BENEFITS BEYOND REBATES

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Maximizing the Value of Your Used Cooking Oil – and Building a More Sustainable World in the Process

By John Bullock, EVP North America Specialty Businesses & Chief Strategy Officer, Darling Ingredients Inc., and Todd Mathes, SVP Restaurant Services, DAR PRO Solutions

Used cooking oil. It's a by-product of running a busy restaurant, and something most owners and managers don't spend much time thinking about. As long as someone picks up their used oil on schedule, and the rebate checks arrive on time, it really doesn't matter to them where the oil goes or how it's handled after it leaves their store. Most believe that all oil collection companies are alike—they all work the same way, do the same thing, and don't provide any real value to the restaurants or supermarkets themselves.

There may have been a time when much of that was true. But, not anymore.

Adding Value Through Service and Innovation

DAR PRO Solutions is a Darling/Griffin brand

DAR PRO SOLUTIONS

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The fact is, where the used cooking oil goes, and how it's handled along the way, can not only impact a restaurant's internal operations, liabilities and employee safety, but the public's perception of the restaurant's brand, as well.

Choosing the right grease service provider can make all the difference.

Through responsible processing, used cooking oil is cleaned of impurities and water, producing a product valued as a nutritional ingredient for animal feed, as feedstock for biodiesel and renewable diesel production, and in assorted industrial and commercial product applications. Instead of simply getting rid of their used oil, restaurants, supermarkets and others in the food service industry have the opportunity to help safeguard our environment, contribute to U.S. energy independence, help ensure a safer food chain, and connect with an increasingly environmentally-conscious consumer base in a whole new way.

This paper will focus on the benefits of processing used cooking oil into biofuel and its impact on the environment and economy. It will also discuss what restaurants and other retailers in the foodservice industry should look for in a service provider to maximize the value of their sustainability efforts – beyond the rebate check.

USED COOKING OIL, BIOFUEL AND WHAT IT ALL MEANS

Let's start with the basics of biofuel.

By definition, biofuel is fuel derived from living matter. One of the first generation biofuels in the U.S. was ethanol, produced primarily from the sugars and starches in corn. For the purpose of this paper, we'll be discussing modern-day biodiesel and renewable diesel. Both are clean, sustainable fuels, but with different characteristics.

Biodiesel is an add-in fuel for petroleum-based diesel, made by combining methanol with

About the Authors

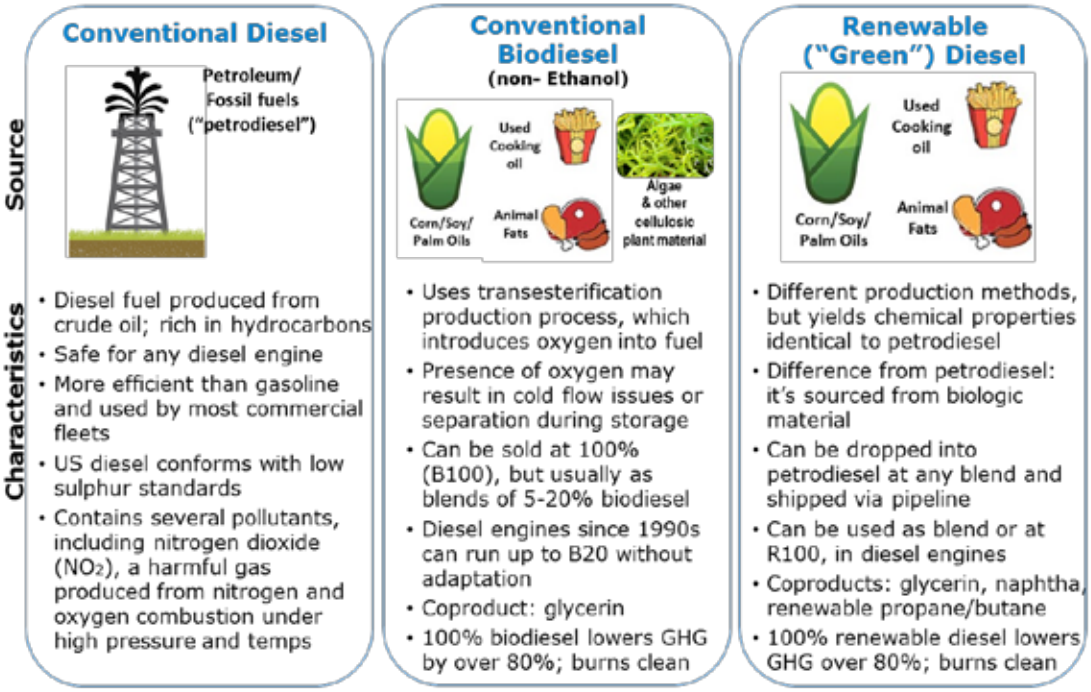
John Bullock *– EVP North American Specialty Businesses and Chief Strategy Officer, Darling Ingredients Inc.*

In January 2014, John Bullock was appointed Executive Vice President of North American Specialty Businesses and Chief Strategy Officer of Darling Ingredients Inc. John is responsible for leading, supporting and developing our strategies and investments globally. Prior to this, he served the company as Senior Vice President of Business Development. He played a significant role in helping Darling Ingredients grow, most notably with the development of and investment in our Diamond Green Diesel facility and several of our acquisitions.

Todd Mathes – *Sr. VP of Restaurant Services (DAR PRO Solutions brand), Darling Ingredients Inc.*

Todd Mathes entered the poultry industry in 1990 serving in various senior management roles across multiple plant operations at Gold Kist and Perdue Farms. In 2003, Todd joined the management team at Terra Renewal where he served in various roles including management, business development, and senior executive positions. Todd was serving as the Chief Operations Officer for Terra Renewal when that organization was acquired by Darling in 2012. Since that acquisition, Todd has served as Sr. Vice President of Darling Ingredients' restaurant services division, which operates as our DAR PRO Solutions brand.

animal fats, distiller oils or used cooking oils. Whereas diesel fuel is a hydrocarbon, made up of hydrogen and carbon, biodiesel is a methyl-ester, containing hydrogen, carbon and oxygen, as well as an alcohol molecule. Diesel producers normally blend between 5% and 20% of biodiesel into a gallon of diesel fuel, and consumers can use that fuel blend without having to modify existing diesel engines. Biodiesel is an environmentally safe, efficient and clean fuel, but may have flow issues in cold weather, and, in the U.S., is mostly distributed via truck or rail.



Comparison of types of diesel fuels, common feedstocks (sources), and fuel characteristics. [Source: company information]

Renewable diesel is a more recent innovation, and like biodiesel, it is made from a variety of fats including animal fats, used cooking oils and distiller corn oils. Its composition has no alcohol and no oxygen, but is a true hydrocarbon, having the same properties and structure as petroleum diesel. As such, fuel refiners can drop renewable diesel into diesel fuel at any percentage and distribute it through the existing diesel pipeline and infrastructure. In fact, renewable diesel is so close to the real deal that companies can operate diesel-equipped vehicles and machinery entirely on renewable diesel, with no performance loss and without the environmental impact.

Both biodiesel and renewable diesel are clean burning, lowering emissions by up to 85%[1] as compared to petroleum-based fuel.

"The use of biofuels significantly impacts air emissions," said Gene Geobolys, founder, president and CEO of World Energy, and chair of the RFS2 Task Force (Renewable Fuel Standard). "Diesel fuel molecules are heavier than oxygen, and the emissions that cause respiratory illness, and asthma in children, float close to the ground. As a result, those emissions are more likely to impact the air that adults and children are breathing. Because biofuel is a blended diesel, it reduces those fine particles, thus having less of a negative impact on human health, because it doesn't fly so close to the ground."

Did you know Darling Ingredients pioneered the use of animal fats and used cooking oils as biofuel in North America?

In 1997, our Butler, KY plant (formerly Griffin Industries) was the 1st U.S. commercial operation to convert this material into biodiesel. Similarly, our Rothsay brand was the 1st such commercial plant in Canada in 2005. Both facilities are still in operation today.

FUELING THE BIOFUEL MARKET

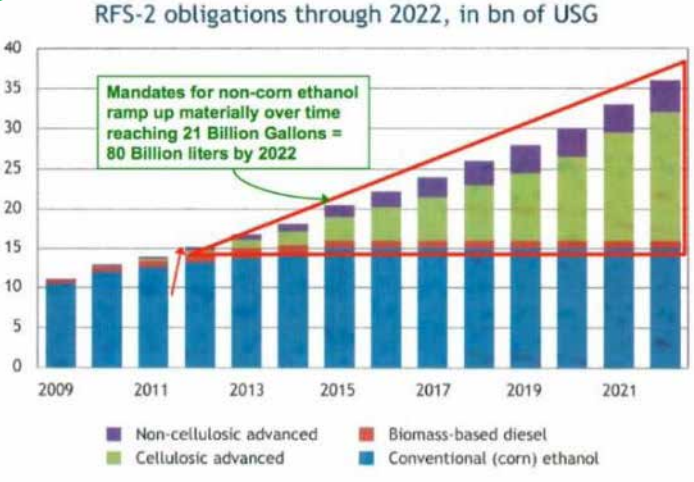
The whole concept of biodiesel began in the late 1980s, a time when European farmers were producing more grapeseed oil than the market demanded. They had to find a way to increase the value of the oil to protect their livelihoods, and avoid surrendering their fields to urban sprawl.

These farmers ultimately turned to the transesterification of vegetable oils, a technique developed during World War II, which took agricultural output and used it as fuel. The idea took hold, and biodiesel plants started opening in Germany and France. Soon, countries like Indonesia, Malaysia and Argentina began exporting their excess palm oil and vegetable oil for biofuel.

The concept expanded to the U.S. in the 1990s, after farmers saw what was going on overseas. Their focus was on ethanol, which not only produced an environmentally friendly fuel, but also created an additional demand for corn. Interest grew and production expanded to include other forms of biofuels, most significantly, biodiesel and renewable diesel that was produced from animal fats, used cooking oil and distiller oils. Darling Ingredients constructed the first commercial biodiesel facility in the U.S. that used animal fats and used cooking oil as feedstock for the production process, well before there were government incentives to do so.

As the benefits of these alternative fuel options were recognized, government entities looked for ways to encourage their proliferation. Some countries mandated renewable fuel production; others offered direct cash payments, tax credits or other incentives. The U.S. chose the incentive route, first by offering ethanol tax credits and then adopting the original Renewable Fuel Standard[2], which included a provision for biofuel. But, the real biofuel boom came in the late 2000s, when the U.S. Congress passed the second Renewable Fuel Standard, better known as RFS2, a demand-generation program that provided market-based incentives for the production of a variety of renewable fuel types, including biodiesel and renewable diesel.

Essentially, the goal of the RFS2 was, and is, to reduce greenhouse gas emissions and expand the nation's renewable fuels sector while reducing



- Categories of fuel types are nested; each category contributes its total towards the renewable fuel total
- UCO and animal fats are used in **Biomass-based diesel** and **Non-cellulosic advanced** (renewable diesel) categories

Source: The Biofuels Digest's "California LCFS/US RFS; What's New? What's Happening?" March 2017

reliance on imported oil. The concept is relatively straight-forward. The government established mandatory usage specifications, which required the inclusion of biofuels into diesel fuel and gasoline, thereby creating demand for the product in order to be in compliance with RFS2.

Other programs, like the California Air Resources Boards' Low Carbon Fuel Standard[3] (LCFS), soon followed, incenting the use of carbon-reducing fuels on the state level. Under the LCFS, if one fuel produces an 80% greenhouse gas emission reduction and another reduces emissions by 30%, that credit is adjusted, based on impact. In other words, the fuel that reduces more greenhouse gas emissions gets the greater reward.

Not only do these programs reduce emissions, but, by encouraging producers to grow their own sources of energy, rather than importing it, they work to stimulate the U.S. economy.

"When you displace fossil fuel, you change the fossil fuel supply and demand mix, so fossil fuel, and all petroleum, becomes less expensive. When petroleum is less expensive, it works as a stimulant to the entire economy," Gebolys said. "So,

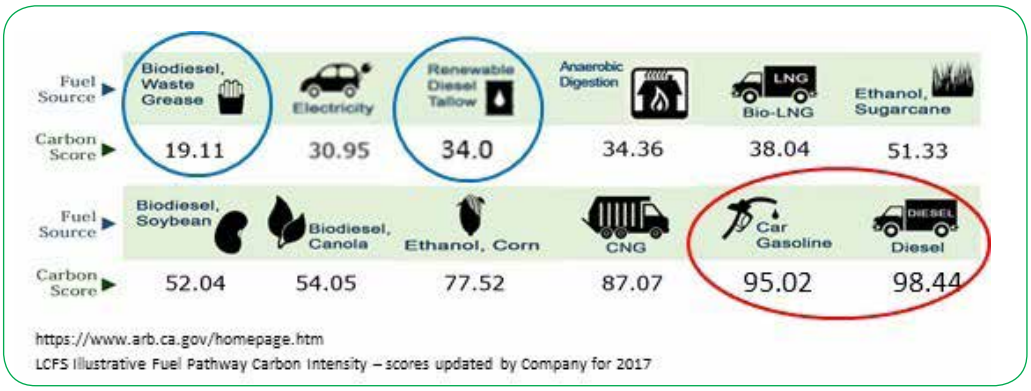
Countries participating in some form of a Low Carbon Fuel Standard. California represents ~12% of all U.S. transportation fuel needs.
Source: http://globalrfa.org/biofuels-map

biofuel is an amazing little technology that can be, and can accomplish, many positive things."

THE BIOFUEL-RESTAURANT CONNECTION

Which brings us to the restaurant-biofuel connection: ***used cooking oil, the stuff that was once considered worthless, now has real value.*** Instead of charging pick-up fees to restaurants (and supermarkets, hotels, arenas or any venues with on-premises fryers) to haul their used oil away, service providers often began paying a stipend, or rebate, to remove it; or at least charging less for their services. As the demand for biofuel grew, more biofuel producers started springing up, eager to collect used cooking oil.

Increased demand = Increased value



Comparison of carbon scores (i.e., "well-to-wheels" lifecycle of GHG emissions) between different fuel sources

On the surface, these used cooking oil collectors and biofuel producers seemed like they did the same thing: they pick up the oil and pay a rebate, deal done. But, the reality is, ***all companies that collect used oil for biofuel are not the same.***

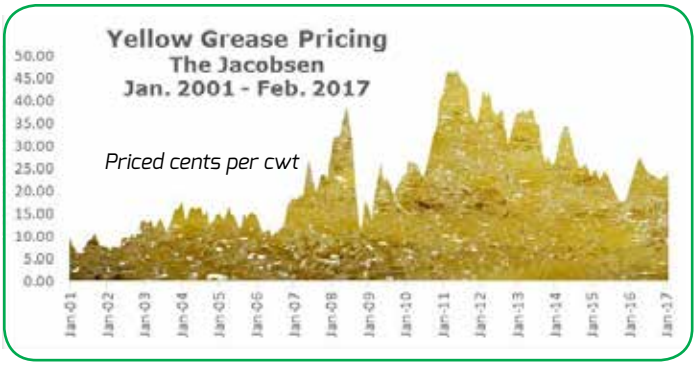
While all pick up the used oils and animal fats and haul it away, that's where the similarity ends. All service providers don't:

- make the same investments in their business and infrastructure – in their fleet, supply chains and their commitment to the restaurant and food industry;
- run their businesses based on safe, ethical and environmentally sound practices; and/or
- operate their own biofuel production facilities, but sell the oil they collect to others, who may or may not operate ethically and safely.

All of these factors have a definitive impact on the total value restaurants receive for their oil, beyond the rebate.

Today, choosing the right service provider is a significant business decision.

Used cooking oil and the fat from meat by-products are processed into yellow grease, a commodity that is valued and reported on by The Jacobsen[4], which tracks agricultural market segments related to the protein conversion, or rendering, industry. The value of yellow grease rises and falls daily, just like the markets for copper or gold, meaning the variance in the prices businesses pay in rebates is very marginal. Restaurant and grocery/retail management need to look beyond the basic transaction, and choose the company that delivers the most overall value.



In other words: which provider not only picks up the oil and provides the best value, but offers benefits to the restaurant that positively impact its internal operation and brand perception?

WEIGHING THE OPTIONS: 5 Ways to Effectively Vet Your Service Partner

What should restaurants and supermarkets look for in a used cooking oil service provider? How can they separate the hype from the real substance?

By using the following criteria, restaurant managers can differentiate the "posers" from the pros.

1. Invests in Innovations That Make Life Easier for Its Restaurant Partners

In a typical scenario, restaurant employees are required to remove used cooking oil from the fryers and physically tote this to outdoor barrels or 300-gallon containers in the parking lot. *This process can create real liabilities.*

- Transporting hot grease from kitchen to parking lot increases the chance of injury. Employees could get burned by the hot oil, injure themselves when lifting the weight of the oil, or spill it en route to the outdoor container.
- Any grease spillage leaves a slippery mess that must be cleaned up, and exposes employees and possibly customers to the threat of falls.
- As the value of used cooking oil increases, those outdoor containers become greater targets for theft, adding a loss of value risk to an already risk-prone process.

Shouldn't your service provider be doing to something to alleviate those pains?

Darling Ingredients, through our **DAR PRO Solutions** brand, has invested the time, money and talent to develop efficient, indoor collection containers that greatly reduce the chance of employee, or customer, injury. We developed the industry's first indoor tank in the 1980's, and have since diversified our product line to accommodate most any restaurant's grease volume or floor space. Because the containers are closer to the fryers, and most models are hands-free, automated, fully-enclosed tanks, any contact an employee has with hot grease is greatly reduced, if not eliminated. Indoor containers also remove the risk of outdoor spills that can cause customer injury, environmental harm, and an unsightly and odorous mess in the parking lot. And, last but not least, indoor tanks retain the oil's value, virtually eliminating contamination of the grease by debris and water, as well as the risk of grease theft. DAR PRO's ***indoor storage options have greatly improved a store owner's problem of "how to handle my used cooking oil,"*** by actively helping to decrease workers' compensation claims and protect employees' well-being, while preventing lost revenue due to oil theft or contamination.

2. Controls the Supply Chain

Numerous companies claim the used cooking oil they collect will be used to make biofuel. A very few own or operate their own biofuel production facilities. Most transport the oil to smaller bio-

Most used cooking oil service providers offer their own used oil collection tanks. DAR PRO Solutions has invested in developing a diverse line of indoor equipment, with direct pump hookup options, that meet most any store's grease volume and back of house space. Outdoor bins are also available, some with theft deterrent lids to combat the growing problem of grease theft.

diesel facilities, some no more than garage set-ups, that may not operate in an environmentally safe manner. Some don't even own the trucks, or employ the drivers, that collect the oil.

Without complete control of the supply chain, there's no guarantee of consistent service, and no assurance a restaurant's oil ends up as renewable fuel. How it's handled along the way, whom it's sold to and what happens to it after it leaves a restaurant are based on good faith. In some cases, that good faith could be unfounded.

Darling Ingredients has invested heavily in our infrastructure to support our restaurant services division.

We operate the 34th largest private fleet[5] in North America and own nearly 800 railcars[6] to move our product across the country. Other than the few geographic areas we can't service and use qualified third-party services, our own employees drive our service trucks, equipped with computerized logistics for the efficient routing, scheduling and reporting of service stops.

Additionally, we have invested millions to develop innovative biofuel solutions. We constructed and still operate the first commercial facilities in Canada and the U.S. to produce biodiesel from animal fats and used cooking oil: the Kentucky plant began operations in the late 1990s and Quebec started up in 2005. These plants produce fuel that is biodegradable, meets all current specifications for biodiesel in their respective countries, and reduces air emissions up to 85%.

Most recently, Darling Ingredients partnered with Valero Energy Corporation to build Diamond Green Diesel®, the largest facility in

A CLOSER LOOK AT DIAMOND GREEN DIESEL

Recycled animal fats and used oils are brought to the Diamond Green Diesel facility by truck and rail, where they are processed into renewable diesel and and can be distributed with petroleum diesel via the pipeline infrastructure.

DIAMOND GREEN DIESEL – A WIN FOR THE FOOD INDUSTRY AND FOR DAR PRO SOLUTIONS

- Joint partnership between **Darling Ingredients and Valero Energy**; began production in 2013
- **Largest North American facility** to produce renewable diesel from animal fats and used cooking and distiller oils (Norco, Louisiana)
- DGD **processes ~11%** of the nation's animal fats and used cooking oil
- Currently **producing 160 mill. gallons/year**
- **Expansion to 275 mill. gallons** by 2018
- **Lowers greenhouse gas emissions** up to 85% as compared to petroleum diesel
- Renewable diesel is chemically identical to petroleum diesel, and can be dropped into and **distributed via the pipeline**
- By creating a steady demand for recycled fats and oils, DGD has helped **maintain the value of used cooking oil**

North America to convert animal fat and used oils into renewable diesel. As stated earlier, renewable diesel has the same chemical properties as petroleum diesel, and like biodiesel, reduces air emissions by up to 85%. Today, Diamond Green produces 160 million gallons of renewable diesel annually[7], with planned expansion to 275 million gallons to be completed by mid-2018. It's on a scale like nothing else in the industry.

The National Renderers Association reports that ***approximately 56 billion pounds of animal fats and meat by-products are collected by North American renderers annually and approximately 4.4 billion pounds of used cooking oil is collected[8].*** The Diamond Green Diesel plant alone uses 11% of the combined animal fats, used cooking oils and distiller oils in the United States, with a rate of output that props up the oil's market value. If Diamond Green Diesel didn't exist, 11% percent of these inedible fats and oils generated by the U.S. food industry would go back into the regular marketplace, lowering rebate amounts and the overall value of the used oil.

In short, Darling Ingredients actively invests in biofuel production, and in the infrastructure to effectively move those used oils from restaurants and supermarkets to our own processing and biofuel processing facilities.

No other company in our industry comes close to this kind of commitment.

3. Helps You Elevate Your Brand by Capitalizing on Your Recycling Efforts

If your service provider owns the supply chain, then you know exactly where your used cooking oil is going. That means you have the opportunity to tell your customers your own sustainable story—to showcase your efforts and active involvement in reducing carbon footprints and U.S. dependence on foreign oil.

"Consumers today—particularly Millennials—are less concerned with finding the cheapest food or product, and instead, make more of their buying decisions based on how companies are impacting the world they live in," Geobolys of World Energy said. "All kinds of companies are trying to position themselves as more responsible, more conscious of waste. So, to that end, what restaurants do with their oil can't be an afterthought any longer. It is a critical component of their business and brand."

According to a 2015 Nielson Global Corporate Sustainability Report[9], ***66% of global consumers are willing to pay more for sustainable brands. A full 70% of Millennials, representing approximately $2.45 trillion in spending power, would switch to a brand that supported a cause, even if they had to pay more for those products.*** The same demographic that wants to know where their food is coming from also wants to know what's happening to the waste produced in that food preparation.

The problem is, very few restaurants or supermarkets are taking full credit for their cooking oil recycling, or are telling that story through their marketing. As routine as it may seem to store owners, recycling oil safely and supporting an effort to transform that oil into biofuel, is just the story many consumers want to hear—*if* that story is told in a true, authentic way.

4. Is Completely Transparent

In the past, and still today, many of the companies that came to pick up used oil flew under the radar. They showed up, they got the oil, and usually didn't tell store operators much about how they did business, whether the person picking up the oil was an employee or a contractor, or what they did with the used oil after it was collected.

In today's culture of social responsibility, it pays to make sure the company picking up your oil is a worthy partner with the resources to do its job well, invest in your success, and use your cooking oil in an environmentally friendly way.

It won't take long to realize that all service providers are not created equal.

Ask your service provider:

- What's different about your service?
- How will you make my life easier and help my restaurant/supermarket/hotel/etc.?
- Do you have any programs in place to help me market our recycling efforts to our customers?
- You claim my oil will become biofuel, but how do I know that for sure?
- What kind of investments has your company made in biofuel production?
- When are customer service reps available?
- How long have you been in business?
- Do you own your processing facilities or fleet?
- What kind of insurance do you carry?
- Do you keep up with grease trap regulations?
- What kind of rebates do you offer?

5. Is In It For the Long Term

When the yellow grease commodity market is high, there's no shortage of service providers; it can become a bit of a street war trying to gain the business of collecting a restaurant's used cooking oil. But, when the market heads south, many of those "companies" disappear, leaving their customers hanging.

The reality is, the market will fluctuate. There will be good years and lean years. ***The best service providers have the stability, financial resources and industry commitment to be there for their customers for the long term.***

Darling Ingredients has been in business for more than 130 years, serving its customers and investing in the future of the industry. We not only have a strong history but, just as important, believe we have a long future ahead. In short, we will be there for our customers, with the same commitment and reliable service, regardless of market values.

CHOOSE THE SERVICE PARTNER THAT IS COMMITTED TO YOU!

Now, more than ever, what you do with your used cooking oil truly matters. ***With the right partner, you maximize your benefits and ensure your oil is actually making a difference*** — to the environment, to U.S. energy independence, and to public health as a whole.

At Darling Ingredients, sustainable operations are fundamental to who we are and what we do. Our processing plants capture and convert the greenhouse gas emissions that would otherwise be released if the meat by-products we process were landfilled, composted, or otherwise discarded. We not only pick up and transport oil, but we have invested hundreds of millions in converting that oil into biodiesel and renewable diesel. Without these biofuels, and standards like RFS2 and LCFS, our roads and cities would suffer from higher emission levels than they do today.

Just as important, we've invested in making it easier for our customers to do the right thing, from our innovative, indoor collection tanks to the professionalism of our staff, dedicated to developing first-class customer relationships. We know you have a store to run. Our mission is to make the oil collection process as simple and unobtrusive as possible.

If you're not thinking about who's picking up your cooking oil, and what's happening to it after it leaves your store, you should. With the right partner, you can maximize the value of your efforts, well beyond the rebate, and make running your business a little easier in the process.

Our Newark, New Jersey office and processing facility.

FOOTNOTES

1 Various studies have been conducted on greenhouse gas emissions and the emissions impact of biofuels as compared to petroleum diesel. US Dept of Energy, Alternative Fuels Data Center cites study by Argonne National Laboratory. http://www.afdc.energy.gov/vehicles/diesels_emissions.html

2 The original Renewable Fuel Standard is a federal mandate, initiated as part of the Energy Policy Act by the EPA in 2005. In 2007, RFS was expanded and renamed RFS2, setting production incentives and minimum volumes of categories of biofuel to be used in the nation's transportation fuel supply.

3 The Low Carbon Fuel Standard (LCFS) is a state mandate. California was first to adopt in 2007 with standards set by California Air Resources Board, requiring producers of petroleum-based fuels to reduce the carbon intensity of their transportation products. California's goal is a 10% reduction of transportation-based carbon intensity by 2020. Oregon is the only other state, at the writing of this paper, who has adopted a LCFS, although other states are examining implementation. Similar LCFS mandates are in effect in parts of Canada and the EU, and other countries.

4 The Jacobsen, www.thejacobsen.com, reports primarily on the agricultural markets that relate to the rendering industry, following trends and prices in an unbiased way for its subscribers

5 Transport Topics, "Essential Equipment & Operating Information for the 100 Largest Shipper-Owned Truck Fleets in North America" 2016 List (ttnews.com)

6 Company provided data.

7 Company provided data.

8 From National Renderers Association, "Rendering is Recycling" infographic, www.nationalrenderers.org

9 "The Sustainability Imperative; New Insights on Consumer Expectations" October 2015, Nielsen, http://www.nielsen.com/content/dam/nielsenglobal/dk/docs/global-sustainability-report-oct-2015.pdf

About Darling Ingredients

Darling Ingredients Inc. is the world's largest publicly-traded developer and producer of sustainable natural ingredients from edible and inedible bio-nutrients. Darling Ingredients creates a wide range of ingredients and customized specialty solutions for customers in the pharmaceutical, food, pet food, feed, technical, fuel, bioenergy and fertilizer industries. With operations on five continents, the Company collects and transforms all aspects of animal by-product streams into useable and specialty ingredients, such as gelatin, edible fats, feed-grade fats, tallow, animal proteins and meals, plasma, pet food ingredients, organic fertilizers, fuel feedstocks, green energy, natural casings and hides. The Company also recovers and converts used cooking oil and commercial bakery residuals into valuable fuel or feed ingredients. In addition, the Company provides grease trap services to food service establishments, environmental services to food processors, and offers their own line of restaurant cooking oil collection equipment.

For additional information about Darling Ingredients, visit the company's website at www.darlingii.com or follow us @darlingingredients on Facebook and Linked In.

About DAR PRO Solutions

DAR PRO Solutions is a U.S.-based brand of Darling Ingredients focusing on providing professional grease removal services to restaurants, supermarkets, and others in the hospitality or foodservice industry. DAR PRO Solutions collects used cooking oil and meat proteins, fats and bone from its customers, and transports it back to Darling's national network of facilities where it is cleaned of impurities and water and used as a nutritional ingredient in animal feed and pet food, as a feedstock for biofuel, or for other commercial and industrial applications, such as soaps, cleansers, paints, and more. DAR PRO Solutions also provides customers proprietary used cooking oil collection and storage equipment for both indoor and outdoor installations. DAR PRO Solutions also offers professional grease trap services to ensure customers are meeting all required environmental codes for wastewater streams feeding into a municipal water treatment supply. The DAR PRO Solutions brand was established after the acquisition of Griffin Industries by Darling Ingredients in 2010.

Learn more bout the DAR PRO Solutions brand at www.darpro-solutions.com, or follow us @darpro-solutions on Facebook, Linked In or Twitter.

For more information about our services, please contact us:

(855) DAR-PRO1 (855) 327-7761 · **recyclingservices@DarPro.com**

251 O'Connor Ridge Blvd. · Suite 300 · Irving, TX 75038

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