA application in the Renewable Energy Industry

NIR acid value & hydroxyl value real time plot during a fatty acid esterification reaction



## Conclusion

- NIR can be an ideal analytical tool for the renewable energy industry.
- The fast and non destructive analysis method allows a renewable energy plant to obtain real time chemical information for better quality control and the increase of the production capacity.
- Using QTA Internet-enabled NIR system, high performance NIR can be used by the renewable energy plant with minimum resources.

